

MANAGING THE DEMAND FOR MOBILITY: A TRANSFORMATIONAL POLICY INSTRUMENT

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INTRODUCTION

Government restrictions on our daily mobility during the strict COVID-19 pandemic lockdowns pushed the topic of Demand Management in front of our very eyes. To ensure that public transport remains COVID-safe, actions such as ‘flattening the peak’ and securing physical distancing in transport vehicles and stations have required to control demand.

During the pandemic, with the exception of essential workers or those whose presence is required for specific activities, many elements of our daily life (such as work, shopping, medical consultations and leisure pursuits) have shifted online. This has persisted, thanks to widespread digitalisation and access to the Internet.

Without minimising the consequences of the pandemic on individuals and society, the strict restrictions - including severe lockdowns - have made significant improvements possible in the quality of the urban environment, with reduced congestion and noise, cleaner air and skies, lower carbon emissions and a more visible presence of animal species in our urban environments. These targeted benefits have rapidly become a reality.

This paper considers that the time has come to accelerate the promotion of Demand Management, which should become a full transport planning tool to reinforce public transport and make our mobility more sustainable.



WHY SHOULD WE LOOK AT DEMAND MANAGEMENT?

In the medium to long-term, a crisis such as the COVID-19 pandemic has proved both a game changer and a breaker of habits. New trends and expectations have started to emerge. **The pandemic has changed people's expectations of travel conditions in public transport** (for example on distancing, comfort, sanitary level). In addition, new mobility practices have been observed. There have been increases detected in the levels of walking and cycling for local and shorter trips, reflecting a change in lifestyles and habits. Meanwhile, trend to working from home, hybrid work and flexible working times have emerged. There has also been a relative increase in leisure and non essential trips. A boom in e-commerce and delivery has also been seen.

Noticeably, the crisis has generated negative impressions of public transport and shared services: **the level of ridership in public transport is lower today than in pre-pandemic times**. This has translated into a revenue crisis: in a challenging funding context and limited public budgets, public transport authorities (PTAs) recognise that there is a need to improve the value proposition of public transport and shared services, and to deliver cost-effective services. Furthermore, a continuous increase in car usage (both for short trips in urban areas or for longer distances where there is no alternative by foot or bicycle) and in congestion has been observed in certain places. In addition, an increase in car use - whether electric vehicles based on subsidy or cheaper, second-hand cars - is another undesirable trend, one that will hamper the goal of sustainable mobility and put climate change mitigation objectives out of reach.

As vaccinations progress and the impact from infection transmission reduces for most citizens, will the pre-COVID-19 lifestyles and behaviours remain, or will these new travel habits persist? How significant will the change be, and what are the gains that can be locked in? How can we limit undesirable trends and mitigate their externalities without hampering the ability of citizens and society to move around freely? What policy tools will reinforce public transport as the backbone of urban mobility?



WHAT IS DEMAND MANAGEMENT?

A common approach to solving transport problems involves managing the supply side: this means developing new infrastructure, better managing existing facilities or implementing new offerings in transport services (shared bikes, cars...). **There is a pressing need to enhance investment strategies and develop new infrastructures or widen transport services. These should be complemented and supported with policies targeting transport demand and supply imbalances.**

This approach consists of **focusing on managing our demand for mobility better**. This will require measures capable of influencing peoples' travel behaviours, habits and mobility patterns in a way that balances what is socially acceptable and positively received against high-level policy goals (such as sustainable development and robust funding models). The goal is to better align them with a certain level or type of transport offering, to implement measures to change travel practices (shifts in mode, time, geography...) or to mitigate the need to travel.

The fundamental nature of demand management is transformational, and will support a transition in our mobility. It also is a societal issue to benefit the public, one which goes beyond the ecosystem of transport and mobility.

Demand Management is different from the following concepts: 'Traffic Management' refers to managing and regulating the flow of road traffic and vehicles; 'Crowd Management' refers to managing and regulating the flow of public transport users in a specific station or transport line; 'Demand forecast' refers to modelling in order to calibrate and plan a new service or transport infrastructure.

HOUSEHOLD SURVEYS IN SINGAPORE

Challenges in planning for future transport infrastructure and assets arise from a lack of clarity and certainty in future trend-driven transport demand.

Transport planners take information and insights from national-level household travel surveys, conducted by Singapore's Land Transport Authority (LTA) every five years. The surveys cover about 50,000 respondents and are used to help understand current travel behaviour, preferences and to reveal emerging transport trends. These become the basis for planning parameters in the forecast for longer-term future transport needs. Key questions in these surveys include the origins, destinations and transport modes used for commuting.

In 2021, the LTA conducted the latest round of household travel surveys digitally for the first time. Respondents can use an intuitive interface to complete the survey in English, Mandarin, Malay or Tamil. Gift cards are also awarded to incentivise participation. The household travel survey allows the LTA to understand travel patterns and car ownership relative to household and individuals' characteristics. The data collected is comprehensive, and supplements observations from other transit data sources, such as passengers' farecard data. The survey results can be dissected across multiple variables, providing updated assumptions / parameters when modelling projected transport demand. This enables more accurate forecasting/forward planning when implementing transport infrastructure and assets (which have an impact on budget, comfort, etc.) to meet longer-term travel demand, thus leading to a more efficient use of limited resources.



1 UITP, 2020. *Flattening peak travel time: Measures to better distribute travel demand.*

A TAXONOMY OF TOOLS

On the next page, you will see a diagram outlining the taxonomy of tools for demand management.

When Demand Management is implemented, the focus is often on how to manage the peak-time demand. Influencing demand starts with measures to manage traffic, movements, trips (represented in green) and requires the use of regulation, financial incentives and taxes. It also relies on reaching out to people with communication on the alternative mobility options that are available.

Yet, Demand Management covers a wider spectrum. Mobility is a derived demand; therefore, two further aspects are considered for management.

- **Policies that influence our way of life** (represented in yellow). As mobility is derived from our daily activities programme and is heavily influenced by our lifestyles (such as work, statutory situation, personal activities), way-of-life-related measures aim to change the representation of the need and the way we travel (awareness raising, promotion and tailored travel advice). They also seek to alter the times of our activities (school, work, shopping, leisure, tourism and so forth), and at developing a digital strategy that could complement or substitute physical mobility.
- **Land use, space and transport planning policies** (represented in red) aim at transforming our living environment – be it urban, suburban or rural, from a street level to a city level – to improve access to different places and activities (residential areas, employment areas, education institutions, commercial and leisure areas, green and blue spaces) and to reduce the dependence on moving around or on using a private car. **Land use, space and transport planning measures** relate to strategic planning (strategic land use planning), to urban transformation of specific areas (such as universities, Central Business District (CBD), commercial areas, leisure activities centre or specific events) or the development of mixed-used areas.

This paper proposes a taxonomy elaborated from practical experiences.

ELEMENTS OF DEMAND MANAGEMENT

MEASURES TO MANAGE MOBILITY



REGULATION

Speed limit
Vehicle Access Restrictions: pollution, noise, size
Geographic and time access restrictions



FINANCIAL INCENTIVES

Travel allowance
Fare integration reduction
Reimbursement, subsidy policies



TAXES

Road Traffic charging occupancy
Road Parking charging
Vehicle tax (purchased, weight, insurance...)
Vehicle use tax (fuel, carbon)



COMMUNICATION ON EXISTING ALTERNATIVE TRANSPORT SOLUTIONS

- Optimised infrastructures
 - Traffic management
 - Infrastructure upgrade (road, hubs...) and space re-allocated (road, parking, bus/tram/BRT, bicycles, pedestrians...)
- Efficient Services
 - Develop, extend, adapt new mobility services (bike sharing, car pooling, ride hailing, autonomous)
 - Fine-tune the service level/offering
- Integrated services: MaaS

POLICIES FOR LAND-USE AND TRANSPORT PLANNING

SPATIAL PLANNING

Strategic, Land-use & Transport Planning
Improving existing areas: density, connectivity
Transit-oriented Development
& mixed-use planning mobility hubs



SITE-BASED APPROACH

A specific population or area: schools, students, commercial shopping areas, working districts...



POLICIES FOR DAILY LIFE

INFORMATION, EDUCATION, AWARENESS, PROMOTION

Provide Mobility advice: Cost calculator
Promote market and encourage alternative behaviours, modes, services
Organise events (Car-free day)



MANAGING OF ACTIVITIES

Work from home & flexible
Adjusted school & university time
Opening times of shops, activities



DIGITAL AND TELE-ACCESS

Shop, E-gov, E-health...
Access to New Technologies
Navigation support applications



Demand Management is relevant in different time contexts and is framed in different contexts. First, as short-term responses to an acute event, a crisis, an emerging technology: it offers the opportunity to accelerate implementation of specific measures and to opportunistically lock in the gains. Second, demand management can be used as part of long-term strategy, triggering a real transformation - carefully planned today - for future outcomes and gains.



BUDAPEST: LESSONS LEARNED FROM EURO 2020 HOST CITY

Budapest was one of the host cities of the EURO 2020 football tournament. Four matches were held in the Puskás Aréna, with up to 67,000 spectators attending. Instead of only managing the supply side, it was mainly the demand that was managed: encouraging spectators to use public transport and other alternatives. No parking spaces were made available, and roads in the vicinity were closed. The well-prepared mobility concept involved the main stakeholders: the transport operators, the police and the airport authority.

For such a city event, the following tools are generally available for handling the demand.

The travelling conditions during the EURO 2020 tournament proved robust and smooth.

The passive, push and pull factors for Budapest's Demand Management strategy are outlined on the next page.



MILAN: A LIFE RHYTHM STRATEGY TO RESPOND TO THE COVID-19 CRISIS

In Milan, a strategy to imagine how life could be organised during the pandemic was implemented. This covered Demand Management for the times of services and activities of the city and their connections with public transport. This strategy considered that demand should be adapted to the transport supply.

First, the strategy makers focused on ‘shifting the peak’, so that people could travel at different times throughout the day. Strategists worked on times for schools, businesses, public offices and even shops (during summer). However, in September 2020, greater optimism around the situation was developing, and the second wave arrived later.

When the second wave hit the city in 2020, restrictions were once again put in place (curfew, shop closure, etc). Time management policies were reintroduced. There were also discussions about who (the local authority or the Prefect (State) should be responsible for deciding on these measures. To achieve this, all stakeholders have cooperated to define the new time management policies under the authority of the Prefect.

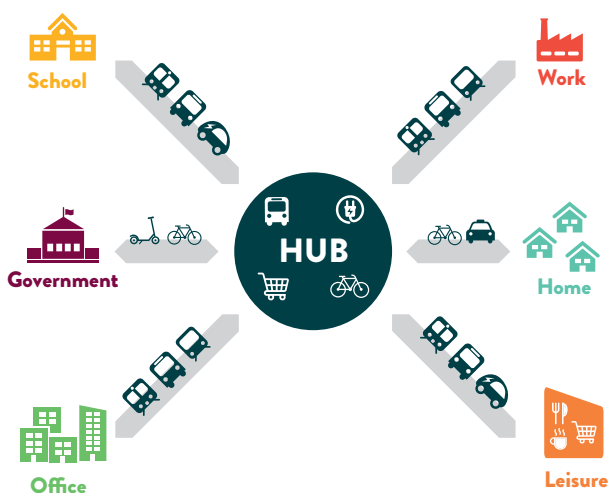


MOBILITY HUBS IN THE DRENTHÉ PROVINCE AS A MOBILITY ENHANCER

A mobility hub is a location that seamlessly integrates different transport modes and multi-modal infrastructure (bicycles, car sharing and carpooling). It increases the inherent value of every single transport mode. As a result, sustainable transport services are viewed as attractive options and as an alternative to private car use.

The network of mobility hubs, developed in Drenthé province in the Netherlands, is composed of places of urban or rural life that provides varied facilities and local public or commercial services. These could include a post office, a site for deliveries, local shops and cafés as well as decentralised services such as a university library or a doctor's surgery.

These hubs have been built around communities' needs to become destinations in their own right and thus reduce the need to travel, as well as making it easier for those that do need to access public transport and other mobility services.



ANTWERP: A DEMAND MANAGEMENT STRATEGY COMBINING REAL AND VIRTUAL MOBILITY

The City of Antwerp has outlined and implemented a multi-step strategy for regulating and aligning real and virtual mobility. The five founding principles are to put users at the centre, offer them a wide range of solutions, support smart and digital choices, and to monitor and evaluate the impact of all measures.

The starting point for the whole process was the estimated impact of planned works on several roads and streets, first in the city centre – breaking up main arteries of the city – and simultaneously, significant works planned on the TEN-T network (structuring networks). The latter measures were delayed, the former had a significant

impact. Had the City not opted for a change in people's travel behaviour within a short timeframe, it would have been faced with gridlock. If there is no room within public spaces, there is no space for infrastructure measures: neither extra bus, tram services nor cycling lanes could have been added. This was one of the reasons why this process was initiated in 2016.

Working with employers, universities, schools, hospitals and event organisers has been a key component of success for managing the demand for mobility. Universities and companies were targeted first. The strategy was developed by looking at residents, employees, and visitors. This helped the City learn a great deal about the motivations, fears and barriers when making travel choices. Then, nudges were put in place to ensure sustainable transport behaviour. The cornerstone of the nudging approach is an intermodal route planner that can be tailored to different users' profile needs. In addition, through data collected from user questionnaires, categories of personas defining different travellers based on their mobility habits and patterns. From the City's point of view, there is a strong social value and societal model behind this. It is important to get people to use sustainable transport modes. If public and private solutions can be combined, we will achieve our goals of sustainable mobility.

Practically, a multilayered mobility application has been developed by the City. Since 2016, it has been expanded with many services: e-scooters, electric mopeds, new types of services (waterbuses). In addition, it covers smart parking and management of traffic lights. As a consequence, the development of an intermodal route planner has been implemented, with a mobility map showcasing the modes available in your immediate surroundings.

The City has launched an inhouse development, working with the help of external consultants specialised in car navigation and companies specialised in biking and walking advice. Mainstream app providers proved no help: these providers consider that there is no business model for the solution developed by the City, and their approach is purely unimodal. The City worked with Open Street Maps to implement its solution. The 'new mobility' providers - bikes, e-scooters, car-sharing - are sharing real time data as is the public transport operator De Lijn. The more operators share data, the better the service will become. At this stage, the City is pioneering this real-time navigation service. When the major route planners such as Google integrate intermodality and active travel advice into their services, the pilot phase will come to an end.

Today, the website is consulted frequently, attracting more than 1.8 million visitors per year. The application will really take off when it offers a fully intermodal navigation solution by mid-2022.

WHAT ARE THE BENEFITS OF DEMAND MANAGEMENT?

Demand Management is relevant in contexts where public transport is available, and can help solve local or structural inefficiencies or supply-demand mismatches. Demand Management can bring a range of benefits for different stakeholders. Addressing all of them can lead to a win-win situation.

Demand Management expands mobility and access opportunities of users and individuals and improve freedom and easiness to move around.

- 1 Demand Management contributes to **improving the travel experience in public transport to meet the new expectations of users**. It provides travel conditions that are physically and psychologically safe and healthy, by shifting the peak and spreading demand better through the day. It improves the level of comfort in public transport to users by avoiding shoulder-to-shoulder travel experience.
- 2 Demand Management **widens the potential to reach places, by using a range of transport modes or by providing online services that substitute for trips**. It helps in choosing the best travel solutions depending on the time, the geography and the requirements of the trip.
- 3 Demand Management is a tool to **enjoy the benefits of a car-lite lifestyle**: this can help individuals spend less on travel, enjoy a collective experience of moving around by public transport, and enjoy a healthy, liveable and people focused urban streets.
- 4 Demand Management is also a way of **nudging and educating, raising awareness of, and promoting, sustainable travel and mobility habits**. More widely, it promotes lifestyles that are healthy and environmentally friendly for themselves and for others.

Demand Management is an effective tool for PTAs and PTOs to strengthen public transport as the backbone of transport services.

- 1 Demand Management is a **transport planning policy tool**. By expanding mobility options, Demand Management serves the overarching value that guides the action of PTAs and the operational role of PTOs: to improve the ability to access people, activities, places...
- 2 Demand Management improves **the daily transport system's operating efficiency and thus its attractiveness**. By seeking a better-balanced and optimised demand profile throughout the day and the year, Demand Management helps increase the robustness of operation in contexts where the supply cannot be in-



creased (due to feasibility, technical or financial limits). Demand Management also helps to avoid injecting supply that disappears where demand (contra peak time flow) does not consume it all. Demand Management can help in bringing urban dwellers to places to access transport by providing wider (non-transport, public or commercial) services.

- 3 Demand Management can be a powerful tool in **encouraging the integration of mobility services** and in providing a full alternative to the ownership and overwhelming single person use of a private car.
- 4 Demand Management is a tool that can be used to adapt quickly to **uncertain events**.

Demand Management is a powerful tool to ensure the sustainability and resiliency of our transport and mobility systems at a societal level.

- 1 **Economically**. Demand Management can help to avoid the cost of chasing the peak and thus can reduce operating costs, so that PTAs can use their scarce financial resources more efficiently. Moreover, Demand Management encompasses low capital and fast-tracked measures that complement investments in infrastructure requiring medium- to long-term investment and resources.
- 2 **Socially**. Demand Management increases equity, fairness, and inclusiveness by looking at specific users and groups - low-income areas, essential workers, those with specific needs (such as age, gender and physical condition). It also can improve working conditions for the public transport operators' workforce: drivers can benefit from better spread-out tours and from working in more relaxed conditions.

3 Environmentally. Demand Management contributes to reducing traffic congestion, the use of the private car or the need to fulfil constraint trips. Demand Management can improve our ability to move around - away from a car-based lifestyle - by encouraging the de-motorisation of households and the adoptions of multimodal behaviours. Demand Management is a way of strengthening the complementarity between dense central urban areas and the role that public transport can play.

4 Demand Management is a way of involving a wider range of stakeholders and users in designing a better future for public transport.

Q CHANGING SCHOOL TIME TO SHIFT THE TRAVEL OF PUPILS AND STUDENTS IN BUDAPEST

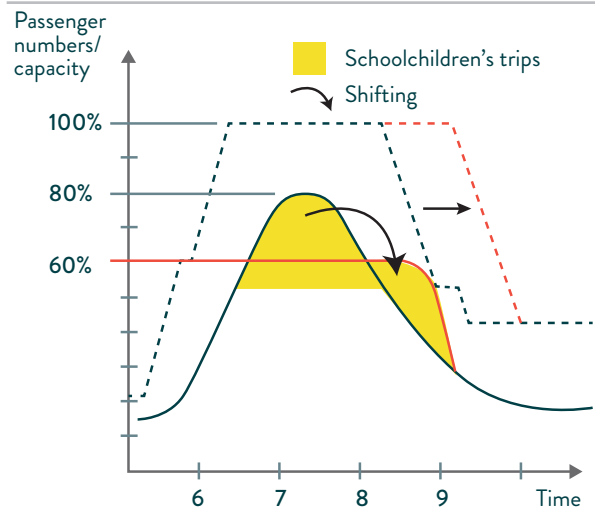
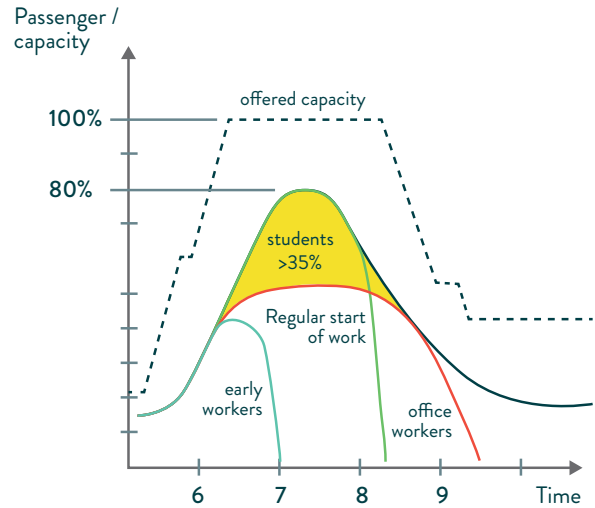
Before 07:00 and after 08:00 on the Budapest transport system, the morning passenger peak is at its highest. Capacity and resources are calibrated accordingly, and there is no more room for further capacity available. On this basis, some of the peak journeys needed to be shifted in time.

Flattening the morning peak curve was a measure first implemented during the pandemic, as safe services were intended to give greater space for passengers on vehicles. However, it is a wider policy tool that also applies to the post-pandemic period; the goal is to provide more comfortable and convenient services.

To flatten the peak, the PTA has identified the most easily 'shiftable' passengers and the ideal timeframe where their journeys could be postponed. At peak time, one-third of passengers are schoolchildren. According to household surveys, most pupils and students over the age of 14 travel independently and use public transport. Therefore, shaping their trips more flexibly could have the greatest impact on the peak period. The considered option for school children is to travel later, after the peak (between 08:00 and 09:00).

To initiate a change in schools' daily schedules by convincing the local authority to propose a shift in the time of the first lesson (09:00, or at least later than 08:00). Discussions started with stakeholders in 2020, and were followed by strong communication efforts around the benefits. As a result, by the start of the school term in 2020, the municipality decided to introduce new timetables in PT, enabling the possibility of convenient travelling in a later timeframe than the peak hour (extended maximum capacity until 09:00), and at least 15-20 high schools shifted the beginning of their first class; universi-

ties also joined the initiative. As 08:00 this shifting is an ongoing continuous process, the PTA has also initiated a second round in 2021 with a letter from the municipality of Budapest sent to school headteachers, advocating that they shift the start time of their school's first class.



HOW TO IMPLEMENT SUCCESSFULLY DEMAND MANAGEMENT?

The successful implementation of Demand Management necessitates a specific mindset, a special governance framework, and evaluation approach/methodology.

CHANGING PEOPLE'S HABITS IS POSSIBLE AND REQUIRES CHANGING OUR MINDSET

Demand Management aims at changing the mobility practices of people. Although behavioural scientists consider that habits are difficult to inhibit and take time to change, their transformation remains possible. **It requires defining strategies and implementing actions that change the representations, attitudes, practices and choices. Therefore, Demand Management requires strong pedagogical skills and ability to focus on people's needs.**

NUDGES IN SINGAPORE

Even as Singapore continues to expand its public transport network, crowding can still be seen on certain stretches at peak periods. Therefore, various initiatives to nudge commuters towards off-peak travel have been tested. LTA embarked on a Travel Demand Initiative in 2012, with the aim of shifting users travel habits either towards off-peak hours or adopting alternative means of transport, e.g. cycling.

Past measures to encourage off-peak travel or alternative modes of transport include:

- Monetary incentives for commuters (initiative include 'Travel Smart Rewards' and 'Travel Smart Journeys').
- Provision of grants to assist organisations in implementing flexitravel arrangements. Examples include funding to install facilities (e.g. shower facilities) or organising programmes and events (e.g. breakfast or yoga lessons) to encourage employees to shift their usual commuting time (initiatives include 'Travel Smart Consultancy Vouchers' and a 'Travel Smart Grant').
- Provision of travel information to help commuters make informed choices (for example, through publicity materials, travel info packs to residents at selected new estates and the provision of MRT platform crowdedness information on the MyTransport.SG mobile application).

Programmes that directly targeted commuters through monetary incentives were the most effective, and helped understand the limits of incentives' effectiveness. The in-

centives need to be carefully calibrated to strike a balance between cost effectiveness and the ability to alleviate the crowding situation in the near term. Moreover, the effectiveness of providing travel information varies. Commuters prefer to access information on their mobile telephones, as and when the need arises. Digital formats such as the MRT platform crowdedness level, which is dynamic and easily accessible, are better received.

COVID-19 has brought about changes, apparent in more flexible work and travel behaviours. Many companies and commuters are now more willing to adopt flexible working arrangements. Demand Management measures can help ensure these behaviours are sustained. COVID-19 also provides an opportunity to assess the efficiency of a governmental and private sector coordinated approach for changing commuters' travel behaviour. The public sector has taken the lead in adopting flexiwork arrangements (such as work-from-home, telecommuting and staggered working hours), while respective government agencies and tripartite associations are working with the private sector to encourage more of them to do so. Travel demand measures are continuously being reviewed to optimise outcomes due to changing travel patterns.

DEMAND MANAGEMENT REQUIRES SPECIFIC GOVERNANCE²

As Demand Management incorporates public life and societal dimensions, so Demand Management strategies should align with the goals of other (non-transport) policies: land use, economic and business development, equity.

Therefore, Demand Management requires the involvement of many non-transport stakeholders, such as those responsible for lifestyle and planning measures. Transport stakeholders need to join forces with non-transport stakeholders, beyond the competences of a PTA, and gather their support and involvement. Therefore, **cooperation across different public authorities, public and private sectors, combining transport and non-transport competences beyond administrative boundaries are all conditions for success.** Of course, this requires convincing non-transport-stakeholders and decision makers to be part of defining and implementing Demand Management measures.

Adopting a flexible governance framework, internal (re) organisation and looking for specific workforce skills will help to ease trialling, piloting, testing and adjusting. Flexibility and boldness are key qualities in implementing Demand Management measures. Failure is part of the process and can be mitigated by adjustments. Small scale implementation of measures provides conditions

2 UITP, 2021. *How to build successful cities: Strengthening the integration between land-use and mobility planning*. Policy Brief.



to test and adjust the measures. Implementing Demand Management relies on high project management skills and the ability to liaise with non-transport stakeholders and non-transport fields of expertise.

DEMAND MANAGEMENT REQUIRES A SPECIFIC MINDSET

One challenge is that Demand Management does not always manifest itself in grand outputs or concrete results, such as a new infrastructure or a new transport service. Therefore, Demand Management requires a specific mindset, one which starts with defining a strong and clear concept of the measures to be implemented; identifying a clear targeted group and specific measures is key.

Moreover, adopting a specific assessment method that applies to people's behaviour change is vital. From a user's perspective, Demand Management evaluation could assess quantitative criteria such as frequency, time and geography of trips, modal share, intermodal behaviour and carbon footprint. Qualitative criteria should also relate to the user's experience including comfort, pleasure, and so forth. From a Transport Authority's viewpoint, Demand Management evaluation should consider transport oper-

ation indicators, quantitative economic indicators (cost of measures and how they compare), societal indicators (share of work-from-home, types demographics (young, family, senior), development of local life/local jobs/businesses/activities and liveability) and environmental indicators (air, noise, fatalities and security, GHG emissions).

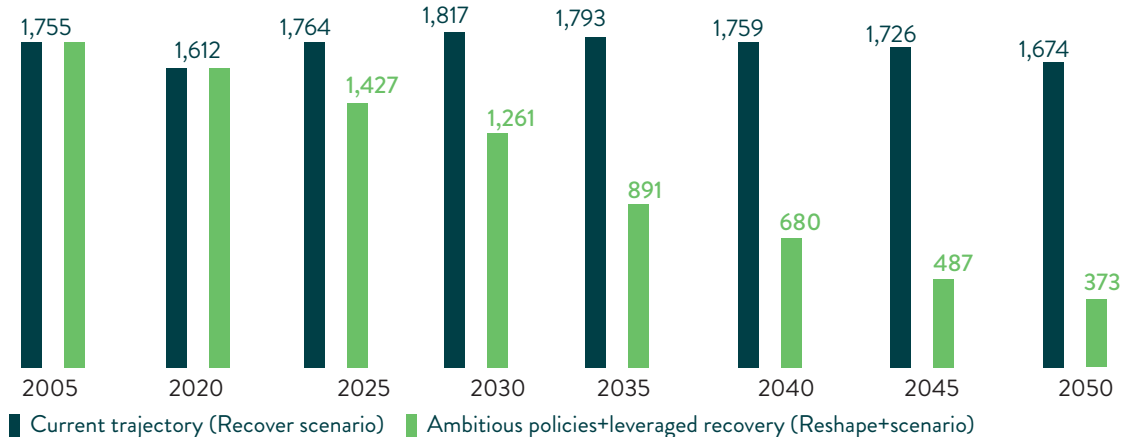
CONTRIBUTION OF DEMAND MANAGEMENT TO CARBON EMISSION REDUCTION: modelling by the International Transport Forum

Demand for urban passenger transport is expected to grow by 163% between 2015-2050, driven by population and economic growth and increasing urbanisation. How cities manage this demand will determine their ability to decarbonise their transport systems and improve the wellbeing of their citizens.

The ITF Transport Outlook 2021 models the impact of different policy scenarios on transport emissions. Today, passenger transport in cities is responsible for 40% of global transport emissions. Yet it is the sector with the greatest number of ready-to-adopt policy measures of all transport sectors. In the most ambitious modelled scenario in ITFs, emissions from urban passenger transport could be reduced by 80% between 2015-2050. Demand Management forms the backbone of these policy measures.

Demand Management touches on land use patterns, and the density of mixed developments, are the primary influences for distances travelled, on measures to encourage people to shift to more sustainable modes or discourage less sustainable modes to improve the alternatives to private car use. Strong Demand Management policies would contribute to a 22% reduction in urban passenger transport demand in 2050 compared with where we would be under the current policy trajectory.

CO₂ emissions (Million tonnes CO₂)



Source: ITF, 2021



RECOMMENDATIONS

This paper aims at promoting Demand Management as a major strategy and policy tool. Transport authorities, with the support of transport operators and many non-transport stakeholders, can implement solutions to mobility challenges and help foster resiliency and sustainability by influencing demand for mobility. The COVID-19 pandemic has accelerated the profile of this set of tools following the implementation of stringent measures in response to the pandemic. Therefore, this paper formulates five key recommendations to promote Demand Management.

Recommendation: Demand Management must be user-centric and understand mobility behaviours and travel patterns.

- In addition to well-developed mobility and transport surveys, Demand Management requires setting up a quantitative and qualitative data collection and analysis strategy in order to understand using behaviour science determinants of travel habits. The data collected should focus on our ways of life, values, perceptions, emotions and psychology.

- A better understanding is needed of how societal trends (such as the future of work, leisure, e-commerce and public services...) influence mobility goals. The way we move around is key to measure in a context where the changing mobility patterns are still not fully stabilised.

Recommendation: Demand Management should focus on initiatives that directly influence commuter behaviour by implementing measures that relate to lifestyle and transport planning.

- Lifestyle change measures relate to changing the representation of the need and the way to travel (education, awareness raising, promotion and tailored travel advice), to managing the timing of our activities (school, work, shopping, leisure, tourism), and to developing a digital strategy that complements or substitutes for physical mobility in order to reconsider why and how we move around.
- Land-use, space and transport measures relate to strategic planning (strategic land-use planning), to urban transformation of specific areas (universities, CBD, commercial areas, leisure activities centre, specific events) or the development of mixed-used areas with the aim of reducing the dependence on mobility or using a private car.

Recommendation: Demand Management can help PTAs achieve the goal of bringing benefits to users, solving transport and mobility challenges and making transport systems more sustainable.

- Demand Management can improve travel experience in public transport to meet new expectations of users, widen potentialities to reach places by using a multiplicity of transport modes or online services and can help to nudge and promote sustainable travel and mobility habits that are individually healthy and environmentally friendly.
- Demand Management can increase the sustainability of the transport system by better matching transport supply and demand. This will help PTAs use their scarce financial resources more efficiently and increase the equity, fairness and inclusiveness of transport services.
- Demand Management can contribute to reducing the carbon footprint of the transport sector in line with global warming mitigation objectives. It can also contribute to moderating energy consumption, by encouraging household de-motorisation and multimodal behaviours for stronger and resilient communities.

Recommendation: Demand Management requires a specific mindset and governance.

- PTAs should be the catalyst for engaging and collaborating with a large ecosystem of stakeholders, as Demand Management necessitates synergies between policies; breaking silos beyond the transport and mobility competencies of PTAs. Demand Management requires convincing non-transport-stakeholders and decision makers to help define and implement Demand Management measures.

- Practically, Demand Management requires setting up an incremental development process, which requires innovation, small-scale piloting (territory, service), adjusting and upscaling solutions supported by sufficient resources. An agile governance framework and internal organisation are also key to success. Demand Management requires a specific evaluation approach: to consider new solutions that bring cost-efficient marginal gains, based on both quantitative and qualitative criteria.

Recommendation: Demand Management should be seen as a mainstream and transformational policy tool for a more resilient transport sector. Its promotion and development require strong leadership from a PTA.

- Demand Management should complement the supply side development and management approach of transport planning (new services, new infrastructures).
- Demand Management is also a relevant tool in responding to crises or unexpected events and to support crisis recovery phases. Demand Management can help lock-in gains from new behaviours arising from unexpected events. By so doing, this tool makes our mobility systems more resilient.

This is an official Policy Brief of UITP, the International Association of Public Transport. UITP represents the interests of key players in the public transport sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

This Policy Brief was prepared by the Organising Authorities Committee

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