



**LAND
TRANSPORT
MASTER
PLAN**



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Executive Summary





LTMP 2040 sets out a bold vision for the future of Singapore's land transport

Following the public consultation exercise last year, the Land Transport Master Plan (LTMP) 2040 describes the future of land transport for Singapore: 1) a transport network that is convenient, well-connected and fast; 2) a transport ecosystem characterised by gracious behaviour and inclusive infrastructure; and 3) a transport environment that supports healthy lives and enables safer journeys.

We want a Singapore that is a **45-Minute City** with **20-Minute Towns** in 2040. All journeys to the nearest neighbourhood centre using Walk-Cycle-Ride modes of transport will take less than 20 minutes. We will aim for 9 in 10 peak-period journeys using Walk-Cycle-Ride to be completed in less than 45 minutes. We will expand our rail network, improve bus speeds and bring jobs closer to homes. These will save the average commuter about 15 minutes every weekday. We will add to our cycling path network, and also introduce self-driving bus services that adjust their routes to passenger demand. Walk-Cycle-Ride modes of transport will become so convenient, fast and comfortable that commuters will choose such modes over private transport for their daily commutes.

Our **Transport for All** vision will see everyone play their part in fostering a gracious and caring commuting culture – one which makes everyone, regardless of their needs, feel welcome. We will continue to improve barrier-free travel. We will work with all stakeholders to foster a gracious culture, where commuters are encouraged to be more thoughtful towards one another. We will also upskill our transport workers to meet the increasingly diverse needs of our commuters. We can look forward to more Walk-Cycle-Ride journeys becoming barrier-free, and more help available to all.

We will also ensure that our transport environment contributes to **Healthy Lives and Safer Journeys**. To support healthier lifestyles, we will dedicate more space to public transport, active mobility and community uses. We will change the way we plan our towns so that people can easily walk, cycle or use other active mobility methods to reach nearby bus stops, MRT stations and other amenities. By 2040, our entire bus and taxi fleet will use cleaner energy, contributing to a clean environment. There will be more education and enforcement efforts towards a safer “Vision Zero” environment with reduced land transport-related fatalities. Influencing user behaviour, implementing new infrastructure designs and introducing new traffic schemes will be some of our key initiatives to promote safety.

In our conversations, we have learnt that you are passionate about the potential of **LTMP in Your Community**. LTMP 2040 will not be possible without active support from all stakeholders, including fellow commuters like you. There will be challenges we need to overcome and trade-offs we need to make in this collective effort. Community and industry stakeholders can partner the Government to deliver fresh and innovative solutions.

LTMP 2040 is a shared journey and experience. We thank you for the strong support you have given us and invite you to partner us on this journey towards 2040.



CHAPTER



Introduction

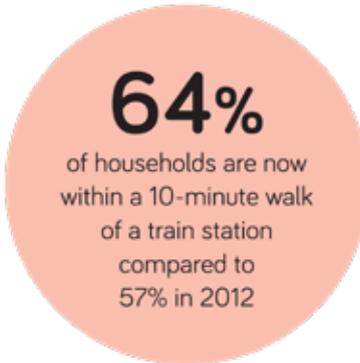


1.1 Where We Are Today

1.1.1 The LTMP 2008/2013 Vision

When we first launched the Land Transport Master Plan (LTMP) in 2008, we envisioned a people-centred land transport system that was shaped by active community engagement and had you at the heart of our policies and plans. These principles continued to guide us in LTMP 2013. In recent years, we have sought to further improve your travel experience by providing you with more connections, better service, and a more liveable and inclusive transport landscape.

We are on track to meet these targets. Our data shows that:



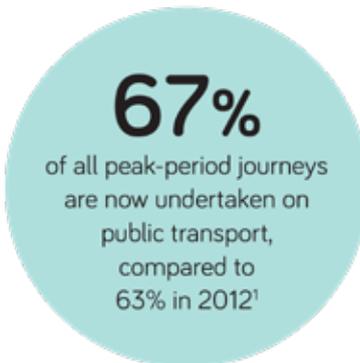
1.1.2 Progress since LTMP 2013

In 2013, we promised you that by 2030:

- a) 80% of households would be within a 10-minute walk from a train station;
- b) 85% of public transport journeys under 20km would be completed within 60 minutes; and
- c) 75% of all peak-period journeys would be undertaken on public transport.



Public transport journeys are faster today



We have made this progress through a three-pronged strategy: providing more connections, delivering better service, and facilitating greater liveability and inclusiveness.

¹From our latest Household Interview Travel Survey (HITS), conducted from 2016 to 2017.



1.1.3 Achieving Progress

A key reason for our progress so far has been our heavy investment in public transport. Since 2013, our rail network has grown from 182km to 229km. In the next decade, the upcoming Thomson-East Coast Line, Jurong Region Line and Cross Island Line, extensions to the North East Line and Downtown Line, and closing of the Circle Line loop, will create an even more expansive rail network that spans 360km by 2030.

This network growth has been accompanied by improvements to the public transport industry financing frameworks too. The bus industry transitioned to the Bus Contracting Model in September 2016.



A new train for the North-South and East-West Lines

The train operators, SMRT and SBS Transit, also switched to the New Rail Financing Framework in October 2016 and April 2018 respectively.

With these changes, the Land Transport Authority (LTA) now owns all bus and train operating assets. This has relieved public transport operators of heavy capital expenditures, freeing them to focus on providing reliable and well-maintained services to you. By opening new rail lines, buying new trains, injecting new buses into the system through the Bus Service Enhancement Programme and mandating higher service standards through the bus contracting model, we have also increased bus and train capacities by about 20% and 50% respectively between 2013 and 2018. This has reduced crowding, shortened waiting times and created more connections for you.

Our rail system has also become more reliable. Our Mean Kilometres Between Failure (MKBF) was 690,000 train-km in 2018, more than three times of the 181,000 train-km in 2017. We expect further improvement going forward. To accomplish this, we have refreshed the signalling systems across the North-South and East-West Lines, and started renewing the power supply and track circuit systems. Your support and patience for the early closures and late openings for parts of our rail lines were essential in giving the rail operators more time to carry out these works.

From 2021, we will also be replacing the first generation of 66 trains that entered service in 1987. The new trains will have integrated condition monitoring features and sensors to help us identify emerging faults and fix them before they impact operations, thus boosting our train system's reliability even further. In total, the investments to renew our train system will amount to \$4.5 billion between 2019 and 2023.

Beyond hardware, we have also taken steps to develop the people who make our systems work – our transport workers. In 2016 and 2017, LTA set up the Singapore Bus Academy and Singapore Rail Academy to deepen local capabilities, raise professionalism and support skills upgrading in our bus and rail industries respectively. Continuous development of our transport workers is a key part of our transport improvement strategy, whether it is coaching service officers to handle train disruptions and assist less ambulant passengers, or empowering engineers to keep our trains and buses running reliably.

We have also worked with our tripartite partners to improve the welfare of transport workers. In the last few years, we have made improvements ranging from facility upgrades, such as more comfortable staff canteens and lounges in the bus interchanges and depots, to installing condition monitoring devices in the buses and trains so that our maintenance crews can detect and rectify faults easily.



Commuters enjoy more reliable train journeys today



More people are choosing to travel by active modes

1.1.4 Major Shifts

As we look to the future of Singapore’s land transport system, we are also mindful that major shifts have occurred in the transport sector since 2013. In the last few years, active mobility, which includes walking, cycling and the use of Personal Mobility Devices (PMDs), has become much more prevalent, especially for shorter journeys. New services such as bicycle-sharing, third-party taxi booking, private hire cars and electric car-sharing services have also expanded the suite of transport options available to the public.

In fact, these transport modes have gained traction so quickly globally that there is, as yet, no collective term to describe them. In LTMP 2040, we will be calling them Walk-Cycle-Ride modes of transport. While “Walk” probably needs no further explanation, “Cycle” refers to travelling by bicycle or other PMDs such as e-scooters. “Ride” refers to public transport such as buses and trains and point-to-point transport defined as taxis, private hire cars and shared cars.

New technologies are also continuing to disrupt land transport systems worldwide [see Box Story 01]. The almost universal usage of smartphones, combined with “Big Data”, has given rise to a variety of mobility solutions, including on-demand transport services. Autonomous vehicles (AVs) will also become a reality and could radically transform our land transport system by enabling more efficient dynamically-routed or on-demand forms of shared transport.

While AVs are not yet ready for large-scale deployment, they are increasingly being tested worldwide. Singapore is taking the lead by making it a key part of our Smart Nation initiative, and by carrying out several trials spearheaded by Government agencies, universities and firms. In January 2019, LTA, together with the Economic Development Board, issued a call for interested firms to submit proposals for a collaborative pilot deployment of autonomous buses and shuttles in Punggol, Tengah and the Jurong Innovation District.



Buses and trains will continue to be the core of our land transport system

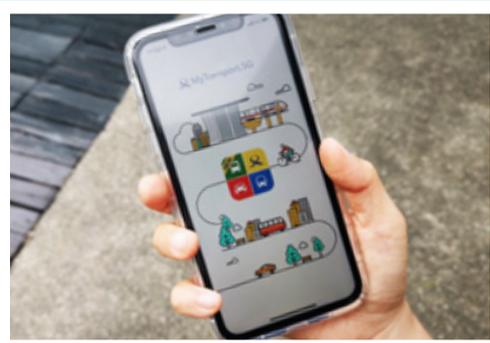


Box Story
01

Using Technology to Transform Commuters' Journeys

New smartphone apps have given Singaporeans the ability to plan door-to-door journeys with the combination of transport modes that best meet their needs. To further improve their travel experience, we enhanced the MyTransport.SG app in 2018 to include a multi-modal journey planner that provides real-time, customised information about different transport modes.

We will also continue to put real-time land transport-related datasets on our DataMall for enterprises, app developers and the public to promote and co-create innovative and inclusive transport solutions.



MyTransport.SG app

Another shift is the ongoing greening of our vehicles, with initiatives such as the Vehicle Emissions Scheme that encourages buyers to choose vehicles with lower emissions, BlueSG, Singapore's first large-scale electric car-sharing scheme, and ongoing trials for electric and diesel hybrid public buses.

In fact, 2018 was a particularly exciting year for our land transport system, with our announcement of the Land Transport Industry Transformation Map (ITM). This blueprint will guide the growth and evolution of our land transport industry into one that is supported by technology and a highly competent workforce. We developed it in close consultation with union and industry partners, to ensure that the land transport industry and its workers will continue to thrive despite our long-term challenges, such as an ageing population, and our land and fiscal constraints [see Box Story 02].

To future-proof our workforce, we also worked with SkillsFuture Singapore (SSG) and the industry to co-develop the Skills Framework for Public Transport to identify current and emerging skillsets, and map these with possible career pathways. By identifying training gaps, the framework will guide the development of programmes to professionalise our public transport workers, as well as upskill and reskill them to meet the industry's changing demands.



Coordinating Minister for Infrastructure and Minister for Transport, Khaw Boon Wan, launched the Land Transport Industry Transformation Map with various stakeholders on 12 Feb 2018

Box Story
02

Using Technology to Enhance Jobs and Rail Reliability

Today, our rail and public bus sectors employ more than 22,000 people to support the 6 million journeys made on public transport each day. With the expansion of our public bus and rail networks, we expect to create up to 10,000 new public transport jobs for Singaporeans from now to 2040. To better serve commuters in the future, we need to take advantage of emerging technologies to make our land transport system even smarter. Rail maintenance is one area in which we are already using technology to drive productivity growth and deliver better services to commuters.

Rail Condition Monitoring:

By equipping our new trains with condition monitoring tools, we will be able to collect more extensive data to track the health of our rail network in real-time. This will help to guide maintenance and repairs to address faults before they impact operations.

Automatic Track Inspection System:

Imaging sensors and laser scanners will be installed below some train carriages to monitor track conditions in real-time, making it easier for the maintenance team to identify and rectify track defects quickly.

Rail Enterprise Asset Management System (REAMS):

By consolidating and integrating the information collected from all the trains and other mission critical systems, REAMS can better assess and predict the condition of the entire network and its components.

Drones:

In the future, drones will be used to inspect MRT tunnels more quickly and safely. Deploying them will also free up engineers' time so that they can focus on analysing the collected data to identify and solve potential problems sooner.



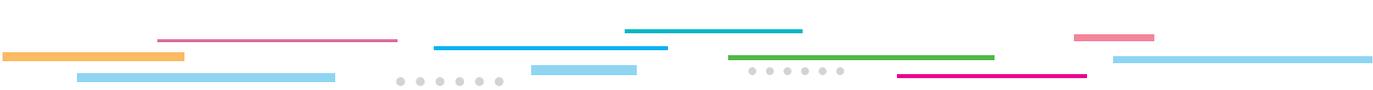
Using drones for tunnel inspections



Electric car-sharing fleet by BlueSG

As we continue to monitor new trends, evaluate new technologies and pursue new urban mobility solutions, we will do so with your travel experience in mind. We are closely watching the impact of the rapid growth of e-commerce, such as online shopping, on our land transport system, and are working with stakeholders to plan for urban logistics solutions for the future.

Our goals, as always, are to improve the experiences of everyday commuters, and ensure our land transport system meets the evolving needs of our growing economy and population.





A train bearing the new red and green livery of the North-South and East-West Lines

1.2 LTMP 2040: Bringing Singapore Together

We are going through a period of significant change, marked by technological disruptions, tighter land constraints and demographic changes. With high expectations for the future of Singapore's land transport system, we decided to review our LTMP in 2018 with a view towards shaping the future of our land transport.

We consulted the public extensively and enlisted the help of an LTMP Advisory Panel to take a fresh look at our vision, policies and targets. These were important steps in charting the future land transport system to 2040, and possibly beyond.

1.2.1 Public Consultation Process and Outcomes

Our public consultation exercise for LTMP 2040 was a valuable opportunity to deeply engage the public on their views and concerns. Every session was planned in detail. For example, we developed fun yet educational games for our Focus Group Discussion (FGD) participants so that they could better understand the complexities of land transport planning. Importantly, we believe that this helped them understand the trade-offs that transport planners inevitably face, and contributed to the exchange of views at the FGDs.

The response to our call for feedback has been overwhelming. We have heard your aspirations and your concerns. Overall, your views and suggestions were centred on three areas. First, you want a convenient, connected and fast land transport system. Second, the land transport system should be inclusive, meeting the needs of Singaporeans from all walks of life. Third, you want healthier lifestyles, more appealing walking and cycling options, and cleaner and quieter roads.



Land Transport Master Plan 2040
Advisory Panel Recommendations

20-Minute Towns & a 45-Minute City

Commuters will have more public, active and shared* modes of transport to choose from to facilitate more convenient, connected and faster journeys.

- Target 1: 20-Minute Towns**
All journeys to the nearest neighbourhood centre using public, active and shared modes of transport are completed in less than 20 minutes.
- Target 2: 45-Minute City**
9 in 10 peak-period journeys using public, active and shared modes of transport are completed in less than 45 minutes. This will help the average peak-period commuter to save about 15 minutes every weekday.
- Target 3: Public, active and shared modes of transport**
are the preferred ways to travel, accounting for 9 in 10 of all peak-period journeys.

- Prioritising public, active and shared modes of transport
- Facilitating more seamless multi-modal travel
- Bringing jobs and amenities closer to home

*This includes public transport such as trains and buses, active mobility such as walking, cycling and the use of Personal Mobility Devices, as well as shared transport such as taxis, Private Hire Cars and car-sharing.

Healthy Lives, Safer Journeys

Commuters can look forward to journeys that promote healthier lifestyles and create a more liveable Singapore.

- Providing more spaces for public transport, active mobility and community uses
- Working towards a future with fewer land transport-related fatalities
- Creating environmentally-friendly vehicles and infrastructure

Transport for All

Commuters desire a more inclusive and welcoming transport system for families, elderly and persons with disabilities (PWDs).

- Nurturing a gracious and caring commuting culture
- Developing the capabilities of public transport workers to meet diverse needs
- Providing infrastructure for better accessibility and barrier-free travel

The Land Transport Master Plan 2040 (LTMP 2040) Advisory Panel has submitted their recommendations for the future of land transport. This was done after hearing the views of Singaporeans from all walks of life.

Read the Advisory Panel Report at bit.ly/LTMP2040LAP

Summary of LTMP Advisory Panel's recommendations

1.2.2 LTMP Advisory Panel Recommendations

The LTMP Advisory Panel considered your feedback and recommended that the Government work towards safe and healthy 20-minute towns and a 45-minute city for all by 2040. This will require a land transport system that is convenient, well-connected and fast, characterised by a commuter experience that is both gracious and inclusive, and which contributes to better health and safer journeys for everyone [see summary above]. Even as we push ahead with these transformations to our land transport system, Singaporeans can be reassured that we will continue to hold firmly to the principle of keeping transport services affordable for everyone.

1.2.3 LTMP 2040 Report

The Government has accepted the Panel's aspirational recommendations, and will work with various stakeholders to implement them. The recommendations are wide-ranging, covering not only what the Government could do for the public, but also how the public, transport workforce, industry as well as wider academic and expert communities can play their part. We have also noted the Panel's views on the enabling role of technology in LTMP 2040. This report represents our detailed response to the Panel's recommendations, where we spell out the exciting initiatives that you can look forward to in the coming years.

LTMP 2040 is ultimately a plan that aims to bring Singaporeans together, both physically and as a people. We invite you to share this journey with us.

CHAPTER



20-Minute Towns and a 45-Minute City





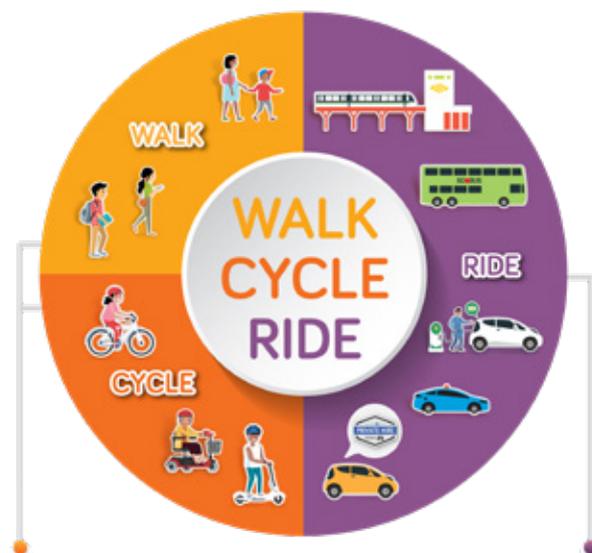
Commuters value a convenient, connected and fast land transport system

Through our public consultations, we learnt that a convenient, well-connected and fast land transport system matters a lot to commuters. We received many suggestions on how to improve the travel experience – from enhancing our public transport and active mobility networks, to boosting first- and last-mile connectivity. It was also clear that Singaporeans wanted to choose from a variety of transport options to meet their everyday needs.

Based on extensive feedback, the LTMP Advisory Panel developed recommendations to make Walk-Cycle-Ride transport more attractive. We have accepted these, as well as the Panel's aspirational targets to realise 20-minute towns and a 45-minute city by 2040:

- (i) **“20-Minute Towns”, where all door-to-door journeys to the nearest neighbourhood centre using Walk-Cycle-Ride modes are completed within 20 minutes;**
- (ii) **“45-Minute City”, where 9 in 10 peak-period door-to-door journeys using Walk-Cycle-Ride modes are completed in less than 45 minutes; and**
- (iii) **Walk-Cycle-Ride modes are the preferred way to travel, making up 9 in 10 of peak-period journeys.**

While these are ambitious targets, we believe that we can get there through a concerted effort across the Government to prioritise and seamlessly integrate Walk-Cycle-Ride modes of transport. This will stand on top of our ongoing efforts to improve the reliability of our transport system to become one that Singaporeans know they can depend on. Besides improving the transport network, efforts in new key developments will give Singaporeans more convenient, connected and fast access to good jobs, education and amenities closer to their homes.



Active Mobility Modes
You will be able to cover short distances easily by walking, cycling or using PMDs like electric scooters.

Mass Public & Shared Transport Modes
For longer journeys, you can count on mass public transport like buses and trains, and shared transport like taxis, private hire cars, and car-sharing.



2.1 Achieving 20-Minute Towns and a 45-Minute City through Enhanced Walk-Cycle-Ride Options

By 2040, we envision a Singapore made up of 20-minute towns within a 45-minute city. Towns are where people live, and where the nearest neighbourhood centre with everyday amenities such as shops, food courts and health services are located. When we say “20-Minute Towns”, we mean that commuters can expect to travel no more than 20 minutes via Walk-Cycle-Ride options to reach daily amenities at their nearest neighbourhood centre and to access facilities such as parks and schools – even as our towns continue to grow in size.

Beyond these 20-minute towns, Singapore will also be a 45-minute city, where 9 in 10 of all peak-period Walk-Cycle-Ride journeys – such as the journey between your home and workplace – are completed in less than 45 minutes.

To realise 20-minute towns and a 45-minute city, we will need a transport system that is convenient, well-connected and fast. Today, about 9 in 10 Walk-Cycle-Ride journeys to the nearest neighbourhood centre are completed within 20 minutes, with only about two-thirds of peak-period Walk-Cycle-Ride journeys completed in less than 45 minutes. Further improvements to these percentages will be challenging to realise. Public transport journey times actually increased between 2008 and 2012, largely due to the increase in average journey distances. Journey times subsequently became shorter between 2012 and 2016, even though average journey distances continued to increase [see Figure 1].

Our goal of “20-Minute Towns and a 45-Minute City” by 2040 is ambitious, and would be impossible to achieve without making significant changes to the way we work. We will need to focus efforts on two broad areas: Firstly, we need to bring about a marked reduction in travel times. Secondly, we need to reverse the trend of longer travel distances, for example, by bringing jobs closer to homes. We will accomplish these goals by enhancing our transport infrastructure to bring commuters more seamless connections, greater convenience and faster door-to-door travel. We have the following initiatives in mind:



2.1.1 Active Mobility

2.1.1.1 Expanding the Active Mobility Network

Walking and cycling are healthy and convenient ways to travel shorter distances or as the first and last part of a longer journey. With only about half of intra-town journeys made on foot or by bicycle today, there is room for more to embrace a healthier lifestyle. By expanding our active mobility network, we will not only improve first- and last-mile connectivity, but also make it more convenient for people to reach everyday amenities in their nearest neighbourhood centre by walking and cycling.

In 2013, we set a network target of 700km of cycling paths by 2030. Of these, we have already built more than 440km of cycling paths. Looking ahead, we will continue to expand the cycling path network to more than 1,000km by 2040. This will include efforts such as placing cycling paths on both sides of the road, where appropriate, in new development areas such as Kampong Bugis, Tengah and Woodlands North Coast. We will also explore facilitating cycling in private residential estates and industrial estates. With these measures, we hope that Singaporeans can enjoy an even more seamless cycling experience within towns and across our entire city.



Figure 1: Trends in average travelling distance and time from 2008 – 2016



2.1.2 Mass Public Transport and Shared Transport

2.1.2.1 Towards Autonomous, Dynamically-Routed Services (DRS)

We see DRS playing a big role in reducing travelling and waiting times for our future land transport system. These services can adjust their routes based on passenger demand, so that commuters can make fewer transfers, while optimising the resources of our transport network. When paired with AV technology, there is further potential to reduce operating and manpower costs [see Box Story 03]. To test these emerging technologies, we plan to deploy AV, on-demand, dynamically-routed buses as part of a pilot programme in Punggol, Tengah and the Jurong Innovation District.

2.1.2.2 Expanding the Rail Network

We know that Singaporeans are looking forward to the completion of new lines like the Thomson-East Coast Line (TEL), Jurong Region Line (JRL) and the Cross Island Line (CRL). Stage 1 of the TEL is on track to open by the end of this year. The remaining four stages will follow between 2020 and 2024. The station locations for the JRL were announced in May 2018, and we hope to open it in three phases from 2026 to 2028. Phase 1 of the CRL was also announced in January 2019, and is targeted to open by 2029.

Beyond Phase 1, we plan to connect the CRL to the Punggol area by 2031. We are also expanding the reach of our current lines to serve newer areas. We are adding Canberra station to the North-South Line by this year; extending the North East Line from Punggol to Punggol Coast by 2023 and the Downtown Line (DTL) from Expo to Sungei Bedok by 2024; closing the loop on the Circle Line from Harbourfront to Marina Bay by 2025 and opening Hume Station on the DTL by 2025 [see Figure 2].

Box Story
03

Autonomous Vehicles

AVs are self-driving vehicles that are capable of sensing their environment, and hence are capable of moving with little or no human intervention.

By reducing the possibility of human error, AVs can make driving safer. When this technology is ready, it can support our land transport system with a greater variety of options for commuters.



An AV undergoing testing
Photo credit: Nanyang Technological University of Singapore



Engineers working on tunneling our new lines

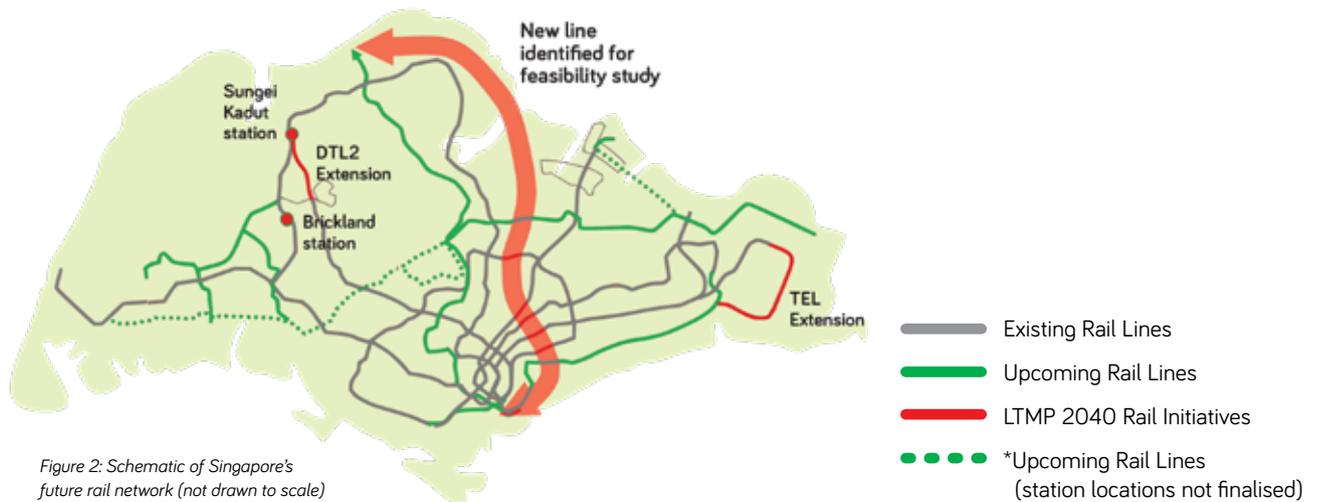


Figure 2: Schematic of Singapore's future rail network (not drawn to scale)

We have other projects in store to make taking the train even more convenient:

Feasibility study for a new line

A proposed new line has been identified for feasibility studies. This new line will supplement the transport network in the north and northeast regions to serve new and growing developments as well as existing towns which currently do not enjoy direct access to the rail network. The corridor served by the new line could include areas such as Woodlands, Sembawang, Sengkang, Serangoon North, Whampoa, Kallang and the Greater Southern Waterfront.

The line could also relieve increasing travel demand along the northeast corridor, and strengthen the overall resilience of the MRT network. This would help to make rail a faster, more convenient and reliable transport option for more Singaporeans.

As part of the feasibility study, we will assess the demand, alignment, station locations and implementation timeline of the line, taking into account existing and future land use developments along the corridor. When completed in phases, the line could serve more than 400,000 households, with commuters in the northern region of Singapore enjoying time savings of up to 40 minutes to the city centre.

Downtown Line Extension to Sungei Kadut Station

We will also extend the DTL beyond Bukit Panjang station to serve the north-western region including Yew Tee, Choa Chu Kang and Sungei Kadut. This extension will join the North-South Line at a new Sungei Kadut interchange station.

This interchange station will serve future developments by JTC Corporation (JTC) at Sungei Kadut, such as TimMac, for SMEs in the metal, machinery and timber industries; Trendsplace, Singapore's first high-rise, multi-tenanted development housing both furniture and furniture-related companies; and the future Agri-Food Innovation Park (AFIP). Residents in the north-western region can also look forward to faster journeys from their homes, with time savings of up to 30 minutes to the downtown area.

Thomson-East Coast Line Extension

Travelling to the airport will eventually be easier with the Thomson-East Coast Line Extension (TELe) from the new Sungei Bedok Station to Changi Airport. Passing through the future Terminal 5, this new link will also connect to the stretch between Tanah Merah and Changi Airport on the East-West Line, which will be converted to form part of the TELe. Beyond providing a direct rail connection from Changi Airport to the city, it will also seamlessly link Changi Airport to stations along the TEL up to Woodlands North, where commuters may be able to transfer to the future Singapore-Johor Bahru Rapid Transit System Link.

Brickland Station

Brickland Station will be a new station along the North-South Line, between the Choa Chu Kang and Bukit Gombak stations. With this new station, residents living in Keat Hong, Bukit Batok West, Pavilion Park, and Tengah town's Brickland district can look forward to faster and more convenient access to the rail network.





2.1.2.3 Improving Bus Speeds

Bus commuters have told us that they want more regular bus arrivals and faster travel times on board our buses. We have already rolled out an additional 1,000 buses under the Bus Service Enhancement Programme, and implemented 211km of bus lanes throughout Singapore.

To further improve the experience of bus commuters, we are planning to progressively implement Transit Priority Corridors (TPCs) that will allow buses to move faster, starting from the 2020s. TPCs will be an enhanced form of bus priority compared to the typical bus lanes today. For example, the North-South Corridor (NSC) which is slated for completion by 2026, will be our longest TPC with dedicated and continuous bus lanes. Other bus priority measures such as sections of bus-only roads and bus signal priority are also being explored for NSC. These features will allow bus commuters to save an average of 10 to 15 minutes.

TPCs can also be integrated with the abutting local land use plans to cater to more inclusive and sustainable travel modes such as public transport and active mobility. We are studying some existing and future roads that could be TPCs [see Figure 3]. Within the TPCs, we are also exploring concepts to boost travel times and convenience by public transport and active mobility such as bus-only roads, bus signal priority at all junctions and dedicated cycling paths alongside bus lanes.

In addition, we are working with industry experts to deploy smart solutions that will help our buses move more quickly. These include smarter traffic light control systems that can detect the presence of vehicles and pedestrians.

By harnessing near real-time data from new sources such as global navigation satellite system (GNSS) data, and using artificial intelligence-based predictive analytics in the ongoing CoopeRative and UnIfied Smart Traffic SystEm (CRUISE) pilot, we can further optimise traffic light timings and deliver faster bus speeds at more regular headways.



An example of a Transit Priority Corridor

2.1.2.4 Facilitate Point-to-Point Mobility

Over the last few years, Singapore's land transport system has evolved rapidly with the entry of new point-to-point (P2P) transport services. P2P services, which include taxis and private hire cars, offer commuters more choices for fast, convenient and direct journeys without the need to own a car. The recent rise of new private hire car booking service operators and third-party taxi booking service operators in Singapore has significantly cut waiting and travelling times.

Our new regulatory framework for P2P transport services aims to maintain an open and contestable P2P market, providing enough oversight to protect the interests and safety of drivers and passengers, while streamlining regulations to keep business and regulatory costs low. Keeping the P2P transport industry in a healthy contestable state will bring about cost savings which can ultimately be passed on from service providers to commuters.

2.2 Making Walk-Cycle-Ride Transport Modes the Preferred Way to Travel

To sustainably transform land-scarce Singapore into 20-minute towns nestled in a 45-minute city, Walk-Cycle-Ride transport modes must be the preferred way to travel. Beyond the initiatives listed earlier, we will also make these modes more pleasant to use.

2.2.1 New Integrated Transport Hubs

Several new Integrated Transport Hubs (ITHs) will provide more seamless connections between bus and train. These fully air-conditioned transit hubs, which are interchange stations integrated with malls, will give commuters convenient access to amenities as part of the public transport journey. Beyond the nine existing ITHs today, commuters can look forward to new ITHs in Bidadari, Buangkok and Punggol North which are already under construction. In the longer term, we plan to build ITHs in areas such as Beauty World, Bedok South, Hougang, Jurong East, Marina South, Pasir Ris, Tampines North and Tengah.



2.2.2 Making Better Use of our Transport Assets

As improvements to public transport infrastructure typically take a long time and are costly to complete, we must also smoothen peak-period travel demand to make better use of what we have [see Figure 5]. For example, we have changed our fare structure to encourage more pre-peak travel. Commuters now pay lower fares if they tap in at any MRT or LRT station before 7.45am.

We have also been developing methodologies and indicators to measure public transport accessibility levels across Singapore to help identify gaps in our public transport network and to aid our network planning. We are developing a public transport accessibility improvement programme to improve local walking networks and/or public transport service provisions depending on local circumstances. Singaporeans can expect these efforts to translate into greater travel convenience that allows them to enjoy 20-minute towns and a 45-minute city.

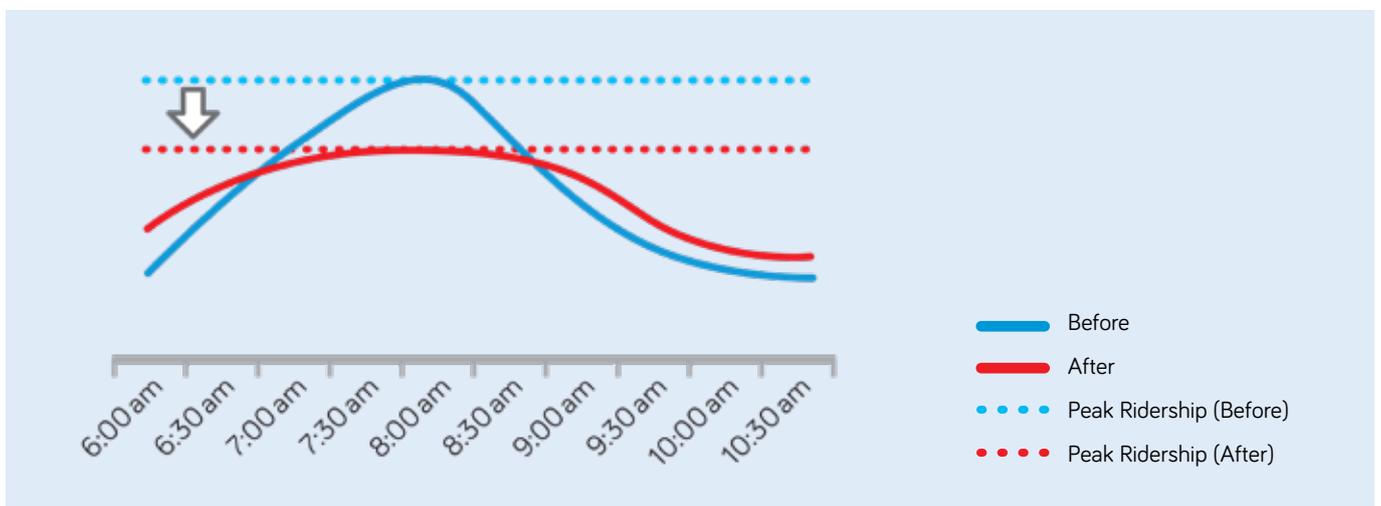


Figure 5: Hypothetical spreading out of peak ridership through travel demand management



2.3 A More Connected Singapore for Every Commuter

We expect that the overall enhancements to our land transport network will help the average peak-period commuter save 15 minutes of travelling every weekday. Our ultimate aim is to give every Singaporean quality live, work and play experiences without the need to own a private vehicle [see Box Story 04].

Box Story
04

A Vision of the Future: Meet the Tans

The Tans live in the future; the year is 2040. They are nestled comfortably in the new Tengah town.

Mr and Mrs Tan are a resourceful couple. Right from the moment they wake up, the latest version of the MyTransport.SG app gives them a variety of options to get to work.

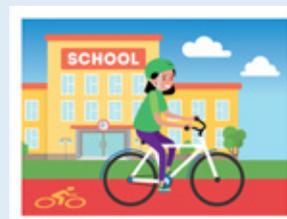


For Mr Tan, his default choice is to take public transport, now that Brickland Station is open to serve the town. 20 years ago, Mr Tan used to wait 10 minutes for his bus at the bus stop. Today, an Autonomous DRS arrives to pick him up downstairs at exactly the time that he wants.

Jobs are no longer concentrated in the CBD, and Mr Tan's job is at a new tech outfit in the Jurong Innovation District. With the new JRL serving this key development, the train journey is short, and he arrives at his office desk well under 45 minutes.

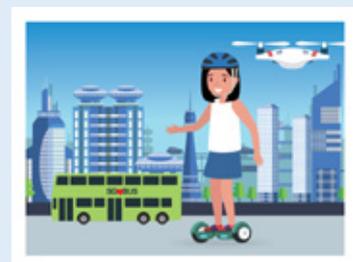


As for Mrs Tan, she must meet her client later this morning. He is the reclusive sort, and stays in a remote location. She uses a MaaS service to schedule a taxi, while riding the train to avoid that reported traffic incident along the way. Thereafter, she has a flight to catch for her next business meeting in Hong Kong. Singapore could use less traffic, she thinks to herself, as the train on the new TEL Extension pulls up at the airport with plenty of time to spare.



Meanwhile, their 10-year old daughter, Tania, is finishing school. With a convenient cycling path network, Tania is used to cycling home from school. As cycling is now much safer, Mr and Mrs Tan are not worried about her.

Tania cycles past a group of workers using drones to clean covered linkways, and she pauses in amazement, wondering to herself what the future holds. Drones are getting more advanced, and perhaps flying taxis are not far away. Cars have become cleaner, and more cycling paths and innovative PMDs are leading more Singaporeans to more active forms of mobility. She smiles, thinking to herself that she would get her parents to buy her that new hoverboard that was just launched a month ago.



CHAPTER

3

Transport for All





Wider fare gates for commuters with special needs

Singapore's land transport system should be inclusive to all Singaporeans, regardless of background, so that everyone has access to the same economic and social opportunities. In our previous LTMPs, we committed to building at least one barrier-free route to all MRT and LRT stations, converting all of our public buses to low-floor wheelchair-accessible ones and installing lifts at key pedestrian overhead bridges. These will all be done by 2020. Beyond that, we will continue to enhance our infrastructure to boost the physical accessibility of our land transport system.

Still, investing in infrastructure is not enough. Our land transport system needs to have "heart". While physical accessibility is important, we should aspire to be a society where everyone looks out for each other. Singaporeans who took part in our LTMP public engagement acknowledged that creating a gracious commuting culture is a shared responsibility. In fact, many were willing to accept slight delays and inconveniences to their journeys if that meant providing help to those in need.

The LTMP Advisory Panel has reflected the public's feedback in its vision of a transport system for all, anchored by a gracious and caring commuting culture. We have accepted the Panel's recommendations. By 2040, we envision a transport system for all Singaporeans where:

- (i) **Everyone plays a part in fostering a gracious and caring commuting culture; and**
- (ii) **More journeys on Walk-Cycle-Ride will be barrier-free, starting with all journeys to public housing estates and public sector infrastructure.**

To realise this future, we will cultivate positive social norms that encourage every person to look out for others and to extend a helping hand when needed. We will also work with transport providers to train our transport workers to make every journey a pleasant and enjoyable one. At the same time, we will continue to improve our infrastructure, intensifying our efforts to meet the diverse needs of all Singaporeans. In the process, we will build on the work and recommendations of the Family-Friendly Transport Advisory Panel.



3.1 Nurturing a Gracious and Caring Commuting Culture

A gracious and caring commuting culture begins with all of us. While we have designed Singapore's land transport to meet a wide array of different travel needs, our travel experiences are not determined by infrastructure alone – actions and behaviour of others also significantly shape how pleasant a journey will be. For example, while we have installed lifts and ramps at all MRT stations to make journeys easier for people who find it difficult to go up and down stairs, able-bodied people also need to play their part and give way to those who need these facilities more. Singaporeans' collective willingness to put others' needs first will go a long way towards enriching all of our travel experiences.

Promoting civic-mindedness and social responsibility through education, recognising exemplary behaviour when using Walk-Cycle-Ride options, and encouraging active citizenry will all contribute towards a gracious and caring commuting culture [see Box Story 05].

“There are limits to what [the] Government can do, as it's ultimately a behavioural matter. It's about taking personal responsibility. Education needs to start as children [with] good habits [and] good practices from young.”

YS, 22

Student and public transport user

Box Story
05

Adopt-a-Station

Camille Yeo, a Primary 5 student at Pei Chun Public School, is one of SMRT's youngest service ambassadors. She and her classmates have adopted Toa Payoh MRT station through the Adopt-a-Station initiative, launched by SMRT in September 2014. She helps commuters with directions, lends a hand at ticketing machines and ensures that seniors and persons with disabilities (PWDs) are given priority use of the lifts. These actions have helped Camille build a stronger connection with her neighbourhood and her community.

Like Camille, 12 year-old Wee Lyn also volunteers her time at the ticketing machines. As she serves, Wee Lyn is reminded of the importance of being gracious and caring to one another. She tells us that she is sometimes at the receiving end of commuters' frustrations, but feels that her efforts are worthwhile when the people she helps smile and thank her. "I feel happy, and forget how tired my legs feel," she says.

SMRT's partnership with the community has instilled a sense of graciousness in students like Camille and Wee Lyn. They have learnt to be more considerate towards their fellow commuters, so that they can be role models to inspire behavioural change in their fellow students and transport users, and in our wider society.

Adapted from a story published by The Straits Times, 4 Feb 2016



Young service ambassadors being briefed on train station operations during a training session

3.1.1. Supporting Gracious and Caring Norms

People learn how to behave and respond in social situations through their formative experiences in school, at home and in society. We will continue to partner the Singapore Kindness Movement (SKM), public transport operators and relevant agencies to nurture young Singaporeans as considerate citizens and active contributors. Together, we will be able to develop gracious and caring social norms for people using Walk-Cycle-Ride options and a national culture in which all Singaporeans are considerate and compassionate [see Box Story 06].



Commuters queuing to board the bus

3.1.2 A Friendlier Land Transport System

How we design Singapore's land transport system affects how inclusive it can be. We will continue to use behavioural insights to guide our infrastructural designs, to nudge people into becoming more aware of others' needs. For example, by the end of 2019, all MRT stations will have priority queues for seniors, expectant mothers, wheelchair users and parents travelling with strollers. This scheme will be extended to all bus interchanges and ITHs by 2021. To complement this, the Public Transport Council (PTC) will expand its Heart Zones initiative to all MRT stations and bus interchanges, where practical. This will allow commuters who require help to easily indicate their needs to others who are able and willing to assist.

Seniors, expectant mothers, wheelchair users, parents travelling with young children and other passengers who need a seat can also look forward to priority cabins on our trains. We will pilot this on one of our MRT lines by 2020. To further help people who need seats when none are available, we will introduce a new "please offer me a seat" identifier. This will be available at all passenger service centres across our MRT and LRT lines.

Box Story
06

Lending a Helping Hand

All it took was a Sunday stroll with Madam Ng Soh Cheng, who is a visually impaired grandmother living in Woodlands, to give Ms. Preiyaa an opportunity to receive an important life lesson. Preiyaa tells the story in her own words below:

It started out after a Grassroots dialogue session held at Woodlands Drive 14, in which the plight of Mdm. Ng was brought to my attention as Manager of Community Partnership in LTA. They said that Mdm. Ng finds it difficult to move around, especially when crossing the road, whenever she visits her granddaughter, who stays nearby.

I felt sorry for her as I too have a grandmother who is partially blind, and so I offered to accompany Mdm. Ng to her granddaughter's house that day. At the signalised pedestrian crossing while waiting for the green man signal to appear, I momentarily closed my eyes, and realised how much more difficult it would be for visually handicapped individuals like Mdm. Ng to cross the road without help from others.



Mdm. Ng and Ms. Preiyaa sharing a moment together

Realising that audio signals at pedestrian crossings would make it safer for the visually impaired like Mdm. Ng, I discussed this idea with our traffic engineers, and also obtained support from the Singapore Association of the Visually Handicapped (SAVH). The audio beacons were subsequently installed at the junction.





LTA's campaign on promoting gracious commuting behaviour on public transport by using the Thoughtful Bunch characters

3.1.3 Inspiring Graciousness

Promoting social awareness is an important aspect of what we do. We want to take this one step further by empowering everyone to make a difference. We will partner SKM and the public to identify and exemplify inspirational, civic-minded and responsible people as role models of gracious and caring behaviour on Walk-Cycle-Ride options.

3.2.1 Upskilling and Reskilling Transport Workers

Many transport workers are already trained to meet the diverse needs of all Singaporeans. We will continue to work with our tripartite partners, the National Transport Workers' Union (NTWU), National Taxi Association (NTA), National Private Hire Vehicles Association (NPHVA), as well as point-to-point and public transport operators, to ensure that transport workers remain well-equipped to meet those needs.

3.2 Developing Capabilities in our Transport Workers to Meet Diverse Needs

Front-line ambassadors like public transport and point-to-point transport workers play a key role in making travel experiences pleasant and enjoyable. We will continue to develop their capabilities through upskilling and reskilling programmes, to prepare them for changes in the transport sector and commuters' evolving needs.



Bus captain helping a commuter with special needs



The Singapore Bus Academy (SGBA) and Singapore Rail Academy (SGRA) are Centres of Excellence where public transport workers can acquire new skills. For example, the SGBA conducts an Enhanced Vocational Licence Training Programme which puts all newly hired public bus captains through customised training to better help people with special needs board and alight from the bus. The training includes practical sessions with persons in wheelchairs, the visually impaired, parents travelling with open strollers, and other people with special needs.

On top of these Centres of Excellence, we will work together with the public transport operators to enhance the training of service ambassadors stationed at our MRT stations, bus interchanges, and ITHs, so that they can readily identify and assist people with special needs. These ambassadors will serve as friendly faces who brighten every journey and ensure that everyone is able to use the land transport system safely and conveniently.

This is complemented by other initiatives undertaken by public transport operators to continually train and upgrade their workers' competencies. For instance, SBS Transit has teamed up with SG Enable for its bus captains to undergo the Workforce Skills Qualifications (WSQ) – Provide Cares Programme, which incorporates experiential learning to help bus captains better serve passengers who have special needs, such as seniors, expectant mothers, parents with young children and persons with disabilities.

Motivated by a similar desire to provide a more inclusive and welcoming travel experience, SMRT also organises the Inclusive Service Delivery Programme in collaboration with NTUC Learning Hub, Lien Foundation and Jurong Health. During the programme, SMRT's frontline service staff learn how to better assist people with special needs. Similarly, SMRT's dedicated bus training centre organises lessons to train all bus captains on how to assist persons with disabilities.

Tower Transit Singapore also conducts a programme to train its bus captains in basic customer service standards. This programme entails putting bus captains through scenarios where they help persons with disabilities and parents travelling with open strollers. Similarly, Go Ahead Singapore organises an in-house training course to equip bus captains with the ability to better serve people with special needs. They have also developed guidelines for bus captains to help passengers who are visually impaired, persons in wheelchairs or those who have dementia.

Our point-to-point operators also invest in training and upgrading the competencies of their workers. For instance, the Singapore Taxi Academy (STA) trains workers with the skills necessary to help people with special needs, such as those in wheelchairs or with visual impairments. As part of a wide-ranging review, we are now partnering Singapore Polytechnic to enhance the curriculum for both Taxi Driver's Vocational Licence (TDVL) and Private Hire Car Driver's Vocational Licence (PDVL) holders.

The SGBA, SGRA and STA are also well-placed to improve their training programmes by working with Voluntary Welfare Organisations (VWOs). This way, transport workers will be better equipped to help people with both visible and invisible disabilities², ensuring that everyone travelling on our public and point-to-point transport modes receives a consistent level of service and support.



Transport workers at the SGBA

² Invisible disabilities is an umbrella term that captures a whole spectrum of hidden disabilities or challenges that are primarily neurological in nature and are not immediately apparent.





Public Transport Workers' Appreciation Day 2018

3.2.2 Appreciating our Transport Workers

As we continue to develop the skills and capabilities of our transport operators and their staff, we also want to show our appreciation for their hard work. Our 22,000 public transport workers, including bus captains, maintenance workers and service ambassadors, play a crucial role in keeping Singapore's land transport system safe, reliable and comfortable.

Since 2017, we have collaborated with NTWU and the four public transport operators—Go-Ahead Singapore, SBS Transit, SMRT and Tower Transit Singapore – to organise an annual Public Transport Workers' Appreciation Day. In 2018, we also began partnering the SKM to invite members of the public to show their gratitude to the public transport workers who keep Singapore's land transport system running. The positive feedback we received from the public has been immensely gratifying and we will continue to work with our partners to organise more of such initiatives in the future.

Working with SKM and our tripartite partners, the National Kindness Award—Transport Gold celebrates outstanding service rendered by transport workers across the bus, rail and taxi industries from the operations, customer service, and automotive and engineering sectors [see Box Story 07]. Now in its 20th year, we will expand the Award by 2020 to recognise private hire car drivers who deliver excellent service to their customers.



Senior Parliamentary Secretary, Ministry of Transport, Baey Yam Keng, visited Tampines MRT Station on 21 Oct 2018 to encourage commuters to express appreciation towards our public transport workers

Box Story
07

A Heart for All

Mohamed Bin Osman, who is SBS Transit's Customer Service Officer on the Downtown Line, has come to recognise some of the regular commuters so well that he even remembers their travel routines and where they alight for work or school. Knowing the inconvenience of missing a planned stop, Mohamed makes a special effort to remember where the regulars are seated so that he can personally alert them if they doze off in the train. Besides serving as a walking alarm clock, he also looks out for people who need assistance, such as seniors, and finds seats for them.

Muhammad Noh bin Abdul Sukor is a Station Manager with SMRT. On hearing reports of a molestation case at Tanah Merah MRT station, Noh headed straight to the incident site. He saw two men pinning down the suspect, who was bleeding from the forehead. After alerting the Police, Noh showed compassion to the suspect by providing him with first aid, but was quick to apprehend him when he tried to escape.

Tay Yu Ying is a Customer Relations Officer at Go-Ahead Singapore. Yu Ying was on duty at Punggol Bus Interchange when someone turned in a lost wallet. Yu Ying was unable to immediately call the owner of the wallet as there was no contact number inside, but she knew that its owner would be distressed. She found the owner's address on an ID card within, and after her shift ended, personally delivered the wallet to its owner that night.

Goh Meow Eng, a Bus Captain with Tower Transit Singapore, is also a dedicated individual who takes pride in being an efficient worker. She has received compliments from passengers for her excellent service, such as going the extra mile to help an elderly lady who had a heavy trolley of groceries board the bus. In another instance, when Meow Eng found out that the destination of an elderly passenger was a long way ahead, she advised her to sit in the upper deck as it would be more comfortable.

Mohamed Bin Osman, Muhammad Noh bin Abdul Sukor, Tay Yu Ying and **Goh Meow Eng** are just four of the 445 individuals who were honoured at the 19th National Kindness Awards – Transport Gold 2018, held in November at the Istana. Their inspiring stories are examples of transport workers who go above and beyond to spread kindness and deliver exemplary service to all Singaporeans with utmost professionalism.



President Halimah Yacob recognising transport workers who delivered outstanding service

Photo credit: Singapore Kindness Movement

3.3 Enhancing Capacity to Meet the Needs of All

Beyond encouraging commuters to look out for others and improving training for transport workers, inclusive infrastructure is important to meet the needs of all too. We will continue to enhance Singapore's land transport facilities so that everyone, regardless of their needs, will be able to enjoy a more convenient, better-connected and faster land transport system.



3.3.1 More Barrier-Free Journeys for Easier Travel

Today, all bus interchanges, ITHs and MRT stations have at least one barrier-free access route. This means that there are ramps, lifts and other improvements to make it easier for those with additional mobility needs, such as seniors and persons with disabilities, to access these public transport facilities. However, we should and will do more to improve barrier-free accessibility, so that more journeys by walking, cycling and riding public transport are barrier-free by 2040. To make travelling easier for people in wheelchairs, we are already trialling hands-free fare gates at selected MRT stations. If these are successful, more commuters with special needs can look forward to quick and easy travel without needing to tap at fare gates. We will also make our transport facilities more welcoming for everyone. The ongoing Bus Stop Infrastructure Enhancement Programme will ensure that all bus stops are barrier-free by 2020.



All taxi stands constructed after 2008 are already barrier-free and where possible, we will make existing taxi stands barrier-free too. Since 2018, all new public buses come with two wheelchair bays, and by 2020, all public buses in Singapore will be wheelchair-accessible. We will also work with other Government agencies to make journeys to public housing estates and public sector infrastructure barrier-free. Since 2013, we have installed lifts at 47 pedestrian overhead bridges, and will continue to upgrade 29 more with lifts by 2022, including 28 near hospitals and polyclinics. We will also build more covered linkways to connect public housing estates and amenities to the expanding land transport network. These linkways will have places for people to stop and rest.



Covered linkways include places for people to stop and rest

3.3.2 Improving Point-to-Point Transport Inclusivity

Taxis and private hire cars offer people convenient and fast point-to-point connections. Presently, SMRT Taxis and ComfortDelGro respectively operate London Cabs and MaxiCabs, for persons using wheelchairs, while Grab offers the GrabAssist service for people with different accessibility needs. We will continue to work closely with other relevant agencies and point-to-point transport companies to increase the accessibility and affordability of the fleet of wheelchair-accessible vehicles available in Singapore. Where necessary, we will also set targets for the availability or the number of such vehicles and improve the efficiency of using these vehicles.

3.3.3 Redesigning Facilities to Meet Commuters' Needs

We have carefully studied and accepted the recommendations of the Family-Friendly Travel Advisory Panel, which found that many Singaporeans want our land transport system to have more facilities to cater to families with young children and seniors. Parents can look forward to more nursing rooms at selected bus interchanges and MRT stations. In addition, we are also exploring the possibility of having quiet rooms which are designed for people who need access to a quiet and calming space during their journey. We have also begun to install stroller restraints in our buses and intend to install them across the entire bus fleet by 2020 [see Box Story 08]. All new bus stops will also have elder-friendly seats with armrests that make it easier for our seniors to stand up from a sitting position. Existing bus stops will be progressively upgraded to include such elder-friendly seats, starting with the first batch of 2,300 bus stops by 2021.



Facilities for parents travelling with young children

Box Story
08

Safer and More Convenient Journeys for Parents with Young Children

Since 2017, parents using strollers can board our public buses without having to close them. Many families and caregivers have welcomed the move, saying that their journeys are more convenient today.

We now intend to put in more measures for a safer journey. In July 2017, we piloted a stroller restraint system on Service 69, which plies between Bedok and Tampines. Developed by Temasek Polytechnic students and built by ST Kinetics, the stroller restraint in the wheelchair bay allows parents to safely secure their open strollers on the bus.

During the one-year trial, 80% of commuters surveyed by SBS Transit supported the stroller restraint device. Respondents, especially parents with open strollers, found it safe and useful. Following the trial's success, we will now install stroller restraint devices across our entire bus fleet by 2020.



A mother using the stroller restraint system to secure her open stroller



The Next-Generation Passenger Information Display provides timely and relevant information for commuters on board our buses

3.3.4 Making Information Accessible

Many persons with disabilities who took part in our public engagement exercise felt that we could make information about our land transport system more easily accessible to them. We have heard them and will continue to work with public transport operators to improve the quality of signage and announcements at all major public transport facilities. In fact, commuters can look forward to more signs with larger fonts and Braille. We will also refine our information displays so that seniors, and those with visual or hearing impairments, can navigate our land transport network more easily.

One example of this is the Next-Generation Passenger Information Display System that is being installed in all new public buses. This system will provide bus passengers with real-time locational information such as upcoming stops and transfers to MRT/LRT stations. It also includes audio announcements of the next stop which will especially benefit visually impaired passengers.

3.3.5 Technology as Enabler

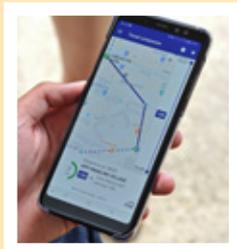
Today, many people rely on their smartphones to plan their journeys. Expectations about transport data have changed fundamentally since the last LTMP in 2013. Hence, we will make more real-time information available to app developers. We are also working with the Singapore Land Authority (SLA) on a trial to map barrier-free routes in the vicinity of the Enabling Village in Redhill by end-2019. If successful, we will explore mapping barrier-free route locations across our towns and city. To help people better plan their routes, we will also explore providing more real-time information about lift and escalator maintenance works at our MRT stations and pedestrian overhead bridges. Together, this data will help developers create apps that can make journeys easier for all. Already, the ongoing trial of the assistive passenger information software known as Mobility Assistance for the Visually Impaired and Special Users (MAVIS) has made bus journeys easier for some people with special needs [see Box Story 09].

Box Story
09

Mobility Assistance for the Visually Impaired and Special Users (MAVIS)

Kwek Bin, 37, is an IT programme executive who is visually impaired. When he travels, Kwek Bin prefers to take the MRT, as the tactile signs in stations and clear announcements at platforms and in trains make it easier for him to navigate our rail system independently. In contrast, he rarely travels by bus. He finds that it is more difficult to orientate himself on buses, and he also has to depend on the bus captain to let him know when to alight. When travelling from his workplace near Toa Payoh to the Enabling Village, Kwek Bin takes 45 minutes by MRT even though there is a direct bus.

To give commuters like Kwek Bin more ways to travel, we collaborated with SG Enable and INIT Asia-Pacific Pte Ltd to launch the Mobility Assistance for the Visually Impaired and Special Users (MAVIS) smartphone application trial. MAVIS aims to make it easier for commuters with special needs to take the bus by providing them with personalised information, such as the estimated time of arrival and notifications to board or alight the bus. This enables passengers like Kwek Bin to travel more independently, as he can rely on audio announcements on board the bus to inform him of the next stop.



Using MAVIS to ride the bus

MAVIS also benefits other commuters: passengers with T-Coil-enabled hearing aids can also listen to announcements at bus stops, such as the service number and final destination of the approaching bus. When required, MAVIS will also alert bus captains that commuters with special needs will be boarding or alighting at the bus stop ahead, so that they can prepare to help if needed. Kwek Bin was on hand to try out MAVIS when it was launched at the Enabling Village in January 2019. He had a positive experience and now feels more confident taking the bus when he travels. Kwek Bin said that he would like to see the app rolled out across the bus network, as it would provide commuters like him with more travel options so that “they can explore bus routes and pick the ones that they never really knew about”.



Bus captain receives an alert from MAVIS

3.4 Building an Inclusive Transport System Together

By 2040, our goal is to have a land transport system that is anchored by a gracious and caring commuting culture, supported by well-designed infrastructure and facilities, and helmed by capable transport operators with well-trained staff who can help deliver pleasant and enjoyable journeys for all commuters.

We will collaborate with relevant agencies and VWOs to develop a meaningful system to measure and guide our efforts. We will also form a “Commuter Advocate” panel, comprising people with diverse needs travelling on Walk-Cycle-Ride options.

We intend to invite seniors, persons with disabilities and parents of young children onto this panel to help us create an inclusive land transport system.

We acknowledge that these aspirational goals will take time to accomplish. They also require concerted effort from all of us – the Government, commuters, transport operators and transport workers. Working hand-in-hand, we can achieve a pleasant and inclusive Transport for All.



CHAPTER

4

Healthy Lives, Safer Journeys



Everyone wants to lead healthy lives in a clean and safe environment. Many Singaporeans have told us that they want a transport system that helps them to improve their own health and well-being. We have heard you and will make it easier for Singaporeans to be active by designing more pleasant, welcoming streets that make walking and cycling a breeze. This new, increased focus on improving our streets and enabling more people to use public transport will also reduce the carbon footprint of the land transport system. As Singaporeans become older and turn more to Walk-Cycle-Ride, it is also vital that our streets are safe for all.

These aspirations are reflected in the LTMP Advisory Panel's vision of a land transport system that contributes to healthy lives and safer journeys. We agree with the Panel's recommendations and envision that by 2040, we will:

- (i) **Dedicate more space to public transport, active mobility and community uses;**
- (ii) **Have cleaner energy fleets for a healthier environment; and**
- (iii) **Reduce land transport-related fatalities towards a safer “Vision Zero” environment³.**



4.1 Support Healthy Lives: More Spaces for Public Transport, Active Mobility and Community Uses

Health professionals recommend all adults do at least 150 minutes of physical activity every week.

One of the easiest ways to include physical activity in our daily routines is by walking and cycling more, either for whole trips or as part of longer public transport trips. For example, regular public transport users spend an average of 15 minutes walking or cycling every day as part of their commute. An internal study by LTA and the Ministry of Health (MOH) showed that the people living between 1km and 2km of a new Downtown Line 2 station lost more weight than people who did not⁴, likely due to the additional physical activity of travelling to and from the station. Furthermore, Public Health England found that children burnt twice as many calories when they walked or cycled, compared to when they travelled by car⁵.

As part of a broader push to help Singaporeans lead healthier lifestyles⁶, we will change the way we plan and design towns to make active modes of transport - like walking, cycling and using PMDs - more convenient, with more connected pathways to save time and to make journeys easier and more direct.

In our future development areas, such as Kampong Bugis, Marina South, Jurong Lake District and Woodlands Regional Centre, we will dedicate more space to Walk-Cycle-Ride transport as compared to roads or carparks for private cars [see Figure 6].

³ While we recognise that reducing the number of fatal accidents to zero is hard to achieve, road designers and road users should still work closely together at the design phase.

⁴ This study compares the change in the body weight of residents living around DTL2 stations, from before station opening to after station opening, to those living further away.

⁵ 'Active People Survey data in Public Health Outcome Framework', Public Health England.

⁶ Ministry of Transport is a member of the MOH-led HealthySG taskforce set up in 2018 to encourage Singaporeans to adopt healthy lifestyles and promote healthy living in Singapore.

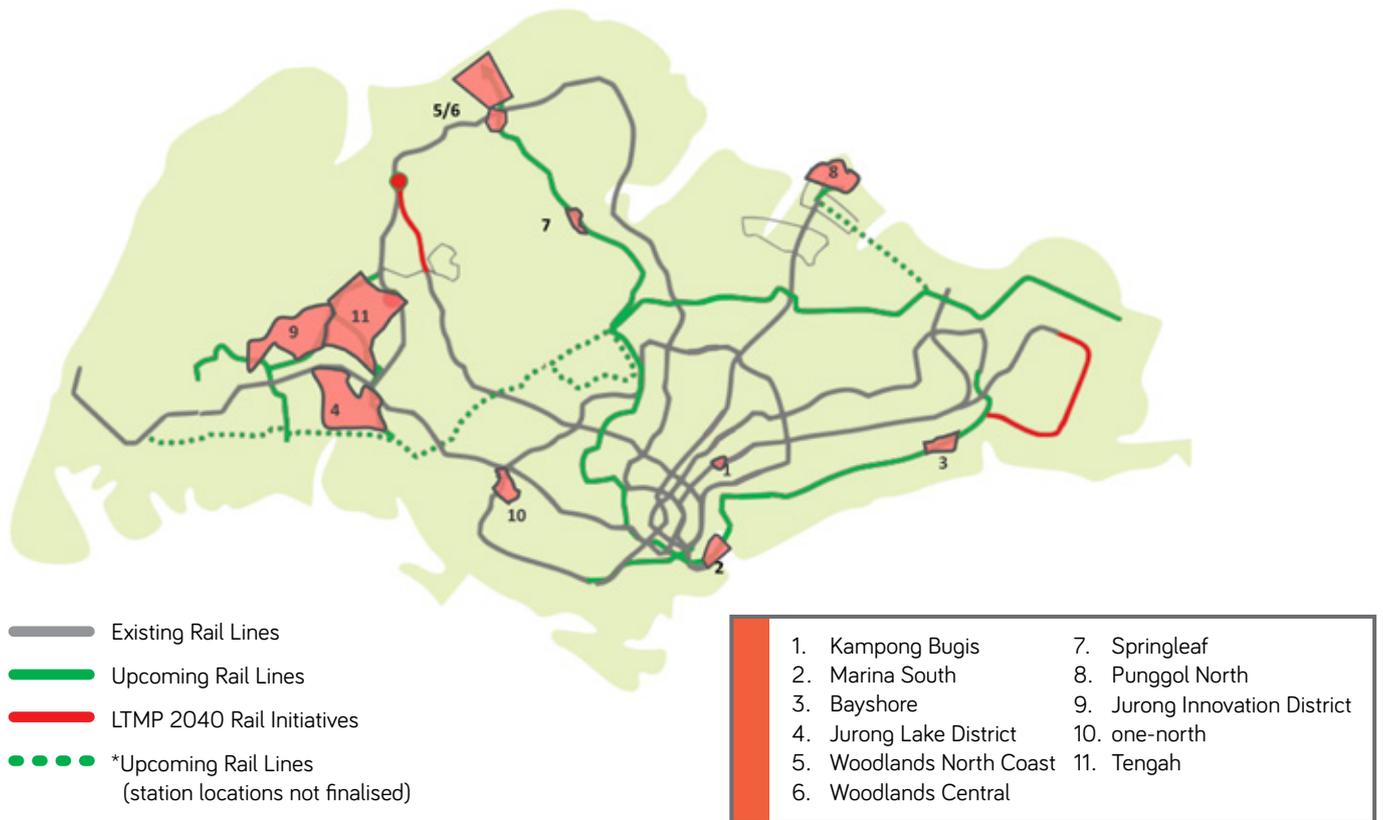


Figure 6: Development areas where more space will be dedicated to Walk-Cycle-Ride transport

We will transform existing towns to become more public transport-centric and active mobility-friendly too. Where feasible, we will convert existing road lanes into spaces for public transport and active mobility, such as bus lanes, dedicated cycling paths and wider footpaths. Beyond upgrading the streets, we will also work with MOH and other Government agencies in the HealthySG Taskforce to encourage more people to incorporate some walking or cycling in their daily routines to improve their health.

Good urban and transport planning will pay dividends beyond boosting Singaporeans’ physical health. Vibrant community spaces, for example, provide residents with opportunities to dwell and interact with others. This can lead to deeper social cohesion among residents, strengthening community ties and enhancing quality of life.

Looking ahead to 2040, we believe that towns should have the following features to support healthier lifestyles:

- (i) Seamless connections enabled by active mobility; and
- (ii) Vibrant community spaces

4.1.1 Seamless Connections Enabled by Active Mobility

More Singaporeans now walk, cycle or use PMDs. Between 2012 and 2016, the number of daily active mobility journeys rose from 2.2 million to 2.6 million⁷.

We will continue to support this by enhancing our infrastructure to provide a more conducive environment for active mobility. By 2030, 8 in 10 households will be within a 10-minute walk from a train station. To facilitate a comfortable walking environment, we will add 150km of covered linkways between MRT stations, residential areas and amenities by 2040. We will also build more underground connections. For instance, there will be an 800-metre-long, 30-metre-wide pedestrianised street with an underground mall to link the Thomson-East Coast Line’s Marina South and Gardens by the Bay MRT stations. This will provide a pleasant and interesting experience for those who choose to walk from the vicinity of one station to the other.

⁷ From our latest Household Interview Travel Survey (HITS), conducted from 2016 to 2017.

We will improve wayfinding signs to make it easier for people to identify routes, navigate and complete their journeys. We are conducting a consultancy study for an integrated wayfinding system, and will develop guidelines for consistent wayfinding and the communication of information to land transport users.

We will also build more bicycle parking facilities across the island to make it easier for people to cycle. Almost all residential estates and key amenities such as polyclinics, community centres, schools and town centres will have bicycle parking facilities within a five-minute walk. Where space permits, we will also provide bicycle parking facilities at every bus stop and MRT station exit. By 2020, Singaporeans will have 267,000 bicycle parking spaces, with more to come by 2040. We will also work with private developers to incorporate more bicycle parking and end-of-trip facilities, like showers and lockers, in their developments. These plans will complement the ongoing expansion of our cycling path network to make cycling a more viable mode of transport [see Box Story 10].

We will also require private developers to submit a Walking and Cycling Plan as part of new applications for development proposals. This will help ensure that people who walk or use active mobility devices can travel safely within the developments and connect easily through these developments to surrounding ones and to key public transport nodes.



Bicycle parking facilities

Box Story
10

Kampong Bugis

Residents in Kampong Bugis town will have a large variety of active travel choices. They can walk under covered linkways to the East-West Line's Lavender and Bugis MRT stations, enjoy an underground walking connection beneath Crawford Street to get to Lavender MRT station, and stroll on a new footbridge across Kallang River to Sims Avenue. The Central Business District will also be a 15-minute bicycle ride away via the Park Connector Network at the planned Kallang Riverside Park.

Residents will also have a variety of active and shared transport options such as shared car services, PMD-sharing services, bicycle-sharing services and shuttle bus services. This will enable the adjustment of the town's car parking provisions to one lot for every two residential units, freeing up a generous amount of space for parks and other community uses.



Artist's impression of Kampong Bugis town
Photo credit: Urban Redevelopment Authority



4.1.2 Vibrant Community Spaces

Today, Holland Village, Ann Siang Hill, Circular Road and Club Street are vibrant community zones on weekend evenings, with many Singaporeans enjoying the lively entertainment scene and outdoor dining areas along these streets. Learning from these successes, we will convert parts of other roads permanently into walking streets and community spaces, starting with Armenian Street and Market Street/Malacca Street in 2019 and 2021 respectively. We are also exploring similar treatments for our historic districts such as Kampong Glam, Chinatown and Little India, with works being planned for Haji Lane and Bali Lane.

This will add life and vibrancy to these and other districts, allowing more people to enjoy rediscovering them on foot [see Box Story 11].



Cyclists and pedestrians enjoying activities in the Civic District during Car-Free Sunday

Box Story
11

Dhoby Ghaut

Working with other agencies, we are studying the feasibility of repurposing Orchard Road into creative new urban spaces in the long term. To start, a section of the road at the Dhoby Ghaut area could be pedestrianised, linking up the green spaces at Istana Park, Dhoby Ghaut Green and the open space at Plaza Singapura. This will create a lifestyle zone nestled in lush greenery, with play areas for children and flexible event venues for festivals and fashion shows.



Artist's impression of pedestrianised Dhoby Ghaut area
Photo credit: National Parks Board (NParks)

We will also continue to support ad-hoc road closure initiatives such as the Urban Redevelopment Authority's (URA) Car-Free Sundays and Streets for People, and People's Association (PA)-assisted community event road closures. We also want to collaborate with the community to create more ground-up shared community spaces as these are key to a more vibrant living environment [see Box Story 12].

Box Story
12

More Community Space in Whampoa Drive

We launched a Silver Zone initiative at Whampoa Drive. Apart from introducing enhanced safety features such as speed-calming measures, we repurposed part of the road to create more community spaces for people to stop and rest. After consulting residents through the Grassroots Adviser, we installed benches in the area for people to interact and bond on their journeys to nearby destinations, such as the Whampoa Makan Place. NParks also spruced up the area by planting more trees. By partnering with the grassroots and Government agencies, we created a more conducive street environment for the residents to enjoy.

“ Besides making Whampoa Drive a safer road for our elderly, the community space provided in the Silver Zone will become an additional community focal point for our residents to relax, enjoy, meet and interact. This will help to further strengthen and enhance the neighbourliness and bonding amongst the residents. ”

Chua Lai Teck, BBM (L)
Vice Chairman of Whampoa Drive Residents' Committee



Whampoa Drive before the introduction of Silver Zone



Whampoa Drive after the completion of Silver Zone



4.2 Contribute to a Clean Environment: Environmentally-Friendly Vehicles and Infrastructure

As people rely less on private cars and use Walk-Cycle-Ride modes more, we can expect cleaner air as vehicle emissions are reduced. However, more can be done. Fleet vehicles, such as buses and taxis, have much higher carbon emissions per vehicle compared to private vehicles. For example, the average carbon emission of a taxi is more than seven times that of a private car. We can decisively reduce the emissions from these vehicles to contribute to cleaner air and a quieter environment.

4.2.1 Cleaner Energy Public Bus Fleets

We are committed to having a 100% cleaner energy public bus fleet by 2040, like electric or hybrid vehicles. We have been conducting trials with 50 diesel hybrid buses since December 2018. We will assess their performance under Singapore's operating conditions and their cost effectiveness, and may buy more of such buses if the trials prove successful.

In tandem with our push to adopt such newer technology, the Singapore Bus Academy has expanded its training facilities to further professionalise bus technical specialists. The Bus Technical Specialist Certification Centre, which is equipped with advanced digital technology like augmented reality tools and tablet devices to provide interactive learning, will ensure that transport workers have the necessary skills to cope with changes in bus technology.



A diesel hybrid bus on the road



4.2.2 Cleaner Energy Point-to-Point Fleets

Our taxi companies have also taken the lead to commit to 100% cleaner energy vehicles by 2040. Such cleaner energy fleets can be hybrid, electric or a mixture of both. HDT Singapore Taxi Pte Ltd has already stepped forward to operate a fleet of fully electric taxis and aims to expand its fleet size to at least 800 by 2021. Some private hire car booking providers and car rental companies have also committed to make their entire fleet run on cleaner energy by 2040. Companies such as Grab have also introduced electric vehicles in their existing fleets [see Box Story 13].

4.2.3 Facilitating Private Adoption of Cleaner Energy Vehicles

As the motor industry continues to produce cleaner and quieter vehicles, we will facilitate their adoption by private individuals by reviewing our regulatory regimes, vehicle registration schemes and vehicular emissions schemes. We will also continue to encourage electric car-sharing programmes such as BlueSG by working with the relevant stakeholders.

4.2.4 Reducing Noise Pollution

To reduce noise pollution for an enhanced living environment, we will continue to install noise barriers along elevated railway sections. We will also build them along road stretches that face noise-sensitive developments. These will be implemented progressively, starting with 20km on expressway flyovers. Together with the wider adoption of quieter vehicles such as electric cars, Singaporeans can expect to have quieter traffic in the future.

Box Story
13

Companies Taking the Lead

The following companies and associations have pledged to make all their vehicles run on cleaner energy by 2040. In fact, the taxi companies have gone even further by committing to have 90% of their fleet run on cleaner energy by 2025.

Taxi Companies

- CityCab Pte Ltd
- Comfort Transportation Pte Ltd
- HDT Singapore Taxi Pte Ltd
- Premier Taxis Pte Ltd
- Prime Car Rental & Taxi Services Pte Ltd
- SMRT Taxis Pte Ltd
- Trans-Cab Services Pte Ltd

Private Hire Car Companies, Vehicle Rental Companies & Associations

- Drive.SG
- Go-Jek
- Grab
- Huang Bao Che
- Lion City Rentals Pte Ltd
- RMG Rent-A-Car Pte Ltd
- Roset Limousine Services Pte Ltd
- Sime Darby Services Pte Ltd
- Singapore Mobility Corporation Pte Ltd
- Vehicle Rental Association



Noise barriers installed along an elevated railway section

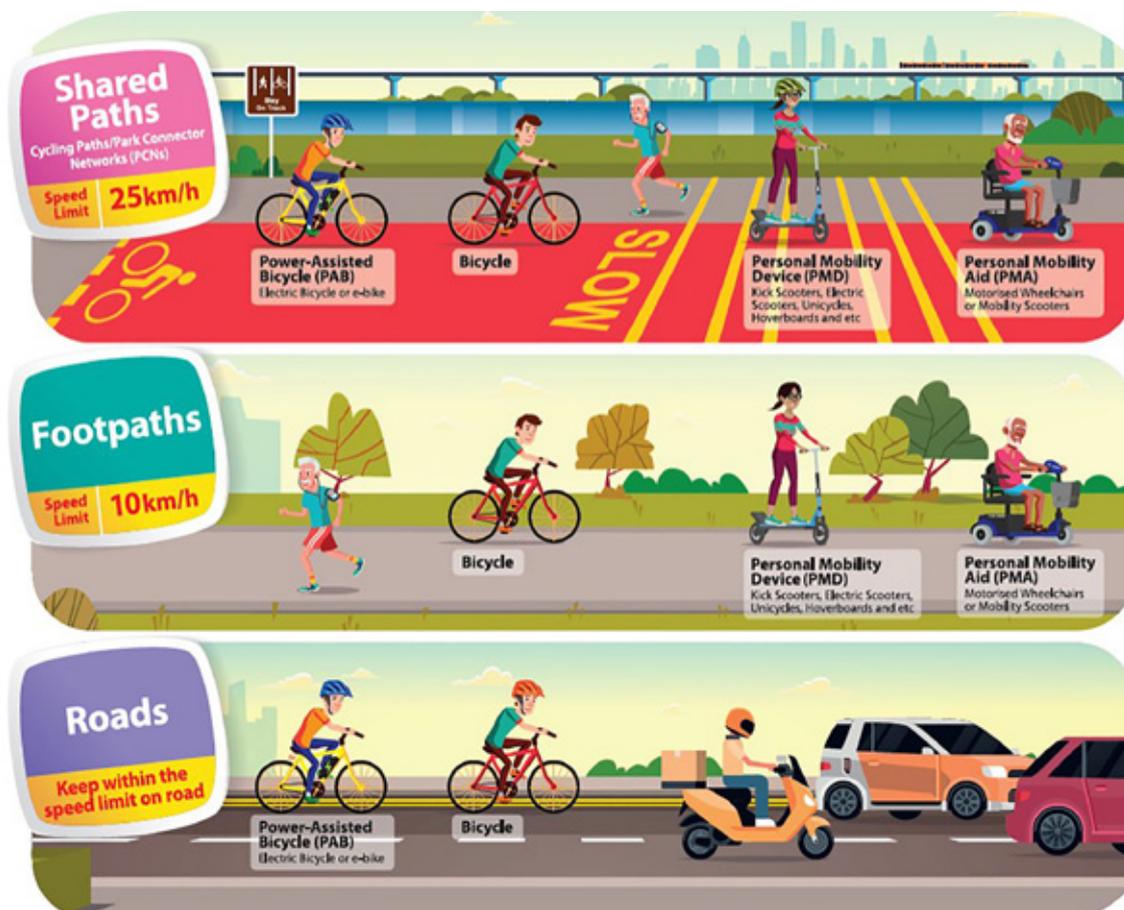
4.3 Facilitate Safer Journeys: Towards a Future with Fewer Land Transport-related Fatalities

One death is one too many for any land transport system. While we will spare no effort to design and build infrastructure that promotes safety, it is critical that all transport users exercise both personal responsibility for their own safety and shared responsibility for the safety of others. A safer “Vision Zero” environment is one where everyone behaves safely and graciously, and where infrastructure and other design elements promote safety. We will work with other agencies and stakeholders to step up education and enforcement efforts, even as we redesign our roads and paths to better minimise conflicts among different users.

4.3.1 Influencing Safe Behaviour

During our public engagement exercise, we heard many Singaporeans express concerns about safety on public paths. They felt that some individuals, such as those who use active mobility devices, could be more gracious and careful when riding on pavements. Conversely, some people who use active mobility devices shared that pathways could be safer if everyone, including those who walk, is more alert to what is happening in their immediate environment. What is clear from this is that everyone has a role to play in keeping themselves and others safe at all times.

We are also aware that different codes of conduct apply to different users in different scenarios today. For example, the Highway Code applies to motorists on roads, while the Code of Conduct on Use of Bicycles and PMDs on Footpaths and Shared Paths applies to cyclists and PMD users on paths. Still, certain key desirable behaviours should apply at all times across all situations.



Code of Conduct on Use of Active Mobility Devices on Public Paths



Some have called on the Government to help foster a gracious commuting culture by identifying norms that all of us can easily remember and practise in our everyday lives, regardless of whether we walk, cycle, use active mobility devices, use public transport or drive. We will work with key stakeholders to determine which norms are suitable, and partner the community to spread them.

We will also continue to collaborate with the Singapore Road Safety Council (SRSC) and Traffic Police (TP) to educate and engage the community on road safety awareness. For example, through schools' road safety programmes, we teach children about school zone safety. This helps to instil a sense of road safety from young and reminds parents to teach their children safe road-crossing habits.

“ Every road user is responsible for one’s own safety and for practising defensive habits whenever they are on the road or on paths. Motorists must always travel at safe speeds and keep a careful lookout for other road users as they share the same road space. The Singapore Road Safety Council will continue working with the Traffic Police, Land Transport Authority and other road safety stakeholders to engage road users through education programmes aimed at improving attitudes and behaviours to road safety. ”

Bernard Tay
Chairman of SRSC

To cultivate a safer and more gracious path-sharing culture, we will also continue to roll out and encourage participation in programmes such as the Safe Riding Programme (SRP). We will also engage the community more widely and deeply through initiatives such as the Active Mobility Patrol (AMP) which allows volunteers to take the lead in reaching out to their fellow residents to encourage safe riding practices.

We will intensify our engagement with other important stakeholders, such as migrant workers, delivery riders and active mobility interest groups, and work with others such as the Singapore Kindness Movement to broaden our outreach.

Even as we strengthen our outreach efforts, we will continue to take a firm stand against errant users. Reckless behaviour on our roads and paths will not be tolerated. LTA and TP will enhance the strict enforcement efforts against unsafe behaviour. For example, we are exploring how new technology such as closed circuit television cameras with video analytics capabilities can augment enforcement efforts.



An Active Mobility Enforcement Officer interacting with a PMD user

4.3.2 Designing for Safety

4.3.2.1 Street Infrastructure & Traffic Schemes

To boost residential towns' safety and walkability, we will also press on with localised street improvements to reduce traffic speeds and make them more welcoming to people who walk [see Box Story 14]. We will start with streets in more mature estates such as Yishun, Ang Mo Kio and Tampines, before moving on to other towns. The focus initially will be on locations where there are larger numbers of people travelling by foot and by car, such as those near town amenities and schools.

In light of Singapore's ageing population, making our roads and paths safer for seniors and those with mobility issues or slower reaction times will also be a priority. To this end, we will complete 50 Silver Zones by 2023. These have features such as narrower roads and speed humps to reduce traffic speed, and two-stage crossings that allow people to rest at the midpoint. We are also conducting a trial to lower speed limits in selected Silver Zones from 40km/h to 30km/h. If successful, the scheme may be extended to other Silver Zones.



Signs informing motorists that they are in a Silver Zone

Box Story 14

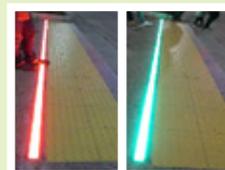
Innovations to Promote Safety

Illustrating our innovative efforts to make our streets safer, we have introduced three-dimensional (3D) traffic calming markings at the Whampoa Drive Silver Zone. This initiative encourages people driving to slow down by making them think that lanes have become narrower. We will review this trial's success later this year.

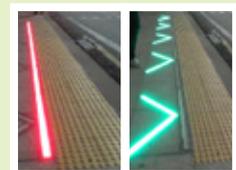


3D traffic calming markings at Whampoa Drive towards Balestier Road

We are also testing if LED Traffic Light Strips can nudge people to become more aware of and comply better with traffic light signals. Such strips flash in sync with the Red-Man and Green-Man signals, and are now situated at four locations: Victoria Street, Buyong Street, St Andrew's Road and Bencoolen Street.



LED traffic light strips at Victoria Street



LED traffic light strips at St Andrew's Road



LED traffic light strips at Bencoolen Street

To improve everyone’s safety on our streets, we will remove discretionary right turns at signalised junctions, where possible. We will introduce controlled right turns or Red-Amber-Green arrows at about 1,000 traffic junctions by 2023. These will be expanded gradually to other junctions. Where it is not feasible to introduce controlled right turns, we will install other safety features such as turning pockets, “Give Way to Pedestrian” signs and lighted road studs.

We will also give seniors and persons with disabilities more time to cross the road. We have introduced the Green Man Plus scheme at about 1,000 pedestrian crossings and will extend this to another 1,500 pedestrian crossings in housing estates by 2026.

4.3.2.2 Dedicated Cycling Paths & Wider Footpaths

As active mobility devices become more popular, we are seeing more user types and needs on our public paths. We note the safety concerns and calls for more dedicated cycling paths during our public engagement exercise. As part of our plans to expand our cycling path network to more than 1,000km by 2040, we will construct dedicated paths to provide additional space where possible. However, due to infrastructure limits and site constraints, such dedicated cycling paths will not be possible everywhere. Nevertheless, we will provide more space where we can by building wider shared paths, or by exploring the widening of footpaths especially at areas where path traffic is high. We will also design crossings to improve safety at high conflict areas such as bus stops.



Dedicated cycling paths are red for easier distinction from footpaths

4.3.2.3 Improving Safety Using Technology

Tapping advances in technology can also help make our journeys safer. For instance, we are installing a collision warning system in 400 new buses. We have also built a reverse warning system at Joo Koon ITH, and we will do so at other new bus interchanges such as Yio Chu Kang. These measures will improve safety for our bus captains, bus passengers and other road users.



Going forward, we will also provide personalised location-based safety alerts to remind motorists to slow down and drive more carefully, especially at School Zones, Silver Zones and areas with road works or incidents.

4.4 Towards a Better Quality of Life

Our land transport system plays a crucial role in creating a more liveable Singapore. We will redesign towns to facilitate healthier lifestyles, support the shift to cleaner vehicles for a healthier and quieter environment, and undertake efforts to reduce land transport-related fatalities and achieve a safer “Vision Zero” environment. At the same time, we urge everyone to look out for one another, lead active lives supported by our transport improvements, and partner us in making our city safer, more liveable and pleasant for all Singaporeans.



CHAPTER

5

LTMP in Your Community





Delighting commuters is at the heart of what we do

More than 7,400 commuters, transport workers, industry players, academics and experts gave us valuable suggestions for LTMP 2040. We were heartened to hear from many people that they wanted to play an active role in shaping our land transport system, even beyond the formal consultation process. We will continue to reach out and listen, expand channels for collaboration and co-deliver programmes to benefit Singaporeans.

5.1 Community Partnership: Building Communities

We formed our Community Partnership (CPN) division more than a decade ago in response to Singaporeans' increasingly diverse and challenging land transport needs. We wanted to connect with the community at large to better understand residents' local transport issues and concerns.

Over time, our CPN officers have formed strong and trusted relationships with various stakeholders, Grassroots Advisers and other community leaders. Our officers are now an important part of the local community. Working at the frontlines, they interact with residents through events and house visits, hearing your concerns and helping to clarify questions and doubts. Their efforts are an integral part of our feedback gathering process, and with their ground knowledge, they have suggested refinements to our policies and projects, often in ways that may not be immediately apparent to the communities that they serve.

We acknowledge that different stakeholders may have contrasting views on how transport initiatives should be implemented. Our guiding principle is to balance the various stakeholder needs as best as we can, by identifying the option that works best for the community as a whole. In the process, what we strive for is a culture of shared responsibility so that residents themselves play an active role in designing innovative land transport solutions with broader community appeal.



5.2 Reaching Out to You

When coming up with new ways to improve transport in our towns and city, we customise our proposals by consulting residents and stakeholders so that people living in the area have a part to play even at the planning stage. For example, we engage local communities when we build Silver Zones and covered linkways, or when we need to amend a bus route [see Box Story 15]. We also reach out to Singaporeans through initiatives like the Safe Riding Programme, which encourages people who are cycling and using PMDs to share paths safely and harmoniously.



Box Story
15

Covered Linkways: Consult Before We Build

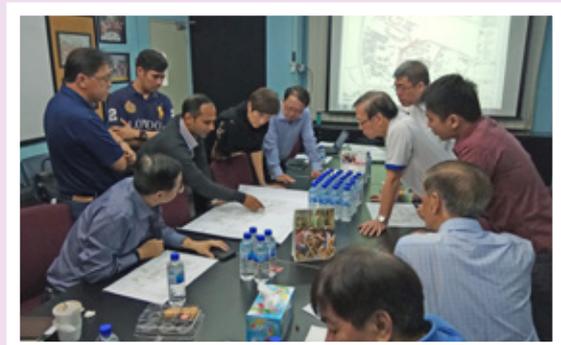
We consult widely whenever we plan local transport infrastructure improvements. Even after we take in feedback and ideas, we still want to know if what we have done meets the community's needs.

In 2013, as part of our people-centred vision for land transport, we committed to promoting greater use of public and active transport. Among other things, we started the Walk2Ride programme, constructing covered linkways to make walking to the nearest transport hub a more pleasant experience.

Where feasible, we build linkways to schools, healthcare facilities and other public amenities within a 400-metre radius of MRT stations, and within a 200-metre radius of LRT stations, bus interchanges and heavily-used bus stops.

Before building these linkways, we meet grassroots leaders and stakeholders to understand the local community's needs and concerns, and to explain our plans.

Sometimes, we receive requests for enhancements that exceed our initial plans. Where feasible, we try to integrate the community's ideas into our eventual design. A good example is the covered linkway leading to South View LRT station, where we took up residents' suggestions to convert an unused space outside the station into a three-metre-wide path for commuters.



Meeting with community leaders on the proposed covered linkway leading towards Bright Hill and Upper Thomson stations on the upcoming Thomson-East Coast Line

Some private developers have also been enthusiastic supporters. For instance, they have erected internal links within their properties to connect to our covered linkways, providing more shade and shelter for people to travel to and from the MRT stations or bus stops.

Together, these efforts allowed us to complete 200km of covered linkways islandwide in September 2018. We will provide more of these linkways, designed with the community at heart, to connect future MRT stations to nearby amenities.



Before and after photos of South View LRT station's covered linkway

Looking ahead, we want to engage the community extensively as we roll out plans to repurpose road spaces for Walk-Cycle-Ride and for community uses. Some of these works have started in Whampoa and Commonwealth, where we have freed up some road space for other uses. In those instances, residents and other stakeholders actively took part in the design process for the additional space, resulting in wider shared paths and community gardening plots.

We are taking a leaf from other cities which have designed street space to benefit local communities. In Barcelona, large portions of roads in neighbourhoods have been converted into community or mixed-use spaces where people stop to rest, relax and mingle harmoniously with those walking, cycling or driving [see Box Story 16]. We are excited to partner the community to explore if this concept can be implemented in Singapore, with entire streets converted for shared use.

In the future, our community engagement efforts will go beyond consultations for improvement plans. We were pleasantly surprised by the warm reception to our LTMP 2040 public engagement exercise's experiential sessions, which included games conducted during the FGDs. Participants shared that the sessions helped them better understand the considerations behind our land transport planning and policies. Buoyed by these encouraging comments, we intend to bring more of such sessions, including the games, to you. Likewise, through our Transport Ambassador Programme (TAP), we will continue to reach out to students, source for novel ideas to seed gracious commuting behaviour, and encourage more people to Walk-Cycle-Ride.

At the same time, we will continue to keep open multiple channels for members of the public to reach out to LTA, to provide feedback or share ideas on how the transport system can be improved. These are valuable to us in our day-to-day operations as well as in our plans for our long-term transport landscape.

Box Story 16

Barcelona Superblocks

In Barcelona, a new model of mobility is reshaping the idea of a typical urban road network. The city's "superblocks" are mini neighbourhoods that span nine blocks each and these push the general vehicular traffic to the periphery. The streets within each square superblock are designed for people to walk and cycle and have a greatly reduced speed limit of 10km/h. Emergency and delivery vehicles, as well as those belonging to the superblock's residents, can use the streets, but only under special circumstances.

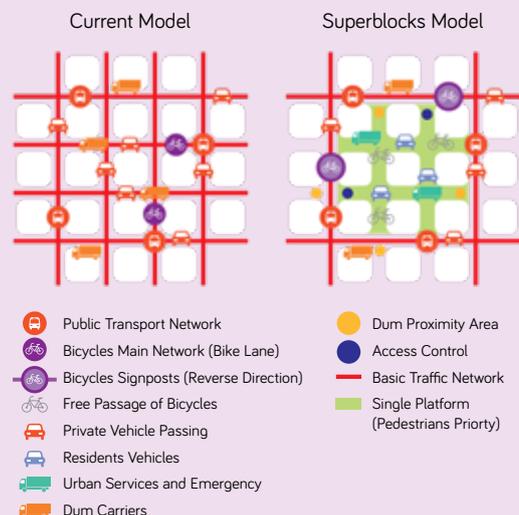
By introducing permanent structures like playgrounds at cross-junctions, temporary street furniture and features like potted trees at other locations, superblocks allow walking and community spaces to extend onto the street. In fact, nearly 60% of street space previously used solely by vehicles can be converted into mixed-use space for citizens, significantly improving urban liveability, social cohesion and economic activity.

Since a superblock was created in the Gràcia district in 2007, its street life has flourished. The number of walking and cycling trips through the district has increased by 10% and 30% respectively, while driving trips within the superblock has fallen by 26%. The number of vehicles driven on the superblock's internal streets has also reduced by 40%.

Source: <http://www.bcnecologia.net/en/conceptual-model/superblocks>



Using temporary street furniture to create more community spaces in Barcelona's superblocks



5.3 Collaborating with You

Everyone can contribute to a better transport system. We want to work with all stakeholders to seize opportunities from emerging trends and technologies, and deliver more innovative solutions for commuters.

Partnerships extending outside the Government have delivered many land transport enhancements in recent years. Many popular third-party wayfinding apps, such as Google Maps and Citymapper, make use of the wealth of transport-related data available on our DataMall.

Academics and industry experts also support our land transport development through their research and projects. For example, we collaborated with researchers from the National University of Singapore to improve the design of noise barriers at construction sites.

The new co-developed noise barriers are 30% more effective at reducing construction noise. We will continue to aid academics and experts interested in designing new solutions for our transport system.

Most importantly, we are inspired by the community-led initiatives in place today, and will partner our communities to pilot and implement more. Some examples include the umbrella-sharing project "Sharella", which was created by students in the TAP [see Box Story 17], and Active Mobility Patrols, where volunteers carry out self-organised patrols in their communities to educate others about the rules and codes of conduct of the Active Mobility Act [see Box Story 18].



Improved noise barriers co-developed by the National University of Singapore and LTA



Box Story
17

Share an Umbrella

Several years ago, Don Chua, now 22, came up with an idea to get residents to share their umbrellas. He disliked carrying a wet umbrella in his bag, yet going without an umbrella meant that he would have to dash across several unsheltered areas when travelling from his home in Bartley Road to his school at Republic Polytechnic on rainy days.

Don thought, "Why not have umbrellas for sharing at such locations?" The sharing of umbrellas would be a practical way to 'cover' gaps where site constraints made it infeasible to build covered linkways across roads or between blocks of flats.

In 2017, Don and three other students from Republic Polytechnic's Diploma in User Experience Design course joined our TAP to pilot the umbrella-sharing initiative as an alternative to constructing fixed covered linkways.

As part of their project, they conducted a 10-day trial in the Gambas constituency along unsheltered footpaths near the Woodlands and Admiralty MRT stations. Stationing themselves at the two MRT stations, they handed out umbrellas to test how receptive members of the public were to the idea. They then designed kiosks to hold the umbrellas and placed them on both sides of the unsheltered paths so that people could take, use and return the umbrellas easily. The service was a hit with residents, who wanted it to be a permanent feature.



Trial of Sharella at Woodlands Square



Don, Min Yi, Wayne and Kishan with their prototype

"Sharella", or "Share an Umbrella", was thus born in December 2017. The students, working with us, launched the scheme across Sembawang GRC at 17 locations. Racks were placed on both sides of unsheltered traffic crossings, and residents were encouraged to donate their umbrellas to the initiative. Wayne, Don's teammate, said, "We are very surprised that Sharella has expanded and continues to attract so much attention even after we graduated from Republic Polytechnic!"



Umbrella rack at St Andrew's Junior College

What started as a social experiment has spread to more than 50 locations across Singapore, including St Andrew's Junior College in Potong Pasir and Masjid Yusof Ishak in Admiralty.

Sharella is proof that effective solutions do not just lie in the domain of experts, engineers and planners. We want to hear more of such innovative suggestions from people from all walks of life, so please come forward. Working together, we can pilot and scale up promising ideas to benefit as many people as possible.

Box Story
18

Active Mobility: A Shared Responsibility

In recent years, more Singaporeans have started cycling, using e-scooters and other PMDs for their daily journeys, spurred on by the expansion of our cycling path network. Active mobility has become an integral part of our transport landscape, with many using PMDs and other active transport modes for the first and last parts of their journeys.

While we have put in rules to guide the use of active mobility devices on our footpaths and shared paths, some individuals still use their devices in an unsafe manner. To educate people on the safe and gracious sharing of paths, we launched the Active Mobility Patrol (AMP) volunteer programme in 2016.

Although they come from all walks of life, AMP volunteers have one common goal: to encourage the safe and harmonious sharing of paths for all users. After they are briefed on the active mobility code of conduct, they carry out regular patrols within their constituencies. While the first AMP was made up of just 16 residents and grassroots leaders in the Toa Payoh-Novena constituency, the programme has since grown to more than 1,000 volunteers in 62 teams across our towns and city.

Edward Lim is one of them. “As part of the community, we need to step up and help to educate residents about active mobility so that it benefits the entire community,” he said.



AMP volunteer in Sembawang constituency on a joint patrol with LTA's Active Mobility Enforcement Officer

A team from Tampines town echoed his sentiments, adding that they had also gone the extra mile to help seniors push bulky items back to their homes. Team leader Steven Yeo said that the residents whom the team reached out to had become their friends, with some of them even joining as ambassadors eventually. “We want to engage more people so that we can build a caring community and ensure that footpaths are safe for everybody,” he said.

Through the AMP, local communities can share in the responsibility of creating a safe and gracious active mobility culture in Singapore. We hope to have AMP teams in all constituencies by 2021.

5.4 A Pleasant Commute Involves Everyone

In Chapter 3, “Transport for All”, we laid out our hope that everyone will play a part in fostering a caring and gracious commuting culture. We were encouraged to learn about the numerous initiatives that various public and private organisations have already developed towards this. While we cannot list every example of the good work that is being done, we would like to highlight a few that have especially touched our hearts. These examples truly embody the spirit of transport that brings Singapore together.

- 1) PTC has initiated several platforms for people who wish to offer or receive help. An example is the Heart Zone at Outram Park MRT station where people can meet and assist fellow travellers who need help getting to areas within the Singapore General Hospital campus. This was started in August 2017, and the PTC has since rolled out two more Heart Zones, one in Novena MRT station with the partnership of Tan Tock Seng Hospital and healthcare institutions within HealthCity Novena, and the other in Jurong East MRT station in collaboration with the Ng Teng Fong General and Jurong Community Hospitals. PTC will continue to identify and implement Heart Zones at other MRT stations, where practical.

- 2) Nanyang Girls' High School (NYGH) started nudging its students to use public transport for their daily travel soon after the Downtown Line Sixth Avenue MRT station opened outside the school in December 2015. The school initially partnered us for the Followme programme, where upper secondary students accompanied lower secondary ones from the MRT station to the school. Since 2016, NYGH has also been encouraging their open house visitors to use public transport by putting up posters in MRT stations and listing public transport travel directions on their school website and Instagram account. Over 5,000 visitors have now used public transport to get to NYGH.
- 3) Taking public transport can be a social bonding experience, as evidenced by the PTC and South West Community Development Council's jointly-launched CARE Ride @ South West programme. The acronym "CARE" stands for "Caring commuters Assist Readily with Empathy". The programme pairs students from Pioneer Jurong College and ITE College West with seniors living in the area for a ride on the feeder services 301 and 302, helping them to create a meaningful shared public transport experience. During the trips, the students also show their appreciation for the bus captains by greeting and thanking them when they board and alight from the bus.
- 4) Marsiling Zone 1 Residents' Committee (RC) was the first RC in Singapore to adopt an underpass along Admiralty Road. Students from the Masjid An-Nur as well as Woodlands and Fuchun Secondary Schools got together to paint a mural with safe cycling messages on the walls of the underpass. The National Environment Agency also chipped in to put up Clean & Green stickers.

Since then, the RC has partnered volunteers from the mosque and schools to maintain the mural and keep the underpass clean, working with relevant agencies to spruce up the environment when necessary. This community effort in adopting an underpass has fostered stronger bonds, bringing residents together.

- 5) If you need an umbrella or a portable mobile device charger during your journey, drop by SMRT's WeCare service counters. You only need to show your identity card to borrow such items, and can return them within three days.

We want to build on this good work by partnering organisations such as the SKM, Singapore Road Safety Council, Active Mobility Advisory Panel, and PTC to develop a set of norms and initiatives that every person and every community can identify with and support wholeheartedly. We are confident that our stakeholders will respond enthusiastically to this call for partnership. Together, we can continue to make travelling easier, more pleasant and more convenient for everyone.

5.5 A Shared Journey

LTMP 2040 has set out aspirational targets for our land transport system. Ultimately, the journey ahead is one that can only be completed together. With your continued support, we are confident that we can build a land transport system that all of us will be proud of for generations to come.



Public transport brings people closer together



CHAPTER

6

Bringing Singapore Together through LTMP 2040



We wanted LTMP 2040 to be an opportunity to bring Singapore together, not just through a comprehensive and sustainable land transport master plan, but also through heart-to-heart conversations among Singaporeans about how we should transform our land transport landscape.

When we embarked on this conversation last year, we were unsure of how Singaporeans would respond to our call for feedback and ideas. Public consultation is not new to us, but engaging so many of you personally on a broad and far-reaching topic like the future of land transport felt like a very different challenge altogether. This was especially true for our technical engineering staff who had little prior experience leading public discussions.

Our concerns, however, were unfounded. Across our different engagement channels, your response was overwhelming and enthusiastic. Your support through every step of this journey gave us the confidence to meaningfully converse with you on your many good ideas. Through these conversations, we were humbled to learn that, oftentimes, you are simply asking for the opportunity to share your ideas with us. This deeper engagement with Singaporeans on our land transport system should continue given the many who stepped forward to participate in this journey to chart out our common aspirations for LTMP 2040.

Our Officers Share Their Lived Experience of LTMP 2040

“ The public’s enthusiasm in contributing to Singapore’s future was amazing! Just through a simple planning game that we introduced at some of our FGDs, you could sense the people’s passion towards transport. I wasn’t sure how people would react to the game we had designed initially. But seeing the excitement on people’s faces as they accepted the challenge of planning for transport made me feel that our hard work truly paid off. ”



Saw Le En
Transport Planner and FGD Game Designer

“ Conversation flowed from the moment we started, and issues and ideas were surfaced quicker than our poor scribe could take notes. The enthusiasm and positivity of the group was tangible; no issue was raised without a solution being offered. Not big money solutions either, simple additions, modifications or mindset changes that could be put in place to improve the daily commute for all. The visually impaired participant in our group was an inspiration to the rest of us and I think we all went away better appreciating the needs of others and respectful of the challenges they face. I am proud to think we have contributed to making a small difference in the lives of commuters. ”



Simon Hoblyn
Tunnelling Engineer and FGD Facilitator

“ To be honest, I was initially really concerned if our LTA staff, who are technical folks, will become defensive with the entire session turning into a battlefield between LTA and the public. But after going through two actual FGDs, I must say that I am really proud of the facilitators, especially those from a technical background, who showed that they can rise to the occasion. I personally enjoyed each facilitation as I now have a better appreciation of how the public thinks and feels. Thanks for the opportunity to participate in LTMP 2040. ”



Jaime Yeo
Knowledge Management and FGD Facilitator



Singaporeans Share Their Lived Experience of LTMP 2040

“ Going into the FGDs, one thing that impressed me was the tremendous amount of thought and effort that LTA had put into setting the context for deep and meaningful conversations. Each of us came to the table from different angles, but everyone was respectful about their views and most importantly, there was wonderful collaboration in the group. All of us had the common desire of wanting to come up with solutions that will make it better for everyone to use our land transport system in future. I was also touched by LTA's decision to include the VWOs in this discussion too. It was an inclusive process, not just for the general public but also to commuters with special needs. If LTA has any plans for future FGDs and transport-related trials, I will be happy to participate in those.

Alister Ong

Sustainability Evangelist,
Singtel

“ I am thankful for the opportunity to participate in one of the LTMP FGDs. As a visually impaired commuter, I have personally experienced some challenges to travelling independently. Sharing these with the group, I was very encouraged that the facilitators and my fellow group members enthusiastically listened to what I said and even went on to suggest ways to overcome the challenges that I faced, for example, through better use of technology. I believe that such discussions help to promote awareness of the different needs of fellow commuters. As we come together to create more innovative solutions, we can build an inclusive transport network that caters to the needs of all Singaporeans.

Yeo Sze Ling

Research Scientist

“ I enjoyed being part of the LTMP 2040 process as an avid user of public transport in our country. While I believe that we have one of the best transport systems in the world, no system is perfect and there will inevitably be quite a number of little everyday annoyances which I hope my contribution would assist to iron out. Where I felt that LTA was previously dismissive of feedback, I am now looking forward to a more open evaluation of all public comments. Thank you for letting me be part of this process!

Andreas Koch

Hotel General Manager



Advisory Panel Members Share Their Views

“ Credit must go to LTA for putting in extra effort to obtain feedback directly from people with additional needs and for involving SPD, an organisation that serves people with disabilities, in the LTMP conversation. Through the various engagements, I am heartened to see able-bodied commuters show empathy and a readiness to accommodate minor inconveniences once they understand other people’s perspectives. I am looking forward to the day when people with disabilities, elderly and young families can enjoy a better quality of life and are better connected in the community through an inclusive transport system. ”



Joyce Wong
Director, Resource and Impact,
SPD

“ Coming from the commercial sector, it was very encouraging to observe two things:

- 1) Through a holistic panel comprising various stakeholders in our transport system, the thought process was rigorous, and the proposals circled around whether people from all walks of life or from across different age groups would be able to benefit and adapt to the recommendations.
- 2) Implementation of the plans were progressive, and carefully considered both technical and commercial viability. The experience of being part of the LTMP 2040 panel was especially enriching for me, and I believe that the journey forward would be equally exciting. Singapore is a thought leader. ”



Arthur Chua
CEO, Goldbell Group

Land transport touches each of us in a very personal way. For some of us, it could mean getting to our destination in a way that is convenient, connected and fast. Others have come to value the pleasant and inclusive travel experiences made possible by gracious commuters.

Many of us also want to see transport designed in a way that creates not only the space to pursue healthier lives for ourselves but the conditions for safer journeys for our loved ones. Beyond simply connecting us to jobs and opportunities, land transport is about all of these meaningful pursuits as well.

In our interactions with you, we heard stories of how many of us carry an emotional connection to transport that has shaped our lived experiences and memories growing up in Singapore. We share your disappointment in areas where we have yet to meet your expectations, but, at the same time, we have been encouraged to hear your appreciation for where we got things right. Every transport experience that we create matters to us, and, in our journey to 2040, we promise that we will keep trying to do even better than before.

LTMP 2040 lays out lofty goals for our land transport system – and Singaporeans should expect no less. Now that we have given a collective voice to our aspirations for land transport, let us build on the conversation we have started. We ask all Singaporeans to work hand-in-hand with us to explore novel ideas and new collaborations, as we press on to bring Singapore together through LTMP 2040.







Singapore Land Transport Authority
We Keep Your World Moving

Land Transport Master Plan 2040

How might we make **WALK CYCLE RIDE** easier and more **INCLUSIVE FOR ALL?**



Annex A

Timeline of Key Initiatives

Short Term Initiatives (Present to 2020)

Chapter 2:
20-Minute
Towns and a
45-Minute City

- Complete Thomson-East Coast Line Phases 1 & 2
- Commence feasibility study of new line in the north/north-east regions*

Chapter 3:
Transport
for All

- Install priority queues in all MRT stations
- Pilot priority cabins on a rail line
- Complete upgrading of bus stops to ensure barrier-free access



- All buses to be wheelchair-accessible
- Install stroller restraints across entire bus fleet
- Trial Mobility Assistance for the Visually Impaired and Special Users (MAVIS)



Chapter 4:
Healthy Lives,
Safer Journeys

- Trial speed limit reduction from 40 km/h to 30 km/h in selected silver zones

Medium Term Initiatives (2021 to 2030)

Chapter 2:
20-Minute
Towns and a
45-Minute City

- Complete expansion of cycling path network to 700km by 2030
- Launch pilot of Autonomous-enabled Services in Punggol, Tengah and Jurong Innovation District



- Complete Thomson-East Coast Line Phases 3, 4 & 5
- Complete Thomson-East Coast Line Extension to Changi Airport*
- Complete Jurong Region Line Phases 1, 2 & 3
- Complete Cross Island Line, in phases*
- Implement Transit Priority Corridors*
- Complete Integrated Transport Hubs*
 - Beauty World ITH
 - Bedok South ITH
 - Bidadari ITH
 - Buangkok ITH
 - Hougang ITH
 - Jurong East ITH
 - Pasir Ris ITH
 - Punggol North ITH
 - Tampines North ITH
 - Tengah ITH



* Timelines are subject to change, depending on the developments in the area

Chapter 3:
Transport
for All

- Install priority queues in all bus interchanges and Integrated Transport Hubs



- Install lifts at 29 more pedestrian overhead bridges, including 28 near hospitals and polyclinics



- Upgrade 2,300 bus stops with elder-friendly seats



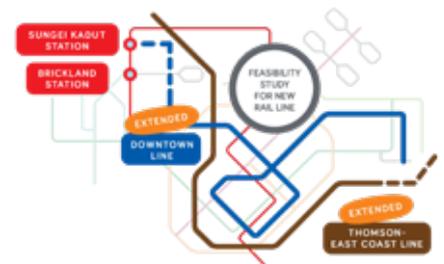
Chapter 4:
Healthy Lives,
Safer Journeys

- Build another 20km of noise barriers on existing flyovers of expressways
- Complete 50 Silver Zones

Long Term Initiatives
(2031 to 2040)

Chapter 2:
20-Minute
Towns and a
45-Minute City

- Complete expansion of cycling path network to more than 1,000km by 2040
- Complete Brickland station
- Complete Downtown Line Extension to new Sungei Kadut interchange station on North-South Line



- Complete Integrated Transport Hub*
- Marina South ITH

Chapter 4:
Healthy Lives,
Safer Journeys

- Complete another 150km of covered linkway connections to MRT stations, residential areas and amenities
- Make 100% of public buses run on cleaner energy



- Work with taxi companies to make 100% of taxi fleet run on cleaner energy
- Implement dedicated cycling paths and widen footpaths where feasible



* Timelines are subject to change, depending on the developments in the area

Annex B

Summary of Initiatives

The key initiatives of LTMP 2040 are summarised below.

Summary of Initiatives	Reference Section
Chapter 2: 20-Minute Towns and a 45-Minute City	
Complete expansion of cycling path network to 700km by 2030	2.1.1
Expand cycling path network to more than 1,000km by 2040	2.1.1
Pilot of Autonomous-enabled Services in Punggol, Tengah and Jurong Innovation District	2.1.2
Complete Thomson-East Coast Line Phases 1 & 2	2.1.2
Complete Thomson-East Coast Line Phases 3, 4 & 5	2.1.2
Complete Thomson-East Coast Line Extension to Changi Airport*	2.1.2
Complete Jurong Region Line Phases 1, 2 & 3	2.1.2
Complete Cross Island Line, in phases*	2.1.2
Complete Brickland station	2.1.2
Complete Downtown Line Extension to new Sungei Kadut interchange station on North-South Line	2.1.2
Commence feasibility study of new line in the north/north-east regions*	2.1.2
Implement Transit Priority Corridors (TPCs)*	2.1.2
> Bayshore^	
> Jurong Canal Drive Extension to Boon Lay Way	
> Jurong Lake District^	
> Loyang^	
> North-East Region^	
> North-South Corridor	
> Punggol North	
> Robinson Road	
> Tengah	
> Woodlands North Coast	
Complete CRUISE pilot	2.1.2
Implement regulatory framework for Private Hire Cars	2.1.2
Complete Integrated Transport Hubs (ITHs)*	2.2.1
> Beauty World ITH	
> Bedok South ITH	
> Bidadari ITH	
> Buangkok ITH	
> Hougang ITH	
> Jurong East ITH	
> Marina South ITH*	
> Pasir Ris ITH	
> Punggol North ITH	
> Tampines North ITH	
> Tengah ITH	

* Timelines are subject to change, depending on the developments in the area

^ Tentative

Summary of Initiatives	Reference Section
Chapter 3: Transport for All	
Install priority queues at all MRT stations, bus interchanges and ITHs	3.1.2
Install Heart Zones in all MRT stations and bus interchanges, where practical	3.1.2
Pilot priority cabins on a rail line	3.1.2
Introduce a “please offer me a seat” identifier on all MRT and LRT lines	3.1.2
Revamp curriculum for Taxi Driver’s Vocational Licence and Private Hire Car Driver’s Vocational Licence	3.2.1
Expand National Kindness Award—Transport Gold to recognise inspirational civic-minded and responsible commuters	3.2.2
Expand National Kindness Award—Transport Gold to recognise Private Hire Car drivers who deliver outstanding service	3.2.2
Trial hands-free fare gates at selected MRT stations	3.3.1
Upgrades to ensure barrier-free access at all bus stops	3.3.1
All public buses to come with two wheelchair bays	3.3.1
All public buses to be wheelchair-accessible	3.3.1
Install lifts at 29 more pedestrian overhead bridges, including 28 near hospitals and polyclinics	3.3.1
Partner point-to-point transport companies to expand wheelchair-accessible taxi fleet	3.3.2
Introduce nursing rooms at selected MRT stations and bus interchanges	3.3.3
Introduce quiet rooms at selected MRT stations and bus interchanges	3.3.3
Install stroller restraints across entire public bus fleet	3.3.3
Upgrade 2,300 bus stops with elder-friendly seats	3.3.3
Complete installation of Next-Generation Passenger Information Display across entire public bus fleet	3.3.4
Work with Singapore Land Authority to provide barrier-free route information around Enabling Village in Redhill, with a view to expand islandwide	3.3.5
Make more real-time information available to app developers, including real-time escalator and lift maintenance monitoring	3.3.5
Trial Mobility Assistance for the Visually Impaired and Special Users (MAVIS)	3.3.5
Form a “Commuter Advocate” panel consisting of commuters with diverse needs	3.4

* Timelines are subject to change, depending on the developments in the area

^ Tentative



Summary of Initiatives	Reference Section
Chapter 4: Healthy Lives, Safer Journeys	
Dedicate more space to Walk-Cycle-Ride transport at future development areas such as Kampong Bugis, Marina South, Jurong Lake District and Woodlands Regional Centre	4.1
Build another 150km of covered linkway connections between MRT stations, residential areas and amenities	4.1.1
Develop guidelines for consistent wayfinding and the communication of information to land transport users	4.1.1
Expand requirement for private developers to submit Walking and Cycling Plans in new applications for development proposals	4.1.1
Convert parts of roads like Market Street/Malacca Street, Orchard Road and Haji Lane into walking streets and community spaces*	4.1.2
Make 100% of public buses run on cleaner energy	4.2.1
Work with taxi companies to make 90% of taxi fleet run on cleaner energy in the medium term	4.2.2
Work with taxi companies to make 100% of taxi fleet run on cleaner energy in the long term	4.2.2
Build another 20km of noise barriers on existing flyovers of expressways	4.2.4
Roll out localised pedestrian-friendly features in mature residential towns such as Yishun, Ang Mo Kio and Tampines	4.3.2
Complete 50 Silver Zones	4.3.2
Conduct trials to lower speed limits in selected Silver Zones from 40km/h to 30km/h	4.3.2
Introduce controlled right turns at about 1,000 traffic junctions	4.3.2
Extend Green Man Plus Scheme to another 1,500 pedestrian crossings	4.3.2
Construct dedicated cycling paths and widen footpaths where possible	4.3.2
Build reverse warning system in new bus interchanges where necessary	4.3.2
Provide personalised location-based safety alerts to individual motorists	4.3.2
Chapter 5: LTMP in Your Community	
Share our LTMP games with schools and the community	5.2
Work with the community on LTMP initiatives	5.3
Develop a set of gracious and safe commuting norms	5.4

* Timelines are subject to change, depending on the developments in the area

^ Tentative



