

CONNECT

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A Day in the Life of an AMEO

LTA'S ACTIVE
MOBILITY
ENFORCEMENT
OFFICER

GETTING
READY FOR
THE FUTURE
WITH NEW SKILLS

DRONES:
THE FUTURE OF RAIL
MAINTENANCE

ON TRACK TO
BETTER,
MORE
RELIABLE
RIDES



READ & WIN

STAND A CHANCE TO WIN PRIZES WORTH \$40!



IN THE WORKS

FEATURES THAT EXCITE YOU

LAUNCH OF LAND TRANSPORT INDUSTRY TRANSFORMATION MAP

Guest of Honour
Mr Khaw Boon Wan
Coordinating Minister for Infrastructure & Minister for Transport
12 February 2018

LOOKING AHEAD

Transport Minister Khaw Boon Wan and transport officials launch the Land Transport Industry Transformation Map in February 2018 at the PSA Building.

GETTING READY FOR THE FUTURE

Not too long ago, you probably could not imagine hailing a private-hire car or renting a shared bicycle simply by using an app on your mobile phone. Today, such services are part of life for many commuters. Such is the speed at which technology changes the way we live, work, play and travel these days.

For bus and rail services, you may not see the impact of technology on these systems – but updates are in progress. For example, trials for on demand bus services and autonomous buses are being planned. Soon, trains will also be equipped with predictive maintenance tools that allow them to detect and predict the condition of major components while they are in operation.

To stay ahead of these disruptive technologies and meet the needs of our future rail and bus networks,

Transport Minister Khaw Boon Wan launched the Land Transport Industry Transformation Map (ITM) earlier this year, a national plan to enhance capabilities and add 8,000 new jobs in the industry by 2030.

“Globally, land transport is being disrupted by new technologies – artificial intelligence, automation, mobile connectivity and big data. Some of these technologies can be unsettling,” said Mr Khaw. “However, we can also ride on them to enhance our land transport system and create even better jobs.”

As we move to transform the industry and create higher value-added transport jobs, he also stressed that we need to be “technology ready, workforce ready and ecosystem ready”. How will we achieve these three objectives?

TECHNOLOGY READY, WORKFORCE READY & ECOSYSTEM READY



1 \$25 million to drive mobility research and trials



2 Equip workers with relevant skills



3 Work with transport unions and industry players

First, we will set aside \$25 million over five years to start mobility-related research and trials, as well as adopt new technology such as autonomous vehicles and augmented reality devices to maintain systems. Two, we will equip workers with relevant skills and build up a steady stream of talent. Three, we will work with transport unions and industry players to improve capabilities, with a Public Transport Skills Framework to be launched in May to help workers see a clearer career path with the new skills they are acquiring.

At the heart of up-skilling and re-skilling transport industry workers are the Singapore Rail Academy (SGRA) and the Singapore Bus Academy (SGBA). We speak to the academies to learn what they are doing to stay updated with industry developments.



RIDING INTO THE FUTURE — WITH — NEW SKILLS

As part of the Land Transport ITM, rail and bus workers are going back to school to acquire new skills to stay ready and relevant in this new digital era. Let's find out what lessons they learn and what's in store at the new training academies.

When Sum Poo Hai joined Tower Transit as a bus captain, he thought he would be more than familiar with the new job. After all, he taught and trained heavy vehicle drivers at the Singapore Armed Forces previously.

But that wasn't the case at all. As a requirement for all new bus captains, the 38-year-old attended a five-day course at the new SGBA to obtain the Omnibus Driver's Vocational Licence.

The training took him by surprise. Apart from going through a computerised simulator test – which would point out problem areas such as hard braking or stopping too far from the kerb at

the bus stop – he learnt how to handle new technologies, and even picked up tips about customer service.

"I never expected bus captains to use such a sophisticated system. It's a surprise to learn it," he said, referring to the new Mobileye's Advanced Driver Awareness System, which alerts drivers to pedestrians, cyclists or motorists in their blind spot.

"I have learnt so much more now," added Poo Hai, who also acquired soft skills such as how to communicate with wheelchair-bound commuters or those who are visually impaired.

FUTURE READY Transport workers will be re-skilled and up-skilled to better meet the demands of a growing transport industry.

LESSON 1: BETTER STANDARDS

Recognising the need to raise the professionalism and skills of bus workers, the bus academy was set up in October 2016. It also builds a pipeline of talent for the growing sector with structured training to help workers adapt to industry changes. For example, diesel-trained technicians may soon have to learn to work on hybrid and electric buses, as they may potentially be rolled out on the roads here.

"The job of a public transport worker has become more challenging," shared Goh Puay San, dean of the bus academy. "They have to keep up with new technologies that improve their work performance, and expectations from commuters have also increased."

The bus academy, she added, aims to raise the standards of the land transport industry for the future.

LESSON 2: BETTER TRAINING

The rail academy is another institution that plans to achieve that. Set up in February 2017, it equips rail workers with the right skills to meet the demands of an expanding rail network and maintain ageing facilities.

"I have gained a better perspective of the work that goes behind bus scheduling and diversions."

LIM HOCK CHUAN, SERVICE MANAGER AT GO-AHEAD SINGAPORE, WHO ATTENDED A COURSE AT SGBA



IN THE WORKS

By 2030, the rail sector is likely to add 5,700 jobs to support an extended rail network that will reach 360km. The sector will employ 15,000 workers in total. To support this expansion, the academy aims to build a local talent pool with not only deep technical expertise, but also cross-functional capabilities.

Before the academy was launched, such training was left to individual rail operators. This led to duplication in resources as well as differing standards, observed Looi Teik Soon, Executive Director of the rail academy.

“One operator may be doing different training from another operator. So there may be gaps in capabilities. A central agency like SGRA can drive industry-wide training and broaden and deepen capabilities of our engineers,” he noted.



LEVEL UP The SGRA aims to develop a local talent pool through continuous training that will broaden and deepen the skills of rail workers.

“One of the highlights of the CORE course was a site visit to an upcoming Thomson-East Coast Line station. It was informative, insightful and made me understand the scope and impact of my work better.”

LAI JUN HAN, EXECUTIVE ENGINEER AT SMRT, WHO ATTENDED A COURSE AT SGRA



BACK TO CLASS Bus transport officers are put through an enhanced training programme to support continual learning and deepening of skillsets.

LESSON 3: BETTER COMMUNICATION

Tang Mun Kiat, an electrical engineer at SBS Transit, is one engineer who has benefitted from the Career Onboarding for Railway Engineers (CORE) programme at the rail academy.

The 38-year-old said the three-day course provided a platform for him to meet other rail operators, feedback on how to improve work processes, share best practices and improve the standards of his work.

During the course, Mun Kiat and his team shared difficulties on the ground and the high costs to rail operators when they have to build a structure of scaffolding to change a fused lightbulb at a train station. The ceilings at new train stations were getting higher and more inaccessible for light maintenance.

The lightbulb case is a simple example on how to foster better communication and cooperation between LTA and rail operators. This ability to share and work together will be crucial down the road when they are faced with more complex challenges.

The rail academy also plans to equip transport workers with future skills in data analytics, Internet of Things and project management for complex systems, Teik Soon said. These will be more clearly mapped out in the Public Transport Skills Framework.

There are many exciting developments in the land transport industry. Given the pace of innovation, we can look forward to a smoother and more efficient public transport system in future!



To learn more about what our land transport of tomorrow will look like, click [here](#).



A DAY IN THE LIFE OF AN AMEO

Have you seen people in green shirts patrolling in your neighbourhoods? They are LTA's Active Mobility Enforcement Officers (AMEOs), who fan out across Singapore to spread pedestrian safety messages and educate cyclists and riders of e-bikes and e-scooters on the new active mobility rules.



MAN ON A MISSION Shahri (left), an LTA AMEO, patrols Singapore to spread messages for safe riding.

At the height of the Pokemon Go fever, mobs of people were out in full force, chasing down Pikachus and Snorlaxes. They did it not only on foot, but even rode on personal mobility devices (PMDs) like e-scooters and e-bikes – sometimes dangerously, phones in their hands, speeding on roads.

Muhd Shahri Samani was also hitting the ground, but he was not a Pokemon hunter. Instead, he was looking to “catch” fans of the game – especially those who were compromising their safety or being a hazard to others when they ride recklessly.

His aim: to spread messages for safe riding.

“Our role is to educate cyclists and riders of PMDs who are not aware of the rules and regulations,” said Shahri, an Active Mobility Enforcement Officer (AMEO) at the Land Transport Authority (LTA).

LTA rolled out the team of AMEOs in 2016 to encourage safe sharing of paths, as cycling and the use of PMDs were gaining popularity.

OFFICERS ON A MISSION

Donning an eye-catching lime-green shirt, and armed with brochures containing safe riding information and tips, Shahri travels across Singapore with seven other officers in a team.

#DidYouKnow

PMD users caught riding on public roads face a maximum penalty of \$5,000 fine and six months jail term. Don't risk your life! Ride safely and on the correct paths.

Starting the day as early as 6.15am, AMEOs patrol neighbourhoods on bicycles or on foot. They flag down riders who flout safe riding rules, such as e-bikers who do not wear helmets, cyclists riding on overhead bridges or people who ride e-scooters on the road.

“From afar, we will signal errant riders to stop. For some, when we ask them to stop, they would say, ‘No, I don't want to buy anything,’” he revealed with a laugh. “They think we are selling them something, like insurance.”

“But we are clear and introduce ourselves as officers from LTA enforcement, who are here to educate them on riding tips.”



While the craze over Pokemon Go has somewhat abated, there are still some safety issues.

The common hotspots today include industrial estates like Loyang, where members of public tend to traverse the area on PMDs, and high traffic areas like Geylang and even Yishun, said Shahri.

Most of the errant riders are typically food delivery riders rushing between destinations on their PMDs, however, Shahri has even encountered parents dangerously riding e-scooters on the road with their kids in tow.

THE FACE OF SAFE RIDING

But the most difficult part on the job, he shared, is communication as there are those who turn a deaf ear or a blind eye to them.

"Some will make a quick U-turn and evade us. But it's OK, as our presence is felt. They can afford to evade us and escape an accident this time, but how many times can they do so?" said Shahri,



SHAHRI SHARES SOME SAFE RIDING TIPS



SLOW DOWN AT ZEBRA CROSSINGS
and when approaching traffic lights



DO NOT USE YOUR PHONE
while riding



DISMOUNT AND PUSH, especially at crowded areas like bus stops



RIDE ON THE CORRECT PATHS.
Do not ride on pedestrian-only paths, like overhead bridges

Want to find out more? Join our Safe Riding Programme [here!](#)

SAFER RIDING FEATURES

To make our shared paths safer and more accessible for pedestrians and riders, we have introduced a number of safety features. See if you can spot them around your neighbourhood.



1 Red cycling paths to clearly mark out lanes for cyclists and PMD users



2 Speed regulating strips near junction crossings to reduce riding speed



3 Wheeling ramps along staircases to make going up and down easier for riders and safer for pedestrians



4 Bicycle crossings at signalised traffic junctions to encourage riders and pedestrians to keep in lane

who has even learnt basic Mandarin to improve his communication.

Apart from patrolling the neighbourhoods, AMEOs are also called in when accidents happen so that they can assess problem areas and suggest solutions to prevent such mishaps.

For instance, an accident between a rider and a pedestrian may happen due to a blind spot at the intersection of a footpath and a shared path. As an AMEO, Shahri is able to advise LTA to install a convex mirror at the juncture, or put rumble strips on the path to alert riders to slow down, reducing collision.

Part of his job is to enforce the law too. When he spots non-compliant e-bikes, such as those with a throttle installed, and people riding e-scooters on the road, he will seize and confiscate the vehicle on the spot.

Because of this, some see Shahri as a 'saman' (summons) officer. But he sees himself more as an ambassador for safe riding.

"At the end of the day, our job is to ensure that the footpaths are clear and safe. Some people may be unaware of the rules and regulations. That's where our role comes in – to educate them about the rules, which are there ultimately for their safety," he said.

#DidYouKnow

PMDs, including kick-scooters, hoverboards and unicycles, are prohibited on roads. They must not weigh more than 20kg and should have a maximum, capped speed of 25km/h.



FLYING SENTINELS Drones are not just used for aerial photos and videos – they may become the new automated flying assistants helping to inspect MRT tunnels.

DRONES: THE FUTURE OF RAIL MAINTENANCE

How can drones improve construction and maintenance processes for our rail networks? LTA's chief drone trainer tells us why these flying robots are the future of rail maintenance.

As the city heads into deep slumber, a squadron of drones buzz around the MRT tunnels, scanning the subterranean network for traces of structural cracks, leaks, and foreign objects. Just then, a lone drone on patrol detects a small crack high up on the concrete ceiling.

It hovers closer to the ceiling and takes an accurate measurement of the defect before moving on. The data collected is subsequently

analysed against historical records to determine if things require fixing before faults occur.

This future scenario where intelligent airborne gadgets are used for predictive maintenance in rail systems could soon be a reality.

THE DRONE MOVEMENT

Leading the way to this airborne future is 64-year-old Low Yew

#DidYouKnow

Drones can reach difficult-to-access locations like the under-bridge of viaducts. This is useful for bridges that go over water bodies where it is more challenging to carry out under-bridge inspection.

Huat, who defies the conventional belief that only millennials embrace new technology.

His fascination with the flying machines spurred him to enrol in a drone based aerial videography and photography workshop at Republic Polytechnic in May 2015.

He is now the proud owner of two drones that he flies recreationally around Singapore and even brings on trips abroad. "I am very passionate about drones," shared Yew Huat, who helms the Land Transport Authority's (LTA) team of 11 drone trainers.



It is, however, not his official position. Yew Huat is, in fact, the project manager of the Thomson-East Coast Line (TEL), Section 5. "All my colleagues are actually volunteers. They have their own respective jobs in LTA," he explained.

His unofficial post began in 2017, after LTA set up a drone task force to explore and trial the use of drones in their various operations. When he found out that the agency was seeking to build in-house capability last year (2017), the drone enthusiast could not resist volunteering to help.

"As I have prior knowledge and my own drones, I was selected to be a trainer. That's how I first started," he said.

HOW DRONES WORK

With LTA set on improving operational efficiency for rail networks, it found a possible solution in drones due to its dexterity in accessing high and hard-to-access locations, mitigating the need to manually construct scaffoldings which require more time and could be a possible obstruction to operations.

This drive to tap on new technology came from top management. "Our Chief Executive has been actively pushing for us to adopt disruptive technologies that can help make our existing work processes safer, better and more cost effective," said Yew Huat.

In fact, LTA is testing the feasibility of eight drones for site monitoring in the construction of TEL stations, as well as MRT and road tunnel inspections. The drone trials are mostly smooth, but it is not without challenges like turbulence from wind drafts, limited battery life, and difficulty in navigating and pinpointing exact locations.

"We are here to understand the processes, limitations, and capabilities with the technology that is available now," he noted.

GROOMING THE HIGH FLYERS

While drones are supposed to be self-piloting, the current drones are still piloted manually. Hence, Yew Huat and his team planned and conducted the training of LTA drone trainees.

"Our training is very structured and detailed, customised for LTA's scope of work," said Yew Huat.

The trainees are paired with drones on a one-to-one basis, maximising airborne time. "One day of training here is solid. We have eight drones with extra battery packs to get by. You won't get this 1 to 1 ratio outside, which is important as you need a lot of hands on training in order to operate the drone," he observed.

In addition to following Civil Aviation Authority of Singapore (CAAS) regulations and LTA's

TRAINING TO FLY
LTA's Chief Drone Trainer Low Yew Huat (centre, in yellow vest), with fellow trainers and trainees during a lesson at the open field along Old Holland Road.

standard operating procedures in tunnels and above ground, drone trainees are also provided with supplementary knowledge of the rules governing the use of drones and their usage in other countries.

By the end of 13-module training, all trainees will have become more knowledgeable but will still have to practise hard to pass the CAAS pilot competency test.

ON THE HORIZON

As LTA explores the viability of drones across a broad spectrum of operations, you can expect to see more drones flying in our tunnels and skies.

"When we have more people who are trained to fly, we can then test where drones can be a useful tool. Difficulties that are encountered during on-going trials will be noted down and written into the specifications for future drone technology providers for LTA projects," said Yew Huat.

From 3D mapping to photogrammetry that will automatically generate 3D computerised images for engineering purposes, the myriad of potential drone deployment is exciting.

Believing that a manpower-lean future is possible with the help of drones, he added: "We will soon transform our existing methods of doing work."

#DidYouKnow

Drones offer a more cost effective way to get aerial photos of construction projects. Sending out a drone over a helicopter is not only more cost effective, it is also safer and more readily available.



SUBTERRANEAN INSPECTION LTA officers are piloting the use of drones to monitor new tunnel constructions.



IN THE KNOW

STORIES THAT SET YOU IN MOTION

ON TRACK TO BETTER, MORE RELIABLE RIDES

You may have heard that Singapore's first Light Rail Transit (LRT) system is next in line for renewal. It's time for an upgrade to keep it up to speed! Here's how the overhaul will benefit commuters.

For almost 20 years, the Bukit Panjang (BPLRT) has tirelessly shuttled residents around the hilly terrains of Bukit Panjang and Choa Chu Kang. Serving as a self-driving inter-town feeder service to connect commuters to nearby MRT networks, BPLRT also sports privacy windows that automatically dim.

Soon, we will embark on a six-year project to revamp the trains, tracks and signalling systems to give the BPLRT a new lease of life. We have engaged Bombardier (Singapore) to conduct the upgrading works and provide long-term maintenance support. As the original supplier of the system, they are well-positioned to provide long-term technical assistance.

The overhaul will start in the first half of 2018, with most works taking place after operational hours to minimise inconveniences. Commuters will be able to enjoy better and more reliable rides as early as 2022. Let's look forward to more pleasant journeys ahead!

TIMELINE OF IMPROVEMENT WORKS

2018
FIRST HALF

Begin renewal works during engineering hours

2018
Q4

Service C (links BPLRT to Junction 10) will cease operations to facilitate the renewal works

2019
Q2

Manufacturing and on-site installation works

2020
Q2

Delivery of the first two new Light Rail Vehicles (LRVs) for testing and commissioning

2022
Q4

New and upgraded vehicles, as well as the new signalling system will be in full operation

2024

Full completion of the renewal works

1

SIGNALLING UPGRADE

Zip around quickly with shorter waiting times and better speed controls.

- » More frequent trains with new train control system for precise location, speed and condition tracking
- » Finer control of train acceleration and braking
- » Similar systems used by the driverless MRT systems such as the Downtown Line as well as NEL lines

2

NEW AND IMPROVED VEHICLES

Get shuttled in a modern Light Rail Vehicle for cooler, more comfortable and greener rides.

- » Brand new vehicles
- » Upgraded vehicles
- » Smart climatic control systems
- » Energy efficient motors and electronics

3

NEW CONDITION MONITORING CAPABILITIES

A smarter and more reliable system with intelligent live condition monitoring.

- » Smart sensors help detect faults to be addressed early

4

NEW POWER RAIL SYSTEM

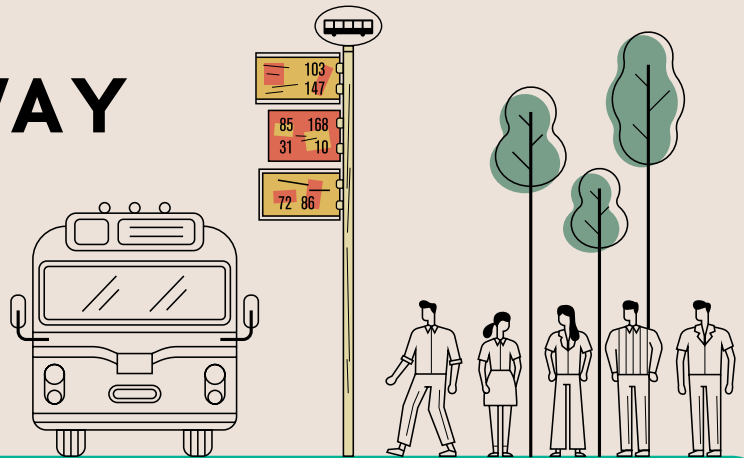
Enjoy enhanced system availability, backed by a dependable power delivery system.

- » Robust power rail brackets
- » Real-time monitoring of rail alignment



BUS STOPS ALONG THE WAY

From a pole to sleek shelters, bus stops today have covered walkways connecting places, offering shelter from rain or shine. Let's see how our bus stops have evolved!



1950s

JUST A POLE

From a lone sign post where commuters gathered, the bus stop has come a long way since our yesteryears.



1950s

A ROOF OVER OUR HEADS

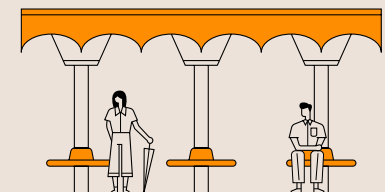
Covered bus stops were a rarity during the 50s and 60s. This unique bus stop can still be found conserved in its original glory along Tanjong Pagar Road. It looks almost like an extension of the shop house behind it, with matching design and roof.



1960s

LINING UP

Queue lines were introduced under 'Operation Q' campaign. Organised by the National Safety First Council, the initiative was launched in 1969 in a bid to encourage commuters to form orderly lines at bus stops.



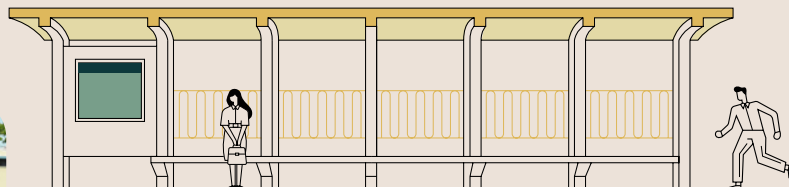
1980s to 1990s

AN ALL-ROUNDER

Curvy orange tops and doughnut-shaped stools were a common sight in the 80s. Bus stops were evolving beyond function, keeping up with contemporary design.



ON THE MOVE



1980s to 1990s

A QUINTESSENTIAL ICON

Do you remember the iconic orange and white zinc-roof bus stops? Once a common sight across Singapore, there are still a handful left as temporary bus stops.

1990s



1990s



SEEING THE LIGHT

Bus stops were designed to match their surroundings. Sporting a plastic translucent roof, which allows natural light through, this bus stop is at Far East Plaza along Scotts Road. It's a hot bus stop – in design and temperature.

ARCHITECTURAL HARMONY

With a triangular green glass roof at the centre of the bus stop, this bus stand is integrated in perfect harmony with its surroundings, echoing the geometrical arches of Masjid Kassim mosque along Changi Road.



NOW

CLEAN AND MODERN

A common sight these days, these cool gray bus stops have broad overhead shelters and are well-connected to key amenities via a network of covered walkways. Commuters can keep walking, rain or shine.

LOVE WHAT YOU SEE?



Grab an attractive knick-knack of some of these classic bus stops at Knackstop, in magnet form! Find out more at [Fb.me/Knackstop](https://www.facebook.com/Knackstop)



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READ & WIN!

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1. Tell us one of the safe riding tips mentioned in the article 'A Day In The Life of An AMEO'.
2. When will the renewal of the Bukit Panjang LRT (BPLRT) system be fully completed?
3. How many new jobs will the Land Transport Industry Transformation Map (ITM) add to the land transport industry by 2030?

Email your answers to connect@lta.gov.sg by 31 May 2018, and include your name and NRIC with the Subject "Connect Apr 2018". The winners will be notified via email. Good luck!

Note: Your email address will automatically be subscribed to Connect when you participate in this contest.

Congratulations to the winners of our Jan 2018 Read & Win Quiz:

1. Edmund Ng
2. Ho Geok Choo
3. Gerard Ang