

CONNECT

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A PUBLICATION BY THE LAND TRANSPORT AUTHORITY

THE TRANSPORT DETECTIVES



**REDEFINING
RETIREMENT:**
WORKING TILL 83

SIMPLY GO
IS THE WAY
TO GO

PUNGGOL:
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FASTER & MORE EFFICIENT
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THE TRANSPORT DETECTIVES

A diverse team of data scientists from LTA is poring over data to provide insights on travel behaviour, traffic conditions and even trends relating to where people live and work, with a view to improving commuter experiences.



Armed with smart analytics tools, a team of data scientists is cracking codes. Behind screens, they scrutinise numbers, algorithms and charts, trying to find patterns in the clutter.

With statistics from EZ-link card transactions, they map out hotspots across Singapore indicating the volume of commuters at transportation nodes.

With rainfall information from the National Environment Agency (NEA), the team assesses if the supply of taxis is adversely affected due to wet weather.

With drone footages captured in the sky, the scientists analyse traffic conditions by detecting the number of vehicles at busy road junctions.

Their mission: Using data to make commuting easier.

HOW LTA BEGAN TO HARNESS THE POWER OF BIG DATA

Not many people are aware that LTA is a data-driven agency with a special team of data scientists and analysts.

The data science division began in 2013. But the genesis of the team goes back to the mid-2000s.

“In 2008, we had a headache. We had a huge volume of data – 11 million records of information every day from our EZ-link transactions when we tap in and tap out,” said Jonah Ong (pictured, 2nd from left), who heads the division.

That was when the IT engineers started to think of a way to create value with the amount of information they possessed.

Jonah adds that,

“Coincidentally, the term ‘big data’ started to become popular all over the world. We looked at ourselves and realised that we were already doing it.”

In 2010, LTA launched the Planning for Land Transport Network (PLANET) system. It conducted advanced data analytics on travel patterns of Singaporeans whether by car, bus or train – with the aim to enhance data-driven decision-making.

Now, the team is making use of better tools, as well as more abundant and accessible data, to do things today that they couldn’t just a few years ago.



A DIVERSE TEAM OF “SKUNKWORKS”

The data science team comprises 12 members who have different specialisations. There are geographers, mathematicians, economists, statisticians and even a chemical engineer among them.

“So, like a patchwork, they can look at a picture from different angles to solve a problem.”



“People refer to us as ‘skunkworks,’” he added, referring to the term used to describe a team put together informally to solve a problem.

“Data looks boring at first. You see rows and columns of numbers and tags. But what’s key is to be observant and see the clues in the data, and sniff out what people cannot see.”

This division anticipates trends and responds quickly to issues.

“Data science is agile by nature. It is highly iterative and unpredictable,” said Jonah who runs the team like a start-up.

“So the way we run the team has to be nimble, so we can respond to business needs faster.”

“We wanted to hire everyone to be unique on their own and bring something different to the table.”

JONAH ONG, DEPUTY DIRECTOR, DATA SCIENCE

Project Spotlight

IS IT HARDER TO GET A TAXI WHEN IT RAINS?

We all feel that cabs disappear when you need them the most, especially during wet weather. Data analyst Rachel Lim (pictured right) wanted to check if this was really true.

She used rainfall data from NEA, which is collected at five-minute intervals at 55 rain gauges islandwide, as well as data of taxi locations.

“We found that during prolonged periods of rainfall, taxi availability tends to decrease marginally in some parts of Singapore,” noted Rachel, who is one of the youngest persons on the team.

“But the effect is not as pronounced as we think. There are other factors like time of day, and peak periods.”

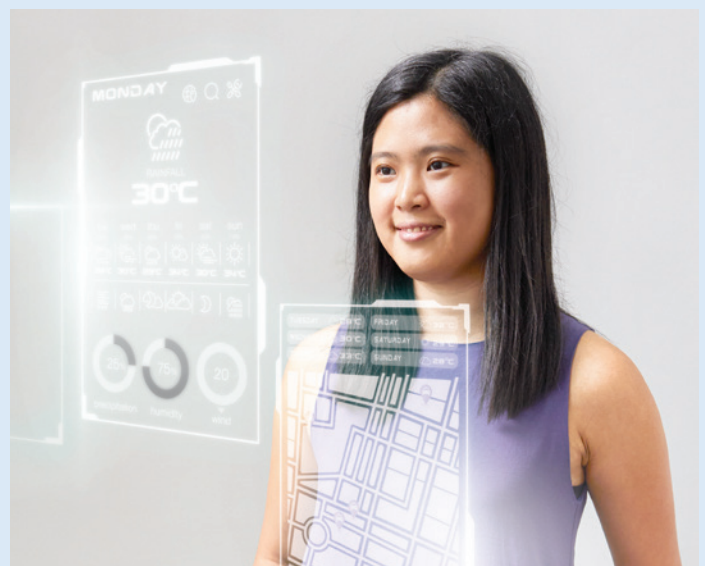
Beyond that, analysing rainfall data has other applications too – including the correlation to bus speeds, which may have implications on bus planning.

Rachel read geography for her undergraduate degree, as she is interested in city planning and urban design.

“I wanted to join the public service because I wanted to contribute to something,” she said. “LTA stood out because during the interview process, it wasn’t simply about what I had to offer. It felt like an organisation that cared, and that there were opportunities for growth.”

She later pursued a Masters in urban data science, saying,

“I felt that geography theories and planning alone were insufficient. So I thought the two would complement each other well.”





CAN WE INFER WHERE PEOPLE STAY AND WORK USING THE GINI CONCEPT?

EZ-link card transactions reveal two common locations that we often travel to – home and office.

But how does data interpret which is home or and and which is the office?

To do so, data analyst Cheo Rui Ming (pictured above) uses the economics concept of Gini.

Traditionally, the Gini coefficient is used to measure income inequality. It ranges from a value of 0 to 1, where 0 is complete equality, and 1 is complete inequality.

“When you are at home, the distribution of the hours spent is more varied. No one can be sure how long you spend at home,” said Rui Ming. “Whereas at work, time spent there is more uniform.”

Translating this to the Gini concept, a value close to 0 means time spent at a location is more consistent – or equally distributed – than a value closer to 1.

This means LTA would be able to zoom in on residential and work hotspots to better size up plans for land transport infrastructure.

Rui Ming, an economics graduate, had gone on a 12-week accelerated private course on data science, and met Jonah who was presenting on LTA’s work.

“I found out that the work that LTA did was diverse,” he said. “I thought joining the team would allow me to explore and expose me to different domains.”

“Data science was an opportunity for me to take my economics training a step further and to sharpen my skills.”

CAN WE ANALYSE TRAFFIC CONDITIONS ON THE ROAD USING DRONE FOOTAGE?

Fixed cameras are usually used to monitor traffic conditions along expressways and at major road junctions. But there are locations with limitations where cameras are not available.

Instead, the data science team uncovered another way to detect and count vehicles – looking at video footage captured by flying drones. This is useful when implementing a traffic scheme change, such as changing the timing of traffic lights.

The analytical approach can detect and count vehicles from a static or moving image, and can even differentiate between cars, buses, motorcycles and pedestrians, said senior data scientist Leong Wei Deng (pictured below), the brain behind the project.

In time to come, LTA would be able to reduce the manpower needed for site visits to manually count the number of vehicles and assess traffic conditions. Wei Deng’s interest in transport planning was piqued after experiencing two train breakdowns, and he now uses drone video footage to analyse traffic conditions.

“I started to realise that transport is something we take for granted. You don’t realise the impact transport has in our lives until something big happens.”





REDEFINING RETIREMENT: WORKING TILL 83

Mr Thambiah Ramasamy joined the public service during the colonial era, and had his hands in infrastructure projects such as the ERP. We speak to the octogenarian to uncover the secret of his long career.

To say Mr Thambiah Ramasamy had a rewarding career may seem a little of an understatement.

After all, the 83-year-old holds the record as the longest-serving employee of the Land Transport Authority (LTA). He retired earlier this year, after an impressive 65 years of work.

All smiles from
LTA's longest-serving
employee



On his last work day in January, colleagues and friends threw him a farewell party, and gifted him a present containing photographs that marked the milestones in his career.

It was a celebration befitting a veteran, who has defied and redefined retirement.

In the span of six decades, Mr Ramasamy, whose last position was as a senior assistant engineer in LTA's road pricing systems division, has done his fair share to shape the changing transport landscape of the nation.

He was involved in a myriad of construction projects, from the building of carparks and widening of roads, to his most notable project: the construction of the Electronic Road Pricing (ERP) gantry.



A fond farewell from Mr Ramasamy's colleagues



Road Pricing Systems - 20 years ago



Road Pricing Systems - 2019

A PIONEER OF THE ERP

The construction of the ERP first began in 1997. Its aim was to reduce traffic by introducing toll charges on vehicles according to time and congestion levels using radio communication equipment, sensors and cameras.

Mr Ramasamy was among its pioneering team that put up the first ERP gantry at Ophir Road.

“It was my proudest moment.”

Later, he supervised the civil engineering works for the erection of other ERP gantries. Today, there are 78 operational ERP gantries islandwide.



Performing a routine inspection

As part of his work, he would also check the density of the soil before a gantry was erected. After so many years of experience, he is able to predict the density and moisture content of the soil by just touching it.

And once a month, he carried out routine inspections of the gantries to look for defects and problems such as rust, corrosion or overgrown trees that could obstruct the gantry.

He takes particular pride in the fact that the gantries have stood safe and incident-free all these years.

RETIREMENT WAS NEVER HIS GOAL

All through his career, Mr Ramasamy never thought of stopping work.

“I didn’t want to retire. Working makes me active.”

Acknowledging Mr Ramasamy’s value and contribution, LTA also continued to re-employ him beyond the retirement age, providing older workers like him with more opportunities to work longer.

On how he managed to build such a long career, he said it’s no secret. Just keep fit, both physically and mentally.



Mr Ramasamy ensured that ERP gantries stood safe.

His job required him to hit the ground and even toil under the hot sun, including walking from one ERP gantry to another to carry out inspections. But he has no complaints. Instead, he sees it as exercise.

He used to jog every morning before going to work, but stopped about five years ago because of knee problems.

He also maintains a healthy diet, and brought home-cooked food to work daily. In the past few years, his wife and son also urged Mr Ramasamy to retire, so that he can “enjoy life”, but to no avail. Working, it seems, was his life’s joy.

“He believed in his work and wanted to contribute as long as he could,” said his son, Vick.



THE ROAD THAT LED TO LTA



NEXT-GEN ERP

From 2020, LTA plans to roll out a second-generation ERP system that relies on satellite navigation technology.

This means a wireless, gantry-less system would soon track vehicles by satellite, alerting drivers to priced roads.

Soon, the streetscape will look different. The blue-and-white ERP gantries dotting the central business district and major highways will be dismantled, and become a thing of the past.

Asked how he feels about it, the transport stalwart said:

“Since I have left, I don’t carry the baby anymore. I have done my job, and I am happy. There was no accident.”

It is perhaps apt that his farewell precedes the phasing out of the ERP gantry, almost as if his departure signals the end of an era.

Since retiring, he has planned a long trip to India, and will spend his time “relaxing”.

“Retiring is a bit boring, but it’s OK. I will be looking after my grandchildren and great grandchildren,” he said with a beam.



Soil testing

1952

Mr Ramasamy joined former City Council straight after completing O-levels

Overseer in the engineering department, responsible for the provision of water, electricity, gas, roads, bridges and street lighting

Moved to Public Works Department (PWD)

1959

Supervised the construction of the National Stadium’s carpark



Overseeing a road construction project

1974

Joined PWD’s mobile laboratory

Carried out soil testing, ensuring that a site’s soil is compact for building structures like roads and expressways

Shifted to LTA that was just set up
Involved in traffic and road management

1995

2018

Retired from service



50-year award



65-year award



SimplyGo. IS THE WAY TO GO

Say hello to a new and more convenient way of paying for your commute! Just like making payment for groceries at the supermarket with your contactless credit or debit card, you can now tap the same cards to pay for your public transport journey – starting with Mastercard®. You no longer need to worry about your card balance. With SimplyGo, simply tap and go!

As Singapore embraces smart technology for better living, the Land Transport Authority (LTA) has introduced more forms of cashless e-payment methods on trains and buses.

The result is SimplyGo, an initiative that enables commuters to use their contactless credit and debit cards to pay for their fares.

With SimplyGo, commuters can tap and go with their MasterCard contactless bank cards or even smart phones and watches linked to them.

VISA is expected to come on board later in the year. Towards the end of the year, commuters using EZ-Link cards can also upgrade their cards to enjoy



benefits like topping up on-the-go via the SimplyGo account.

The launch of SimplyGo on 4 April was a bustling affair held at Downtown MRT station. Crowds of commuters visited the various booths during lunchtime to learn more about SimplyGo from ambassadors clad in bright yellow.



SPS Baey Yam Keng at the launch of SimplyGo at Downtown MRT Station



Representatives from various banks were also present to explain the benefits of SimplyGo and promote perks for using the new payment method with their cards.

SimplyGo works on an 'account-based' system where fares are computed back-end. LTA has been piloting with Mastercard® since March 2017.

Commuters who have previously signed up for the ABT pilot will automatically continue their journeys with SimplyGo.

Commuter Isabelle Xie likes SimplyGo.

“It is a very good initiative. Everyone is looking for automation today, and SimplyGo can help commuters save a lot of time by avoiding long queues to top up our cards.”



“We want to make the experience for commuters as hassle-free and as convenient as possible...I think (SimplyGo) will be a great convenience to every commuter.”

BAEY YAM KENG
SENIOR PARLIAMENTARY SECRETARY
FOR TRANSPORT



What Commuters Are Saying

“The TL SimplyGo app is very useful for tracking my transport expenses. This is on top of not needing to top up my card at the machine again.”

MARSAYUTI NOVIAR

“While I still continue to use my senior concession card for my travels, I signed up my credit card with SimplyGo as a backup in case I run out of money in my main concession card.”

JOAN LEE



“Psst, check if your bank offers promotions when you use SimplyGo to pay for your journeys!”



PUNGGOL: A SHOWCASE IN FASTER & MORE EFFICIENT ROAD CONSTRUCTION

Punggol residents have been enjoying a new route to the various expressways, thanks to the early completion of newly-constructed road links that connect the town to the two expressways.



Being stuck in peak hour traffic between your home in Punggol and your downtown office is no one's idea of a fun time. But ever since two new roads were added, driving has become easier as bottlenecks on road networks have eased in this rapidly expanding new town.

The best part is, the new roads – opened in November 2018 and March 2019 – were completed ahead of time – much to the joy of motorists and bus commuters.

The first new road, which is a 160m-long bridge across Sungei Serangoon, was completed almost a year ahead of schedule.

This new link, connecting Punggol Central to KPE and TPE(PIE), will help to alleviate traffic congestion along the main roads leading to the expressways.

Similarly, the second new slip road, from TPE(SLE) Exit 6 at KPE/TPE Interchange to Halus Link towards Lorong Halus and Punggol Central, will further smoothen traffic conditions. It also finished sooner than expected.

“Since the opening of new link roads... outgoing traffic from Punggol town during morning peak hours is observed to be smooth flowing.”

NG SAY CHEONG
LTA DEPUTY PROJECT MANAGER

“Traffic condition at Punggol Road and Punggol Way towards TPE (PIE) is also observed to have improved too.”

When all the new roads in this project are completed in the second quarter of 2021, “they will provide Punggol residents with a more direct link to and from KPE and TPE and improve traffic flow of connecting roads in the vicinity”, he added.

It could be even sooner, with help from new construction methods and technology.



HOW TECHNOLOGY MAKES ROAD PLANNING EASIER

It started with manually drawn blueprints on huge rolls of paper. Over the years, computer aided design (CAD) made the pen drawings redundant.

Building information models (BIM) then became the new standard for three-dimensional modelling and better collaboration among engineers, architects, and construction professionals.

But now, a new disruptor in the construction scene is revolutionising how construction projects can be better managed and executed.

Called virtual design and construction (VDC), this method of virtually planning, modelling, collaborating and executing building projects emphasises more on the collaboration and integrated working aspects through the sharing of project data and other relevant information.

Synergising BIM and VDC technologies, designers and construction teams are able to simulate the construction stages in the virtual environment. This enables more efficient planning, design and management before actual construction work begins.

Say Cheong shared that,

“The adoption of these productive technologies sped up the entire process of design and construction by minimising interruption or abortive work due to late detection of design clashes and changes during construction.”

NEW WAYS TO CONSTRUCT ROADS FASTER

Much like how many new HDB flats are now built – modularly using components that have been made in concrete casting yards off-site – the adoption of an extensive precast system during the construction of flyovers, bridges or roads has allowed for faster, safer, and more environmentally-friendly construction.

By using this precast method, the construction time can be shortened. This is because key structural components such as columns, crossheads and beams can be fabricated while the construction of other parts of structural components such as piles and piled caps on site can go on concurrently.

The construction process can also be quicker as no massive installation of temporary supports and scaffolds are needed for the precast method, as compared to the conventional casting on-site method.

Apart from saving time, the adoption of these new construction methods optimises the use of materials. This also leads to less waste, fewer manpower required on site due to prefab and process optimisations, increased safety, and higher quality of workmanship as fabrication of precast components is carried out in a factory environment.

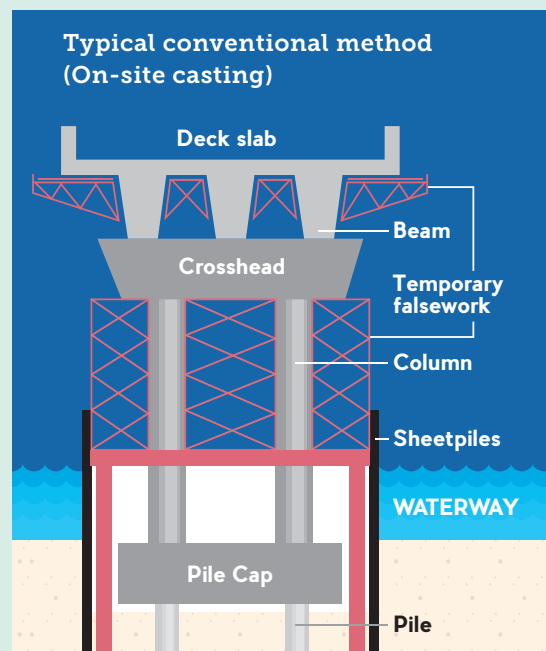
LTA has previously adopted VDC on a smaller scale for construction of other projects. The success of this project will serve as a template for future LTA projects involving construction of bridges, flyovers and viaducts.

As a resident in Punggol, faster completion of bridges and roads means smoother traffic. Way to go!

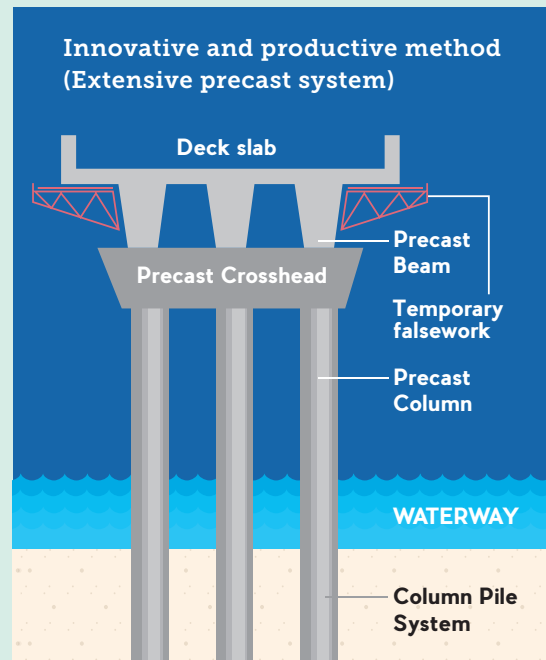


DIFFERENT METHODS FOR BRIDGE CONSTRUCTION ACROSS WATERWAY

Typical conventional method (On-site casting)



Innovative and productive method (Extensive precast system)



Fun facts:

According to the data from the Singapore Department of Statistics, the residential population in Punggol has tripled.

It is only going to grow bigger as new housing developments are built.





BRINGING YOU DOOR TO DOOR WITH FEEDER BUSES

Commuters may not spend a lot of time on feeder buses, but they perform a critical function - connecting people from bus interchanges and MRT stations to their homes, offices or other destinations. Here are some fun facts you might not know about the short-trip service that began 44 years ago.



70

Total Number Of Feeder Services

About one in five basic bus services here are feeder buses, dedicated to fulfilling the first-mile and last-mile connections. Today, there are 70 feeder services across Singapore, except in areas that are already well-served by existing trunk routes – such as Geylang, Queenstown and Sembawang.



1975

The Dawn Of Feeder Services

The journey began in December 1975. For a flat fare of 20 to 50 cents a trip, residents of Jurong Industrial Estate, Changi Village, Sembawang Hills Drive, Bedok New Town, and Singapore Polytechnic's Dover Road campus were among the first to enjoy feeder bus pick-ups from nearby bus stops to transport hubs. From there, commuters could seamlessly transfer to trunk services to town. This paved the way for a similar hub-and-spoke public transport model in other estates.

8



Most Number Of Feeder Services In A Town (Woodlands And Yishun)

The North wins again! Bigger towns often require more feeder services which extends the reach of transport nodes to residents. Over 250,000 residents in Woodlands and 210,000 residents in Yishun have access to eight feeder services each which efficiently connects them to their respective town centre and transport hub.

17.4km

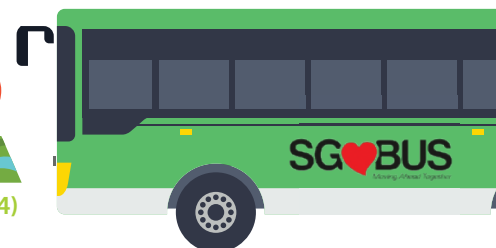
The Longest Feeder Route (Service 912)



Feeder buses are meant to be short trip services, but not bus service 912. It travels a route with 40 bus stops, covering 17.4km over a 70-minute journey. It sounds more like a typical trunk service! The feeder service plies around Woodlands, one of Singapore's largest towns in terms of population. No wonder it takes so long to cover all the ground.

1.7km

The Shortest Feeder Route (Service 284)



Stopping at just three bus stops along Clementi Avenue 4, service 284 makes a complete 1.7km loop at Clementi interchange in the blink of an eye. Fall asleep and you will be back at the starting point in 15 minutes!



New Features to Enhance your Journeys!

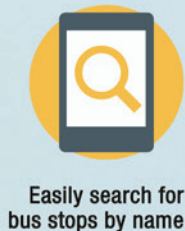
MY TRANSPORT.SG App

Your essential travel companion!

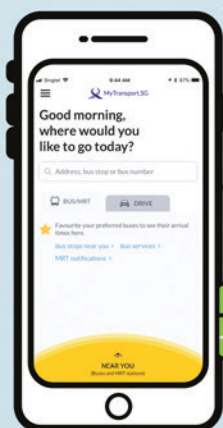
Check weather and Pollutant Standards Index (PSI)



Traffic camera images can be enlarged. See different cameras along a stretch of road.



Easily search for bus stops by name



Check COE bidding results



Quick access to OneMotoring digital services using Singpass

Land Transport Authority

We Keep Your World *Moving*



MyTransport.SG Mobile App

is available for download from the App StoreSM and Google PlayTM.

New downloads of the old MTM app are no longer available. Users of the old app are encouraged to switch to the new MTM app by October 2019.

Download on the App Store



ANDROID APP ON Google play





#ICYMI WHAT'S TRENDING

The upcoming 43km-long Thomson-East Coast Line will connect the northern, eastern and central regions of our island. Come on a journey with us, through the lens of photographers from Canon's EOS World Community, and let us show you the full picture of the hard work that goes into building the future transportation system of Singapore. Head down to our **"Show The Full Picture"** photo exhibitions at Woodlands, Bencoolen and Paya Lebar stations before the end of May!



ONE SIMPLE MOVE IS ALL IT TAKES TO BE THOUGHTFUL

The Thoughtful Bunch is back! This year, their doppelgangers have been dressed in trendy outfits styled by students from the Nanyang Academy of Fine Arts, showing that each of us can be a Thoughtful Character who makes a difference in our daily commute!



Catch a ride with the Thoughtful Bunch on the Graciousness Themed Trains running on the North East Line, Circle Line, Downtown Line as well as the North-South and East-West Line before the end of June*! Be part of the Thoughtful Family and make it a joyful ride for everyone!

*Theme Train on NEL and DTL will be running till end May 2019.



Click on the links below to find out more about what's trending on LTA's Facebook page!

New Canberra Station

#RailUpdate: 75% of the new Canberra Station is completed! Find out what's coming next at <http://bit.ly/2GqSFG6>

New Northbound Lornie Highway

#AttentionMotorists: The northbound Lornie Highway will open to traffic on 19 April 2019 at 3am! What do you need to know? <http://bit.ly/2GiyngM>

Active Mobility Enforcement Officers

#PatrolOnWheels: Using bicycles to cover wider geographical areas to keep everyone safe! <http://bit.ly/2VY4Mjf>

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READ & WIN!

JUST ANSWER 3 SIMPLE QUESTIONS

Stand to win a set of 4 limited-edition NETS FlashPay cards worth \$40!

1. LTA's transport detectives are a diverse team from the data science division. True or false?

2. Mr Thambiah Ramasamy is 83 years old and holds the record as the longest-serving employee of the LTA. He retired recently. Name one of his most notable projects.

3. The longest feeder route covers a whopping 17.4km. Which service number serves this route?

Email your answers to connect@lta.gov.sg by 31 May 2019, and include your name with the subject "Connect Apr 2019". 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 Feb 2019 Read & Win Quiz:

1. Yoo Su Ling, Linda
2. Ong Bong Hock, Tony
3. Tang Puay Eng

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