

Legislative Council of the Hong Kong Special Administrative Region Delegation of the Panel on Transport Report on the duty visit to the Yangtze River Delta Region 10 to 13 September 2024



Autonomous
Driving



Big Data



Smart
Motorway



Smart
Charging



Hydrogen-
powered vehicles



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1. Introduction

1.1 The delegation of the Legislative Council (“LegCo”) Panel on Transport (“the Panel”) (“the Delegation”) conducted a four-day duty visit to Shanghai and Hangzhou from 10 to 13 September 2024 to learn about the experience of the two cities in promoting the development of autonomous vehicles (“AVs”) and vehicle-to-everything, the application of smart motorway management, and the promotion of the new energy transport industry and green transformation of public land transport. This report presents the highlights of the duty visit, as well as Members’ observations and recommendations.

Background

1.2 In 2020, the State Council issued [the Notice on the New Energy Vehicle Industry Development Plan \(2021-2035\)](#) (“the Notice”), which outlines the national strategy for developing new energy vehicles (“NEVs”) with “electrification, connectivity, and intelligence” as the direction of development. The Notice also proposes promoting the integration of NEVs with integrated smart mobility services, expediting the construction of a new type of intelligent traffic control system, and accelerating the smart application of NEVs in different scenarios.

1.3 The abovementioned national policies are also embodied in Hong Kong’s smart city planning. The Government published the [Hong Kong Smart City Blueprint](#), the [Smart Mobility Roadmap for Hong Kong](#), and the [Hong Kong Smart City Blueprint 2.0](#) in 2017, 2019, and 2020 respectively to promote smart transport infrastructure and the application of data sharing and analytic technologies, with a view to achieving better traffic planning and management while facilitating smart mobility for the public. In addition, the 2023 Policy Address stated that the Government would make every effort to promote the new energy transport industry and green transformation of public land transport, so as to achieve the target of zero vehicular emissions by 2050.

1.4 The Panel has been actively following up on the development of smart mobility, smart traffic management and the new energy transport industry, as well as expressing views on the implementation of different areas of work. The Panel has noted the rapid development in areas such as sensing detection, artificial intelligence (“AI”), big data analysis and the new energy transport industry. Many cities in the Yangtze River Delta (“YRD”) Region, including Shanghai and Hangzhou, are leading the world in numerous aspects. For example, the establishment of City Brain systems

and integrated traffic monitoring platforms, the development and application of autonomous driving technology, and the introduction of electric and hydrogen fuel cell public transport vehicles. Moreover, the infrastructure, technological development, pilot testing and application deployment, etc. of smart mobility in these cities are relatively mature, offering many valuable references and insights for Hong Kong.

Objectives of the duty visit

1.5 At its meeting on 21 June 2024, the Panel agreed to conduct a duty visit to the YRD Region from 10 to 13 September 2024, and welcomed the participation of officials from the Transport and Logistics Bureau and relevant departments. The main objectives of the duty visit are as follows:



Visiting organizations and units such as the Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center, the intelligent holographic intersection in Jiading District, Shanghai, Baidu's Apollo Park in Shanghai and the Geely Auto Group Headquarters to **learn about the latest development and application of new energy, intelligent connected vehicles and charging systems**



Conducting on-site visits to organizations such as the Shanghai Urban Construction City Operation (Group) Company Limited ("Shanghai Urban Construction (Group)") and the City Brain Operation Command Center in Hangzhou to **understand how smart traffic management is**



Getting first-hand experience of travelling on a Shanghai Lingang hydrogen-powered medium-capacity tram to **gain an understanding of the operation and development of China's first hydrogen-powered transport route and the world's first Digital-rail Rapid Transit ("DRT") tram**

1.6 At the meeting held on 12 July 2024, the House Committee of LegCo endorsed the proposed duty visit.

Membership list of the Delegation of the Panel on Transport

1.7 Members of the Delegation include:

Panel members

- (a) Dr Hon CHAN Han-pan, BBS, JP (Chairman and Delegation Leader)
- (b) Hon Dominic LEE Tsz-king (Deputy Chairman)
- (c) Hon Michael TIEN Puk-sun, BBS, JP
- (d) Hon Frankie YICK Chi-ming, GBS, JP
- (e) Hon LEUNG Man-kwong, MH
- (f) Ir Hon CHAN Siu-hung, JP
- (g) Hon CHAN Hok-fung, MH, JP
- (h) Hon YIM Kong, JP

Other Members participating in the duty visit

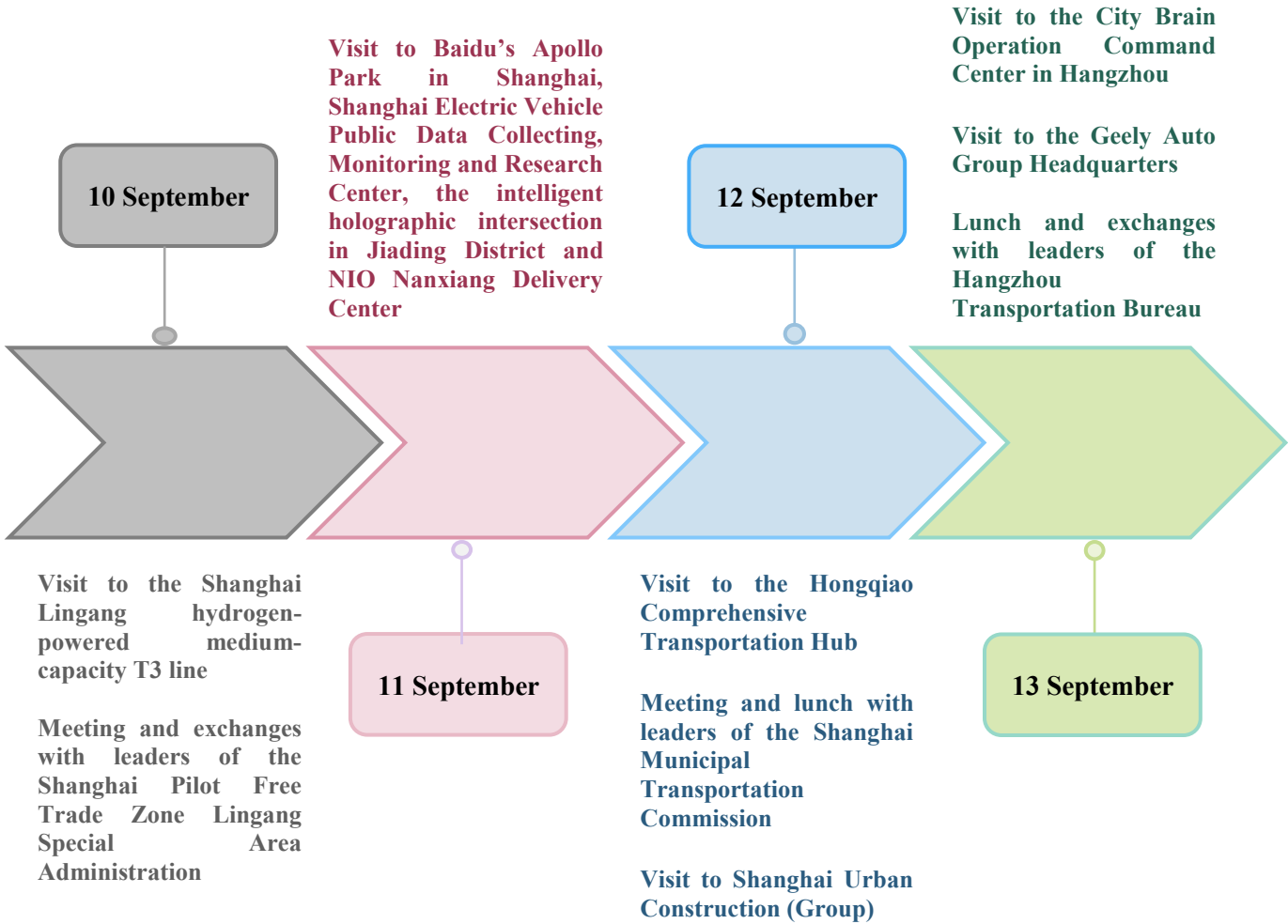
- (i) Hon Holden CHOW Ho-ding, JP
- (j) Hon LAU Kwok-fan, MH, JP

1.8 At the invitation of the Panel, Mr LAM Sai-hung, Secretary for Transport and Logistics, led a delegation from the Government of the Hong Kong Special Administrative Region (“HKSAR Government”) to participate in the duty visit. The membership list of the HKSAR Government delegation is in **Appendix 1**.



Visit programme

1.9 The meetings and activities attended by the Delegation are listed in the table below and the visit programme of the Delegation is in **Appendix 2**.





2. Visit to Shanghai

Overview of Shanghai

2.1 Shanghai, abbreviated as “Hu” (滬), is one of the four municipalities under the direct administration of the Central Government. It reigns as the largest international economic centre and an important international financial hub in the Mainland. As at the end of 2023, it has a permanent population of 24.87 million, comprising 14.8 million registered residents and 10.07 million non-registered residents.

2.2 Shanghai ranks **third in automobile production** in the Mainland, with a production volume of 2.156 million in 2023, representing 7.1% of the country’s total production volume. The production of NEVs (including pure battery/plug-in hybrid vehicles) reached 1.287 million in 2023, accounting for approximately 60% of Shanghai’s total automobile production volume that year. **Over the past five years, the number of NEVs produced in Shanghai has increased by 14.5 times.** Furthermore, Shanghai boasts a well-developed automotive industry ecosystem, encompassing upstream and downstream supporting industries and services such as automobile manufacturing, parts and accessory systems, automotive electronics and power, etc. As at the end of 2022, Shanghai is home to eight large-scale automobile enterprises and over 600 parts and accessory systems enterprises.

2.3 Apart from being a strategic production base, Shanghai is also a major market for NEVs in China. It has incentivized the public to purchase and use NEVs through measures such as free special licence plates (green licence plates) and subsidy provision for the purchase and charging of NEVs. Moreover, in accordance with the Implementation Plan for Accelerating the Development of the New-energy Vehicle Industry in Shanghai (2021-2025), **the public transport in Shanghai will go fully electric during the 14th Five-Year Plan period, and new energy buses should account for 96% by 2025.**

2.4 As the global trends in the automotive industry are shifting towards intelligence and connectivity, Shanghai formulated the Implementation Plan for Intelligent Connected Vehicle Industry Innovation Projects in Shanghai as early as 2017 to resolutely promote the innovation and development of the intelligent connected vehicle industry. In 2022, it promulgated the Implementation Plan for Accelerating Innovation and Development of Intelligent Connected Vehicles, which sets out a number of key tasks. **These include improving the systems of testing, evaluation and technology standards, building intelligent infrastructure and a complete ecosystem of intelligent connected vehicles in Jiading. The target is to first establish a pioneering framework for the innovation and development of intelligent connected vehicles in China by early 2025.**

2.5 To dovetail with the national development strategies of building the “transportation of a great country” and introducing smart transportation, the Shanghai Municipal Government issued the White Paper on Shanghai’s Transportation Development in 2022. It states that over the next decade, Shanghai will strive to develop a **smart transportation system comprising “intelligent transportation infrastructures, automated transportation and customized transportation services”**, so as to realize a “one-ticket system” and “one-code access” for payments, create fully intelligent transportation hubs and corridors, and integrate intelligent connected services into people’s daily lives.



Visit to Shanghai Lingang Special Area to experience hydrogen-powered medium-capacity tram system

2.6 Upon arrival in Shanghai on 10 September, the Delegation first visited the Shanghai Lingang Special Area and took a ride on the Lingang hydrogen-powered medium-capacity T3 line (“T3 line”).

2.7 The Delegation notes that the **medium-capacity tram system is the world’s first digital rail tram** which does not need any ground trackwork. As the tram is equipped with sensors, it can read coded information of magnetic nails continuously laid on the road surface to track the vehicle’s position in real time and control the direction of its wheels according to the route. While the medium-capacity T1 line, the earliest in operation, utilizes the energy storage technology of high-capacity lithium-ion battery, the **T2 line (in operation since October 2022) and the T3 line (in operation since July 2023), on which the Delegation travelled, are both fuelled by hydrogen.**



Members of the Delegation pose for a photo with the Lingang hydrogen-powered medium-capacity tram after taking a ride on it

2.8 Following the ride on the T3 line, the Delegation had an exchange session with representatives of China (Shanghai) Pilot Free Trade Zone Lingang Special Area Administration (“LSAA”). The session was chaired by Mr WU Jie, Member of the Party Committee of the Lingang Special Area and Full-time Deputy Director of LSAA. Full-time departmental leaders of LSAA and leaders of other relevant enterprises explained the planning, construction and operation of the medium-capacity system, as well as the development of the hydrogen energy industry in Lingang. The Delegation was briefed on the advantages of hydrogen-powered medium-capacity trams, e.g. the hydrogen-powered T2 and T3 have a shorter hydrogen refuelling time and a driving range of over 150 km. Compared to T1, which is battery-powered and has a driving range of about 30 km, **the hydrogen-powered T2 and T3 do not require frequent refuelling and therefore have no impact on train schedule.**



The Delegation receives a briefing by LSAA on the development of the hydrogen energy industry in Lingang

2.9 The Delegation was also briefed on the use of hydrogen energy in the Lingang Special Area and noted its increasing usage in the transportation sector in the area. In addition to medium-capacity trams, hydrogen energy is also used in buses, medium and light goods vehicles, municipal street cleaning vehicles and commercial vehicles. **As at the end of June 2024, the number of hydrogen-powered vehicles in Shanghai has already exceeded 3 000.**

2.10 The Delegation also notes that a safe and efficient hydrogen filling station network plays a key role in the sustainable and robust development of the hydrogen-powered vehicle industry. To this end, **the Lingang Special Area is exploring the transition of its hydrogen filling stations from demonstrative applications to commercialized operations.** Currently, there are two hydrogen filling stations operating in the Lingang Special Area. The integrated service station on Tonghui Road in the area boasts the largest hydrogen filling capacity in Shanghai and provides customized hydrogen filling services for medium-capacity trams. In addition, the station has a daily filling capacity of 2 000 kg, which can meet the hydrogen filling demands of medium-capacity trams in the near, medium and long term.

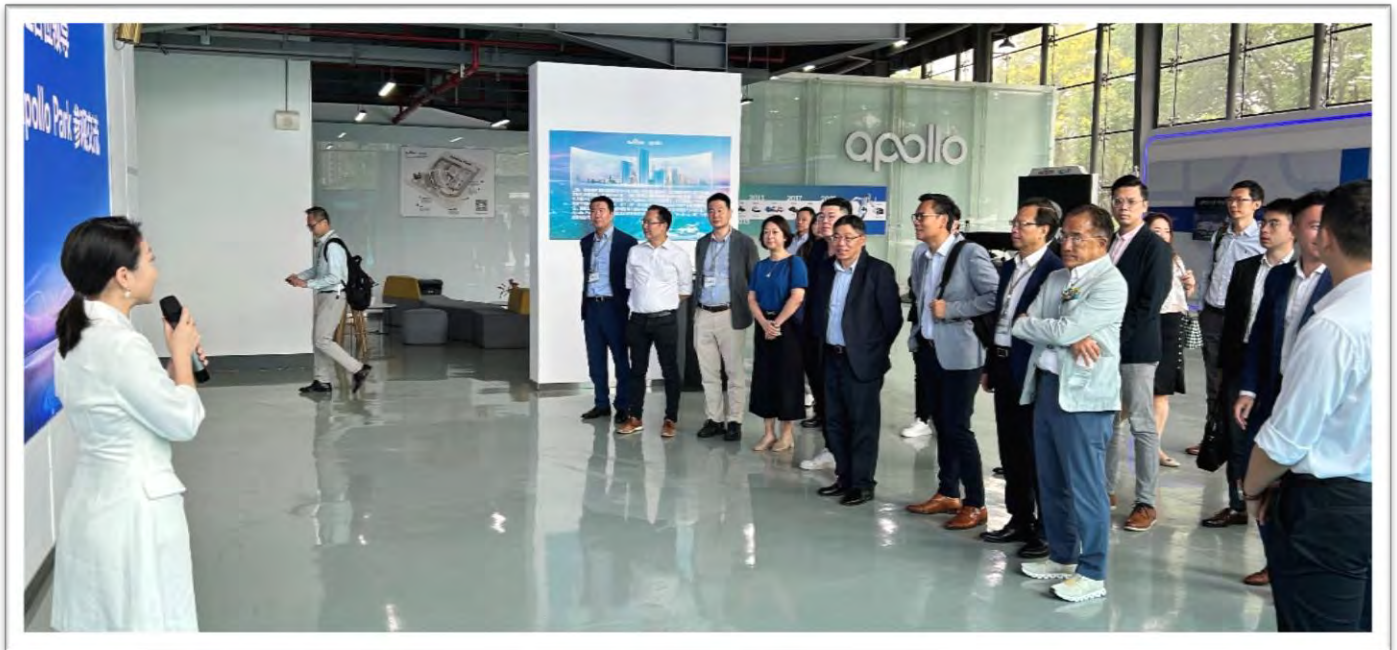


The Delegation and the government officials pose for a group photo with LSSA after the exchange session

2.11 The delegation understands that LSSA operates under the guiding principles of “leading the way, achieving full chain integration, being innovation-driven, fostering international cooperation and being scenario-led”. Their vision is to develop the Lingang Special Area into a place where research on the hydrogen-powered vehicle industry is planned and initiated, a high-end manufacturing area in China, as well as an international cooperation zone for the hydrogen-powered vehicle industry with global influence. The goal is to establish the distinctive brand of “International Hydrogen Valley” at the municipal level for the Lingang Special Area.

Visit to Baidu's Apollo Park in Shanghai

2.12 The Delegation visited Baidu's Apollo Park in Jiading District, Shanghai on 11 September to learn about the company's intelligent connected and cloud-based command platform, as well as research and testing on smart traffic management and autonomous driving. These include the integration of smart sensors, image sensing technology and AI technology in AVs.



A representative of Baidu's Apollo Park introduces the park to the Delegation

2.13 The Delegation then engaged in an exchange session with representatives of Baidu's Apollo Park. The Delegation notes that the country is actively expediting the development of connected and cloud-controlled infrastructure. It is also exploring **various application scenarios of autonomous driving technology through the efficient collaboration among “vehicles” (smart vehicles), “roads” (smart traffic management facilities), “networks” (communication networks), “cloud” (cloud computing) and image (image sensing technology).** These applications include smart public transportation and passenger vehicles, as well as automated parking or goods delivery. Technological breakthroughs in intelligent connected vehicles and industry development will also be accelerated.

2.14 The Delegation also exchanged views with representatives of Baidu's Apollo Park on matters related to smart traffic management and autonomous driving. Topics covered the sharing, compatibility and management of traffic data collected by different manufacturers in Shanghai; the legal liability of AVs in the event of traffic accidents; and the progress towards the full introduction of higher levels of autonomous driving in Shanghai.



Members of the Delegation actively express their views during the discussion session with representatives of the Apollo Park

2.15 The Delegation also **took a trial ride on rental cars with autonomous driving function in the Park** to experience their performance under autonomous driving. The Delegation notes that Baidu's autonomous ride-hailing platform was granted the first batch of intelligent connected vehicle demonstration rental operation permit in Shanghai in 2023, and the demonstration operation has been commenced on some road sections in Jiading District. The platform's rental cars are subject to a maximum speed limit of 40 km/h. To ensure safety, there must be a safety personnel in the driver's seat to operate the vehicle when necessary. Passengers can book the service through a mobile app, and get on and off the rental car at designated points.





The Delegation takes a trial ride on autonomous rental cars at Baidu's Apollo Park

Visit to Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center

2.16 The Delegation then visited the adjacent Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center (“Data Center”). Members note that the Data Center, established in 2014, is the **first third-party public platform in China to collect, store and analyze data on intelligent connected vehicles**. It has connected over 1.5 million NEVs, covering more than 2 000 vehicle models.

2.17 The Data Center collects static and real-time traffic, energy, environmental and safety data related to NEVs, which will be used to analyze the usage characteristics of private and commercial NEVs. With the help of big data and AI, the Data Center can also simulate traffic conditions under different scenarios, such as the traffic flow on a road at different times of the day. Such data and analysis will not only assist the relevant government departments in Shanghai to enhance their policy initiatives, but will also enable vehicle manufacturers and energy providers to improve their products based on the analysis results. In addition, the Data Center has a data sharing platform that can be accessed by other organizations for data research and innovation purposes.



The Delegation receives a briefing by representatives of the Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center

Visit to Intelligent Holographic Intersection

2.18 The Delegation then conducted a site visit to the intelligent holographic intersection at Boyuan Road, which is also located in Jiading District. The intelligent holographic intersection utilizes technology such as sensors, accurate mapping technology and AI algorithm to obtain a wide range of real-time data including vehicles' identity, location, speed, trajectory and the status of traffic lights at the road junctions. The data serves as a basis for the delicacy management of road junctions.

2.19 Members note that **Jiading is one of the four districts in Shanghai which are open for road testing of AVs.**¹ Members note that the detection devices, including cameras and radar sensors, installed in Jiading District can effectively collect real-time images of the road or perform data monitoring. The data, after being processed by the roadside intelligent cabinets, will be transmitted in real time to Internet-connected vehicles (including AVs) on the road to help them adjust their driving routes and solutions. Members note that there are a total of 60 intelligent holographic intersections in the entire Jiading District.



The Delegation is observing the detectors installed at the holographic intersection

¹ The four approved demonstration zones in Shanghai for autonomous driving road testing are Jiading, Lingang, Jinqiao and Fengxian, with more than 2 000 km of road sections serving as testing scenarios.

Visit to NIO Delivery Center in Nanxiang

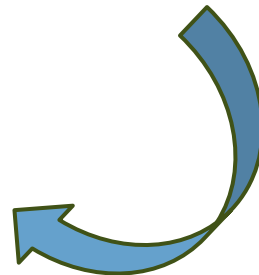
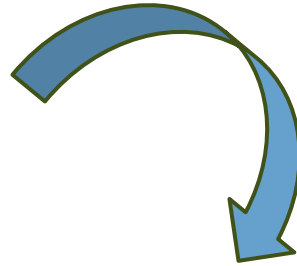
2.20 The Delegation then went to the NIO Delivery Center (“Delivery Center”) in Nanxiang to visit its battery-swapping stations for electric vehicles (“EVs”). NIO, which was established in 2014, manufactures and sells high-end EVs, and the Delivery Center is where vehicle buyers pick up their purchased vehicles. At the Delivery Center, Members received a briefing by NIO’s representatives on the manufacturing process of EVs and the arrangements for buyers to collect their new vehicles.



The Delegation receives a briefing by NIO’s representatives on the manufacturing process of EVs and the latest developments

2.21 Members note that **in addition to EV charging stations, NIO has established more than 2 500 battery-swapping stations across the country.** During the visit to the Delivery Center, Members experience one of NIO’s latest third-generation swapping stations. **The fully automated swapping process took only about 3 minutes,** faster when compared with conventional chargers. While some Members point out that the introduction of these quick battery-swapping facilities in Hong Kong can indeed save some vehicle owners the time it takes to charge their vehicles, there are also concerns about the technical challenges that may need to be addressed in the application of battery-swapping technology in Hong Kong due to the variety of battery systems used by EV manufacturers.

The Delegation experiences the fully automated swapping process while remaining inside the car



Visit to Hongqiao Comprehensive Transport Hub

2.22 The Delegation toured the Hongqiao Comprehensive Transportation Hub on the third day of the visit (11 September). The Delegation learns that the Hongqiao Comprehensive Transport Hub is **a key transport link comprising the airport, high-speed railway, inter-city railway, underground railway, online hailing hire cars and various public transport modes.** It is one of the world's largest transport hubs, with a daily passenger flow of up to 1.4 million people, enabling Shanghai to connect with the YRD Region, serve the whole country and link with the Asia-Pacific region.



The Delegation observes the Hongqiao Comprehensive Transport Hub

2.23 During the visit, Members learn that passengers can quickly transfer to other transport modes at the Hongqiao Comprehensive Transport Hub. Coupled with the ancillary facilities of car parks and parking garages as well as other transport arrangements, the hub can effectively divert passengers and traffic during peak hours of long holidays. Moreover, representatives of the emergency response center of the Shanghai Hongqiao Comprehensive Transportation Hub introduced to the Delegation its guard duty and emergency response platform as well as the relevant emergency response mechanism.



Representatives of the emergency response center of the Shanghai Hongqiao Comprehensive Transportation Hub brief the Delegation on the overview of the Hub and its emergency response mechanism

Exchange session with Shanghai Municipal Transportation Commission

2.24 The Delegation then visited the Shanghai Municipal Transportation Commission (“the Commission”) for an exchange session and was received by Mr LIU Bin, Deputy Director of the Commission, and leaders of various dedicated departments under its purview. The Commission briefed the Delegation on the development and vision of smart and green transportation:

- ※ **Smart transportation facilities:** Promulgate a unified development technology standard for various aspects of smart transportation (e.g. online map data); open up scenarios in different districts for testing smart technologies, with four main application scenarios covering major transportation systems, public transportation, hire cars and goods distribution; install intelligent sensing systems in existing road sections which linked to traffic signals and other facilities to improve transport efficiency.
- ※ **Refined mobility services:** With the concept of Mobility as a Service (“MaaS”), the “Suishenxing” mobile device application is used as a service platform to integrate various transportation services and data in the municipality,² thus facilitating citizens’ commute planning, payment of relevant fees, etc.
- ※ **Digital traffic management:** Develop a digital management system for public transportation to help with crowd control, traffic management and mobilization, enabling citizens to receive traffic forecasts to facilitate commuting.
- ※ **Green transportation:** Continue to promote green transportation, use NEVs and charging facilities,³ and encourage citizens to use public transportation more to reduce carbon emissions. The “Suishenxing” application is also used to keep a record of the cumulative emission reduction figures of individual citizens in exchange for rewards.

² The service platform covers modes of transport such as public buses, taxis (including intelligent connected hire cars), online ride-hailing vehicles, railways/metros, as well as services such as vehicle charging, smart parking, towing and maintenance. Shanghai plans to expand the service platform in the future to include data on clothing, food, accommodation, shopping and entertainment and other areas, and to promote it as an integrated mobility tool for places in the YDR Region.

³ According to the Commission, as at September 2024, Shanghai has cumulatively launched more than 1.36 million NEVs, establishing itself as the leading municipality in China for NEV deployment. In addition, Shanghai has installed nearly 200 000 public charging posts.

2.25 Members express concern about how Shanghai would tackle traffic congestion in the city resulted from the increase in vehicles due to the policy to promote NEVs. They are also concerned about how the Shanghai Municipal Government will encourage container port users to replace their traditional heavy-duty diesel vehicles with NEVs. Members also exchanged views with the Commission on the challenges of introducing electronic road pricing.



**The Delegation exchanges views with
the Shanghai Municipal Transportation Commission**

Visit to digital management center of City Operation

2.26 The Delegation visited the Shanghai Urban Construction (Group) on the afternoon of 12 September and observe the operation of the digital management center of City Operation. The Delegation notes that the Shanghai Urban Construction (Group) is **an integrated service provider that combines design, investment, construction and operation**. Through synergistic development from design to various construction phases, it has achieved **integrated operation of the entire life cycle of urban transport infrastructure** and all-sector collaborative operation. This operation model helps accelerate the construction cycle, improve management efficiency and effectively manage risks.



**The Delegation is introduced to the use of real-time data
as a tool for managing and maintaining transport infrastructure
at the digital management center of City Operation**

2.27 On smart road management, the Shanghai Urban Construction (Group) has installed equipment such as road cameras, sensors and millimetre-wave radar to develop a comprehensive smart sensing and monitoring system aimed at achieving fully intelligent and digital management of urban roads. The smart sensing system has the following application scenarios:

Real-time traffic monitoring: The smart sensing system can monitor real-time traffic conditions on the roads. Combined with AI algorithms, it can identify various unexpected circumstances such as traffic congestion, road works and traffic accidents, thereby assisting the traffic management authority in detecting and addressing these issues in a timely manner.

Emergency handling: In the event of an emergency, the smart sensing system can quickly detect the situation and issue notifications, as well as provide the most optimal strategy and route. This greatly enhances the efficiency and accuracy of responses while reducing the risk of secondary accidents.

Smart toll management: The introduction of an auto-payment function can facilitate smart toll management and enable the quick passage of vehicles. This improves traffic flow at toll booths and reduces the errors in manual toll collection.

2.28 Members learn that in addition to improved traffic management efficiency and enhanced road safety, the smart sensing system is an integral part of a smart city in promoting smart urban development and enhancing a city's productivity and service capacity.

2.29 As extreme weather conditions become more frequent, the Delegation is very interested in how intelligent sensing systems can help maintain the operation and safety of traffic infrastructure under extreme weather conditions. Members note that the Shanghai Urban Construction (Group) has used various intelligent sensing technologies to monitor road surfaces, tunnel structures, bridge wind speeds and rainfall in real time to detect early signs of anomalies such as cracks and damage,

leakage and ponding. In addition, the Shanghai Urban Construction (Group) has established an intelligent transportation management platform for the city's traffic infrastructure. This platform can instantly detect anomalies and provide rescue plans to enhance the resilience of the city's overall traffic system against extreme weather.



**The Delegation is briefed on the latest technology in
intelligent sensing and monitoring systems**



3. Visit to Hangzhou

Overview of Hangzhou

3.1 Located in the southern wing of YRD Region, Hangzhou is the capital city of Zhejiang Province and serves as the economic, cultural, scientific and educational centre of the province. With a total land area of 16 850 sq km, Hangzhou has a permanent population of 12.522 million as at the end of 2023, making it the most populous city in Zhejiang Province. In 2023, Hangzhou's gross domestic product ("GDP") was RMB2.0059 trillion, representing a year-on-year growth of 5.6%, while the value added of its industries above designated scale amounted to RMB435.5 billion, a year-on-year growth of 2.4%.

3.2 In 2000, the Hangzhou Municipal Government proposed the vision of "Building a Digital Hangzhou". It aims to make use of cutting-edge technologies such as big data, cloud computing and AI to promote innovation in city management models and concepts, thereby enhancing the intelligence and efficiency of urban governance. The development of a "Digital Hangzhou" is supported by the following three core pillars:



City Brain: Comprehensive collection and consolidation of all types of urban data enables real-time monitoring and smart regulation and control of urban operations. The scope of application of City Brain is constantly expanding to cover areas such as traffic management, environment monitoring and public safety



Big data and cloud computing: Through the application of big data analytics and cloud computing services, the Hangzhou Municipal Government can take the pulse of urban development dynamics and gauge citizens' needs more accurately. This provides a scientific basis for policy formulation and public services



AI : The introduction of AI technology enables smart data analysis and forecasting in areas such as traffic volume and environment monitoring, thereby enhancing the level of intelligence of city management

3.3 At the G20 Hangzhou Summit in 2016, Hangzhou became one of the first “digital economy” cities in China. The city has applied digital transformation to various scenarios, including urban transport, healthcare, payment, entertainment and education, so as to provide its citizens with a more convenient and intelligent lifestyle and service experience.

3.4 The Delegation’s main programme in Hangzhou include visits to the City Brain Operation Command Center in Hangzhou and the Geely Auto Group Headquarters, as well as a luncheon with officials from the Hangzhou Transportation Bureau to exchange views on matters of mutual interest.



**The Delegation visits
the City Brain Operation Command Center in Hangzhou**

Visit to City Brain Operation Command Center in Hangzhou

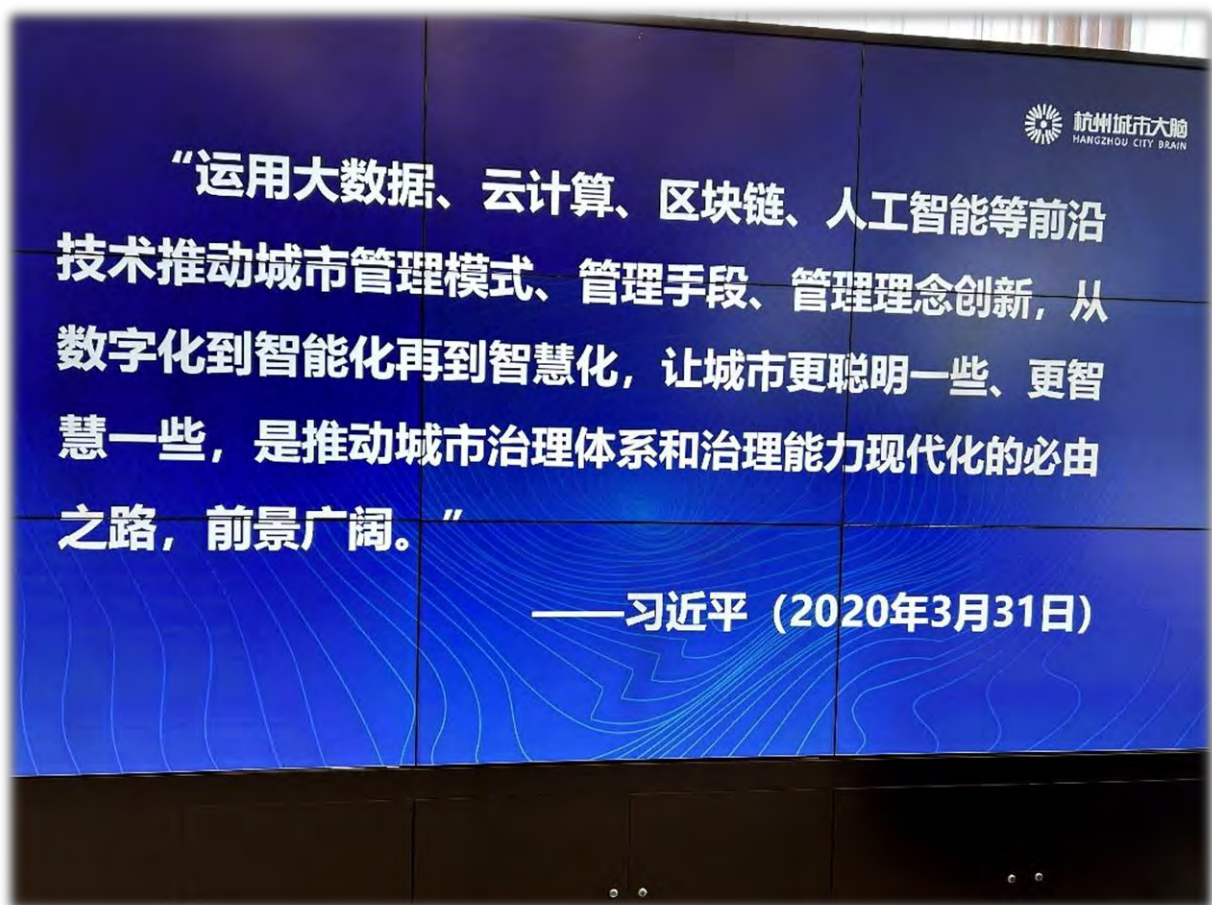
3.5 As the first stop of its programme on 13 September, the Delegation visited the City Brain Operation Command Center (“Operation Command Center”) in Hangzhou. The Operation Command Center, which was completed in 2019, occupies an area of over 8 000 sq m. Located in Yunki Town, Xihu District, it serves as the headquarters for Hangzhou’s City Brain, integrating core operations, command and application, results demonstration, and technology research and development (“R&D”) under one roof.

3.6 The Delegation received a briefing by the representatives of the Operation Command Center on the development and application of smart traffic management in Hangzhou. Members have learned that in response to traffic congestion problems, Hangzhou launched the first City Brain system in the Mainland in 2016. The system is a collaboration between the Hangzhou Municipal Government and Alibaba Cloud, a subsidiary company of Alibaba Group. Its objectives are to **amalgamate big data on people, vehicles and roads; utilize AI analytic technology to improve traffic management; and combine real-time road monitoring to enhance road safety and efficiency.** Following the launch of City Brain system, Hangzhou saw a significant improvement in its traffic congestion ranking, dropping from the top three in 2014 to 34th place among the country’s 50 major cities in 2021.



3.7 Regarding the application of “City Brain” technology, Members note that Hangzhou’s City Brain can provide drivers with optimal driving routes and information on nearby parking spaces, helping them avoid congested road sections and improving traffic flow. In terms of traffic management, Hangzhou’s City Brain uses video feeds and real-time vehicle trajectory data to automatically control traffic signals with AI. This feature allows vehicles ahead to be pre-emptively diverted, enabling ambulances to navigate quickly without jumping red lights or interfering with other vehicles during emergency missions. In 2018, Hangzhou’s City Brain also introduced the world’s first AI patrol system. This system can automatically identify car accidents, illegal driving behaviours, jaywalking and other traffic violations, and report them to the police within 20 seconds.

3.8 In addition to traffic control, Members note that **Hangzhou’s City Brain has continuously optimized its applications, expanding to a total of 48 application scenarios across 11 areas, including city management, health, tourism and environmental protection.** In recent years, the system has been introduced in more than 20 cities, including Beijing, Shanghai, Guangzhou and Macao.



**President XI Jinping highly commends
the application of “City Brain” technology**

Visit to Geely Auto Group Headquarters

3.9 Geely Auto Group, headquartered in Hangzhou and founded in 1986, is the country's first privately owned automobile company. With a portfolio of internationally renowned brands, Geely Auto Group is committed to advancing NEVs, intelligent driving technology, R&D of electric vehicles and the development of battery swapping technology. The company has achieved remarkable success in the global market.



3.10 The Delegation received a briefing by the leaders of Geely Auto Group on the NEVs developed by the company. Members note that the company has invested heavily in the R&D of methanol vehicles in recent years in support of the country's policy goal of developing new energy technologies to achieve carbon neutrality and promote green development. **As one of the pioneering domestic automobile companies that has ventured into the methanol industry, Geely Auto Group has successfully developed a number of methanol-fuelled vehicle models, including methanol sedans and heavy trucks.** In the field of methanol vehicles, the company has developed more than 200 patented technologies and collaborated with countries like Iceland and Denmark on a series of tests on methanol vehicles, receiving positive feedback and results.

3.11 Members then had a test ride on **the Geely Farizon methanol hybrid heavy truck** and learned that methanol, as a clean energy source, has high combustion efficiency and lower emissions, making it both environmentally friendly and energy-efficient. The vehicle model uses extended-range methanol, **providing a driving range of up to 1 000 km and a combined cost of only RMB 0.5-0.65 per km.** Its remarkable cost-effectiveness compared to conventional fuel-propelled vehicles makes it **suitable for a variety of applications such as freight transport, refrigerated transport, and transport of dangerous goods.** Members believe that Hong Kong should closely monitor the latest developments and applications of methanol vehicles in the country. They also call for active consideration of the introduction of methanol heavy trucks in transport, logistics and port operations. The affordability and efficiency of these vehicles could help reduce industry costs, which would greatly benefit the development of Hong Kong's freight forwarding and logistics industry.

The Delegation has a test ride on a methanol hybrid heavy truck
and other new energy vehicles



3.12 The Delegation was then briefed by the leaders of Geely Auto Group on the company's battery swapping technology. Members note that the setup of Geely's battery swapping platform is compatible with various classes of vehicle body types, including sedans, SUVs, MPVs, light trucks and pickup trucks. In addition, Geely Auto Group has adopted patented technology to ensure precise docking between the battery and the vehicle chassis, as well as fast battery swapping. The entire process takes only about a minute. In terms of batteries, Geely Auto Group's battery swapping technology can extend battery life. When operating in battery swapping mode, the batteries can have a lifespan of up to 600 000 km over an eight-year period. The Aegis Short Blade Battery developed by Geely Auto Group further enhances the performance and safety of battery swapping vehicles. In addition, the company is actively involved in formulating national battery swapping standards to prepare for the next stage of development and the wider application of charging and battery swapping technologies.



Geely Auto Group's representative introduces the company's digital cockpit computing platform, which supports the intelligent sensing and driving functions of its vehicles

3.13 The Delegation was also shown a number of NEVs and the latest intelligent driving technology by Geely Auto Group to better understand the latest technological developments and scientific research achievements in the industry.

Exchanges with Hangzhou Transportation Bureau



The Delegation and Government officials pose for a group photo after meeting with the Hangzhou Transportation Bureau

3.14 In the afternoon, the Delegation departed for Shangcheng District, where they had a luncheon with the Hangzhou Transportation Bureau and were received by leaders including Mr WU Zhirong, Member of the Leading Party Members Group and Deputy Director of the Hangzhou Transportation Bureau. Over lunch, **the two sides exchanged views on various areas, including the development of green transport and smart transportation in Hangzhou.** The Delegation also took the opportunity to learn about Hangzhou's experience in regulating hire cars for passenger transport and online hailing platforms. This experience can serve as a reference for Hong Kong in formulating its future regulatory framework.



4. Observations and Recommendations

4.1 During the four-day visit, the Delegation met and exchanged views with leaders from the Shanghai Municipal Transportation Commission and the Hangzhou Transportation Bureau, as well as toured various units. These interactions allowed Members to better understand and learn from valuable experiences in areas such as implementing smart mobility, pursuing smart traffic development and management, developing intelligent connected vehicles and promoting new energy public traffic and transport systems. Members found the visit programme to be enriching and fruitful, providing an important reference for the Panel in its future study and monitoring of the relevant policies and work of the HKSAR Government. Members' observations and recommendations on individual areas are set out below.

Smart mobility and smart traffic development

Observations

4.2 Members observe that Shanghai has been striving to develop a smart transportation system featuring **“intelligent transportation infrastructures, automated transportation and customized transportation services”** to incorporate intelligent services into the daily commute of the public. In promoting the intelligentization of transport infrastructural facilities, Shanghai **has promulgated unified technical standards across** various fields and **opened up diverse scenarios for technology testing**. The standardized development and open testing scenarios can promote the rapid advancement of smart transport technologies. At the same time, Shanghai **has established a unified public traffic management platform**. This, combined with facilities like smart sensing systems installed on major roads, fairways, ports and terminals, as well as linked traffic lights, enables the quick **collection, analysis and centralized dissemination of traffic information**. **As a result, traffic management and law enforcement become much more efficient.**

4.3 On the other hand, to achieve smart mobility, Shanghai has launched a **“Mobility as a Service”** platform in recent years, which integrates real-time information on various public transport modes, parking spaces, hire cars, etc. in Shanghai. Passengers are provided with **one-stop travel services** in multiple application scenarios through the **“Suishenxing”** application. This not only enriches the travel experience of citizens but also greatly enhances efficiency.

Recommended measures

✧ Accelerating the development of smart facilities and data platforms

The HKSAR Government has made strenuous efforts to promote smart mobility in recent years, and Members consider this direction worthy of support. While the Transport Department has planned to install sensors and ancillary equipment at about 50 independent signalized junctions, and the Real-time Adaptive Traffic Signal System at eight linked signalized junctions in Tung Chung are already in place, **Members find the implementation work inadequate. They recommend that the HKSAR Government expedite the installation of a smart sensing system on various highways and major roads, and open up more testing scenarios for the application of smart transport technologies,** so as to promote their application and rapid development in Hong Kong.

On data openness, Members recommend that **the HKSAR Government enhance data integration across government departments** to provide a “single portal for online transport and government services”.⁴ In the meantime, **the HKSAR Government should also break down information barriers with commercial organizations (e.g. public transport operators, private car park operators, etc.) and build a comprehensive and unified data platform** to enable real-time updating and application of traffic information.



The Shanghai Urban Construction (Group) shares with the Delegation its experience in installing smart sensing systems on highways

⁴ “One-network management” for urban operations was included in the country’s 14th Five-Year Plan in 2021 in order to expand smart cities’ application scenarios, facilitate business collaboration across regions, social strata and departments, and enhance the efficiency and convenience of transport services.

Recommended measures

※ Enhancing the “HKeMobility” mobile application

Members note that as at the end of January 2024, the “HKeMobility” mobile application has reached 2.7 million downloads. To further improve the application, Members recommend that **the HKSAR Government draw on Shanghai’s experience in implementing the “Suishenxing” application and consider enhancing HKeMobility’s functionality to provide one-stop travel services.** The enhancement could include the use of big data and AI to analyze real-time traffic data, advising the public on travel routes (including the best transport modes, journey durations, waypoints, service frequencies and fare information), providing public transport arrival times, offering online hire car hailing services and facilitating mobile payments. Moreover, in view of the strong public demand for northbound travel, Members recommend that the HKSAR Government explore adding cross-boundary transport services to the application (e.g. booking for “Northbound Travel for Hong Kong Vehicles”, service frequency and ticketing for the Guangzhou-Shenzhen-Hong Kong Express Rail Link). Furthermore, Members recommend that **the HKSAR Government may also study how the data collected by “HKeMobility” can improve public transport operations and the efficiency of road use.**

※ Promoting smart traffic enforcement

Members learn that to enhance the efficiency of traffic enforcement, the Shanghai Municipal Government monitors traffic contraventions with the help of electric bicycles equipped with Radio Frequency Identification (“RFID”) technology (commonly known as “e-police”)⁵. Members believe that given the passage of Electric Traffic Enforcement (Miscellaneous Amendments) Bill 2023 by LegCo in June this year to implement electronic traffic enforcement, the HKSAR Government should draw on Shanghai’s experience in smart traffic enforcement and **consider deploying sensing devices (such as road cameras and facial recognition technology) at congested road sections and traffic blackspots.** This would assist the Police in capturing traffic violations (such as jaywalking and illegal parking), thereby improving road usage and enhancing deterrent effects.

⁵ An electric bicycle plate fitted with an RFID chip automatically uploads real-time vehicle dynamic information to the back-end system via collection devices installed at junctions and road sections.

Recommended measures

※ New generation of Transport Interchange Hubs

Members note that the HKSAR Government is considering the construction of a new generation of Transport Interchange Hubs (“TIHs”) at strategic locations (e.g. the Northern Metropolis), which will integrate various transport facilities and amenities in a one-stop manner. In addition to efficiently gathering and dispersing passengers, TIHs will integrate transport with the daily lives and various activities of the public and drive the development of neighbouring areas. The Delegation visited the Hongqiao Comprehensive Transport Hub in Shanghai. Members learn that the Hub brings together various modes of transport, including the airport, high-speed and intercity railways, long-haul buses, the metro, public transport and rental vehicles, with a designed passenger throughput of over one million passenger trips per day. Its efficient interchange system enhances the integration and synergy between different modes of transport and connects Shanghai with the transport nodes of many cities in the Mainland and overseas, thus providing favourable conditions for the development of tourism, business, etc. **Members recommend that the HKSAR Government draw on the successful example of the Hongqiao Comprehensive Transport Hub and explore ways to fully utilize the new generation of TIHs to closely link different modes of transport in order to enhance overall transport efficiency and traffic capacity, while also improving the overall journey experience of passengers.**



The Delegation visits the Hongqiao Comprehensive Transport Hub for an understanding of its operation

Smart traffic management

4.4 Faced with a shortage of land resources and an ever-increasing number of vehicles in Hong Kong, the HKSAR Government proposed the introduction of smart motorway management in the Traffic and Transport Strategy Study (“TTSS”) published at the end of last year. Members support the proposal and consider that leveraging on technology can optimize the use of limited road resources to alleviate traffic congestion, while increasing the resilience of transport infrastructural facilities in handling emergencies. In this regard, Members consider the exemplary performance of the Shanghai Urban Construction (Group) and the Hangzhou City Brain Company Limited in smart traffic control and city management as invaluable reference for the introduction of smart motorway management in Hong Kong.

Observations

Full life cycle management model

4.5 Members note that the Shanghai Urban Construction (Group) was established in 2017. It is responsible for managing, operating and maintaining more than 95% of the transport facilities in Shanghai. **The Shanghai Urban Construction (Group) adopts a business model that prioritizes the cost-effectiveness of its projects to steer its operations. Its services cover the entire life cycle of transport facilities**, starting from design and construction in the early stages to operation, maintenance and decommissioning in the middle to late stages of a project. This approach requires meticulous long-term planning and management from the initial design stage, departing from **the conventional operational model of “treating the head when it aches and the foot when it hurts”**. In addition, **by installing an intelligent sensing and monitoring system and utilizing technologies such as 5G, big data and AI**, the Shanghai Urban Construction (Group) **conducts real-time, around-the-clock monitoring and assessment of transport facilities** to identify early unforeseen incidents such as traffic congestion and traffic accidents. Furthermore, it monitors road conditions, facility structures, wind speeds and rainfall under extreme weather conditions to detect abnormalities at an early stage, thereby effectively **enhancing the resilience of the transport infrastructure networks**.

4.6 Regarding the construction and maintenance of facilities, the Shanghai Urban Construction (Group) **adopts standardized design and the “Modular Integrated Construction” method to enhance the efficiency of construction and maintenance works**. In addition, **to enhance productivity and minimize human errors**, the company uses advanced equipment to monitor and analyze the quantity of required materials, manpower allocation and completion time of various projects. To

achieve smarter and more efficient motorway management, the company has taken the initiative to develop advanced equipment such as smart surveillance vehicles and autonomous inspection robots to assist in the relevant management tasks. Members believe that the above experience in the application of advanced technology warrants careful consideration by the HKSAR Government.



The Delegation learns that the Shanghai Urban Construction (Group) adopts a full life cycle management model to make meticulous long-term planning and management of transport facilities

Recommended measures

✧ Introducing smart motorways

Members note that TTSS has initially recommended that all major roads in Hong Kong currently being planned, as well as those proposed for construction under the Strategic Studies on Railways and Major Roads beyond 2030, be designated as smart motorways. Members recommend that the **HKSAR Government ensure that smart motorway elements and requirements**, including technical specifications for the installation of various intelligent sensing systems, maintenance requirements, facility renewal needs, etc., **are incorporated into the respective planning and design of projects at the early planning stage.**

Regarding highway maintenance, Members note that in Hong Kong, road construction and maintenance are undertaken by different contractors. This, combined with the generally short duration of maintenance contracts, contributes to higher costs, which in turn disincentivizes contractors from introducing technological elements to enhance maintenance efficiency. **Members recommend that the HKSAR Government consider the Shanghai Urban Construction (Group)'s service management concept, which covers the entire life cycle of transport facilities**, with future maintenance needs being taken into account from the early stages of road construction. **Maintenance contracts are also signed with contractors during the construction phase. As a result, contractors make long-term planning for road maintenance during the construction phase** and are willing to invest resources in deploying various intelligent sensing technologies and monitoring systems to enhance the resilience of the city transport networks to extreme weather conditions.

In addition, Members recommend that the HKSAR Government proactively familiarize themselves with the rules and regulations of Mainland cities in the Guangdong-Hong Kong-Macao Greater Bay Area and the specifications of relevant infrastructural facilities, so as to **explore ways to facilitate connectivity and data sharing between smart motorways in Hong Kong and those in Mainland cities.**

Recommended measures

※ Smart traffic and city management

Members observe that Hangzhou, as one of the first “digital economy” cities in China, **has achieved real-time monitoring and smart regulation and control of city operations through the development of a City Brain system.** The application of City Brain has been extended to various domains including **digital economy, social governance, and health and hygiene**, advancing the city towards full intelligentization. Members acknowledge that data integration and sharing under the comprehensive data monitoring and sharing mechanism established by the relevant authorities in Hangzhou play a key role in enabling precise decision-making in smart traffic and city management.

During his visit to the City Brain Operation Command Center in Hangzhou in March 2020, President XI Jinping advocated for **smart governance for the people, intelligence for the city and a quality life for all.** Furthermore, he instructed that the **modernization of city governance be pursued** through the adoption of technologies such as big data, cloud computing and AI. Currently, Hong Kong is fully committed to building a smart city so that citizens can better experience the benefits that smart cities and innovation and technologies bring to their daily lives. Based on the observations in Shanghai and Hangzhou, Members consider that the HKSAR Government **should establish a more robust data integration and sharing mechanism, expedite the installation of smart sensing devices on major roads and transport nodes, and build a city brain system that integrates technologies such as big data, cloud computing and AI**, with a view to achieving real-time monitoring and smart regulation and control of city operations. In addition, Members also recommend that the HKSAR Government **direct enterprises to increase their R&D and investment in smart services across various areas**, such as smart car parks, smart payment services and smart medical consultation services, thereby providing more efficient and convenient services to the public.

Developing intelligent connected vehicles

Observations

Development of intelligent connected vehicles in Shanghai

4.7 As early as 2017, Shanghai formulated the Implementation Plan of Shanghai Municipality for the Innovation Projects for the Intelligent Connected Vehicle Industry, striving to promote the innovative development of the intelligent connected vehicle industry. A series of key tasks were subsequently proposed, including **building a leading domestic application environment for cooperative vehicle-infrastructure systems in Jiading District**⁶, **expanding high-level autonomous driving test scenarios and demonstration applications, accelerating commercial operations in specific scenarios**⁷, and **exploring the feasibility of conducting full-scale testing in areas with suitable conditions**. In Jiading District, the Delegation visited an intelligent holographic intersection⁸, Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center (“the Data Collecting, Monitoring and Research Center”), and Shanghai Baidu’s Apollo Park. Members gain a deeper understanding of Shanghai’s efforts in developing intelligent connected vehicles.

4.8 Members learn that **Jiading District is one of the first national “Dual Intelligent” (i.e. smart city infrastructure and intelligent connected vehicles⁹) pilot**

⁶ Jiading District is the largest automotive industry hub in China, boasting the most comprehensive industrial chain. In 2023, the total output value of its automotive industry reached RMB720 billion (HK\$780 billion).

⁷ Autonomous driving is generally categorized into six levels, ranging from L0 (no automation) to L5 (full automation). Only L3 and above are considered automated driving requiring no human driver supervision. More precisely, L3 (conditional automation) can operate autonomously in specific scenarios, L4 (high automation) in most scenarios, and L5 (full automation) in any scenario.

⁸ An intelligent holographic road intersection is a system that uses sensors, high-precision mapping technology, AI algorithms and other technologies to obtain real-time data such as vehicle identity, location, speed, trajectory, and intersection traffic light status. Once the relevant data is processed by the integrated intelligent cabinets at the roadside, real-time push notifications will be sent to intelligent connected vehicles on the road, assisting them in adjusting their driving routes and plans.

⁹ These vehicles are equipped with advanced sensors and control systems, combined with communication and network technologies, which can exchange information and data in real time with other vehicles, traffic infrastructure, etc., to flexibly assist and coordinate driving, as well as achieve fully automated driving.

zones, and the Data Collecting, Monitoring and Research Center is the largest data collection and analysis platform for NEVs in the Mainland, currently housing data from over 1.5 million NEVs to understand their application. Additionally, the Apollo Park is an intelligent connected cloud control platform established by Baidu based on the concept of “vehicle, road, cloud, and map”. Baidu’s autonomous driving ride-hailing service, “Apollo Go”, has been in demonstration operation on certain roads in Jiading District. This not only showcases the feasibility of autonomous driving technology but also provides useful data for the commercial operations of AVs in the future.

4.9 On the application of autonomous driving technology, Members learn that the country is actively promoting the construction of networked cloud control infrastructure and exploring **multi-scenario applications of autonomous driving technology based on a synergy among “vehicle”, “road”, “network”, “cloud” and “map”, etc.** These applications include intelligent public transport, passenger cars, automatic parking and goods distribution, which not only enhance traffic efficiency but also enable people to travel with greater convenience and comfort.



The Delegation visits the Geely Auto Group Headquarters to learn about the latest technology and development of intelligent connected vehicles

Recommended measures

※ Development of AVs in Hong Kong

LegCo passed the Road Traffic (Amendment Autonomous Vehicles) Bill 2022 last year to further promote the testing and application of AVs. Subsequently, the HKSAR Government made a new piece of subsidiary legislation in March this year to provide a flexible regulatory framework for AVs. Members recommend that the SAR government **establish standards for the trial and use of AVs on public roads, and set a specific timetable for gradually opening public roads for the trial and use of AVs.** At the same time, the HKSAR Government also needs to **build more road infrastructure**, including the development of comprehensive telecommunications networks, intelligent sensor monitoring systems and cloud computing facilities, so as to meet the technical requirements of AVs.

Members point out that technological innovation and R&D play a pivotal role in advancing the development of intelligent connected vehicles. Therefore, they recommend that **the HKSAR Government scale up investment in scientific research in the field of intelligent connected vehicles to drive innovation and breakthroughs in related technologies across different domains.** In this regard, Members note that the HKSAR Government is providing financial incentives for autonomous driving technology through the Smart Traffic Fund (“the Fund”), which subsidizes enterprises or academic institutions in conducting pilot projects. As of June 2024, a total of 55 projects have been approved. Amongst them, AVs and vehicle-to-everything (“V2X”) technology constitute the largest category, accounting for 35% of the approved fundings. Members recommend that **the HKSAR Government expedite the progress of pilot projects related to AVs and V2X technology, so as to facilitate the application of the relevant technologies and accelerate their commercial development.**

In addition, Members recommend that **the HKSAR Government enact comprehensive regulations and standards for the technical requirements, safety performance, data protection, and other aspects of AVs.** Meanwhile, it is also necessary for the HKSAR Government to **clearly define the legal liability of AVs in traffic accidents and set up a compensation mechanism**, so as to protect the safety of passengers and pedestrians.

Recommended measures

※ Development of AVs in Hong Kong

Finally, in promoting demonstration operations and commercialization, Members **recommend that the HKSAR Government actively promote the testing of AVs, and identify locations with suitable conditions for trial operations**, such as establishing broader application scenarios in the Northern Metropolis. Through demonstration operations, more experience and technical data can be gathered. At the same time, **the HKSAR Government could play a bridging role by actively bringing in more corporate capital and talent into the field of intelligent connected vehicles to accelerate the industry's development.**



Baidu's autonomous driving ride-hailing service "Apollo Go"

New energy vehicles and new energy mass transit systems

Observations and recommendations

Promoting green transformation of public transport

4.10 The development of NEVs is a strategic initiative in China to address climate change, achieve carbon neutrality and promote green development. In Hong Kong, the HKSAR Government actively promotes the development of new energy to achieve the goal of carbon neutrality by 2050.¹⁰ Members consider that Shanghai's experience in developing new energy transport can provide very useful reference for Hong Kong.

4.11 Firstly, the Shanghai Municipal Authorities has set clear targets for the development of green transformation of public transport and introduced numerous measures, such as requiring all newly commissioned public transport to use new energy; providing different types of purchase and operating subsidies to public transport operators, streamlining the approval procedures for the construction of charging and hydrogen refuelling stations, and providing operators with energy price guarantees, etc. Members consider the above measures as crucial and recommend that the HKSAR Government **consider providing subsidies to encourage public transport operators to buy NEVs, and concessions or subsidies for the construction of related ancillary facilities (including charging facilities and repair and maintenance equipment)** to lower the operating costs of the operators.

Adopting the “moderately ahead of actual demand” strategy when planning charging facilities

4.12 In terms of charging facilities, Members observe that the Shanghai Municipal Authorities proposes to develop an urban charging network “**moderately ahead of actual demand**” to meet the needs of commuters, and to plan charging facilities based on the principles of “**charging piles first, cars later**” and “**fast charging as the mainstay**”, e.g. requiring the provision of a certain number of charging facilities in newly-built public car parks, supporting the construction of hire cars charging demonstration stations with the provision of subsidies, and converting

¹⁰ The Chief Executive has proposed in the 2024 Policy Address that \$750 million would be earmarked under the New Energy Transport Fund to launch a subsidy scheme for electric taxis and electric buses to implement the green transformation of public buses and taxis, aiming to make available about 3 000 electric taxis and about 700 electric buses by 2027. Furthermore, the HKSAR Government will discuss in detail with stakeholders, including the taxi trade, franchised bus companies and public vehicle importers and understand their operational needs to ensure that the trade completes green transformation in an orderly manner.

public charging facilities from “slow to fast” charging. Given the current inadequacy of charging facilities in Hong Kong, Members consider that the HKSAR Government **should expedite the building of an EV charging network, and that the relevant facilities should be integrated with town planning and the layout of the public transport system for easy access by the public and the transport industry.** Moreover, although as stated in the 2024 Policy Address, the HKSAR Government will earmark \$300 million to subsidize the private sector for installing quick-charging facilities, and will consider building quick-charging stations on existing petrol-filling station sites under the “single site, multiple use” model, Members are concerned that the construction progress of such facilities may lag behind the scale of EV use in Hong Kong.¹¹ In view of the HKSAR Government’s vigorous efforts in promoting the green transformation of private cars and public transport modes, particularly considering the taxi trade’s need for a fast and extensive charging network to meet their operational needs, Members recommend that **the HKSAR Government expedite the construction of more charging facilities, adopting their Shanghai counterpart’s principle of “charging piles first, cars later” to provide adequate charging services for vehicle owners and the transport industry.**

4.13 Furthermore, the Delegation visited EV manufacturers in Shanghai and Hangzhou to study the operation of the **“vehicle-battery separation charging mode”**. Members learn that the entire “vehicle-battery separation” battery swapping process takes only a few minutes and is fully automated. Some of the battery swapping stations also support automated parking and automated battery swapping functions. Vehicle owners can navigate to the nearest battery swapping station through in-vehicle systems for automated battery swapping service. Members find the charging mode fast and highly efficient. Although the battery specifications of different EV models vary, and that some EVs currently in use in Hong Kong do not support battery swapping technology, Members call on **the HKSAR Government to closely monitor the latest development of EVs and battery standards in the market, and proactively explore the possibility of introducing such a service in Hong Kong to provide the public with more charging options.**

Hydrogen-powered public transport systems

4.14 On hydrogen transport, Members learn that Shanghai is at the forefront of the research, development and application of hydrogen vehicles in the country. The Shanghai Municipal Authorities **are actively promoting the use of hydrogen fuel cell transport**, and enhancing the construction of hydrogen refuelling stations, along with providing special funds to subsidize hydrogen prices in related industries. In addition, Shanghai is actively promoting the trial and application of hydrogen fuel cell buses in the Lingang New Area. Notably, the medium-capacity T2 and T3 lines running in the special area are both powered by hydrogen fuel cells. Members

¹¹ According to government figures, as at the end of June 2024, there were 8 728 public chargers in Hong Kong, of which only 1 511 were fast chargers, while the number of EVs had already exceeded 100 000.

consider that **when introducing new modes of transport, Hong Kong should follow the Mainland's approach by leveraging on industrial development as the primary driving force. In addressing people's needs for transport services, it is also necessary to explore markets and identify business opportunities through the testing and application of relevant systems.**



The Delegation experiences the operation of the vehicle-battery separation charging mode in the NIO Delivery Center in Nanxiang



The Delegation rides and poses for a group photo on the hydrogen-powered medium-capacity tram in Lingang, Shanghai

Recommended measures

※ Development of hydrogen-powered transport and methanol vehicles

Members note that the HKSAR Government is actively implementing the strategies and measures outlined in the Strategy of Hydrogen Development in Hong Kong, including introducing a bill into LegCo in 2025 to ensure the safe use of hydrogen fuel in Hong Kong. In addition, the SAR Government has launched trial projects for hydrogen fuel cell vehicles through the New Energy Transport Fund, including the test run of Hong Kong's first hydrogen fuel cell double-decker bus and trials of hydrogen fuel cell street-washing vehicles. Despite the launch of the hydrogen strategy, Members are of the view that Hong Kong is still lagging behind in the establishment of a robust hydrogen energy supply chain. They therefore **recommend that the HKSAR Government promptly set long-term targets and timelines for promoting hydrogen transport. This should be accompanied by a detailed action plan that includes developing relevant standards for hydrogen transport and offering incentives, such as purchase subsidies for the transport industry. Members also recommend that the HKSAR Government subsidize petrol filling stations for the conversion into integrated stations equipped with hydrogen refuelling facilities, as well as increase investment in hydrogen research, development and distribution technologies to foster innovation and application of relevant technologies.**

Technology is advancing in leaps and bounds. Members note that the Mainland's automotive manufacturers are investing significant resources in the R&D of methanol vehicles. Members learn that **methanol has high combustion efficiency, produces fewer emissions, and is cost-effective.** For instance, a methanol hybrid long-distance heavy goods vehicle ("HGV") can achieve a driving range of up to 1 000 km, with an overall cost of only RMB0.5 to 0.65 per km. Furthermore, these vehicles are sold at a price lower than that of traditional petrol or diesel HGVs. Members **recommend that the HKSAR Government keep abreast of the latest developments and applications of methanol vehicles. Once the relevant technologies and standards have become mature, it should actively explore the feasibility of offering subsidies to the transport, logistics and port industries to encourage them to introduce methanol HGVs, thereby phasing out traditional petrol or diesel HGVs.** Members are of the view that methanol HGVs are not only more environmentally friendly, but also have low-cost and high-performance characteristics that can help the industry reduce costs, **which will greatly benefit the development of Hong Kong's freight forwarding and logistics industry.**

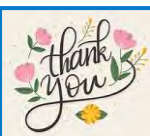


5. Conclusion

5.1 In summarizing the four-day intensive programme, Members consider the visit to be highly rewarding. Through meetings with leaders and representatives of the relevant authorities and examining successful cases of various projects, Members have gained a deep understanding that Hong Kong shares a common vision with Shanghai and Hangzhou in a number of areas, such as the promotion of smart traffic and city management, the development of intelligent connected vehicles, as well as the promotion of NEVs and public transport systems. The shared goal is to make traffic management smarter, enhance public mobility, and improve the quality of life for the people.

5.2 As Hong Kong is gearing towards smart mobility, Members found that the experiences of Shanghai and Hangzhou in planning smart transport infrastructure and establishing unified data collection and dissemination platforms could provide insights for Hong Kong. In addition, Members are inspired by the management approach of the Shanghai Urban Construction (Group), which takes an entire-life-cycle perspective. They suggest that the HKSAR Government should embrace new thinking and methods to manage, operate and maintain transport infrastructure projects in Hong Kong. Furthermore, Members have gained a deeper understanding of the evolving and innovative landscape of R&D of NEVs that is paving the way for a green transformation of transport to move relentlessly towards the goal of carbon neutrality.

5.3 Members hope that the invaluable experiences gained from this visit will serve as useful references for the HKSAR Government in formulating relevant policies and contribute to the advancement of smart mobility in Hong Kong.



6. Acknowledgements

6.1 The successful completion of this duty visit would not have been possible without the strong support from the Shanghai Municipal People's Government, the Hangzhou Municipal People's Government and the relevant departments. The warm hospitality of the receiving units and their detailed introduction of the relevant policies and facilities to the Delegation made the visit highly rewarding. The Delegation would like to express its heartfelt gratitude to the relevant government departments and receiving units in the Mainland.

6.2 In addition, the Delegation is deeply grateful to the Transport and Logistics Bureau and the Hong Kong Economic and Trade Office in Shanghai of the HKSAR Government for their assistance in liaising with the relevant government departments and receiving units in the Mainland, which facilitated the preparation of this duty visit. Thanks are also extended to Mr LAM Sai-hung, Secretary for Transport and Logistics, and other officials of the HKSAR Government for participating in this duty visit and facilitating the exchanges between the Administration and Members, thereby fostering consensus on transport policies and measures to promote development in related areas in Hong Kong.

Appendix 1: Membership list of the HKSAR Government Delegation

Transport and Logistics Bureau

Mr LAM Sai-hung, GBS, JP

Secretary for Transport and Logistics

Miss Winnie WONG Wing-nam

Press Secretary to Secretary for Transport and Logistics

Mr Alfred CHAN Yuet-chuen

Political Assistant to Secretary for Transport and Logistics

Miss CHENG Sze-ling

Acting Deputy Secretary for Transport and Logistics 3

Mr Henry TSOI Hey-Yeung

Principal Assistant Secretary for Transport and Logistics 1

Mr Noky CHEUNG Man-nok

Assistant Secretary for Transport and Logistics 5A

Transport Department

Ms Angela LEE Chung-yan, JP

Commissioner for Transport

Mr LEUNG Sai-ho

Assistant Commissioner/Strategic Studies

Ms Janet LAM Sze-mei

Chief Electrical and Mechanical Engineer/Bus Safety

Mr Ken WONG Pak-kin

Principal Transport Officer/New Territories 2

Mr Frankie TAI Lap-for

Senior Engineer/Strategic Studies 5

Environment and Ecology Bureau

Dr Ron YANG Rong

Principal Assistant Secretary for Environment and Ecology (Air Policy)

Appendix 2: Duty visit programme of the Delegation of the Panel on Transport

10 September 2024 (Tuesday)	
Morning	■ Travel to Shanghai
Afternoon	<ul style="list-style-type: none"> ■ Visit to the Shanghai Lingang hydrogen-powered medium-capacity T3 line ■ Meeting and exchanges with leaders of the Shanghai Pilot Free Trade Zone Lingang Special Area Administration
11 September 2024 (Wednesday)	
Morning	<ul style="list-style-type: none"> ■ Visit to Baidu's Apollo Park in Shanghai ■ Visit to Shanghai Electric Vehicle Public Data Collecting, Monitoring and Research Center
Afternoon	<ul style="list-style-type: none"> ■ Visit to the intelligent holographic intersection in Jiading District ■ Visit to Shanghai NIO Nanxiang Delivery Center
12 September 2024 (Thursday)	
Morning	<ul style="list-style-type: none"> ■ Visit to the Hongqiao Comprehensive Transportation Hub ■ Meeting and lunch with leaders of the Shanghai Municipal Transportation Commission
Afternoon	<ul style="list-style-type: none"> ■ Visit to the Shanghai Urban Construction City Operation (Group) Company Limited ■ Depart for Hangzhou
13 September 2024 (Friday)	
Morning	<ul style="list-style-type: none"> ■ Visit to the City Brain Operation Command Center in Hangzhou ■ Visit to the Geely Auto Group Headquarters
Afternoon	<ul style="list-style-type: none"> ■ Lunch and exchanges with leaders of the Hangzhou Transportation Bureau ■ Return to Hong Kong