Institution of Civil Engineers Hong Kong Association
Graduates and Students Division

Japan delegation 2025

Innovative smart city solutions: transforming and revitalising Tokyo's urban infrastructure

Study report

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Foreword

It is my pleasure to present to you the study report for the Japan delegation 2025, the making of which was entirely undertaken by the Session 2024-25. As highlighted in the foreword to the information booklet, visiting Japan is not new to ICE HKA G&S, yet there is much to learn from our Japanese counterparts, from the collective effort afforded to site safety and cleanliness, to the urban tunnelling and seismic designs which have received increasing attention in Hong Kong.

Early January is likely one of the coldest times of the year in the Northern Hemisphere, but I was delighted to learn of the warm hospitality received by our delegation group during technical visits and exchanges with the academia. Apart from acknowledging the novel technologies applied in the construction and operation of transport infrastructure, substantial references have been made in the report summaries to the background and constraints of the projects. This is proof that the delegation group has developed a sound appreciation of the optioneering and thought process undertaken by our hosts in Tokyo, which would be one of the most, if not the most, rewarding takeaways from knowledge exchange with overseas engineers. I am similarly delighted to learn that the mingling with students and staff of the University of Tokyo has reinforced their sense of pride as an engineer.

I wish to take this opportunity to extend our sincere thanks to our advisors and sponsors, who have supported us on our mission. A special mention goes to Mr Fumihiro Aikawa and Dr Johnny Cheuk from AECOM Asia Company Limited, who has linked us with promising opportunities, without which this delegation would not have been as rewarding.

Mr Sampson Tam
Immediate Past Chairman | Session 2025-26
Graduates and Students Division
Institution of Civil Engineers Hong Kong Association

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About ICE

The Institution of Civil Engineers (ICE) is a registered charity in England & Wales (no 210252) and Scotland (no SC038629) that strives to promote and progress in civil engineering. We believe that civil engineers are at the heart of society, delivering sustainable development through knowledge, skills, and professional expertise. With this in mind, we are a qualifying body, a centre for the exchange of specialist knowledge, and a provider of resources to encourage innovation and excellence in the profession worldwide.

Founded in 1818 by a small group of visionary young men, with its first Royal Charter granted by King George IV in 1828 and by Queen Elizabeth II again in 1975, ICE today represents more than 97,000 professionally qualified civil engineers worldwide. ICE embraces the very best talent available in the engineering profession, with members in the UK, China, Russia, India, and over 150 other countries.

ICE Hong Kong

Hong Kong is one of the largest regions outside the UK, and comprises ICE Representative, the Hong Kong Association, the Graduates and Students Division (G&S), and the Regional Support Team serving over 8,500 members. The Hong Kong Association has been the host of well received activities with the prime objective to foster member's professional development. We believe in the walking the talk of lifelong learning, and we make sure our members are well supported in their continuous pursuit of skills and expertise across a variety of disciplines.

ICE HKA G&S

The Graduates and Students Division (G&S) is a sub-division of the Institution of Civil Engineers Hong Kong Association (HKA). Comprising recent graduates and current students embarking on a civil engineering career in Hong Kong, the G&S emphasises both professional and personal development and connects graduate and student members with the industry.

G&S presents a variety of opportunities, spanning site visits, hands-on workshops, enrichment seminars, networking opportunities, overseas delegations and much more. We spare no effort in promoting civil engineering among the next generation, with initiatives covering industry visits, experiential learning, idea pitching and career talks. G&S also maintains strong ties with young committees of local professional institutions and local branches of reputable institutions.

To find out more about ICE Hong Kong, please visit our website: ice.org.uk/hongkong

Japan delegation 2025

by Enoch Lee and Bianca Lee

Japan stands out as an exceptional destination for our construction industry professionals looking to broaden their horizons and explore the dynamic intersection of innovation, history, culture, sustainability, and cutting-edge technology. With its rich architectural legacy, emphasis on sustainable design practices, and a thriving engineering community known for innovation, Japan provides a unique and inspiring environment for engineering students and young professionals to discover. Our delegation to Japan focus on areas such as renewable energy, sustainable transportation infrastructure, and pioneering construction methods, offering participants the chance to witness firsthand these successful engineering endeavors.

Additionally, Japan hosts a variety of companies and engineering organisations that prioritise sustainability, innovation, and collaboration, promoting knowledge sharing and partnerships. Japan's notable accomplishments in sustainable infrastructure development and its dedication to inventive solutions position it as an ideal destination for a delegation tour for progressive construction practitioners from Hong Kong.

Image credit: Shutterstock

Kuden Kasama Tunnel (Kajima Corporation)

by Kelvin Chan and Jack Li

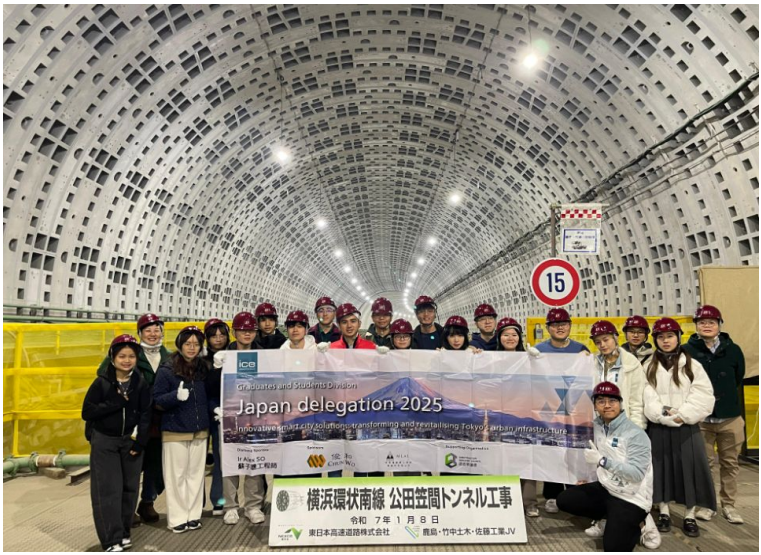
The delegates visited the Kuden Kasama Tunnel Construction, which is part of the Yokohama Ring Expressway South Line, located within a 50-kilometer radius of Tokyo's city center. The overall expressway spans 8.9 kilometers and connects the southern section of the 300-kilometer Ken-O Expressway (Metropolitan Inter-City Expressway), the Yokohama-Yokosuka Expressway, and National Route 1. Notably, approximately 70% of the entire route is situated underground, including various tunnels, with the Kuden Kasama Tunnel located in the middle of the route.

The construction of the Kuden Kasama Tunnel is a collaborative effort between the joint venture of Kajima, Takenaka-Doboku, and Sato Kogyo. The tunnel consists of a 0.3-kilometer retaining wall section, and a 1.7-kilometers Shield Tunnel Boring Machine (TBM) Section. The TBM employed for this project has a remarkable diameter of 15.28 meters and operates by moving back and forth through the geological strata, primarily consisting of mudstone.

During the visit, the project team briefed the delegates on several challenges they faced. One significant issue was the buoyancy of the TBM tunnel in shallow ground conditions. To mitigate the effects of buoyancy forces, the project team utilised heavier tunnel segments, which feature steel ingot and prefilled concrete in the steel segment. These modifications increased the overall self-weight of the tunnel in shallow sections. Additionally, a soil embankment with 2 meters in height was also implemented to enhance the overburden pressure for uplift countermeasure.

Furthermore, the project team innovatively opted for steel rings in place of conventional concrete rings for some tunnel segments. This facilitated easier removal of portions of the ring, enabling connections to the ventilation duct and widening works for the emergency parking area unground.

In conclusion, the visit to the Kuden Kasama Tunnel Construction provided delegates a valuable insight into advanced engineering techniques and collaborative problem-solving in the face of complex geological and hydrological challenges.



The University of Tokyo

by CK Choi and Irene Li

The visit to the University of Tokyo was an enriching experience that highlighted the institution's esteemed academic reputation and its commitment to innovative research. Upon arrival, we were welcomed into a vibrant environment fostering learning and creativity, creating an inspiring backdrop for the day's activities.

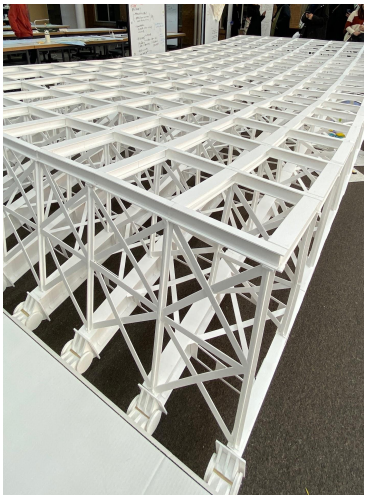
Our day kicked off with a thorough orientation led by Professor Horita, Dr Aygul, and Researcher Arashida, who shared the university's illustrious history and its critical impact on global education and civil engineering research. Along with these insights, we attended lectures on key topics like bridge deterioration prediction and mechanical metamaterials, presented by PhD students. These sessions were not only educational but also sparked engaging discussions among us, prompting us to critically consider the role of education and research in addressing major global challenges.

The campus tour showcased its unique blend of traditional and modern architecture. During the tour, we explored various faculties and had the opportunity to see cutting-edge laboratories where groundbreaking research takes place. The state-of-the-art facilities exemplified the university's dedication to advancing knowledge and technology. This hands-on experience allowed us to appreciate the rigorous academic environment encouraging exploration and discovery.

Following the campus tour, we engaged in discussions with faculty members who shared insights into their ongoing projects. These interactions provided a deeper understanding of the research initiatives at the University of Tokyo. The faculty's enthusiasm and expertise highlighted the collaborative spirit that drives innovation within the institution. We learned about various projects, particularly those focusing on technology and sustainability, which are crucial in addressing global challenges.

Networking opportunities with current students and alumni further enriched our experience. We were able to engage with the university's diverse community, gaining insights into student life and the various paths graduates take after completing their studies. This interaction showcased the supportive network that exists within the university, emphasising the importance of collaboration and shared experiences.

Overall, our visit to the University of Tokyo reinforced its commitment to excellence in education and research. The experience inspired us to consider future collaborations, whether through joint research projects or academic exchanges. The visit left us motivated to explore how we could engage with the university and contribute to the important work being done in addressing societal challenges. This inspiring day highlighted the vital role that institutions like the University of Tokyo play in shaping a better future through education and innovation.



Shibuya Station Redevelopment Project

by Clarice Li and Janice Lee

The Shibuya Station Redevelopment is one of Tokyo's most ambitious urban renewal projects, spearheaded by Tokyu Construction. Shibuya Station serves as a central hub for rail and pedestrian activity, making this redevelopment critical to improving transportation infrastructure, easing congestion, and creating a more interconnected urban environment.

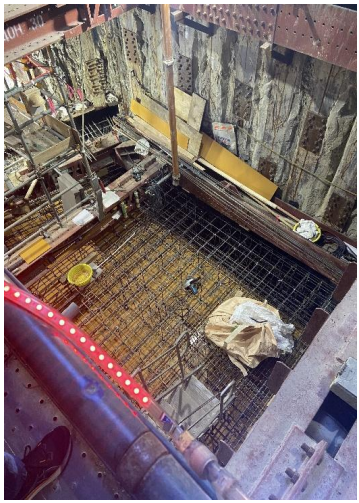
The Shibuya Crossing underpass at the Shibuya Station redevelopment project employs the Partial PreCast (PPCa) method, combining off-site manufacturing with on-site assembly to minimise disruptions and enhance construction efficiency. Tokyu Construction also integrates 4D Construction Information Modeling (4D CIM) to optimise workflows, visualise construction sequences, and coordinate stakeholders, underscoring their commitment to innovation, efficiency, and safety. During our site visit, we observed the meticulous planning and execution required to manage construction in a high-traffic area. The team redirected community facilities like electricity and water systems to maintain essential services. Due to the heavy foot and vehicular traffic, excavation is conducted cautiously in small sections, with immediate stabilisation to prevent road collapses. This methodical approach ensures the safety and integrity of the surrounding infrastructure, demonstrating the project's careful balance between progress and public safety.

The footbridge over Route 246 is a key element of the Shibuya Station Redevelopment Project, serving as a crucial pedestrian link that offers safe and convenient crossing over the busy road. Its design is both functional and aesthetically pleasing, seamlessly integrating with Shibuya's urban landscape. The robust structure provides security and enhances area connectivity.

Additionally, the footbridge offers a unique vantage point for pedestrians to observe the dynamic traffic and vibrant life of Shibuya, symbolising modern urban development and reflecting careful consideration of both utility and user experience.

The inspection concluded with a visit to the rooftop terrace at FUKURAS, specifically the 17th-floor SHIBU NIWA. This area provides an excellent vantage point for observing the overall redevelopment project. The terrace offers a bird's-eye view, allowing for a comprehensive assessment of ongoing construction activities, equipment deployment, and the integration of new structures into the existing urban landscape. The ability to visualise the overall master plan was invaluable. The rooftop garden is designed to be a public space, demonstrating to the public how the redevelopment project is contributing to improving the urban connectivity and accessibility at Shibuya, accommodating the ever-growing number of visitors.

The Shibuya Station Redevelopment Project by Tokyu Construction showcases innovative urban planning. Using PPCa and 4D CIM ensures efficient, safe construction in high-traffic areas. The Route 246 footbridge enhances pedestrian connectivity, while the FUKURAS rooftop terrace offers a comprehensive view, highlighting improved urban connectivity and accessibility in Shibuya.



Shibuya Station Redevelopment Project

by Jessica Lau and Rain Lung

Shibuya is a densely populated area, with a population of approximately 110,000 recorded between 2019 and 2020. On average, nearly 3 million passengers utilise Shibuya Station on weekdays. In recent decades, this borough has become synonymous with the ever-evolving trends associated with youth culture and fashion. It is also renowned for its massive video screens adorning building facades, a vibrant array of neon signs, and the bustling Shibuya Scramble Crossing. The Shibuya Station redevelopment project was officially introduced on 9 January 2025. This initiative focuses on several key areas, which will be discussed below. A primary reason for the platform relocation is the significant deterioration of the station's infrastructure over the past 82 years. Despite serving as a major terminal station with an impressive daily passenger count of 220,000 (as of 2018), the station currently lacks essential facilities such as elevators, platform doors, restrooms, and an integrated design with neighboring department stores. This has resulted in a complicated and inconvenient transfer experience for passengers moving between different routes.

Toyoko Line Underground Switching Work is to switch the underground line between Shibuya Station and Daikanyama Station in the middle of 15 March, 2013, The main reason for the relocation of the platform this time is that the building, including facilities and facilities, has deteriorated considerably since 82 years since Despite the terminal station boasting 220,000 passengers per day (2018), there are no elevators, home doors, toilets, and special structure integrated with department stores, so it is possible to transfer to other routes. It was complicated and inconvenient.

Tokyo has two distinct rainy seasons, one in summer and one in autumn, and a lot of the city is low-lying. So, to combat flooding due to excess rainwater, a new water storage facility has been built underneath Shibuya Station.

In the underground of Shibuya Hikarie (Figure 2), a huge new cavern for water storage built by Tokyu Corporation which can store a whopping 4,000 tonnes of rainwater. The excess rainwater, collected via storm drains, will then be pumped out and emptied into a sewer once the rain stops. Shibuya is particularly prone to flooding, due to its valley-like topography and proximity to the Shibuya River, and the facility will help drain the excess drain water.

The Shibuya Underground Plaza is a key infrastructure project beneath Shibuya Station, specifically designed to improve pedestrian accessibility and enhance the commuting experience in one of Tokyo's most vibrant urban centers. Spanning approximately 3,500 square meters, the plaza features wide walkways and clear signage to manage heavy foot traffic, especially during peak hours. It houses a variety of amenities, including over 20 retail outlets ranging from convenience stores to cafes, providing commuters with quick access to food and necessities. The plaza seamlessly connects to multiple train lines, including the JR Yamanote Line and the Tokyo Metro, as well as bus terminals and taxi stands, ensuring efficient transfers for thousands of daily passengers. Enhanced safety measures, such as surveillance cameras and well-lit areas, contribute to a secure environment. Additionally, the plaza serves as a dynamic public space, hosting seasonal events and art installations that enrich the community, making it a vital component of Shibuya's urban landscape and cultural identity.

Developer Tokyu also aims to revitalise the little-known Shibuya River, currently a narrow chute behind buildings that's lined with concrete and devoid of any greenery. The river has been diverted and a large catchment tank has been constructed for heavy rain. The Shibuya River will be diverted to flow above the underground east exit square (Figure 4 and 5). In an unusual move for Tokyo, the space along one part of the river will be opened up into a plaza with trees and a walkway for pedestrians (Figure 3 and 4). The skyscraper and surrounding area are slated to be complete in fiscal 2017, which ends in March 2018.

Ukishima Shaft for Tama River Tunnel

by King Ho and Cory Ngai

During our visit to the Ukishima Shaft of the Tamagawa Tunnel Project, Penta Ocean Construction Co. Ltd., the main contractor for the project, introduced us to two construction methods that captured our interest.

The first method is the Pneumatic Caisson Method. This involves constructing a reinforced concrete caisson on the ground, which contains a pressurised air supply working chamber in the lower section. This setup prevents underground water from entering while workers excavate soil. After the excavation, the entire caisson structure is then sunk into place. The principle behind this method is similar to that of an upside-down cup holding air: the air pressure inside the cup prevents water from intruding.

In Hong Kong, the hand-dug caisson method has been generally banned in public works since July 1993 due to safety concerns and a high accident rate, unless an exemption is granted by Government Authorities (refer to CEDD Technical Circular No. 04/2021). Additionally, the ban on hand-dug caissons was enacted in the Building Ordinance on January 19 1995 (BD, APP-59).

While the Tamagawa Tunnel Project did utilise the hand-dug caisson method, the Hong Kong construction industry could benefit from adopting the modern Pneumatic Caisson Method as it has improved safety by incorporating a shovel machine in the lower working chamber. This machine allows for operations to be controlled remotely, significantly reducing the risks associated with manual labor.

Another construction method that intrigued us is the Trench Cutting Re-mixing Deep Wall Method (TRD). This technique involves cutting through the soil with a chainsaw-like cutter while simultaneously injecting hardening agents, such as concrete. This process allows for the creation of continuous underground solid walls, making it possible to construct a uniform wall across various soil types, from soft clay to hard rock, with minimal disruption to the public and the environment. This method offers significant advantages to traditional construction practices, such as constructing diaphragm walls, sheet piling, and jet grouting, which are commonly used in Hong Kong.

However, there are challenges associated with adopting this method. For instance, as observed on-site, a heavy lifting crane is required to lift and position the chainsaw-like cutter. Additionally, the costs can be substantial due to expenses related to renting cranes, specialised cutting equipment, and hiring skilled operators. Furthermore, new construction methods must undergo thorough testing and approval processes before they can be implemented, which may lead to project delays.

Railway elevation project at 'Tokyo Skytree Station'

by Gary Lung and Ricky Lam

The Railway Elevation Project at Tokyo Skytree Station, led by Obayashi Corporation, is a remarkable engineering achievement that is reshaping Tokyo's transportation landscape. Situated in the shadow of the iconic Tokyo Skytree tower, this project seamlessly integrates innovative design, urban planning, and advanced engineering techniques to enhance transportation efficiency and revitalise the surrounding urban environment.

One of the primary objectives of this project was to address long-standing transportation challenges in the area, including traffic congestion, safety risks at level crossings, and the fragmentation of urban spaces caused by traditional railways. By elevating the Tobu Skytree Line, the project not only improves train operations but also enhances pedestrian mobility, reduces vehicular congestion, and fosters a more connected urban environment.

Aesthetically, the elevated railway structure blends harmoniously with the architectural marvels of the area, including Tokyo Skytree itself. The design prioritises both functionality and urban aesthetics, ensuring that the new infrastructure complements the city's skyline rather than disrupting it. This thoughtful integration highlights the importance of infrastructure projects that contribute to both transportation efficiency and city beautification.

From an engineering perspective, the project demonstrates cutting-edge construction techniques and the use of state-of-the-art materials, ensuring structural integrity and long-term durability. Obayashi Corporation's expertise in precision engineering and large-scale infrastructure development is evident in the seamless execution of this complex project. The elevated railway minimises disruptions to the bustling streets below, allowing Tokyo's vibrant commercial and residential districts to thrive without major interruptions.

Although the project required significant upfront investment, the long-term benefits far outweigh the costs. By reducing congestion, improving urban safety, and fostering a more pedestrian-friendly environment, the Railway Elevation Project at Tokyo Skytree Station demonstrates the value of investing in sustainable infrastructure solutions. It underscores the importance of balancing transportation needs with broader urban development goals, ensuring that infrastructure projects contribute to the livability and sustainability of cities.

In conclusion, the Railway Elevation Project at Tokyo Skytree Station serves as an exemplary model of urban infrastructure innovation. By addressing critical transportation challenges while simultaneously enhancing the quality of life for residents and visitors, this project sets a precedent for future railway and urban development initiatives worldwide. As trains glide gracefully above Tokyo's bustling streets, this transformative project stands as a symbol of progress, engineering excellence, and sustainable urban growth.

Yamanashi Prefectural Maglev Exhibition Center

by Thomas Tam and Larry Yeung

The Yamanashi Prefectural Maglev Exhibition Center, situated in Tsuru City, Yamanashi Prefecture, Japan, is a distinctive facility dedicated to the exhibition of the advancements and future potential of maglev (magnetic levitation) technology. This centre is closely associated with the Linear Chuo Shinkansen project, which aims to revolutionise high-speed rail travel in Japan.

The Maglev Exhibition Center provides visitors with a comprehensive insight into the technology behind the world's fastest train, the maglev. The center is divided into several sections, each meticulously designed to educate and engage visitors of all ages. Key areas include the "Dokidoki Linear Hall", where visitors can learn about the principles of superconductive linear mechanisms, and the "Waku Waku Yamanashi Hall", which provides interactive exhibits and educational materials about the Linear Chuo Shinkansen project.

A notable attraction is the opportunity to witness test runs of the maglev train on the Yamanashi Maglev Test Track, which allows visitors to experience the remarkable speed and smoothness of maglev technology firsthand. Additionally, the center features detailed models and displays explaining the science behind magnetic levitation and the engineering challenges involved in developing such advanced transportation systems. The center also offers various educational programs and workshops aimed at students and researchers. These educational programs encompass a wide range of topics, including the history of maglev technology, the environmental benefits of high-speed rail, and the future implications of widespread maglev adoption. The interactive nature of these exhibits is designed to ensure that visitors acquire a comprehensive understanding of the technology and its potential impact on society.

The Linear Chuo Shinkansen project represents a significant undertaking by the Central Japan Railway Company (JR Tokai), with the aim of constructing a high-speed rail line that will connect Tokyo and Osaka. The maglev trains that will operate on this line are expected to travel at speeds of up to 500 km/h, thereby significantly reducing the travel time between these major cities. This project is widely regarded as a major advancement in transportation technology, with the potential to transform the way people travel in Japan.

The Yamanashi Prefectural Maglev Exhibition Center is a pivotal institution in fostering public cognisance and comprehension of this pioneering endeavour. The centre provides a platform for education and engagement, thereby fostering support for the continued development and implementation of maglev technology.

In conclusion, the Yamanashi Prefectural Maglev Exhibition Center is an essential resource for anyone interested in the future of transportation. Its comprehensive exhibits, educational programs, and live demonstrations offer a unique and informative experience, highlighting the potential of maglev technology. As the Linear Chuo Shinkansen project progresses, the center will continue to serve as a vital hub for learning and innovation in the field of high-speed rail.

Metropolitan Area Outer Underground Discharge Channel

by Benson Wong and Ralph Lau

The Metropolitan Area Outer Underground Discharge Channel (MAOUDC), a stormwater management scheme situated in Kasukabe, Saitama at the outlying areas of the Tokyo Metropolis, was constructed to mitigate the flooding issue in the nearby waterways. On average, since its full commissioning in 2006, the MAOUDC has been operated 7 times per year on average, mitigating losses of more than 140 billion yen arising from adverse weather conditions.

Our visit to the stormwater storage tank and the Showa Stormwater Pumping Station under the project has provided us with valuable insights into Japan's strategy on urban resilience; inspiration for tackling similar issues in Hong Kong from climate change; and a model for "infrastructure tourism" and the promulgation of engineering expertise.

In Japan's post-war period, the country's metropolitan areas experienced increased flooding risks due to rapid development and increased emissions. The MAOUDC was therefore proposed and constructed to mitigate subsequent hazards.

Similar to Tokyo, Hong Kong has one of the world's densest urban environments, while also susceptible to heavy rainfall and strong tropical cyclones. The solution presented by the design and construction of MAOUDC has well demonstrated engineering measures to mitigate issues arising from the ongoing climate crisis and has given ideas to where our infrastructure may also improve accordingly.

The embodiment of public open spaces was observed with football pitches and skateboarding ground above the stormwater storage tank, both managed by the local Kasukabe City Government. It provides an example of ensuring good use of land resources from the scarce land availability of the Tokyo Metropolis and its surroundings.

Public awareness and engagement initiatives are crucial in promoting resilient infrastructure and sustainable development. The visitors centre (Ryu-Q Kan) and a variety of educational tours offered at MAOUDC, have well demonstrated the needs for resilient infrastructure, while engaging the local community and fostering an understanding of civil infrastructure internationally, in line with the "infrastructure tourism" initiative by the Government of Japan.

The professionalism demonstrated across the design, construction and operation of MAOUDC has been observed and widely appreciated. Looking forward, it is clear that Hong Kong has much capacity to put forward capital works to enhance its climate resilience, protect livelihoods, while going the extra mile to engage the society on the appreciation of infrastructure works.

Student prize awardees sharing

by Irene Li

Kicking off 2025 with a vibrant and empowering delegation to Japan, alongside fellow ICE members, was an exhilarating experience! Our six-day adventure showcased Japan's exemplary construction and urban infrastructure, emphasising sustainability, technological innovation, and a deep appreciation for culture. We were thrilled to witness and engage with cutting-edge advancements that truly redefine the landscape of engineering.

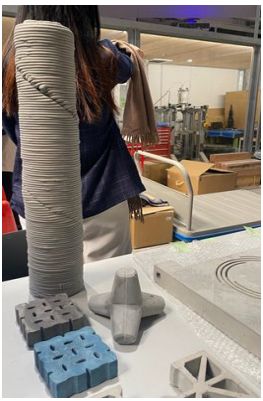
During our trip, we explored remarkable projects like the Ukishima Shaft for the Tama River Tunnel by Penta-Ocean Construction Company Limited and the Shibuya Station Redevelopment by Tokyu Construction Company Limited. These projects exemplified forward-thinking engineering solutions that effectively address urban sustainability challenges. We were captivated not only by the detailed design and management showcased at these sites but also by the profound and enduring lessons on construction principles they imparted.

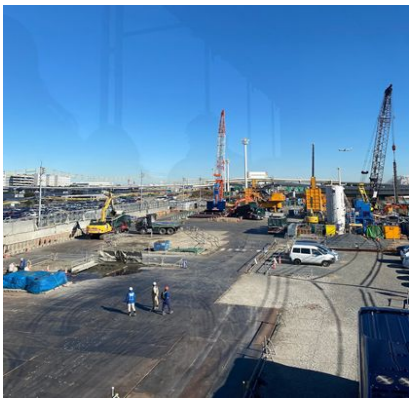
Similarly, the Railway Elevation Project at Tokyo Skytree Station and the Kuden Kasama Tunnel developed by Kajima Corporation illustrated how engineering solutions harmonise with advanced technology to enhance public transportation and urban connectivity. Our reflections illuminated the interconnectedness of theoretical knowledge with practical problem-solving in the real world.

Another highlight of our journey was the visit to the prestigious University of Tokyo (Todai), which was both captivating and enriching. Known for its academic excellence and pioneering research in civil engineering, Todai welcomed us with an insightful orientation, detailing its historical contributions to global knowledge. We had the incredible opportunity to engage with researchers and PhD students who shared their groundbreaking studies, including i-Construction systems and integrating construction materials. The tour of the state-of-the-art laboratories showcased pioneering research in civil advancement, sparking stimulating discussions between Todai students and our group.

The Japan delegation 2025 opened our eyes to innovative construction practices and technological advancements, all while underscoring the importance of sustainability and safety. In today's tech-driven world, the synergy of advanced technologies with sustainable practices reflects the forward-thinking mindset essential for modern urban planning. As we face similar challenges globally, the experiences and insights from this delegation serve as an inspiring model. They remind us that embracing innovative practices in urban infrastructure can lead to transformative changes and sustainable solutions.

Reflecting on our journey, we left Japan not only with a wealth of knowledge but also with a renewed sense of responsibility. The dedication of Japanese engineers and researchers to pushing the boundaries of what is possible in construction and urban planning has motivated us to advocate for similar innovations back home. As we continue our professional paths, the lessons learned and relationships built during this remarkable delegation will undoubtedly resonate with us, urging us to contribute meaningfully to the global conversation on sustainable urban development.





Student prize awardees sharing

by Ricky Lam

As a final-year Civil and Environmental Engineering student at HKMU, being selected as a Student Prize winner for the ICE HKA G&S Japan delegation 2025 has been an invaluable experience. With my passion for civil infrastructure, highways, and bridges, as well as my deep interest in new town development—inspired by my lifelong residence in Tung Chung New Town—this delegation allowed me to explore Japan's innovative urban infrastructure and smart city solutions.

The delegation provided a unique opportunity to visit cutting-edge engineering projects, exchange knowledge with industry professionals, and gain insights into Japan's sustainable urban planning and transportation infrastructure. Below are my key takeaways from the experience.

Visiting the Kuden Kasama Tunnel (Kajima Corporation) was particularly exciting as I had previously studied tunnel boring machine (TBM) methods during the ICE HKA G&S South Korea delegation 2023. Seeing the TBM in action reinforced the significance of automation and precision in large-scale tunnel construction, which is highly relevant to Hong Kong's ongoing underground infrastructure projects.

Similarly, the Metropolitan Area Outer Underground Discharge Channel showcased Japan's advanced flood management systems. Walking through the massive underground structure made me appreciate Japan's proactive approach to disaster resilience, which Hong Kong can learn from given its increasing climate challenges.

Having interned at MTR Corporation Limited in the High-Speed Rail department, I was particularly excited about visiting the Railway Elevation Project at "TOKYO SKYTREE STATION" (Obayashi Corporation). Observing Japan's railway elevation techniques deepened my understanding of track modifications, structural reinforcement, and urban integration, which are highly relevant to Hong Kong's Tung Chung Line Extension project.

Another highlight was the Shibuya Station Redevelopment Project (Tokyo Construction Company Limited), where I saw firsthand how engineering and urban design converge to create a seamless transportation hub. The site visit, guided by project managers, provided valuable insights into underground station construction, pedestrian flow management, and smart city integration.

Visiting the Yamanashi Prefectural Maglev Exhibition Center was a particularly rewarding experience, given my internship experience with MTR's Infrastructure Maintenance Department – High-Speed Rail. Learning about Japan's magnetic levitation (maglev) technology and its potential to revolutionise high-speed rail travel gave me a broader perspective on future railway innovations.

Our visit to The University of Tokyo provided a unique academic perspective. I was particularly inspired by a presentation from PhD student Mr. Koichi Imagawa, whose research on cement-based metamaterials with spiral perforations for vibration attenuation closely aligned with my final-year project on 3D-printed aluminum structures. This interaction reinforced the importance of engineering research in advancing real-world applications.

The ICE HKA G&S Japan delegation 2025 has been an eye-opening journey, enhancing my understanding of smart city solutions and infrastructure innovations. I am deeply grateful for this opportunity and look forward to contributing to Hong Kong's engineering industry by applying the insights gained from this remarkable experience.

Conclusion

by Ashley Cheng and Louis Pang

The ICE delegate group consists of 20 members has visited Tokyo, Japan from 07 - 12 January 2025 and been immersing in actions of infrastructure redevelopment driven by Japanese engineering sectors.

The tour kick-started with the visit to Kuden Kasama Tunnel near Yokohama which adopts the tunnel boring machine approach like some of the Hong Kong projects, yet with different design details due to difference in material preference and design practices between two places. Engineer members cherished the chance to exchange their tunnelling experiences with practitioners of Kajima Corporation after the walk.

The delegate then visited The University of Tokyo, with PhD students showcasing their research works, idea-incubating studio and laboratories. Various geomaterial tests are ongoing to optimise resilient design against natural hazards like earthquakes or floods. It is also motivating to see collaborative research amongst scholars and construction companies to put better engineering design in practice.

Next stops of the tour are the Shibuya Station Redevelopment Project, Ukishima Shaft for Tama River Tunnel, and the railway elevation project at Tokyo Skytree Station, which are situated at the heartbeat of Tokyo centre. Presenters from Tokyu Construction, Penta-Ocean Construction and Obayashi Corporation explained how they tackled the site constraints during construction with innovative methods and planning. It is rewarding to learn how construction shall be phased to minimise nuisance to the vicinity.

The trip ended with visits to the Yamanashi Prefectural Maglev Exhibition Center and Metropolitan Area Outer Underground Discharge Channel. Apart from learning the principles and development of maglev and stormwater management, members were also fascinated with Japanese's effort to cultivate citizens' interest and appreciation to their engineering achievements, through interactive exhibits and guided tours.

Being a busy and highly developed city with similar characteristics to Hong Kong, the unparalleled exposure to methods and culture of revitalisation in Tokyo will definitely transforms our insights to drive Hong Kong's sustainable growth.

Participant list

Mr Chan Ka Tsam (Kelvin)

Mr Chan Wing Pang (Louis)

Ms Cheng Chun Wing

Ms Choi Chung Kiu

Mr Ho King Hin (King)

Mr Lam Ka Chun (Ricky)

Ms Lau Ching Yee (Jessica)

Mr Lau Ka Hong

Ms Lee Ho Yan Janice

Ms Lee Wing Yee (Bianca)

Mr Lee Yee Nok (Enoch) *

Ms Li Yan Wa (Irene)

Mr Li Yan Wo (Jack)

Ms Liu Kei Yiu (Clarice)

Mr Lung Kit Chun (Gary)

Ms Lung Wing Sze (Rain)

Mr Cory Ngai

Mr Tam Chun Him (Thomas)

Mr Benson Wong

Mr Yeung Tsz Yuen (Larry)

* Team leader for this delegation

Organising committee

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Deputy Delegation Manager:	Bianca Lee
Advisors:	Sampson Tam
	Monique Hui
	Tommy Shum

Members (surname in alphabetical order):

Chris Chan	Marco Lai	Bryan Mak	Clement Wong
Kelvin Chan	Sky Lam	Derek Ng	Hazel Wong
Teresa Chau	Desmond Lau	Charles Ngan	Marco Wong
Matthew Cheung	Jessica Lau	Cow Ngau	Steven Wong
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Derek Fung	Sam Li	Christy Tong	
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Notes

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Ir Alex So

Ir Alex So is a passionate Associate at Binnies Hong Kong Limited with 15 years of experience. He is a Chartered Civil Engineer, CIC-certified BIM Manager, and a NEC4 ECC Project Manager specialising in solar farms, waterworks and sewerage design. Previously, he was a Site Agent at Ming Hing contributing to WSD Contract No. 6/WSD/13 on Replacement and Rehabilitation of Water Mains.

An active member of the engineering profession, Alex humbly served the Institution of Civil Engineers Hong Kong Association from 2017 to 2019 and its Graduates and Students Division from 2014 to 2015. He also enjoys giving back to the community as a Rotarian.

Academically, Alex graduated from the Hong Kong University of Science and Technology with a Master's Degree in Civil Infrastructural Engineering and Management, as well as MTR Academy with an Advanced Diploma in Railway Engineering. Prior to that, he pursued degree studies in the United Kingdom at Birmingham, LSE and Imperial.


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