

# *Smart Mobility in the Smart City*



APAS  
汽車科技研發中心

hkpc  
生產力局



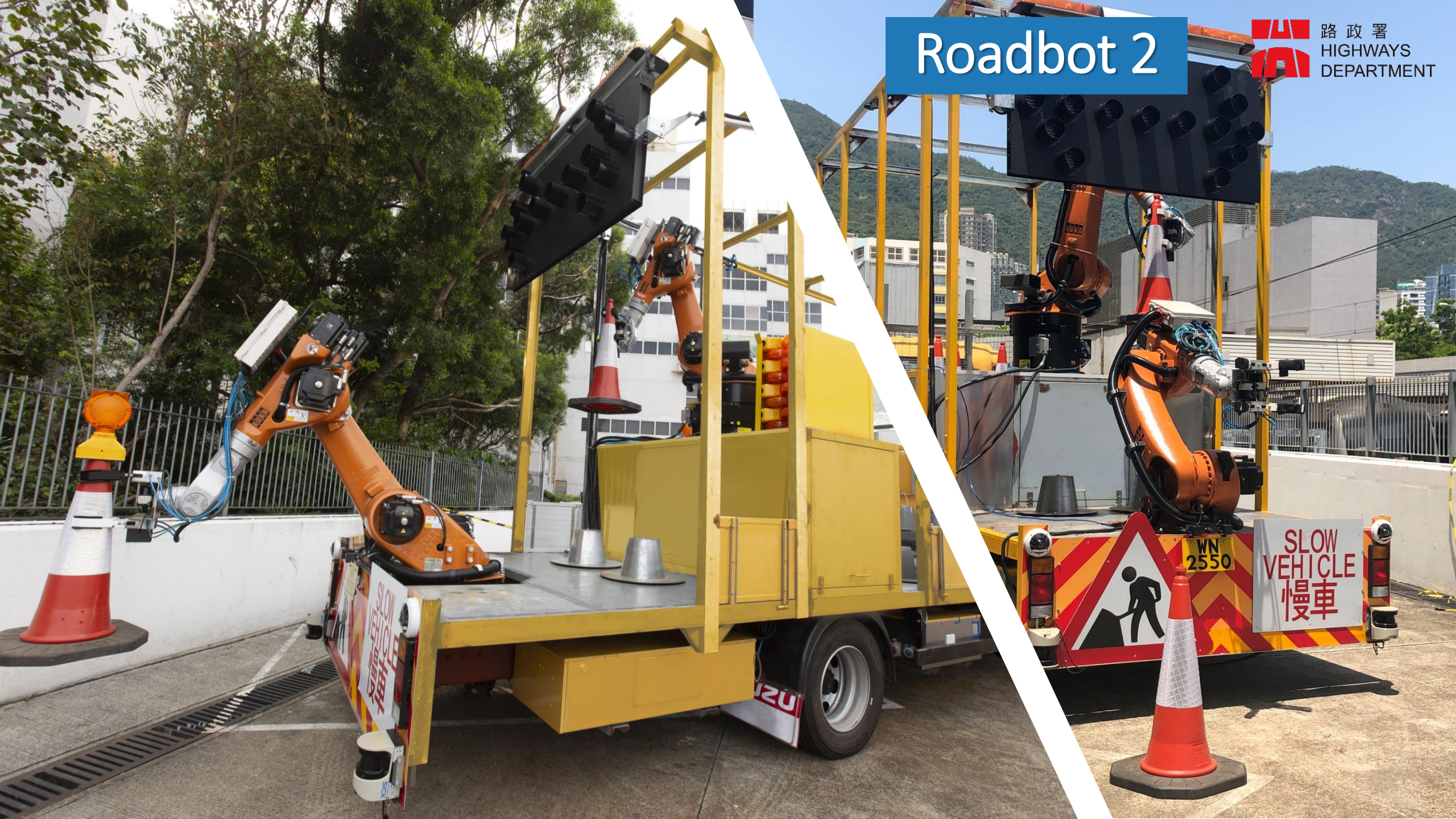
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# **2022 Smart City Tech. Roadmap**



# Roadbot 2





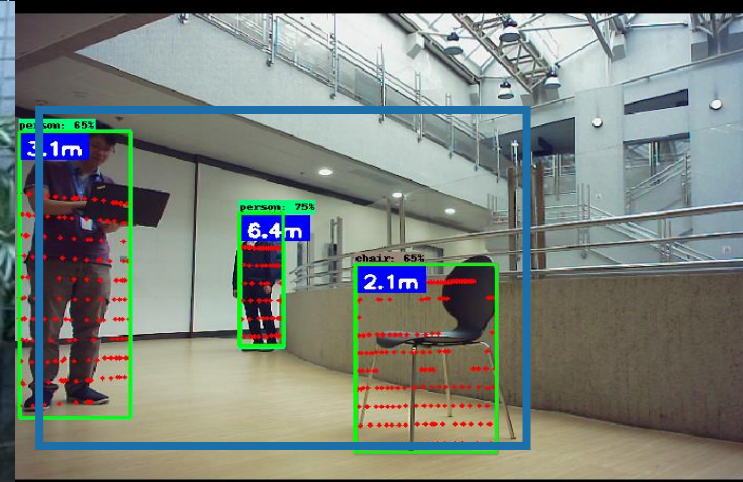




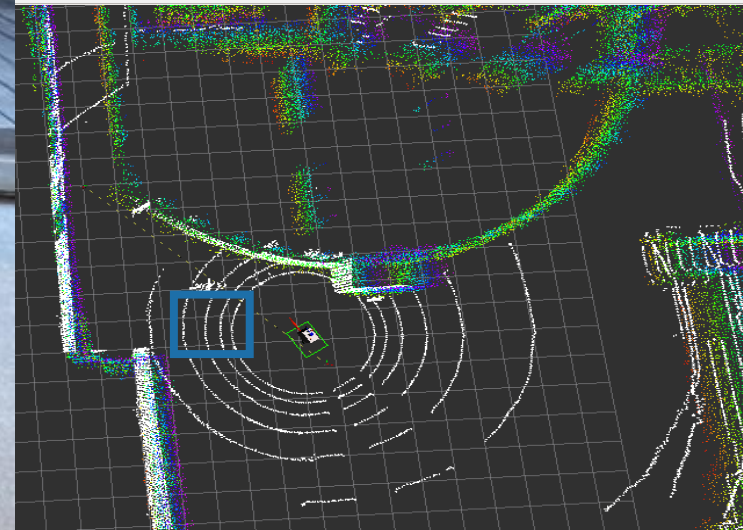




# Mobility Robots – The MiniMover Family



Object recognition with distance estimation



LiDAR - Simultaneous Localisation And Mapping (SLAM)

# The Problems



## Severe shortage in human labour

According to the government's findings in 2019, Hong Kong could be short of somewhere between 170k and 255k workers by 2027 due to a declining number of younger people entering working age.



## Ineffective & Error-prone

Human beings cannot work 24/7 and subject to human errors



## Prevalence of disease due to human-to-human contact

Potential outbreak of infectious diseases



# The Solution

ITSP project

Autonomous Delivery Mover, MiniMover I



## Unmanned delivery

Perform last-mile delivery tasks with collision avoidance in a more frequent and less labour intensive way

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## Site-specific handling

Move to destination autonomously  
(including taking lift ride & passing through doors!)

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## A.I. algorithms for inspection/ patrolling

Co-work with staff to enhance operational efficiency  
at customised sites

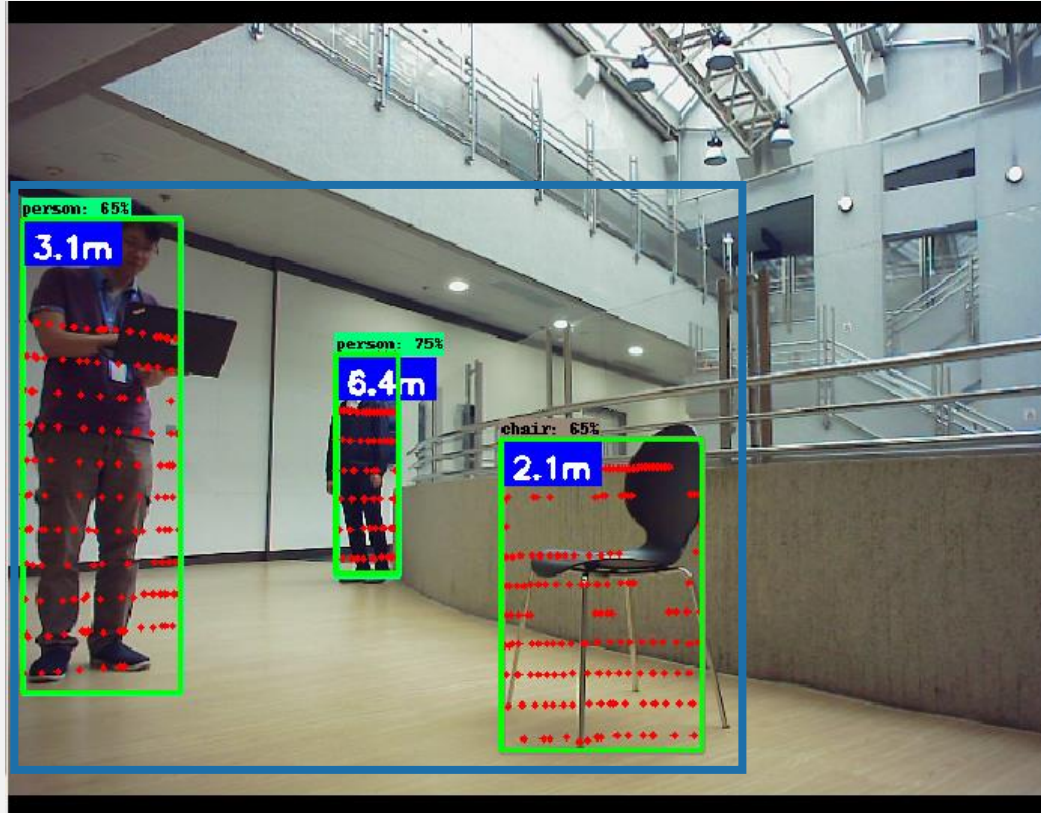


# The Solution

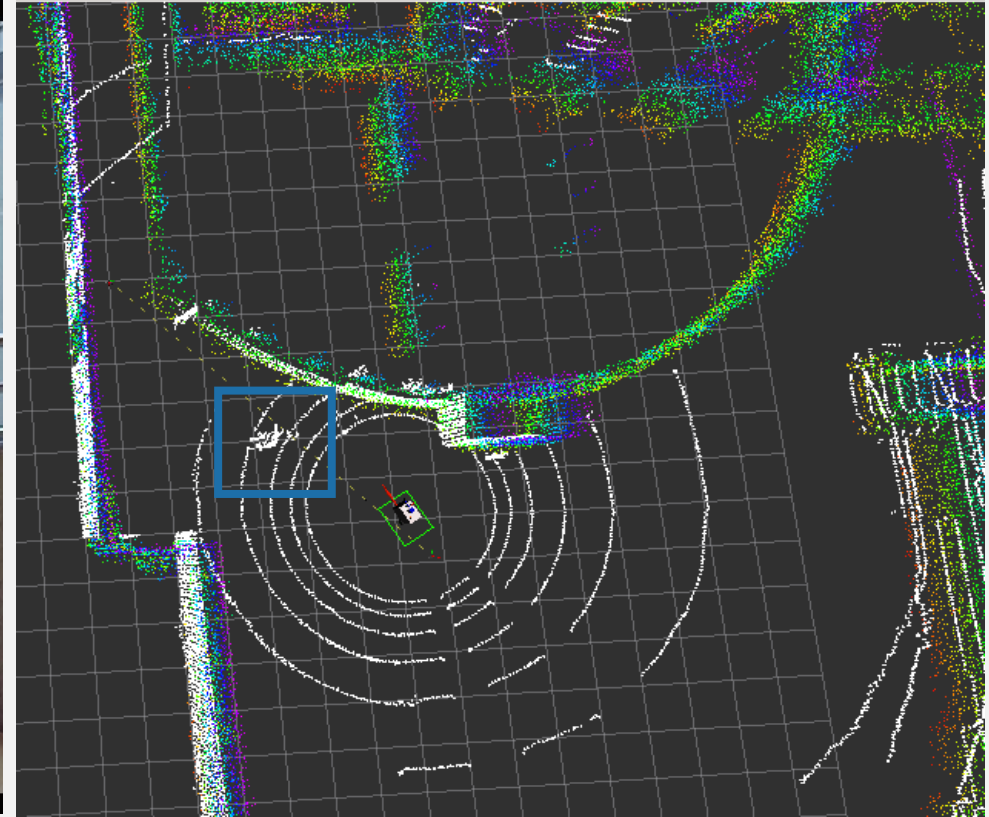




# Technologies



Sensor fusion demonstration – Object recognition with distance



LiDAR - Simultaneous Localization And Mapping (SLAM)

- > Equipped with a sensor suite that includes cameras, an integrated DPGS/IMU system, LiDAR and Ultrasonic sensors
- > Utilising deep learning and sensor fusion technologies, this low-speed autonomous mobile platform can conduct path planning with collision avoidance of stationary or moving obstacles





# The Solution

ITSP project

Autonomous Patrol Robot, MiniMover II



## Unmanned patrol for multiple devices

Perform patrolling and surveillance tasks with collision avoidance



## 5G-enabled teleoperation

Drive from a remote location with real-time video streaming enabled by 5G connectivity



## Improve workplace safety

Enhance workplace safety and resource utilisation



# The Solution





# Awards and Patents



- **Hong Kong Short-term Patent:**  
Publication no.: 30029868A (Feb 19, 2021)
- **Hong Kong Registered Design:**  
Registration no.: 2016944.3 (Oct 10, 2020)



- **2<sup>nd</sup> Asia Exhibition of Inventions Hong Kong (2019)**  
Silver award



- **Geneva International Exhibition of Inventions (2021)**  
Silver award



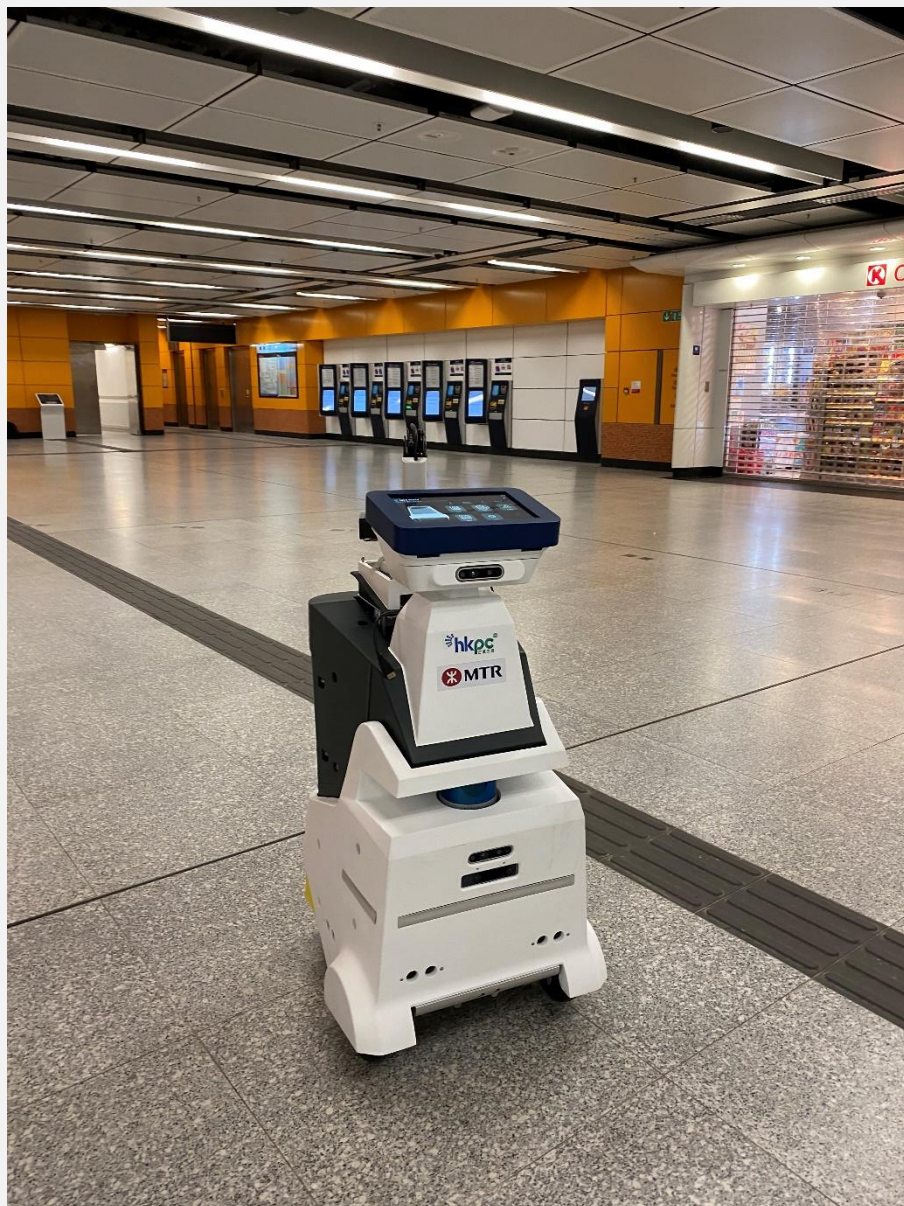
# Strategic Collaborations





# The Solution

Autonomous Inspection Robot, Checker-T



## Co-worker

Assist station operators on regular inspections to enhance railway service and operational efficiency



## Autonomous inspection

Patrol during non-traffic hours (NTH) to check facility conditions, including lighting and signage

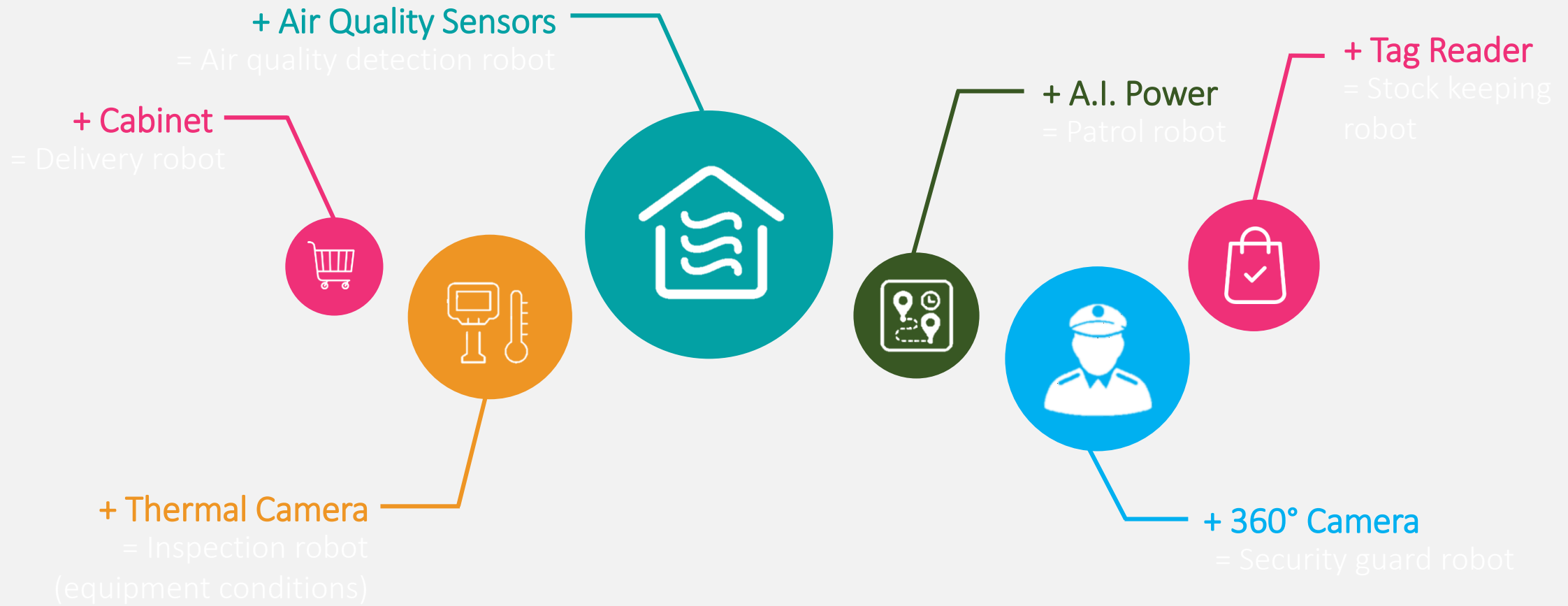


## A.I. algorithms for inspection/ patrolling

Co-work with staff to enhance operational efficiency at customised sites



# Hatching Point for Future Expansion Ideas

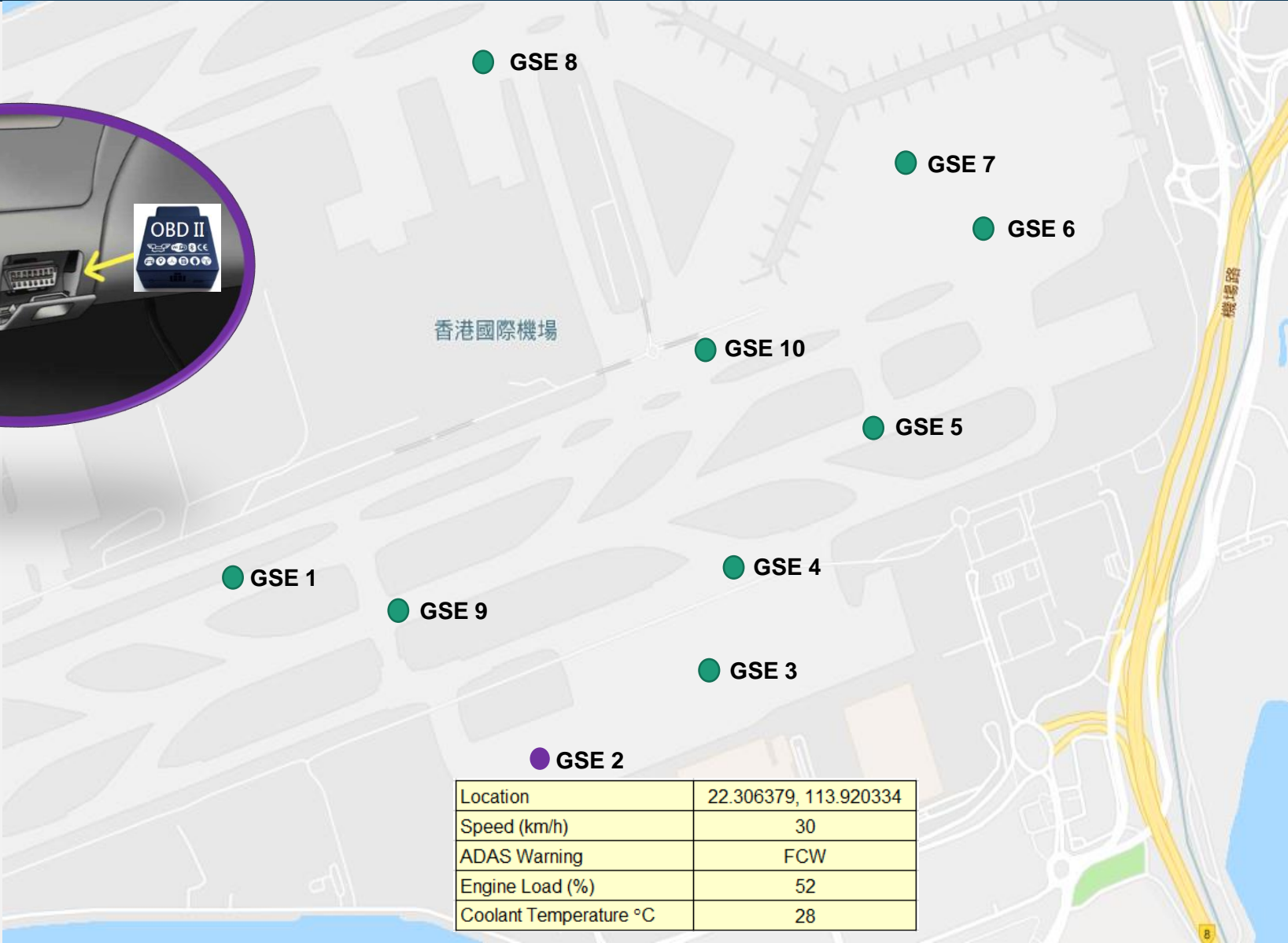


Trainee

KEEP LEARNING

Co-worker

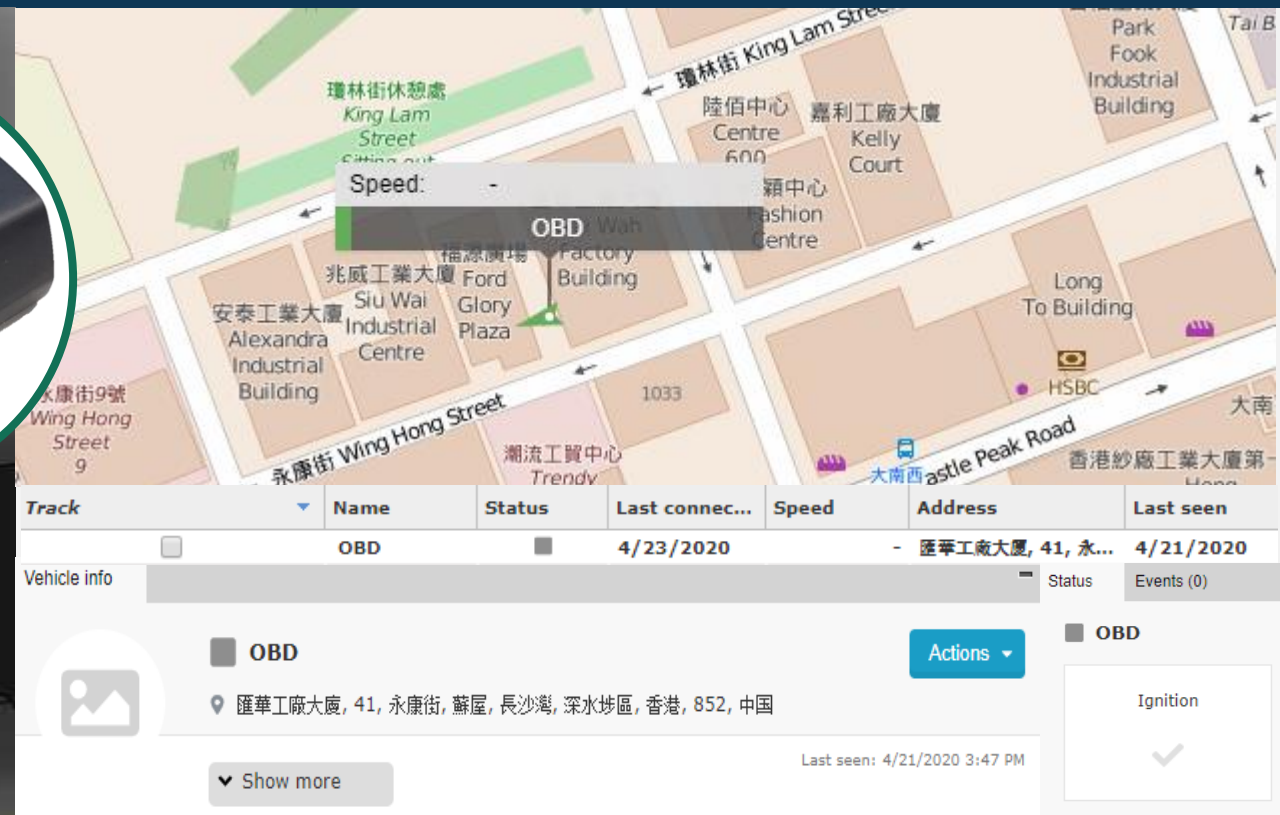
# V2X for Airport GSE Fleet



Location	22.306379, 113.920334
Speed (km/h)	30
ADAS Warning	FCW
Engine Load (%)	52
Coolant Temperature °C	28



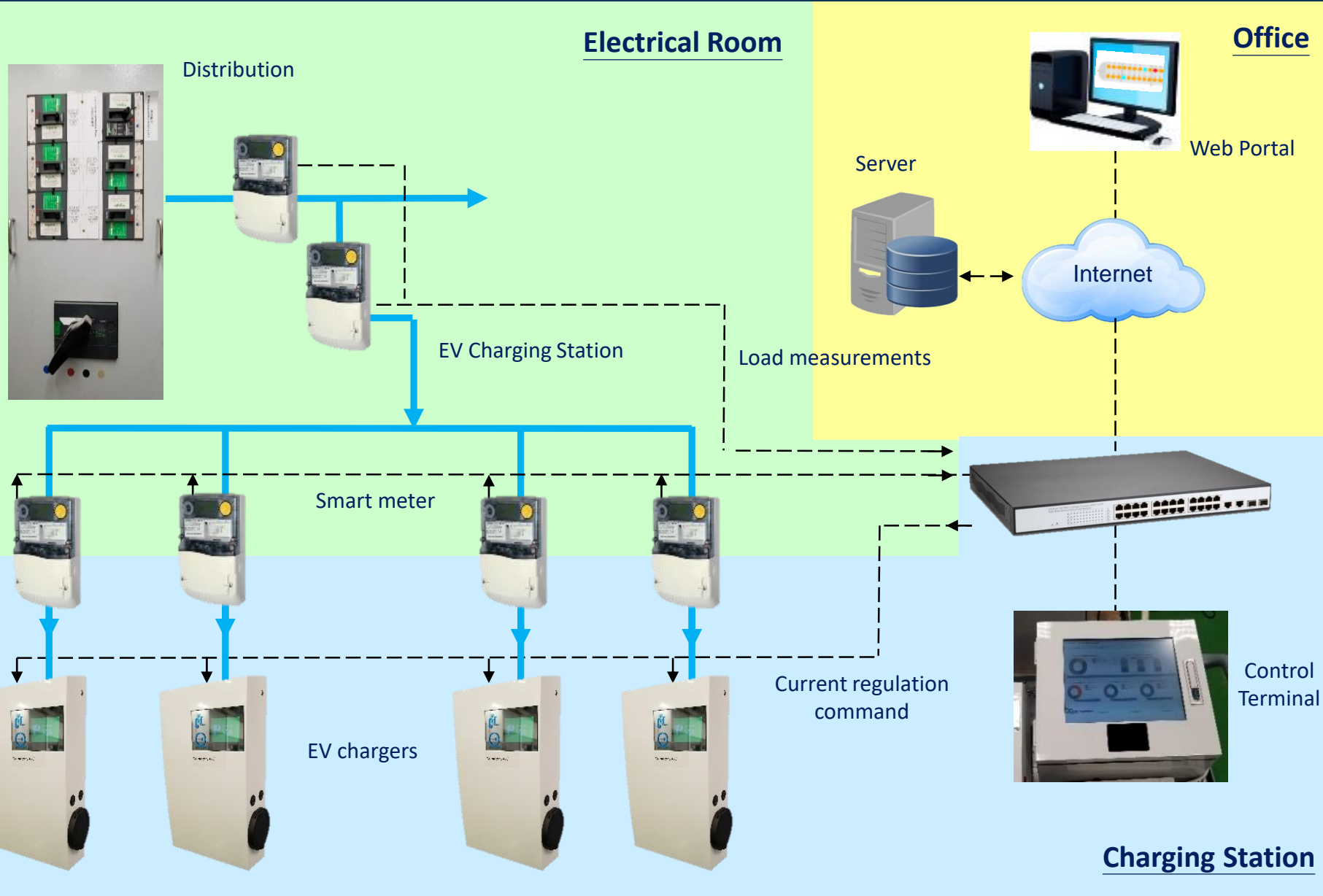
# On-board Diagnostic System With Telemetry For Civil Service Vehicles



**The latest achievements.....**



# Smart EV Charging Station



CLP 中電

HONG KONG  
HOUSING SOCIETY  
香港房屋協會



這智能充電器首次引入「喜薈」





Ceiling-mounted fast charger



50kW Quick Charger



Multi-standard Mobile EV Charger



Portable Charger Kit





2  
0  
1  
5

Single-deck Pure Electric Bus





Single-deck Pure Electric Bus



# 16-tonne Pure Electric Truck





***Thank You !***

