The digital signages at Metroplaza's restroom entrances leverage the 5G network and sensors to show the restroom's real-time occupancy, reducing queuing time
新都会广场洗手间外设有电子显示屏,运用5G网络及传感器,提供洗手间的实时使用情况,有助缩短轮候时间

The Tai Lam Tunnel utilises the 5G SmarTransport Safety Monitoring System, which enhances traffic safety and operational efficiency
大榄隧道采用5G智能交通安全管理系统,提升交通安全及营运效率

The public can experience the latest 5G applications in the SmarTone 5G LAB
SmarTone "5G LAB" 设有多个展区,公众可亲身体验最新5G科技应用

Leveraging 5G technology in the Group's businesses, taking Hong Kong a step closer to becoming a 5G smart city

'Continuous Improvement' is one of the Group's key corporate values, and to put it into practice, the Group has introduced innovative technologies and ideas to keep up with the market trends, and to enhance work efficiency and service quality. Since Group subsidiary SmarTone's 5G service launch in mid-2020, some of the Group's business units have integrated SmarTone 5G and other advanced technologies such as artificial intelligence (AI) analytics and Internet of Things (IoT) in various enterprise solutions, including 5G Smart Malls, 5G Smart Construction System SmartWorks and 5G SmarTransport Safety Monitoring System for the Tai Lam Tunnel, to enhance customer experience and operational efficiency for the management companies. The SmarTone 5G network provides nearly full coverage of Hong Kong, covering all MTR stations, key commercial buildings and shopping malls, and popular country parks, campsites and hiking trails, providing an ultra-high speed 5G network experience for users. Meanwhile, SmarTone has leveraged the high-speed, low latency, mass connectivity characteristics of 5G to implement a series of innovative 5G services and applications for different industries, driving Hong Kong towards becoming a smart city and further integrating it into the Greater Bay Area.

5G Smart Malls

The Group has introduced 5G technology in its malls, delivering a brand new shopping experience to customers. Early this year, Metroplaza rolled out 5G Smart Restrooms to shorten queuing time. This relaxing, fluid shopping and leisure experience helps stimulate foot traffic in the mall. In addition, other SHKP Malls, such as MOKO, will also introduce 5G smart applications to enhance operational efficiency.

5G Smart Restrooms are equipped with a high-speed 5G network and multiple sensors installed inside the restrooms, whose data is sent to cloud servers in real time. The digital signages at restroom entrances indicate the real-time occupancy of restrooms, which effectively diverts customers to less busy restrooms for a shorter queuing time.

5G Smart Restrooms also expediate operations for the management offices. The restrooms include indoor air quality sensors that measure five major air quality parameters: temperature, humidity, PM2.5 (fine suspended particulates), H2S (hydrogen sulphide) and NH3 (ammonia). Through the 5G network, the collected data is sent to the 5G cloud management platform for analysis, monitoring the overall cleanliness and air quality of the restrooms. In addition, the mall operations team can monitor the restroom supplies through the 5G cloud management platform, which sends out alerts when the stock of paper towels, toilet paper, antiseptic soap, etc. drops to a certain level. The mall operations team can then refill the supplies immediately, which is particularly useful for accessible restrooms and nursery rooms where attendants are absent. Through the 5G cloud management platform, operations staff can access information like restroom traffic and air quality to effectively enhance restroom cleanliness, operational efficiency and service quality, and formulate operation solutions that best fit customers' needs.

5G Smart Construction

For construction, Group subsidiaries Yee Fai Construction and SmarTone jointly developed SmartWorks to enhance occupational safety and worker health, leveraging the 5G network to further optimize operational workflow. The Group's How Ming Street development in Kwun Tong was the first construction site to apply SmartWorks.

SmartWorks is an end-to-end solution, supported by the ultra-high speed, low latency 5G network for better construction safety and operational efficiency. It uses cloud and IoT technology to create a smart site management that helps safeguard workers and facilitate effective operations by employing image analysis, AI and machine learning.

Smart applications in SmartWorks included Smart Helmet, SmartHealth Station, Environment Station, Dump Truck Management, Danger Alert & Access Control, and Safety Alert System for Temporary Lift Shaft Gate. SmartWorks utilises various IoT sensors to automatically monitor temperature, humidity, water leakage, air quality, motion detection, etc. In abnormal situation, alerts are issued for operations staff to follow up immediately, thus enhancing site safety, worker health and operational efficiency. The system was awarded First Prize in the Construction Safety category in the CIC Construction Innovation Award 2019.

5G Smart Transport

In November 2020, the Tai Lam Tunnel, which is operated by Group subsidiary Route 3 (CPS) Company Limited, implemented the first 5G SmarTransport Safety Monitoring System for vehicular tunnels and highways in Hong Kong. The system ensures that passengers, hikers, cyclists or animals are prevented from entering the tunnel area and related facilities.

Taking advantage of the fast uplink of the 5G network, combined with AI analytics, the system provides instant detection and identification of jaywalkers, such as hikers and cyclists, trespassing the tunnel area, triggering real-time alerts in the control room for an appropriate response. This removes reliance on physical monitoring and provides added safety to road-users while significantly enhancing traffic safety and tunnel operational efficiency.

SmarTone 5G LAB

SmarTone 5G LAB on the ICC's Sky100 Hong Kong Observation Deck features Hong Kong's latest 5G applications and emerging applications on a global scale. The 5G LAB aspires to inform the public of the latest trends on 5G's development in Hong Kong and shows how 5G infrastructure supports Hong Kong's development as a smart city and digital hub.

The interactive showcases in the 5G LAB present innovative 5G applications to the public, including SmarTransport Safety Monitoring System, Smart Construction, Smart Mall, Smart Health, Smart Home and more. In addition, visitors can experience the daily life applications, such as real-time 5G tele-operated driving, 5G VR cycling, VR experience, 5G robots, etc. to appreciate and learn about the wide adoption of 5G innovation.

Even for restrooms without attendants, the mall operations team can remotely monitor the use of restroom supplies through the 5G cloud management platform and refill them as needed
洗手间即使没有驻厕员工,商场管理团队仍可通过5G云端管理平台,遥控监测洗手间用品的使用情况,适时安排补充

4

5

集团业务运用5G技术　　齐建香港5G智慧城市

"与时并进"是集团的主要企业理念之一，旨在按市场需要引入创新科技新理念，以提升工作效率及服务品质。集团旗下SmarTone自2020年中推出5G服务后，集团旗下部分业务已率先引入SmarTone 5G，配合其他先进技术，如人工智能分析及物联网技术等，推出不少企业应用方案，包括5G智慧商场、5G智慧建筑"智安建"及大榄隧道的5G智能交通安全管理系统，为顾客提供更佳体验，亦为管理公司提升营运效率。现在SmarTone 5G网络接近覆盖全港，包括全线港铁线、主要商业大厦和商场以及热门郊野公园、露营营地及登山道等，为用户带来极速5G网络体验。与此同时，SmarTone还运用5G的超高速、低延时及泛连接特性，为不同行业推出一系列创新5G服务及应用，协助推动香港成为智慧城市，与大湾区进一步融合。

5G智慧商场

集团将5G技术引入旗下商场，为顾客提供崭新的购物体验。今年初新都会广场引进5G智慧洗手间，缩短轮候时间，缔造安心、灵活的休闲购物体验，同时可带动商场人流。此外，其他新地商场（如新世纪广场）也将陆续引入5G智能应用，提升营运效率。

5G智慧洗手间通过高速5G网络及连接多个装置于商场楼层洗手间内的传感器，将数据实时传送至云端分析，配合位于洗手间走廊入口的电子显示屏，为顾客提供实时使用情况，有效分流顾客到使用率较低的洗手间，缩短轮候时间。

5G智慧洗手间还可为管理公司提升营运效率。洗手间内装置室内空气质量传感器，以收集温度、湿度、PM2.5（微细悬浮粒子）、H2S（硫化氢）及NH3（氨）五大空气质量指标。相关资料通过5G网络，实时上传至云端管理平台作数据收集及分析之用，方便监测洗手间的整体卫生情况及空气质量。另外，商场管理团队可通过5G云端管理平台监测洗手间用品，当洗手间内的擦手纸、厕纸及消毒皂液等用品的消耗量达到一定水平时，系统将作出提示。商场管理团队即可适时安排补充，对没有驻厕员工的伤健洗手间及育婴室尤为方便。商场管理团队更可通过5G云端管理平台，掌握洗手间人流及空气质量等资料，有效提升洗手间整洁度、营运效率及服务品质，制订更贴合顾客需要的营运方案。

5G智慧建筑

在建筑工程方面，集团旗下怡辉建筑与SmarTone合作研发"智安建"系统。系统采用5G网络，优化建筑流程，加强保障建筑工地工人的健康及安全。集团的观塘巧明街发展项目为首个引入"智安建"系统的建筑工地。

"智安建"系统为端对端方案，运用5G网络的超高速及低延时特点，来提升建筑安全及营运效率。系统以云端和物联网技术为基础，配合影像分析、人工智能及机器学习，推行工地全面化智能管理，提升工人安全及营运效率。"智安建"系统的智能应用包括智能头盔、健康监测站、环境监测站、泥头车管理、安全预警系统及进出管制以及临时升降机闸门安全警报系统。

"智安建"系统提供多个物联网传感器，可自动监测特定范畴，包括温度和湿度、漏水、空气质量及动态侦测等。如发生不寻常的情况时，系统会发出警报通知操作人员实时跟进，提升职业安全健康水平及营运效率。该系统亦在"2019建造业议会创新奖"中，荣获建造安全组第一名。

SmartWorks offers the Safety Alert System for Temporary Lift Shaft Gate to mitigate the risk of workers falling from lift shafts. The alert system deploys mobile-IoT technology, together with sensors, a network platform and a mobile app
"智安建"提供临时升降机闸门安全警报系统，运用移动物联网技术连接传感器、网络平台及手机应用程序，降低工人从升降机槽坠落的风险

5G智能交通

集团旗下三号干线（郊野公园段）有限公司营运的大榄隧道，于去年11月开始采用全港首个用于行人隧道和公路的5G智能交通安全管理系统，以防止行人、登山人士、单车使用者或动物误闯隧道范围及相关设施。

系统运用5G网络的高速上行连接，配合人工智能分析，实时侦测识别误入隧道范围的非道路使用者，如登山人士或单车使用者，实时发出警报到控制室以便采取相应行动，减少依靠人工监测隧道情况，保障道路使用者的安全，同时大大提升交通安全及隧道的营运效率。

SmarTone 5G LAB

SmarTone现通过于环球贸易广场的天际100香港观景台内的"5G LAB"，展示香港最新的5G科技应用及世界新兴的科技应用，让公众了解香港5G的最新发展趋势，以及5G基建如何支持香港发展成智慧城市和创新科技中心。

"5G LAB"通过不同的互动展示，向公众介绍5G创新应用，包括智能交通安全管理系统、智能建筑、智能商场、智慧医疗及智慧家居等。另外，也设有不少日常生活应用，如实时遥控5G驾驶、5G虚拟现实单车、虚拟现实体验及5G机械人等，让大众亲身感受及认识5G网络带来的创新普及应用。

The 5G LAB offers a real-time 5G tele-driving, allowing visitors at the Sky100 Hong Kong Observation Deck to remotely control real cars in Cyberport to compete with opponents
"5G LAB"设有实时远程5G驾驶，参与者可在天际100香港观景台远程控制远在数码港的实体车辆，与其他车手实时竞技

The VR scaffolding freefall in the 5G LAB uses VR technology to create a thrilling experience comparable to that of standing on top of a teetering scaffolding
"5G LAB"的棚架体验利用虚拟现实技术，让参与者感受站在摇摇欲坠的棚架上的离心力

SmartWorks' Smart Helmet is equipped with sensors to track the worker's real-time location and health. The Smart Helmet can trigger an emergency alert to safeguard workers
"智安建"的智能头盔内置多个传感器，可监测工人实时位置及健康状况；在紧急情况下发出警报，保障工人安全