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SMART CITY UND URBANE TECHNOLOGIEN

STADTPLANUNG

UMWELTECHNOLOGIE

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1. ZUSAMMENFASSUNG

Hongkong will smart werden

Die Hongkonger Regierungschefin Carrie Lam hat in ihrer Ansprache bei ihrem Amtsantritt 2017 als einen Schwerpunkt ihrer Arbeit die Förderung von Innovation und Technologie genannt. Unter anderem soll sich der Anteil der Ausgaben für Forschung und Entwicklung am Bruttoinlandsprodukt (BIP) von derzeit 0,8 Prozent verdoppeln. Vor allem soll aber die Stadt mit Smart-City-Konzepten effizienter, nachhaltiger und lebenswerter werden.

Am 15. Dezember 2017 hat die Hongkonger Regierung den auf Empfehlungen des Consultingunternehmens PWC basierende „Smart City Blueprint“ veröffentlicht. Dieser beinhaltet die Regierungsstrategien und Initiativen in sechs Schwerpunktbereichen, nämlich für „Smart Mobility“, „Smart Living“, „Smart Environment“, „Smart People“, „Smart Government“ und für eine „Smart Economy“. Unter einer „Smart City“ versteht man laut Hongkonger Sprachgebrauch eine Stadt, deren Verwaltung möglichst effizient verwaltet wird und dazu vor allem IT- und Datenaustausch einsetzt, um als Resultat die Stadt lebenswerter zu machen. In Österreich werden unter „Smart City Technologien“ vielfach auch allgemeine Kommunaltechnologien verstanden.
<https://www.smartcity.gov.hk/>

PWC hatte zuvor auch analysiert, welche Konzepte aus führenden Städte wie London, New York und Wien auch für Hongkong geeignet sein könnten. Wien wurde dabei als federführend erwähnt bei e-health und m-health (mobile health) für Senioren und beim Umgang mit von der Bevölkerung gesammelten Daten und der der angebotenen Wahlmöglichkeit für einzelne Bürger, welche Daten er zur Verfügung stellen möchte.

In der ersten Phase wurde insbesondere an der Umsetzung folgende Projekte gearbeitet:

- 1) 400 multifunktionale smarte Straßenbeleuchtungs-Masten (multi-functional smart lamp poles)
- 2) elektronische Ausweiskarte (ID Karte) für alle Hongkonger Einwohner
- 3) Weiterentwicklung der bestehenden e-government Lösungen und Schaffung einer zentralen Datenplattform
- 4) Installation von smarten Parkbezahlsystemen auf öffentlichen Straßen mit Bezahlungsmöglichkeit mittels apps und Echtzeit-Information über verfügbare Parkplätze

Im ersten Halbjahr 2020 noch soll die bestehende Smart City Strategie Hongkongs aktualisiert werden und dabei wieder wichtige betroffene Gruppen eingebunden werden.

Kowloon-East als Testgebiet

Das „Energizing Kowloon East Office“ soll anhand des Stadtgebiets Kowloon-East (Region rund um den ehemaligen Flughafen Kai Tak) den Einsatz fortschrittlicher smart City/IT-Technologien testen und die daraus gewonnenen Erfahrungen der breiteren Öffentlichkeit zur Verfügung stellen („Proof of Concept Trials“). Zurzeit arbeitet das Büro an der testweisen Umsetzungen von Lösungen für Smart Waste Bin Systeme, Kerbside Loading/Unloading Bay Monitoring System, Real Time Roadworks Information, Structural Integrity/Detection of Infrastructure, Sensing Infrastructure und Water Quality Alert System

Langfristige Stadtplanung ab dem Jahr 2030

Parallel dazu gibt es für die langfristige Stadtplanung ab dem Jahr 2030 eine im Jahr 2017 ausgearbeitete Strategie „Hong Kong 2030+“ <http://www.hk2030plus.hk/>. Das Hongkonger Development Bureau (Amt für Stadtplanung und Erneuerung, Grundbewirtschaftung und Infrastruktur) hat dazu gemeinsam mit Experten und unter Einbindung der breiten Öffentlichkeit einen Entwurf für die weitere langfristige Stadtplanung Hongkongs für den Zeitraum ab 2030 erarbeitet. Das Konzept „Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030“ ist auf <http://www.hk2030plus.hk/> basiert auf drei Fundamenten mit dazugehörigen Maßnahmen, um die dicht besiedelte Stadt der Welt lebenswerter zu machen, den wirtschaftlichen Herausforderungen Paroli bieten zu können und ausreichend Kapazitäten für einen weiteren und nachhaltigen

Zuwachs bei der Bevölkerung zu schaffen. Bei der Erstellung des Plans haben einige Ministerien und Behörden gemeinsam mit Expertinnen und Experten zusammen gearbeitet. Die geplante Raumentwicklung baut auf drei Achsen auf, nämlich eines städtischen Geschäftskerns, zwei strategischen Wachstumsräumen und drei wichtigen Entwicklungsachsen.

Das innerstädtische Geschäftsviertel soll aus dem schon jetzt bestehenden Geschäftsviertel (Central Business District) rund um den Victoria Hafen, dem Central Business District 2 in Kowloon Ost und einem weiteren Central Business District 3, in einer neuen Stadt East Lantau (nahe des Flughafens) bestehen. Die zwei strategischen Wachstumsräume befinden sich in Ost-Lantau und in den Neuen Territorien. Als zukünftige Achsen für die weitere Entwicklung sind der West-Wirtschafts-Korridor (Western Economic Corridor), der östliche Wissens- und Technologiekorridor (Eastern Knowledge and Technology Corridor) und der nördliche Wirtschaftsgürtel (Northern Economic Belt) angeführt. Die Raumplanung sieht verschiedene Maßnahmen zur Förderung der Lebensqualität vor, wie mehr öffentliche Flächen und Grünräume und Arbeitsplätze näher beim Wohngebiet.

Hongkong ist schon jetzt mit 27.000 Personen pro km² die dicht bevölkerte Stadt der Welt. Die Hongkonger Regierung geht von einem weiteren Bevölkerungswachstum aus, nämlich von derzeit rund 7,4 Mio. auf 8,2 Mio. oder gar 9 Mio. ab dem Jahr 2030. In 30 Jahren wird ein Drittel der Bevölkerung über 65 Jahre alt sein, 6% werden mind. 85 Jahre alt sein. Eine große Herausforderung wird auch der immer älter werdende Gebäudebestand werden.

Abkommen mit Österreich

Am 26. Jänner 2016 wurde ein Abkommen/MoU zwischen der ATC (Austrian Technology Corporation) und dem Hongkonger Smart City Consortium <https://smartcity.org.hk/> über die Zusammenarbeit im Bereich Smart Cities + Urban Development abgeschlossen, welche die Basis für einzelne Firmenprojekte darstellen könnte. Das Abkommen steht unter der Schirmherrschaften der beiden für Innovation zuständigen Ministerien, dem Hongkonger Innovations- und Technologieministerium und dem Österr. Bundesministerium für Verkehr, Innovation und Technologien. Nach Arbeitsausschuss-Sitzungen fanden seit 2017 mittels von Workshops und von Webinaren mehrere Präsentationen österr. Technologien für Hongkonger Problembereiche statt.

Lesson learned so far

Viele in Österreich erprobte Technologien müssen an die spezifische Hongkonger Situation, nämlich den Einsatz in einer Stadt mit einer der höchsten Bevölkerungsdichte der Welt und mit vielen Hochhäusern ("high rise, high density") angepasst werden. Für solche Zwecke müssen Lösungen oft kleiner sein, geruchsärmer, mehr Design aufweisen, Steigungen überwinden können, also stellen oft keine Standardlösungen dar. Hongkong könnte sich da als Art Testgebiet auch für andere dicht besiedelte Städte anbieten.

Wie auch in anderen Fernmärkten müssten österr. Unternehmen am besten mit Partnern vor Ort oder mit einer eigenen Niederlassung arbeiten, vor allem auch um bei öffentlichen Ausschreibungen wie zB vom Umweltministerium schon vorab Vorschläge unterbreiten zu können und dann bei der Ausschreibung selbst auch mit lokalem Service punkten zu können. Innovative Unternehmen könnten sich dazu auch begünstigt im Wissenschaftspark HK Science and Technology Park ansiedeln.

Das AußenwirtschaftsCenter Hongkong kann für österreichische Technologieanbieter Erstvorstellungen ermöglichen und Feedback einholen, Präsentationen organisieren und potentielle Vertriebspartner vorschlagen. Das AußenwirtschaftsCenter arbeitet dazu auch eng mit wichtigen Stakeholdern in Hongkong (wie dem Innovations- und Umweltbehörden, Wissenschaftsparks, Smart City Consortium) und in Österreich (wie BMVIT, FFG, AWSG, ATC, Clustern) zusammen.

2. LONG-TERM URBAN PLANNING: HONG KONG 2030+

Hong Kong is a fast growing city with a population increasing by one million people every ten years. In mid-2019, Hong Kong recorded a population of 7.5 million people (vs Austria 8.8 million). Hong Kong is known as one of the world's most densely populated cities.

Hong Kong's land size is 1,106 km² (vs Austria 83,858 km²) with only 24% of the land built-up. The average population density in these built-up areas is 27,330 person/km². According to the Transport and Housing Bureau the average living space per person in Hong Kong is 13.3 m² (vs 100 m² per person in Austria). (<https://www.thb.gov.hk/eng/psp/publications/housing/HIF2019.pdf>)

The life expectancies at birth for both sexes have steadily increased during the past 48 years, from 67.8 years for males and 75.3 years for females in 1971 to 82.3 years and 87.7 years respectively in 2018. Hongkongers have the highest life expectancy in the world and have even surpassed the Japanese in this regard. In 30 years, one third of Hong Kong's population will be over 65 and 6% even older than 85 years.

The Hong Kong Development Bureau published their long-term strategy on Hong Kong's urban development. The strategy is based on intensive consultations with stakeholders.

The strategy "Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030"

<http://www.hk2030plus.hk/> provides Hong Kong's vision to ensure the heavily populated city remains livable, stands up to the economic challenges and that there is sufficient capacity for further and sustainable growth. The vision also sees Hong Kong's population continue to increase (by 1 million every 10 years).

The conceptual spatial framework is to divide Hong Kong into different blocks, namely metropolitan business cores, two strategic growth areas and three primary development axes:

The Metropolitan Business Cores will consist of three Central Business Districts (CBD):

- 1) CBD1: High value-added financial services and advanced producer services around Central area.
- 2) CBD2: Transform Kowloon East into CBD2 as an alternative location for enterprises.
- 3) CBD3: Create CBD3 at the proposed East Lantau Metropolis near Hong Kong Island West as a new and smart services hub strongly tied to the airport

The Two Strategic Growth Areas are:

- 4) East Lantau Metropolis (area ~1,000 ha, population ~400-700,000, employment ~200,000 people). It is suggested to build a bridge between Hong Kong Island and Lantau and thus create a new metropolis with a CBD mainly through land reclamation by making better use of the under-utilized land in Mui Wo.
- 5) New Territories North (area ~720ha, population ~255-350,000, employment ~215,000) - A next generation new town at Heung Yuen Wai/Ping Che/Ta Kwu Ling/Hung Lung Hang/Queen's Hill and two potential development areas at San Tin/Lok Ma Chau and Man Kam To.

Three Emerging Development Axes:

- 6) Western Economic Corridor - Capitalizes on the international and regional gateway and strategic transport infrastructure in West Hong Kong, and increases economic activities and employment in

Hung Shui Kiu, Tuen Mun, Yuen Long South and various developments in North Lantau

- 7) Easter Knowledge and Technology Corridor - Strengthens the corridor by additional knowledge and technology developments proposed in Tsung Kwan O, Kwu Tung North, Lok Ma Chau Loop, Ma Liu Shui and near the future Liantang/ Heung Yuen Wai Boundary Control Point

- 8) Northern Economic Belt – Comprises of six boundary crossings (Sha Tau Kok, Man Kam To, Lo Wu, Lok Ma Chau, Lok Ma Chau Spur Line, Shenzhen Bay) and an additional one under construction (Liantang/Heung Yuen Wai), as well as New Territories North development.

Spatial planning provides various measures to promote the quality of life, such as creating more public and green space, jobs closer to residential areas (move from currently 24% to 38% of all jobs outside the city center and in the area of train connections). The transportation system will also expand to provide better connection to the city center from Lantau.

Another goal of the Hong Kong 2030+ initiative is to transform Hong Kong into an “SGR City”. “S” stands for Smart, “G” stands for Green and “R” stands for resilient. The signing of the Paris Agreement in 2016 signified a collaborative international commitment to combat climate change. In general, a SGR city aims to minimize demand for and use of resources, promote low-carbon smart economy and living, reduce carbon emissions, enhance city efficiency, promote business productivity, improve quality of urban living and enhance climate resilience.

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3. SMART CITY STRATEGY

On December 15, 2017, Hong Kong's Innovation and Technology Department published a "Smart City Development Blueprint for Hong Kong [https://www.smartcity.gov.hk/doc/HongKongSmartCityBlueprint\(EN\).pdf](https://www.smartcity.gov.hk/doc/HongKongSmartCityBlueprint(EN).pdf))

Hong Kong's Smart City Blueprint focuses on six areas:

- 1) Smart Mobility
- 2) Smart Living
- 3) Smart Environment
- 4) Smart People
- 5) Smart Government
- 6) Smart Economy

The Blueprint is based on an intensive study conducted by the consulting company PricewaterhouseCoopers (PwC) and its concept and suggestions for the "Office of the Government Chief Information Officer" for the further development of Hong Kong into a smart city. PwC had contacted key stakeholders and gathered recommendations to develop Hong Kong into a smart city. PwC also analyzed other leading international cities such as London, New York, Vienna and suggested potential concepts for Hong Kong. Vienna was specially recognized for e-health, m-health (mobile health) for seniors and in dealing with citizen data collection.

The dialogue between Austrian and Hong Kong professionals is fostered by regular exchanges between governments, semi-public institutions and companies. On 26 January 2016, the Hong Kong Smart City Consortium <https://smartcity.org.hk/en/index.php> signed a Memorandum of Understanding (MOU) with the Austrian Technology Corporation <http://www.atc.or.at/> in Hong Kong, witnessed by Mr Nicholas Yang, Secretary for Innovation and Technology and the Government Chief Information Officer. Smart City Consortium's Convener Eric Yeung signed the document with Austrian Technology Corporation's Chief Executive Officer Tino Terraneo. The signing of the Memorandum of Understanding facilitates the Smart City expertise exchange between Austria and Hong Kong. Both, Austria and Hong Kong, would like to learn from each other's experience and share best practice solutions.

Smart City Consortium (SCC) is a non-government and non-profit organization to facilitate the development of the smart city agenda in Hong Kong with several public companies like the HK Airport International Airport, the Mass Transit Rail (MTR), smaller companies and consultants as members. One of SCC's mission is to be a platform for the Hong Kong Government, technology partners, academia and commercial organizations to collaborate and exchange ideas relating to Smart City issues.

Under the existing MOU, the Austrian Technology Corporation together with bmvit and FFG in Austria and AUSSENWIRTSCHAFT AUSTRIA have brought several Austrian tech companies to Hong Kong and presented their solutions at Austrian Tech Days organized in partnership with the Smart City Consortium. Several webinars to highlight Austrian technologies were given. Austrian companies can benefit from travel subsidies given by FGG's TecXport program (<https://www.ffg.at/programm/tecxport>) and by being featured on a designated web platform (<https://www.tecxport.at/home>).

In the following we will go into further details and explain Smart City Blueprint priority areas plus other related challenges for Hong Kong such as the ageing problem, water supply and leakage, and waste management issues.

3.1 Smart Mobility

Hong Kong records 12.6 million passenger trips on public transportation every day. The most important transportation means to move people is provided by the extensive Mass Transit Railways network (<http://www.mtr.com.hk/en/customer/main/index.html>). “Smart Mobility” envisions integrating multimodal transportation to create a seamless, customer-centric travel experience that also accommodates the needs of elderly and disabled people in Hong Kong. It should improve the flow of people, while providing high service quality as well as minimizing the impact on the environment.

Some on-going projects are:

- a. Installation of **traffic detectors** covering 80% of the strategic routes of Hong Kong. These detectors are to collect real-time traffic information and recommend route choices to users. (https://www.td.gov.hk/en/transport_in_hong_kong/its/intelligent_transport_systems_strategy_review_and_traffic_detectors/index.html)
- b. **Smart Parking**: According to the Transport Department, the number of private cars in Hong Kong has soared from 402,000 in 2006 to 618,000 in 2018. They are usually only in use for 3-5% of their lifetime, remaining parked for the rest of the time. The number of vehicles is outnumbering parking spaces, resulting in illegal parking on the streets, especially also caused by delivery trucks.

In Kowloon East, under the core concept of “Smart City”, the Transport Department proposed to deploy a cylinder-vertical-lifting technology to park cars into empty spaces via a lift.

An ongoing project entails the installation of next generation **smart parking meters** which can accept payment through a variety of electronic means and can automatically detect and report occupancy (<https://www.mobileworldlive.com/apps/news-apps/hkt-selected-for-smart-parking-system/>).

Hong Kong International Airport (HKIA) is with 72 million passengers and 4.8 million tons of cargo handled in 2019 one of the world’s busiest airports. HKIA is currently building a third runway. The **Three Runway System (3RS)** is supposed to provide the infrastructure for the passenger growth until at least the year 2030. HKIA also drives to ensure passenger safety, security and a seamless airport experience. Some of the ongoing initiatives to become a “Smart Airport” <https://www.hkairport-technovation.com/en/> are:

- 1) Launch of the “HKG MyFlight” App. The app allows access to flight and public transportation information, enables the booking of car parking, suggests navigation within the terminals, shopping and dining options and more
- 2) MyTAG: A smart luggage tag to pair up with “HKG MyFlight” app to alert travelers when their baggage arrives
- 3) Self-service Check-in: 120 self-bag drop counters and cloud-based check-in kiosks “ICUSS” will be installed to reduce check-in time.
- 4) Trolley Tracking System – The availability of luggage trolleys is supervised via video analytics technology in order to reduce manpower

As in other Chinese cities Hong Kong is exploring the provision of a better travel experience by using facial biometrics technologies at check-in, boarding pass checkpoints and boarding at gates

(<https://www.scmp.com/news/hong-kong/transport/article/2164901/facial-recognition-technology-installed-hong-kong>)

c. **Mass Transit Railways (MTR Corporation)**

(<http://www.mtr.com.hk/en/customer/main/index.html?notice=read>) is the largest public transportation company in Hong Kong and carries an average of 5.8 million passengers every weekday (based on 2018 figures). The corporation is listed on the Hong Kong Stock Exchange and is 77 % owned by the Hong Kong Government. Apart from Hong Kong rail operations, MTR also engages in development and sale of residential and commercial properties in Hong Kong. MTR also has operations in mainland China, Europe and Australia.

Major new rail expansion projects include:

- 5) 17km Shatin to Central Link plans to open in phases from 2020 (<http://www.mtr-shatincentrallink.hk/en/tuen-ma-line-phased-opening/tuen-ma-line-phase-1.html>)
- 6) 7 new railway projects under the Railway Development Strategy 2014 (ongoing)

d. **Roads, Bridges and Cross-boundary projects**

A major emphasis is to further strengthen the infrastructure in connecting Hong Kong over the still existing borders with mainland China and the Special Administrative Region Macao:

- 7) The Hong Kong-Zhuhai-Macao Bridge (HZMB) opened in October 2018, spans a total of 55 km and is the longest bridge-tunnel sea crossing in the world.
- 8) The Heung Yuen Wai Boundary Control will be the 7th road-based crossing between Hong Kong and Shenzhen, with capacity to handle up to 30,000 passengers and 17,850 vehicles per day
- 9) Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) commenced operation in September 2018, connecting Hong Kong to the 30,000km PR China national high-speed rail network.

A number of major new roads are also under construction, including:

- a. Tuen Mun–Chek Lap Kok Link (TM-CLKL) Southern Connection opened in stages late 2018. The TM-CLKL Northern Connection works are expected to be finished by end-2020
- b. Tseung Kwan O–Lam Tin Tunnel expected to be commissioned by end-2021
- c. Cross Bay Link, a 1.8 km bridge connecting Tseung Kwan O to the Lam Tin Tunnel, will have a dual two-lane carriageway, cycle track and footpath and is expected to be completed in 2022.

- e. **Walkability** is a key element for sustainable cities. A comprehensive development of an integrated walkway system is meant to reduce the public's reliance on road-based transport, which in turn alleviates the demands put on the transport system and lessens the impact on the environment. Improve city walkability should increase people mobility, enhance road safety and improve local air quality, contributing positively to smart city development.

In order to improve walkability there is an emphasis on the provision of pavements with sufficient effective width, more greenery, sufficient public seating at appropriate locations, more enriching pedestrian experiences, the minimization and coherent management of utility installations, signage and other pedestrian obstacles, coordination of pedestrian desire lines, and the formulation of a coherent navigation strategy. Shelters are suggested to be installed along key pedestrian routes to mass transit nodes in order to enhance the pedestrian's comfort in bright sunny or rainy days.

The Hong Kong government carried out studies to enhance the walkability in Kowloon East, Sham Shui Po, and Central Area under the sustainability concept of Walkable Kowloon East, connecting people with places and providing a safe and comfortable walking environment.

(<https://walk.hk/en>)

<https://www.scmp.com/news/hong-kong/community/article/2130762/why-should-hong-kong-be-more-walkable-environmentalists-and>
https://www.ekeo.gov.hk/en/smart_city/walkability_mobility.html

3.2 Smart Living

“Smart Living” enhances the overall living experience of Hongkongers across age groups and demographics. The proposed projects focus on improving an individual’s ability to interact with electronic services and on improving general wellbeing and health. This aims to create a safer, more secure, accessible and happier society.

Ongoing initiatives include:

- a) Increase the number of **free hotspots** under “Wi-Fi.HK” to provide free public Wi-Fi service (currently already over 20,000 Wi-Fi hot spots in Hong Kong).
- b) Develop a **Faster Payment System (FPS)** to support the use of mobile payment.
<https://www.hkma.gov.hk/eng/news-and-media/press-releases/2018/09/20180928-3>
- c) By 2020 provide all residents with a free **electronic identity (eID)** to enable them to conduct government and commercial transactions online (<https://www.scmp.com/news/hong-kong/community/article/2116393/hong-kong-roll-out-electronic-identification-two-years>)

3.3 Smart Environment

“Smart Environment” initiatives aim to make best use of technologies to reduce waste production, monitor and manage pollution and to reduce emission stemming from the built up environment.

Some strategies and initiatives include:

- a) Climate Action Plan 2030+: **Phase down coal-fired electricity generation** and replace it with natural gas and non-fossil fuel sources. The electricity share generated by coal is to be reduced from 47% in 2016 to 25% in 2020. (<https://www.climateready.gov.hk/files/report/en/3.pdf>,
<https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf>)
- b) **Promote energy efficiency** and conservation in the community in focus on building which accounts for nearly 90% of electricity consumption.
<https://www.gov.hk/en/residents/environment/sustainable/buildings.htm>
- c) **Install LED lamps** in public lighting systems and encourage retrofitting LED lighting for existing government buildings.
https://www.ledinside.com/news/2017/4/hong_kong_to_upgrade_street_lighting_to_led
- d) Reduce waste by implementing a **Municipal Solid Waste (MSW) charging scheme** (<https://www.mswcharging.gov.hk/index.php?lang=en>) by late 2020. According to the Environmental Protection Department, Hongkongers send per day an average of 1.53kg of municipal solid waste, which includes domestic, commercial and industrial debris, to landfills. The trend towards increased waste per capita should be stopped by two suggested charging methods:
 - 10) Charging by designated garbage bags: Residents have to purchase and use pre-paid “designed garbage bags” to wrap their waste properly before disposal
 - 11) Charging by “weight through gate-fee”: Mainly for oversized waste and waste from commercial and industrial premises, the charge will be based on the weight of the waste disposed.

- e) According to the “Hong Kong Blueprint For Sustainable Use Of Resources 2013-2022” (<https://www.enb.gov.hk/sites/default/files/WastePlan-E.pdf>) published in May 2013, the Environmental Protection Department is seeking to increase the recycling rate in Hong Kong to 55% by 2022. Waste separation in housing estates will be essential to achieve this goal.

Source Separation of Domestic Waste is to make residents to separate waste at source by encouraging and assisting property management companies to provide waste separation facilities within apartment complexes / building premises. Residents only need to separate recyclables from their waste by category, such as waste paper, metals and plastics, and then take them to the designated recycling points in their apartment complex.

- f) **Smart garbage bin** will notify street cleaners when the garbage bin is almost full. Smart garbage bin can accommodate eight times more garbage than traditional bins and thus also reduce transportation cost.
- g) Use remote sensing devices to monitor air pollution, cleanliness of streets and public places, usage of litter and recycling bins.

The Environmental Protection Department (EPD) manages facilities for collecting, transferring, treating and disposing of a variety of waste types (municipal solid waste, food waste, construction waste, chemical waste, clinical waste and waste cooking oils plus other special wastes).

Hong Kong’s recycling rate is only around 30 percent. The most commonly recycled materials in Hong Kong are metals, paper and plastics. Currently waste separation and recycling requires lots of manual work as processing facilities are often small and are in the middle of highly populated areas. In January 2018 mainland China stopped accepting waste exports from Hong Kong and other countries and regions, which due to the lack of processing facilities in Hong Kong proved to be a big challenge, especially for plastic waste and paper.

The EPD’s waste processing infrastructure consists of three strategic landfills, the network of refuse transfer stations and a Chemical Waste Treatment Centre. The landfills however are nearly reaching capacity and have to be either further enlarged or new sites have to be found, all a very difficult task in one of the world’s most densely populated cities.

- 12) The three strategic landfills are located in the New Territories (Nim Wan, Tseung Kwan O and Ta Kwu Ling).
- 13) Seven refuse transfer stations are located in different areas in Hong Kong. These are centralised collection points for the transfer of waste to the strategic landfills. The waste from smaller refuse collection trucks is compacted and transferred into containers, which are then loaded onto trucks or barges for further shipment to landfills.
- 14) The Chemical Waste Treatment Centre on Tsing Yi Island accepts a variety of chemical wastes and clinical waste.
- 15) The Sha Ling Composting Plant in the northern New Territories accepts livestock waste. The waste is composted into soil conditioner for use in Hong Kong.
- 16) The Sludge Treatment Facility located at Tsang Tsui, Tuen Mun receives and treats sewage sludge from 11 sewage treatment works from Drainage Services Department.

Street cleaning in Hong Kong is provided by the Food and Environmental Hygiene Department. The Department and its cleaning contractors employ a total workforce of 11,900 people to keep the city clean and provide other cleansing services, including street sweeping and waste collection etc. All streets are manually swept at least once a day. In main commercial and tourist areas, streets are swept an average of four times a day and up to eight times a day in the busiest pedestrian areas.

Many of the streets are small, curvy, and hilly and are in high-traffic areas, which provides a big challenge to use machines and technologies. The Department and its 10 cleansing contractors employ in total 113 street washing and sweeping vehicles which operate day and night. Highways and central roads are cleaned during the night.

Reduce Energy Use in Buildings

Major source of carbon emissions in cities is the building sector, and Hong Kong is no exception. Hong Kong's buildings account for about 90 per cent of the city's electricity usage. Over 60 per cent of Hong Kong's carbon emissions is due to the electricity generation for buildings.

The Hong Kong Government has established a USD 130 million Construction Innovation and Technology Fund to promote the wider adoption of technology and innovative solutions in the industry. There are however only few examples for progressive buildings in regards to energy conservation in Hong Kong. CIC-Zero Carbon Park (CIC-ZCP) in Hong Kong's Kowloon area serves as an exhibition, education and information Centre for low/zero carbon design and technologies (<https://zcp.cic.hk/eng/home>).

Austria's passive house technologies still sounds very futuristic - even for Hong Kong's building professionals. In a region with some of the world's most expensive land and buildings, speed of new construction is of essence. Like in other countries, Hong Kong's building sector is very traditional and reluctant to accept new technologies like wooden roof structures or multi-story wooden buildings. In this aspect Hong Kong is probably lagging behind other Asian economies like Singapore where the governments see their role in adopting some of the latest technologies in public building and accepting alternative building proposals in public tenders.

- h) Certification by BEAM Plus (http://greenbuilding.hkgbc.org.hk/posts/view/BEAMPlus_Intro). BEAMS Plus is Hong Kong's leading initiative to independently assess the sustainability of building promoted by the Hong Kong Green Building Council. BEAM Plus consists of four assessment tools, namely for new buildings, existing buildings, interiors, and neighborhood, covering the whole building life cycle.

The assessment of a building's performance covers the following aspects:

- Integrated design and construction management
- Health and wellbeing
- Sustainable sites
- Materials and waste
- Energy use
- Water use
- Innovations and additions

A list of assessed green buildings in Hong Kong can be found at (<http://greenbuilding.hkgbc.org.hk/>). Green buildings are also encouraged in further development of Kowloon East (https://www.ekeo.gov.hk/en/green_map/building/index.html)

3.4 Smart People

"Smart People" aims to fundamentally transform the way that people access public and private sector services in their capacity as individuals, businesses, parents, investors, employees and employers, and facilitate retooling of talents and lifelong learning.

Projects include:

- a) Provide more **STEM education** (Science, Technology, Engineering and Mathematics) for primary and secondary schools (<https://stem.edb.hkedcity.net/en/home/>)
- b) Provide enhanced **information technology (IT) training** to secondary school students outside the normal school curriculum.
- c) Encourage industry to hire STEM graduates for R&D projects through “Postdoctoral Hub” program (<https://www.itf.gov.hk/l-eng/TTS-PH.asp>) and to offer enhanced Internship Programs.
- d) Launch easier access to visa for international tech talents under the **I&T Talent Admission scheme** (<https://www.immd.gov.hk/eng/services/visas/TECHTAS.html>)
- e) Expand **incubation programs** at **Hong Kong Science & Technology Park** (HKSTP) (<https://www.hkstp.org/en/>) and Cyberport Smart-Space. (https://www.cyberport.hk/en/about_cyberport/cyberport_entrepreneurs/smart-space)

The two major science parks under the Secretary for Innovation are to be expanded even further: HKSTP’s Expansion Program Phase 1 will provide additional 74,000 sqm office and tech center space for new InnoHK research clusters (Health@InnoHK focusing on healthcare technologies and AIR@InnoHK focusing on artificial intelligence and robotics technologies), an incubation center and a robotic catalyzing center.

HKD 5.5 billion is earmarked for Cyberport to expand its campus so that it can offer more space for technology companies and start-ups as well as enhance the environment and facilities of the Cyberport Waterfront Park.

- f) Attract Venture Capital Fund to support entrepreneurship
- g) Establish MTR Academy (<https://www.mtracademy.com/en/index.html>) and Hong Kong International Aviation Academy (<https://www.hkinternationalaviationacademy.com/>) to train professional expertise.

3.5 Smart Government

Through its Innovation and Technology Bureau (ITB), the government makes HKD 500 million available to other government departments for implementing projects that improve quality, efficiency and effectiveness of the delivery of public services. Projects funded under the “TechConnect Fund” should enable government departments to think outside of the box and to provide additional budgets for innovative solutions.

Initiatives include:

- a. **Open data** – open up more public and private sector data in digital forms to facilitate research and innovation via Hong Kong government’s one-stop public sector information portal (<https://data.gov.hk/en/>)
- b. Adopt eID and enhance e-services user experience with the help of AI, Chatbot and big data analysis.
- c. Implement **smart lamppost** with video analytic capabilities for monitoring various types of real-time city data such as meteorological data, air quality data and traffic flow and to enable 5G mobile networks. There are several parallel initiatives going on:
 - a) Office of the Government Chief Information Officer - Smart Lampposts

Hong Kong Multi-functional Smart Lampposts pilot scheme is a three-year program in which some 400 smart lampposts will be installed in phases in four districts with higher pedestrian and traffic flow. The lampposts are to be installed in Central/Admiralty, Causeway Bay/Wan Chai, Tsim Sha Tsui and Kwun Tong/Kai Tak Development Area.

Since the end of June 2019, 50 smart lampposts have already been put in place on Sheung Yuet Road in Kowloon Bay, Shing Kai Road in Kai Tak and in the Kwun Tong city center. The public raised some concerns with privacy issues with the first installations and the Government is trying to communicate better the system's advantages

(https://www.ogcio.gov.hk/en/our_work/strategies/initiatives/smart_lampposts/)

b) Hong Kong Productivity Council - Smart Street Lamps

Hong Kong Productivity Council (HKPC) currently connects over 200 sets of street lamps in San Po Kong and Kai Tak by a wireless network to enhance their management significantly using the LoRa (Long Range Low Power Wide Area Network) solution. Smart street lamps are the first phase for future smart lampposts to follow.

After the upgrade, the new smart street lamps can transfer real-time current and voltage data through the wireless network for the remote monitoring of the lamps' operation. Apart from being able to turn on and off the street lamps with mobile devices, the operators can also notify engineering personnel through the system to promptly repair the faulty lamps, shorten their downtime and ensure road safety. (<https://www.hkpc.org/en/industry-support-services/latest-information/7560-smart-street-lamp>)

c) Hong Kong Highways Department – Smart Street Lighting

Telensa, a global player in connected street lighting and smart city applications has been selected by Hong Kong's Highways Department to deploy its PLANet intelligent street lighting system in a pilot program led by the engineering services group South King-Kum Shing JV to replace about 600 streetlights in Yuen Long Town with wirelessly managed LED lights.

(<https://telecomdrive.com/hong-kong-highways-department-taps-telensa-for-yuen-long-smart-street-lighting-pilot/>)

d. Adopt **Building Information Modelling (BIM)** for major government capital works projects starting from 2018 and develop Common Spatial Data Infrastructure (CSDI) by 2023 to facilitate sharing of geo-spatial data across government departments and government-to-business (G2B) applications, including the launch of CSDI portal, 3D digital map, electronic submission hub for building plans.

3.6 Smart Economy

Smart Economy is supposed to improve Hong Kong's productivity and competitiveness by fostering an environment of greater collaboration among government, citizens, businesses, academia, and NGOs to spur innovation in new high technology products and services. It also helps to attract leading talents and investments globally to Hong Kong.

Some initiatives include:

a) **Promote Fintech** and explore distributed ledger technology applications and in different areas.

- b) Provide **smart tourist** facilitation services at Hong Kong International Airport, the West Kowloon Station and Guangzhou-Shenzhen-Hong Kong Express Rail Link and the Hong Kong Boundary Crossing facilities of Hong Kong-Zhuhai-Macao Bridge.
- c) Promote R&D and re-industrialization, includes provide tax deduction for enterprises invested in R&D and build Data Technology Hub and Advanced Manufacturing Centre

Collaborate with Shenzhen to develop a 87-hectare site Innovation and Technology Park at Lok Ma Chau Loop for I&T enterprises with the goal to have first building completed in 2023.

(<https://www.hkstp.org/en/our-stories/our-footprint/hong-kong-shenzhen-innovation-and-technology-park/>)

4. OTHER URBAN AND ENVIRONMENTAL TECH OPPORTUNITIES

4.1 Water Leakage and Waste Water Treatment

Other than the above Smart City project, Hong Kong also needs to pay attention to water quality and waste water treatment. Currently, up to 80% of Hong Kong's water is imported from Guangdong in mainland China for which the Water Supplies Department (WSD) spends about HKD 4.8 billion a year under the current agreement.

The Water Supply Department (WSD) (<https://www.wsd.gov.hk/en/home/index.html>) serves over 7 million people with water supply through more than 8,000 km of water mains. Similar to most developed countries, water loss in the water distribution network of Hong Kong is an ongoing problem. Factors such as high water supply pressure due to the hilly topography, a congested urban setting and the large number of underground utilities services pose challenges to maintain a highly reliable and sustainable water supply network. The WSD's ongoing effort in reducing water leakage in the water distribution network are showing results: The leakage rate dropped from 25% in 2000 to about 15% in 2018.

However, water mains continue to age and deteriorate. The existing large scale replacement and rehabilitation (R&R) works is no longer the only effective means to sustain the healthiness of the network. WSD is considering to implement a "Water Intelligent Network" (WIN) to maintain the water distribution network through analyzing the network condition and determining the most cost-effective means to maintain its healthiness.

WSD - Replacement and Rehabilitation Program of Water Mains

<https://www.wsd.gov.hk/en/core-businesses/major-infrastructure-projects/r-r-projects/index.html>

<https://www.wsd.gov.hk/en/core-businesses/operation-and-maintenance-of-waterworks/reliable-distribution-network/index.html>

<https://www.info.gov.hk/gia/general/201804/17/P2018041700740p.htm>

Water Intelligent Network (WIN)

<https://www.wsd.gov.hk/en/core-businesses/major-infrastructure-projects/water-intelligent-network-win/index.html>

<https://www.wsd.gov.hk/en/core-businesses/operation-and-maintenance-of-waterworks/reliable-distribution-network/index.html>

Some Leak Detection Methodologies used by the Water Supplies Department are:

- Sounding and Visual Inspection
- Leak Noise Correlation and Noise Logger
- Pinpointing by Ground Microphone
- Inline Inspection e.g. Trials of "Sahara" and "Smartball"
- Use of Drone (for remote locations and locations difficult to access)
- Use of Hydrophone (for detection of large diameter pipe)

4.2 Waste Water Treatment

With a daily usage of 220 litres water per capita – including seawater used for toilet flushing – Hongkongers use twice as much as others in the world. Waste water treatment and recycling waste water are essential.

About 93% of the population is served by the public sewerage system operated by the Drainage Services Department (DSD) (<https://www.dsd.gov.hk/EN/Home/index.html>). This system includes a sewerage

network of about 1,700km in total length and around 300 sewage-pumping stations. The treatment facilities

collects and treats 2.8 million cubic meters of sewage (enough to fill up 1,120 standard size swimming pools) per day from residential, commercial and industrial premises in the territory prior to its disposal to the sea for dilution and dispersion through submarine outfalls.

DSD has actively implemented energy-saving initiatives and deployed additional resources in promoting and adopting renewable energy technologies on a wider and larger scale in its existing and new facilities to reduce carbon emissions. In 2018, DSD's plants generated 28 million kilowatt-hours of electricity which constituted around 9% of DSD's annual energy demand.

The development of T-PARK (<https://www.tpark.hk/tc/>) was part of a wider investment from Hong Kong into modernizing its wastewater treatment plants. T-PARK also includes a recreational and educational public center, a theatre, food court and even spa.

4.3 Refurbishment, Urban Planning and Spatial Planning

Revitalization of Industrial Building

The revitalization plan for industrial buildings was first announced in Oct 2009 by the government. It aims to provide more floor space for suitable uses in order to meet Hong Kong's residential and commercial space requirements by converting industrial buildings into non-industrial uses, especially for hotels and offices. The government have approved 124 applications so far, 110 of them wholesale conversions, and 14 of them for redevelopment of aged industrial buildings. These approved applications (upon completion of the conversion or redevelopment works) will provide 2.1 Mio. sqm floor area.

(https://www.landstd.gov.hk/en/reIntBuild/policy_add_IndBuilding.htm)

Urban Renewal

The Urban Renewal Authority (<https://www.ura.org.hk/en>) is Hong Kong's statutory body to undertake, encourage, promote and facilitate urban renewal of Hong Kong, with a view to addressing the problem of urban decay and improving the living conditions of residents in old districts.

The URA adopts a comprehensive and holistic approach by ways of its two core businesses i.e. redevelopment and rehabilitation, as well as heritage preservation and revitalization, for creating a sustainable and quality living for the people of Hong Kong.

An overview of Urban renewal projects is given at <https://www.ura.org.hk/en/project/redevelopment>

4.4 Aging Society / Gerontech

Hongkongers enjoy the highest life expectancy world-wide. What is good news for the individual will pose a huge challenge for the government. Hong Kong has to prepare itself for a further ageing society. By 2043 two out of five Hongkongers will be 65 and above. By 2064 this rate is projected to be 46%, 10% of the population will be 85 years and above.

The Hong Kong Government has set up a HKD 1 billion fund to promote appropriate technology for elderly care use (gerontech) and subsidize elderly service units to trial use and procure technology products.

The Hong Kong Productivity Council (HKPC), acting as a supportive statutory body for the industry, has initiated Hong Kong's first GeronTech Cluster, named GLink (<https://www.hkpc.org/en/industry-support-services/gerontech/our-service/7762-gerontech-cluster>).

The already rolled out **eHealth record** System is intended to facilitate the active management of health data for the use of doctors and patients and enhance core functionalities and security/privacy protection.

<https://www.ehealth.gov.hk/en/home/index.html>.

The Jockey Club Charities Trust launched a 3-year Community eHealth Care project (2016-2019). The project adopted an innovative, technology-based approach to promote a preventive healthcare management and support model among the elderly. The innovative service model included telecare, well-being survey and big data analytics. (<http://www.jc-ehealth.hk/en/index.html>)

The Hong Kong Jockey Club Charities Trust is sponsoring a 3-year project (2019-2022) at Lingnan University named "LU Jockey Club Gerontechnology and Smart Ageing Project". The project aims to promote Gerontechnology and support smart Socialpreneurship development. This project also serves as an educational platform to provide training courses and workshops on "Gerontechnology in Healthcare, Dining, Living and Transport"(<https://www.ln.edu.hk/apias/gerontechnology/en/index.html>).

5. OPPORTUNITIES FOR AUSTRIAN COMPANIES

Hong Kong is one of the world's most open economies. There is practically no production taking place in Hong Kong anymore (92% of gross domestic products comes from the service sector) and technology is sourced world-wide. Very often price still plays a big role in sourcing. Local companies and companies from South of China have an advantage in getting first information on upcoming projects.

Existing technology and solutions used in Europe probably have to be adjusted to be used in a densely populated, high-rise city like Hong Kong. While as the relative small size of Hong Kong (7.2 mio. people) might not encourage companies to put too much effort in offering non-standard solutions or even to set up a local presence, Hong Kong might be a good learning experience for companies also for working in other urban centres with similar challenges.

Hong Kong is one of the most visited places worldwide. Other cities in mainland China and Asia are following closely those who Hong Kong work with and which technologies they adopt. Projects realized in Hong Kong could also probably be used to demonstrate abilities to other cities. Hong Kong could also serve as a hub for Austrian companies to work with mainland China and all over Asia.

Hong Kong Government's public tenders are published at <https://pcms2.gld.gov.hk/iprod/#/home?lang-setting=en-US> but especially in the infrastructure sector it is advisable to start project development long before.

For international tech companies it is essential to have a local partner or its own office in Hong Kong. Although lots of business is conducted in English, in the tech environment, Cantonese is often the preferred language. The need for frequent and quick communication and after sales services makes sourcing from companies only located in Europe less attractive.

6. SMART CITY IN MACAO

The Macao Government has developed a "Five-Year Development Plan of the Macao Special Administrative Region (2016-2020)" (https://www.cccmtl.gov.mo/files/plano_quinquenal_en.pdf) to enhance people's standard of living, the industrial environment, and the city's competitiveness, and facilitate Macao's sustainable development. Major tasks includes:

- Development and Application of Information Technology: promote application of mobile networks and Internet of Things.
- Establish a Publicly Accessible Data Centre: to support development and application of big data
- Enhance Wi-Fi Coverage and Global Telecommunication Quality: The no. of Wi-Fi spots to be increased from 183 in 2016 to 260 by 2020.
- Update and Improve Telecommunication Emergency Reporting, Responding and Handling Mechanisms: to enhance responsiveness on telecommunication network and service quality.
- Build a Three-dimensional City: strive for a 10% annual increase in geographical information of Macao. Information regarding urban planning, transportation, land, economy and society, and humanity will be incorporated to perfect the information platform.

7. SMART CITY IN SHENZHEN

Just across the border from Hong Kong or a 14-minute fast train ride away is Shenzhen, also known as the heart of “China’s Silicon Valley” and often named as “China’s smartest city”. Shenzhen’s population has increased within the last 40 years from only 310,000 people to 22.9 million. As a dedicated “national pioneering area”, Shenzhen is probably six to seven years ahead of other cities in China in smart city implementation.

Shenzhen is also home to two giant telecom firms Huawei and Tencent. These firms are playing an important role in advancing the smart city movement in China and also have global ambitions to sell their technologies. Huawei’s hardware and Tencent’s software products put their home city in a competitive position for becoming a smart city. Huawei’s ‘smart city’ project aims to make Shenzhen ‘smarter, safer and more efficient’, and also to be rolled out to more than 160 cities across 40 countries.

(<https://e.huawei.com/hk/solutions/industries/smart-city>)

As part of the city’s plan, Shenzhen launched its “Weaving Net Project” in 2013 under which it divided the city into thousands of data zones and designated an “information collector” to each zone. The system also uses 2 million surveillance cameras dotted all over the city. About 80 per cent of criminal cases are solved with the help of video surveillance.

A good overview on smart city topics in Shenzhen can be found in a MDPI study <https://www.mdpi.com/1996-1073/12/22/4375/htm>.

8. APPENDIX

8.1 Fairs

Name	Website
Start me up HK Festival 2020 – The Connected Cities Conference (July 2020)	https://www.startmeup.hk/ https://kpmg.eventbank.com/event/the-connected-cities-conference-2020-16749/%20
Eco Expo Asia (28-31 October, 2020)	http://m.hktdc.com/fair/ecoexpoasia-en/Eco-Expo-Asia-International-Trade-Fair-on-Environmental-Protection.html
Gerontech and Innovation Expo Cum Summit (Nov 2020)	https://gies.hk/en
Construction Innovation Expo (Nov 2020)	https://ciexpo.cic.hk/
Internet Economy Summit (April 2021)	https://www.ieconomysummit.hk/

8.2 Studies

Date	Topic	Website
Dec 2017	Smart City Blueprint	https://www.smartcity.gov.hk/doc/HongKongSmartCityBlueprint(EN).pdf
June 2017	Report of Consultancy Study on Smart City Blueprint for Hong Kong	https://www.smartcity.gov.hk/report/summary/en/
Oct 2016	Hong Kong 2030+ booklet	https://www.hk2030plus.hk/document/2030+Booklet_Eng.pdf
Jan 2017	Environment Bureau Climate Action Plan 2030	https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf
2019	Transport and Housing Bureau - Housing in Figures 2019	https://www.thb.gov.hk/eng/psp/publications/housing/HIF2019.pdf
2018-2019	Drainage Services Department – Sustainability Report	https://www.dsd.gov.hk/uploads/page/DSDSustainabilityReports/0503338_DSD_SR_2018_19_v14.pdf
Dec 2018	Hong Kong Green Building Council - Green Building in Action 2018	https://www.hkgbc.org.hk/eng/resources/publications/reports/green-building-in-action-2017/green-building-in-action-2018/images/Green%20Building%20in%20Action_2018EN.pdf

Mar 2019	Colliers Radar – Industrial 2.0: More than a face lift	https://www.colliers.com/-/media/images/apac/hong%20kong/2019_images/radar/industrial_revitalization/190301_%20colliers_ind_revitalisation_report_r1.pdf?la=en-GB
Feb 2020	Building for the future	https://www.brandhk.gov.hk/uploads/brandhk/files/factsheets/Hong_Kong_Themes/Building%20for%20future_E_Feb%202020.pdf
Nov 2019	The State of Smart Cities in China: The Case of Shenzhen	https://www.mdpi.com/1996-1073/12/22/4375/htm

8.3 Useful links

Website

Hong Kong Smart City Blueprint	https://www.smartcity.gov.hk/
Hong Kong 2030+	https://www.hk2030plus.hk/
Office of the Government Chief Information Officer	https://www.ogcio.gov.hk/en/
Hong Kong Green Building Council	https://www.hkgbc.org.hk/eng/main/index
Lands Department	https://www.landsd.gov.hk/
Urban Renewal Authority	https://www.ura.org.hk/en
Energizing Kowloon East Office	https://www.ekeo.gov.hk/en/home/index.html
Transport and Housing Bureau	https://www.thb.gov.hk/eng/index.htm
Transport Department	https://www.td.gov.hk/en/home/index.html
Highways Department	https://www.hyd.gov.hk/en/home/index.html
Hong Kong Productivity Council	https://www.hkpc.org/en/
Hong Kong Science and Technology Park	https://www.hkstp.org/en/
Water Supplies Department	https://www.wsd.gov.hk/en/home/index.html
Drainage Services Department	https://www.dsd.gov.hk/EN/Home/index.html
eHealth Record Sharing System	https://www.ehealth.gov.hk/en/home/index.html
Hong Kong International Airport	Jockey Club Community eHealth Care project http://www.jc-ehealth.hk/en/index.html https://www.hongkongairport.com/

Smart Airport

<https://www.hkairport-technovation.com/en/>

Three Runway System

<https://www.threerunwaysystem.com/en/>

8.4 News scripts

Jul 23, 2019	Smart Lampposts and privacy concerns http://www.ejinsight.com/20190723-smart-lampposts-and-privacy-concerns/
Jul 17, 2019	Hong Kong unveils plan to install 400 multifunctional lamp posts as part of smart city drive https://www.scmp.com/news/hong-kong/society/article/3018877/government-unveils-plan-install-400-multifunctional-lamp
May 20, 2019	HKT wins HK\$680 million-plus contracts for the procurement cum management, operation and maintenance of new generation of parking meter system https://www.hkt.com/About%20HKT/Press%20information/Press%20Information%20Detail?guid=9d1ab7d7b54da610VgnVCM1000006a8ba8c0____&language=en_US
Sep 19, 2018	Facial recognition technology installed at Hong Kong International Airport https://www.scmp.com/news/hong-kong/transport/article/2164901/facial-recognition-technology-installed-hong-kong
Apr 4, 2019	Hong Kong to implement electronic ID system https://www.smartcitiesworld.net/news/news/hong-kong-to-implement-electronic-id-system-4038
Sep 19, 2018	Why HKMA's new faster payment system is a big deal http://www.ejinsight.com/20180919-why-hkmas-new-faster-payment-system-is-a-big-deal/
Apr 2018	Hong Kong's urban planning problems must be addressed, experts say. Is Singapore's model the answer? https://www.scmp.com/news/hong-kong/economy/article/2141808/problems-hong-kongs-urban-planning-must-be-addressed-experts
Aug 2017	Hong Kong's rising number of aged buildings need facelifts https://www.scmp.com/property/hong-kong-china/article/2104785/hong-kongs-rising-number-aged-buildings-need-facelifts

- Apr 2018 Ombudsman criticizes water leaks costing HK\$ 530 m a year
<https://www.chinadailyhk.com/articles/238/189/230/1523984065733.html>
- Jun 2017 Why Hong Kong urgently needs to tackle its water problem
<https://www.hongkongfp.com/2017/06/20/hong-kong-urgently-needs-tackle-water-problem/>
- Aug 2018 'Smart' technology could get cars off the roads in Hong Kong and into parking spaces faster
<https://www.scmp.com/business/article/3023403/smart-technology-could-get-cars-roads-hong-kong-and-parking-spaces-faster>

8.5 Contacts

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W. <https://www.ogcio.gov.hk/en/>

Headed by the Government Chief Information Officer (GCIO), OGCIO is responsible for formulating information technology (IT) strategies, programs and measures and provide IT services and support within the Government to help sustain Hong Kong's position as Asia's leading digital city.

Hong Kong Productivity Council (HKPC)

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The Hong Kong Productivity Council (HKPC) is a multi-disciplinary organization established by statute in 1967, to promote productivity excellence through integrated advanced technologies and innovative service offerings to support Hong Kong enterprises.

Knowledge Dialogues

Contact person: Ms Waltraut RITTER

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A. P.O. 33976, Sheung Wan, Hong Kong

As an independent researcher, Ms Ritter engages in applied research and action learning projects around knowledge, innovation and intellectual capital that are difficult or new and require ideas, ingenuity and foresight to explore. Such research often emerges in the space between universities, society, and business, and requires boundary spanning between these different worlds.

Smart City Consortium

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E. gary.yeung@smartcity.org.hk / garyyeung@techtecture.com.hk

W. www.smartcity.org.hk

A. Blk A, 4/F Eastern Sea Industrial Building, 29 -39 Kwai Cheong Road, Kwai Chung, Hong Kong

SCC is a non-government and non-profit organization to facilitate the development of the smart city agenda in Hong Kong. SCC has provided multiple professional advice to policy formulation, which includes submitting a proposal for the development of smart city to the Government and holding meetings with different Government departments regularly to discuss the latest progress of the development. On 26 January, 2016, the Hong Kong Smart City Consortium signed a Memorandum of Understanding (MOU) with the Austrian Technology Corporation in Hong Kong.

Hong Kong Applied Science and Technology Research Institute Company Limited

Contact person: Ms Eunice CHENG, Director, Public Affairs

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W. <https://www.astri.org/>

A. 5/F, Photonics Centre, 2 Science Park East Avenue, Hong Kong Science Park, Shatin, Hong Kong

ASTRI has seven core competencies and technology divisions, namely: Mixed Signal Systems IC, Advanced Digital Systems, Electronics Components, Opto-Electronics, Intelligent Software and Systems, Security and Data Sciences and Communications Technologies.

ASTRI combines its ICT talents with sensors, intelligence, and next generation network and security technologies to improve the way the city operates, shares information and, ultimately, improves the quality of residents' lives. ASTRI develops various tools and platforms that enable Smart City technologies to seamlessly communicate with each other.

<https://www.astri.org/technology/smart-city/>

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Hong Kong Science Park is a living laboratory where innovative technologies are tested and applied, and valuable data and feedback are collected to enable future innovation. It is also piloted as a smart region to further Hong Kong's Smart City vision.

Urban Renewal Authority

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The URA is the statutory body to undertake, encourage, promote and facilitate urban renewal of Hong Kong, with a view to addressing the problem of urban decay and improving the living conditions of residents in old districts.

The Hong Kong Green Building Council Limited (HKGBC)

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HKGBC strives to promote the standards and developments of sustainable buildings in Hong Kong.

The Council aims to raise green building awareness by engaging the public, the industry and the government, and to develop practical solutions for Hong Kong's unique, subtropical built environment of high-rise, high-density urban area.

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