

Emails to government departments and their replies

(Re: The application of advanced technologies proposed in research)

A. Sample of Email

Dear Officers in xx Department,

I am a researcher from xxx, also one of the team members of the project titled "xxx". During our research, we have reviewed the existing literatures regarding the application of big data and human mobility analytics for smart city. We found that some advanced technologies and applications are related to xx, which is within the management scope of xx department. However, we are not that familiar with the works your department have done so far in the aspect of smart city development. Therefore, we email to ask your opinion about "how the advanced technologies proposed in researches can be applied in the real work?"

Questions are specified as follows: ...

B. List of questions sent to different departments

Department	Email	Question	Reply
Transport Department (TD)	Enquiry email as shown on official website	<p>1. About Route Planning of Public Transport What is the current procedure of route planning? How big data analytics could be applied to facilitate the planning of transport route and improve the efficiency of public transport system? E.g. researches use taxi GPS traces to explore the travel demand passengers, based on which bidirectional bus routes expecting the maximum number of passengers are planned.</p> <p>2. About Big Event Transportation Management What is the current strategy for managing the transportation during big event? How big data analytics could be applied to enhance the management? E.g. researches use vehicle trajectories to discover occurrences of big events from mobility patterns and reveal the temporal patterns of arrival and departure of event attendees.</p> <p>3. About Taxi Dispatching What is the current strategy for reducing the vacancy rate of taxis? How could big data analytics help to improve taxi management and dispatching? E.g. modeling of taxi behavior simulation with probe vehicle data helps to get deeper understanding of taxi behavior for further management.</p> <p>4. About Vehicle Crash Analysis How could big data analytics be applied to mitigate the risks of accidents in specified areas, particularly the junction black sites? E.g. models were developed to establish the relationships between the crash counts</p>	on 13/06/2019

		reported in a targeted zone and various contributing factors based on social media data.	
Hong Kong Police Force (HKPF)	Online contact form on official website	<p>5. About Crime Prediction</p> <p>Can crime be predicted with big data? E.g. in recent researches, aggregated human behavioral data captured from the mobile network infrastructure, in combination with basic demographic information, social media data, subway usage data, and taxi usage data were analysed to classify crime level and can be used to predict crime.</p>	on 21/05/2019
Department of Health (HD)	Enquiry email as shown on official website	<p>6. About Disease Control</p> <p>How could we apply big data analytics to mitigate the transmission of diseases? E.g. mapping intra-urban transmission risk of infectious diseases with big cell phone data, to design spatiotemporally resolved programs for disease control. We just wonder if there are any potentialities for applying such technologies/analytcs? If not, what may be the difficulties?</p>	on 26/07/2019
Environmental Protection Department (EPD)	Enquiry email as shown on official website	<p>7. About Air Pollution Exposure of Population</p> <p>How could big data analytics help to reduce pollution exposure? E.g. to measure the real-time population exposure using mobile- and station-based big data, considering the spatiotemporal variability of both population distribution and pollutants concentrations.</p> <p>8. About Electric Vehicle Adoption</p> <p>Can we use big data to evaluate the implementation of environmental policies? E.g. to assess whether the policy of energy-saving vehicles can be implemented, big data analytics of real mobility information was used to demonstrate the feasibility of adopting electric taxi cabs for the taxi fleet manager.</p> <p><u>Following-up questions after 1st-round reply:</u></p> <p>Many thanks for your response to the enquiry. In your response, it mentions the positive outcomes of big data analytics for improving air quality and the difficulties in obtaining air quality data from devices. As shown in EPD website, there are already many monitoring stations installed in HK, through which the data of air quality is collected and the Air Quality Health Index (AQHI) could be calculated. May I know is there any future plan to provide the large number of stationary or mobile devices?</p> <p>To evaluate the impact of urban environment on human health needs other sources of data such as population, building, planning, mobility, disease, etc. A latest paper of estimation of population exposure is attached as reference to show a possibility of integrating different data sources. May I know has EDP conducted any research or</p>	on 27/05/2019 & 05/06/2019

		<p>cooperated with other departments to analyse the influence of air quality on human daily life?</p> <p>Regarding EV, I am very glad to know the government has already done some work such as installing equipment and establishing public EV system. Here, I would like to share another latest article, which provides a model for calculating the spatio-temporal demand of electric energy required and the optimal location of charging infrastructure. However, similar to the air quality issue, the model is applicable only with qualified big data, even though the analysis will be helpful for policy adoption.</p>	
The Hong Kong Tourism Board (HKTB)	Online contact form on official website	<p>9~11. About smart tourism</p> <p>9. Can big data (e.g. from social media and mobile phone) be used to demonstrate the characteristics of tourists, attractions, and the tourism behavior? E.g. recent research has identified the hotspots in US and EU cities city based on information from geotagged photographs, which in turn discovers the power-law distribution of the attractiveness of tourist attractions.</p> <p>10. Can big data be used to elaborate the characteristics of the tourism market and facilitate the provision of tourism services? E.g. tourism market segmentation based on crowdsourced mobile phone data facilitates not only the traditionally applied market analysis, but also the provision of personalised tourism services as well as the provision of a higher level of service to visitors.</p> <p>11. Can big data analytics contribute to the Smart Tourism of HK? Focusing on Old Town Central in HK, we are conducting research with the data collected from social media to demonstrate the destination image of Old Town Central. Based on the tourists' preferences reflected in Instagram, the study aims to identify the perceived images of tourism destinations. However, how the results could be applied to improve tourism service is doubted since the users of Instagram could only represent proportional tourists.</p>	on 27/05/2019
Planning Department (PD)	Enquiry email as shown on official website	<p>12. About Land Use Function</p> <p>12. In urban planning, can big data (e.g. from vehicles trajectories, social media, points of interest and mobile phone) be used to demonstrate the characteristics of land use function and facilitate urban planning and design? E.g. recent studies have discovered land use clusters in land use pattern based on big data, not only the traditional residence and office area clusters, but also the new clusters of leisure-commerce and rush hour. Moreover, by involving the information of land use functions, the spatial variation of self-containment of employment and jobs-housing balance could be demonstrated. Three related references are attached. We</p>	on 20/06/2019

		just wonder if there are potentialities for applying such technologies/analytics? If not, what may be the difficulties?	
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C. Responses from departments

Question No.	Response
1. About Route Planning of Public Transport (TD)	<p>Under the current mechanism, franchised bus companies will submit proposals for service adjustment through the annual Route Planning Programmes ("RPP") to meet passenger demand. These proposals may include introduction of new routes, adjustment to the frequencies, operating hours and alignments of existing routes, as well as cancellation or amalgamation of routes to meet passenger demand. Franchised bus companies would also from time to time consider introducing special departures with service for specific periods only in response to passenger demand during peak hours.</p> <p>In formulating proposals for bus route rationalisation, the Transport Department ("TD") and franchised bus companies make reference to the Guidelines on Service Improvement and Reduction ("the Guidelines"), which were amended and promulgated by the TD after consultation with the Legislative Council in 2010. The Guidelines state that in approving any new bus service, the TD will consider the impact of such new service on the traffic conditions on major roads, and will as far as possibly refrain from providing long haul bus routes or routes that operate via busy districts such as Mong Kok, Tsim Sha Tsui, Central, Wan Chai, Causeway Bay, etc. Priority will be accorded to routes serving areas that are beyond the catchment area of existing railways or to railway feeders.</p> <p>Every year, the TD consults the Traffic and Transport Committees of relevant District Councils on the RPP proposals. The TD will duly consider all views canvassed and revise the implementation details as necessary before implementing individual proposals.</p>
3. About Taxi Dispatching (TD)	<p>Thank you for your email regarding the taxi dispatching.</p> <p>The Transport Department encourages the taxi trade to leverage on technology to enhance the operational efficiency and service quality, such as setting up or integrating taxi hailing application platforms so as to improve the operating environment.</p> <p>Thank you very much for your concern on taxi service in Hong Kong.</p>
4. About Vehicle Crash Analysis (TD)	<p>The Transport Department (TD) maintains an accident database sourced from the Police records of their investigation. The TD currently makes use of a computer programme which, by searching the accident data, identifies locations that are clustered with accidents and satisfy the criteria for an accident blacksite.</p> <p>With the identified accident blacksites, accident blacksite investigations will be carried out and traffic engineering measures will be implemented, with reference to the accident characteristics, to improve the road environment.</p>
6. About Disease Control	<p>Thank you for your email to the Department of Health (DH).</p> <p>After reviewing the remit of DH's various services, I regret to inform you that the question may fall outside the purview of DH. You may wish to contact Office of the Government Chief Information Officer (OGCIO) through the channels listed in their official website: Office of the Government Chief Information Officer (OGCIO).</p>

	<p>(Note: The response was received in July 2019 before the outbreak of COVID-19. In 2020, to achieve effective prevention and control of COVID-19, mobility trajectories of confirmed cases were published in the official website of https://www.coronavirus.gov.hk/eng/sitemap.html, including the buildings they lived and the flights/trains/ships/vehicles they have taken in the past 14 days).</p>
<p>7. About Air Pollution (EPD)</p>	<p>About Air Pollution Exposure of Population</p> <p>The application of big data analytics for air quality has a lot of positive outcomes. It can help to improve numerical modelling for air quality forecasting, enhance the air quality monitoring network for real-time air pollution exposure on a street-by-street basis and better understanding of the spatial distribution and transportation of the air pollutants for devising the air control policies to protect the public health, etc. However, the quality of the big data analytics highly depends on the availability of powerful and advanced technology at affordable cost for good quality measurements of air quality data by using a large number of stationary or mobile devices.</p> <p>Air quality monitoring</p> <p>The EPD operates a network of 16 air quality monitoring stations (AQMSs) in Hong Kong comprising 13 general stations and 3 roadside stations. Having considered the spatial distribution and the future development in the North District and Southern District, we plan to set up general AQMSs in these two districts by the end of this year/ early 2020. When these AQMSs commence operation, the number of AQMSs in the monitoring network would be increased to 18. While some lower cost air monitoring devices are capable of providing quality data, their operating cost is not much lower than that of our existing station. Thorough consideration is essential in planning for long term deployment of additional monitoring.</p> <p>Influence of air quality on human daily life</p> <p>We noted your research on the use of big data to reduce air pollution exposure of the population and we welcome your sharing of the results when available. Although EPD has not conducted any research in integrating different data sources to analyse real-time the influence of air quality on human daily life, we have conducted other studies relating to air quality and health. For details of the studies, please visit EPD's website¹.</p>
<p>8. About Electric Vehicle Adoption (EPD)</p>	<p>To support the development of Smart City, the Government plans to set up a smart system for the Government's public EV charging network. The features will include, but not limited to, instant electronic information on the status of chargers, payment system and management facilities for parking spaces equipped with chargers, etc. The feasibility of enabling reservation of parking space equipped with chargers will also be explored. The EPD is now installing equipment on public chargers in some Government car parks to test the real-time electronic information on the use of 100 chargers for public information through the Government Electronic Platform. The trial will be completed by the end of this year.</p>
<p>9~11. HKTB's initiatives on digital promotions</p>	<p>Strengthen public relations effort especially through collaboration with major international media</p> <p>The HKTB's DiscoverHongKong.com website, which recorded over 100 million page views in 2018, and its various social media accounts, which have</p>

¹ https://www.epd.gov.hk/epd/english/environmentinhk/air/study/rpts/air_study/rpts.html

and smart tourism (extracted from the shared document of “Work Plan for 2019-20”)

accumulated over 10 million fans and followers, provide a solid foundation for its digital marketing work. The HKTB will continue to promote Hong Kong’s diverse travel experiences through digital media, including internet and social media, by enriching the content of its digital platforms and strengthening collaboration with leading social and digital media players that boast extensive consumer reach and market penetration. Related work includes the followings

- (A) Leveraging Google’s various travel-related applications and functions, including Google Maps, Google Posts, Google Events, Google Trips and Destinations, the HKTB will provide visitors with all-round travel information throughout their journey, from pre-trip planning to exploring the city during their stay.
- (B) The HKTB will strengthen collaboration with TripAdvisor, a veritable social media platform for travellers, to provide users with content on Hong Kong’s diverse travel experiences and share visitors’ Hong Kong travel tales.
- (C) Through working with Facebook, the HKTB will encourage Facebook users to share their travel experiences in Hong Kong on their accounts and repost the related videos, texts and images to increase promotional effectiveness. Authentic user-generated content will be made use of to trigger interest in Hong Kong among other users.
- (D) In addition to airlines, online travel agencies and travel portals, online collaboration will be extended to partners in the catering and fast-moving consumer goods sectors to promote Hong Kong’s mega events and unique tourism products through thematic content. Lucky draws and quizzes will also be organised to drive sales of tourism products.

Build a smart travel platform with the latest technologies

In view of the popularity of digital tools among visitors for trip planning and destination exploration, the HKTB will transform its DiscoverHongKong.com website into a platform for “smart travel”, using new technologies. Related work has commenced and the upgrade of the DiscoverHongKong.com website is expected to be completed in 2020:

- (A) Revamping DiscoverHongKong.com
 - (i) More customised content will be introduced to users based on the data they provided and their browsing habits.
 - (ii) The HKTB will work with Google to create seamless integration among websites on desktop, mobile and tablet. The HKTB mobile app, My Hong Kong Guide, will be integrated with the HKTB website so that users can use Google functions like Google Maps Navigation and Google Trips and Destinations without downloading or installing the application. Push notifications will also be sent to users about travel information, such as attractions, mega events, and dining and shopping options near their current location, and related e-coupons offered by the local trade.
- (B) QR codes will be displayed at attractions for visitors to get more related information, such as historical background, interesting facts and recommended routes. Meanwhile, the VR and AR technologies, voice and video navigation and live streaming will be employed to enhance user interaction.

**12. About
Land Use
Function**

Thank you for sharing with us the research you are doing.

The research papers enclosed in your email are related to the application of big data in land use planning. Surely, this is an interesting topic and Planning Department (our department) has been exploring using such application to facilitate land use planning. However, the use of big data collected by telecommunications base stations has not yet particularly been explored by our department. Our department adopts a positive approach in collaborating with the academics in exploring new technologies to enhance planning work and the application of using big data is definitely one of them. We would be happy to have you, as the academics, sharing with us the ideas of applying such technologies in land use planning as well as the results of research work.