SMART TRANSPORTATION

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“Smart city” – the use of technologies to provide intelligent response to the needs of the city. *(Smart City and the Applications, 2011)*
What are the needs for developing a smart city in the future?

- **eService** (Government, Education, Healthcare, Tourism)
- **Multimodal Intelligent Transportation Systems**
- **Public Safety**
- **Alternative Energy System**
  - Solar Panel
  - Offshore Wind Farm
- **Environment-friendly Design Buildings**
- **Water/ Gas Distribution Management & Leak Detection**
- **Metering Management & Demand Response**
- **Smart House**
- **Emergency & Disaster Management**
  - Urban Flooding
- **Electric Vehicle Infrastructure**

Source: District of future
http://www.districtoffuture.eu/
Smart Transportation is About ……

Urban Planning

System Design, Management & Operation

Outcomes & Impacts

Smart City Planning
- Integrated development & spatial planning
- Transportation & traffic strategy
- Environment & public safety

Technologies & Urban Infrastructure
- Automation
- Real-time information
- Advanced control methods

Urban Multimodal Systems for High-Density Megacities

Smart Sensing and Computing
- Stationary & mobile data
- Urban informatics & data analytics

Smart Travel Behavior
- Data driven (Short-term)
- Infrastructure (Medium-term)
- Technology driven (long-term)

Smart Performance
- Efficient
- Resilient and reliable
- Safe
- Green and sustainable
Smart City Planning

- Is high-density development a solution to rapid urbanization?
- What are the enabling technologies and urban infrastructure to enhance sustainability, accessibility, mobility, and wellbeing?
Technologies & Urban Infrastructure

- How would autonomous vehicles modify fundamental traffic flow properties, and impact infrastructure design and urban form?
- How would electric vehicles interface with the smart grid in terms of energy distribution and storage?
What are the sensing strategies for collecting stationary and mobile sources of multi-modal traffic data and how are these data integrated and interpreted?

What are the computing strategies for centralized and distributed data transmission, processing, interfacing, analysis, sharing, dissemination, and storage, in the context of big data arena?
Smart Travel Behavior

Data driven

- How would accurate, reliable and timely multi-modal traffic information affect travelers’ decision making processes?
- How would future technologies, such as autonomous self-driving vehicles, electric vehicles, multi-modal traffic information, massive and robust traffic control affect activity and mobility patterns?

Technology driven

Infrastructure driven

Short-term

Medium-term

Long-term
Better mobility and less congestion

Web services and Apps

crowd-sourcing information

V2V and V2I technologies

Smart vehicles

Uncertainties and disruptive conditions

How to develop a cost-effective but highly resilient multi-modal transportation system in response to increasingly frequent and serious natural and manmade disruptions?

How would the above smart developments help to maintain safe, healthy, rapid, reliable, comfortable, convenient, affordable, equitable, and environmentally compatible mobility of mankind?
Hong Kong’s Role

Excellent Test-bed with Various Multi-modal Transport Modes

Hong Kong Universities’ QS Rankings in Related Disciplines

- Civil and Structural Engineering (9th, 11th, 17th, 35th)
- Computer Science & Information Systems (8th, 12th, 18th)
- Engineering - Electrical & Electronic (19th, 22nd, 25th, 37th)
- Engineering - Chemical (27th)
- Engineering - Mechanical, Aeronautical & Manufacturing (31st, 46th)
- Architecture / Built Environment (12th, 13th, 47th)
- Geography & Area Studies (19th, 46th)
- Economics & Econometrics (30th, 36th, 49th)