Inter-Modal Transport Data-Sharing Programme

Use Case Development Workshop

• 28 October 2019
• Room 206, HKUSPACE Admiralty Learning Centre
• 2:00 - 5:30 pm
Dr John Ure
Director of the Technology Research Project (TRP) of the University of Hong Kong and co-Director of TRPC Pte Ltd (Singapore)
Ir Andrew Pickford
Managing Partner, Transport Technology Consultants, Hong Kong
Key themes in Transport today (1 of 2)

“Motor vehicles and drivers’ relationships with them are likely to change significantly in the next ten to twenty years, perhaps more than they have changed in the last one hundred years.”

“[We’re] on the threshold of a period of dramatic change in the capabilities of, and expectations for, the vehicles we drive…. [and] improving highway safety, increasing environmental benefits, expanding mobility, and creating new economic opportunities for jobs and investment.”

Source: Preliminary Statement of Policy Concerning Automated Vehicles, National Highway and Traffic Safety Administration (NHTSA)
Key themes in Transport today (2 of 2)

- Intelligent, Connected and Autonomous Vehicles
- Crowdsourcing and big data analytics
- Sustainable smart cities
- Multimodal transport of people & goods
- Safety for drivers & vulnerable road users
- Policies, standards and harmonization
- Innovative pricing and Travel Demand Management (TDM)
- Cybersecurity & data privacy

Source: ITS World Congress, Singapore 22-25 October 2019
Hong Kong: Smart City Blueprint

Source: Smart City Blueprint (2017)
https://www.smartcity.gov.hk/
Unlocking the silos

Impact:
•Disconnected
•Not customer focused / transactional
•Inefficient
•Closed systems, not available to externally stimulated innovation
•No ability to enable cross-system innovation
•No ability to scale rapidly

Based on BSI PAS 181:2014 Smart City Framework – Guide to establishing strategies for smart cities and communities
Hong Kong: Smart Mobility Roadmap

Source: Smart Mobility Roadmap, July 2019:
Hong Kong: Smart Mobility Roadmap

Identifies 5 ‘key objectives’:
• Safe
• Informative
• Green
• Mobile
• Accessible

Key themes in Transport today
... and our focus includes

• Intelligent, Connected and Autonomous Vehicles
• Crowdsourcing and big data analytics
• Sustainable smart cities
• Multimodal transport of people & goods
• Safety for drivers & vulnerable road users
• Policies, standards and harmonization
• Innovative pricing and Travel Demand Management (TDM)
• Cybersecurity & data privacy

Source: ITS World Congress, Singapore 22-25 October 2019
Use Case Development Workshop
Participants: 34 organisations

- Arup
- BEC
- University of Chicago
- Citybus / NWFB Limited
- Civic Exchange
- Clean Air Network
- Consumer Council
- Daimler Mobility AG
- Deon Digital Hong Kong Limited
- Eco Counter
- EMSD
- Ernst & Young Transactions Ltd
- HKIA
- HKLland
- HKTaxi App Limited
- HKU
- HKU SPACE
- KMB
- Kwoon Chung Bus
- Mother App
- Mott Macdonald
- MTR
- New World First Ferry Services
- Octopus
- OGCIO
- PCPD
- PICO
- Siemens
- Star Ferry
- Thales Transport & Security
- Transport Department
- Via Transportation
- Visa
- Walk DVRC
Use Case Development Workshop

Agenda

1.15 to 2:00  Registration
2:00 to 2:15  Introduction to workshop goals and structure
2:15 to 2:45  Brief introduction to each case: each lead organisation (5 mins per group)
2:45 to 3:45  Focus groups working on use cases
3:45 to 4:15  Tea break
4:15 to 4:45  Presentation of results: (5 x 5 min each and Q&A)
4:45 to 5:15  Whole group discussion
5:15 to 5:30  Next steps and conclusion
Use Case Development Workshop
5 themes and focus groups:

Use Cases:
1. On-demand mobility services
2. Inter-modal data sharing (bus-ferry, minibus/taxis/tram-MTR, bus-bus)
3. Integrating active transportation data (walking and cycling) into mobility data platforms

Application Example:
4. New services development at HKIA through data sharing

Enablers:
5. Regulatory innovation for intermodal data-sharing: process and potential for regulatory sandbox
Use Case Development Workshop

Structure

Each of the 5 themes includes:

- Background
- Proposed focus area
- Deliverables

1 hour discussion and 30 minutes to prepare the deliverables – so please keep to time!
Waltraut Ritter
founder of Knowledge Dialogues
Use Case Development Workshop

Introductions from lead organisations

5-minute presentations from:

1. Robin Pilling, Daimler Mobility
2. David Adelman, Via
3. Joy Kwan, Thales
4. Jean Francois Rheault, Eco Counter
5. Mark Barnekow, University of Chicago
New services development at the HKIA: An integrated mobility perspective for transportation and data sharing

Workshop on inter-modal transportation data-sharing in HK, 28.10.2019

Robin Pilling, Head of Product, Daimler Mobility Blockchain Factory
Manual integration and centralization are the reasons why no integrated mobility ecosystem exists today.

Source: Survey among industry leaders conducted by Bearing Point Institute (2017): Mind the Gap – closing the gap between multimodal theory and reality
To enable integrated mobility offerings, open standards within a decentralized mobility platform are needed.

- A pluggable platform for companies, enabling on demand B2B business processes and deals
- Based on open & democratized protocols and open mobility business software
- Businesses can define their own offering through their customer channel by additionally providing services or assets from other companies
- Together with business and technology partners a Minimum Viable Ecosystem (MVE) needs to be established.
New service development at HKIA: An integrated mobility perspective for transportation and data sharing

(1) What **product service** do we want to jointly build for inter-modal transportation in HK?

(2) Which **technical capabilities** would our service offering need?

(3) Which **partners** have the expertise and are interested in building such technical capabilities?

(4) How would a **governance** and operating model needs to look like?
Backup
New service development at HKIA: An integrated mobility solution for airport transportation and data sharing

<table>
<thead>
<tr>
<th>Mobility mode</th>
<th>Relevant data</th>
</tr>
</thead>
</table>
| Car, bike, scooter, moped-sharing | • # of vehicles  
• Sticking to parking rules  
• Sticking to speed limits  
• Usage of docks/racks  
• Cluttering  
• Propulsion/ engine type |
| Taxi/Ridehailing/ Ridesharing   | • # of vehicles  
• Average speed/ traffic jams/ congestion  
• Emission levels  
• Propulsion/ engine type  
• Parking data  
• Accidents |
| Individual motorized traffic    | • # of trips  
• Accidents |
| Individual biking and walking   | • Network/ stations  
• Tariffs  
• Frequency  
• Punctuality  
• Customer satisfaction  
• Other KPIs |

City mobility platform

City objective function based on long-term goals

Day-to-day mobility management
• Transparency and monitoring  
• Intelligent routing based on objective function  
• Machine-learning for better prediction

Blockchain-enabled multimodal citizen app

Long-term infrastructure planning
Customer (citizen) app

Mobility Service Provider Integration examples:
- Public transport (routing, schedule, stop information, station monitor, ticketing);
- Car-, bike- and scooter sharing;
- Ridehailing and ridesharing/ DRT

- Real-time information (e.g. traffic and PT data) will be critical
- Intermodal routing is an optional part of the solution
- Ecology information as e.g. carbon footprint could as well be integrated as e.g. credit system

Note: Scope of citizen app can go beyond mobility, e.g. by integrating traffic situation and mobility recommendations or PT discounts
On-Demand Mobility in Hong Kong
Use-case workshop | October 2019

David Adelman | VP of Global Partnerships
david@ridewithvia.com
Re-imagining public transit

Private Car

Taxi

Public Transit

Car Sharing

Ride-hailing

On-Demand Transit

Private Car

Taxi

Public Transit

Car Sharing

Ride-hailing

On-Demand Transit
ON-DEMAND ADDRESSES FIXED TRANSIT CHALLENGES

Challenges of fixed-route transit

- **Coverage**
  Many areas are underserved by transit

- **Convenience and reliability**
  Consumers now expect fast, quality service

- **Capital**
  Infrastructure budgets are squeezed

Strengths of on-demand model

- **First/last mile**
  Connect riders to local transit (i.e. BRT feeders)

- **Tech-enabled and dynamic**
  Appeal to younger, more demanding riders

- **Affordable to city and riders**
  Pilot with limited upfront costs, and easily adapt
A variety of use cases

**FIRST MILE / LAST MILE**
Complement existing public transit network and increase access to transit hubs

**TRANSIT DESERTS**
Provide high-quality service in areas underserved by public transit

**PARATRANSIT**
Reduce operating costs and improve rider experience

**CORPORATE / UNIVERSITIES**
Provide transport for commutes and intra-campus trips while reducing parking demand

**SCHOOLS**
Reduce costs thanks to smarter routing, and improve experience for parents and students
On-demand is now established in major cities around the world
Overview of Via and ViaVan presence

90+ Deployments
20+ Countries
2m+ Rides/month
250+ Engineers

*Launching soon*
$551 billion

Global market for Direct Response Transit (DRT) in 2030, up from $3 billion in 2017

50%

annual growth rate

“Demand-responsive shuttles are modelled such that they are **complementary to public transit**; hence, public-private partnerships will be vital to widen the market and direct resources effectively…

Efficient shared mobility that offers convenience along with increasing utilization of assets and the overall efficacy of the model would be **instrumental in revolutionizing the mobility market.**”

Source: Frost & Sullivan, ‘Strategic Analysis of the Global Demand-Responsive Transit (DRT) Market, Forecast to 2030’
How will we get people in Hong Kong to embrace shared rides?

QUALITY SERVICE

ATTRACTIVE PRICING

SMART CAMPAIGNS

Get $20 of Ride Credit when they ride! Your friend will get $20 too. Sweet

Share via text

Share via email

Share via Facebook
Why pilot soon?

- **Gain experience** | Understand what it takes to be successful, and get ahead of the curve
- **Optimize the service** | Tweak the algorithms and adapt the service to local market needs
- **Prepare for autonomy** | AVs will start with public fleets. Will Hong Kong be ready?
# Agenda for today’s workshop discussion

**Challenges**
- What specific HK challenges can on-demand address?
- What are the challenges we’ll face when implementing on-demand?

**Opportunities**
- What use-cases are most attractive for a POC?
- Which are easiest to implement first?

**Enablers**
- Which stakeholders should we engage to ensure success?

**Next steps**
- What needs to happen between today and POC launch?
Thank you.

David Adelman | VP of Global Partnerships
david@ridewithvia.com
Integrating Active Transportation Data

Why count pedestrians to improve walkability in Hong Kong?

Jean-Francois Rheault
VP International Operations
October 28th, 2019
About Eco-Counter

Design & manufacture bike and pedestrian counters

Work with cities to develop data collection programs

More than 18,000 counters in 55 countries
What is Active Travel?

Simple  Everywhere  Not Connected
Surveys / Travel Diaries / App

BICYCLING TODAY

Percent: Bicycle to Work (2017)
- Less than 1%
- 1% - 5%
- 5% - 10%
- 10% - 15%
- Greater than 15%

Bike Network
Volume Counts

DOWNTOWN
Toronto

PEDESTRIAN VOLUMES

PEAK VOLUMES
12:30 P.M. - 1:30 P.M.
NORMAL WEEKDAY

Why Count Pedestrians?

Plan

Maintain

Communicate
Where to Count Pedestrians?

- On sidewalks
- On bridges and overpasses
- Parks and trails
- Pedestrian streets
- In retail areas
Types of Count Duration

- Manual Counts
- Short Term Counts
- Permanent Counts
Case Study – San Francisco

San Francisco Pedestrian Volume Model

Prepared for: San Francisco Municipal Transportation Authority & San Francisco County Transportation Authority
Prepared by: Fehr & Peers and University of California, Berkeley, Center for Transportation Education Resource Center (CATEC

May 2011
San Francisco – Pedestrian Involved Collisions
Identifying Collision Rate

Collision rate = \frac{\text{Number of collisions in a specified time and place}}{\text{Amount of exposure in a specified time and place}} \quad (1)

Table 6: Alameda Corridor Pedestrian Activity for Project Safety Sensitivity

<table>
<thead>
<tr>
<th>Day</th>
<th>Amount of Exposure</th>
<th>Amount of Collisions</th>
<th>Collision Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MON</td>
<td>450,000</td>
<td>3</td>
<td>0.0067</td>
</tr>
<tr>
<td>TUE</td>
<td>500,000</td>
<td>3</td>
<td>0.0060</td>
</tr>
<tr>
<td>WED</td>
<td>400,000</td>
<td>2</td>
<td>0.0050</td>
</tr>
<tr>
<td>THU</td>
<td>300,000</td>
<td>1</td>
<td>0.0033</td>
</tr>
</tbody>
</table>

4th Street & Market Weekly Pedestrian Volume Pattern
San Francisco – Pedestrian Collision Risk
Proposed Deliverables for the Focus Group

1. Identification of data, potential methods of collection and statement of data that is not currently collected (with examples) relating to walking and cycling, including the infrastructure on which they depend;

2. Minimum requirements on data that would make it usable to operators of public transport, PTIs and the regulator, whilst ensuring meaningful integration of walking and cycling into the transport hierarchy; and

3. Potential POCs
Thank you

Jean-Francois Rheault
VP International Operations, Eco-Counter
jfr@eco-counter.com
City of San Francisco
Meeting the Smart City Challenge
A Focus on Innovation and Collaboration
October 28, 2019
OUR VISION
Get the greenest, most affordable trip choice in 2 minutes and easily get anywhere in the city within 20 minutes.
<table>
<thead>
<tr>
<th>Ownership Model</th>
<th>On-Demand Services</th>
<th>Shared On-Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>All modes operate independently. Congestion, pollution, collisions, waste, noise. Public space dominated for parking and roads. Lack of funding to maintain system. Lack of supply means long wait times and high prices for on-demand. Lack of social equity.</td>
<td>Supply greatly increased for on-demand services but still out of reach for most. Sharing becomes viable. Car/bike and pool services emerge reducing costs. Shared Delivery services emerge reducing costs for suppliers and receivers.</td>
<td>Most vehicles are now shared vehicles, modes are integrated, trips costs are low enough for most users to participate. Supply is closer to being satiated with shared services and parking demand peaks. TaaS is preferred way of navigating city.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shared &amp; Connected</th>
<th>SECAV Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected technology optimizes shared services. Collision avoidance technology and speed reduction reaching Vision Zero. Parking and street use demand reduces enough to re-purpose some space to temporary uses. More equitable transport. Built out bike network.</td>
<td>SECAV services are fully optimized. Fatalities eliminated Vision Zero goal met. Pollution, noise, costs, impacts minimized. Social equity and access significantly improved. Parking structures repurposed for affordable housing, streets become shared spaces for all.</td>
</tr>
</tbody>
</table>

The city will explore different types of partnerships at each phase to guide outcomes and help drive costs down so that all users can participate.
Transportation Network Indicators

- Collisions & Fatalities
- Affordability
- Streets/Parking
- Congestion
- Reliability
- Emissions/Noise

Phase 1: Traditional Transportation
Phase 2: On-demand Rides
Phase 3: Shared On-demand Rides
Phase 4: Shared Electric & Connected Rides
Phase 5: Shared Electric Connected & Automated Rides

Point when streets are repurposed
Point when re-develop parking lots to housing
SF Open Data

Urban Analytics

Performance Measurement: Reports, Forecasts, etc.
Real-Time Controls: Traffic Management Decisions
Proactive Management: Predictive Decision Analysis

Roadside Sensors
Other Data Sources
Connected/Automated Vehicles
Pavement Sensors
4. ANNOTATED PRELIMINARY SITE MAP

A City within an Innovation Region
This cycle of continuous regional innovation starts with CAV testing in Concord and Silicon Valley then scaled deployment in San Francisco, Oakland and San Jose. The SFMTA and its local and regional partners will work together to ensure our existing infrastructure and resources are leveraged to maximize the outcomes.

1. CROSSTOWN COMMUTER
- NOW: Nicole school route via shared mobility app
- Carpool/shared parking hub
- Uses peer app to share car and earn money
- Muni Transit Signal Priority improves reliability to get to work
- Saves money and time
- FUTURE: Uses SECAV option to deliver groceries and do other errands

2. SUBURBAN VISITORS
- NOW: Mango and Steve use "Lifestyle" app to offer carpool ride to Fort Mason.
- Routing software links to ITS on freeway to create a "virtual pooling" lane.
- Queue priority on the highway, leave highway routed to smart street using Van Ness.
- Drop-offs passengers at hub.
- Use credit toward priority parking for shared vehicle.
- Drive home with another set of passengers.
- FUTURE: Trip is SECAV

Use Cases-Local and Regional Connections
Travel is local and regional with great in/out-bound commutes from each direction. The city traffic system is managed with a traffic management center, CCTV traffic cameras, changeable message signs and other ITS elements. The city public transit network (local and regional rail, bus and ferry) includes corridors with transit signal priority. The four use-cases aim to highlight some of the local and regional transportation challenges we hope this grant can help solve.

3. LATE NIGHT TRANSPORTATION TO EAST BAY
- NOW: Juan uses app to get micro-transit stop and ticket to destination
- Route utilizes smart street ITS to get on the freeway ramp from Nob Hill to on-ramp in SoMa with priority access for shared vehicles
- FUTURE: trip is with SECAV, so price comes down

4. DELIVERY IN CITY
- NOW: Michael uses app to get loading zones.
- Parklet sensors notify that space available to dock.
- Route uses smart streets to get to the locations.
- App routes Sarah with beacons and Wi-Fi understands topography to choose least inclines to deliver them.
- FUTURE: SECAV van is shared and it can deliver for him more place

Figure 8. Annotated Preliminary Site Map
San Francisco Municipal Transportation Agency (SFMTA) will lead the team and be responsible for legislation and governance process described below.

- **Legislation:** the implementation of changes to existing land uses will be led by SFMTA (for removal and reconfiguration of transportation features) in partnership with the Planning Department and Public Works.

- **Governance Process:** SFMTA’s Office of Innovation will convene a Smart City Working Group led by the SFMTA. The agency is likely to foster partnerships with a lead Consultant and with City Innovate, a San Francisco-based non-profit entity. City Innovate is opening a civic innovation lab and will be organizing the public/private partnerships including private investment and data programs. The Smart City Working Group will meet to go over the three focus areas, TaaP, TaaS and Smart Streets. The City team will develop the policy, while the academic representatives (e.g., UC Berkeley’s Transportation Sustainability Research Center) will provide research, and evaluation, and roadmaps to replicability.

- **Regional Partnership:** The Bay area is polycentric and city partnerships offer synergies that we feel would greatly leverage this grant opportunity. Working with MTC, the CAV research and development in Concord in the east bay, linked with the site testing in San Jose with the Silicon Valley partners, and then deployment in San Francisco then Oakland, San Jose and beyond creates a continuous cycle of innovation.

We have firm commitments from UC Berkeley’s ITS teams, MIT’s Media Lab and commitment in concept from our shared mobility and CAV/ICT providers as shown below. These partnerships will be codified upon being selected as a finalist. We will bring a “World-Class” team that includes innovators and globally recognized partners to support the deployment.
<table>
<thead>
<tr>
<th>Agency Partners</th>
<th>Community &amp; Business Partners</th>
<th>Research &amp; Data</th>
<th>Shared Mobility Providers</th>
<th>Connected &amp; Automated Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Departments</td>
<td><strong>Community Engagement:</strong> Community Partners through the Community Mobility Challenge City Innovate (Public-Private Partnerships), TaaS Pilots, Smart City Infrastructure</td>
<td>ITS UC Berkeley, PATH: Partners for Advanced Transportation, Technology Transportation Sustainability &amp; Research Center, MIT Media Lab Waze, Zen Drive</td>
<td><strong>Carshare:</strong> Zipcar &amp; Carma (City Carshare) <strong>Bikeshare:</strong> Motivate Bay Area Bikeshare <strong>Transportation Network Companies:</strong> Uber, Lyft, Shuddle <strong>Scootershare:</strong> Scoot <strong>Pooling:</strong> Carma <strong>e-Hail Taxi:</strong> Flywheel <strong>Microtransit:</strong> Chariot</td>
<td><strong>CAVs:</strong> Adelphi, BMW, GoogleX, Zoox, Cruise, GM, Ford, Tesla. <strong>ICT:</strong> Systems Integrated, Bosch, Siemens, Technology</td>
</tr>
</tbody>
</table>