

Smart City Solution Mobility in Kowloon East

—team 5





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PROBLEM

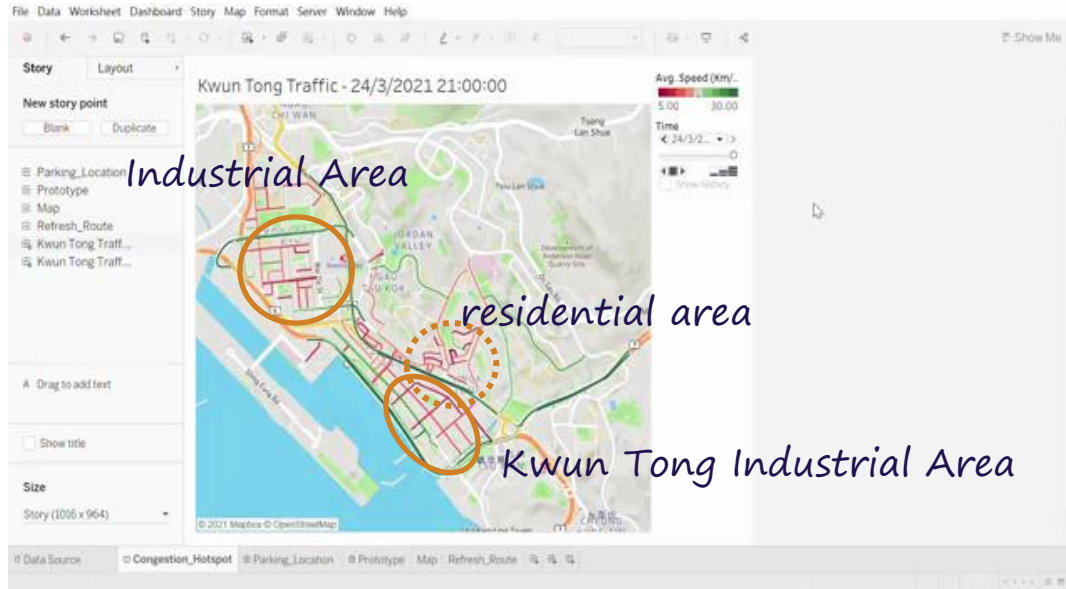
Kowloon East (KE) is undergoing urban revitalization into the second core business district (CBD) of HK. However, the public is complaining about the traffic especially in the congested Kwun Tong of KE.



年共接獲近2.5萬宗投訴及建議，按年減少24.6%，其中71%、約1.8萬宗屬公共交通服務。不過，去年共接獲666宗與交通擠塞有關的投訴，按年大增53.1%，其中以觀塘區最為嚴重，共有92宗投訴，按年大增76.9%。

PROBLEM

1. Congestion Hotspot

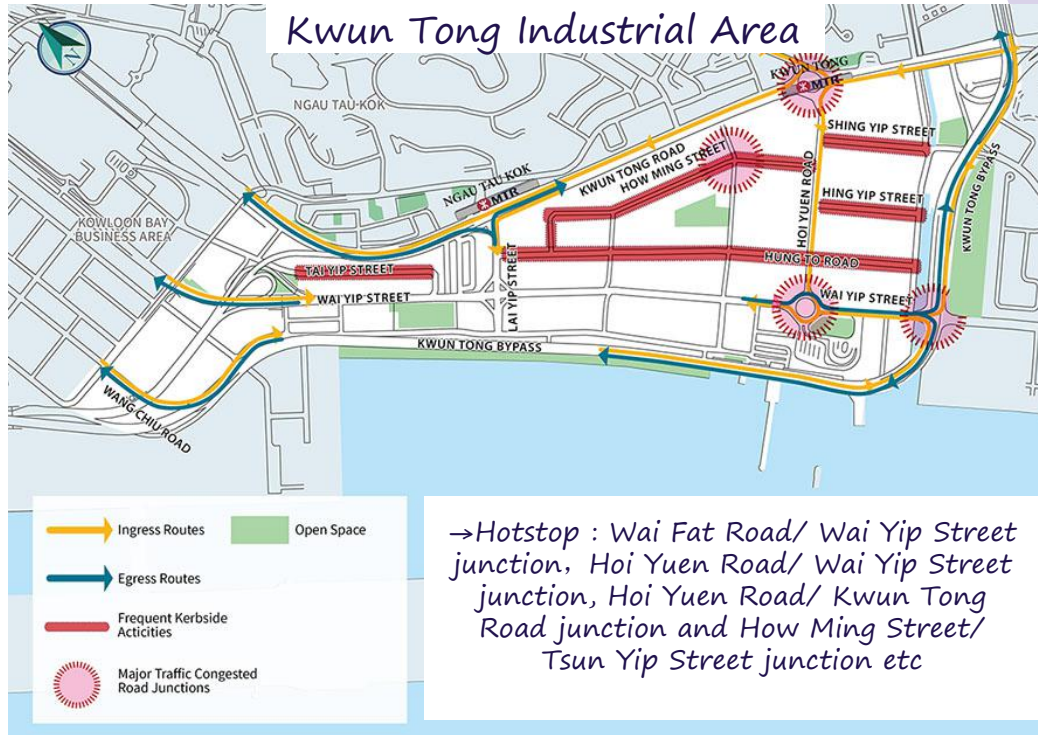


historical average traffic conditions
(from 7 a.m. to 9 p.m.)



PROBLEM

1. Congestion Hotspot



PROBLEM

2. Vehicle classification and occupancy --Monday to Friday

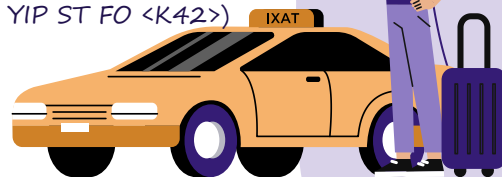
Time		Class of vehicle									
		Motor	Private	Taxi	Private	PLB	Goods veh.		Non	Fr. Bus	
		Cycl	Car	LB			Light	M & H	Fr. Bus	SD	DD
0700-0800	Pro	5.5	37.1	17.9	2.7	5.2	17.2	5.2	2.7	0.1	6.2
0800-0900	Pro	6.3	44.2	11.1	1.1	3.8	18.1	3.4	1.7	0.1	6.3
0900-1000	Pro	6.3	42.1	11.3	0.8	3.8	22.8	6.9	1.5	0.1	6.5
1000-1100	Pro	6.7	34.5	11.7	0.8	2.9	25.5	7.9	0.7	0.1	5.1
1100-1200	Pro	6.7	34.5	10.4	1.1	3.3	28.5	7.7	0.9	0.1	4.8
1200-1300	Pro	6.4	36.8	10.0	1.4	3.3	26.9	6.3	1.0	0.1	4.9
1300-1400	Pro	6.8	34.5	18.5	0.8	2.9	28.2	6.5	0.8	0.1	4.9
1400-1500	Pro	6.8	36.7	17.5	0.8	2.3	28.0	6.5	1.2	0.1	4.1
1500-1600	Pro	6.9	36.1	17.7	2.2	2.4	26.3	6.7	1.1	0.1	4.6
1600-1700	Pro	6.6	36.2	18.1	2.1	2.4	24.9	5.2	2.2	0.1	5.2
1700-1800	Pro	6.1	44.9	11.4	2.2	3.6	17.3	3.7	1.6	0.1	5.2
1800-1900	Pro	6.7	54.3	11.0	0.4	4.4	10.4	3.4	1.6	0.1	5.8
1900-2000	Pro	6.7	57.6	11.6	0.2	3.9	9.7	2.1	1.4	0.1	5.8
2000-2100	Pro	6.2	49.9	11.3	0.1	4.8	8.6	1.4	0.7	0.1	7.0
2100-2200	Pro	6.3	47.3	11.8	0.0	5.6	7.2	1.9	0.7	0.0	6.3
2200-2300	Pro	1.1	44.0	33.5	0.5	5.9	4.6	2.2	1.0	0.1	6.5
16 hours	Pro	3.5	41.7	18.4	1.1	3.7	19.7	5.0	1.3	0.1	5.5

KWUN TONG BYPASS
(from KAI YAN ST to LUNG CHEUNG RD)

Time		Class of vehicle									
		Motor	Private	Taxi	Private	PLB	Goods veh.		Non	Fr. Bus	
		Cycl	Car	LB			Light	M & H	Fr. Bus	SD	DD
0700-0800	Pro	2.9	55.1	13.7	3.5	1.8	13.3	3.0	4.3	0.0	2.5
0800-0900	Pro	2.6	56.3	12.3	0.6	0.8	15.4	5.2	1.9	0.0	2.9
0900-1000	Pro	2.3	51.6	11.9	0.7	1.1	23.1	6.1	1.2	0.0	2.8
1000-1100	Pro	2.2	48.5	11.0	0.8	1.3	24.4	7.9	0.7	0.0	2.2
1100-1200	Pro	2.8	44.3	11.8	1.5	1.7	24.8	8.9	0.7	0.0	2.5
1200-1300	Pro	2.8	48.3	11.5	2.1	1.0	22.5	6.4	0.9	0.0	2.5
1300-1400	Pro	2.0	45.9	12.9	2.1	0.9	23.9	8.8	1.2	0.0	2.3
1400-1500	Pro	2.3	46.4	12.5	0.3	0.7	25.4	7.7	1.4	0.0	2.2
1500-1600	Pro	2.5	48.9	12.5	1.9	0.8	23.7	5.6	1.3	0.0	1.9
1600-1700	Pro	2.1	51.4	11.8	1.9	0.8	20.9	4.6	1.5	0.0	2.1
1700-1800	Pro	2.4	54.1	11.9	1.7	0.8	18.2	3.6	1.8	0.0	2.4
1800-1900	Pro	2.7	72.4	11.6	0.3	0.9	9.2	1.5	1.1	0.0	2.3
1900-2000	Pro	2.8	70.8	11.0	0.1	0.9	8.5	0.7	0.9	0.0	3.3
2000-2100	Pro	3.1	74.0	11.2	0.1	1.3	5.4	0.6	0.2	0.0	2.9
2100-2200	Pro	4.1	62.1	11.7	0.0	1.4	6.1	0.3	0.3	0.0	3.6
2200-2300	Pro	3.0	66.7	18.5	0.0	0.9	6.6	0.8	0.3	0.0	3.2
16 hours	Pro	3.4	55.9	12.7	1.1	1.0	17.4	4.6	1.3	0.0	2.6

KWUN TONG RD
(from PING SHEK EST EASTERN END to WAI YIP ST FO <K42>)

→Private car account for a large proportion



PROBLEM

3. Car Park Distribution

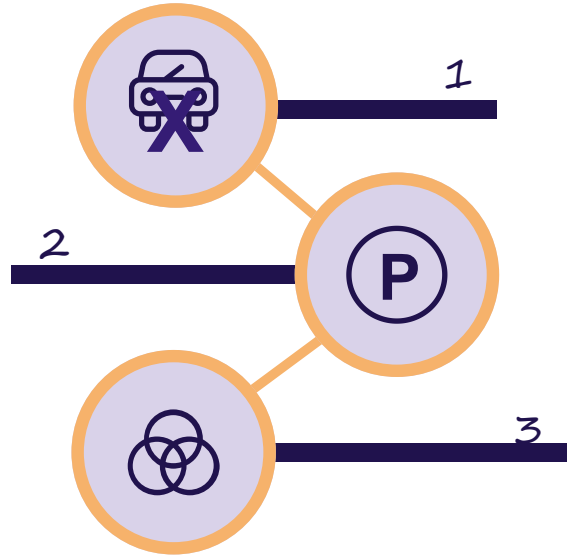


→ Most car parks are located in the congestion points



SOLUTIONS

Set up some **new car parks** far from the congestion roads and near the Green Way Network (an example).



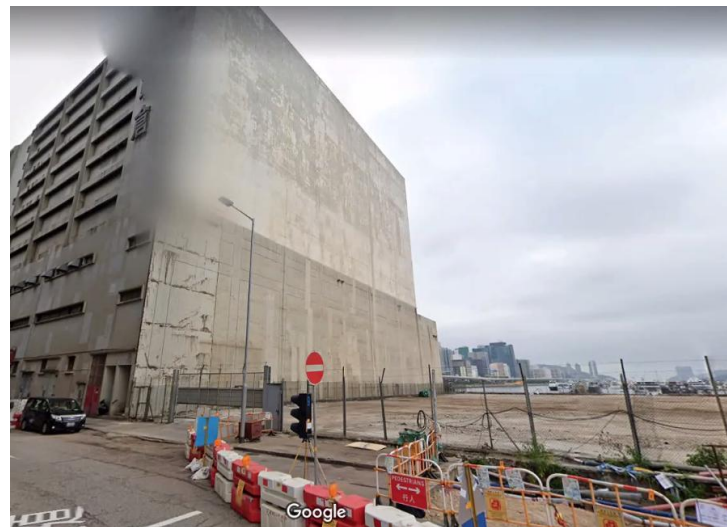
Add **road access restriction** on the identified congestion hotspot (industrial area in Kwun Tong starting from Hoi Yuen Road), to reduce the numbers of private cars on road in peak hours.

Promote using **e-scooters + multiple transport modes** in a journey.
→ Set e-scooters renting service in the car parks.
→ Introduce an **app** helping e-scooter users to plan their journey.

New Car Park Example



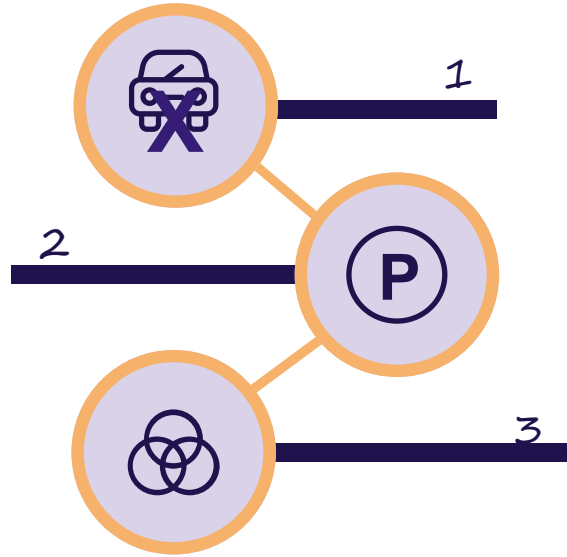
Future GreenWay Plan by Government



Street View

SOLUTIONS

Set up some **new car parks** far from the congestion roads and near the Green Way Network (an example).



Add **road access restriction** on the identified congestion hotspot (industrial area in Kwun Tong starting from Hoi Yuen Road), to reduce the numbers of private cars on road in peak hours.

Promote using **e-scooters + multiple transport modes** in a journey.
→ Set e-scooters renting service in the car parks.
→ Introduce an **app** helping e-scooter users to plan their journey.

Smart Journey

--Mobile App



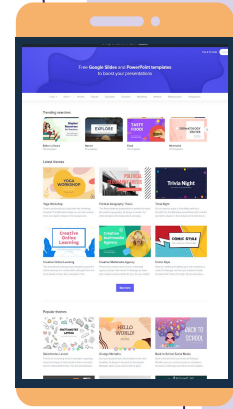
Easy parking

Using technology like image analysis, machine learning, AI on the real-time vacant parking space information, combining with the traffic congestion situation, help customers choose a right place to park.

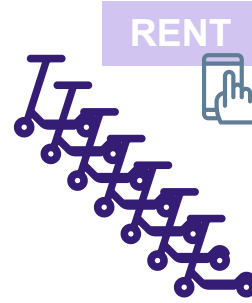


E-scooter service

- (1) E-scooters rental service
- (2) Journey planner combining other transport modes with e-scooters, and customers can choose the fastest or the properest way to get to the destination.
- (3) Other services like e-scooters sales, maintenance, and license applying.



Model



CUSTOMER PROFILE



Private car drivers

who want to look for car parks
under the restriction hours or
serious traffic congestion



E-scooter users

who want to plan their journey with
e-scooters or have alternative routes
under heavy traffic

PROFIT MODEL



E-scooters rental income

RENTAL
SERVICE



The revenue received by
advertisers for placing
advertisements in app




ADVERTISING



Pro+ features ...

MEMBER
SERVICE

COMPETITIVE ANALYSIS

<i>App</i> <i>Function</i>	Google Map	HKeMobility	Smart Journey
	✓	✓	✓
	✗	✗	✓
	✗ (in HK)	✗	✓

A man with a beard, wearing a purple baseball cap and a purple polo shirt, is smiling and looking out the window of a white van. He is holding a smartphone in his hands. The background shows a blurred city street. The image is decorated with purple and orange abstract shapes in the corners.

Prototype Showing
in Tableau

THANKS

Do you have any questions?

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RESOURCES

PICTURES

- p5: https://www.ekeo.gov.hk/walkablekwuntong/1st_stage_key.html
- p7: <https://www.google.com/maps/>
- p9: <https://www.legco.gov.hk/yr20-21/english/panels/dev/papers/dev20210126cb1-447-5-e.pdf>

DATA

- n6: https://data.gov.hk/sc-data/dataset/hk-td-tis_7-traffic-flow-census
- 

CONTRIBUTION



CHENG, Wing Kit

Problem Identification, Solution and
Prototype Design, Progress Update



GAO, Jingqi

Prototype Design



WENG, Yuxuan

Problem Identification, Solution Design



MA, Xinyi

Data Collection



LEI, Lin

Data Collection, PPT, Presentation