

Bicycle Injury Prevention Program in Tuen Mun District

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Collaboration

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Outline

- Introduction
- Methodology
- Results and Findings
- Promotions and Interventions
- Key messages

Introduction

Background

- Cycling is increasingly popular in Europe and North America
- Cycling is not the primary mode of commuter transport in Hong Kong
- Cycling is mainly used for recreational purposes in Hong Kong
- Cyclists in Hong Kong are exposed to a high risk of injury and fatality in road crashes

Introduction

Objectives

- To identify the hazardous road locations for bicycle accidents in Tuen Mun District
- To propose some remedial measures to reduce bicycle accident and injury risk

Introduction

Scientific approach to enhance and promote cycling safety

- Team (community leaders, clinicians, university academics)
- Scientific analysis (engineering, medical, geography)
- Promotions and publicity
- Interventions
- Evaluations

Methodology

Data of bicycle accidents and injured cyclists

Traffic Information System (TIS) (2005-2010)

- Accident location
- Accident day and time
- Involvement of vehicle, pedestrian, and bicycle
- Age of bicyclist
- Injury severity
- Helmet use

Methodology

Identification of bicycle hot zones

Geographical Information System (GIS) technique

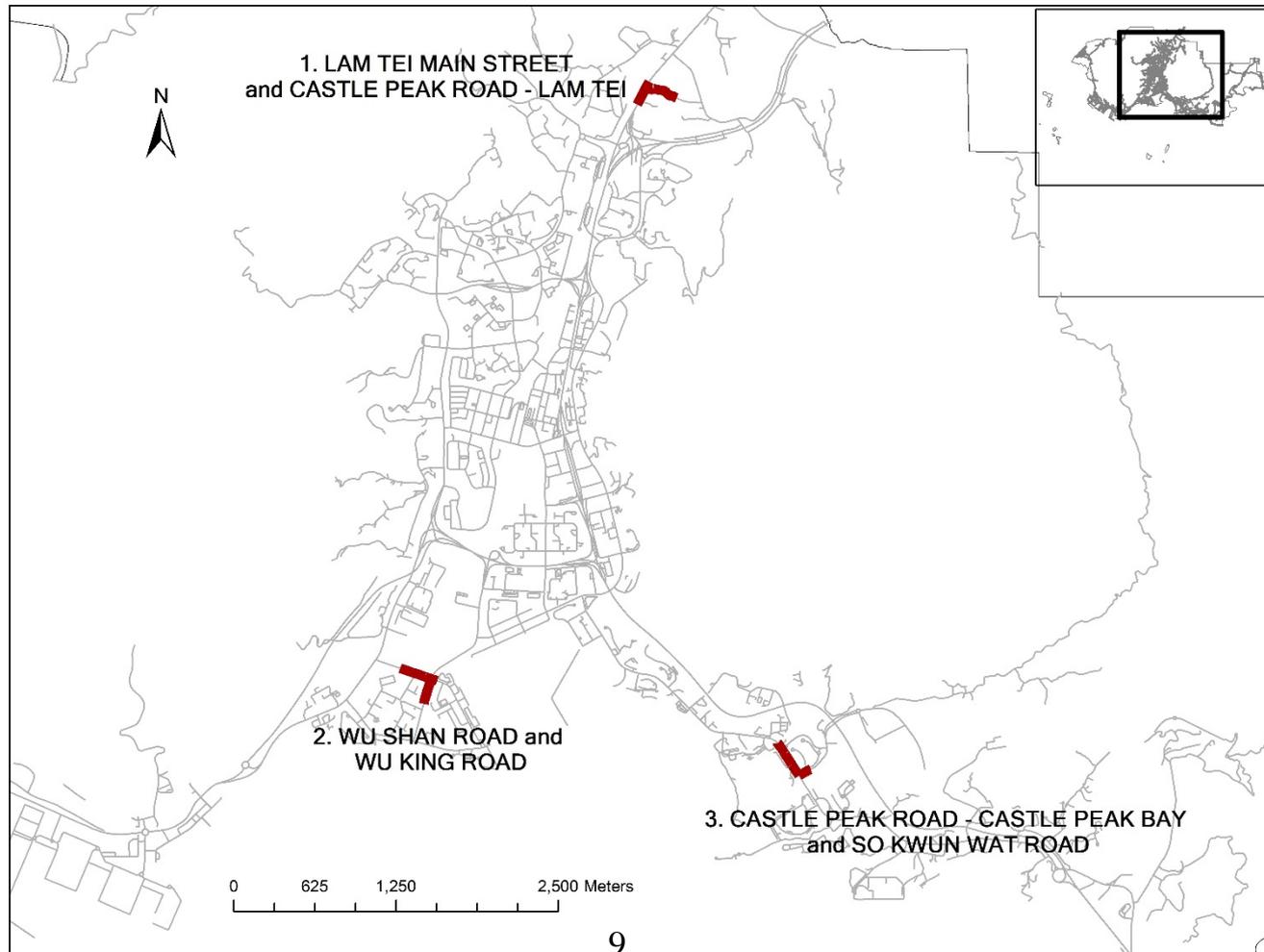
Results & Findings

Bicycle accident hot zone analysis

- 26 candidate zones with 4+ bicycle crashes were screened out
- **3 bicycle accident hot zones** in Tuen Mun with 4+ bicycle crashes in each of the both periods were identified
 - **Castle Peak Road (Lam Tei) and Lam Tei Main Street**
 - **Wu Shan Road and Wu King Road**
 - **Castle Peak Road (Castle Peak Bay) and So Kwun Wat Road**

Results & Findings

Bicycle accident hot zones



Methodology

Site investigation using engineering perspectives

- Geometry of cycle tracks
- Pavement surfaces
- Traffic signs and markings
- Traffic composition
- Behavior of road users (include drivers, cyclists and pedestrian)

Results & Findings

Bicycle accident hot zone analysis

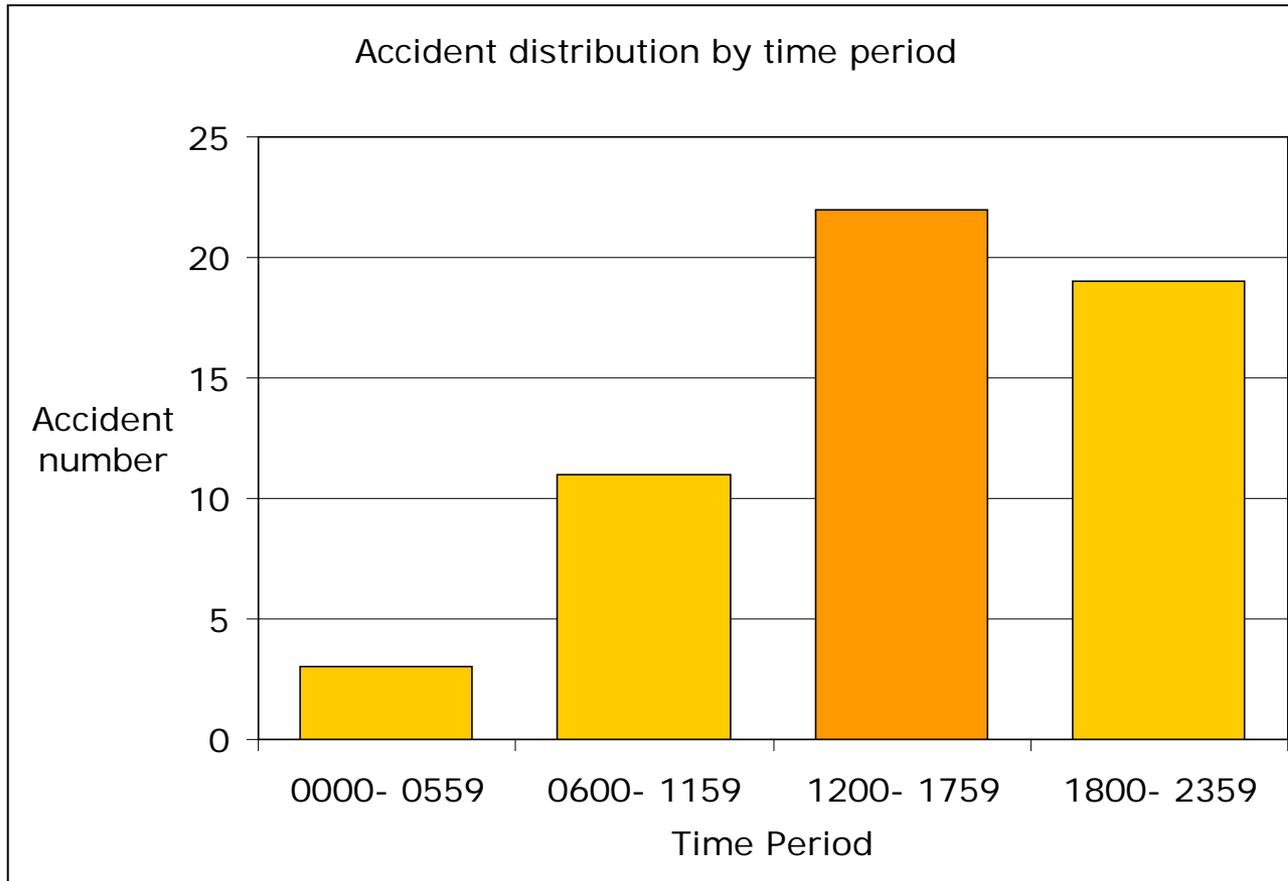
Number of bicycle crashes at hot zones in 2005-2010

Bicycle accident hot zone		All bicycle crashes	All injured cyclists	Killed & severely injured cyclists
1	Castle Peak Road (Lam Tei) & Lam Tei Main Street	22	17	5
2	Wu Shan Road & Wu King Road	20	18	3
3	Castle Peak Road (Castle Peak Bay) & So Kwun Wat Road	13	12	1
Overall		55	47	9

Results & Findings

Diagnosis of bicycle accidents

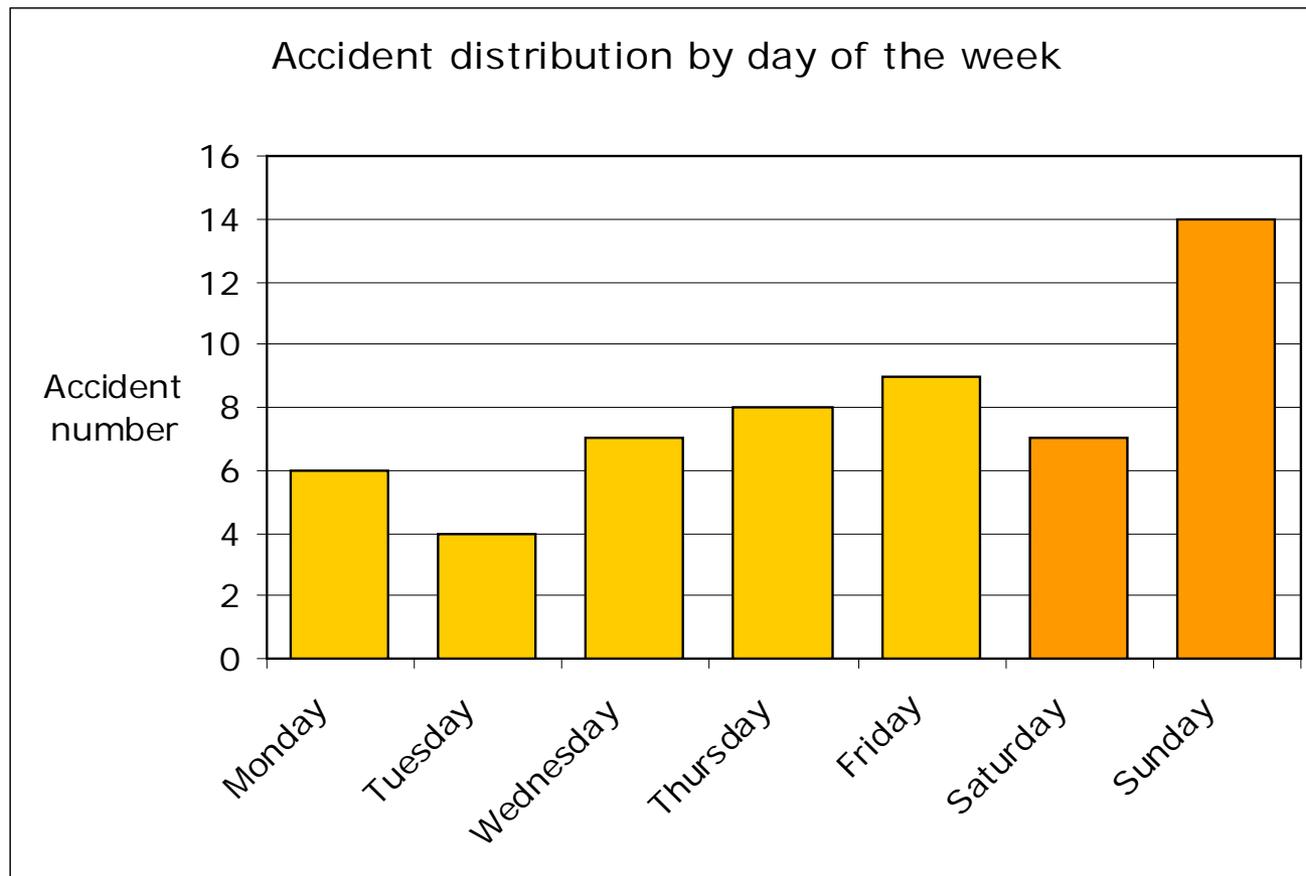
Accident distribution by time period



Results & Findings

Diagnosis of bicycle accidents

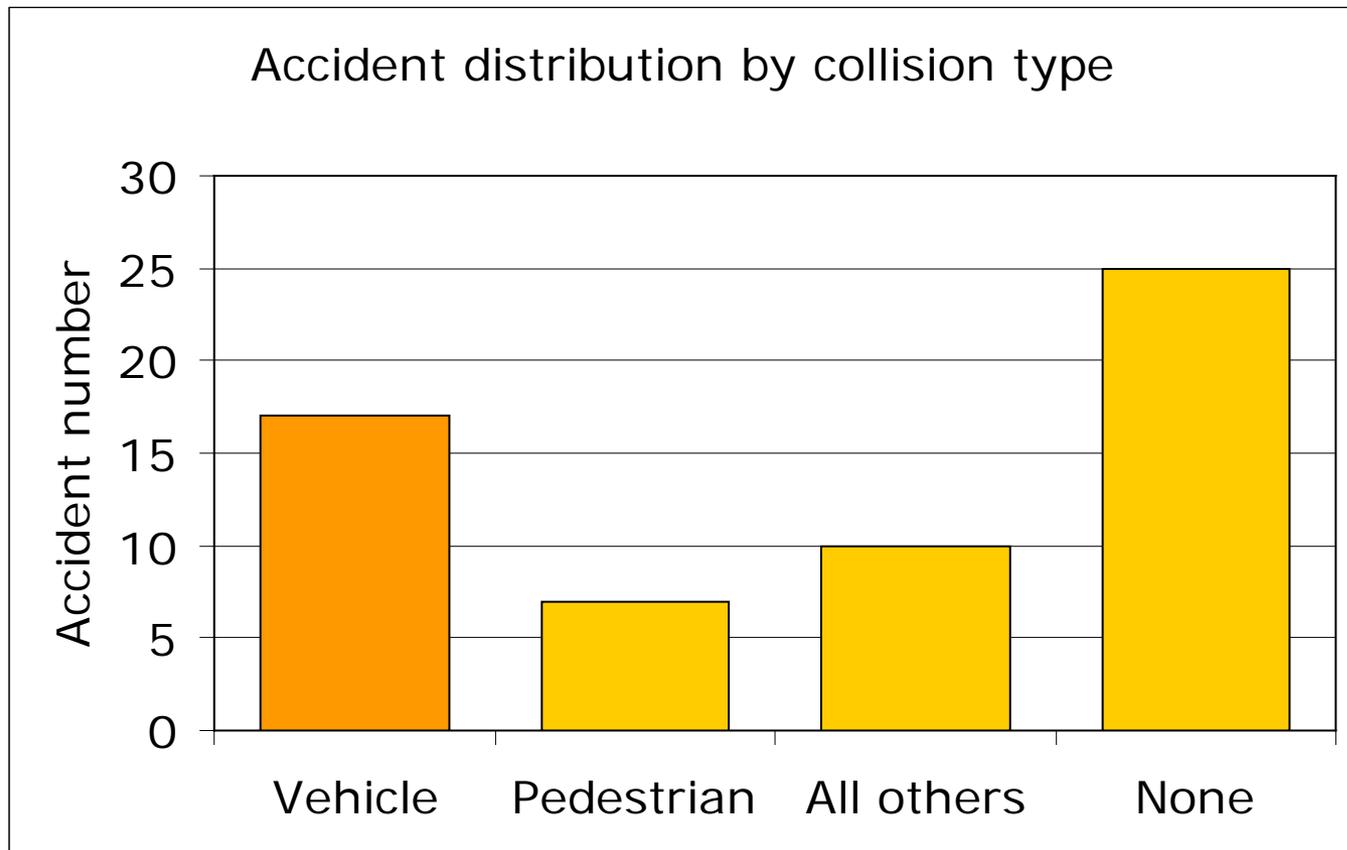
Accident distribution by day of the week



Results & Findings

Diagnosis of bicycle accidents

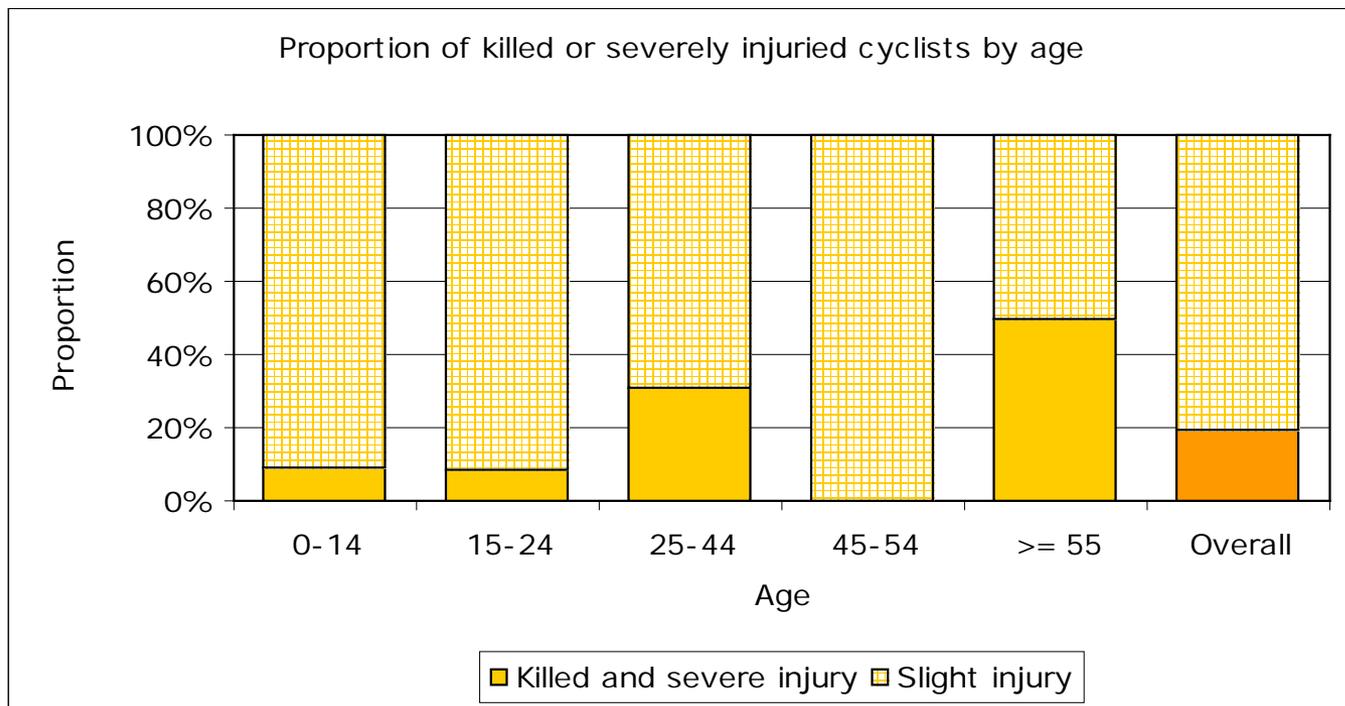
Accident distribution by collision type



Results & Findings

Diagnosis of injured cyclists

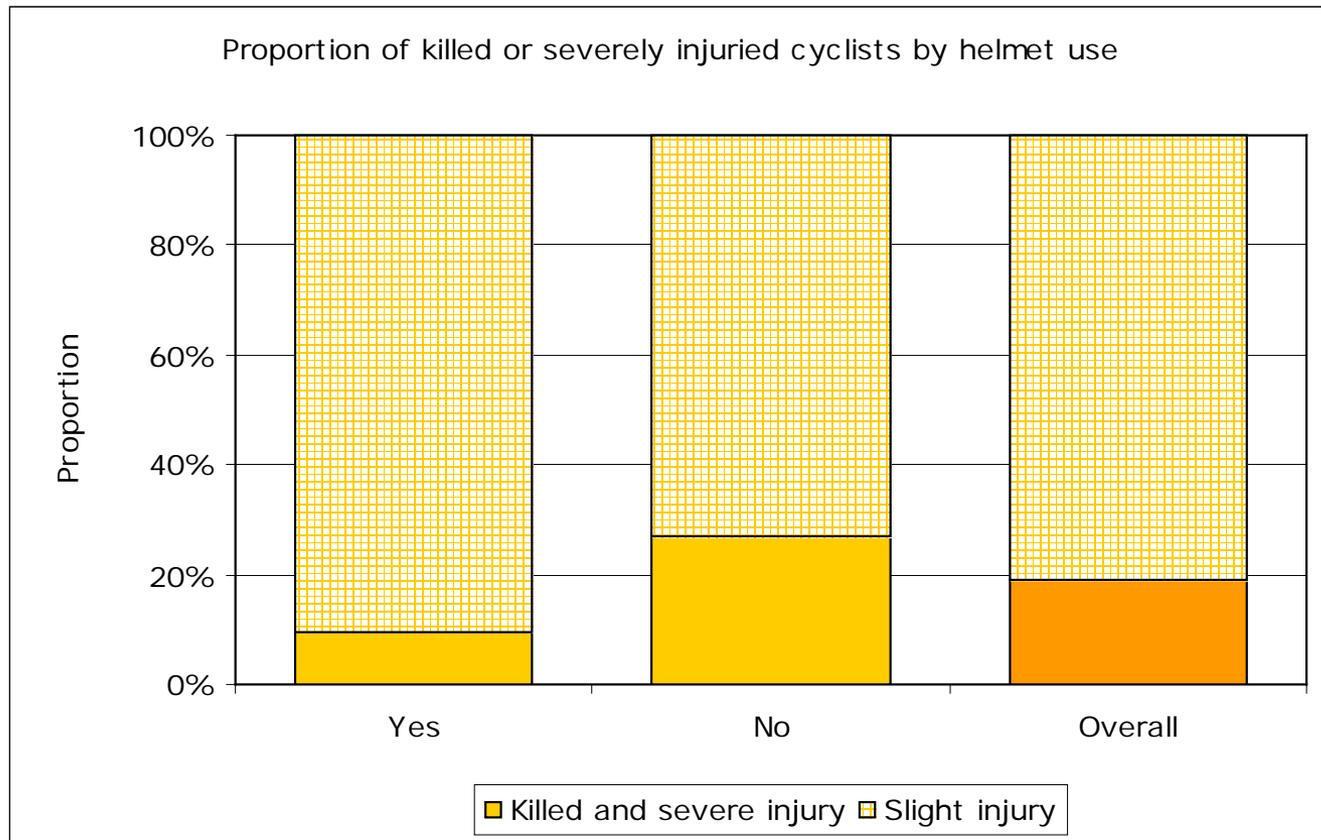
Proportion of killed or severely injured cyclists by age



Results & Findings

Diagnosis of injured cyclists

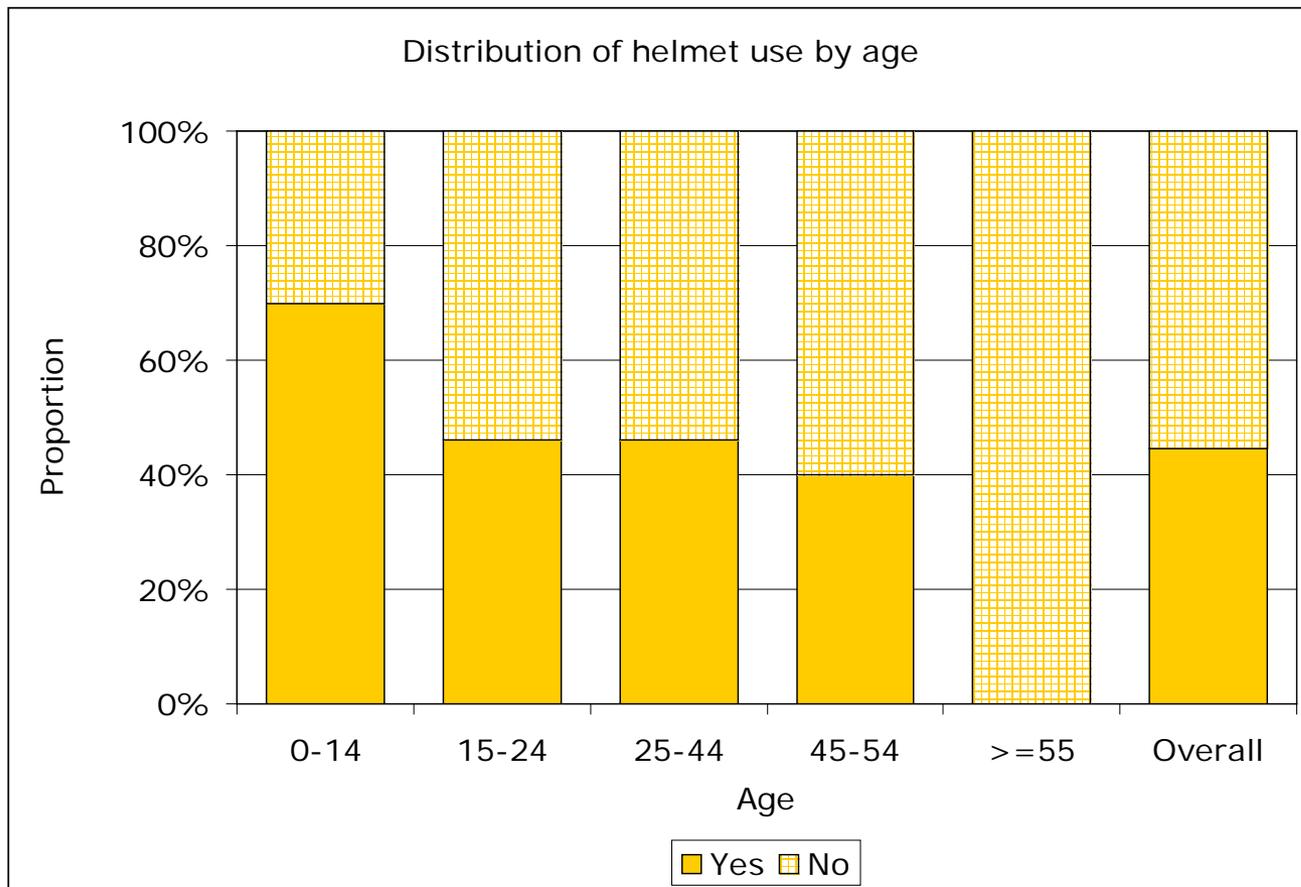
Proportion of killed or severely injured cyclists by helmet use



Results & Findings

Diagnosis of injured cyclists

Proportion of helmet use by age



Results & Findings

Diagnosis of injured cyclists

Proportions of killed or severely injured cyclists and helmet use by age

Age	All injured cyclists	Killed or severely injured cyclists (%)	Helmet use (%)
<15	11	1(9.1%)	7(63.6%)
15-24	12	1(8.3%)	6 (50.0%)
25-44	13	4(30.8%)	6(46.2%)
45-54	5	0(0.0%)	2(40.0%)
>54	6	3(50.0%)	0(0.0%)
Overall	47	9(19.1%)	21(44.7%)

Methodology

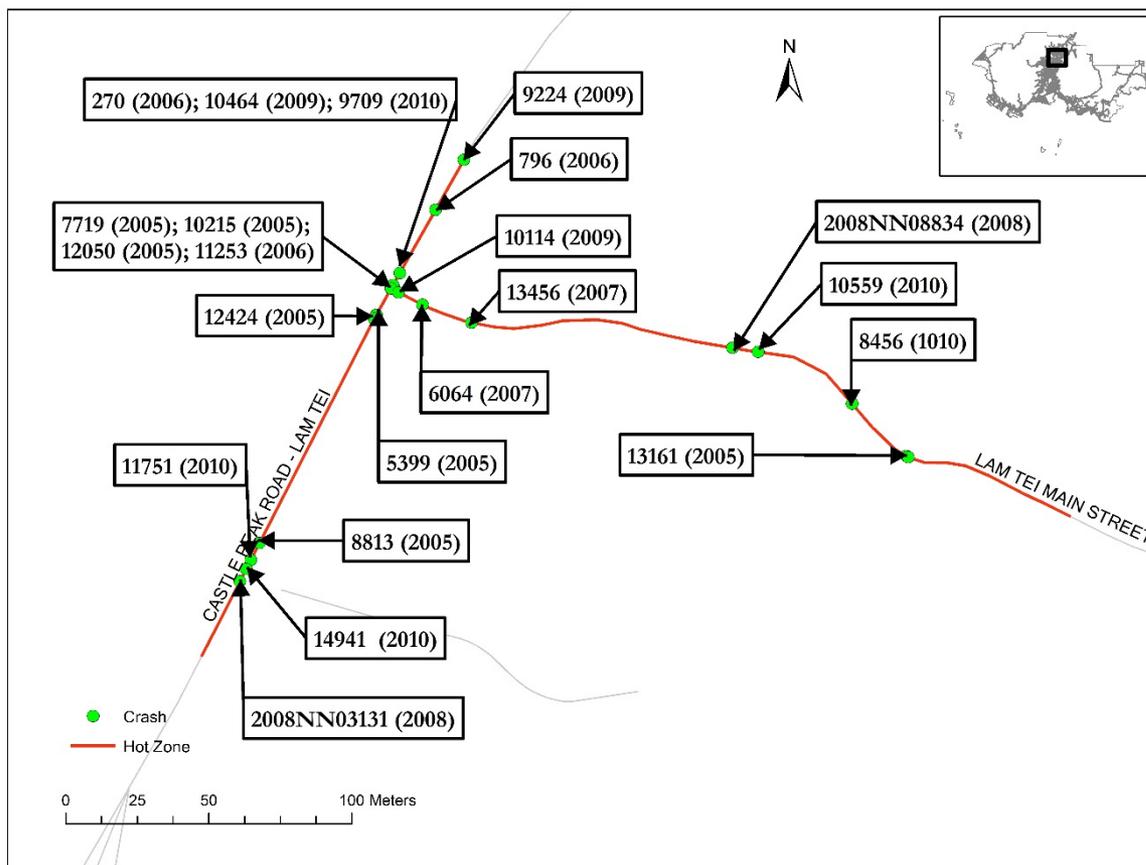
Site investigation using engineering perspectives

- Geometry of cycle tracks
- Pavement surfaces
- Traffic signs and markings
- Traffic composition
- Behavior of road users (include drivers, cyclists and pedestrian)

Results & Findings

Site investigation

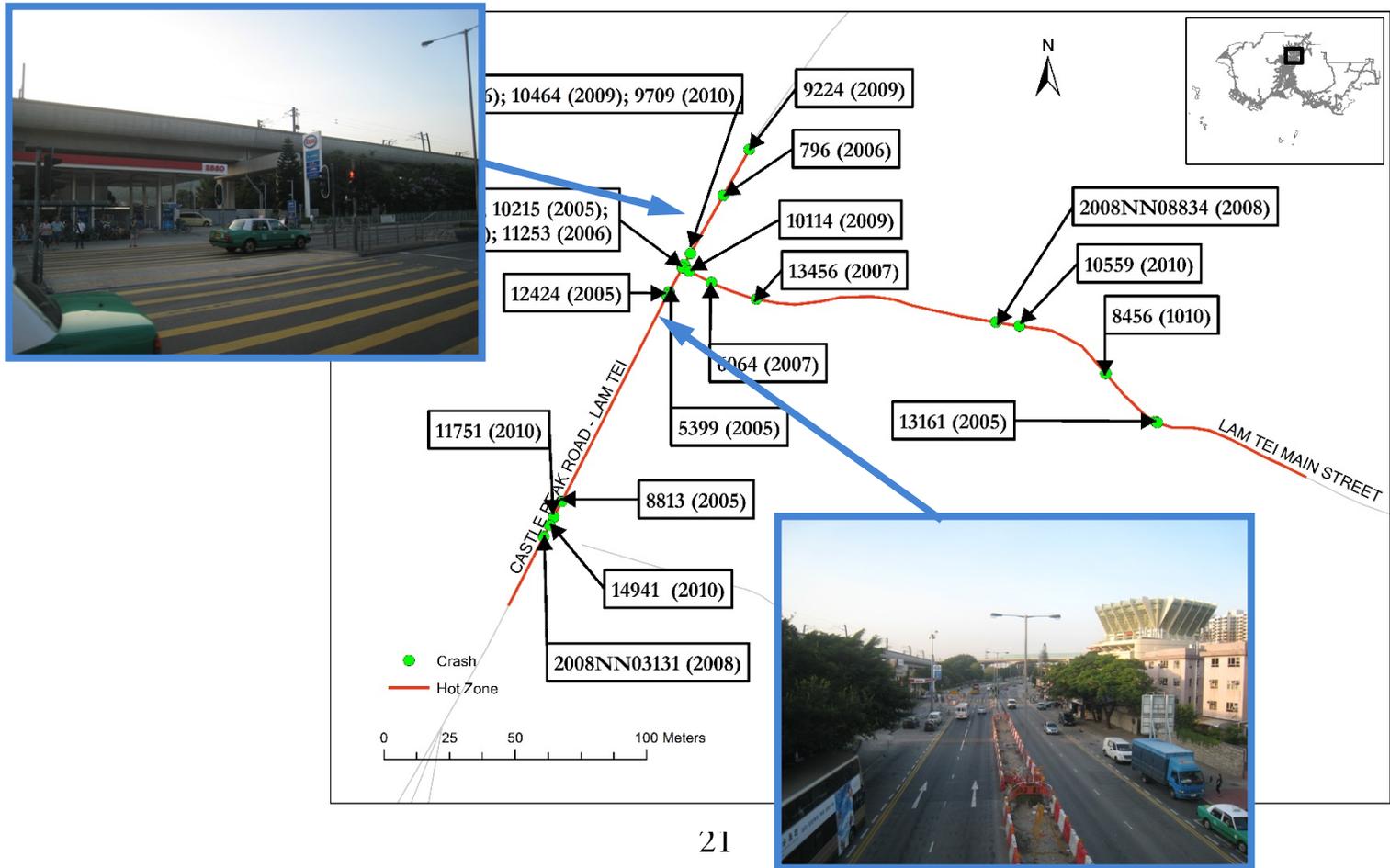
Castle Peak Road (Lam Tei) & Lam Tei Main Street



Results & Findings

Site investigation

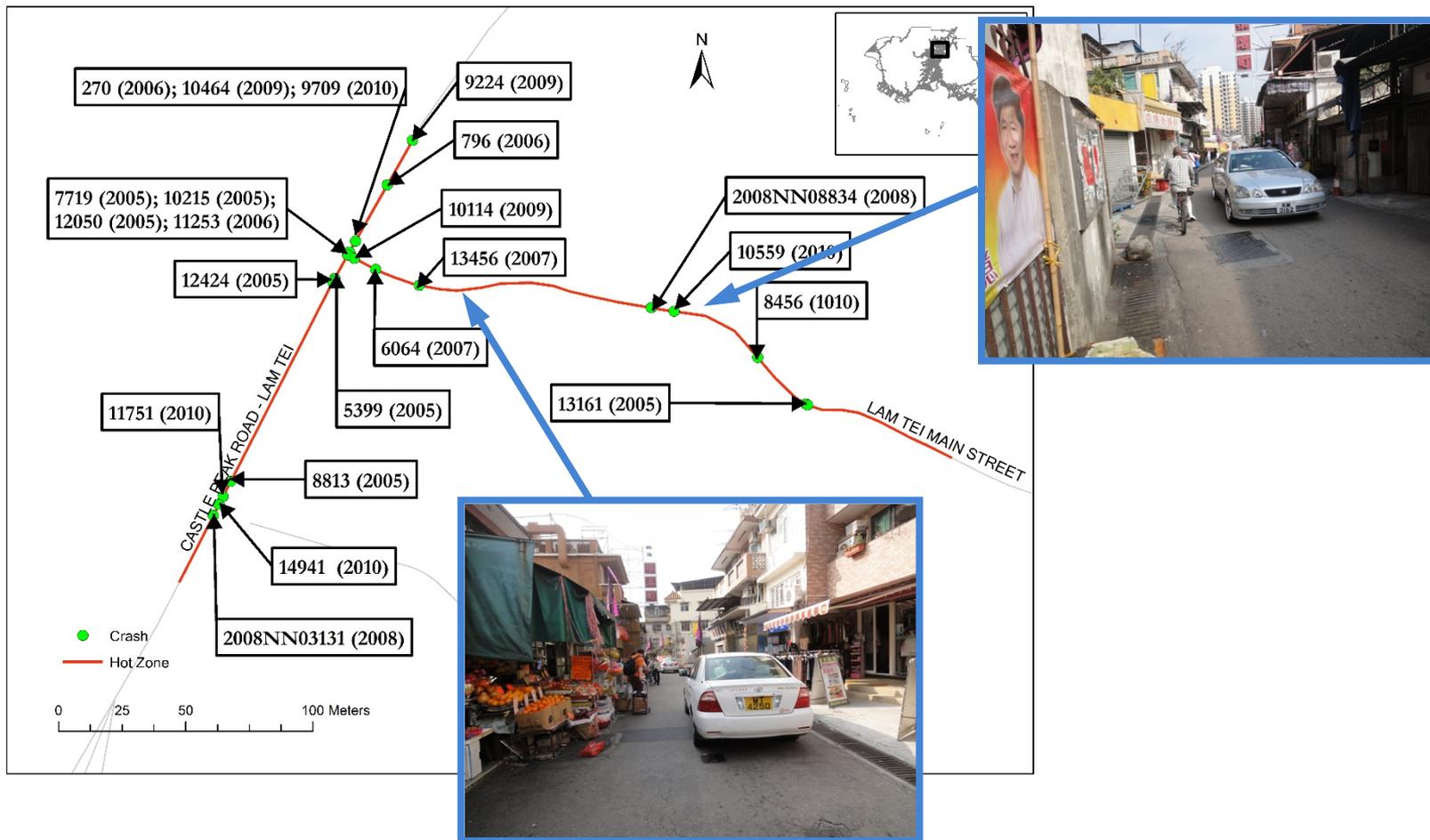
Castle Peak Road (Lam Tei) & Lam Tei Main Street



Results & Findings

Site investigation

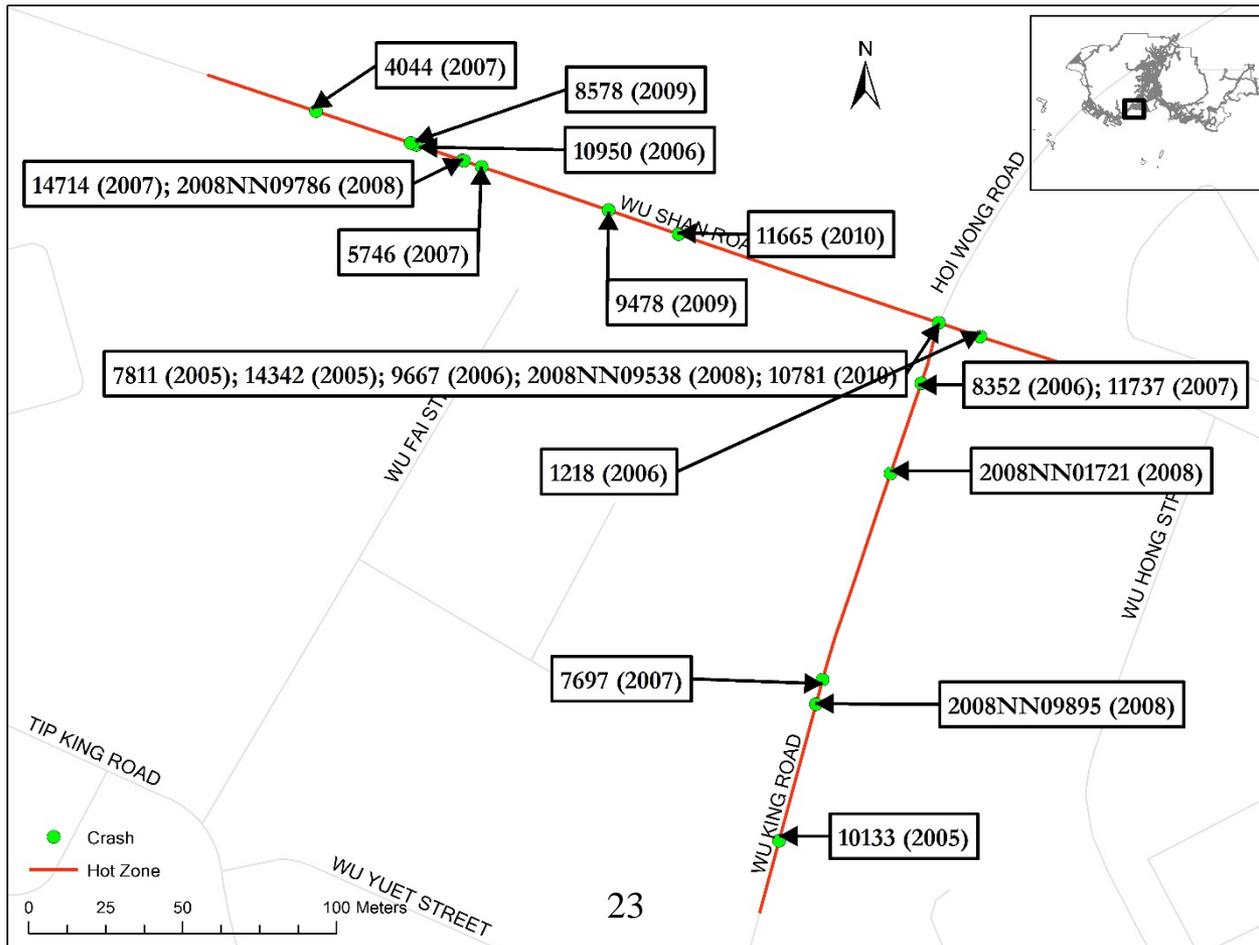
Castle Peak Road (Lam Tei) & Lam Tei Main Street



Results & Findings

Site investigation

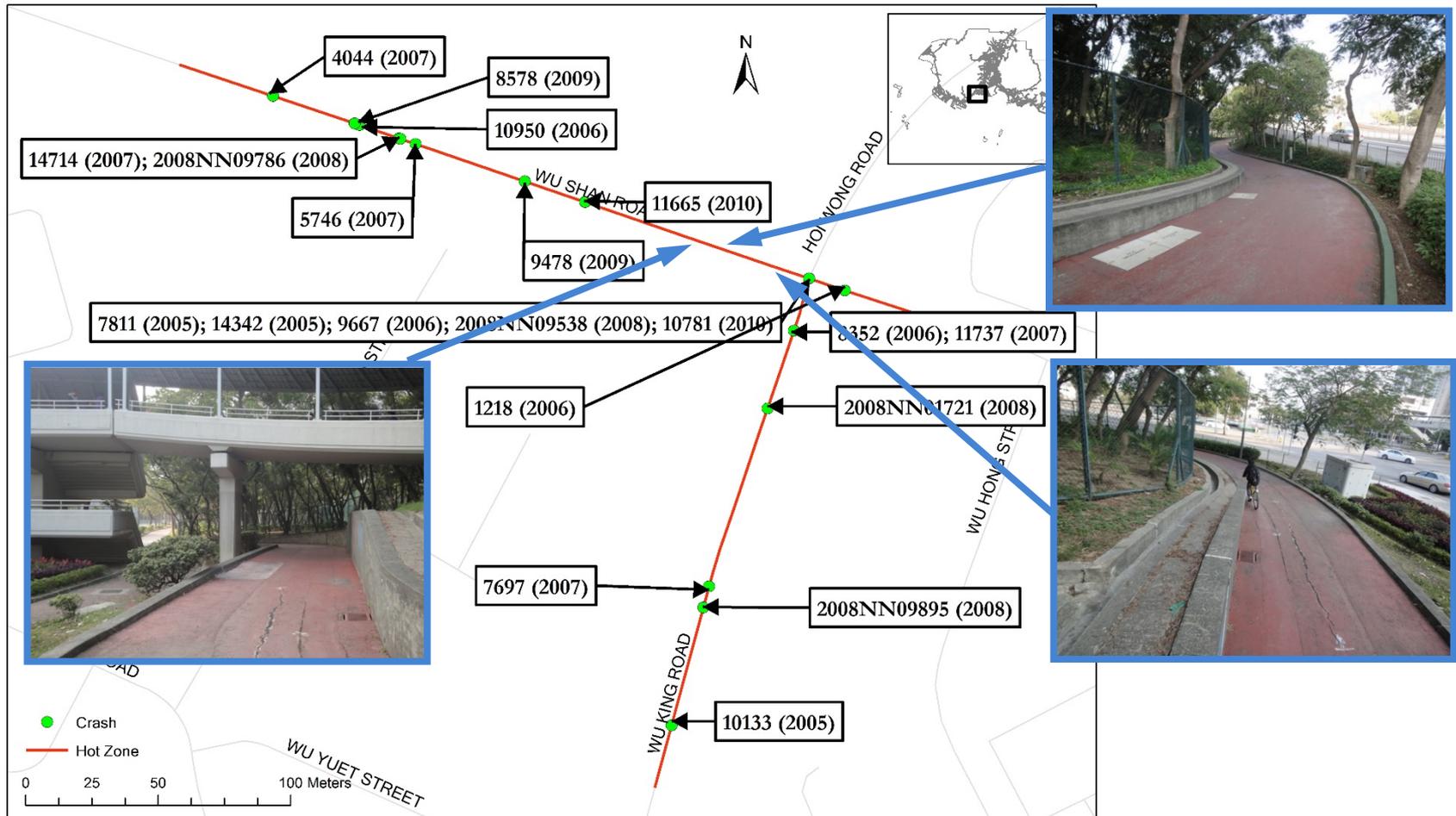
Wu Shan Road & Wu King Road



Results & Findings

Site investigation

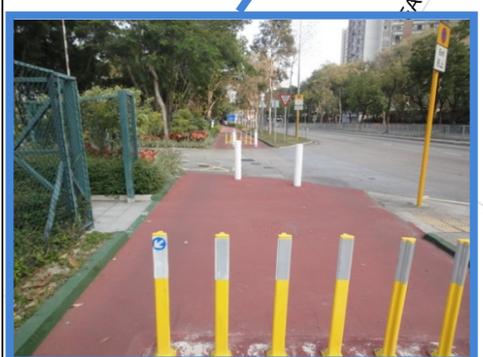
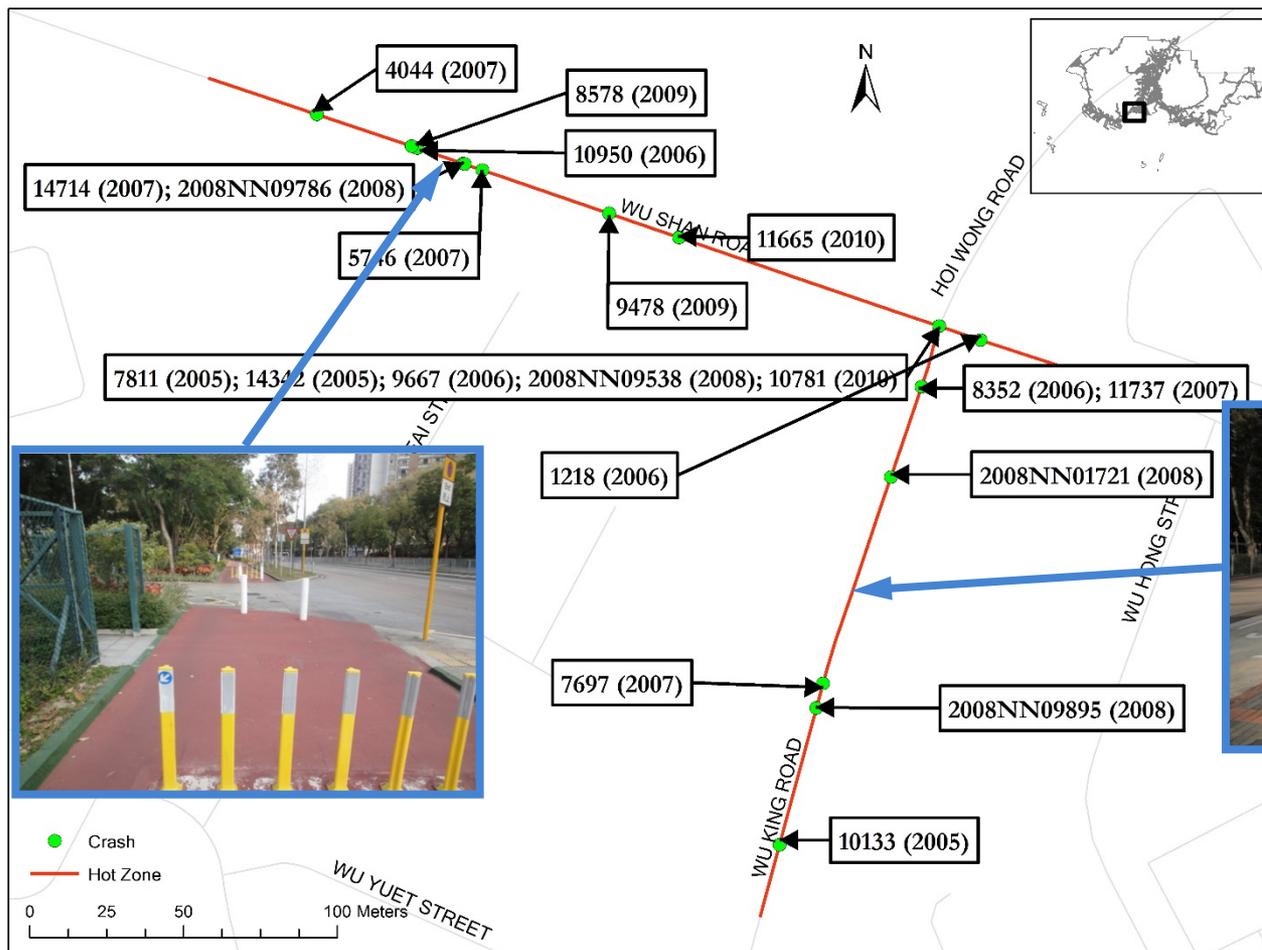
Wu Shan Road & Wu King Road



Results & Findings

Site investigation

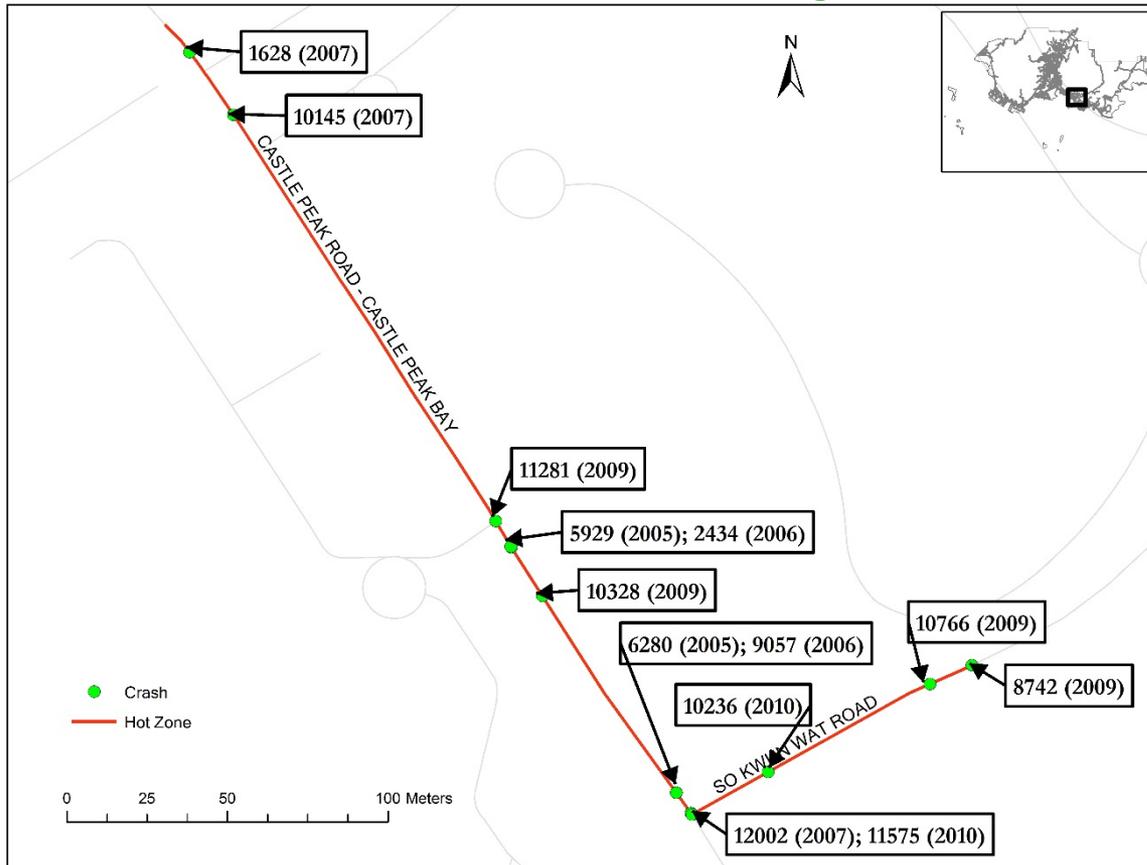
Wu Shan Road & Wu King Road



Results & Findings

Site investigation

Castle Peak Road (Castle Peak Bay) & So Kwun Wat Road



Results & Findings

Site investigation

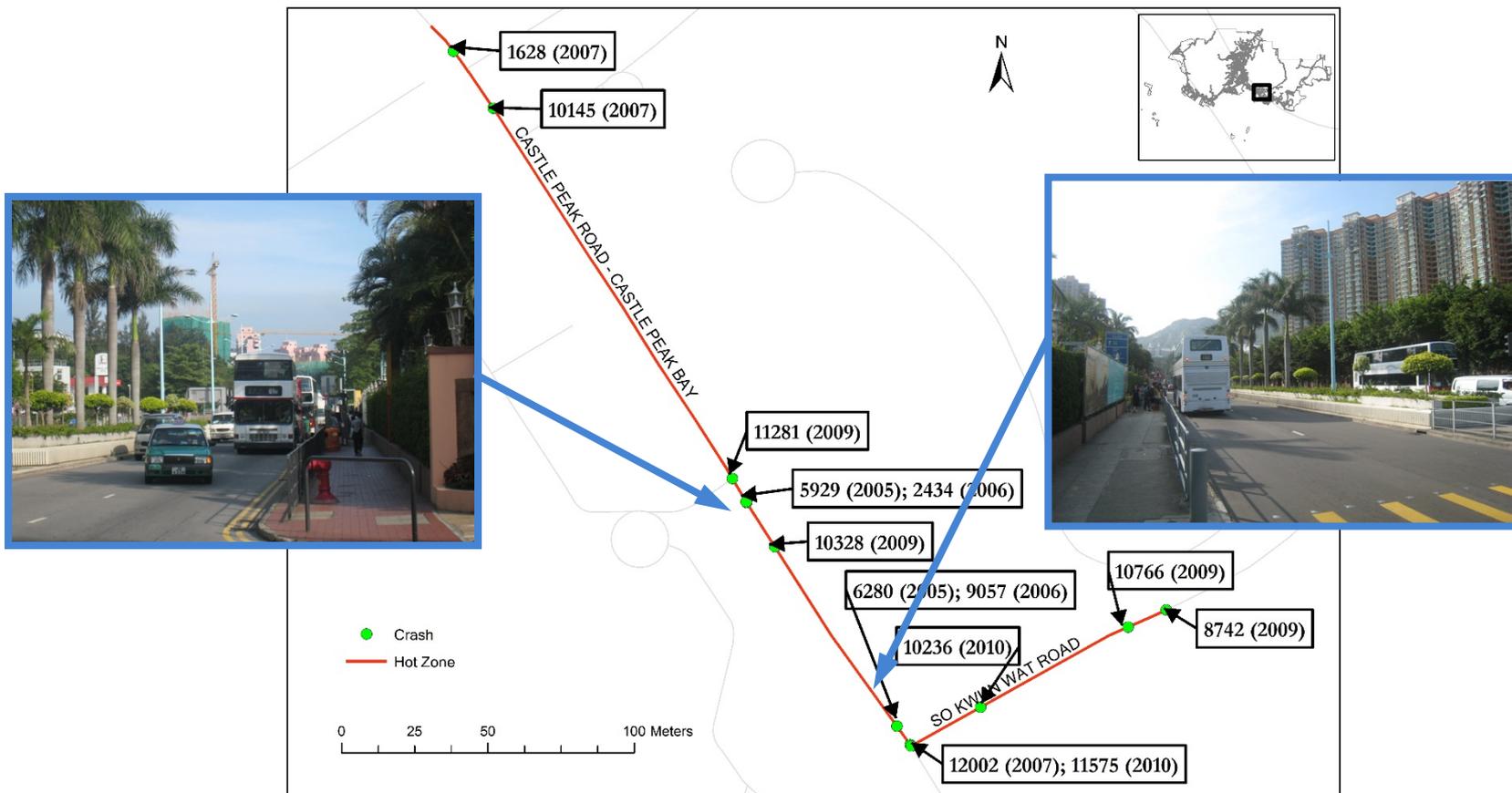
Castle Peak Road (Castle Peak Bay) & So Kwun Wat Road



Results & Findings

Site investigation

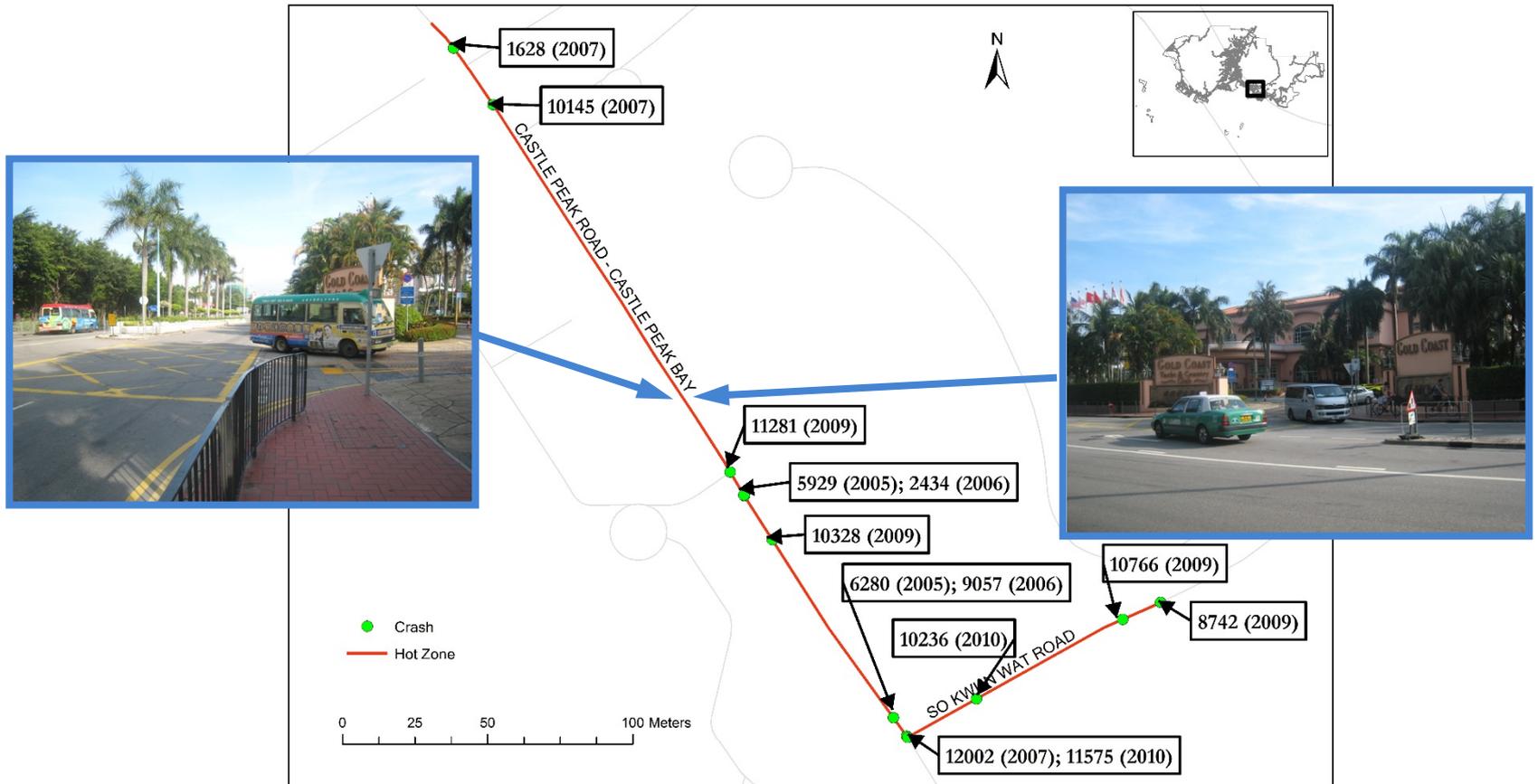
Castle Peak Road (Castle Peak Bay) & So Kwun Wat Road



Results & Findings

Site investigation

Castle Peak Road (Castle Peak Bay) & So Kwun Wat Road



Promotions and Interventions

Remedial engineering measures

- To apply appropriate traffic calming measures
- To rectify the defects in the pavement surface
- To provide designated markings at pedestrian junctions
- To provide appropriate warning signs and road markings



Promotions and Interventions

Dissemination of publicity & education

- Featured campaigns and publicity (Nov 2012)
- Poster exhibitions at
 - Tuen Mun Town Plaza (3-11, Nov 2012)
 - Tuen Mun Hospital (12- 25 Nov 2012)
- Bicycle associations, Tuen Mun District Council, Tuen Mun Hospital, Chartered institute of Logistics and Transport in Hong Kong, Hong Kong Society for Transportation Studies, Institute of Transport Studies of HKU
- Assessment survey

Interventions

Dissemination of publicity & education

- Banners displayed at the three identified bicycle accident hot zones
- Study report disseminated to:
 - HK Police Force
 - Transport Department
 - Tuen Mun District Council

Key Messages

- Three bicycle accident hot zones identified in Tuen Mun District using state-of-art science GIS
- Site investigations to identify problematic road features and cyclist behavior using engineering science
- Hot zone injury data analysis by medical & transport science experts
- Featured campaigns and exhibitions to disseminate results with the help of community leaders and professional bodies
- Banners established at hot zones as intervention
- Study report disseminated to stakeholders (HKPF, TD, TM DC) providing recommendations for remedial measures and effective traffic strategies



Thank you!

Acknowledgement:

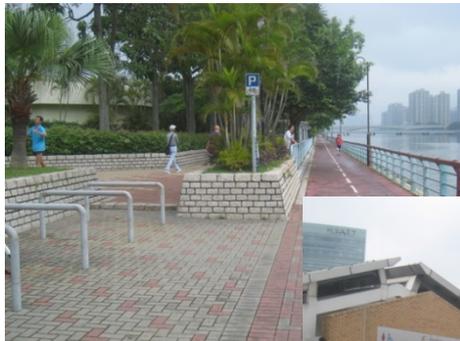
The work was supported by the Health Care and Promotion Fund from the Food and Health Bureau (Project No.: 24100244)

State-of-the-Practice

Engineering

Cycle tracks and facilities

- To develop segregated cycle tracks that separate cyclists, motorized vehicles, and pedestrian
- To set out design standards for cycle track width, gradient, and horizontal curves
- To provide supporting facilities near cycle tracks



State-of-the-Practice

Engineering

Surface, signs, and markings for cycle tracks

- Colored and anti-skidding pavement surface
- Road markings and traffic signs
- Surfacing and collapsible bollards at pedestrian junctions



State-of-the-Practice

Enforcement

Road Traffic Ordinance

- Reckless or careless cycling and cycling under the influence of alcohol and drugs are prohibited
- Use of bicycles by children under age 11 without the supervision of parents or guardians are prohibited
- All bicycles and their parts, including the braking systems, warning instruments and obligatory reflectors, are required to be in the good condition
- Cyclists are required to follow the designated traffic signs and road markings, including regulatory signs, warning signs, and informatory signs as specified in Road Users' Code

State-of-the-Practice

Education

- Cycling safety campaign and leaflet publicity organized by the Police and Road Safety Council
- Ongoing publicity through electronic media
- Internet-based central point for information relating to cycling developed by Transport Department