



Bicycling in the New Territories of Hong Kong

An Interactive Qualifying Project

Submitted to:

Project Advisor: Stanley Selkow, WPI Professor

Project Co-advisor: Jeanine Skorinko, WPI Professor

Sponsor Liaison: HUNG Wing-tat, PhD

Submitted by:

Kimberly Gallagher

Michael Isidoro

Huong Nguyen

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Abstract

Due to the high number of bicycling accidents and recent public outcry regarding bicycling, this project examines the current trends, safety, and convenience of Hong Kong's bicycling policy and infrastructure. Through surveys and naturalistic observation, we found that people in Hong Kong bicycle for both recreation and transportation, contrasting the prevailing government view. Additionally, we found that there is a lack of bicycling education, law abidance and enforcement, and the need for maintenance and improvement to the existing bicycling infrastructures, which may contribute to the high number of bicycling accidents. Given these findings, we set out to make recommendations to improve the safety and convenience of the bicycling system.

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Executive Summary

Recent media reports in Hong Kong paint a bleak picture of bicycling in Hong Kong by showcasing the large number of traffic accidents and the discontent residents have with the existing bicycling infrastructure. Many Hong Kong residents and advocacy groups are campaigning for safer roads for bicyclists, better infrastructure, and a reduction of illegally parked and abandoned bicycles (Cheng, 2008; Ho, 2007; Liu, 2007). These campaigns are primarily focused on bicycling in the New Territories, an outlying region of Hong Kong that excludes the city limits of Kowloon and Hong Kong Island. The New Territories is where 97% of Hong Kong bicycling trips take place, and where 1,386 recorded bicycling accidents occurred in 2007 (Cheng, 2008).

Due to recent protests and the high number of bicycling-related accidents, we set out to evaluate the safety and convenience of the existing bicycling policy and infrastructure in the New Territories. In order to explore people's perceptions of bicycling policies and how frequently and why people bicycle, we surveyed local inhabitants in one of the towns in the New Territories. To examine the abundance of bicycling laws and the efficiency of the existing infrastructures, we conducted a naturalistic observation. Given the media attention and the extensive bicycling infrastructure, we focused our studies on the new town of Tin Shui Wai.

Our results revealed that bicycling is used for both transportation and recreational purposes. From surveying, we found that approximately 70% of bicycling trips by Tin Shui Wai inhabitants are for transportation. In addition, our surveys found that 7% of respondents reported receiving education or training concerning bicycling and 60% of bicyclists report they do not

follow all bicycle laws. Of the respondents who reported breaking the law, 54% indicated that they are not afraid to be penalized, suggesting that the public perceives lax law enforcement.

From our observations we found several factors influencing the safety and convenience of the bicycling infrastructure. For instance, we found disconnections of bicycling tracks, poor signage, and obstacles on bicycling tracks (e.g. fire hydrants, trashcans, benches, etc.). Past research has shown that disconnections of bicycling tracks may force bicyclists to cross road junctions, increasing the likelihood of accidents (Chung, 2007).

Another important component to bicycling infrastructure is available parking facilities and spaces. Despite 1,640 designated parking spaces in Tin Shui Wai (Transport Department, 2009), we found that some parking areas were overcrowded while others were nearly empty. In addition, we found a number of abandoned (e.g. flat and missing tires) and illegally parked bicycles. These findings suggest that the current parking infrastructure may not adequately accommodate bicyclists.

Since past research shows that educating the general public increases bicycling safety (Pucher & Dijkstra, 2000), future research should examine methods to educate bicyclists and non-bicyclists in Tin Shui Wai. Furthermore, we also found that many people disobeyed bicycling laws; thus, future research should investigate methods of increasing law enforcement and changing peoples' perceptions of lax law enforcement. Based on our findings, we recommend that future research should explore methods to increase the safety and convenience of the bicycling policy and infrastructure. Thus, this project examines the inhabitants' perceptions and behavior regarding bicycling in order to suggest recommendations that could increase the safety and convenience of the existing bicycling policy and infrastructure.

Authorship Page

Kimberly Gallagher, Michael Isidoro, and Huong Nguyen all contributed to the research, the writing of the report, and the execution of the methodology. The following is a breakdown of the contributions of each individual to this report.

Kimberly Gallagher contributed to this report by writing the results chapter (including statistical analysis, tables, and graphs), sections of the literature review, executive summary, and conclusion and recommendations chapters.

Michael Isidoro wrote sections of the methodology, literature review, and conclusions and recommendations chapters. He also compiled and created all of the appendices.

Huong Nguyen was responsible for sections of the introduction, literature review, methodology, executive summary, and conclusions and recommendations. Ms. Nguyen also contributed by editing the flow of the entire paper.

All members contributed equally to the execution of the methodology, including the survey and direct observations.

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1. Introduction

“Hong Kong bicycle accidents rise 14.6%” --News Guangdong (2005)

“Roads Should Be Safe For All Who Use Them”—South China Morning Post (2007)

Recent media reports in Hong Kong, as headlined above, paint a bleak picture of bicycling in Hong Kong by showcasing the large number of traffic accidents and the discontent residents have with the existing bicycling infrastructure. Many of these media exploits are a result of increased protests and complaints by the residents who campaign for safer roads for bicyclists, better infrastructure, and a reduction of illegally parked and abandoned bicycles (Cheng, 2008; Ho, 2007; Liu, 2007). These complaints may not be unfounded, as recent reports show an average of 1,673 bicycling accidents a year in Hong Kong over a recent 4-year period (from 2004-2007; Transport Department, 2007). And, studies show that 75 percent of bicycling accidents occur on the roadways (Transport Department, 2004).

Due to the number of bicycling accidents and resident discontent, we examined the current trends in Hong Kong’s bicycling policy and infrastructure. More specifically, we investigated three main objectives: 1) how bicycling is conducted in Hong Kong—for recreation or for transportation¹; 2) whether residents are educated on bicycling and abide by bicycling laws; and 3) the existing bicycling infrastructures.

¹ In our review of the literature, we discovered that “transportation” was often defined differently by different studies (e.g., some referred mechanized or utilitarian trips to refer to transportation; Transport Department, 2004). For the purposes of our project, we defined transportation as trips to school, work, residential areas, social activities, and commercial areas—and this included mechanized and utilitarian trips.

2. Literature Review

2.1 Views on Bicycling

In order to understand the current state of Hong Kong's bicycling policy and infrastructure, we examined both the government and public opinions regarding the role of bicycling. We found that Hong Kong's government and public have conflicting viewpoints of how bicycling is conducted in the New Territories². The disconnection stems from the underlying purpose of bicycling--whether for recreational or a means of transportation.

The Hong Kong government perceives bicycling as a recreational sport, a viewpoint that is presented in the 2002 Travel Characteristics Survey (TCS) and 2004 Cycling Study of the Hong Kong Department of Transport. These two studies provide statistical data indicating that bicycling is not widely used as a transportation method. According to the TCS, among the total daily 12.3 million transportation trips, bicycling only accounts for 62,000 trips. Based on these numbers, the Cycling Study concluded that bicycling represents an estimated 0.5% of the overall weekday transportation trips in Hong Kong (Transport Department, 2004). The 2004 Cycling Study also provided evidence that 70% of all bicycling trips are for recreational (including bicycling to improve health) purposes.

Although the two studies provide evidence that bicycling is not a popular transportation method, there are limitations to these studies that should be considered. Since 97% of Hong Kong bicycling trips take place in the New Territories (Transport Department, 2004), the studies' incorporation of all transportation trips in all of Hong Kong (including the city limits) dilute the importance of transportation bicycling trips within the New Territories.

² The New Territories is an outlying region of Hong Kong that excludes the city limits of Kowloon and Hong Kong Island

In contrast to the government's stance on bicycling, many residents in the New Territories view bicycling as a means of transportation and advocate for the incorporation of bicycling into Hong Kong's transportation system. Within the New Territories, residents claim that bicycling is a main source of transportation (Chung, 2007). In addition, in reaction to the number of accidents, residents and advocacy groups have begun to protest and raise their concerns. These concerns aim to persuade the government to improve the bicycling infrastructure for all who use it—including recreational and transportation users (Chung, 2007; Liu, 2007; Hong Kong Cycling Alliance, 2004). Due to the difference in the government and residents' opinions, the first objective of the current research project is to examine how bicycling is conducted in the New Territories—for recreation (as the government maintains) or for transportation (as the residents maintain).

2.2 Issues and Concerns on Bicycling

Another reason to investigate how bicycling is conducted within the New Territories is to better understand the bicycling accident rates that have occurred in recent years. For example, in 2007, there were 1,386 recorded bicycling accidents in the New Territories (Cheng, 2008). Several factors that may contribute to the number of bicycling accidents are the lack of bicycling education, lack of law abidance and enforcement, and the need for maintenance and improvement to existing bicycling infrastructures (Pucher & Dijkstra, 2000, 2003; Pedestrian and Bicycle Information Center, 2009; US Transportation Department, 1993).

2.2.1 Bicycling Education

Research shows that educating bicyclists, motorists, and the general public about bicycling helps to increase bicycling safety and reduce fatal bicycling accidents (Pucher & Dijkstra, 2000). For example, countries such as Germany and the Netherlands offer educational programs that teach safety features and prevention methods, such as teaching the rights bicyclists

have on roadways, and how to bicycle and drive defensively in order to prevent collisions (Pucher & Dijkstra, 2003). These studies suggest that making the general public aware of safe bicycling practices and regulations can help promote safe behaviors—especially in motorists and bicyclists. Thus, we explored whether residents in the New Territories received bicycling education.

2.2.2 Law Abidance and Enforcement

In addition to educating the public about bicycling practices and regulations, two other factors that may play a substantial role in safety are abidance of bicycling regulations and the enforcement of them. In fact, research shows that both law abidance and strict enforcement of bicycling regulations can increase public safety—especially for bicyclists (Pucher & Dijkstra, 2000; US Transportation Department, 1993). For instance, studies show that a lack of law abidance and a subsequent lack of law enforcement correlates with unsafe bicycling behavior and bicycling accidents (US Transportation Department, 1993; Pedestrian and Bicycle Information Center, 2009). Given that law abidance and enforcement are strong predictors of safety for bicyclists, we examined whether residents abide by bicycling regulations and the extent to which these laws are enforced.

2.2.3 Bicycling Infrastructure

In addition, research shows that another key feature for safe bicycling is the bicycling infrastructure (Land Transport New Zealand, 2004). While the specific components of the infrastructure may differ based on the type of bicyclist (recreational or transportation), both require safe and convenient bicycling infrastructure (e.g., unobstructed bicycling tracks, convenient parking facilities, etc.; Land Transport New Zealand, 2004).

To increase both safety and convenience for recreational and transportation bicyclists, other countries have worked on expanding and improving their bicycling infrastructure (Pucher

& Dijkstra, 2003). For example, Denmark, Germany, and the Netherlands revamped their bicycling infrastructure to: a) provide connected and convenient bicycling tracks, b) increase the safety at intersections, c) increase the number and convenience of parking facilities, especially near main and popular destinations (e.g., outside public transportation terminals), and d) increase the signage to better direct bicyclists to points of interest, such as residential developments, shopping centers, and recreational facilities (Button & Hensher, 2001; Pucher & Dijkstra, 2003; and Tri-State Transportation Campaign, 1998).

In contrast to these countries, Hong Kong's bicycling infrastructure is lacking. For example, bicycling tracks are frequently disconnected by vehicular roads which often expose bicyclists to high danger of being in traffic accidents (Chung, 2007). In fact, research shows that 75% of all bicycle related accidents occurred on the roadways (Transport Department, 2004). Due to the high percentage of bicycle accidents on roadways, we set out to identify methods of enhancing safety and convenience in the existing bicycling infrastructure.

2.3 Conclusion

Given recent media attention highlighting bicycling accidents, public discontent and conflicting views on the purposes of bicycling, factors influencing Hong Kong bicycling policy and infrastructure should be examined. More specifically, past research shows that bicycling education, law abidance and enforcement, and infrastructure are key factors contributing to overall bicycling safety (Button & Hensher, 2001; Pucher & Dijkstra, 2001, 2003; Pedestrian and Bicycle Information Center, 2009; US Transportation Department, 1993). Hence, we explored the purposes of bicycling in Hong Kong, whether residents are educated on bicycling, whether residents abide by bicycling laws, the extent to which bicycling laws are enforced, and the existing bicycling infrastructures.

3. Methodology

Interested in the current bicycling trends in Hong Kong, we set out to evaluate the existing bicycling policy and infrastructure in Tin Shui Wai. The project focused on this town for the following two reasons: 1) there is an extensive bicycling track infrastructure present for evaluation; and 2) this area is less urbanized than Hong Kong Island and Kowloon (Holly, 2000). Therefore, Tin Shui Wai can better accommodate changes to transportation infrastructure (Holly, 2000).

Specifically, this project evaluated the following aspects of the Tin Shui Wai bicycling system: the bicycling trends and popularity of bicycling and the constraints of safety and convenience regarding policy and infrastructure. In order to conduct these evaluations two different methodologies were implemented; surveys and direct observations. Surveys were used to examine the frequency and purpose of bicycling trips, and residents' perceptions of bicycling policy and infrastructure in Tin Shui Wai. A naturalistic observational study was also conducted to examine bicycling tendencies and the efficiency of infrastructure. These methods were conducted to obtain a comprehensive view on the current state of the bicycling system within Tin Shui Wai.

3.1 Study 1: Assessing Local Attitudes Towards Bicycling

3.1.1 Participants

A total of 301 (171 males, 128 females, 2 did not respond) people participated in the survey. Of these 301 participants, 257 were Tin Shui Wai residents and 44 were non-residents. In addition, 252 identified themselves as bicyclists (transportation or recreation) and 49 identified themselves as non-bicyclists. Participants were not offered any incentives for their participation.

3.1.2 Design and Materials

In order to examine the frequency and purposes of bicycle trips, as well as the residents' perceptions of bicycling policy and infrastructure, we conducted a short survey. The survey assessed the frequency of bicycle trips by using a 5-point Likert-type scale (1 = never, 2 = 1-2 times per year, 3 = 1-2 times a month, 4 = 1-2 times a week, 5 = most days) and the purposes of bicycling trips were assessed by having participants indicate why they bicycled (i.e. transportation or recreation). The survey assessed public perceptions on the following aspects of bicycling: education, law, and infrastructure. We measured participants' education on bicycling by asking them whether they have received bicycling training or education (yes/no). In addition, the survey assessed whether participants obeyed bicycling laws (yes/no) and reasons for any law breaking behavior. To assess the reasons they broke laws, participants read a list of reasons (e.g., inconvenience, unafraid of being penalized, safety issues), and checked all that applied. In order to examine perceptions of the bicycling infrastructure, participants indicated whether they considered aspects such as design, maintenance, and location of the bicycling tracks as a problem (yes/no). For exploratory purposes we also surveyed perceptions on the affordability of transportation (1 = too expensive, 2 = reasonable, 3 = not important to my budget). The gender and age of the participants were also gathered.

3.1.3 Procedure

Participants at parks, public transportation interchanges, and shopping centers throughout Tin Shui Wai were randomly selected to participate in the survey. After agreeing to participate, respondents were informed that the survey investigated attitudes towards the bicycling system, and that their responses were voluntary and would be kept anonymous. The survey was conducted over eight consecutive days and at multiple time periods (morning, afternoon, and evening), thus limiting the influence of day of week and time of day. After completion,

participants were thanked for their participation. See Appendix B for the Survey of Inhabitants in English and Appendix C for the Survey of Inhabitants in Chinese.

3.2 Study 2: Naturalistic Observational Study

3.2.1 Design/Purpose

To examine how bicycling is conducted in the existing infrastructure in relation to bicycling policies, we conducted a naturalistic observation study. In particular, we focused our observations on behaviors of bicyclists while riding, law abidance of bicyclists and pedestrians, and different aspects of the bicycling infrastructure that affect the safety and convenience of bicyclists.

3.2.2 Design and Materials

Behavior Observation. To examine both bicyclists and pedestrians' tendencies to behave in safe manners and abide by laws, we observed unsafe behaviors exhibited by bicyclists and pedestrians and the number of law violations witnessed. Unsafe behaviors were determined by referring to the Transport Department Road User's Code that identifies laws and guidelines for safe bicycling practices. For example, the Road User's Code specifies that a bicyclist must dismount when crossing an intersection, thereby making the act of not dismounting illegal (see Appendix C for a list of all behaviors and law violations observed).

Bicycling Infrastructure Observation. In order to understand how the bicycling infrastructure influences the safety and convenience of bicyclists, we observed connectivity of bicycling tracks, obstacles on bicycling tracks (e.g., uneven road surfaces and items on the track), signage, and parking facilities. The connectivity of the bicycling tracks was observed by using a map of the Tin Shui Wai bicycling tracks to identify areas of disconnection and the quantity of the disconnections. To verify that the map represented the current infrastructure, we walked through Tin Shui Wai using the bicycling track map. Outlying areas were excluded from

this observation. Refer to Appendix E for a detailed list of specifications and Appendix F for the map.

Possible safety concerns for bicyclists using the existing bicycling infrastructure were observed by identifying and recording different types of obstacles on the bicycling tracks. Another component of safety is the clarity, visibility, and presence of posted signs for bicyclists (and pedestrians). Thus, we observed, indicated, and recorded whether posted signs were clear, visible, and present in locations that the Transport Department Road Users' Code, considered as the road safety guide for bicyclists, prescribes (Transport Department, 2005). In addition, we marked the map with the areas that had poor signage (e.g. unclear, obscured, or missing signage).

Parking facilities are another important characteristic of bicycling infrastructure, especially their percent capacity and convenience. Percent capacity refers to the parking facilities' occupancy rate; it compares the actual number of bicycles parked at a facility to the quantity of bicycles the parking facility can actually accommodate. To assess the percent capacity of the existing parking facilities, we counted the total number of parking spaces available at each parking facility, and the number of bicycles that were parked in the parking facility. The percent capacity of a parking facility can be limited by items that take up otherwise available space; therefore, we also counted the number of abandoned bicycles at each parking facility, and identified any additional items that obstructed parking spaces. Abandoned bicycles were classified as bicycles that were missing tires, had flat tires, or were dismantled to a point of being unusable. In addition, the convenience of the parking facilities was observed by indicating the proximity in feet of the parking facility to points of interest (e.g., shopping centers, MTR and light rail stations).

Additionally, the efficiency of the parking facilities can be measured by the number of bicycles parked in areas not originally designated for bicycle parking. Therefore, we counted the number of areas where bicycles were parked in areas not clearly identified as parking facilities

(e.g., no pre-existing parking spaces or signs delineating a parking facility). We classified these areas as being undesignated parking areas if they contained 50 or more parked bicycles. Since the bicycles parked in undesignated parking areas are technically parked illegally based on the laws within Tin Shui Wai, we also counted the number of illegally parked bicycles.

3.2.3 Procedure

In order to examine bicycling behavior and the existing bicycling infrastructure, three observers visited Tin Shui Wai over the course of six days and each person observed bicycling behavior and infrastructure. Each component of the observations was standardized by the use of observation sheets that classified and recorded the different aspects being observed (see Appendix G, H, and I for these sheets). To limit the influence that day of week and time of day might have, the observations were made repeatedly over six days and during multiple time periods per day, including morning, afternoon, and evening hours. In addition, the location of each observation was recorded.

Behavior Observations. When observing bicyclist and pedestrian behavior, the observations focused on tendencies to behave in unsafe or illegal manners. The observers used a standardized observation sheet to count and record the different behaviors and law violations being observed (see Appendix G for the sheet used, and Appendix D for further description of the classifications of these behaviors). The observations were conducted over three different days (Monday, Friday, and Sunday) at six different locations throughout Tin Shui Wai and included areas that had intersections, roadways, and bicycling tracks. The multiple sites were observed to increase the representativeness of the observations. When conducting the observations, if a behavior was not observed (e.g., because it did not occur or because the infrastructure did not support it) it was recorded as not applicable (N/A).

Bicycling Infrastructure Observations. While observing the different components of the bicycling infrastructure, the observers used a standardized observation sheet to count and record the different factors being observed (see Appendix H for the sheet used for bicycling tracks, Appendix I for the sheet used for parking facilities, and Appendix E for the classifications of the different factors). Observations investigated factors such as connectivity of the bicycling tracks, obstacles on the tracks, signage, number of available parking spaces, and number of abandoned and illegally parked bicycles.

The observation of bicycling tracks was conducted over the course of one day throughout Tin Shui Wai, and excluded tracks located in outlying areas of the town (see Appendix F for map and selected tracks). Observers walked the entirety of the selected tracks, and observed obstacles in the tracks and signage. These were recorded using a standardized observation sheet (see Appendix H for the sheet used), and problematic areas (e.g., disconnected tracks, unclear signage) were recorded on the map (see Appendix F for map).

The observations for the parking facilities were conducted over three different days (Tuesday, Thursday, and Saturday) at 12 designated parking facilities and 3 undesignated parking facilities throughout Tin Shui Wai. The multiple areas were observed to increase the representativeness of the observations. Residential areas, however, were excluded from the observations because they are for private bicycle parking only. To enable the ability to observe multiple parking facilities at multiple times throughout the day, the town was divided into three sections and each observer was assigned an area to observe for the three-day observation period. The locations of these parking facilities were recorded on a map, and observations were recorded on standardized observation sheets (see Appendix F for map and Appendix H for observation sheets).

4. Results

4.1 How is Bicycling Conducted?

Given the number of bicycling accidents occurring in the New Territories and the discrepancy in how the government and public view the purpose of bicycling in the New Territories, we examined how bicycling is conducted. To do so, we surveyed the bicycling tendencies of the inhabitants of Tin Shui Wai. Overall, survey results suggest that people bicycle for both recreation and transportation. Out of the 247 bicyclists surveyed, 65% reported bicycling for recreational purposes, and 35% reported bicycling mainly for transportation. However, a one way ANOVA test shows that transportation bicyclists ($M=4.15$, $SD=1.14$) report more frequent bicycling trips than recreational bicyclists ($M=2.75$, $SD=.94$), $F(1,245)= 107.71$, $p=0.00$. The scale used was from 1-5, with 5 signifying the most frequent trips, and 1 signifying never.

Considering these findings, we determined an approximate percentage of bicycling trips made for transportation purposes. This percentage was found by looking at the 247 responses from bicyclists who correctly answered our survey questions regarding how often they bicycle and for what reason. We assumed that 100% of each respondent's bicycling trips were for either transportation or recreation, depending on their response. Since they answered most days, 1-2 times per week, 1-2 times per month, and 1-2 times per year, we approximated the frequency to be 4 times per week, 1.5 times per week, 1.5 times per month, and 1.5 times per year, respectively. We converted our findings to occurrences per year based on 52 weeks and 12 months in a year. The occurrences per year were then individually multiplied by the amount of people surveyed who responded accordingly. Table 1 displays that there were approximately 11,605 transportation trips made by bicyclists and 4,931 recreational trips per year made by

survey respondents. The percent of bicycling trips that are for transportation purposes was then calculated to be 70%.

Table 1: Assessment of Transportation and Recreation Bicycle Trips

TRANSPORTATION	Approximate # Times in a Time Period	#Times in a Year	Amount Respondents	Total Trips
# Transportation most days	4 times/week	208	49	10192
#Transportation 1-2/week	1.5 times/week	78	16	1248
# Transportation 1-2/month	1.5 times/month	18	8	144
# Transportation 1-2/year	1.5 times/year	1.5	14	21
				11605
RECREATION	Approximate # Times in a Time Period	#Times in a Year	Amount Respondents	Total Trips
# Rec. most days	4 times/week	208	12	2496
# Rec. 1-2/week	1.5 times/week	78	19	1482
# Rec. 1-2/month	1.5 times/month	18	46	828
# Rec. 1-2/year	1.5 times /year	1.5	83	124.5
				4931

% Transportation Trips	70%
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4.2 Education of Bicycling Regulations

Since there is a high number of bicycling accidents and since past research showed that educating the public about bicycling is a key predictor of safe bicycling practices (Pucher & Dijkstra, 2000), we surveyed whether the inhabitants of Tin Shui Wai received bicycling education. Overall, we found that most Tin Shui Wai residents (regardless of whether they bicycled) received little to no education or training concerning bicycling and many reported not abiding by the laws. More specifically, only 18 out of 257 respondents (7%) reported receiving education or training concerning bicycling. While most residents lacked bicycle education, there was a positive correlation between the frequency of bicycling and education, such that educated bicyclists ($M=4.42$, $SD=1.02$) bicycle more frequently than uneducated bicyclists ($M=3.15$,

$SD=1.18$), $F(1,250)= 20.54$, $p=0.00$. The results of this one way ANOVA test suggest that more frequent bicyclists are at least more aware of bicycling regulations and safety procedures.

4.3 Bicycling Law Abidance

4.3.1 Bicyclists.

Another key factor in bicycling safety is abidance of laws (U.S. Department of Transportation, 2003). Thus, we observed and surveyed whether the inhabitants of Tin Shui Wai obeyed bicycling laws. Overall, we found that 90 out of 150 respondents (or 60%) reported that they do not abide by bicycling laws and that 37% of those who do not abide by laws attribute it to their lack of knowledge (or education) of bicycling laws.

In addition, we observed that most bicyclists disobeyed posted laws. Throughout all our observations, only 200 of the 1,884 observed bicyclists (13%) obeyed the rules and advice of the Road Users' Code. In terms of abiding by the posted laws to dismount, it was observed that only 157 bicyclists out of 1,508 bicyclists followed these posted signs (See Appendix F for locations of these law violations and Appendix D for a description of all violations observed). This indicates that the law was only followed 10% of the time. During our observation, it was also found that 175 bicyclists ran red lights, 92 bicyclists rode in the wrong direction on the road, and 180 bicyclists used pedestrian pathways. These violations of laws were only among the many that were observed which reinforces that bicyclists do not abide by the law (see Appendix G for pictures of selected violations).

Participants indicated reasons why they chose not to obey bicycling laws. As shown in Table 2, what they perceive to be unreasonable laws, the lack of expectation of being penalized, and being unaware of the laws are the main reasons why bicyclists do not obey bicycling laws.

Table 2: Reasons for Not Following Road Users Code

Reasons For Not Following the Law	# Responding Yes	Percentage
Some laws are unreasonable	57	63%
Don't expect to be penalized	49	54%
Don't know all of the relevant laws	33	37%
Some laws are inconvenient	30	33%
Aren't treated as a legitimate road user, so why should they?	9	10%

4.3.2 Motorists & Pedestrians.

Since the behaviors of both motorists and pedestrians can also affect the safety of bicyclists, we surveyed bicyclists' perceptions of aggressive motorists in regards to their safety, and we observed pedestrian behaviors. We found that 86 out of the 252 (34%) surveyed bicyclists believed that aggressive motorists were a problem to their bicycling. Additionally, analysis of a chi-square test found that more transport bicyclists were bothered by aggressive drivers (48%) than recreational bicyclists (29%), $\chi^2 (N = 237) = 4.66, p = 0.03$. In addition to aggressive motorists, pedestrians may also play a role in the overall safety of bicyclists. For instance, pedestrians, by law, are not supposed to walk in the bicycling tracks. Despite pedestrians having a separate walkway, we found that 5,952 pedestrians walked on bicycle tracks. The rate of pedestrians on bicycling paths was found to be 331 pedestrians per hour.

4.4 Law Enforcement

Since approximately half (54%) of the respondents disobey laws because they do not expect to be penalized, we investigated law enforcement by analyzing police reports. Comparing the total number of law violations we observed with the total number of law violations reported

by the Tin Shui Wai police department during 2006-2008, we found that people are not being penalized to the same extent that they are violating the law (see Figure 1; K.S. Leung, personal communication February 4, 2009).

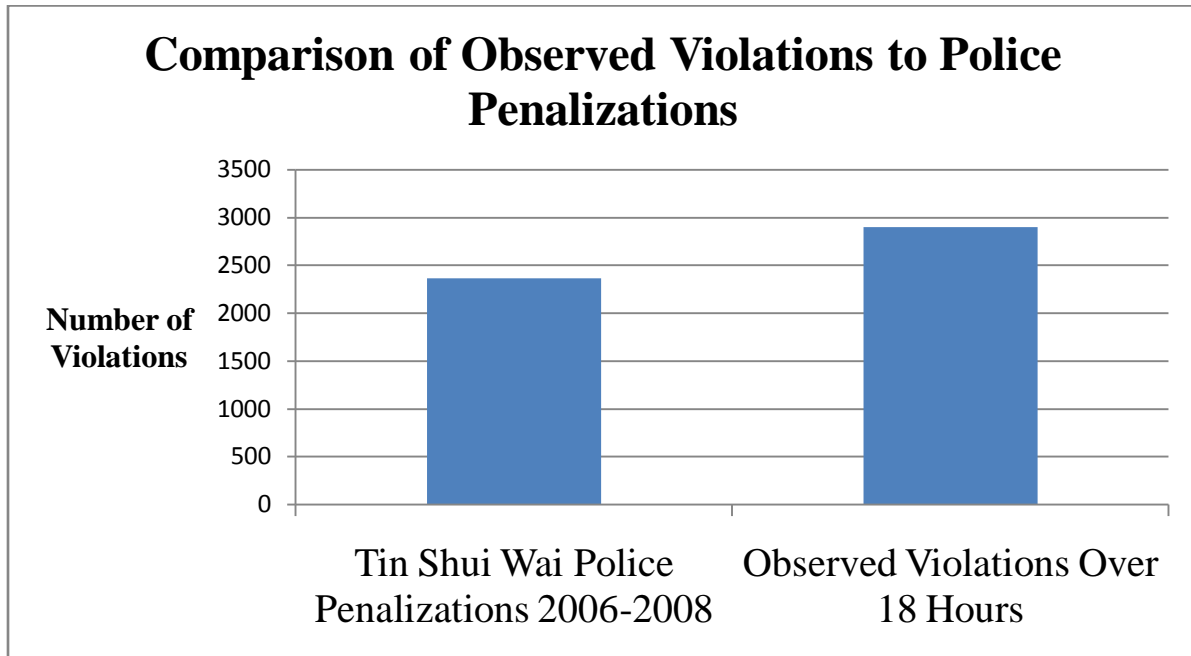


Figure 1: Graph: Comparison of observed violations to police penalizations

4.5 Infrastructure

Due to public outcry regarding the safety and convenience of bicycling infrastructure, we examined the existing bicycle infrastructure through direct observation focusing on connectivity of bicycling tracks, obstacles on bicycling tracks, signage, and parking areas.

4.5.1 Connectivity of Bicycling Tracks.

Out of 252 bicyclists surveyed, 174 of them (69%) believed that there were problems with the current connectivity of the bicycling tracks. As seen in a map of the bicycling tracks in Tin Shui Wai, a number of disconnections between the bicycling tracks and the roadways were noticed. In our observations of the infrastructure, we confirmed the disconnections existed (see Appendix F for a map of the area).

4.5.2 Obstacles on Bicycling Tracks.

While observing the bicycling tracks, we also noticed a number of obstacles interfering with bicyclists' ability to safely use the tracks, as seen in Figure 2. The observed obstacles included many uneven road surfaces, such as roots jutting out from track surface, and many items blocking the track surface (e.g., parked bicycles, sign posts, trashcans, etc.).



Figure 2: Examples of obstacles

4.5.3 Signage.

In addition to obstacles, we observed that there was unclear, obscured, and absent signage along the bicycling tracks, as seen in Figure 3. For example, there were signs in Tin Shui Wai intended for bicyclists that have unclear meanings. These signs were not found in the Transport Departments' Road Users' Code Manual. An additional factor interfering with the posted signage were obstructions blocking the visibility of these signs, such as trees. While observing signage in Tin Shui Wai, we also found that necessary signs (according to the Road Users Code) were not on the bicycling tracks.



Figure 3: Examples of poor signage on bicycling tracks

4.5.4 Parking Facilities.

Another important component to bicycling infrastructure is available parking facilities and spaces. From the survey, 20% non-bicyclists reported that they do not bicycle due to insufficient parking facilities. Looking at the available parking spaces provided by the government, there are 1,640 spaces in Tin Shui Wai (Transport Department, 2009); however, our observations of 15 of these parking areas suggest that the current parking infrastructure does not adequately accommodate bicyclists. Comparing the capacity of the observed bicycle parking areas and the average number of bicycles present in these parking areas, some parking areas were overcrowded while others are nearly empty. As displayed in Figure 4, of the 15 parking areas observed, six parking areas (40%) were above capacity, five parking areas (33%) were underutilized, three popular parking areas (20%) were not designated parking facilities, and one parking area (7%) was full but not necessarily above capacity (refer to Table 3). Locations of parking area can be found in Appendix F and further details on each parking area can be found in Appendix I.

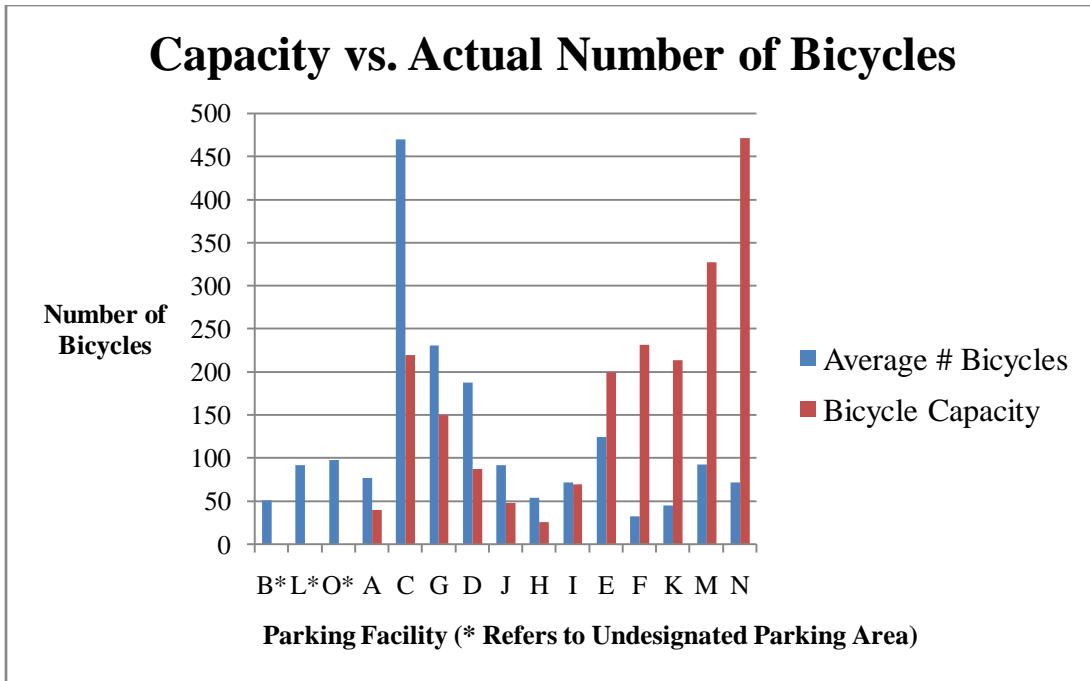


Figure 4: Graph: Capacity vs. actual number of bicycles

Overcrowded parking areas, such as the area depicted in Figure 5, were most common at popular destinations like light rail stops, such as Locwood, Tin Heng, Chestwood, and Tin Shui (parking facilities C, G, H, and D respectively). For instance, bicycle parking at the Locwood facility (site C) has the capacity to accommodate 220 bicycles, but an average of 486 bicycles was consistently present. Underutilized parking facilities as depicted in Figure 5 were more common at inaccessible destinations with few points of interest, such as the MTR parking facility outside exit A (parking facility N). This parking facility has the capacity of 472 bikes but only an average of 72 bicycles was observed.

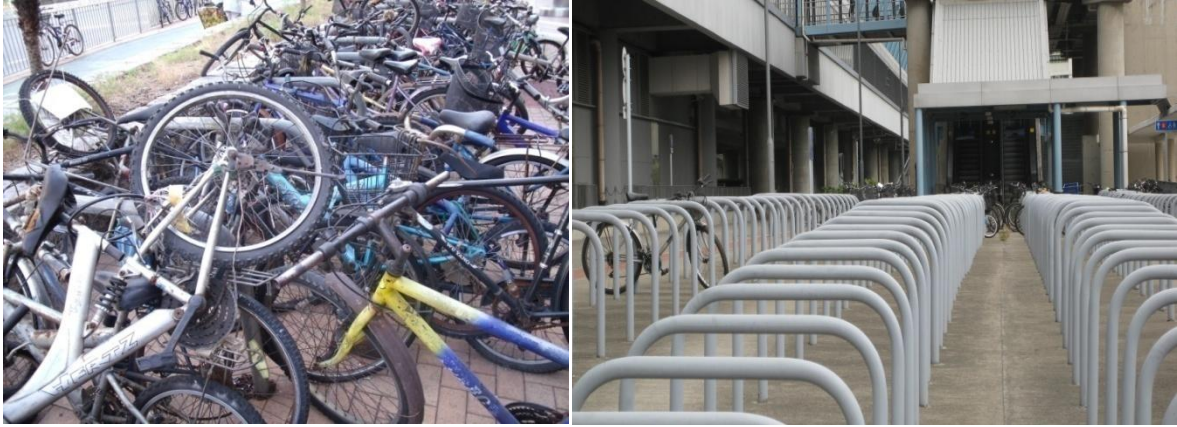


Figure 5: Examples of overcrowded and underutilized parking facilities

In addition, the number of illegally parked bicycles indicates insufficient parking facilities in Tin Shui Wai. Although there were a number of illegally parked bicycles throughout Tin Shui Wai, we observed three main areas that were not official parking facilities but had a large number of bicycles parked there (parking areas O, L, and B in Figure 4). Possible factors contributing to illegally parked bicycles stem from non-existing, inconveniently located, and inaccessible parking facilities.

We observed a number of illegally parked bicycles near light rail stations that had no parking facilities. For example, one such area was approximately 150 feet from the Tin Yiu Light rail station and contained an average of 51 illegally parked bicycles on a nearby fence (parking facility B in Figure 6).



Figure 6: Example of illegally parked bicycles

Through observation, a number of illegally parked bicycles were found in areas where an existing parking facility was inconvenient to access. For example, Tin Shui Wai Mass Transit Railway (MTR) Station provides two bicycle parking facilities (parking facilities M and N in Figure 4) that are only conveniently accessed from 2 out of 5 exits from the station. While some bicycles were parked at the existing parking facilities, we observed an average of 100 illegally parked bicycles outside at least one of the other MTR exits (recorded as parking area L).

In addition to non-existent and inconveniently located parking facilities, some of the existing parking facilities were inaccessible. For example, there is a parking facility (Parking Facility E according to map in Appendix F) on one corner of the roundabout connecting Tin Shui and Tin Wah roads that has no pedestrian crosswalks or bicycling tracks to enable access into the facility (see Figure 7), and an average of 41 illegally parked bicycles were observed on the other three corners of the roundabout.



(<http://maps.google.com>)

Figure 7: Map indicating the location of inaccessible parking facility at roundabout

4.6 Exploratory Analysis of Reasons for Insufficient Parking

4.6.1 Abandoned Bicycles.

One possible reason why there is insufficient bicycle parking in some areas of Tin Shui Wai is due to abandoned bicycles (e.g., flat tires, missing tires, etc) that take up otherwise available parking spaces (refer to Figure 8). As seen in Table 3, on average there were a total of 1,793 bicycles present at observed parking areas but 641 (or 36%) of these bicycles appeared to be abandoned.

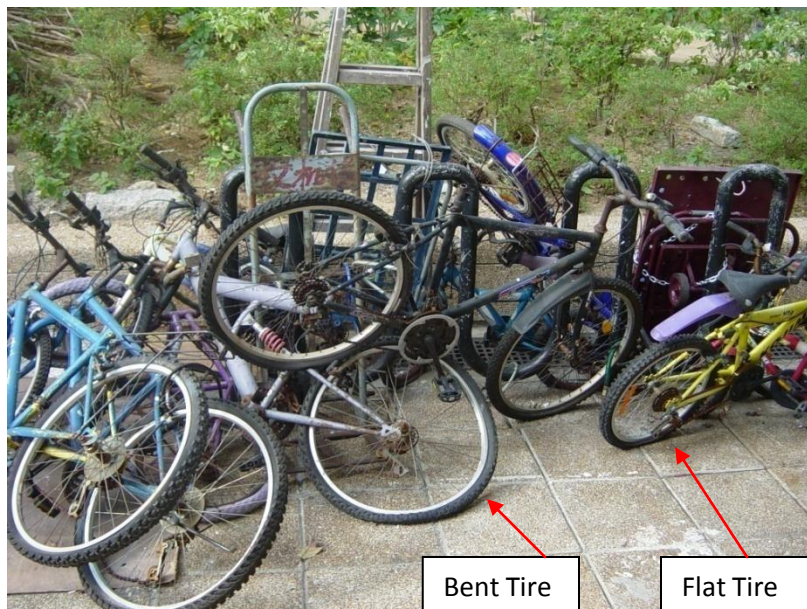


Figure 8: Examples of Abandoned Bicycles

Table 3: Characteristics of Observed Parking Facilities

Parking Spot	Average # Bicycles	Average # Abandoned Bicycles	Percent of Bicycles Abandoned
A	77	34	44%
B	51	5	10%
C	470	149	32%
D	188	53	28%
E	125	63	50%
F	33	20	61%
G	231	62	27%
H	54	27	49%
I	72	43	59%
J	92	58	63%
K	45	0	0%
L	92	30	33%
M	93	62	67%
N	72	8	11%
O	98	27	28%
Total	1793	641	36%

4.6.2 Obstructions in Parking Spaces.

In addition to abandoned bicycles occupying otherwise available parking spaces, we observed other obstructions (e.g., dollies, ladders, boxes, etc.) that also contribute to the inefficient usage of parking facilities (see Table 4 for the average number of obstructions in each parking facility).

Table 4: Number of Obstructions at Observed Parking Facilities.

Parking Spot	Average Number of Obstructions
A	5
C	5
D	12
E	5
F	5
G	7
H	9
I	10
J	4
K	9
M	5
N	2
Total	78

4.7 Exploratory Analysis of Reasons Why People Do Not Bicycle

Additionally, we wanted to better understand reasons why people might not bicycle.

Through our survey, we found that 40% of non-bicyclists choose not to bicycle because they believe bicycling is unsafe. In addition, non-bicyclists choose not to bicycle because they do not know how to bicycle (38%), fear their bicycle will be stolen (33%), believe bicycling is too slow and inconvenient (20%), and believe the air is too polluted (18%), as seen in Figure 9.

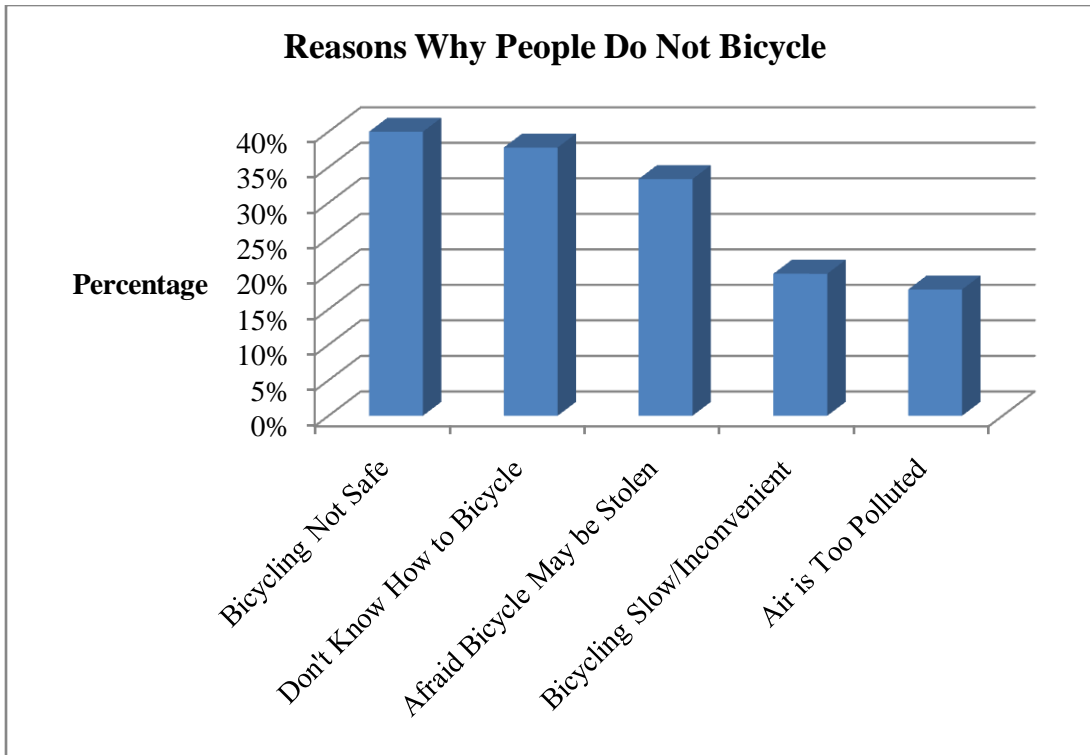


Figure 9: Graph: Reasons why people do not bicycle

4.8 Exploratory Analysis about the Affordability of Mass Transportation

Due to the economic downturn and media reports of the expense of mass transportation, we assessed perceptions of the affordability of mass transportation in Tin Shui Wai. Based on our survey, 100 out of 301 (or 33%) of the respondents believe mass transportation (i.e., buses, the MTR, and the light rail) is unaffordable.

4.9 Conclusion

Overall, the results of our survey and observations suggest that people bicycle for recreation and transportation. In addition, we found that people tend to be uneducated on bicycling regulations, tend to disobey bicycling laws, and believe the laws will not be enforced. Looking at the current bicycling infrastructure, we also found a number of areas for improvement including increasing connectivity of bicycling tracks, ridding obstacles from bicycling tracks, improving visibility and clarity of posted signs, and improving parking facilities.

5. Conclusions and Recommendations

Due to the high number of bicycling accidents and the resulting public outcry that occurred within the New Territories of Hong Kong, we investigated how bicycling is conducted as recreation or transportation. To understand public awareness of safety issues, we examined the extent to which inhabitants in the New Territories were educated on bicycling laws and the extent to which these laws were obeyed and enforced. In addition, we observed the bicycling infrastructure to evaluate any improvements needed to increase bicycling safety and convenience.

5.1 Improving How Bicycling is Conducted

Through our survey and our observations, we found that people bicycle for both recreation and transportation, and transportation bicyclists conduct more frequent bicycling trips than recreational bicyclists. Based on these findings, we recommend that the Hong Kong Transport Department should design future bicycling policies and infrastructures to accommodate all bicyclists, regardless of their purposes for bicycling.

5.1.1 Education.

Most people in our survey reported not receiving any education on bicycling regulations. This finding suggests that bicycling education for both bicyclists and non-bicyclists is inadequate. Past research shows that bicycling education and training are important for increasing bicycle safety (Pedestrian and Bicycle Information Center, 2009). Therefore, future research should examine how to effectively improve the education of bicyclists and non-bicyclists in the New Territories. For instance, future research could evaluate the effectiveness of adopting safety programs used in other places that implement safety education through a variety of means (e.g., providing free pamphlets, free training courses, using television and radio

public service announcements) to encourage safe bicycling, pedestrian, and motorist behavior (US Transportation Department, 1998).

5.1.2 Law Abidance and Enforcement.

In addition, not only did people report that they frequently disobeyed bicycling laws, but we observed a large number of bicyclists and pedestrians actively disobeying the bicycling laws, even when the law was visibly posted. This finding corroborates the need to investigate ways to improve bicycling safety education. Our survey also shows that people perceive law enforcement to be lacking because they reported that they are not afraid of being penalized for their infractions. Past studies have shown that strict law enforcement typically improves compliance with laws, and this in turn increases safety by reducing the number of bicycle crashes and injuries (Pedestrian and Bicycle Information Center, 2009). Thus, future research should examine methods of both increasing the enforcement of the laws and changing peoples' perceptions of law enforcement.

5.2 Improving Infrastructure

5.2.1 Bicycle Tracks

Besides law abidance and enforcement, we also observed the bicycling infrastructure in terms of connectivity, obstacles (e.g., uneven road surfaces and items on the track) on the tracks, signage, and parking facilities. We found many areas for improvement in the current infrastructure. Many of the bicycling tracks were disconnected and forced bicyclists to cross road junctions; thereby, increasing the probability of traffic accidents. Hence, we recommend that bicycle tracks should be better connected.

Along with path disconnections, bicycling tracks were observed to have a number of different obstacles that inhibit both the safety and convenience of bicycling on these tracks. While observing these infrastructures, we noticed that some bicyclists tended to lose their

stability when passing through bollards (vertical posts meant to reduce bicyclists speed). Future research should investigate the ramifications bollards have on bicycling safety.

In addition, we found that some of the signage in Tin Shui Wai was unclear, obscured, and missing. For example, the meaning of some signs was hard to decipher, and further investigation showed that some of the posted signs are not included in the Transport Departments' Road Users Guide. From our observations, the visibility and the absence of these posted signs is also a problem in Tin Shui Wai. For example, signs were sometimes blocked by objects such other posted signs, as seen in Figure 7. Future research should investigate methods of improving the signage issues, and the benefits of standardized signs.



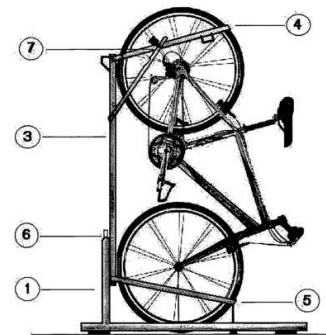
Figure 10: Picture of an obscured sign.

5.2.2 Parking Facilities

From our observations of 15 bicycle parking areas in Tin Shui Wai, we found that the current parking facilities do not adequately accommodate bicyclists. While some parking facilities were above capacity, other facilities were underutilized. In addition, some parking facilities were limited by being inaccessible, inconvenient, and some areas had no parking facilities nearby.

Given the number of factors that contribute to limiting the efficiency of adequate parking, future research should investigate methods to improve these limitations. Studies should examine the popular areas for bicycle parking and areas that have no parking in order to accommodate the

needs of bicyclists. To improve the ability to accommodate more bicycles per parking facility, researchers could examine other types of parking infrastructures that maximize the number of bicycles parked in limited space. For instance, a vertical parking device that reduces the amount of occupied space by 50% compared to conventional parking infrastructures has been successfully implemented in Germany, Italy, France, the United States, and other countries (World Intellectual Property Organization, 2006; see Figure 11 for a picture of this device).



(<http://www.bikepark.auto-mart.hr/>)

Figure 11: Examples of vertical bicycle rack

In addition, we observed a number of illegally parked bicycles that can create inconvenient obstacles along the streets, sidewalks, and bicycling tracks, as they often secured to railings, light posts, benches and other city infrastructure. Future research should examine ways to discourage illegal bicycle parking. One factor that could be examined is how increasing the penalties for this offense influences illegal bicycle parking. Another factor that could be examined is how increasing the amount of signage outlining the consequences of the offense influences illegal bicycle parking. For example, countries like Japan and Great Britain mass

produce clear, permanent, and recognizable signs such as those depicted in Figure 12 (London Cycling Campaign, 2007; Public Works Bureau, 2008).



(<http://www.city.osaka.jp/kensetu/english/bicycle/remove.html>) (<http://www.superstock.com/stock-photos-images/1613R-16728>)

Figure 12: Examples of warning signs for illegally parked bicycles.

Throughout our observations, we also noticed a large number of abandoned bicycles that reduced the overall capacity of parking facilities. Future research should examine effective methods of implementing the removal process of abandoned bicycles. In addition, future research should explore ways to discourage the abandonment of bicycles. One method future research could explore is to adopt an identification system to create a database that links the owner to the bicycle in order to better regulate bicycle parking. Another method future research should examine is how a bicycle recycling program could reduce the number of abandoned bicycles.

5.3 Conclusion

Based on our survey and observational studies, we found that bicycling, regardless of whether conducted for recreation or transportation, is popular in Tin Shui Wai. However, we also found a number of areas that are in need for improvement in terms of education, law abidance and enforcement, and infrastructure.

Given that a safe and convenient bicycling system provides a positive impact on society, future research should investigate ways to encourage the government and people to embrace changes to the bicycling system. For example, research has shown that bicycles reduce the carbon footprint of society by minimizing emissions and decreasing energy consumption, as no

fossil fuels are directly used (Dill & Carr, 2003). In addition, research has consistently linked bicycling to an increase in overall health of those who bicycle (Nelson, 1995), and consequently can result in lowered healthcare costs which can be translated into an economic benefit (Sélenminde, 2004). In conclusion, our findings suggest that Hong Kong should promote bicycling due to its popularity, and the number of environmental and socioeconomic benefits that result from bicycling.

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Appendix A: Sponsor Profile

Dr. Wing-Tat Hung, liaison for this project, is an associate professor at Hong Kong Polytechnic University. The University sponsored this project because Dr. Hung promotes sustainable and eco-friendly alternative transportation methods, like bicycling. Currently working in the Department of Civil and Structural Engineering, Dr. Hung previously received a Master's of Science Degree in Transport Planning and Engineering from Leeds University and a PhD in Engineering from Hong Kong University. In addition, he has several published many articles regarding environmental awareness, energy consumption, traffic flow, and many subjects relevant to this IQP. Some specific examples include: "Vehicular fuel use characteristics in Hong Kong," "An environmentally sustainable transport policy for Hong Kong," and "Planning and Management of Vehicular Emission in the Hong Kong and Guangzhou (China) Urban Environment" (Hung, 2008). His mission is to improve the energy consumption and pollution associated with the urban transport of Hong Kong, and he is a vital asset to our project because he is a specialist on sustainable transportation methods and sees bicycling as a promising option for Hong Kong.

Dr. Hung's involvement in many professional and community service positions have made him a distinguished figure in Hong Kong. Some of his positions and efforts that are relevant to this project include the following:

- Member- Road Safety Research Committee, Transport Bureau, HKSARG.
- Board Member- Hong Kong Society for Transportation Studies.
- Council Member- Chartered Institute of Logistics and Transport in Hong Kong.
- Member- Town Planning Appeal Board
- Director- The Conservancy Association.

- Advisor- HK 2030 Study of Planning Department
- Expert Advisor- Greater Pearl River Delta Township Planning Study
- Expert Member- Capital Projects Committee, KCRC

The Hong Kong Polytechnic University (PolyU), employer of Dr. Hung, was also a major supporter for this project. PolyU is located in Hung Hom, Kowloon, and is the largest UGC-funded tertiary institution in terms of number of students. PolyU is a cornerstone of Kowloon by providing a world-class education, professional training, applied research services, and consultancy to its workforce. The university aims to equip students not only with professional competency but also the ability of independent thinking, good communication skills, and a global outlook.

Dr Hung works in PolyU's Department of Civil and Structural Engineering. The department had many resources available that assisted our research and helped us define a research method. The University has many qualified professionals within the fields of urban development, environmental, civil, and transportation engineering. The school also offered research facilities like libraries and databases; furthermore, it allowed us to access networking connections with important governmental departments within the city, such as the Transport Department and Civil Engineering and Design Department.

Dr. Wing-Tat Hung is sponsoring this project to collect information regarding the public's needs and opinions on bicycling infrastructure and policy. Since bicycling is highly sustainable, space-efficient, and beneficial to the environment and public health, Dr. Hung plans to analyze the needs and opinions of the public to determine whether bicycling would be a feasible and successful transportation method. In addition this project also seeks to recommend

changes to the existing bicycle policies and infrastructure to maximize the efficiency and convenience of the current bicycling system in the New Territories of Hong Kong.

Appendix B: Survey of Inhabitants (English)

Cycling in Tin Shui Wai – Survey

Thank you for your attention.

We are researching what people in Tin Shui Wai think about cycling, in conjunction with Hong Kong Polytechnic University. Your assistance is very much appreciated.

The survey should take only 2-3 minutes to complete. There are no right or wrong answers. Your responses will be treated confidentially, so please answer each question as truthfully as possible.

1. Are you a resident of Tin Shui Wai?

Yes No

2. Can you ride a bicycle?

Yes No

3. Have you ever received cycle training or education?

Yes No

4. How often do you ride a bicycle? (choose one)

Never (please go to **Section 2**)
1-2 times per year (please continue below)
Every month or few months (please continue below)
1-2 times per week (please continue below)
Most days (please continue below)

5. What is your main reason for cycling? (choose one)

- For transport (to work/school, shops, to meet friends)
- For recreation / as a leisure activity
- As a sport (eg. BMX, mountain biking, road racing)

6. As a cyclist, which of the following do you consider a problem?

	Yes	No
Drivers' lack of respect towards cyclists	<input type="checkbox"/>	<input type="checkbox"/>
Drivers passing too close / too fast	<input type="checkbox"/>	<input type="checkbox"/>
Aggressive behaviour by drivers	<input type="checkbox"/>	<input type="checkbox"/>
Design and maintenance of cycle tracks	<input type="checkbox"/>	<input type="checkbox"/>
Extent or location of cycle tracks	<input type="checkbox"/>	<input type="checkbox"/>
Inappropriate barriers and bollards on cycle tracks	<input type="checkbox"/>	<input type="checkbox"/>
Lack of cycle training provision	<input type="checkbox"/>	<input type="checkbox"/>
Any other comments? _____		

7. Do you always follow bicycle laws (including all posted signs)?

Yes No

8. If you do not always follow bicycle laws, why is that? (Check all that apply.)

- Some laws are inappropriate for cyclists
- Some laws are inconvenient
- I don't expect to be penalized.
- I don't know all the relevant laws
- I am not treated as a legitimate road user, so why should I?

Other _____

Section 2

9. What is the status of cyclists on normal roads in Hong Kong? (choose one)

- The same as other vehicles
- Allowed but should give way to other vehicles
- Illegal on the roads

10. How much do you agree with each of the following statements?

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
Cycling is a useful form of transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyclists have the same rights as other vehicle users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling should be encouraged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hong Kong roads are too dangerous for cycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(If you are a cyclist, please skip this question)

11. Why do you not cycle (or not cycle much)? (check all that apply)

- I don't know how to ride
- The air is too polluted
- It's too slow / inconvenient
- It's not safe
- It's too tiring / uncomfortable
- Parking is too difficult

The bike may be stolen

Other _____

12. How would you describe the amount of money that you spend on public transport (eg. MTR, bus and minibus)? (choose one)

Too much

Reasonable

Not important to my budget

13. Are you:

Male or Female

14. Please indicate your age:

0-9 yrs 40-49 yrs

10-19 yrs 50-59 yrs

20-29 yrs 60-69 yrs

30-39 yrs 70 or older

I prefer not to say

Thank you for your time!

Please add any further comments you have on the back of this sheet.

Appendix C: Survey of Inhabitants (Chinese)

單車使用—天水圍區

意見調查

謝謝您願意接受是項意見調查。

我們希望知道天水圍居民對使用單車的看法，因此聯同香港理工大學展開一項意見調查。懇請您為我們提供寶貴的意見。

此項調查只須花2-3分鐘完成。答案並無對錯之分，而您所回答的內容亦會絕對保密，因此懇請如實表達您的意見。

1. 您是否天水圍居民？

是 不是

2. 您懂得使用單車嗎？

懂 不懂

3. 您曾否接受正式的單車訓練？

有 沒有

4. 您每隔多久使用一次單車? (請選一個答案)

- 從不使用 (請跳至**第2部分**)
- 每年1-2次 (請繼續作答)
- 每一個月或幾個月一次 (請繼續作答)
- 每星期1-2次 (請繼續作答)
- 平日大部分時間 (請繼續作答)

5. 您為甚麼會使用單車? (請選一個答案)

- 代步 (上班/上學、購物、社交聚會)
- 作為娛樂 / 消閒活動
- 作為運動 (例如: BMX越野單車、爬山單車、賽車)

6. 作為單車使用者, 對您而言以下問題是否存在及有待改善?

- | | 是 | 不是 |
|------------------------|--------------------------|--------------------------|
| 駕車人士對單車使用者缺乏尊重 | <input type="checkbox"/> | <input type="checkbox"/> |
| 駕車人士過分靠近單車使用者 / 駕駛速度太快 | <input type="checkbox"/> | <input type="checkbox"/> |
| 駕車人士的態度具有攻擊性 | <input type="checkbox"/> | <input type="checkbox"/> |
| 單車徑的設計和保養 | <input type="checkbox"/> | <input type="checkbox"/> |
| 單車徑的覆蓋範圍和位置 | <input type="checkbox"/> | <input type="checkbox"/> |
| 單車徑上的屏障和路柱不足夠 | | |
| 單車培訓的提供不足夠 | <input type="checkbox"/> | <input type="checkbox"/> |
| 其他建議? _____ | | |

7. 您是否經常遵守單車法例 (包括所有路面指示)?

是 否

8. 若您不是經常遵守單車法例, 為甚麼? 請在合適的答案旁劃上「√」號。

一些法例不適用於單車使用者

一些法例容易造成不便

估計不會受到懲罰

不認識所有相關的法例

在路上使用單車既被視為不恰當, 為甚麼還要去遵守法例?

其他原因 _____

第2部分

9. 香港一般道路上, 單車使用者的身份是什麼? (請選一個答案)

跟其他車駕車人士一樣

有權使用道路, 但必須讓路給其他車輛

非法人士

10. 您是否認同以下的說法?

	非常同意	同意	不同意	非常不同意
單車是實用的交通工具	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
單車使用者跟其他車輛使用者享有同等權利	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
單車的使用應該受到鼓勵	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
在香港的道路上使用單車是危險的	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(若您是單車使用者, 可跳過這一條問題)

11. 您為甚麼不使用 (或不常用) 單車? (可選多個答案)

- 我不懂使用單車
- 空氣污染嚴重
- 單車走得太慢 / 不方便
- 不安全
- 容易令人疲倦 / 不舒適
- 泊車太困難
- 單車容易被偷
- 其他 _____

12. 您在公共交通工具上花費多少 (例如: 地鐵、巴士、小巴)? (請選一個答案)

- 大量金錢

合理水平

微不足道

13. 您的性別是:

男性 或 女性

14. 請選擇您的年齡組別:

0-9 歲 <input type="checkbox"/>	40-49 歲 <input type="checkbox"/>	
10-19 歲 <input type="checkbox"/>	50-59 歲 <input type="checkbox"/>	
20-29 歲 <input type="checkbox"/>	60-69 歲 <input type="checkbox"/>	
30-39 歲 <input type="checkbox"/>	70歲或以上 <input type="checkbox"/>	不願透露 <input type="checkbox"/>

謝謝您抽空完成訪問!

如有其他意見, 請寫在背頁上。

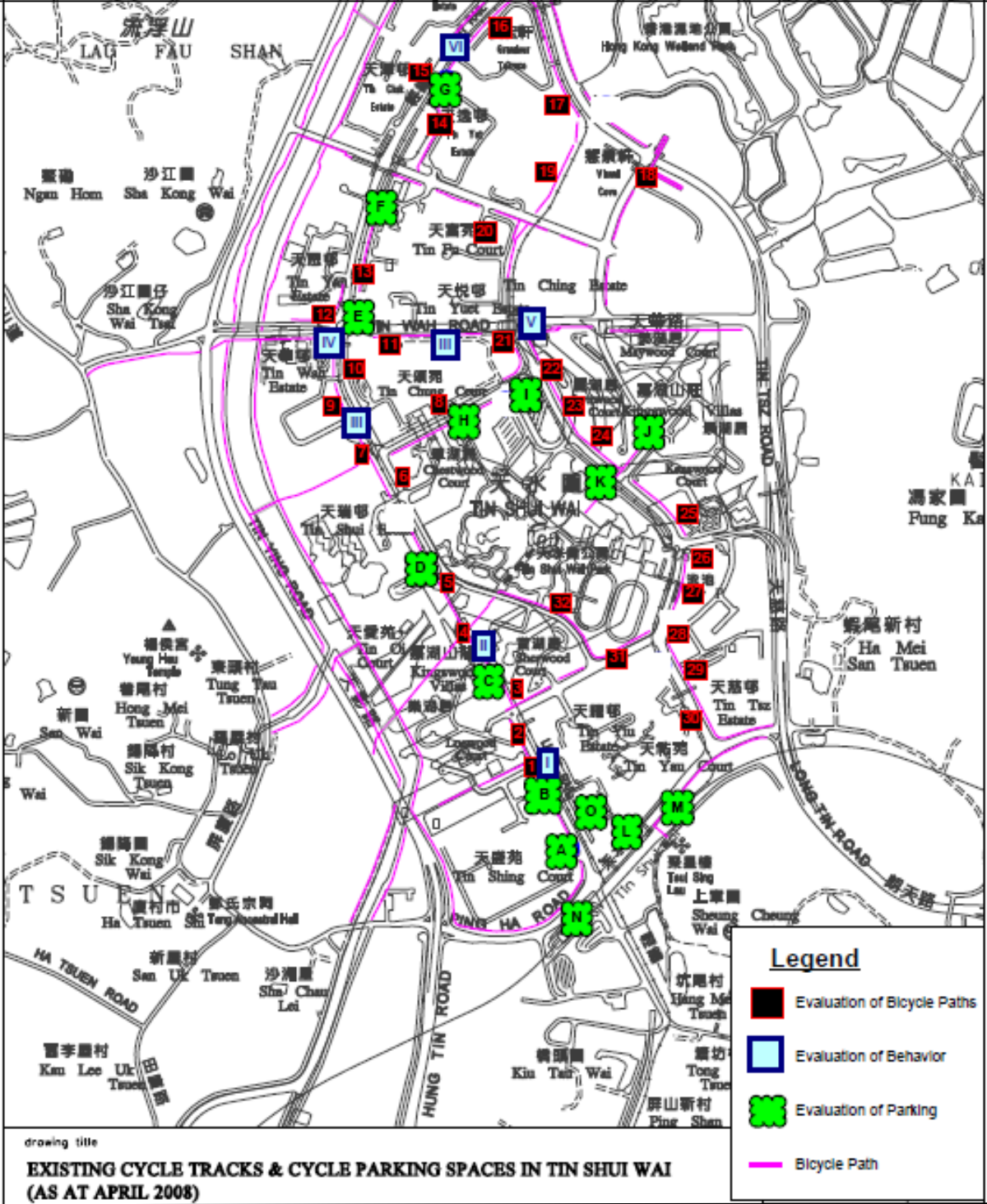
Appendix D: Explanation of Road User's Code Violations

Bicyclists	Description	Picture Appendix-Ref. #
Bicyclists Observed	The total number of bicyclists that were observed.	
Bicyclists Following Rules	The total number of observed bicyclists that did not violate any of the Road User's Code guidelines stated in the following section.	
Bicyclists Dismounting	The total number of bicyclists that were observed dismounting at the end of bicycling tracks, on pedestrian walkways, and on pedestrian crossings.	
Bicyclists Wearing Helmets	Total number of bicyclists observed wearing helmets.	
Bicyclists Not Using Signals	Total number of bicyclists observed using the proper signals stated in the Road Users Code	
Violations of Road Users' Code	Description	
Bicyclist Not Dismounting	The total number of times that a bicycle was not dismounted at the end of bicycling tracks, on pedestrian walkways, and on pedestrian crossings.	1-1
Bicyclists Using Pedestrian Walkway	The total number of times a bicyclist was observed riding on a pedestrian walkway.	1-2
Pedestrians Using Bicycling Track	The total number of pedestrians that were observed utilizing a bicycle track.	1-3
Bicycling Riding in Wrong Direction	The total number of times a bicyclist was observed riding on the road, in the opposite direction of traffic.	1-4
Bicyclist Too Far from Curb	The total number of times a bicyclist was observed riding on the road, more than 1/2 meter from the curb.	1-5
Crossing Roadway Incorrectly	The total number of times a bicyclist was observed crossing a road way without using the designated pedestrian crossing or crossing an intersection diagonally (diagram in picture appendix).	1-6, 1-7
Switching Lanes with No Signal	The total number of times a bicyclist was observed on the road changing from one lane to another without using the correct hand signal.	1-8
Carrying Passenger	The total number of times a bicyclist was observed transporting a passenger.	1-9
Using Crosswalk with Red Signal	The total number of times a bicyclist was observed crossing a road on a pedestrian crosswalk when there was a red (Don't Walk) signal.	1-10
Running Red Lights on Road	The total number of times a bicyclist was observed riding on the road and violated a red traffic signal for automobiles.	1-11
Not Using Two Hands	The total number of bicyclists that were observed steering their bicycle without having both hands on the handlebars (this violation does not apply to signaling bicyclists).	
Items on Handle Bars	The total number of bicyclists that were observed transporting items that were attached to their handle-bars.	1-12
Not Paying Attention	The total number of observed bicyclists performing tasks that would distract them while riding (talking on cell phone, lighting cigarette, drinking/eating).	

Appendix E: Explanation of Bicycle Path Deficiencies

Deficiency	Description	Picture Appendix -Ref. #
Dangerous Track Design:	A track segment that is difficult to safely maneuver around: poor visibility(sight distance<50ft ahead); sharp turn(curvature < 30 ⁰); narrow track(width<15ft)	3-1, 3-2
Obstruction:	obstacles permanently fixed to track (includes sign posts, garbage barrels, benches, and fire hydrants)	3-3, 3-4, 3-5, 3-6
Obscured:	Signs that are hidden from view by objects such as trees, other signs, etc.	3-7, 3-8
Unnecessary Bollards	Bollards present on bicycling tracks that do not initiate/terminate a track	3-9, 3-10
Uneven Surface:	Bicycle track surface that is not smooth due to the presence of roots, cracks, holes, or protruding bricks.	3-11, 3-12, 3-13, 3-14
Large Disconnection:	A disconnection in tracks that does not have a pedestrian crossing for more than 500ft which may encourage bicyclists to cross the road in an undesignated location for convenience purposes	
No pedestrian walkway/bicycle track split	Bicycle track does not have this necessary sign which indicates to pedestrians that they not allowed to walk on the bicycling path(stay to the left) and indicates that bicyclists are not allowed to ride on pedestrian walkways(stay to the right)	3-15, 3-16
No road surface markings	The bicycle track lacks the markings on the road surface which indicates the beginning and end of the bicycle track	3-17, 3-18
No Mount Sign	Track lacks sign that indicates when it is allowed for a bicyclist to mount his/her bicycle	3-19, 3-20
No Dismount Sign	Track lacks sign that indicates when it is necessary for a bicyclist to dismount his/her bicycle	3-21, 3-22
Undefined Sign	A bicycle sign that is not included in the Road Safety Code	3-23
Conflicting Signs:	Cycling track has two signs present that have opposing meanings	3-24

Appendix F: Tin Shui Wai Map with Observation Sites



Appendix G: Evaluation Sheets: Observation of Behavior

Observational Survey: Behavior								
Location: Intersection of Tin Yui and Tin Ho Roads								Code: I
Time Stamp	Monday		Friday		Saturday		Pic. Ref. and Violation Explanation	
	Time						Appendix 9	
	7:30	10:30	7:30	10:30	7:30	10:30		
Bicyclists	Number						Average	Comments
Bicyclists Observed	40	43	62	46	32	60	47	
Bicyclists Following Rules	1	26	16	6	7	5	10	
Percent of Obedient Bicyclists	3%	61%	26%	13%	22%	8%	22%	
Bicyclists Dismounting	1	26	16	3	7	3	9	Observed a bicyclist dismount until he passed 2 policeman, then mounted bicycle again
Bicyclists wearing helmet	0	0	0	2	0	1	1	
Bicyclists Using Signals	0	0	0	0	0	0	0	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Not Dismounting	10	17	42	43	23	43	30	
Bicyclists Using Pedestrian Walkway	0	3	0	0	0	0	1	
Pedestrians Using Bicycling Track	438	323	405	318	96	294	312	
Bicycling in Wrong Direction	2	0	0	2	0	2	1	
Bicycling Too Far from Curb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Crossing Roadway Incorrectly	5	3	4	3	2	5	4	Slanting across traffic, riding adjacent to pedestrian crosswalk to avoid people
Switching Lanes with No Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Carrying Passenger	4	0	5	2	1	3	3	
Using Crosswalk with Red Signal	5	3	3	5	2	2	3	
Running Red Lights on Road	2	0	1	2	1	10	3	Officer saw bicyclists run light-no penalty
Not Using Two Hands	3	0	2	0	2	1	1	
Items on Handle Bars	3	4	2	15	3	7	6	Many bicyclists were delivering food
Not Paying Attention	4	3	2	3	1	4	3	talking on phone, smoking, eating
Total violations per hour	476	356	466	395	131	372	366	
Other Observations								

Observational Survey: Behavior								
Parking Location: Kingwood Richly Plaza- 10ft away from pedestrians bridge							Code: II	
Time Stamp	Monday		Friday		Sunday		Pic. Ref. and Violation Explanation	
	Time						Appendix 9	
	7:30-8:30	10:15-11:15	7:30-8:30	10:15-11:15	7:30-8:30	10:15-11:15		
Bicyclists	Number						Average	Comments
Bicyclists Observed	94	55	110	47	35	50	65	
Bicyclists Following Rules	1	5	6	4	1	3	3	
Percent of Obedient Bicyclists	1%	9%	5%	9%	3%	6%	6%	
Bicyclists Dismounting	1	5	6	4	1	3	3	
Bicyclists Wearing Helmet	1	0	0	1	0	0	0	
Bicyclists Using Signals	0	0	0	0	0	0	0	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Not Dismounting	93	50	104	43	33	47	62	
Bicyclists Using Pedestrian Walkway	3	7	7	9	8	8	7	
Pedestrians Using Bicycling Track	173	85	170	95	20	90	101	

Bicycling in Wrong Direction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Bicycling Too Far from Curb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Crossing Roadway Incorrectly	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Switching Lanes with No Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Carrying Passenger	12	0	17	0	1	2	5	
Using Crosswalk with Red Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Running Red Lights on Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Not Using Two Hands	2	2	2	2	1	0	2	Using cell phone
Items on Handle Bars	23	13	9	23	0	15	14	
Not Paying Attention	4	1	5	2	0	3	3	Smoking and drinking while biking
Total Violations per Hour	310	158	314	174	63	165	198	
Other Observations								
M-F:Two cops walk by without ticketing or warning pedestrians to get off bicycling track								

Observational Survey: Behavior								
Parking Location: Tin Yau Court: Southwest Corner (Intersection of Tin Yiu Road & Tin Fuk Road)							Code: III	
Time Stamp	Monday		Friday		Sunday		Pic. Ref. and Violation Explanation	
	Time						Appendix 9	
	8:30-9:30	2:00-3:00	8:30-9:30	2:15-2:45	8:30-9:30	2:30-3:30		
Bicyclists	Number						Average	Comments
Bicyclists Observed	62	57	59	52	54	49	56	
Bicyclists Following Rules	8	9	4	8	14	5	8	
Percent of Obedient Bicyclists	13%	18%	7%	15%	26%	10%	15%	
Bicyclists Dismounting	0	0	0	0	0	1	0	
Bicyclists wearing Helmets	0	0	0	0	0	0	0	
Bicyclists Using Signals	0	0	0	0	0	0	0	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Not Dismounting	24	15	26	34	18	6	21	

Bicyclists Using Pedestrian Walks	9	11	7	13	9	7	9	
Pedestrians Using Bicycling Track	10	14	8	19	12	19	14	Overpass makes it unlikely for pedestrians using track
Bicycling in Wrong Direction	6	5	7	2	4	1	4	
Bicycling Too Far from Curb	7	14	8	5	5	9	8	
Crossing Roadway Incorrectly	10	11	13	14	6	14	11	
Switching Lanes with No Signal	9	11	4	7	7	5	7	Illegal Slanting across intersection
Carrying Passenger	6	1	4	2	1	3	3	
Using Crosswalk with Red Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Running Red Lights on Road	17	18	13	13	16	26	17	
Not Using Two Hands	2	1	1	1	0	1	1	
Items on Handle Bars	0	0	3	1	0	5	2	
Not Paying Attention	0	0	3	1	1	2	1	
Total Violations per Hour	100	101	97	112	79	98	98	
Other Observations								
Bicyclist Using Overpass: 146 Bicyclist Not using Overpass: 176								

Observational Survey: Behavior								
Parking Location: Roundabout								Code: IV
Time Stamp	Monday		Friday		Sunday		Pic. Ref. and Violation Explanation	
	Time						Appendix 9	
	8:30-9:30	2:00-3:00	8:30-9:30	2:00-3:00	8:30-9:30	2:00-3:00		
Bicyclists	Number						Average	Comments
Bicyclists Observed	9	10	13	10	10	8	10	
Bicyclists Following Rules	1	2	3	1	2	0	2	
Percent of Obedient Bicyclists	11%	20%	23%	10%	20%	0%	14%	
Bicyclists Dismounting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Bicyclists Wearing Helmet	0	0	1	0	0	0	0	

Bicyclists Using Signals	0	0	0	0	0	0	0	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Nor Dismounting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Bicyclists Using Pedestrian Walkway	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Pedestrians Using Bicycling Track	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Bicycling in Wrong Direction	5	4	5	2	2	4	4	
Bicycling Too Far from Curb	0	1	1	3	3	0	1	
Crossing Roadway Incorrectly	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Switching Lanes with No Signal	2	2	4	4	3	2	3	
Carrying Passenger	1	0	1	0	0	0	0	
Using Crosswalk with Red Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Running Red Lights on Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Not Using Two Hands	1	0	0	0	0	0	0	
Items on Handle Bars	0	0	0	0	0	0	0	
Not Paying Attention	0	0	0	0	1	0	0	Using cell phone while biking
Total Violations per Hour	9	7	11	9	9	6	9	
Other Observations								
Sometime bicyclists would carry their bike over the street railing to ride on the road. Pedestrian would often cross the road illegally to do their shopping or to get from side of the street to another. Lack of safe crossing areas in vicinity								

Observational Survey: Behavior				
Parking Location: Tin Yau Court: Southwest Corner (Intersection of Tin Yiu Road & Tin Fuk Road)				Code: V
Time Stamp	Monday	Friday	Sunday	Pic. Ref. and Violation Explanation
	Time			Appendix 9

	7:30-8:30	11:30-12:30	7:30-8:30	11:30-12:30	7:15-8:15	11:30-12:30		
Bicyclists	Number						Average	Comments
Bicyclists Observed	92	61	110	58	42	52	69	
Bicyclists Following Rules	8	4	6	3	8	4	6	
Percent of Obedient Bicyclists	9%	7%	5%	5%	19%	8%	9%	
Bicyclists Dismounting	5	0	14	8	0	2	5	
Bicyclists Wearing Helmets	0	0	0	0	4	0	1	3 were worn by uniformed sport cyclists
Bicyclists Using Signals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Not Dismounting	55	58	61	61	39	46	53	a single cyclist fails to dismount multiple times
Bicyclists using Pedestrian Walks	13	9	16	5	8	6	10	
Pedestrians Using Bicycling Track	359	228	348	263	178	204	297	
Bicycling in Wrong Direction	5	1	8	10	4	4	5	
Bicycling Too Far from Curb	3	2	2	2	3	1	2	traffic is very dense for bicyclists to stray far from the curb
Crossing Roadway Incorrectly	19	16	20	23	16	10	17	
Switching Lanes with No Signal	0	0	0	0	0	0	0	too many cars to switch lane
Carrying Passenger	8	2	15	2	2	5	6	
Using Crosswalk with Red Signal	23	21	21	34	25	29	26	
Running Red Lights on Road	9	5	8	4	4	5	6	
Not Using Two Hands	0	3	2	1	0	1	1	
Items on Handle Bars	0	2	2	5	7	2	3	
Not Paying Attention	0	1	0	4	0	2	1	

Total Violations per Hour	494	348	503	414	286	315	394	
Other Observations								
No bicyclists used turning/stopping signals at this intersection								

Observational Survey: Behavior								
Parking Location: Tin Shui Road across from Tin Heng Carpark								Code: VI
Time Stamp	Monday		Friday		Saturday		Pic. Ref. and Violation Explanation	
	Time						Appendix 9	
	8:40	2:00	8:40	2:00	8:40	2:00		
Bicyclists	Number						Average	Comments
Bicyclists Observed	39	64	57	91	42	109	67	
Bicyclists Following Rules	4	2	5	12	3	3	5	
Percent of Obedient Bicyclists	10%	3%	9%	13%	7%	3%	0%	
Bicyclists Dismounting	4	2	5	12	3	3	5	
Bicyclists Wearing Helmets	1	0	0	1	0	0	0	
Bicyclists Using Signals	0	0	0	0	0	0	0	
Violations of Road Users' Code	Number						Average	Comments
Bicyclists Not Dismounting	35	62	52	76	39	96	60	
Bicyclists Using Pedestrian Walkway	3	2	3	9	2	3	4	
Pedestrians Using Bicycling Track	312	249	324	317	143	438	297	
Bicycling in Wrong Direction	0	0	0	2	1	4	1	
Bicycling Too Far from Curb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Crossing Roadway Incorrectly	10	12	13	15	2	17	12	Slanting across the intersection, not utilizing the pedestrian crossway

Switching Lanes with No Signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Carrying Passenger	0	0	2	5	1	3	2	Small children on back of bicycles
Using Crosswalk with Red Signal	7	3	9	6	1	14	7	
Running Red Lights on Road	0	4	4	8	2	3	4	
Not Using Two Hands	0	0	2	3	1	4	2	
Items on Handle Bars	12	27	15	32	9	25	20	Food deliverers/ mall returnees
Not Paying Attention	2	1	4	3	2	6	3	Talking on phone, smoking
Total Violations per Hour	382	360	428	477	203	613	411	
Other Observations								
Very long stretch of abandoned bikes, even though the space has room to facilitate designated parking spaces. Wall would also hide bikes from view								

Appendix H: Evaluation Sheet: Observation of Bicycle Tracks

Observational Survey: Bicycling Tracks	
Code	Description
1	Dangerous Track Design: poor visibility for bicyclists at this intersection
2	No pedestrian walkway/bicycle track split; Unnecessary Bollards; Obstruction: sign posts
3	Uneven Road Surface: missing tiles and holes on cycling track
4	No road surface markings; No mount sign; No dismount sign; No division sign for pedestrian walkway/bicycle track or signs on track
5	Obstruction: bikes parked here overflow onto bicycle track
6	Uneven Road Surface: roots causing cracking on tracks
7	No mount sign; No division sign for pedestrian walkway/bicycle track
8	No dismount or mount signs; Unnecessary Bollards
9	No road surface markings; No mount sign; Obscured: division sign for pedestrian walkway/bicycle track are obscured by tree
10	Obscured: cyclist dismount sign is covered by black bag; No division sign for pedestrian walkway/bicycle track; Large Disconnection: can't get from site 9 to site 10, two cycling tracks
11	Obstruction: Illegally parked bicycles create obstructions on tracks
12	Dangerous Track Design: narrow bicycle path; Obscured: bicycle track signs obscured by other signs; No mount signs; Large Disconnection: bicyclists not allowed on nearby overpasses
13	Obstruction: trashcan fixed to road surface
14	Obstruction: fire hydrant fixed to road surface
15	Obstruction: benches fixed to road surface
16	Uneven Road Surface: roots causing cracking on tracks
17	Unnecessary Bollards
18	Undefined Sign: a red and white sign with a picture of a bicycle (refer to Picture Appendix 3-24)
19	Uneven road surface: there is a 2cm ridge on bicycling track (refer to Picture Appendix 3-13)
20	Dangerous Track Design: sharp turn
21	No division sign for pedestrian walkway/bicycle track; No mount sign; the bicycle route is very indirect compared to the pedestrian path (encourages bicyclists to use Pedestrian walk way); Unnecessary Bollards
22	No dismount sign; Conflicting signs: road surface says end while sign says mount
23	No road surface markings (at either end of track); No division sign for pedestrian walkway/bicycle track; No mount sign
24	No road surface markings, , No mount sign, no dismount sign (on either end of track)
25	No division sign for pedestrian walkway/bicycle track; Obstruction: sign posts on track
26	No dismount sign; No mount sign, Uneven Road Surface: brick protruding from track
27	No mount road marking
28	No mount road marking
29	No division sign for pedestrian walkway/bicycle track

30	Obstruction: sign post on bicycle track
31	No pedestrian walkway/bicycle track split sign, no dismount sign, unnecessary bollards
32	No division sign for pedestrian walkway/bicycle track
Other Comments	
<p>Signage is an overall problem on the cycling tracks of Tin Shui Wai because many times, appropriate signs are completely missing. Also the signs are confusing because different signs mean similar things. These similar signs are interchanged quite frequently, and there is no logical pattern as to when a particular sign should be used. The mount and dismount signs are also confusing because the drawing of a dismounted bicyclist looks very similar to a bicycle with a mounted bicyclist.</p> <p>Refer to Appendix 10 for picture locations and deficiency explanations</p>	

Appendix I: Evaluation Sheets: Observation of Parking

Observational Survey: Bicycle Parking								
Parking Location: Tin Yiu Road: Tin Shing Court side (West)								Code: A
Bicycle Capacity:	40						Proximity to Points of Interest:	
Capacity type	20 standard U-Bars						300 feet- Tin Shui Wai Railway Station entrance, 20 feet - market	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:45	7:08	2:45	7:15	2:54	7:10		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	34	36	37	40	40	37	34	
Obstructions	5	7	4	4	4	5	5	piles of cardboard, ladders
Number of Bicycles Present	77	80	75	82	85	81	77	
Percent Abandoned Bicycles	44%	45%	49%	49%	47%	46%	44%	
Percent Capacity	193%	200%	188%	205%	213%	219%	193%	
Additional Comments								
<p>There are few other designated parking areas around, which leads to a large number (56) of illegally parked bicycles at the intersection of Tin Ho Road and Tin Yiu Road (along Tin Yiu)</p> <p>Picture Appendix-Ref #:2-1</p>								

Observational Survey: Bicycle Parking								
Parking Location: Intersection Tin Ho & Tin Yiu Streets (mainly along Tin Ho)								Code: B
Bicycle Capacity:	N/A						Proximity to Points of Interest:	
Capacity type	No parking infrastructure						150 feet - Light Rail Station, 175 feet - Tin Yiu Market	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:57	7:00	2:56	7:10	3:03	7:01		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	4	4	4	5	5	5	5	
Obstructions	0	0	0	0	0	0	0	
Number of Bicycles Present	50	52	51	46	56	48	51	
Percent Abandoned Bicycles	8%	8%	8%	11%	9%	10%	9%	
Percent Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Additional Comments								
Picture Appendix-Ref #: 2-2								

Observational Survey: Bicycle Parking								
Parking Location: Within Sherwood Court, adjacent to Locwood Light Rail Stop								Code: C
Bicycle Capacity:				220			Proximity to Points of Interest:	
Capacity type				110 Standard U-bars				
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date		15 feet- shopping center, 20 feet- Light Rail Stop	
	3-Feb		5-Feb		7-Feb			
	Time							
	3:05	7:10	3:05	7:34	3:11	8:02		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	145	145	145	152	154	155	149	
Obstructions	11	11	12	12	10	14	12	large stacks of cardboard boxes, dollies, ladders
Number of Bicycles Present	496	427	494	470	452	479	470	
Percent Abandoned Bicycles	28%	33%	28%	31%	32%	32%	32%	
Percent Capacity	225%	194%	225%	214%	205%	218%	213%	
* See Appendix X for details								
<p>This area is very popular for bicycle parking and there is a large amount of area under construction for more seating, but it does not appear that there is more parking infrastructure planned to be constructed</p> <p>Picture Appendix-Ref #: 2-3, 2-4, 2-5</p>								

Observational Survey: Bicycle Parking								
Parking Location: Tin Shui Road, west of Tin Shui Light Rail Stop							Code: D	
Bicycle Capacity:	88						Proximity to Points of Interest:	
Capacity type	44 Standard U-bars						15 feet- Tin Shui Light Rail Stop, 54 feet- Tin Shui Joy Square, 170 feet- Bus Terminus	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:57	7:53	3:14	3:05	3:26	7:56		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	52	52	54	54	54	54	53	
Obstructions	6	6	7	3	5	5	5	dollies, signs, crate, plant
Number of Bicycles Present	196	187	193	173	193	187	188	
Percent Abandoned Bicycles	27%	28%	28%	31%	28%	29%	28%	
Percent Capacity	223%	213%	219%	197%	219%	213%	214%	
Additional Comments								
<p>There are about 143 illegally parked bicycles scattered around bus terminal/shopping center (reasonably far from parking area), probably caused by the designated area being consistently overcapacity.</p> <p>Picture Appendix-Ref #: 2-6</p>								

Observational Survey: Bicycle Parking								
Parking Location: Roundabout where Tin Shui and Tin Wah streets meet							Code: E	
Bicycle Capacity:	200						Proximity to Points of Interest:	
Capacity type:	4 sections (200)(0)(0)(0) Assortment of varying capacity spaghetti bars						Chung Fu=14steps. This area is a central hub for transportation to reach many areas of Tin Shui Wai	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:34	7:06	2:26	7:08	2:38	7:00		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	61	62	63	63	65	65	63	
Obstructions	3	4	3	4	7	7	5	dollies, ladders
Number of Bicycles Present	140	128	138	123	105	113	125	
Percent Abandoned Bicycles	44%	48%	46%	51%	62%	58%	51%	
Percent Capacity	70%	64%	69%	62%	53%	57%	62%	
Additional Comments								
<p>The parking around this roundabout is poorly designed. A large number of parking places exists at one corner, but it is not fully used, while the three other corners have no parking. This encourages illegal parking since it is difficult to cross from one corner of the roundabout to the other. Instead of having all parking infrastructure at one corner it should be evenly distributed around four corners.</p> <p>Picture Appendix-Ref #: 2-7</p>								

Observational Survey: Bicycle Parking								
Parking Location: Intersection of Tin Sau and Tin Shui Roads							Code: F	
Bicycle Capacity: 232						Proximity to Points of Interest:		
Capacity type: Assortment of different capacity spaghetti bars						25 feet- Light Rail Stop		
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:21	7:28	2:10	7:04	2:30	7:00		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	17	18	20	20	21	21	20	
Obstructions	5	5	5	5	6	6	5	wheelchair, motorcycle, dollies
Number of Bicycles Present	33	36	32	35	28	32	33	
Percent Abandoned Bicycles	52%	50%	63%	57%	75%	66%	60%	
Percent Capacity	14%	16%	14%	15%	12%	14%	14%	
Additional Comments								
Parking lot is around few points of interest, it is very large and unoccupied Picture Appendix-Ref #: 2-8								

Observational Survey: Bicycle Parking									
Parking Location: Tin Shui Road, between Tin Chak Shopping Centre and Tin Heng Carpark								Code: G	
Bicycle Capacity:						150			Proximity to Points of Interest:
Capacity type						75 standard U-Bars			20 feet- mall, 60 feet- bus terminus
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date				
	3-Feb		5-Feb		7-Feb				
	Time								
	2:01	6:48	2:08	6:51	2:10	6:42			
Bicycle Parking	Number						Average	Comments	
Abandoned Bicycles	58	58	63	64	65	65	62		
Obstructions	6	6	6	6	8	8	7	Dollies, cardboard boxes	
Number of Bicycles Present	232	234	232	216	234	235	231	232	
Percent Abandoned Bicycles	25%	25%	27%	30%	28%	28%	27%	25%	
Percent Capacity	155%	156%	155%	144%	156%	157%	154%	155%	
Additional Comments									
Picture Appendix-Ref #: 2-9									

Observational Survey: Bicycle Parking

Parking Location: Along Tin Wing Road beside Chestwood Court Light Rail Station								Code: H
Bicycle Capacity:	26						Proximity to Points of Interest:	
Capacity type	13 standard U-bars						Chestwood Station=2ft Bus Stop=35ft	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:24	7:19	2:33	8:05	2:50	7:25		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	26	26	27	27	27	27	27	
Obstructions	8	8	10	10	10	10	9	Dollies, Signs, and Ladders
Number of Bicycles Present	51	52	55	54	55	55	54	
Percent Abandoned Bicycles	51%	50%	49%	50%	49%	49%	50%	
Percent Capacity	196%	200%	212%	208%	212%	212%	206%	
Additional Comments								
Picture Appendix-Ref #: 2-10								

Observational Survey: Bicycle Parking									
Parking Location: Tin Shing Road: Lynwood Court side (East)							Code: I		
Bicycle Capacity:	70						Proximity to Points of Interest:		
Capacity type	35 standard U-Bars						Bus stop- 10ft, Light rail - 55ft		
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date				
	3-Feb		5-Feb		7-Feb				
	Time								
	2:31	7:28	2:43	8:14	3:00	7:36			
Bicycle Parking	Number						Average	Comments	
Abandoned Bicycles	42	42	43	43	43	43	43		
Obstructions	12	12	13	13	4	6	10	dollies, trash bags	
Number of Bicycles Present	83	68	84	61	72	65	72		
Percent Abandoned Bicycles	51%	62%	51%	70%	60%	66%	59%		
Percent Capacity	119%	97%	120%	87%	103%	93%	103%		
Additional Comments									
Picture Appendix-Ref #: 2-11									

Observational Survey: Bicycle Parking								
Parking Location: Intersection: Tin Lung & Tin Kwai							Code: J	
Bicycle Capacity:	48						Proximity to Points of Interest:	
Capacity type	24 standard U-Bars						bus stop=22ft 2 parks, 33 ft and 83 ft away school=84ft	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:39	7:36	2:48	8:20	3:07	7:43		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	56	56	58	58	59	59	58	
Obstructions	3	3	4	4	5	4	4	dolly, signs, plant
Number of Bicycles Present	95	93	95	84	91	93	92	
Percent Abandoned Bicycles	59%	60%	61%	69%	65%	63%	63%	
Percent Capacity	198%	194%	198%	175%	190%	194%	191%	
Additional Comments								
This parking area is located in a very attractive section of the town, and the number of abandoned and illegally parked bicycles detract from this. Picture Appendix-Ref #: 2-12								

Observational Survey: Bicycle Parking								
Parking Location: Tin Yiu Road: Tin Shing Court side (West)								Code: K
Bicycle Capacity:	214						Proximity to Points of Interest:	
Capacity type	27 standard U-Bars, 15 unknown structures						2 hotels/shopping centers, 23 ft and 78 ft away bus stop- 68 ft light rail=194ft	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:46	7:54	2:55	8:00	3:15	7:46		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	0	0	0	0	0	0	0	
Obstructions	8	8	9	9	13	8	9	large pile of cardboard, dollies, trash bags,
Number of Bicycles Present	60	24	64	20	65	36	45	
Percent Abandoned Bicycles	0%	0%	0%	0%	0%	0%	0%	
Percent Capacity	28%	11%	30%	9%	30%	17%	21%	
Additional Comments								
Picture Appendix-Ref #: 2-13								

Observational Survey: Bicycle Parking								
Parking Location: Along Tin Fuk Road: from Tin Fuk Road								Code: L
Bicycle Capacity:	0						Proximity to Points of Interest:	
Capacity type	N/A						MTR Station Entrance- 20ft	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:31	7:38	2:31	7:20	2:11	7:42		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	29	29	31	31	31	31	30	
Obstructions	0	0	0	0	0	0	0	
Number of Bicycles Present	82	91	84	106	89	101	92	
Percent Abandoned Bicycles	35%	32%	37%	29%	35%	31%	33%	
Percent Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Additional Comments								
<p>Illegally parked bicycles occupy the whole block along Tin Fuk Rd and TinYiu Rd. There is insufficient space along these roads to accommodate designated parking spaces. Picture Appendix-Ref #: 2-14</p>								

Observational Survey: Bicycle Parking								
Parking Location: Tin Fuk Road, Tin Shui Wai MTR Station Parking Area, Exit E								Code: M
Bicycle Capacity:	328						Proximity to Points of Interest:	
Capacity type	164 U-Bars						54 ft- Entrance E to MTR station	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:31	8:16	2:31	8:46	2:31	8:25		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	58	59	61	61	66	68	62	
Obstructions	3	4	3	8	6	8	5	plants, dollies, sign, trailers, cone, desk-drawer
Number of Bicycles Present	99	89	96	92	90	94	93	
Percent Abandoned Bicycles	59%	66%	64%	66%	73%	72%	67%	
Percent Capacity	30%	27%	29%	28%	27%	29%	28%	
Additional Comments								
<p>Very inconvenient because it is only accessible by (exit E), parking area should be more centralized, numerous smaller areas should be dispersed evenly throughout the station.</p> <p>Picture Appendix-Ref #: 2-15</p>								

Observational Survey: Bicycle Parking								
Parking Location: Tin Shui Wai MTR Station Parking Area Exit A							Code: N	
Bicycle Capacity:	472						Proximity to Points of Interest:	
Capacity type	236 something							
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:43	7:55	2:42	8:23	2:43	7:55		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	5	5	7	8	10	10	8	
Obstructions	2	2	3	2	2	2	2	sign, baby carriage
Number of Bicycles Present	71	80	96	63	54	69	72	
Percent Abandoned Bicycles	7%	6%	7%	13%	19%	14%	10%	
Percent Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Additional Comments								
Very inconvenient because it is only accessible by (exit A), parking area should be more centralized Picture Appendix-Ref #: 2-16								

Observational Survey: Bicycle Parking								
Parking Location: Along Tin Yiu Road: from Tin Yat Station to Tin Fuk Rd								Code: O
Bicycle Capacity:	0						Proximity to Points of Interest:	
Capacity type	N/A						Shopping Center-83 feet Light rail station 91 feet MTR station 112ft Light rail station 134ft	
Time Stamp	Day 1 Date		Day 2 Date		Day 3 Date			
	3-Feb		5-Feb		7-Feb			
	Time							
	2:31	7:38	2:31	7:20	2:11	7:42		
Bicycle Parking	Number						Average	Comments
Abandoned Bicycles	26	26	27	28	28	28	27	
Obstructions	0	0	0	0	0	0	0	
Number of Bicycles Present	90	95	97	110	94	102	98	
Percent Abandoned Bicycles	29%	27%	28%	25%	30%	27%	28%	
Percent Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Additional Comments								
<p>Illegally parked bicycles occupy the whole block along Tin Fuk Rd and TinYiu Rd. There is insufficient space along these roads to accommodate designated parking spaces.</p> <p>Picture Appendix-Ref #: 2-14</p>								