Identification for a Bicycle Parking Condition of Dormitories in the University of Tsukuba.

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1. Motivation

Encouraging cycling to make cities more "liveable", healthy and sustainable has been very effective (Pucher & Buehler, 2008). Therefore, cycling maintains and encourages the popular and beneficial use of the bicycle as an important mode of transportation to, from and on campus. The bicycle parking becomes important service for civitas on a campus. Therefore, the study to identify a bicycle parking condition is necessary to be conducted.

2. Introduction

The purpose of this study is to identify the bicycle parking condition at around the university dormitories area. The identification will be based on the cleanliness of the parking place, the condition of construction and structure such as rust of poles, wall's condition, and the adequacy of space.

3. Study Area

The study area includes 3 dormitories in the University of Tsukuba, consisting of Ichinoya, Hirasuna, and Oikoshi.

4. Methodology

The methodology is presented in figure 1. The first step is to conduct the field survey to check the condition of the bicycle parking in the dormitories using GPS handheld and survey123 application. GPS is used for marking the location of bicycle park. Then, survey123 is applied to identify the condition of bicycle park based on three criteria. Each criterion is assessed as score performing Logic Scoring of Preference (Montgomerya et.al, 2016). The score is 4 for highest and 1 for lowest.
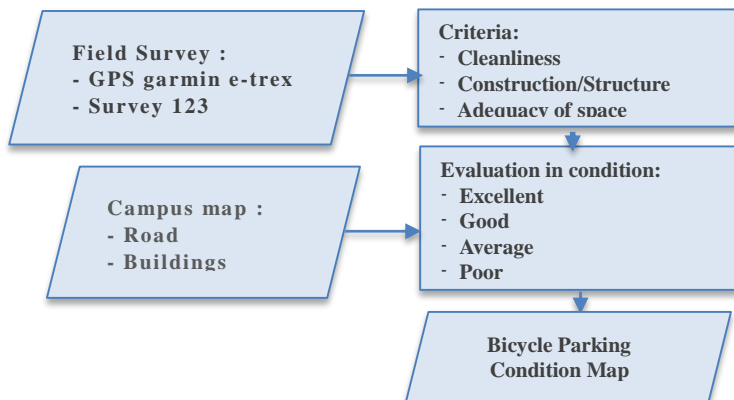

Figure1. Methodology of the study

Modelling employs statistical algorithm (Sturgess, 1972) as follow.

$$C_i = \frac{S_{max} - S_{min}}{n}$$

C_i is for class interval, S_{max} is the highest of sum score, S_{min} is the lowest of sum score, and n is number of class.

5. Results and Discussion

Based on field survey, the number of bicycle parks in Ichinoya, Hirasuna, and Oikoshi is 46, 23, and 26 respectively. All criteria are combined in the bicycle parking condition map as performed in figure 2. it can be concluded that Oikoshi area reaches the largest number of excellent condition, while Hirasuna area has the largest number of poor condition. It means that many renovation and improvements are needed for bicycle parks in Hirasuna area.
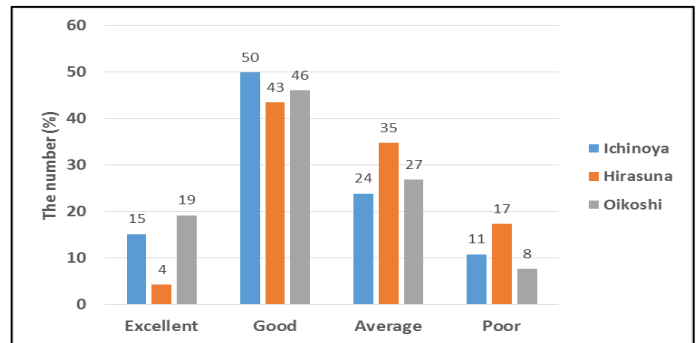

Figure 3. The percentage of the bicycle parking condition

The condition of each criterion is presented in figure 3 as follow. Comparing three dormitories in term of cleanliness, Ichinoya area achieves the best, since this area is typically family or couple dorm. It indicates that people having a family are more concern in term of cleanliness than the single one. While Oikoshi reaches the best condition for space because many rooms are vacant in that area according to student welfare office. For the construction/structure condition, it is no one describing the excellent condition. The graphic is actually plotting for good level. The structure of all bicycle parks in three dormitories has to be renovated because of the rusted pole.
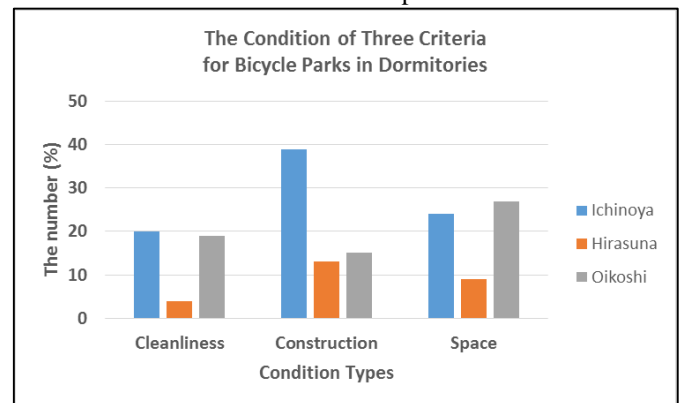

Figure 3. The condition of each criterion