THE METHODS OF DEVELOPING BIKEWAYS IN SPITE OF THE LIMITED ROAD SPACE

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1. INTRODUCTION

Japan had allowed bikers to run on the sidewalks for long periods of time. While the total number of traffic accidents is, however, dramatically decreasing, that of traffic accidents involving in bikers tends to increase. This can be explained by both the development of bike technologies and Japanese aging society. As shown in Fig. 1, in July 2016, both the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the National Police Agency (NPA) noticed that one can distinguish three types of bikeways depending on legal speeds and traffic volume on the roads concerned. Although road administrators have been trying to allow this distinction introducing bikeways, actually doing so requires several challenges.

Types	Bike paths	Bike lanes	Shared lane markings
Photos			
Criteria	50km/h or more	Others	40km/hour or less and 4,000 vehicles/day or less

Figure 1. Three types of bikeways

2. METHODOLOGY

The research question addresses *"how do we create bikeways, given the limited road space available?"* Road administrators in charge of bike policies are always confronted with this question. In concrete situations, it is difficult for road administrators to observe the distinction referred to above. One reason is that the designs of on-going projects have already been determined. Another is that local police tend to resist changing out of fear an increase of traffic accidents involving bikers. This paper outlines several challenges met by the following three projects: the Hakata Bypass project on National Route 3; the Rehabilitation project on National Route 202; and the Utility Poles Removal project on the Chihaya-Najima sector of National Route 3. This paper also analyzes the most efficient means answering the research question.

3. CASE STUDIES

3.1. Case 1: The Hakata Bypass project on National Route 3

The road designs were established in March 2015. In these designs, bikeways development did not appear. In October 2016, the office started to coordinate local police on the issue. Although the office proposed bike paths in line with the distinction refer to above, local police declined. After one-year negotiation, the office introduced bike lanes. Local police were worried that because of a lack of traffic education, traffic accidents among bikers would increase on the bike paths. It should be remarked although Fukuoka pref. has been 5 million people, the total length of bike paths is only 5km.

Therefore, the office needed to reconsider adding more bike lanes at least 1.5 meters width. In order to do so, one challenge was to secure adequate width on the Wakita pedestrian bridge. The bridge had already been completed. The office finally solved the problem by bike lanes exterior the bridge, as shown in Photo 1. Further complication was drainage facilities which had already been completed at the bridge sections. As shown in Photo 2, the office resolved the problem by classifying continuous spillway lids, even though this meant bike lanes is 1.25m width. The Hakata bypass was opened to service on March 17, 2018.

Photo 1. Bike lanes at the section of Wakita pedestrian bridge

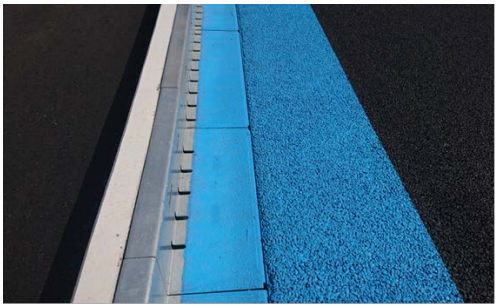

Photo 2. Bike lanes on the Mizutani bridge

3.2. Case 2: Rehabilitation project on National Route 202

In this case, principle problem was how to develop bikeways on the existing roads without changing road shape. The section which had been rehabilitated was on famous street crossing at the Fukuoka city center.

Keywords: Road accidents, Bikeways, and Road space reallocation.
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While the volume of traffic is around 30,158 vehicles/day, there are 2,118 bikers every 12 hours and 11,751 pedestrians during the same periods. Since both bikers and pedestrians are packed into the 2.4 meters width sidewalks, traffic accidents involving both bikers and pedestrians had become serious problem. The office decided to develop bike markings to the left of vehicle lanes following completion of road rehabilitation. To enlarge the amount of movement space of pavement under the restricted area involved, the office introduced slit-type drainage boxes.

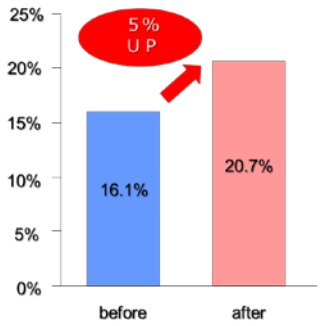

Figure 2. Proportion of bikers running left on vehicle lanes at the intersection of Kego Shrine

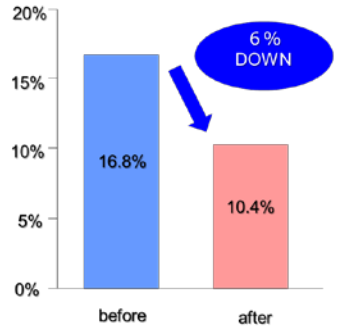

Figure 3. Proportion of bikers running to the opposite direction at the intersection of Kego Shrine

Both Fig. 2 and Fig. 3 represent the proportion of bikers running on the left of vehicle lanes and the opposition direction before and after setting markings. Five percent of the total number of bikers changed from sidewalks to bikeways. Also, 6 percent of the total number of bikers running right side decreased. This meant a decrease of probability on traffic accidents involving both bikers and pedestrians. Road administrators can find it useful to utilize such dataset in negotiating with stakeholders regarding changing bike culture.

3.3. Case 3: Utility Poles Removal project on the Chihaya-Najima sector of National Route 3

The office is currently removing utility poles on a 2.3 km stretch of roads between Chihaya district and Najima. The aims of the removal are to provide greater available sidewalks with, to highlight beautiful picturesque view in the areas, and to diminish the risks caused by utility poles being knocked down due to natural disaster. Removing the poles requires installing underground electric cables. The office decided to introduce 1.5 meters width of bike lanes in the sector. The existing allocation of lanes and sidewalks had to rearrange as shown in Fig. 4. This meant dealing with the following two challenges.

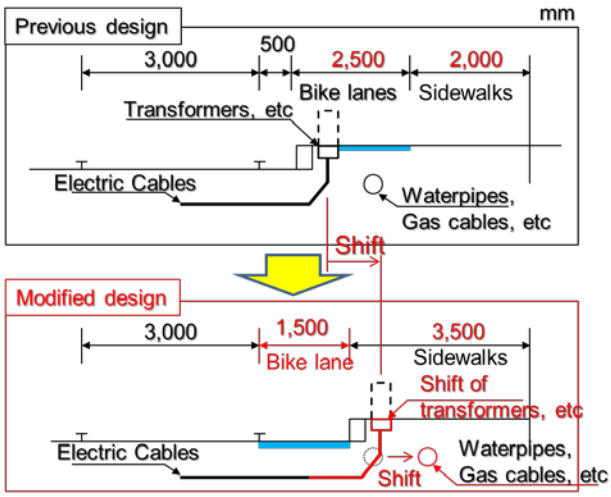

Figure 4. A modification of Road transversal designs

First, it had to be adequate width enough to allow passengers for waiting at the existing 8 bus stops. The office developed bike lanes between bus stops and sidewalks. Pedestrians, bikers, and people waiting at the stops are separated by physically barrier.

Second, the pillars of the existing 4 pedestrian bridges limit possible reallocation of road space. It has been decided the pillars of the two bridges, the Miyuki pedestrian bridge and the Nakano pedestrian bridge, must be shifted in outward direction. As shown in Photo 3, the office decided to extend the length of pedestrian bridge and shift the pillars around one meter to both sides. Even after utility poles have been removed, it would be necessary to modify present electric switch tower, transformer voltage converter, and other facilities in order to provide more sidewalk space. One of the most difficult points is to need to move not only utility poles but also the related facilities such as electric cables and underground boxes, in order to provide more spaces to bike lanes. In terms of the other two bridges, the Chihaya pedestrian bridge will be removed because it's very little use. The Najima bridge has been secured sufficient width for bike lanes.

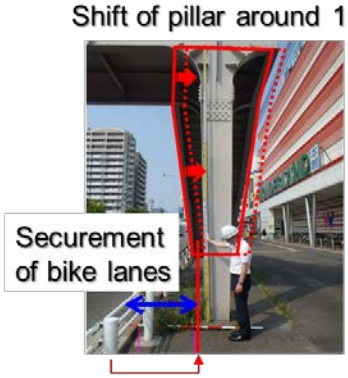

Photo 3. Shift of bridge pillar

4. Conclusions

Road administrators mainly face three challenges to developing bikeways. The first challenge is to educate bikers to use bikeways correctly. The fact is that bikers have been accustomed to running sidewalks rather than bikeways. Local police think that it takes long time to educate bikers to run bikeways correctly. The second is to coordinate with local police. It is necessary to reassure local police the above risks increasing traffic accidents between bikers and vehicles. The third is to need to change road designs, especially transversal design drawings. Telling out the modified designs requires changes of road developing budgets. Therefore, road administrators can carry out such changes only those sectors which such projects as utility pole removal and road safety have been or will be authorized.

The one factor common of all these challenges is that road administrators must explain to local people and other stakeholders how developing bikeways will affect traffic safety on the roads concerned.