

# Research into the revision of the "Guidelines for Facilitating Smooth Transportation on Roads"

## -Experiments to evaluate the Method of Installing Guidance Indicators for the Visually Impaired on Road Crossings-

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### 1. Introduction

The "Guidelines for Facilitating Smooth Transportation on Roads (Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism)<sup>1)</sup>" (hereinafter called the "Guidelines"), which show that according to universal design a road space should allow all people including the aged, people with disabilities, and others to utilize the space easily. The Guidelines are intended to be used when road administrators formulate a plan and implement or evaluate a project. They help the administrators understand the structure of a road in order to form the appropriate road space.

The NILIM is engaged in researching the method of installation of guidance indicators so that the visually impaired can walk on roads safely and smoothly. In 2023 - 2024, we conducted research on the method of installation of guidance indicators with dents and projections on the surface of a crosswalks, and in 2024 - 2025, we have been conducting research on the method of installation of guidance indicators on the boundary using a corner cut between a sidewalk and a vehicle lane (tactile paving for guidance for the visually impaired). This paper presents the research, focusing on the former topic.

### 2. Experiments to evaluate the method of installation of guidance indicators for the visually impaired on road crossings.

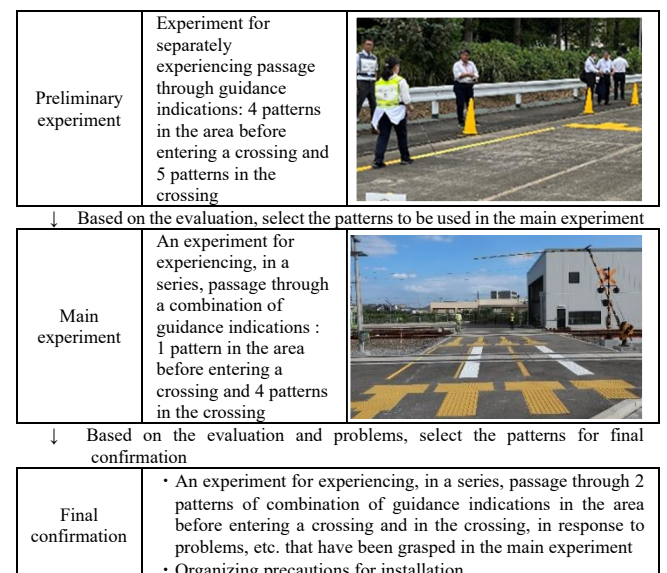
In April 2022, on a road crossing in Yamato Koriyama City, Nara Prefecture, a crossing accident occurred in which a visually impaired person came into contact with a train without being able to recognize that they were within the crossing. Following this accident, we conducted evaluation experiments with visually impaired persons in order to examine the method of installation of guidance indicators for the visually impaired on road crossings.

### (1) Viewpoints and procedure of the evaluation experiments

The evaluation experiments were performed according to the procedure in Fig.-1, based on A - C within the parameters of the viewpoints required for the prevention of accidents in crossings shown in Table-1.

Table-1 Viewpoints required for the prevention of accidents in crossings

A) Recognizability	Entry into/exit from an crossing shall be capable of being recognized.
B) Distinguishability	Presence in a crossing shall be capable of being recognized. (Distinction from a pedestrian crosswalk / distinction from a sidewalk)
C) Straight passing performance	The crossing shall be capable of being passed without deviation toward the railroad or vehicle lane.
D) Situation handling performance	When a person has been left in a crossing, the situation shall be capable of being handled correctly.



/\* It was assumed that vibrations due to the dents and projections of guidance indications might cause hindrance to the passage for wheelchair users. Therefore, in the main experiment and final confirmation, we checked with wheelchair users as well for their opinions.

Fig.-1 Procedure of the evaluation experiments

## (2) Results of the evaluation experiments

We present the major results below, that have been obtained through the evaluation experiments with visually impaired persons before entering a crossing area and while in the crossing.

The area before entering a crossing was mainly evaluated from the viewpoints of A (Recognizability) and B (Distinguishability), and the structure with a clearance between the blister tactile paving and the crossing barrier as shown in Fig.-2 left was highly evaluated, and it was considered that the visually impaired person recognized the entry into/exit from the crossing by means of the clearance. Also, the most highly evaluated structure was the structure pasted with a rubber chip sheet, as shown in Fig.-2 right.

The area within the crossing was mainly evaluated from the viewpoints of B (Distinguishability) and C (Straight passing performance), and the two structures shown in Fig.-3 were thoroughly evaluated, and a tendency was found for the evaluation of a guidance indicator with a greater width to be more highly evaluated than a guidance indicator with a smaller width. Also, the structure equipped with an escort zone that is installed in a pedestrian crosswalk was evaluated to be inferior from the viewpoint of distinguishability from a pedestrian crosswalk, resulting in a risk that the visually impaired person could not distinguish the situation where they were within the crossing.

## (3) Reflection in the Guidelines

Based on the results of the evaluation experiments, discussions were held and working groups established by the Road Bureau of the MLIT, and the Guidelines<sup>1)</sup> were revised in January 2024. In the Guidelines, as the structures for guidance indicators on road crossings, the standard method of installation and the standard method of installation when the width is small took wheelchair users into consideration as shown. (Fig.-4). In addition, as an improvement, rubber chip paving for the clearance in the area before entering a crossing was also shown.

## 3. Future schedule

The Guidelines show the method of installation of tactile paving for guidance for the visually impaired in the boundary with a corner cut between a sidewalk and a vehicle lane in an intersection with tactile paving. However, one concern that has been expressed is the potential difficulty to grasp the walking direction due to the adjacent tactile paving tiles used for guidance for the visually impaired before entering a pedestrian crosswalk being connected to each other, or being installed in the form of a stairway.

In the future, the NILIM plans to make efforts in developing the method of installation of tactile paving for guidance for the visually impaired in a corner cut, taking into account the opinions of the visually impaired as well as knowledgeable persons in order to contribute to a the study made by the discussion meetings of the Road Bureau of the MLIT regarding the method for appropriately showing the walking direction in a corner cut of an intersection.

Through these efforts, we would like to be able to

show how to improve road spaces that can be utilized safely and with confidence by the aged, people with disabilities, and all others in keeping with the actual situation of each locality.

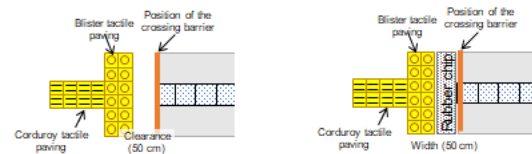


Fig. 2 Structures of the area before entering a crossing that were highly evaluated

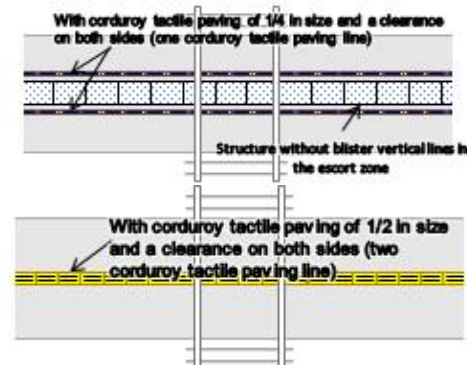
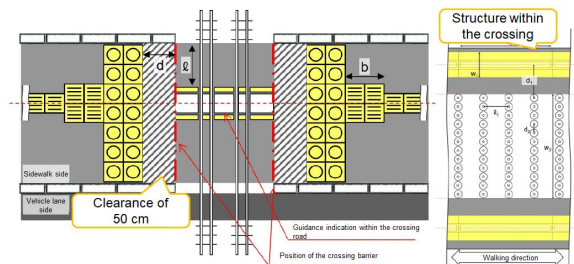


Fig. 3 Structures within a crossing that were highly evaluated

### Standard method of installation



### Standard method of installation when the width of the waling space is small

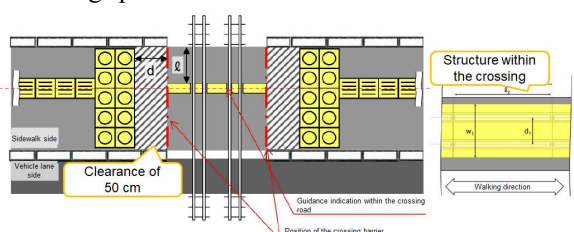


Fig. 4 Methods of installation of guidance indications shown in the Guidelines



impaired in a corner cut

For more detailed information, refer to the following:

1) Road Bureau of the MLIT: Guidelines for Facilitating Smooth Transportation on Roads (January 2024) pp. 7-45-7-68

<https://www.mlit.go.jp/road/road/traffic/bf/kijun/pdf/all.pdf>