

Pedestrian movement characteristics at tourist attractions

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1. Introduction

While tourism-related measures are being increased and promoted, street spaces are becoming seriously congested with pedestrians at some tourist attractions. This study conducted observations in the areas with characteristic purposes in pedestrian movement. After obtaining data on walking speed and pedestrian density, the traffic capacity was calculated, and the data were compared between areas with many tourist pedestrians and areas with many pedestrians commuting.

2. Target of observation

Areas near Shinbashi Station and Kachidoki Station on weekday mornings were selected as sidewalks with many pedestrians commuting. Areas near Shinjuku-Sanchome Station and Keisei Ueno Station on weekdays in the late afternoon were selected as sidewalks with many pedestrians shopping. Areas near Asakusa Kaminarimon and Kamakura Komachi Street were selected as sidewalks with many tourist pedestrians. In these areas, pedestrian density and walking speed were measured at straight road sections without slopes or steps. The table shows details of the observed areas.

Table Observed areas

Name of observation point	Expected main purpose of pedestrian movement	Location of observation point	Date of observation (year/month/day) [day of the week]	Observation time	Weather
Shinbashi	Commute	Shinbashi, Mnato-ku 1-18-16	2015/11/24 [Tue.]	8:00-9:00	Cloudy
Kachidoki	Commute	Kachidoki, Chuo-ku 2-5-8	2016/12/5 [Mon.]	8:00-9:00	Sunny
Shinjuku	Shopping	Shinjuku, Shinjuku-ku 3-30-13	2016/12/5 [Mon.]	18:00-19:00	Cloudy
Ueno	Shopping	Ueno Park, Taito-ku 1-60	2016/12/5 [Mon.]	18:00-19:00	Cloudy
Asakusa	Sightseeing	Asakura, Daito-ku 1-2-2	2018/3/10 [Sat.]	12:00-13:00	Sunny
Kamakura	Sightseeing	Komachi, Kanakura City 2-7-24	2018/2/11 [Sun.]	9:00-17:00	Sunny

3. Results of the observation

As shown in Figure 1, a certain number of pedestrians were moving at a fast pace of 2.0 (m/s) or faster on sidewalks with many pedestrians commuting under low-density conditions of about 0.5 (persons/m²) or less. Meanwhile, few pedestrians were moving fast at tourist attractions even under low-density conditions. Compared to pedestrians commuting, the dispersion was low, and the overall speed was slow.

The regression analysis of the speed and density was conducted for individual purposes of pedestrian movement in regard to Figure 1. Figure 2 shows the

relationship between pedestrian density and traffic volume created using the obtained regression formula.

Based on this result, the study found that congested flows would occur under lower density conditions, and the traffic volume was low in pedestrian spaces with many tourists compared to pedestrian spaces with many pedestrians commuting.

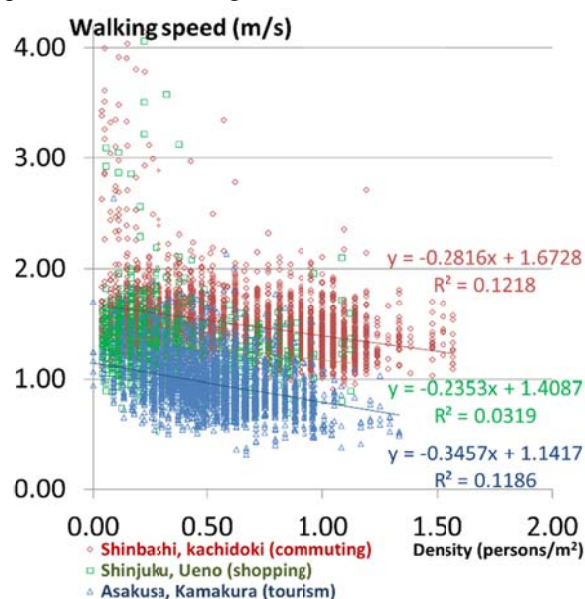


Figure 1 Relationship between pedestrian density and walking speed by purposes of movement

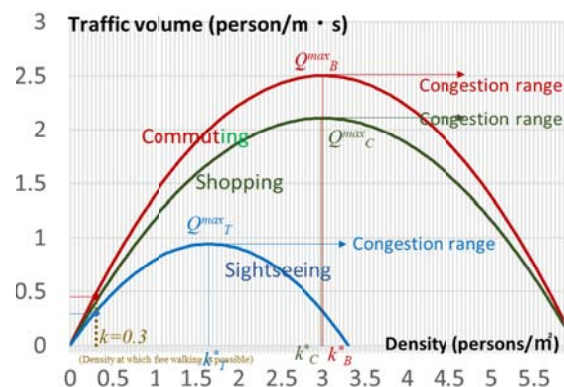


Figure 2 Relationship between pedestrian density and traffic volume by purposes of movement

For more information:

1) The 38th Presentation of the Japan Society of Traffic Engineers, compilation of papers No. 38