

## Research Trends and Results

# Development of Accessibility Indicators Evaluating the Livelihood Convenience of Cities

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### 1. The characteristics of accessibility indicators

The Ministry of Land, Infrastructure, Transport and Tourism aims to realize urban structures of an intensive type. For this reason, in order to correct the excessive car dependency trend in which low residential density is thinly spread, the Urban Planning Department has developed an accessibility indicator to comprehend the current status and evaluate a policy draft. This indicator illustrates easiness of a means of transportation other than cars (public transport, bicycles, or walking) to reach from residential areas to the spot where urban service facilities are located.

The purpose of this research is to assist for staff of local public authorities in charge of urban planning/urban transport planning to evaluate and improve the current state of the urban structures for themselves when implementing periodical review for planning (PDCA). Therefore, we defined the indicator based on the time required (unit: minutes) so as to readily be understood intuitively. We will describe the outline of two categories of accessibility indicators in the following.

### 2. Accessibility indicator for public transportation

This indicator evaluates easiness in utilizing public transport at each point in the urban areas (mesh) as being higher if users can reach the boarding zones (railroad stations or bus stops) in less time and the frequency of transport service is high, and the indicator is boosted to be higher proportionately. The indicator value is a sum of the transfer time required for reaching to the boarding zones of public transportations by road and the waiting time to board the bus or train. In addition to the distance from each spot to the boarding zones, there is a characteristic in a point deemed as a time required by transforming the number of routes and operating frequencies utilizable from there to the expectation value synthesized averaged waiting times according to directions/routes.

### 3. Accessibility indicator for urbanized services

This indicator evaluates according to the amount of time required (minutes) for reaching sites with facilities offering urbanized services (central parts of town and central stations, nearest hospital complex or the like) by

road and using public transportation during the time zone of daytime on weekdays.

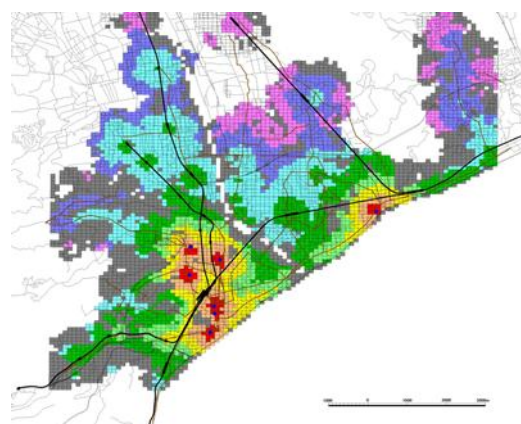


figure1: Trial calculation example of Accessibility indicator (hospital)

### 4. Publication schedule for outcomes

Using the indicator developed here, regarding a) location of residential areas, b) location of facilities offering urbanized services, c) location and service frequency for public transport to connect both sides, the changes in accessibilities before and after the enforcement of policies can be forecast and evaluated for these three multiple policy drafts. An interpretation for utilization method including examples of policy evaluations using the indicator is slated for its publication from the homepage of the Urban Planning Department as a Guide for Accessibility Indicator Utilization (draft).

### [Reference data]

The two indicators introduced have been posted as (analysis item A0601) Accessibility indicator to public transport, (analysis item A0602) Accessibility indicator to major facilities in the Land, Infrastructure, Transport and Tourism Ministry, City Bureau, Urban Planning Survey Division Homepage Urban Planning Basic Survey Data Analysis Examples (Draft) (2013.7).