Research on Urban Transportation Planning Method Taking Account of New Mobility

SHINGAI Hiroyasu, Head   YOSHIDA Jundo, Senior Researcher
Urban Facilities Division, Urban Planning Department

Keywords: Urban transportation system, compact city, urban structure, mobility, automated driving, lifestyle support function

1. Background and Purpose of Research

In a society where population is rapidly declining, it is necessary to maintain the sustainability of urban functions. In the field of urban transportation, it is not enough to simply address traffic issues, but establishment of a sustainable urban transport system is an urgent necessity.

When we have a look at the characteristics of people's movement in urban areas, it is likely that they move in all directions in the area instead of moving intensively along the trunk lines, which was common in the past. Under such circumstances, how we realize a compact urban structure is more important than ever.

When we turn our attention to the development of mobility-related technologies, we find that new transportation systems are emerging, including on-demand services utilizing ICT and automated driving technologies. On the other hand, the combination of these new technologies has not yet been well established in terms of an urban transportation network that contributes to the compactness of the urban structure.

The purpose of this research is to clarify how a transportation network realizing a compact city and configuration techniques should be and to clarify the method of verifying the effectiveness of a system as a whole through case studies that focus attention on the combination of modes (Figure 1) or networks instead of evaluating the performance of each new transportation system separately.

2. Main Research Field

We collected and organized information on new technology development, trend of diffusion and future prospect regarding urban transportation systems. The relationship between each transportation system/vehicle and transportation-related technologies (element technologies such as controlling and driving and

Figure 1: Schematic View of a Network Where Various Technologies are Combined

Table 1: Relationship between Transportation Systems and Elemental Technologies
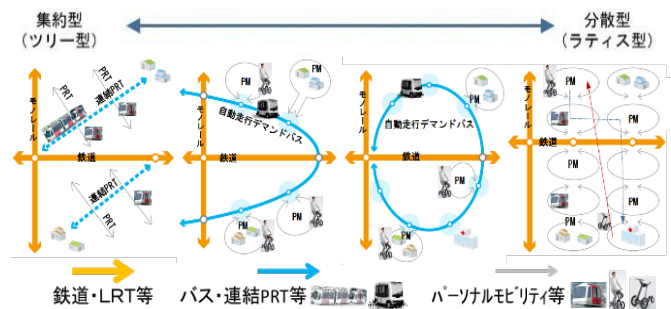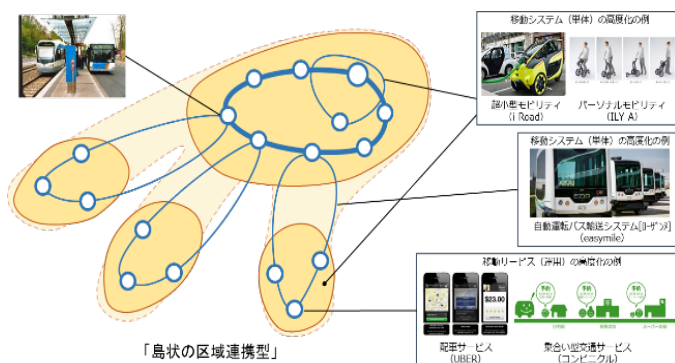

Figure 2: Schematic View of Categorization of Basic Patterns of Network

operation technologies) are shown in Table 1.

Basic patterns of transportation that constitutes an urban transportation network are categorized by concentration/diffusion as the horizontal axis (Figure 2).

New analytical indicators are established to measure the effect of the introduction of an urban transport system comprised of these basic patterns, and it is verified through case studies.

3. Future Development

Remarkable technological advancement in recent years is often observed not only in the field of transportation but also in land use. Examples include convenience store's multifunctional character and function as social infrastructure. Technologies that identify various possibilities that urban structures could have in association with the advancement of lifestyle support functions and to evaluate the effect on the compactification of cities and improvement of quality of life as a whole are wanted. We are going to tackle the development of such technologies. [1]

1) Overview of the Finalized Budget for FY 2017, Press Release, p5, NILIM, December 2016