Research on Urban Transportation Planning Method Taking Account of New Mobility

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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

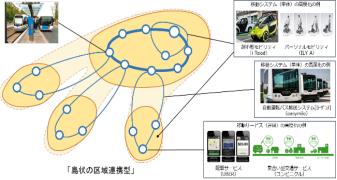


Figure 1: Schematic View of a Network Where Various Technologies are Combined

Table 1: Relationship between Transportation Systems and

	技術カテゴリー							1.制御技術(自動運転等)					4.マネジメント		
技術がブラッー								*	·操作	П	駆動技術	3.動力	予約	Τ.	
都市交通システムの種類	移動距離	輸送力	速度	神口性	車両	1)情報収集	2)分析・認識	3)制動技術	4)判断・撏	5)通信	2.8		a.配車・予	bシェアリング	年 の 様り 様子
(1) サイクルシェアリング	短距離	個人	低速	近隣	②自転車/③電動自転車	0				0		0	0	0	C
(2) 自転車タクシー	短距離	少量	低速	近接	③電動自転車	0				0		0	0		С
(3) パーソナルモビリティ	短距離	個人	中速	近接	④電動二輪車/⑤電動車椅子 /⑥パーソナルモビリティ	0					0	0			С
(4) パーソナルモビリティシェアリング (自動運転・配車制御)	短距離	個人	中速	近接	④電動二輪車/⑤電動車椅子 /⑥パーソナルモビリティ	0	0		0	0	0	0	0	0	С
(5) 電動カート(自動運転)	短距離	少量	中速	近接	⑦電動カート	0	0		0	0	0	0			C
(6) 超小型モビリティシェアリング	短距離	個人	中速	近隣	⑧超小型モビリティ	0	0			0	0	0	0	0	C
(7) 超小型モビリティ	中距離	個人	中速	近接	⑧超小型モビリティ	0	0			0	0	0			C
(8) PRT(自動運転·配車制御)	中距離	少量	中速	近隣	⑨PRT/③自動走行バス	0	0	0	0	0	0	0	0		C
(9) 自動走行デマンドバス	中距離	中量	高速	近隣	③自動走行バス	0	0	0	0	0	0	0	0		C
(10) 賈物/病院バス	中距離	中量	高速	遠い	②小型パス/③自動走行パス	0	0	0	0	0	0	0	0		
(11) コミュニティパス	中距離	中量	高速	遠い	②小型パス/③自動走行パス	0	0	0	0	0	0	0			C
(12) コミュニティカーシェアリング	長距離	少量	中速	遠い	⑧超小型モビリティ/⑩乗用車	0				0	0	0	0	0	
(13) カーシェアリング	長距離	少量	中速	遠い	⑧超小型モビリティ/⑩乗用車	0				0	0	0	0	0	
(14) ライドシェア(カーブーリング)	長距離	少量	高速	近隣	⑩乗用車	0					0	0	0	0	Г
(15) タクシー	長距離	少量	高速	近接	①タクシー	0				0	0	0	0		C
(18) デマンドタクシー	長距離	少量	高速	近接	①タクシー	0				0	0	0	0		C
(17) 路線パス	長距離	大量	高速	違い	(4)大型バス	0		0			0	0			C
(18) BRT	長距離	大量	高速	遠い	⑩大型バス/®BRT	0		0			0	0			C
(19) LRT	長距離	大量	高速	遠い	(§LRT	С		Ó			0	Ó			C



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