

# Tokyo Past, Now and Future: Transportation and Development ~ Aging, Structural Change, Sustainability ~

2016/11/18

Mamoru Taniguchi

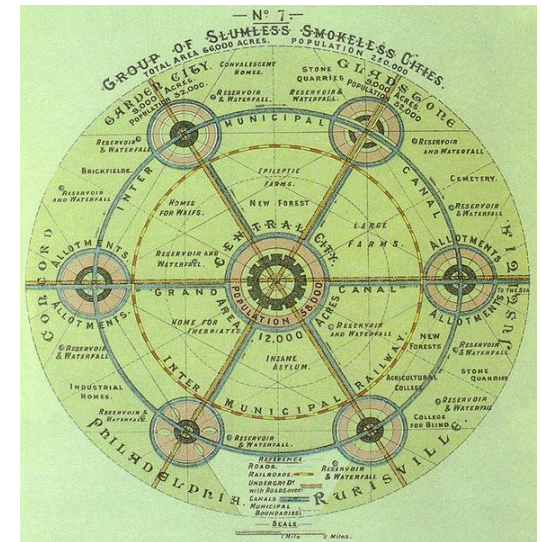
Professor, University of Tsukuba

# Mamoru Taniguchi, Dr. Eng.

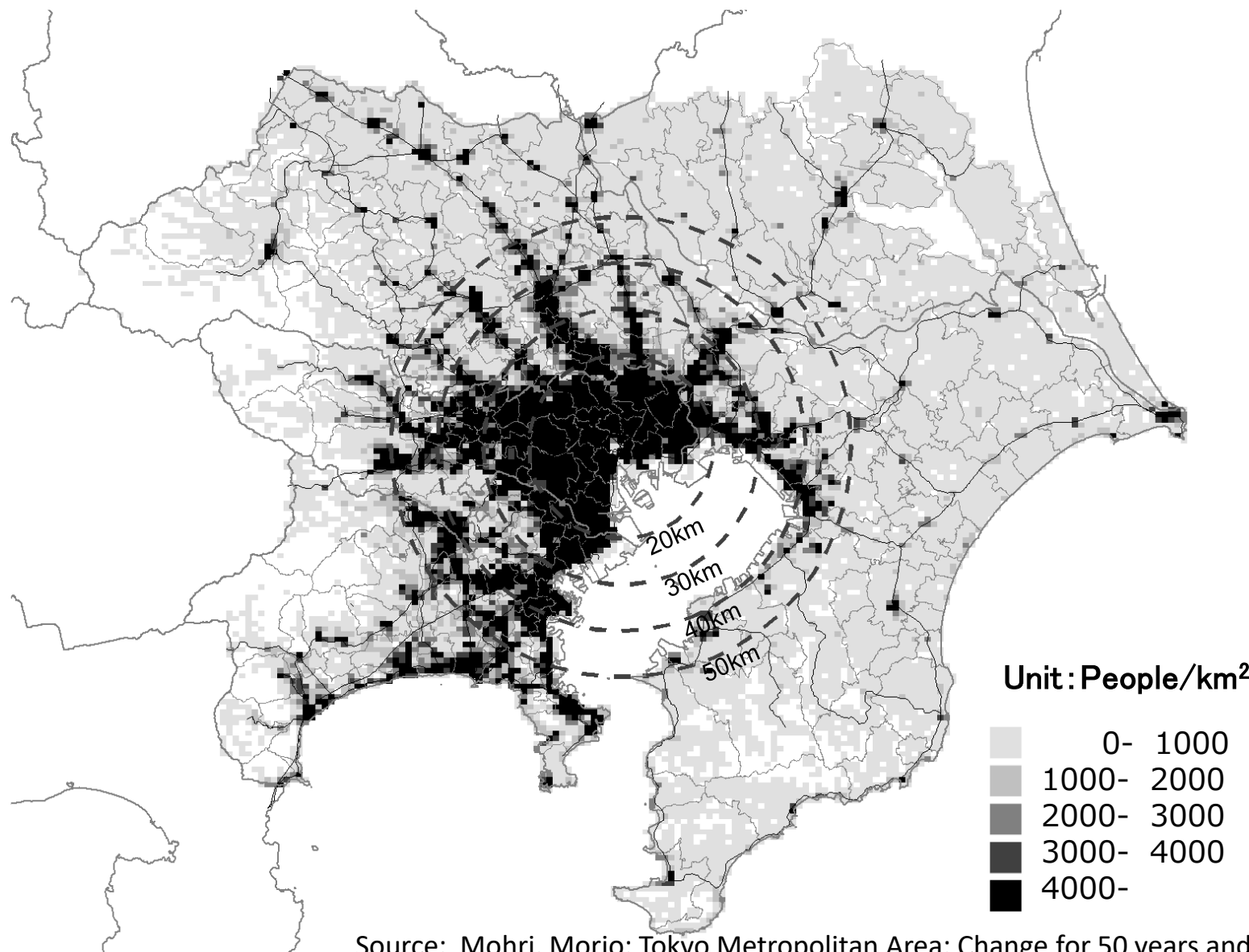
Chair of Department of Policy and Planning Sciences

International Federation for Housing and Planning (Previous Council Member)

In Japan, Member of  
 National Land Council  
 Council for Transport Policy  
 National Council for Infrastructure  
 Central Environment Council

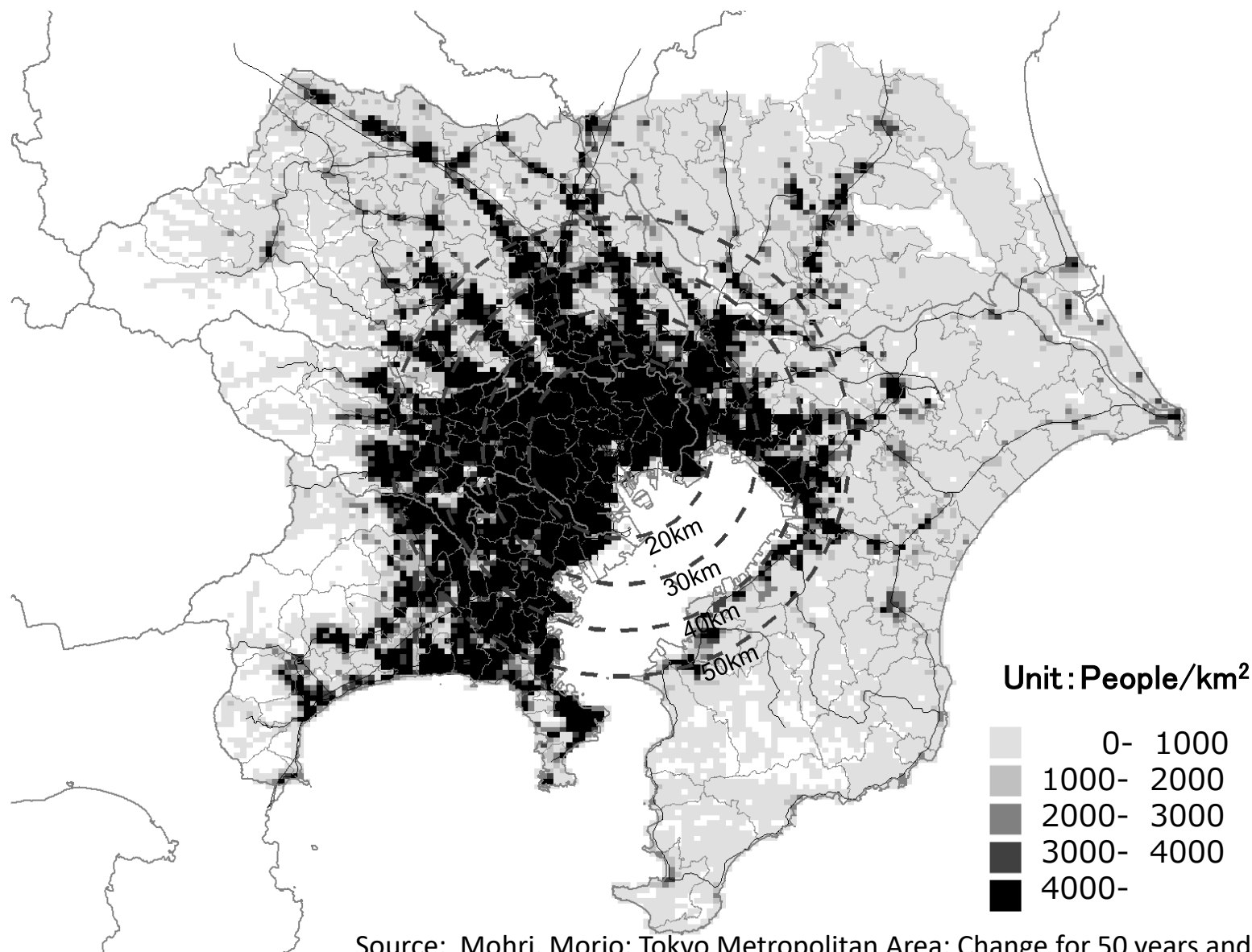


# Population density of Tokyo metropolitan area (1970)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)

# Population density of Tokyo metropolitan area (2010)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)





Hair & Ma

いま子

美研堂  
rose

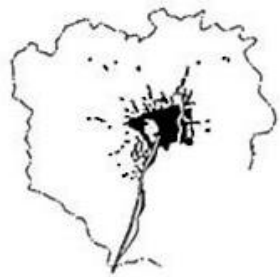
大隆

40-1-10001-1-10001-1-10001



# 首都圏における市街地の拡大

市街地



1880年



1910年



1932年



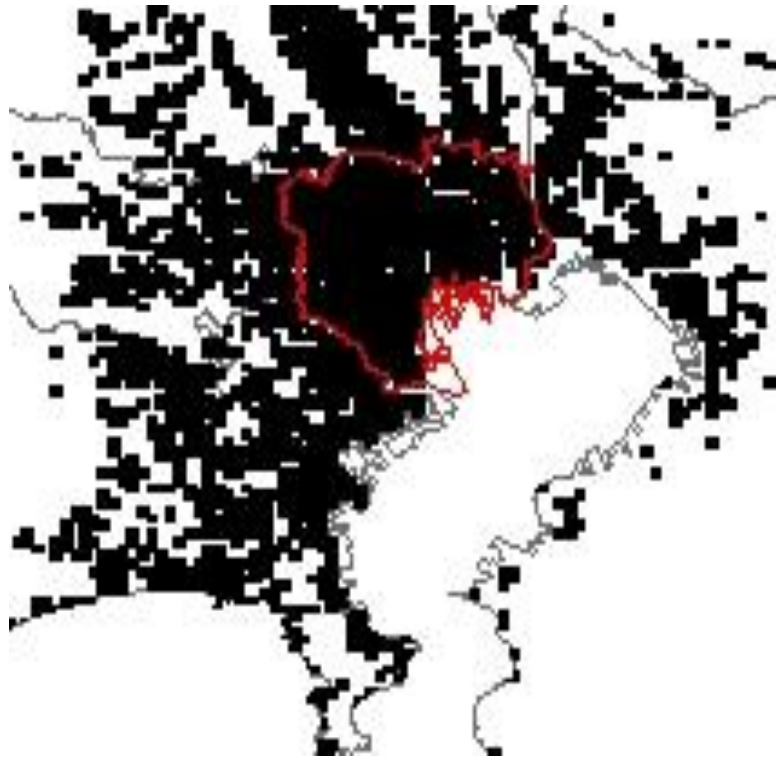
1937年



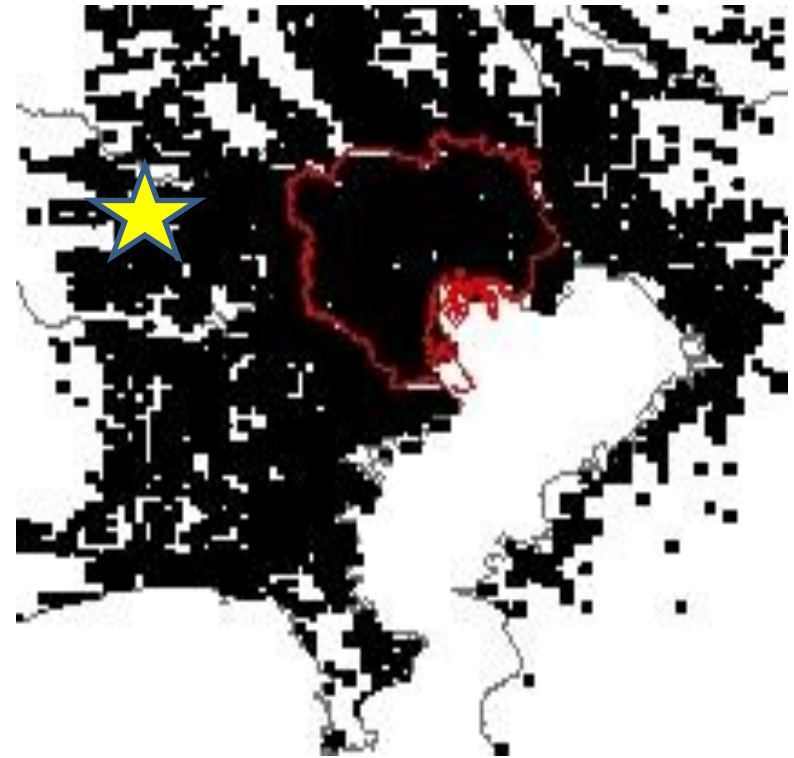
1947年



1957年



1976年



2006年

出典:新谷洋二, 都市交通計画, 技法堂出版, 1993 (1880年から1957年の図)

国土数値情報ダウンロードサービス<http://nlftp.mlit.go.jp/ksj/index.html> より作成 (1976年から2006年の図)

*Urban Area : Sprawl*  
Tokyo suburb (1956)





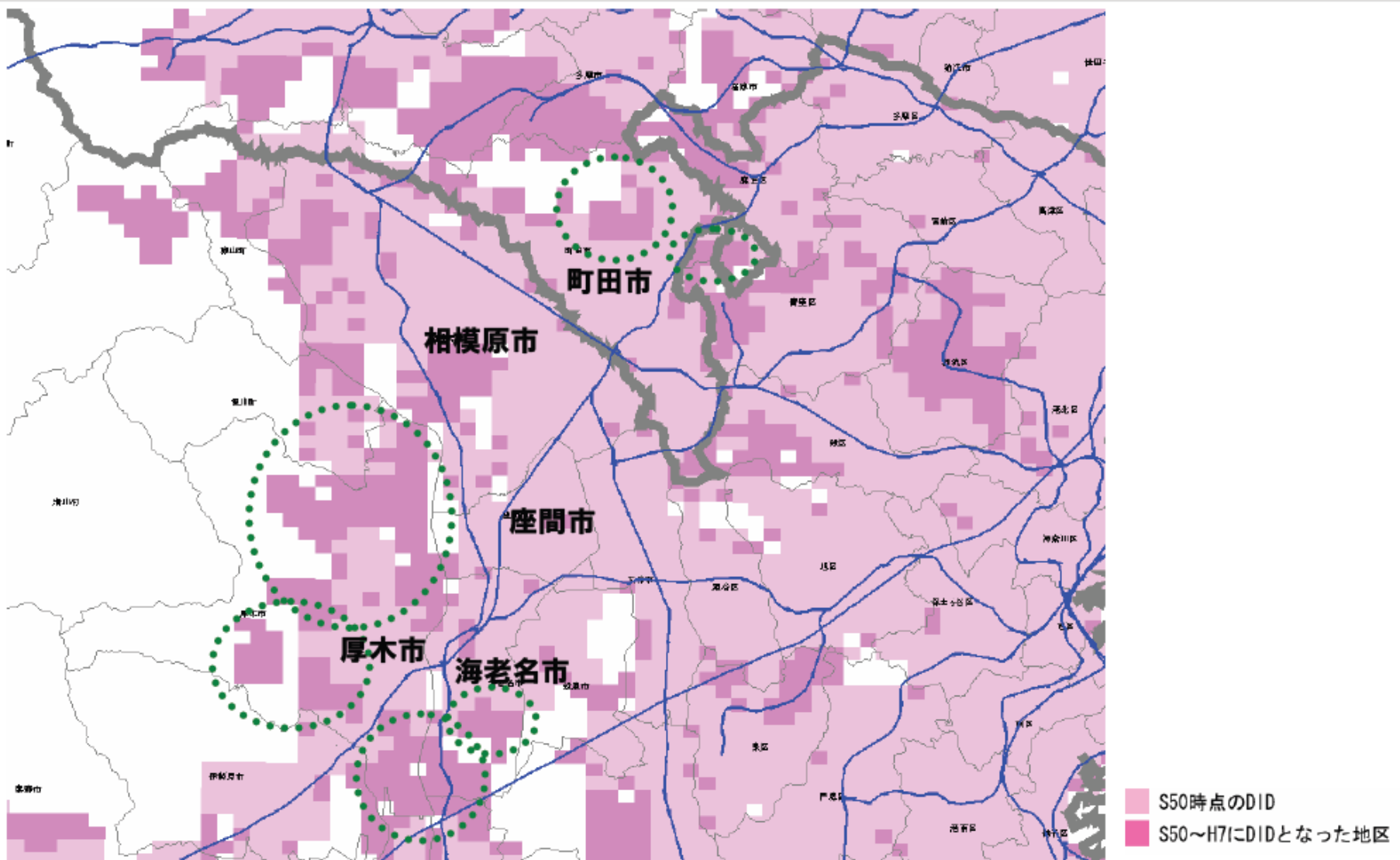
# *Urban Area: Sprawl*

## Tokyo suburb (1991)





Late development areas after 1985, that locate far from train stations cause serious problems in near future.  
How to explain citizens? → ‘Inferno Cartton’

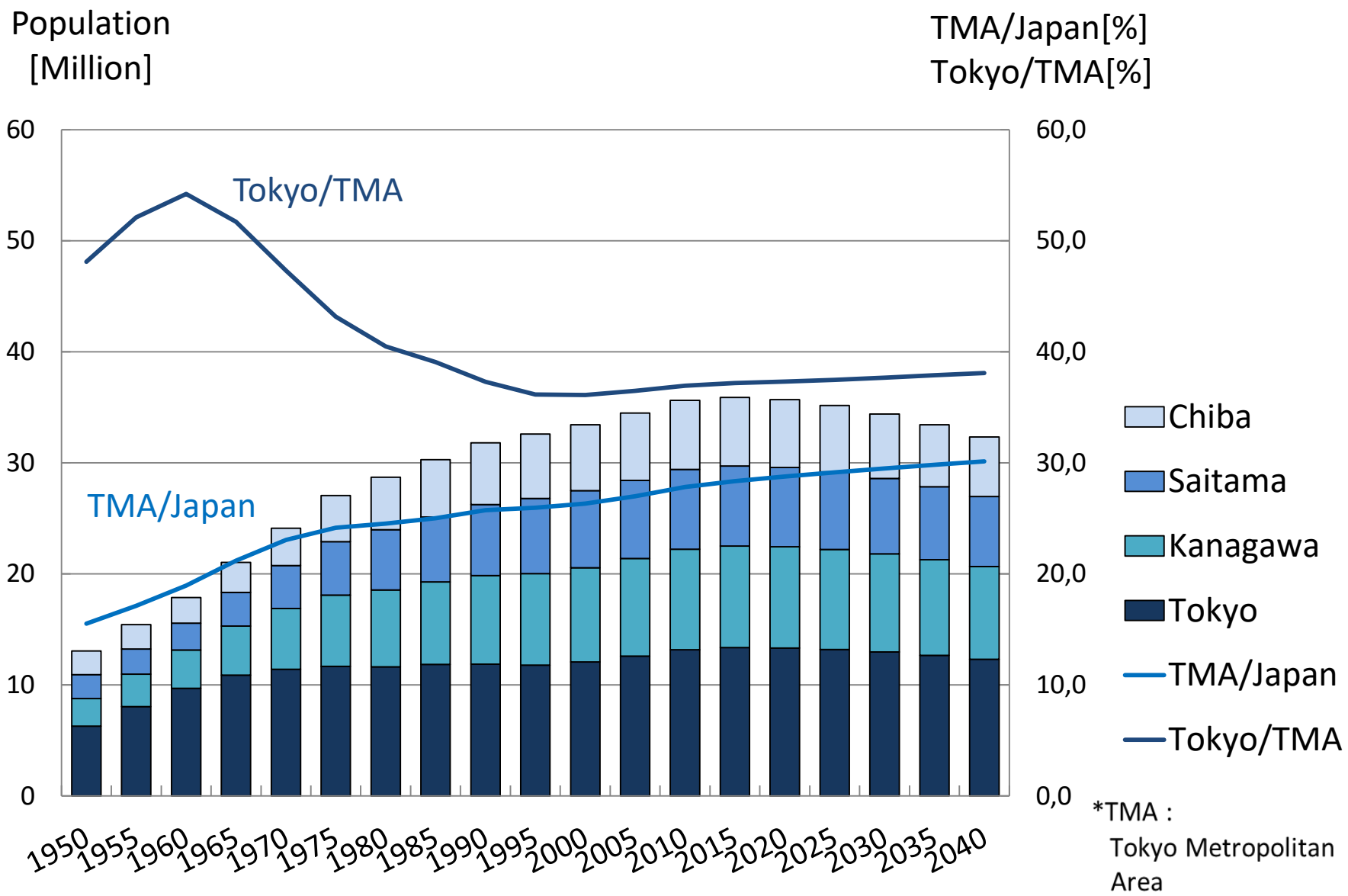




駐車禁止  
この道路は無余地につき  
駐車されますと  
道交法で罰せられます  
御園自治会

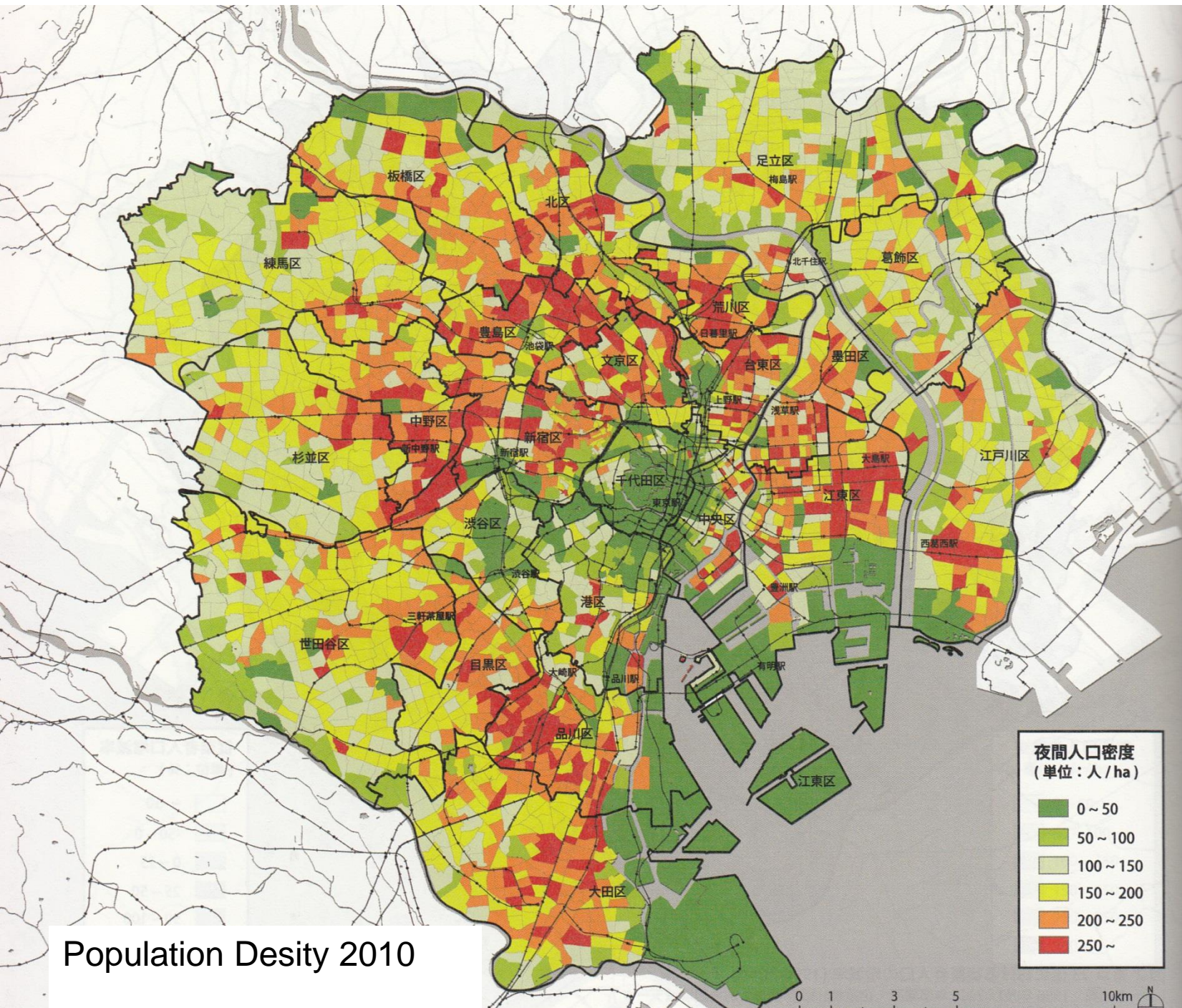


# Population estimation of Tokyo metropolitan area

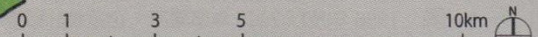


Source: Mohri, Morio (2014) and National Institute of Population and Social Security Research





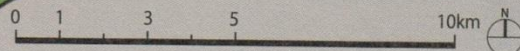
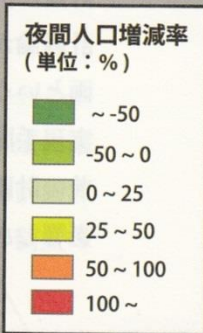
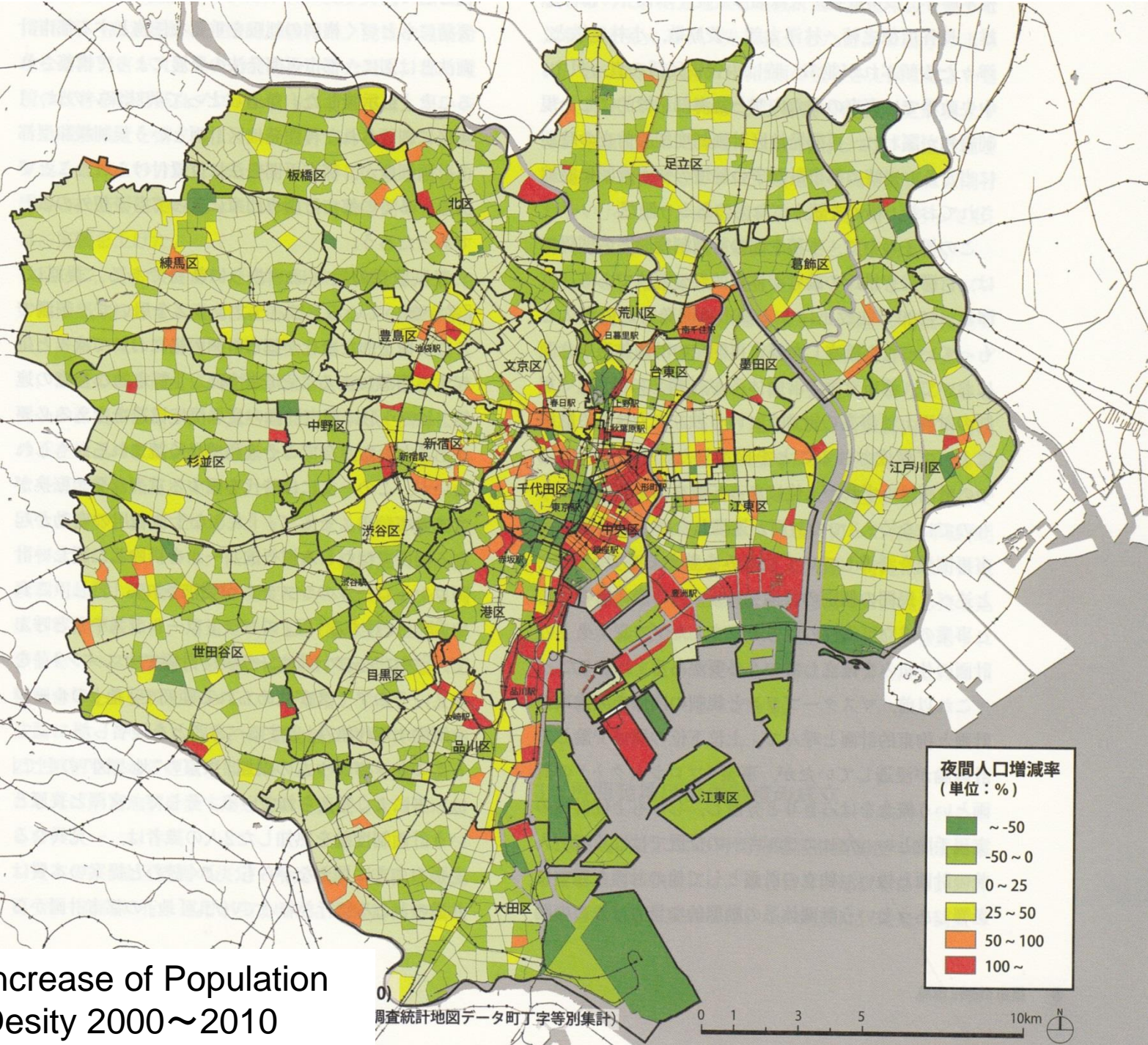
Population Density 2010



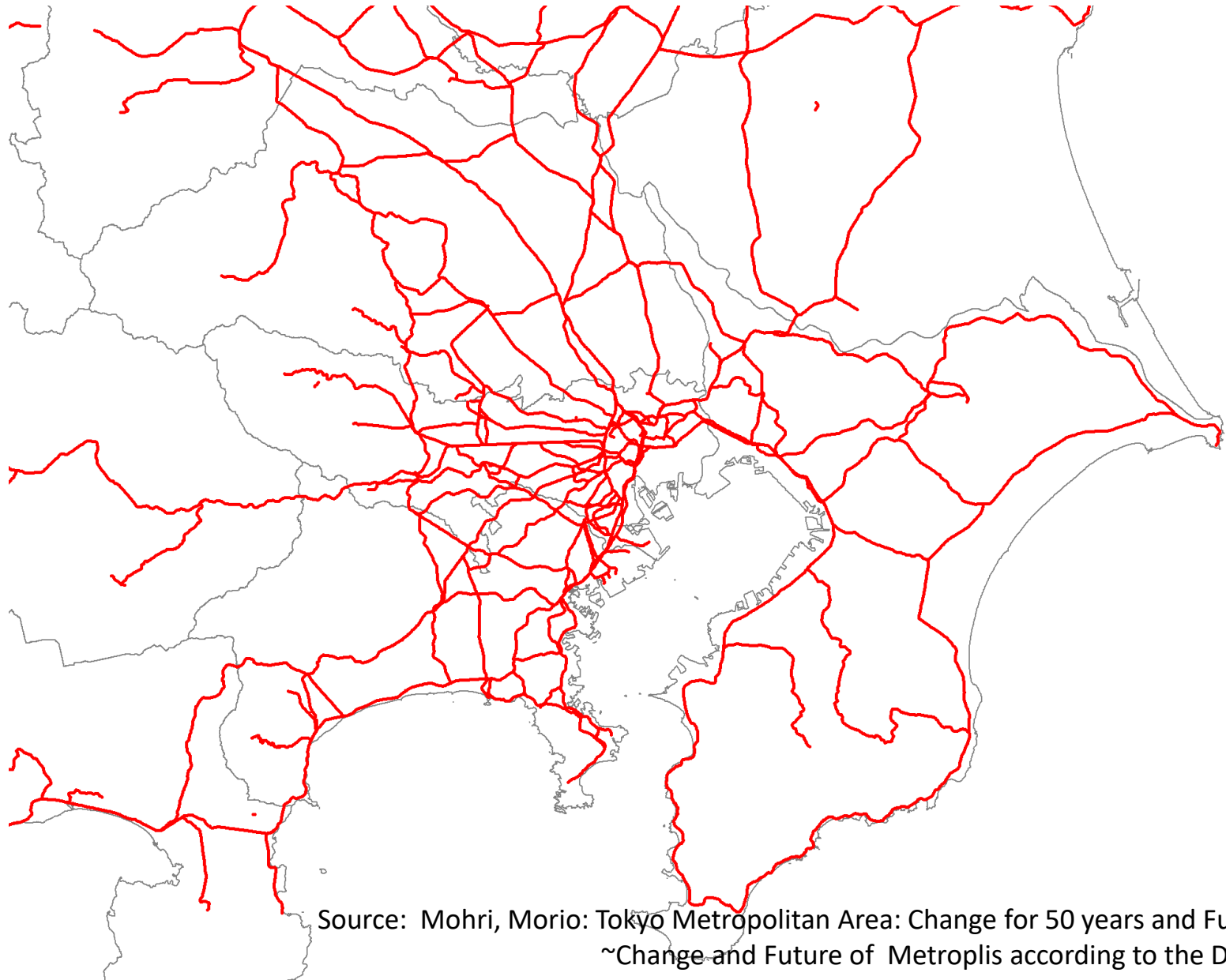


# Increase of Population Density 2000~2010

調査統計地図データ町丁字等別集計



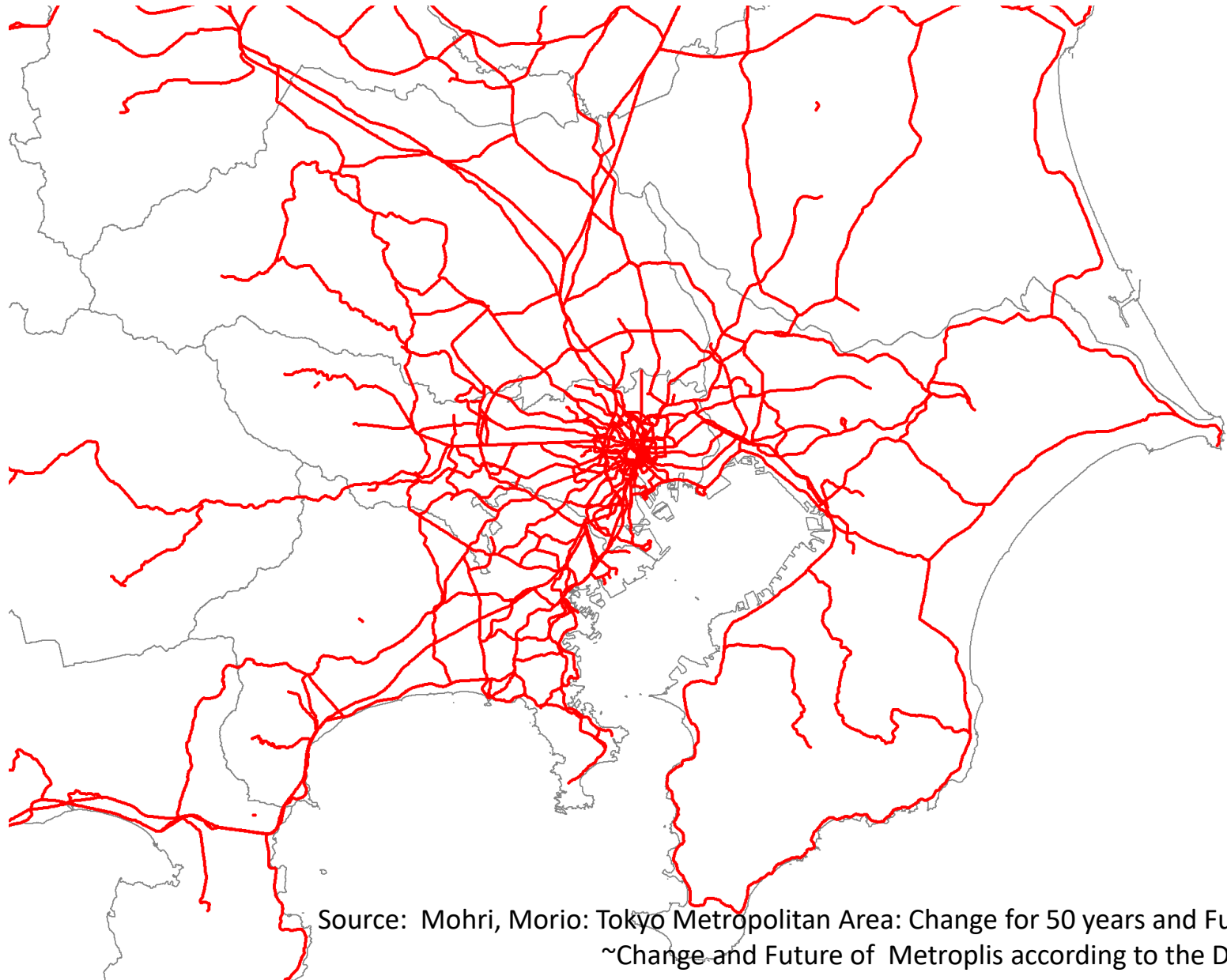
# Railway network of Tokyo metropolitan area (1960)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)



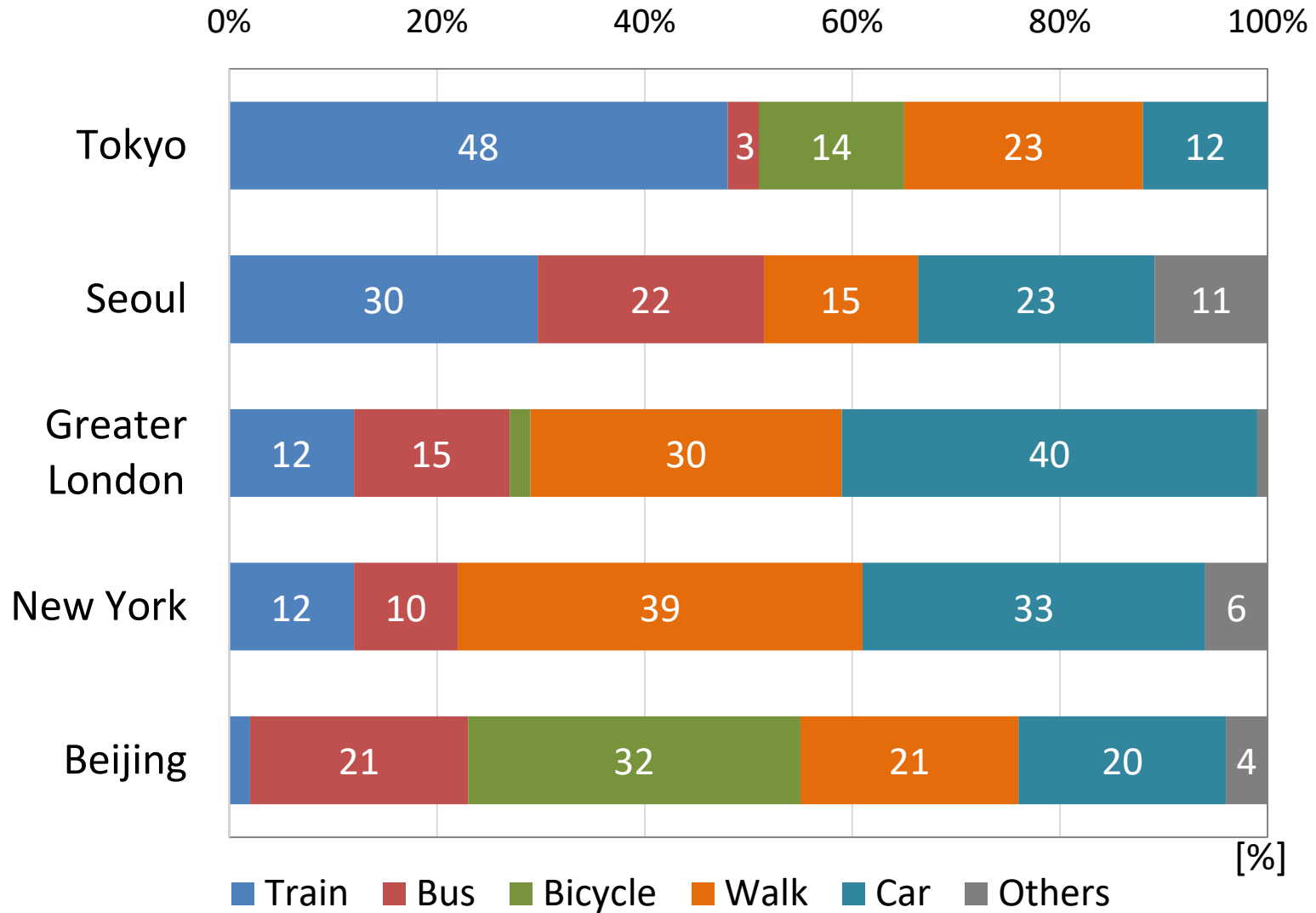
# Railway network of Tokyo metropolitan area (2010)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)

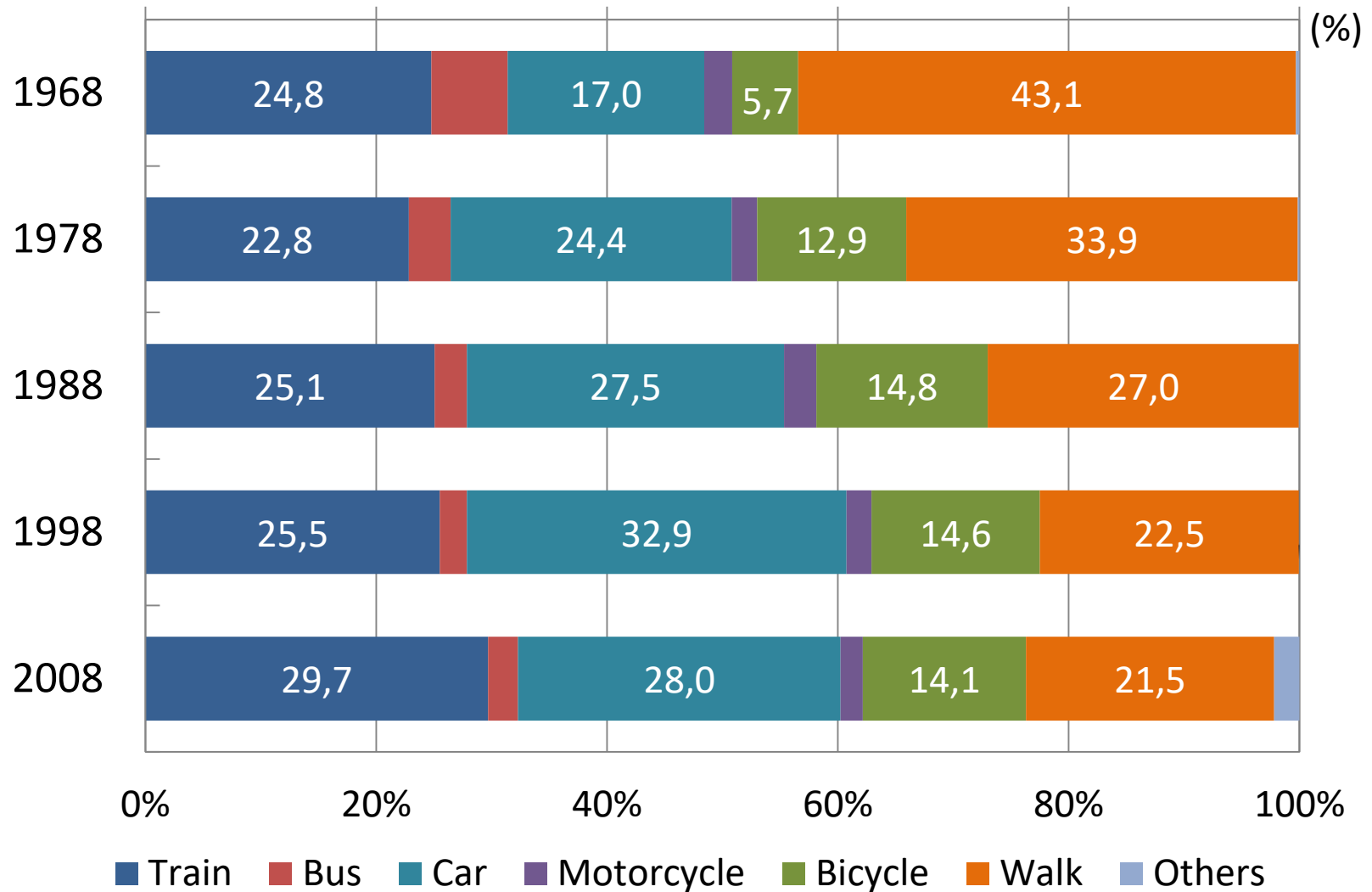
City Name		Tsukuba	Tozuka Ward (Yokohama)	Tama	Mishima
Population	1960	52,568	113,514	9,746	64,971
	2010	214,590	274,324	147,648	111,921
	Ratio	4.11	2.42	15.15	1.72
Main Station	1960	Tsukuba Sta.	Tozuka Sta.	Seiseki Sakuragaoka Sta.	Mishima Sta.
	2010	Tsukuba Sta.	Tozuka Sta.	Keio Tama Center Sta.	Mishima Sta.
Route	1960	1. Tsukuba~Tsuchiura (Tsukuba Line) 2. Tsuchiura ~ Ueno (Joban Line) 3. Ueno ~ Tokyo (Yamanote Line/ Kehin Tohoku Line)	Tozuka ~ Tokyo (Yokosuka Line)	1.Seiseki Sakuragaoka ~ Shinjuku 2. Shinjuku ~ Tokyo (Chuo Line)	Mishima ~ Tokyo (Tokaido Line)
	2010	1. Tsukuba~Akihabara (Tsukuba Express) 2. Akihabara ~ Tokyo (Yamanote Line/ Kehin Tohoku Line)	Tozuka ~ Tokyo (Tokaido Line/ Yokosuka Line/ Soubu Line)	1. Keio Tama Center ~ Shinjuku (Keio Sagami-hara Line) 2. Shinjuku ~ Tokyo (Chuo Line)	Mishima ~Tokyo (Tokaido Shinkansen)
Required Time to Tokyo Sta. (min)	1960	168	44	75	111
	2010	62	41	58	55
	Ratio	0.37	0.93	0.77	0.50
Frequency of Service (/3h)	1960	4	14	9	6
	2010	17	57	20	12
	Ratio	4.25	4.07	2.22	2.00

# Mode of transportation in world cities



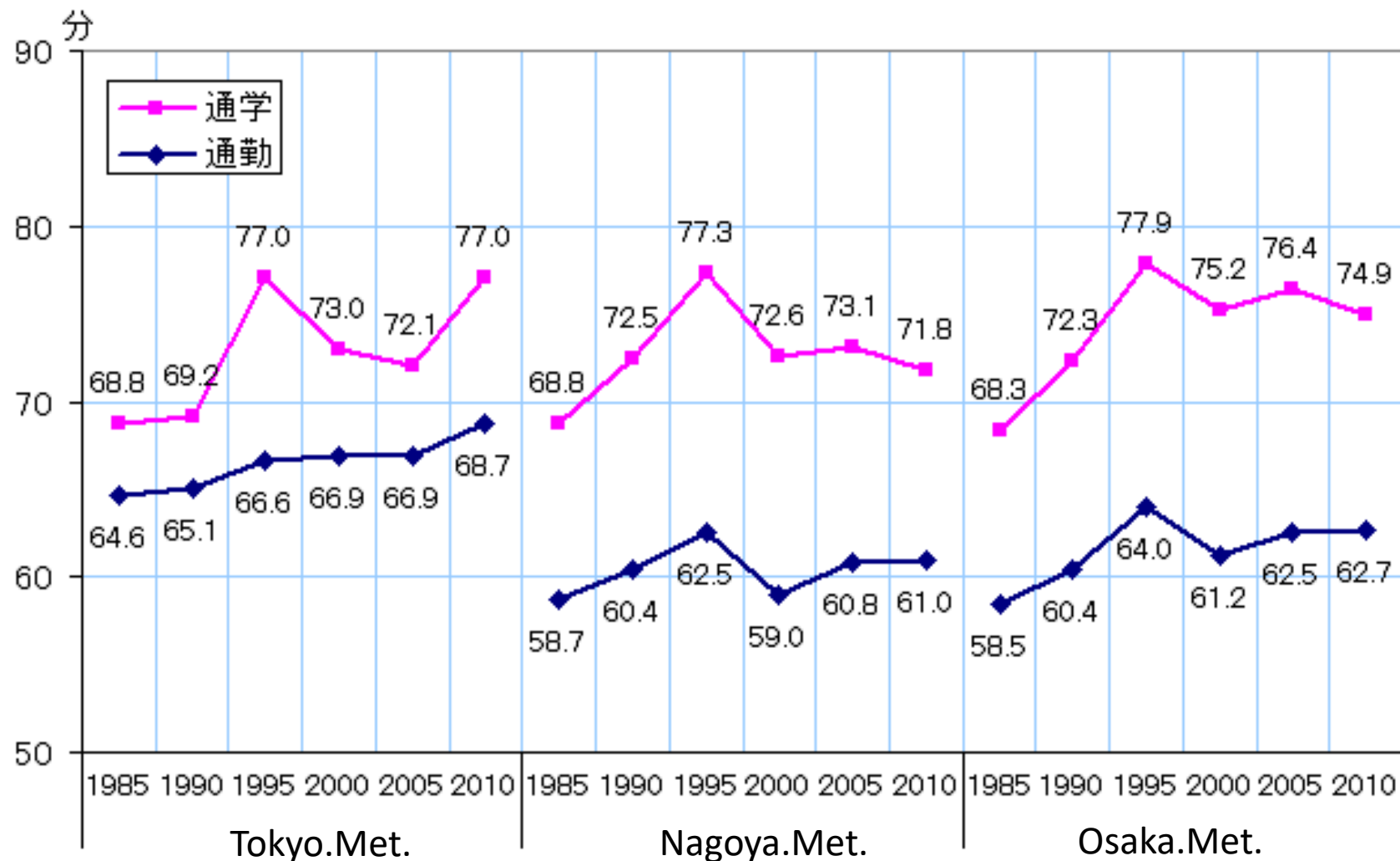


# Transportation share of trips in Tokyo metropolitan area 18



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)

# Change of Commuting Minutes (Only Season Thickets Passengers)



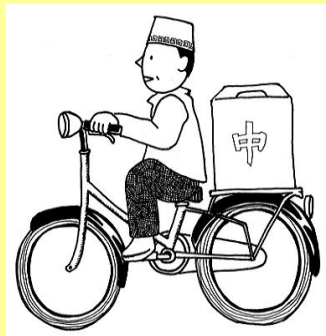
(注) 定期券利用者の平均鉄道所要時間。鉄道利用者に対して行ったアンケート調査の結果。

(資料) 国土交通省「大都市交通センサス(鉄道定期券・普通券等利用調査)」

<http://www2.ttcn.ne.jp/honkawa/2340.html>



①非車依存  
ホワイトカラー



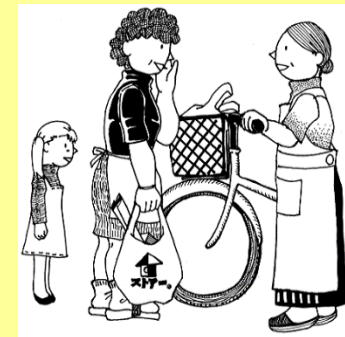
②非車依存  
ブルーカラー



③非車依存学生



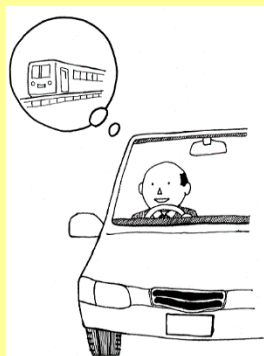
④非車依存  
農林漁業



⑤非車依存  
非就業者



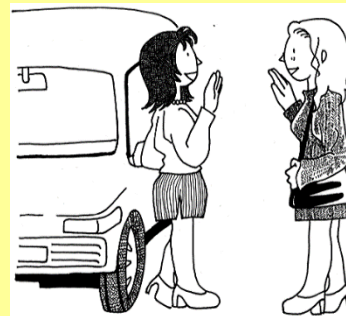
⑥非車依存  
高齢者



⑦車依存就業者  
公共交通併用



⑧車完全依存  
就業者



⑨車依存  
女性就業者



⑩車依存  
非就業者



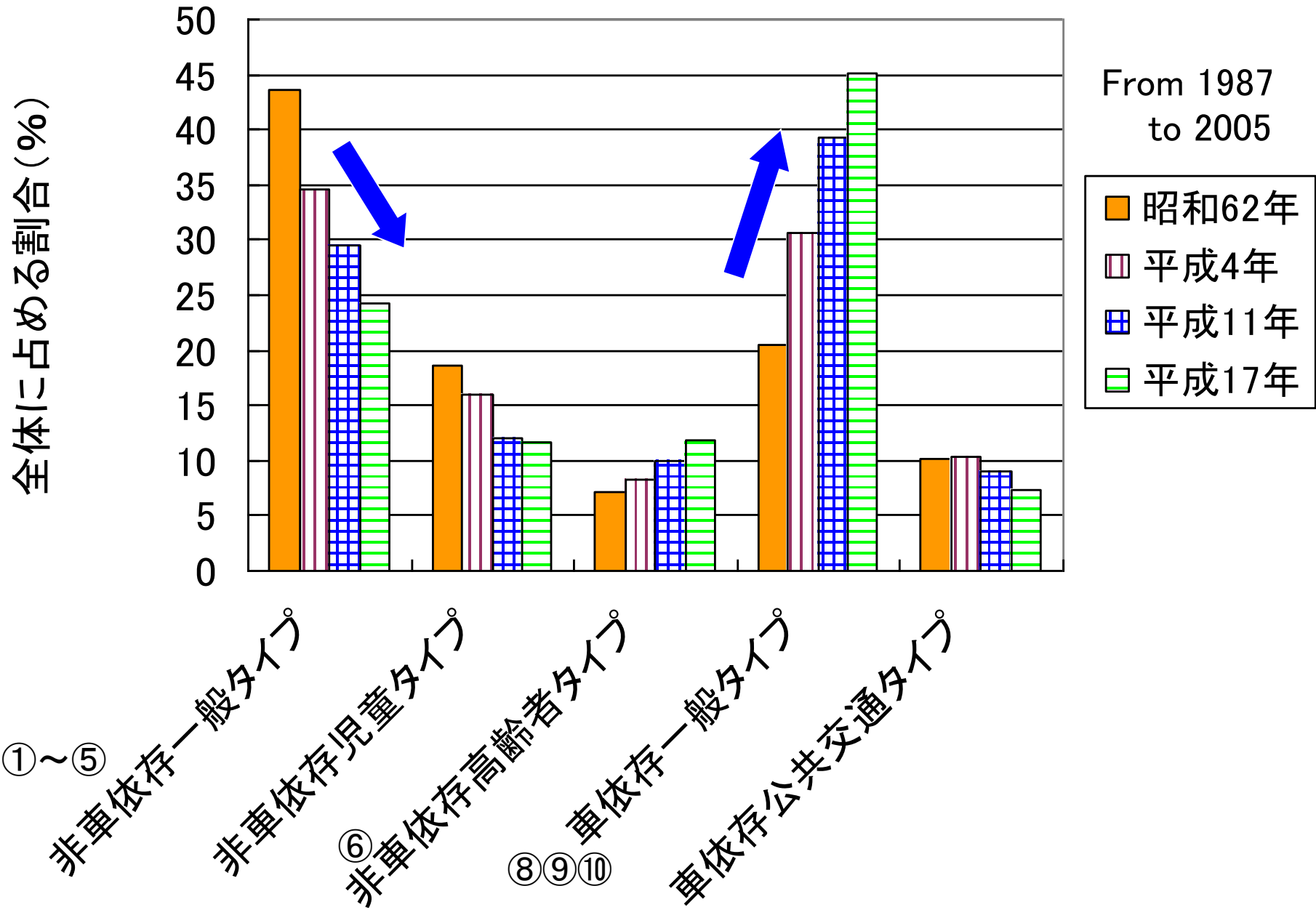
⑪生徒・児童・園児

## 行動群分析への展開

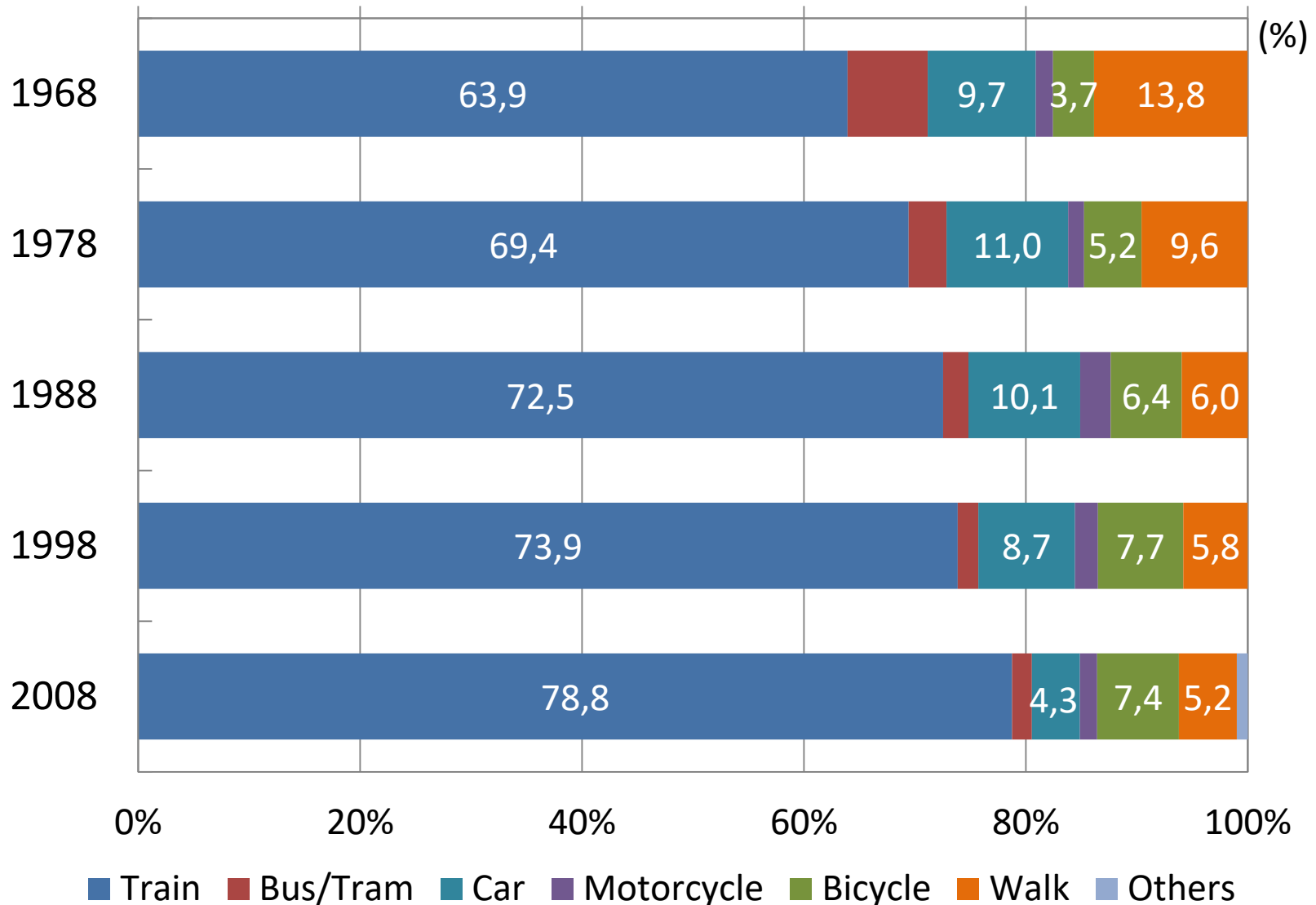
Differet Groups (Transportation Modes and Lifestyle)



# 行動群構成比の経年変化 (Total Japan)

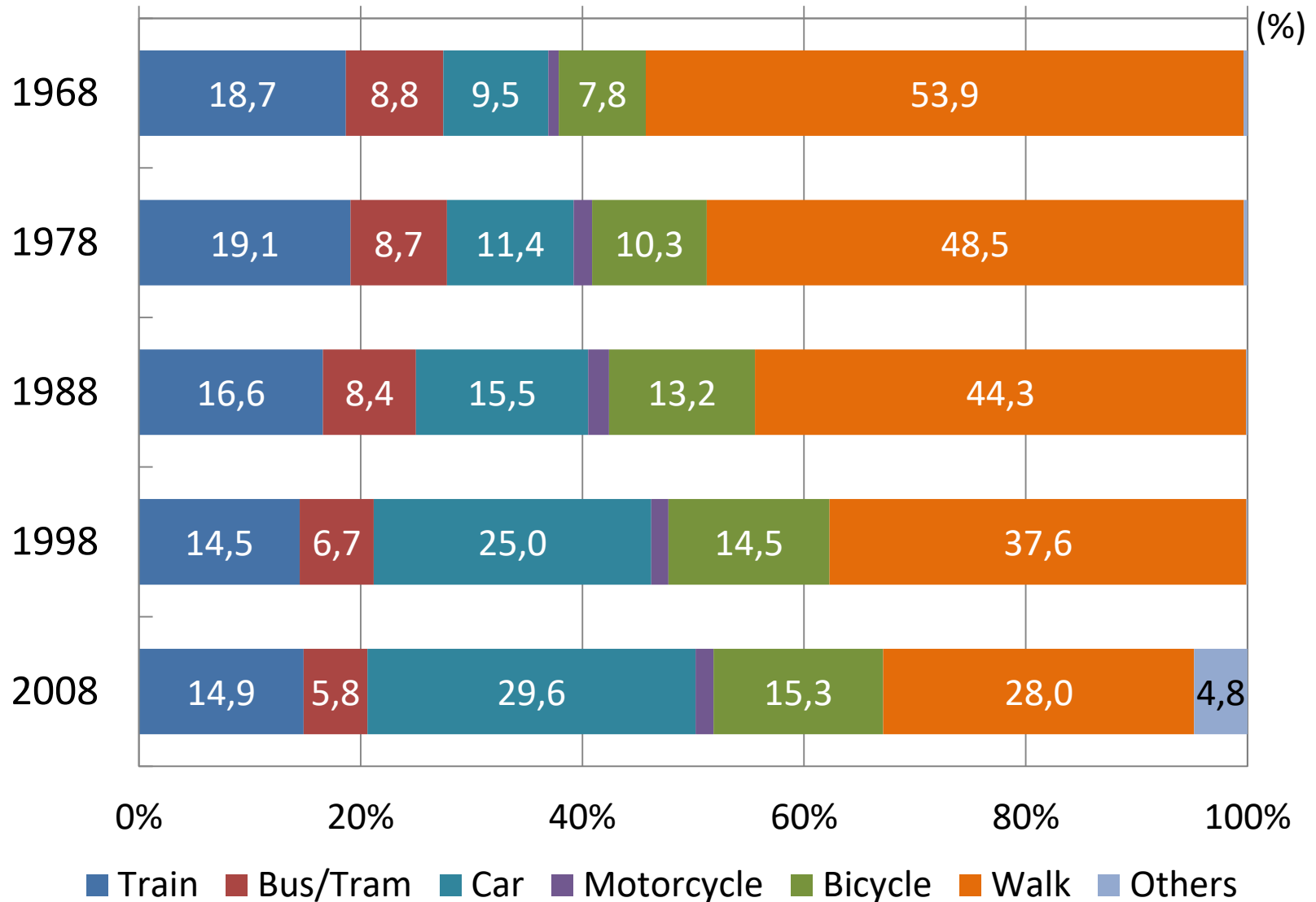


# Transportation mode of trips to Tokyo city area



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
 ~Change and Future of Metroplis according to the Date~.(2014)

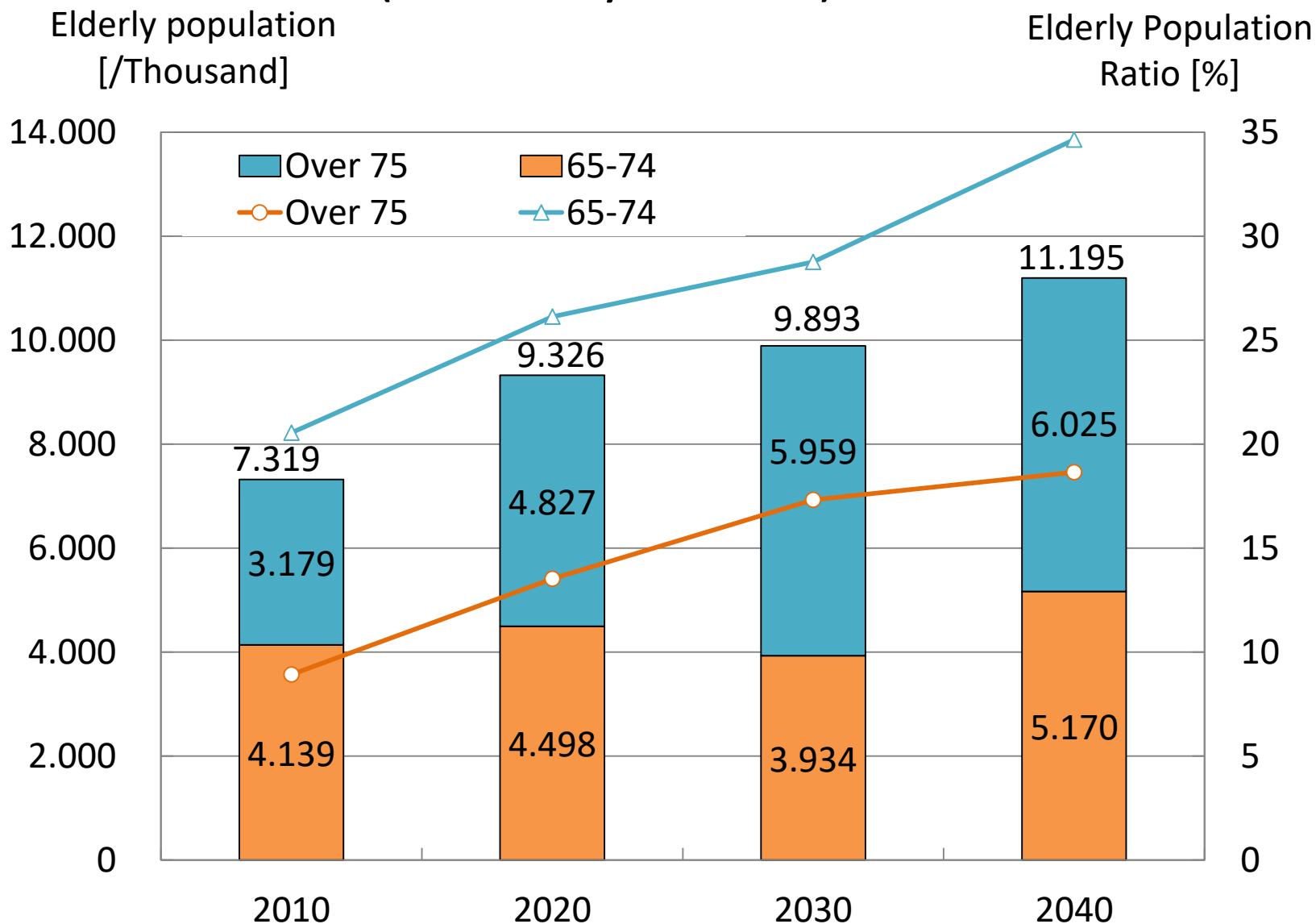
# Transportation mode of elderly people (Over 65 years old)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)

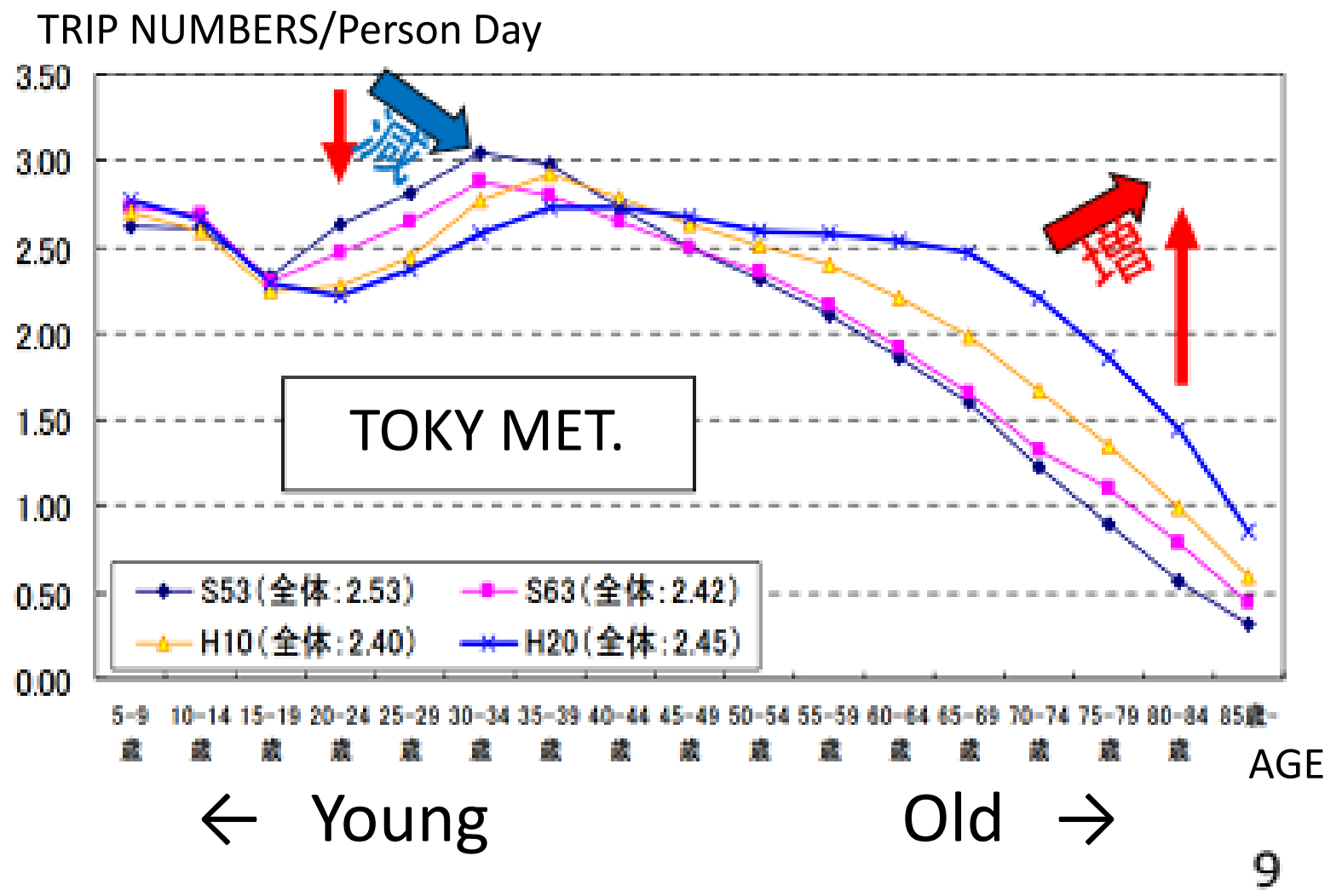


# Population estimation of Tokyo metropolitan area (Over 65 years old)



Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision  
~Change and Future of Metroplis according to the Date~.(2014)

# Decrease of Trip Numbers



## Challenges of Urban Area

Current urban trend

- Depopulation and Aging
- Urban Sprawl



### ■ Deterioration of functions supporting urban lives

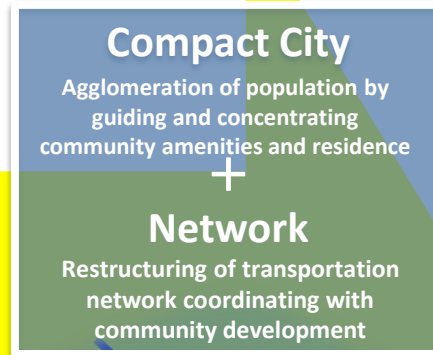
- ✓ Difficulty in maintaining medical, welfare, and commercial service
- ✓ Shrink of the public transportation network and deterioration of the quality of the service

### ■ Regional Economic Decline

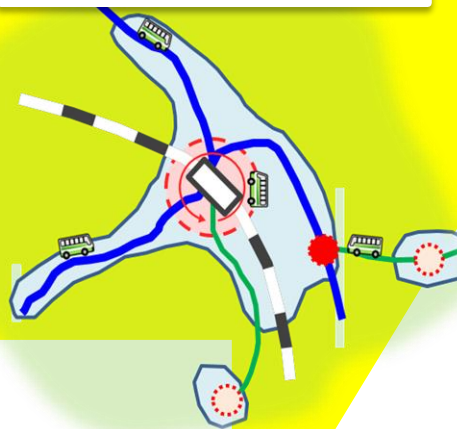
- ✓ Regional industrial stagnation
- ✓ Increase of vacant lands and stores, decline of downtown

### ■ Strict Governments' Finances

- ✓ Increasing social security costs
- ✓ Addressing the aging infrastructure



***Polycentric Network-based Compact City with city center and local cores linked by user-friendly public transport***



## Effects of Compactness

### Maintenance and improvement of urban livability

- ✓ Maintaining community services
  - ✓ Improving accessibility to local services
  - ✓ Social participation by the elderly
- ➔ Making urban Environment to safe and comfortable for the elderly and households with children

### Revitalization of regional economy

- ✓ More productive in service industries, such as public transport, medical care, welfare and commerce.
- ➔ Maintaining and improving business environment

### Reduction of administrative cost

- ✓ Reducing the maintenance cost of for infrastructure
  - ✓ More efficient in administrative service
  - ✓ Maintaining land value and the revenue of property tax
  - ✓ Controlling social security cost through health enhancement
- ➔ Financially sustainable urban management

### Less burden on global environment

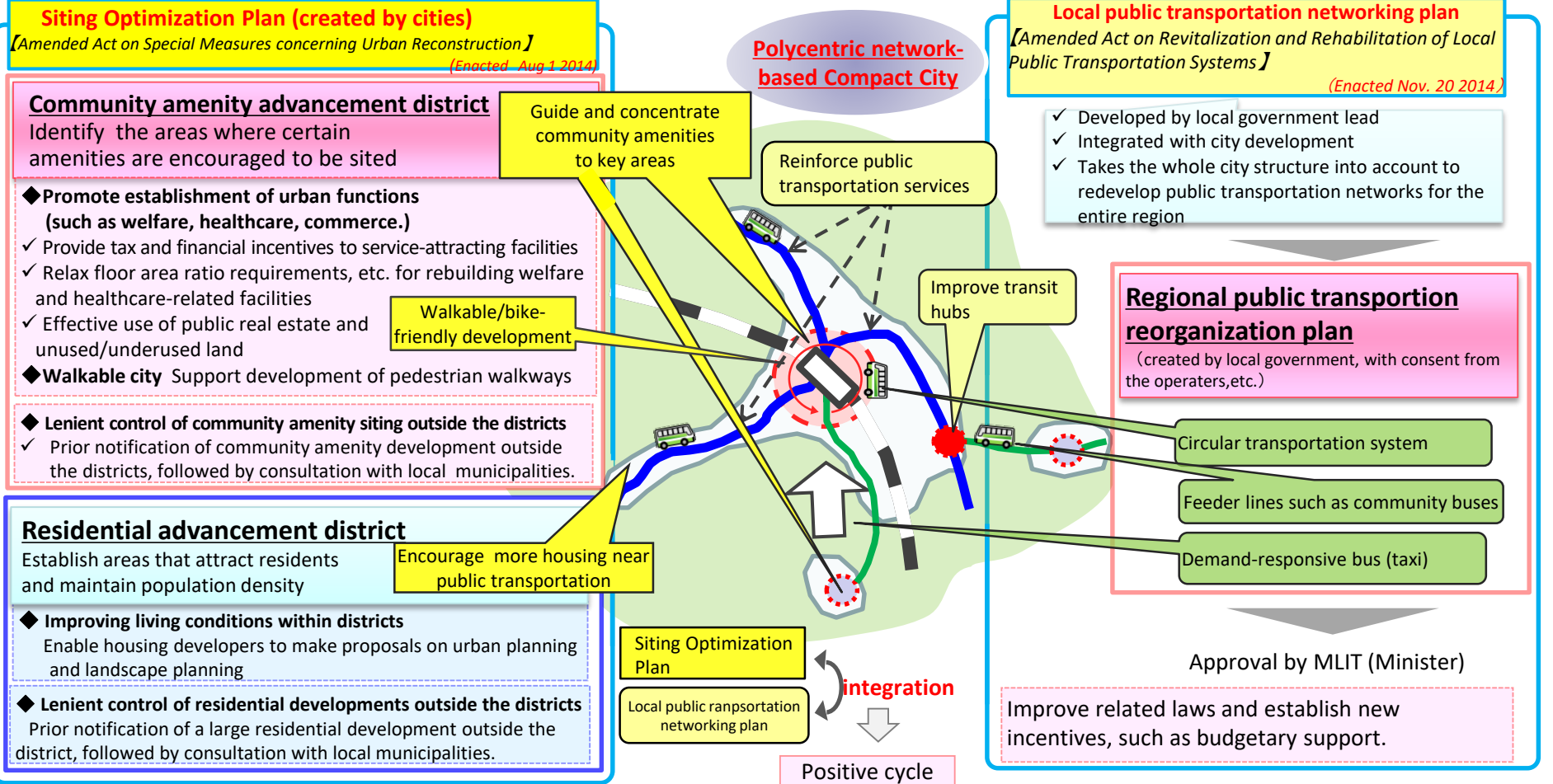
- ✓ More efficient use of energy
  - ✓ Reducing CO<sub>2</sub> emission
- ➔ Realization of urban structure with low carbon emission



# Working Toward "Network-based Compact City"

Source: Ministry of Land, Infrastructure, Transport and Tourism

- Based on the **Act on Special Measures concerning Urban Reconstruction** and **Act on Revitalization and Rehabilitation of Local Public Transportation Systems amended in 2014**, the local municipalities are expected to guide houses and community amenities into key areas and to develop a sustainable local public transportation network which connects these areas, while taking the entire city structure into account.
- In order to encourage the municipalities to guide community amenities into designated districts, the Japanese Government provides incentives such as budgetary support for creating and implementing such plans.



# Siting Optimization Plan (figure)

Source: Ministry of Land, Infrastructure, Transport and Tourism

