

Summer Seminar
"Urban Rail & Dev."
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Tokyo univ.

ADB Seminar
"Japanese Rail & Dev."
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Tokyo Station

Japanese type of TOD in Tokyo Metropolitan Region

2017

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Profile

1967 Bachelor of Eng. (Tokyo Univ.)

1971 Master of Sci. (MIT-USA)

1998 Doctor of Eng. (Tokyo Institute of Tech.)

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1967~1995 Ministry of Construction, Japan(City Bureau and Road Bureau),and Prefectural Governments

1976~1979 Asian Dev. Bank (Urban Dev. Specialist)

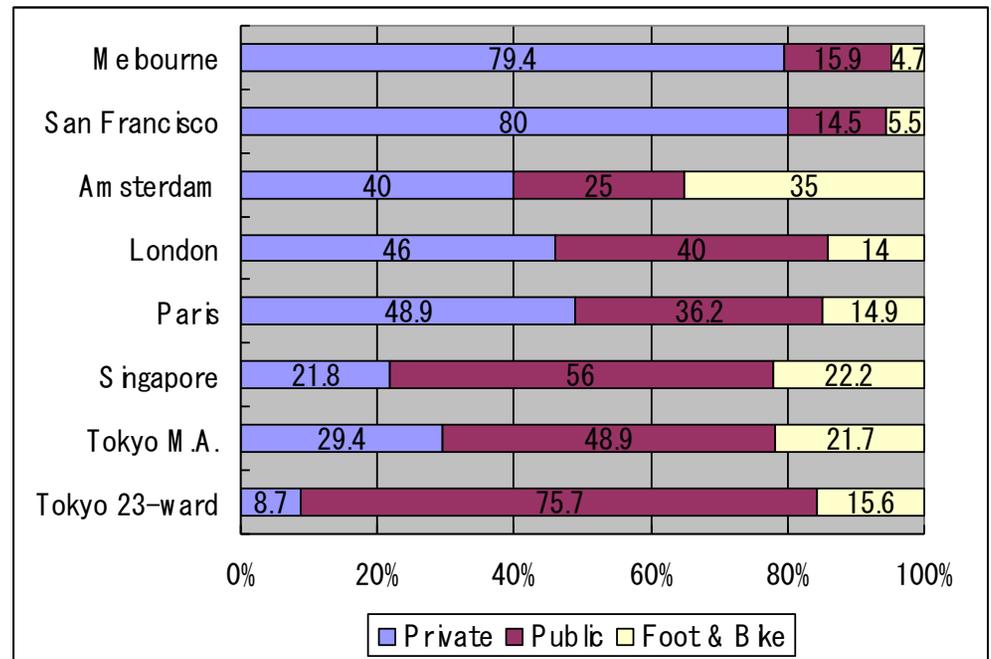
1997~2002 Director, Tokyo Rapid Transit Authority

2003~2015 Vice President, Institute Behavioral Sciences
(Urban transp. planning and urban dev.)

2010~ Advisor, Japan Railway East Co.ltd.

Higher Rail Use in TMR

- Public transp. share for commuting trips
- In TMR, rail share 30%
- For Central Tokyo, rail share 70%
- <Fundamental Q>
Why is it so ?



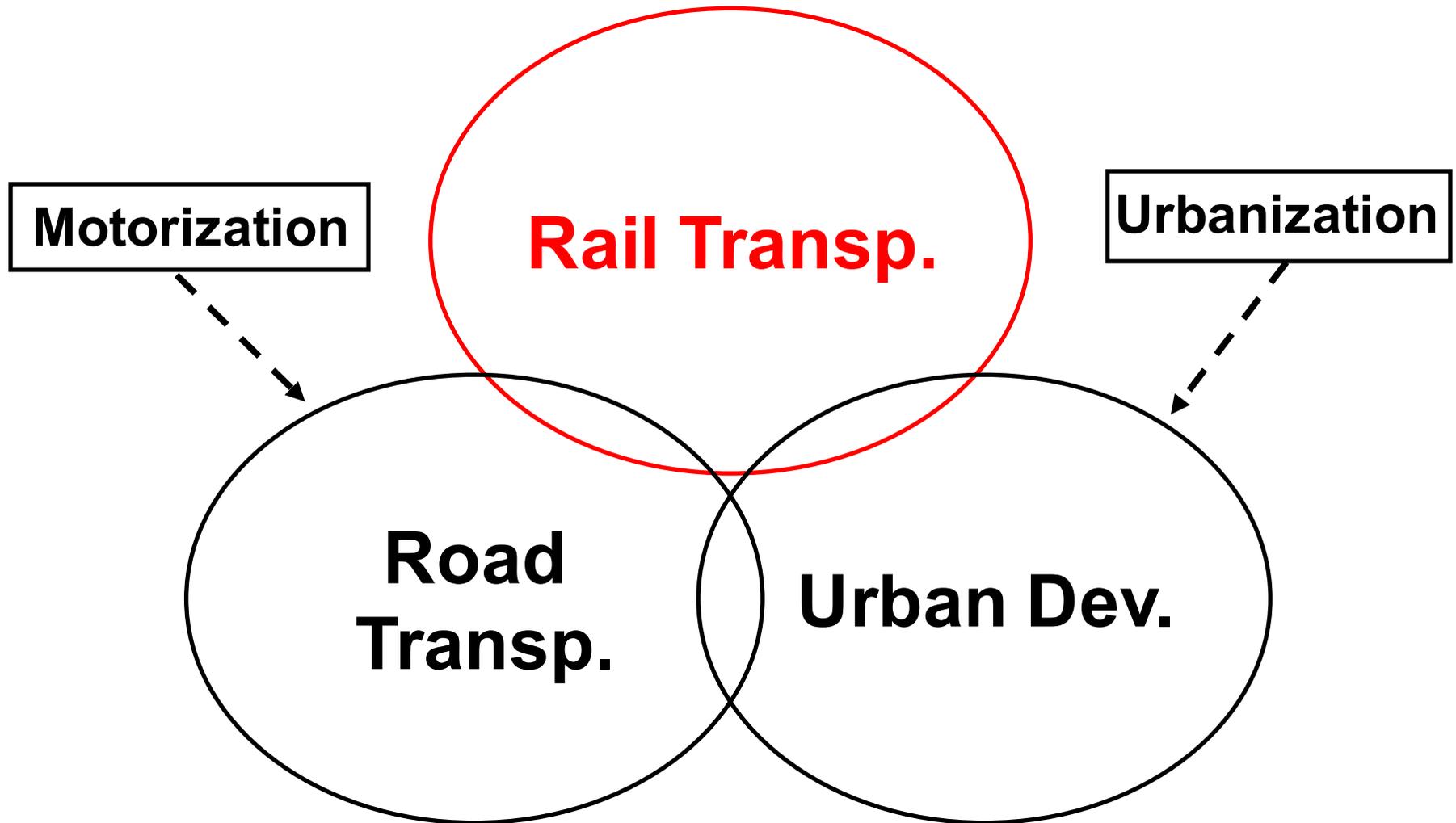
Source: The Millennium Cities Database for Transport (2001)

Why higher rail use is Realized?

Throughout the 20th century in Japan

- (1) Mega trend has been in favor of fostering “Transit Metropolis”
- (2) Rail operators have implemented coordinated [Rail + Development] business model , and contributed to form up “Transit Metropolis”

Three Sub-sectors in Urban Transport



Urban Transp. Problems in Megacities

- (1) Two Basic Changes: Urbanization (U)
Motorization (M)
- (2) Tokyo Metro. Region: Experienced U+M
(U) came earlier, (M) followed
- (3) Growing Asian Megacities ; Experiencing
extensive (U+M) overlapped

Contents

1. Urbanization, Motorization and Urban Transp. System in Tokyo Metropolitan Region (TMR)
2. Coordinated Planning and Finance between Rail and Suburban Development
3. Example; Tama Garden City(TGC)
4. Conclusive Remarks
5. Japanese type of TOD and its characteristics

1. Urbanization, Motorization and Urban Transp. System in Tokyo Metropolitan Region (TMR)

1-1 Tokyo Metropolitan Region (TMR)



Tokyo and 3 pref.

Area: 6,060km²
Population: 28 million

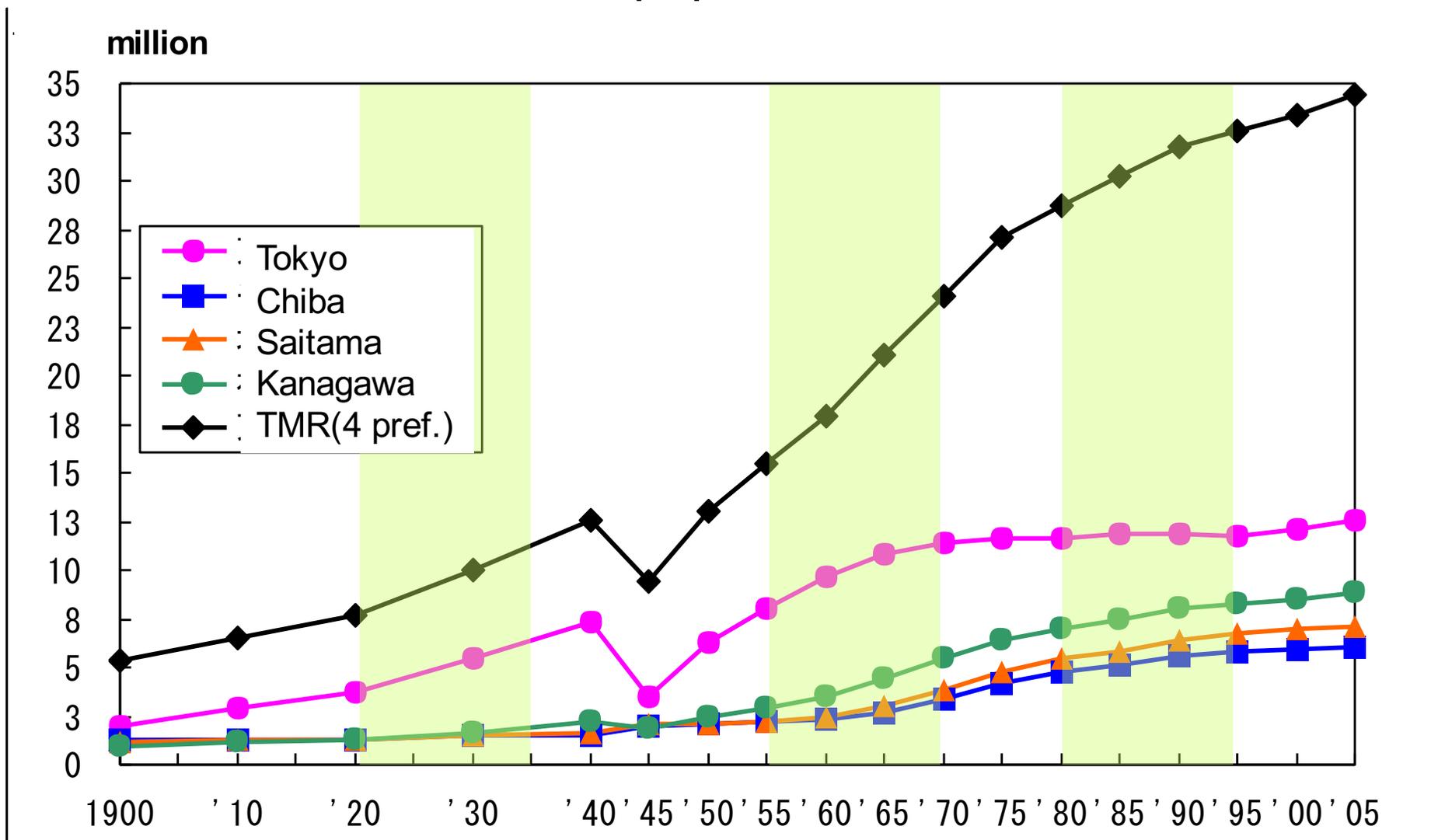
50km radius from
central Tokyo

1-2 Three Phases of Urbanization in TMR

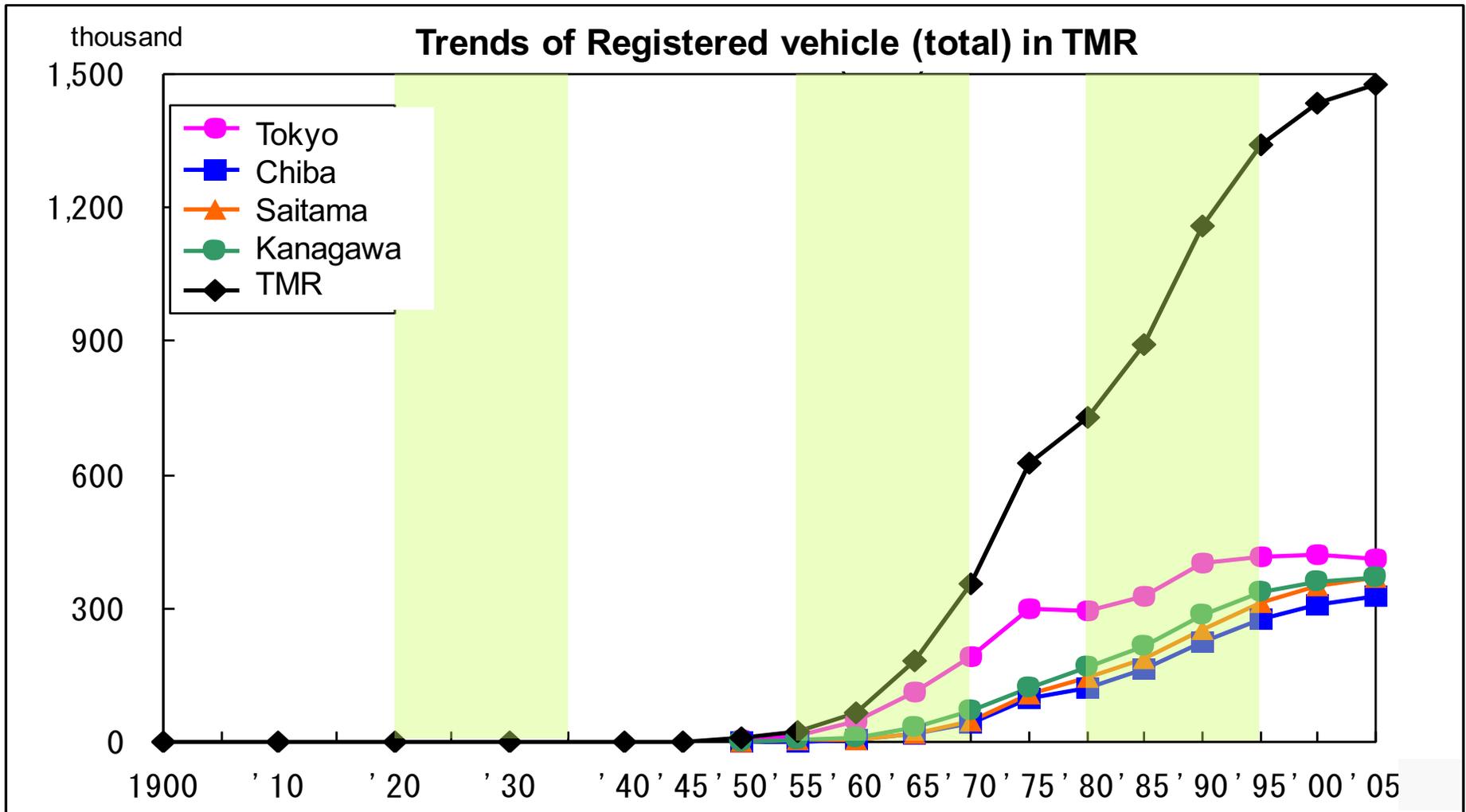
- Phase I ('20 - '35) Light Industry
 - Phase II ('55 - '70) Heavy Industry /
High economic growth
 - Phase III ('80 - '95) High-tech and Service Industry
-
- Phase I, II \Rightarrow Common to major large cities
 - Phase III \Rightarrow Solely to TMR / Cosmopolitan TMR

1-3 Trend of Population in TMR

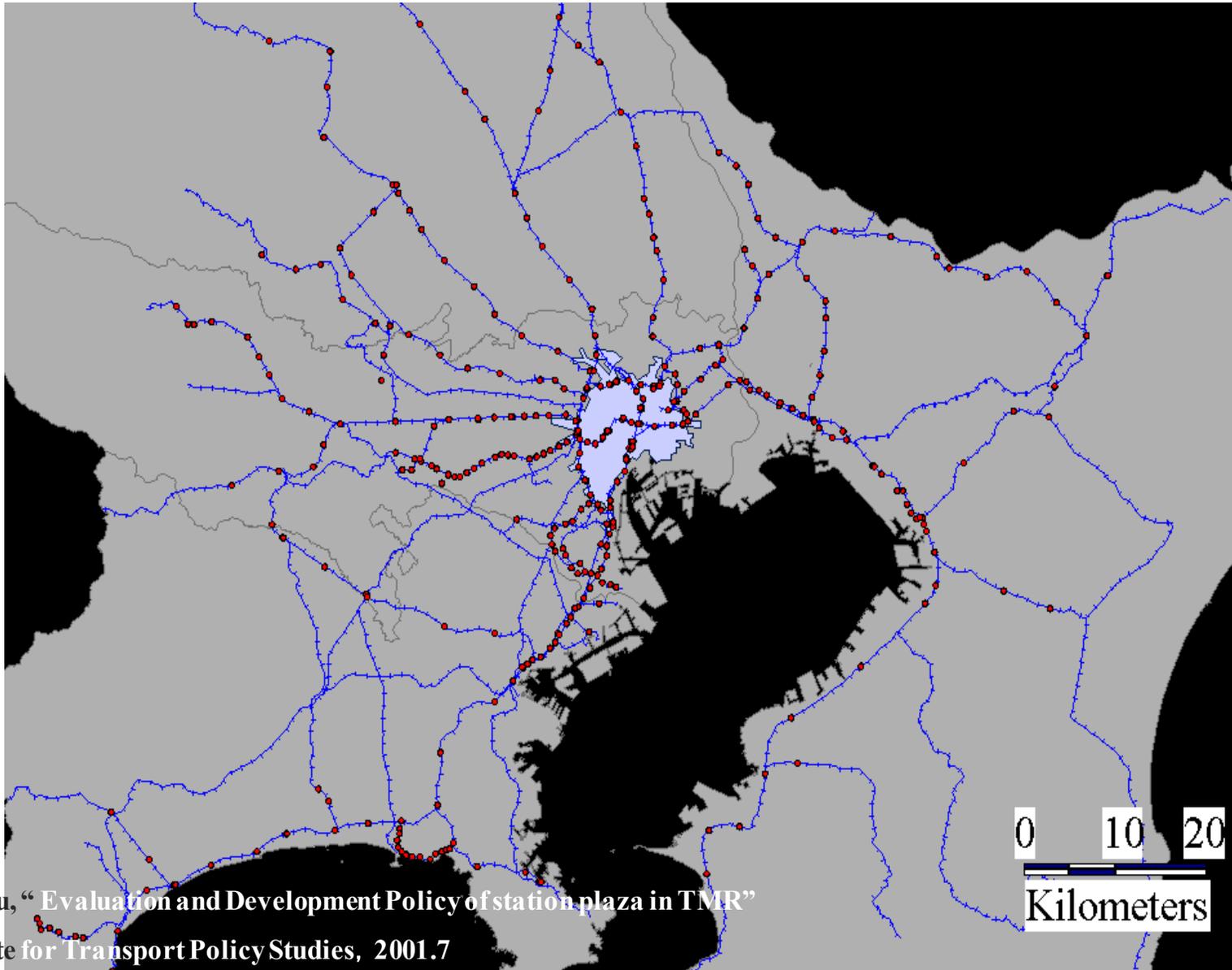
Trends of population in TMR



1-4 Trend of Motorization



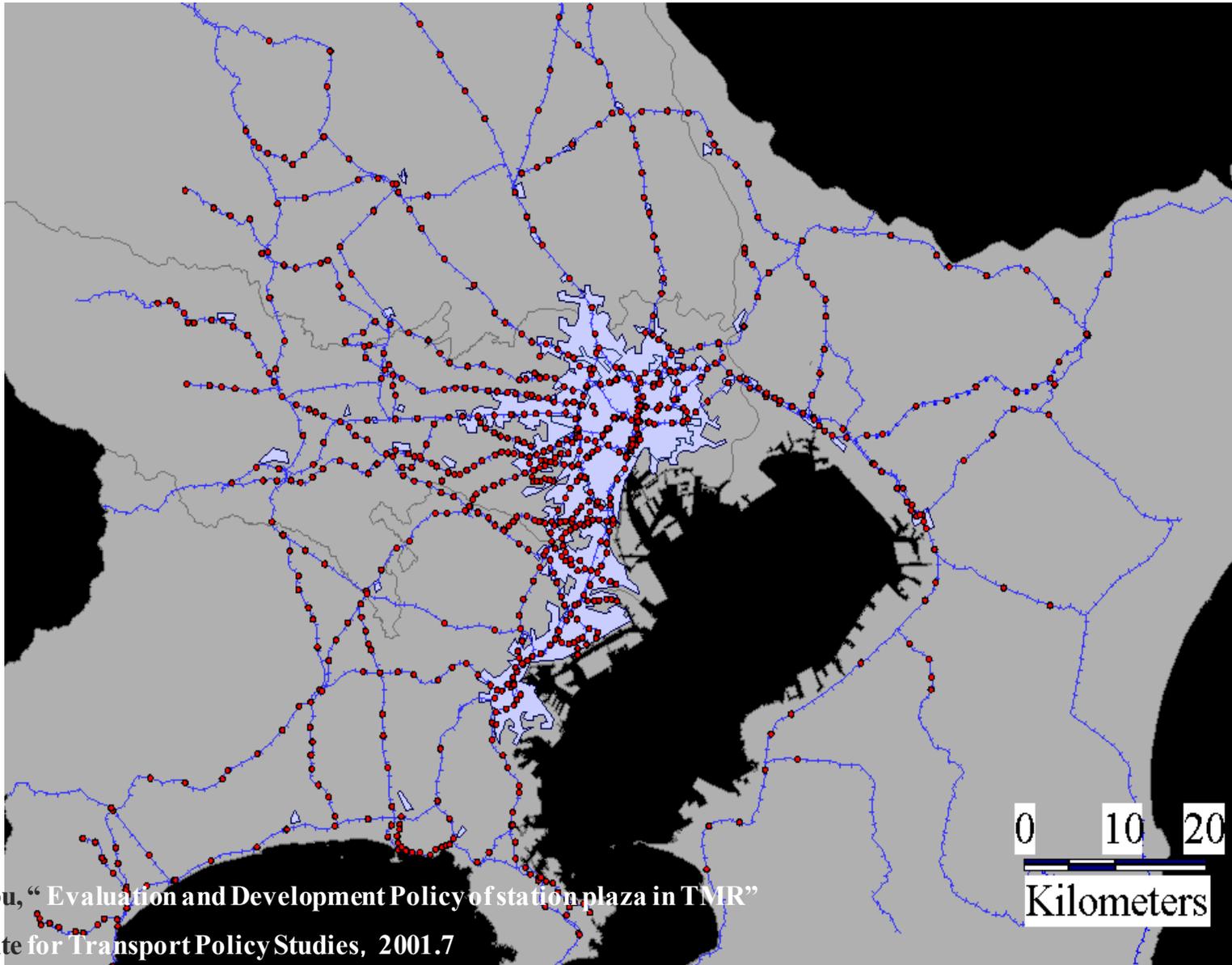
1-5(1) Urbanization and Rail Net Phase I (- 1923)



KII, Masanobu, "Evaluation and Development Policy of station plaza in TMR"

Source: Institute for Transport Policy Studies, 2001.7

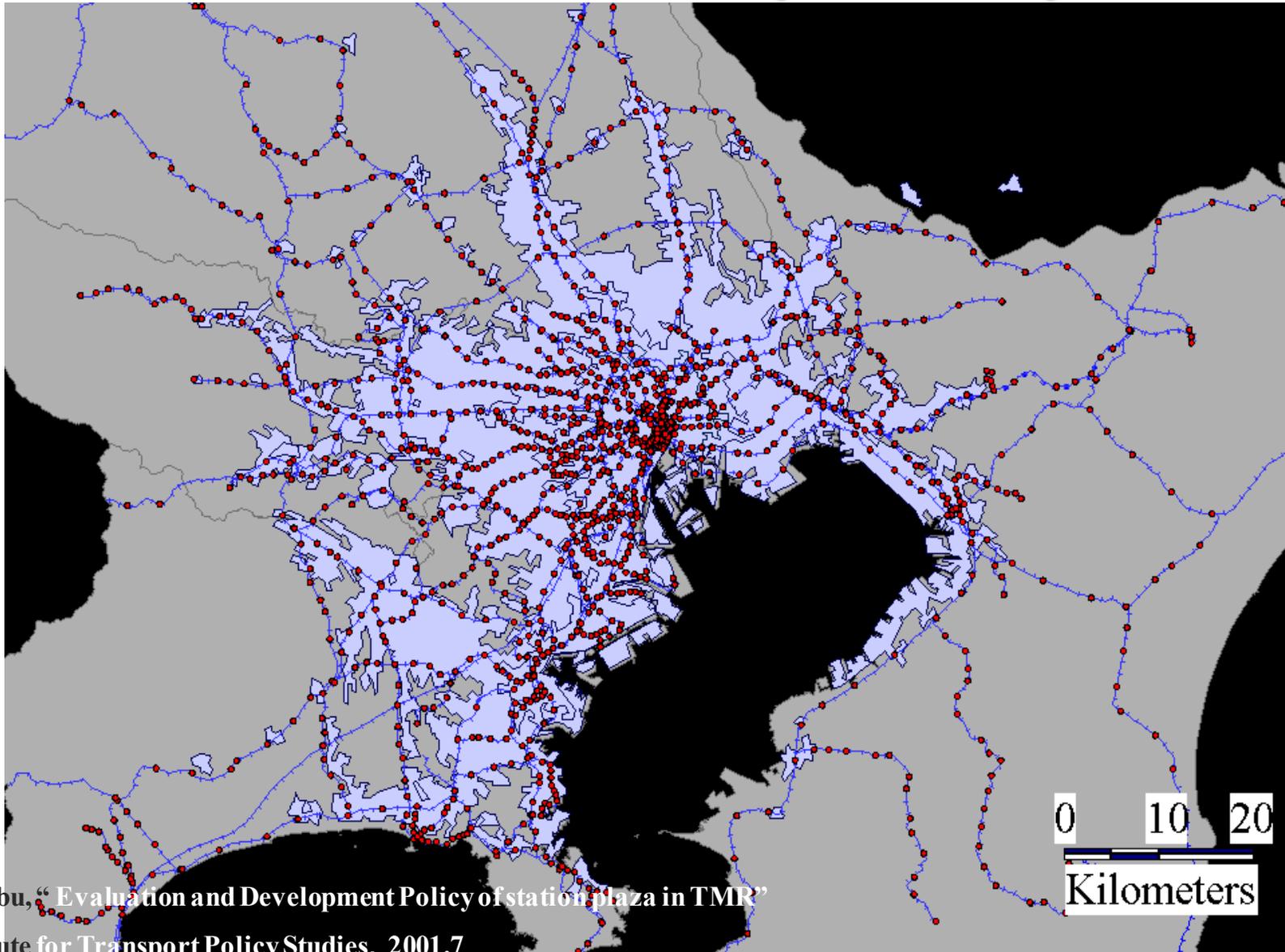
1-5(2) Urbanization and Rail Net Phase I (1923 - 45)



KII, Masanobu, "Evaluation and Development Policy of station plaza in TMR"

Source: Institute for Transport Policy Studies, 2001.7

1-6 Urbanization and Rail Net Phase II + III (1945 -)

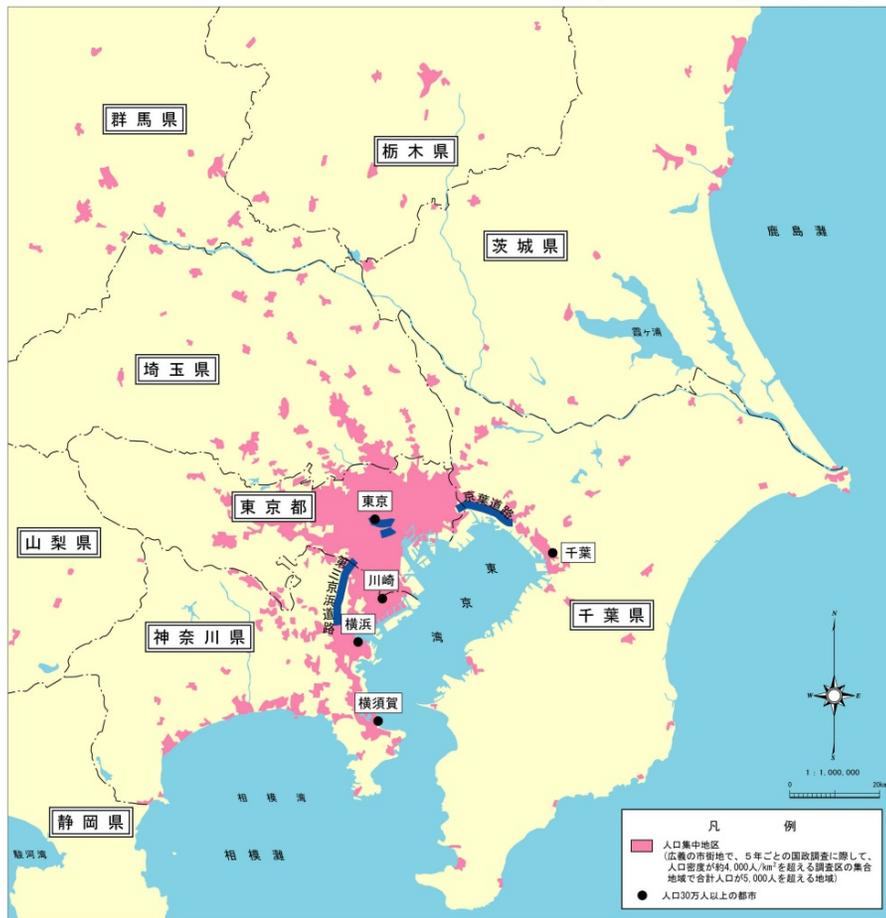


KII, Masanobu, "Evaluation and Development Policy of station plaza in TMR"

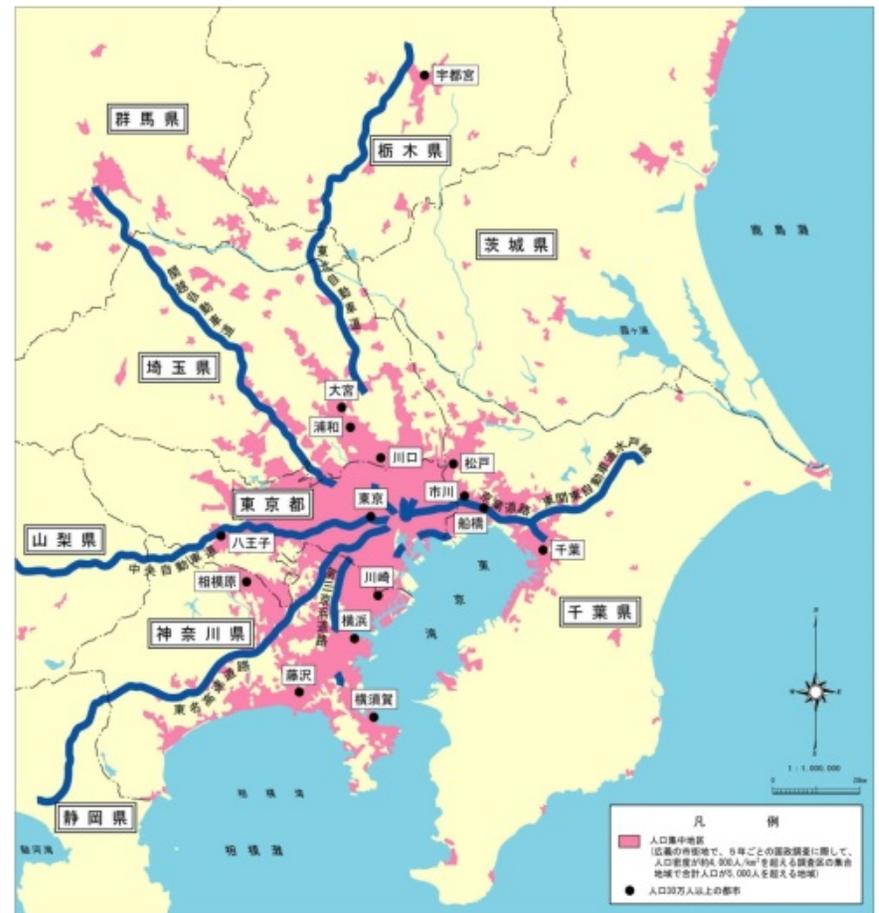
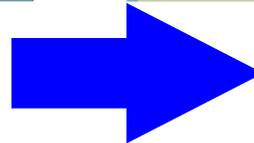
Source: Institute for Transport Policy Studies, 2001.7

1-7 National Expressway Net. Dev.

From outskirts to center



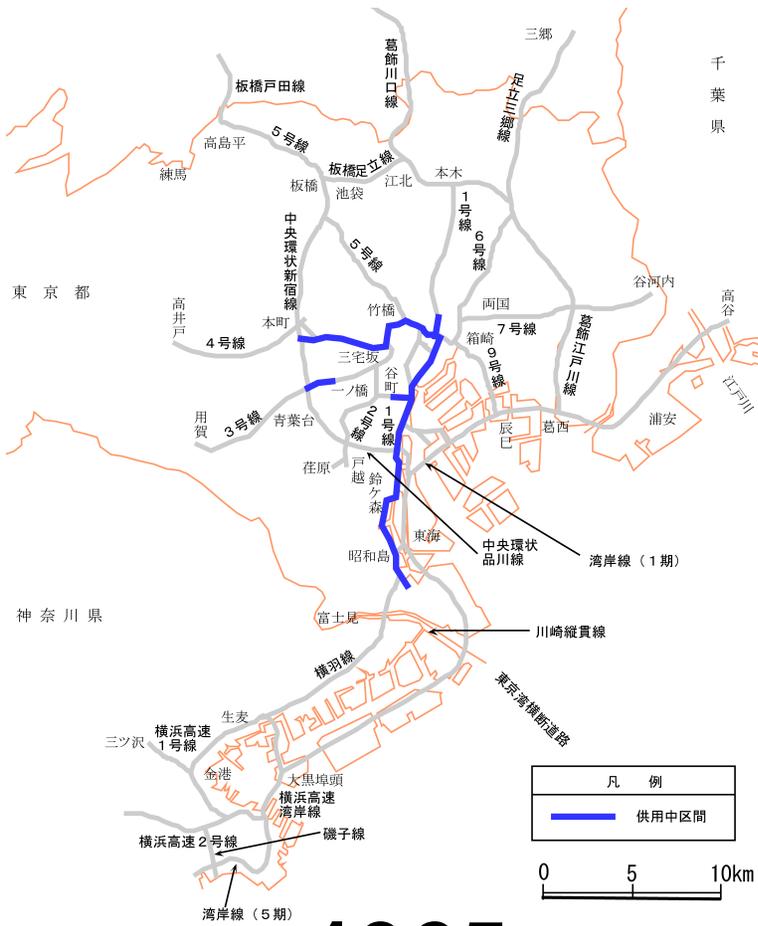
1965
(The Olympic)



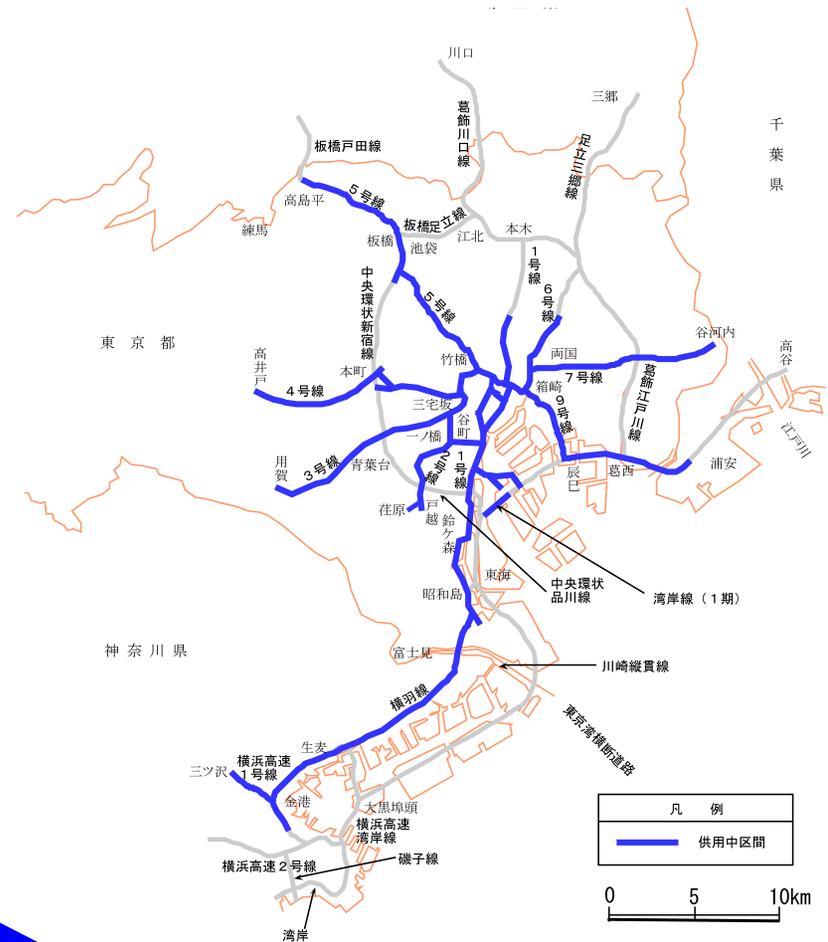
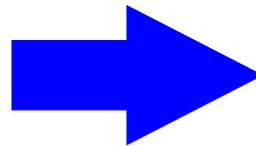
1980

1-8 Urban Expressway Net. Dev.

From center to outskirts



1965
(The Olympic)



1980

**2. Coordinated Planning and Finance
between Rail and
Suburban Development
([Rail + Development] Business Model)**

2-1 Backgrounds and Basic Idea

- The 20C: Age of urbanization in Japan
- Basic idea of coordination; development benefit finances rail investment
- Mutually supportive business activities;
 - (i) Rail extension and new stations provide means of commutation and attract people for new dev't.
 - (ii) New dev't. provides passenger increase for rail operations

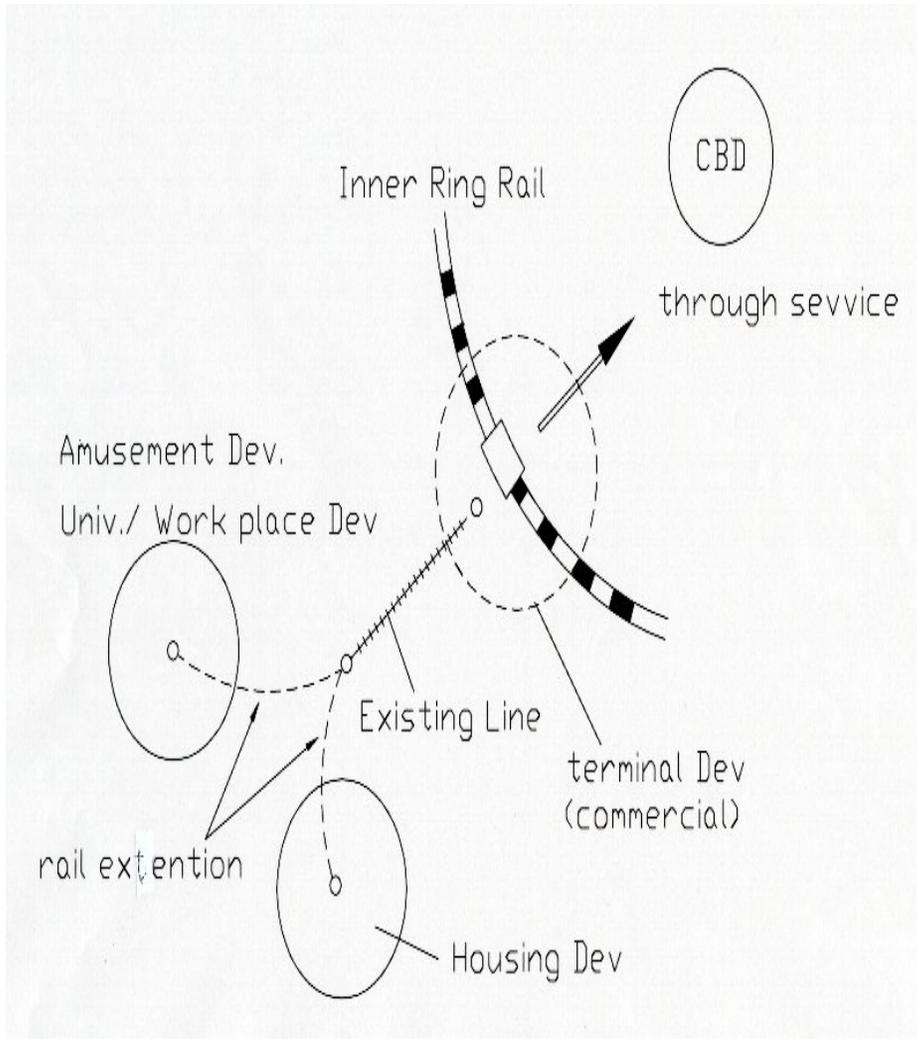
2-2 Private Rail Companies in Large Cities

- Private rail companies play key role in urban transport
- More or less 80-100 years history
- Without gov't subsidy, construct and operate (ROW, facilities, rolling stock)
- [Rail + Development] business model (Two sectors under one company; rail and dev.)

2-3 Steps of Coordinated Plan, Dev. and Finance by Private Rail Companies

1. Obtain blanket license for suburban rail operation, in a radial corridor (before the 1930's)
2. Purchase of land tenure for development, and set up development unions (including ROW)
3. Form up development plans, including rail route and stations
4. Implementation of rail and suburban dev.
5. Financial source from rail revenue of existing lines
6. Sales of suburban housing/housing site
7. Reinvestment of gained dev. benefit

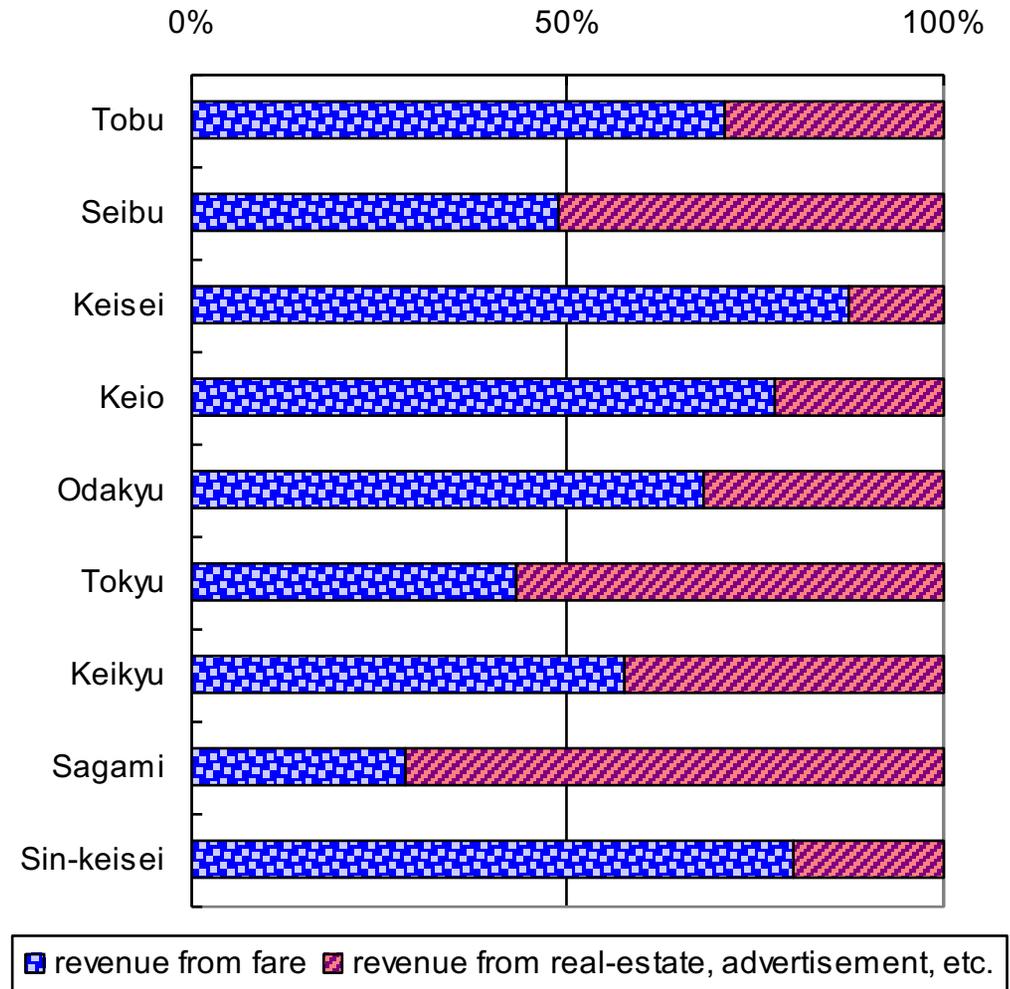
2-4 Important Consideration for Coordinated Plan Dev. and Finance



- (1) Rail extension and/or new station coupled with piecemeal development (size and timing of development)
- (2) Choice of land-use pattern, creating dual directional transport demand
- (3) Through service to CBD enabling faster and seamless commuting

2-5 Revenue Base of Private Rail Companies

- In TMR, 9 companies operate 880km lines
- Rail companies rely on non-rail revenue, esp. on real estate and advertisement
- Its percentage is 30~50% for private rail companies in TMR excluding JR



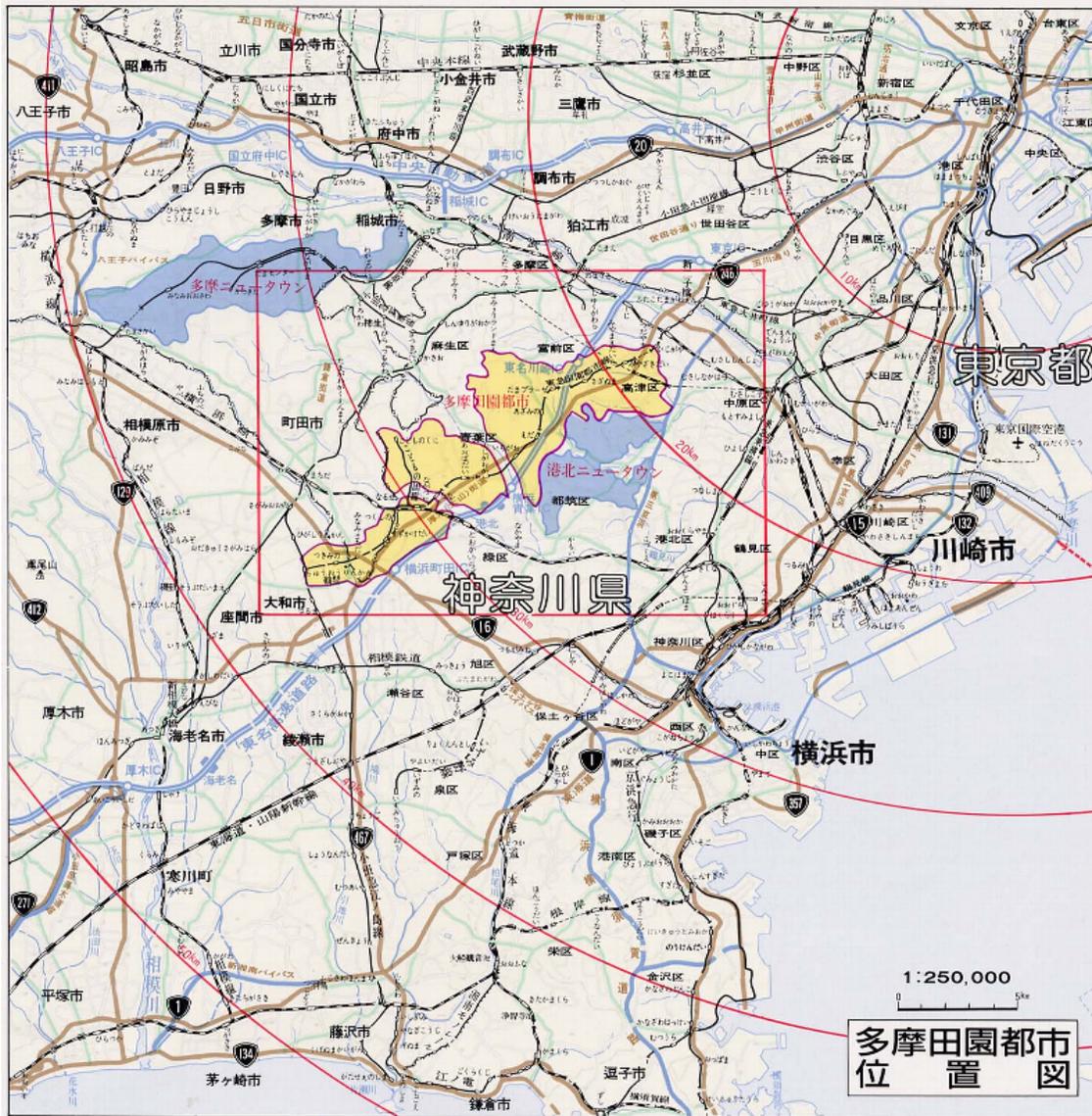
2-6 Traditional Business Model

- 1910 Ikeda City (20km from central Osaka),
by Hankyu Electric Rail Co. , Area 11ha
- Land acquisition and dev. works before rail
opened, sales (ready-made house + lot) after
rail opening
- Average lot area 330m², 248 lots
two-storied wooden house
floor area 66 - 99m²

2-8 Supporting Role of Public Sector

- (1) Master-plan of transit Networks construction and improvement
- (2) License for exclusive rail operation, in a certain corridor , based on master-plan
- (3) Provision of government low-interest loan for rail investment
- (4) Issue development permits
- (5) Authorize city planning and land use control in favor of the Planned Dev.

3.Examples;Tama Garden City (TGC)



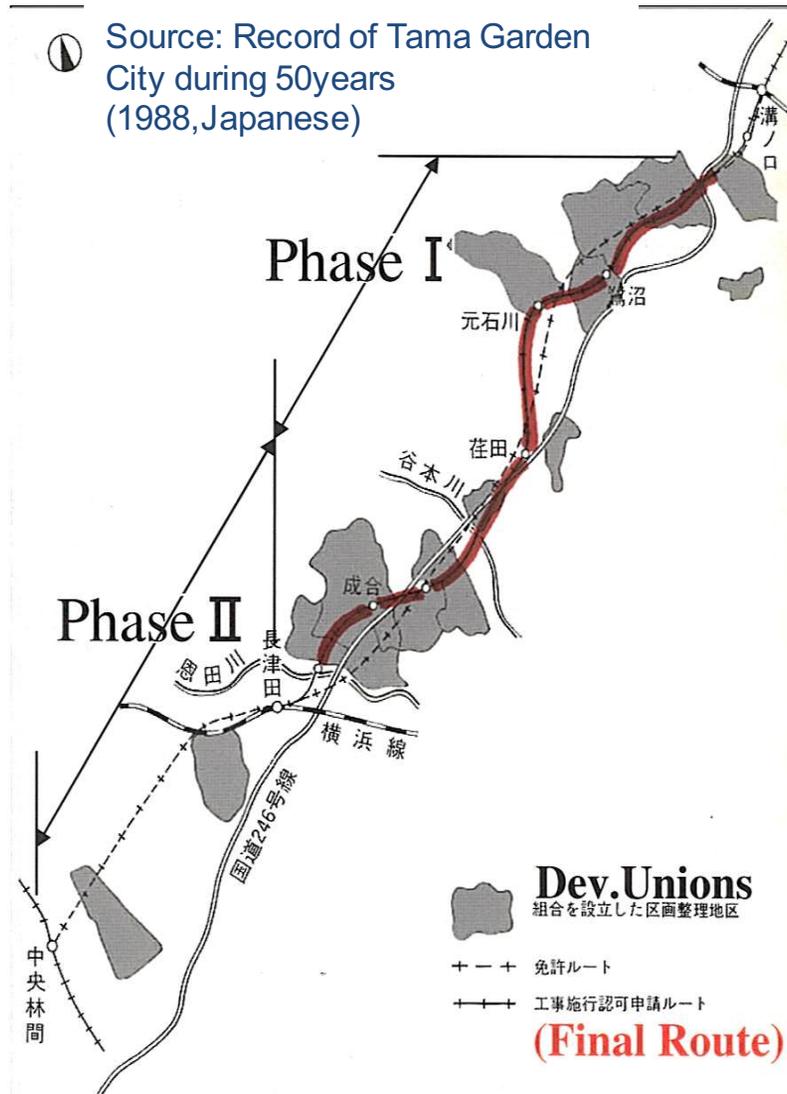
- Largest application of the business model by a private rail company

- Location: 20 - 35km from Central Tokyo

3-1. TGC Dev. Plan 1956

- (1) Area: 5,000 ha
- (2) Former land use: hilly forest and farm land
- (3) Goal: amenity conscious residential dev.
incl. universities etc. (popul. 400 thousand)
- (4) Transportation: Extension of existing rail line
- (5) Planner: Tokyu Corporation

3-2. Dev. Union Initiated by Rail Company



- Land purchase by Tokyu beforehand from 1953
- 20% purchase from land owners
- Tokyo persuade land owners Agreement on dev. union



Finalize extension route new stations

Phase I 14.2K (11 st.)
Phase II 5.4K (5 st.)

3-3. Planned Dev. Prior to Rail Extension

stage dev.	ha.	
Dev. Union	(A)	3,160
before ext. start	(B)	1,188
before ext. complete	(C)	1,903
after ext. complete		69
Other Dev.		1,840
TOTAL	(D)	5,000

- Planned dev. by union
 $A/D = 63\%$
- Dev. agreed prior to rail extension
 $B/A = 38\%$
 $(B+C)/A = 98\%$

3-4. Implementing Dev. and Rail Extension

Development

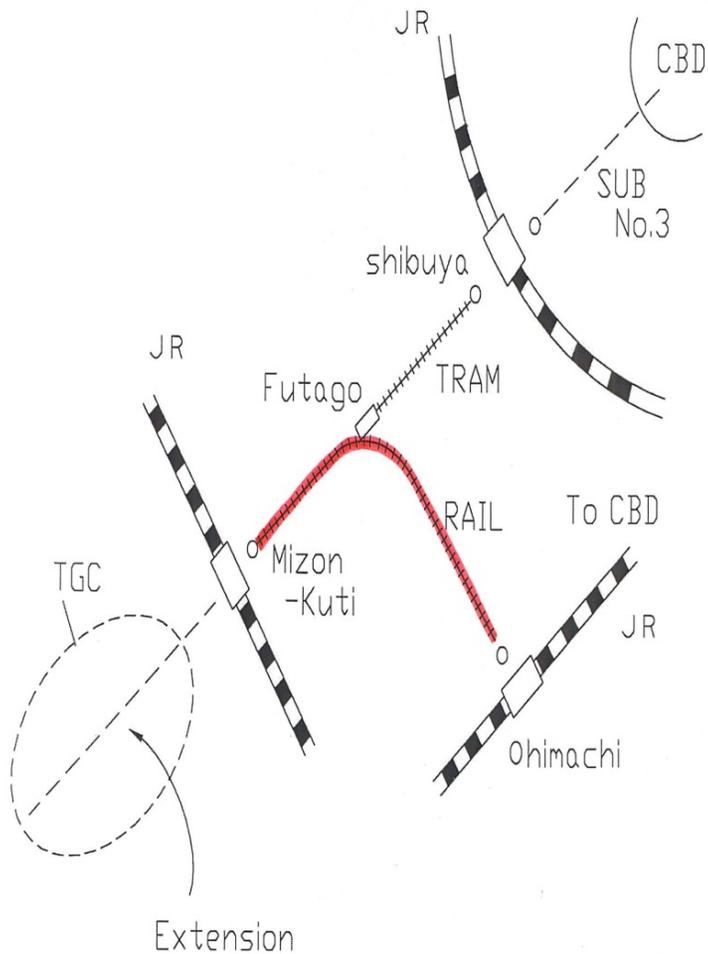


Rail. Ext.



Source: Tokyu Corporation, <http://www.tokyu.co.jp/company/outline/history.html>

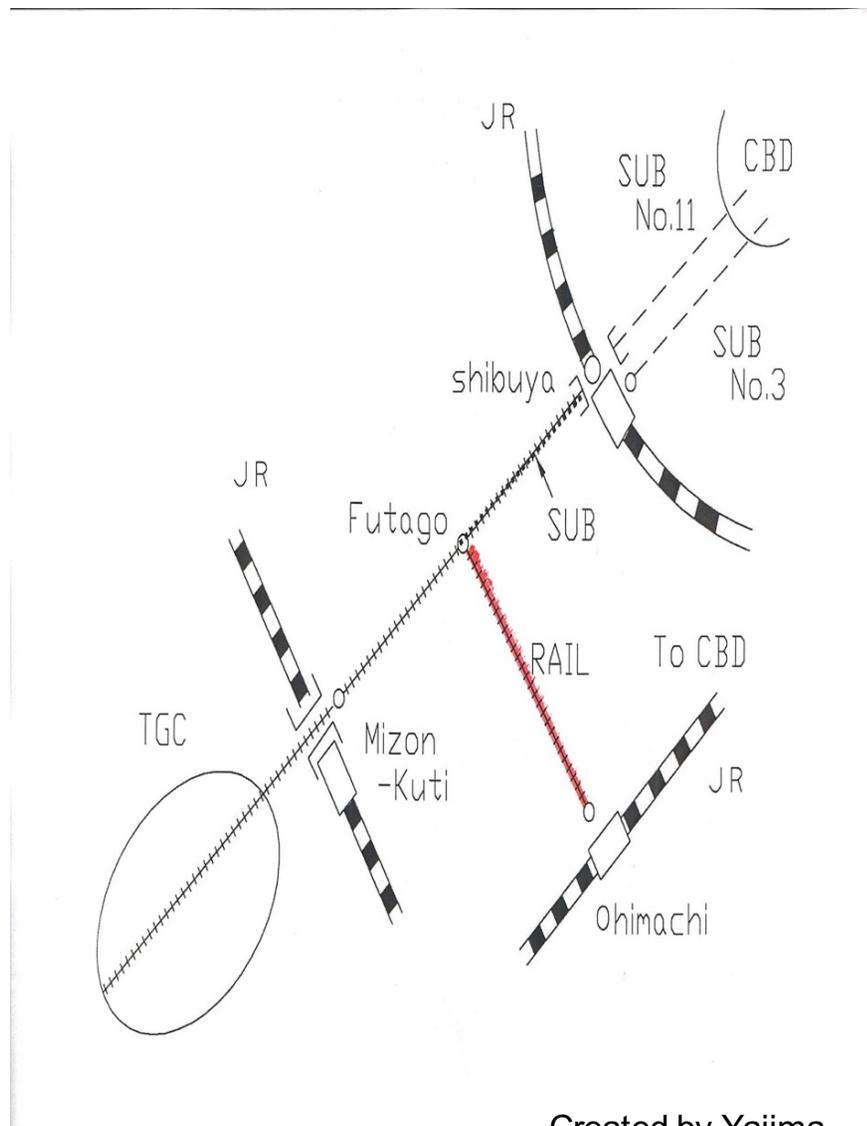
3-5. Rail System before TGC Dev.



Created by Yajima

- Extension
Track gauge: 1,067mm
Power collect: overhead
- Tokyu tram (1,372mm)
- Subway No.3
Track gauge: 1,435mm
Power collect: third rail

3-6. Through service to CBD after TGC Dev.



Created by Yajima

- Tram replaced by new Tokyu subway (8.8km)
Track gauge: 1,067mm
Power collect: overhead
- Subway NO.11 (new)
(Gauge / Power: same)
- Through service to CBD from TGC, enabled

3-7. TGC Development History

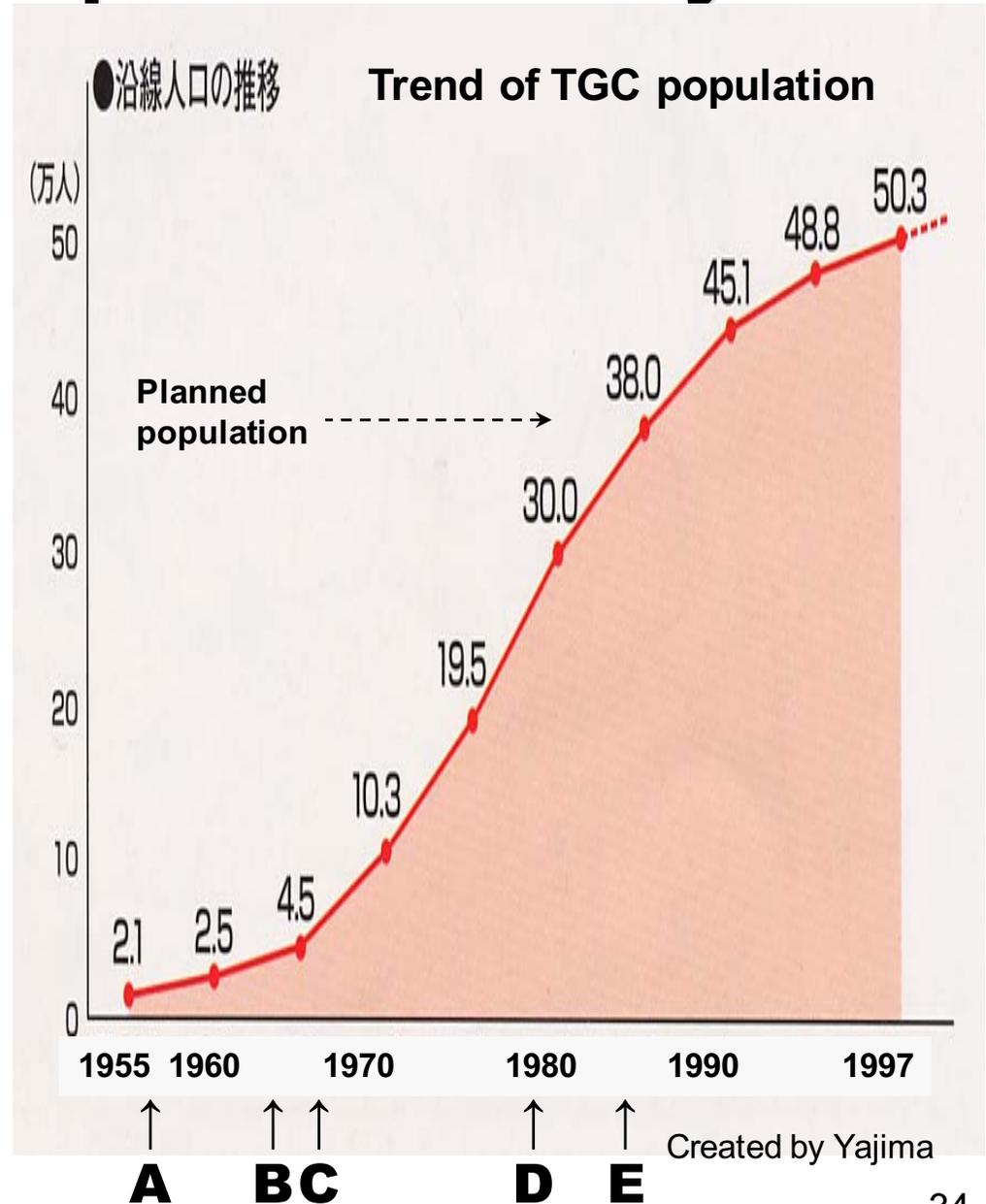
1956: Master plan announced
(A)

1963: Rail extension started
(B)

1966: Phase I extension
completed
(C)

1979: Through service to CBD
(D)

1984: Extension completed
(E)



3-8. View of TGC (1989)



4. Conclusive Remarks

4-1 Timing, Efforts and Strategy

- Fundamental question:
Why rail is highly utilized in TMR ?
- Answer from the above:
 - (i) good timing and efforts for rail network formation (Phase I)
 - (ii) rail improvement efforts (Phase II)
 - (iii) explicit coordinated P & F through Phase I and II

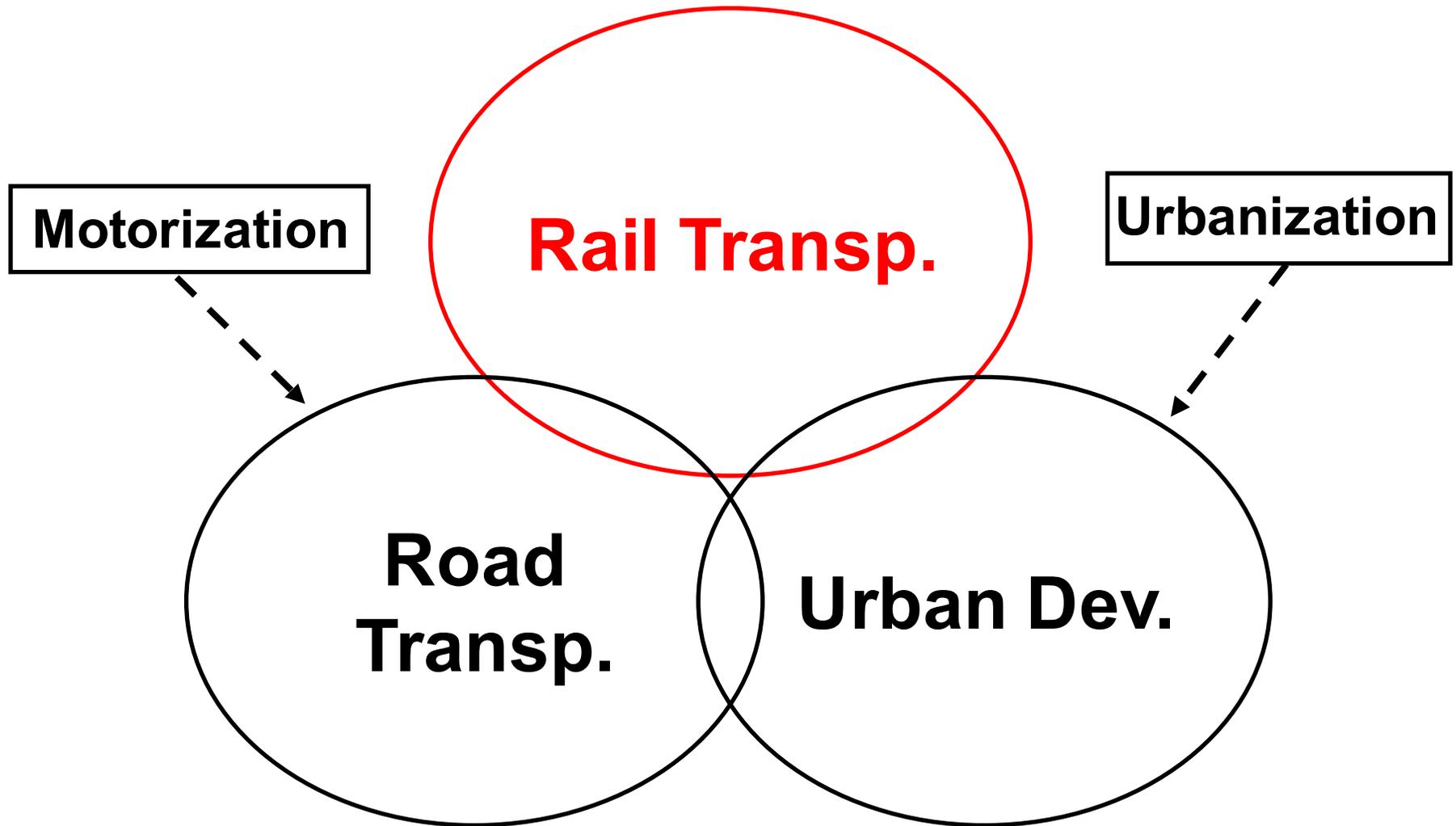
4-2 Good Timing and Efforts

- Phase I urbanization was limited to the center
- By the end of Phase I, basic rail network completed (central and suburban)
- During Phase I, motorization was negligible. Public investment efforts for the National Rail. Private investment for suburban rail
- During Phase II, effective improvement of existing rail network and construction of subway network.
- Since Phase II, road improvement implemented, but delayed.

4-3 Explicit Coordination Strategy

- The Coordination Strategy worked well, as an urban transport policy. (Phase I and II)
 - (1) to accommodate increasing urban population,
 - (2) to provide efficient rail service
 - (3) to avoid over-dependence upon motor-traffic
- The Strategy worked well also, as “the Business Model of Private Rail”
- Public sector supports

Coordination



Thank you!!