Summer Seminar "Urban Rail & Dev." 2015.8.27 Tokyo Univ.	ADB Seminar "Japanese Rail & Dev." 2017.6.19 Tokyo Station	UNCRD Seminar "Urban Rail & Dev." 2018.2.28 UN Univ.

Japanese type of TOD in Tokyo Metropolitan Region

2018

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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.)

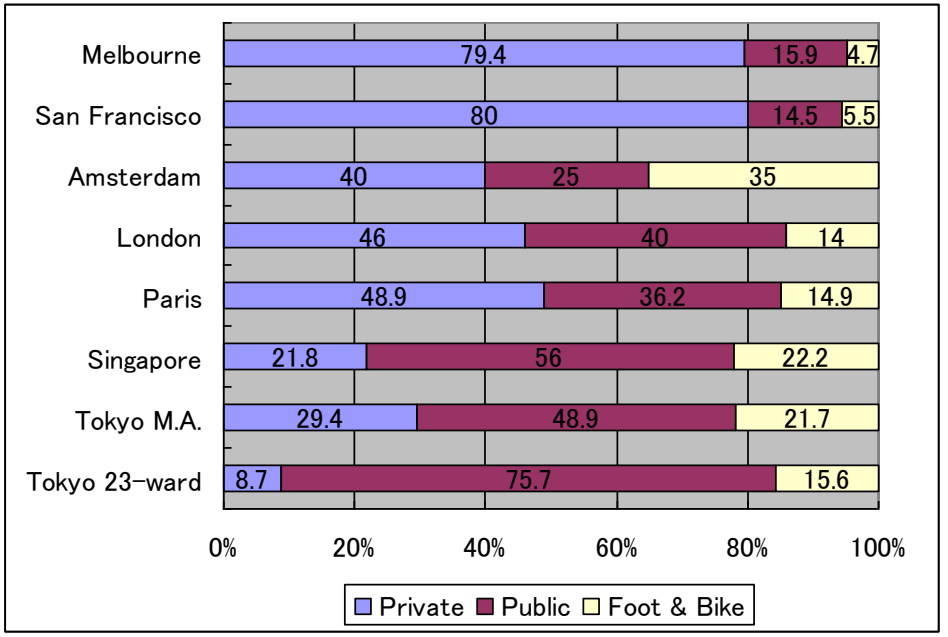
2008～ Visiting Professor, Nihon Univ.

2010～ Advisor, Japan Passenger 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 ?



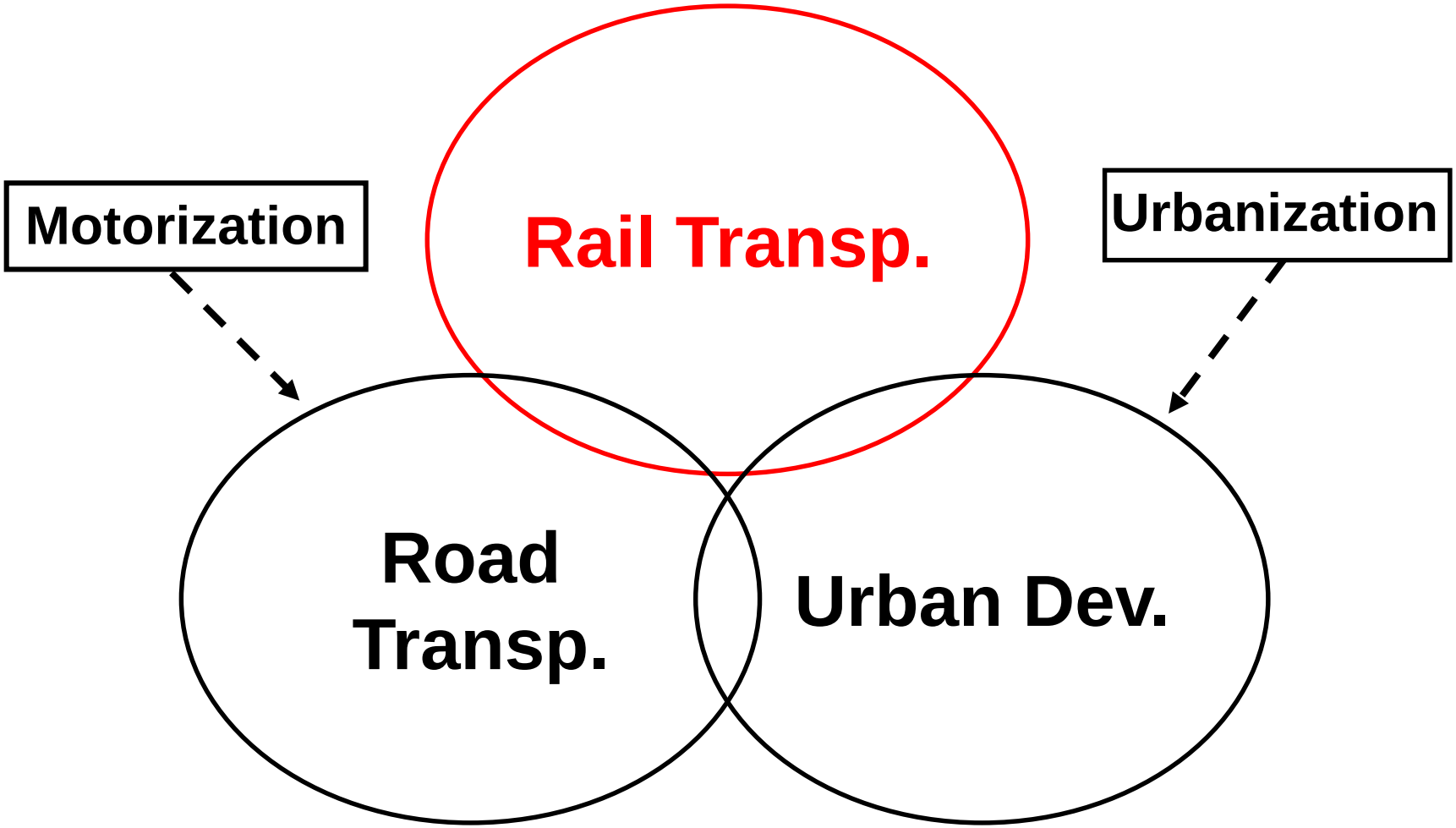
Why higher rail use is Realized?

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: 6,060km^2

Population: 28 million

50km radius from central Tokyo

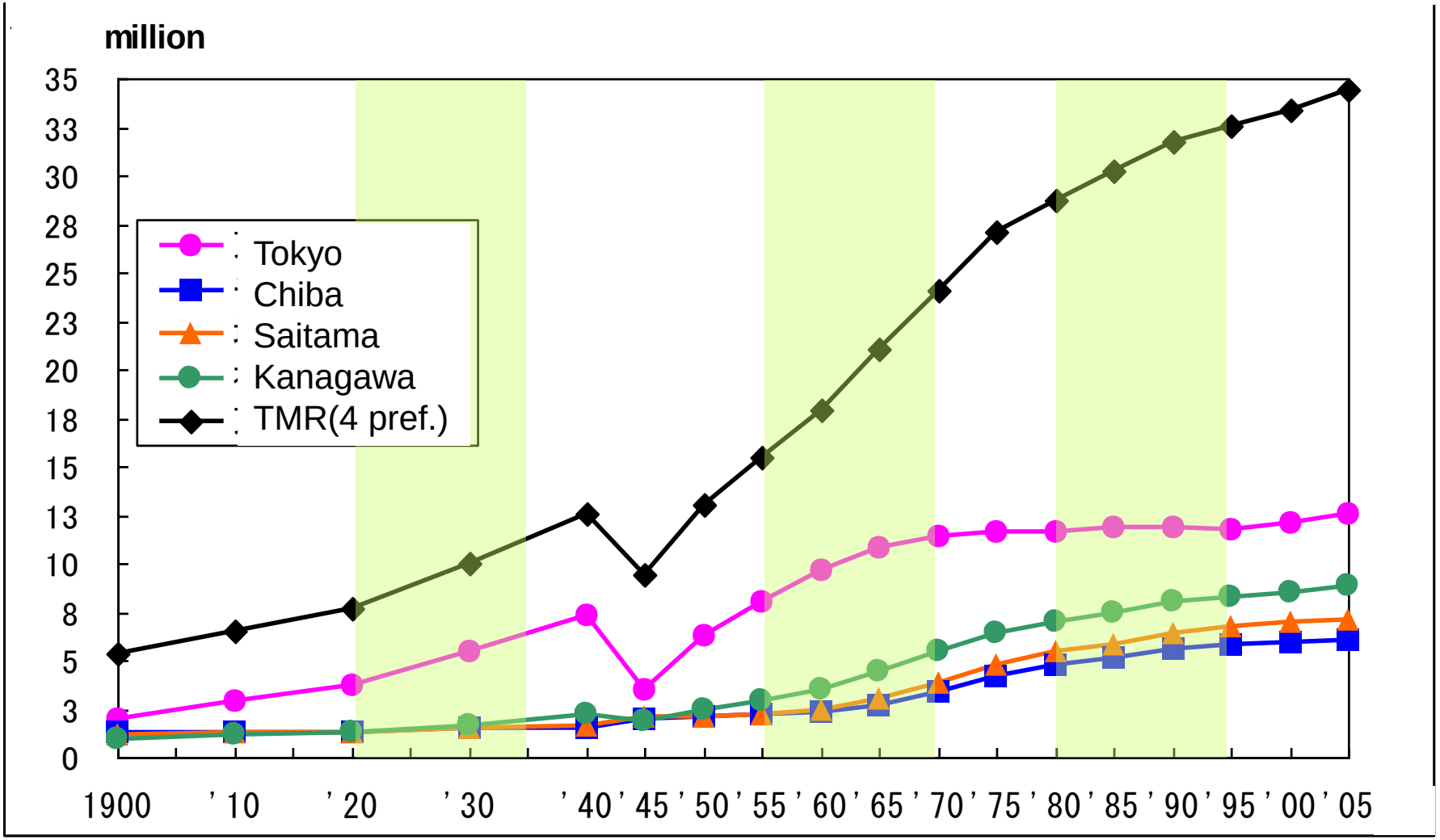
1-2 Three Phases of Urbanization in TMR

- 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 ⇒ Common to major large cities
- Phase III ⟹ Solely to TMR / Cosmopolitan TMR

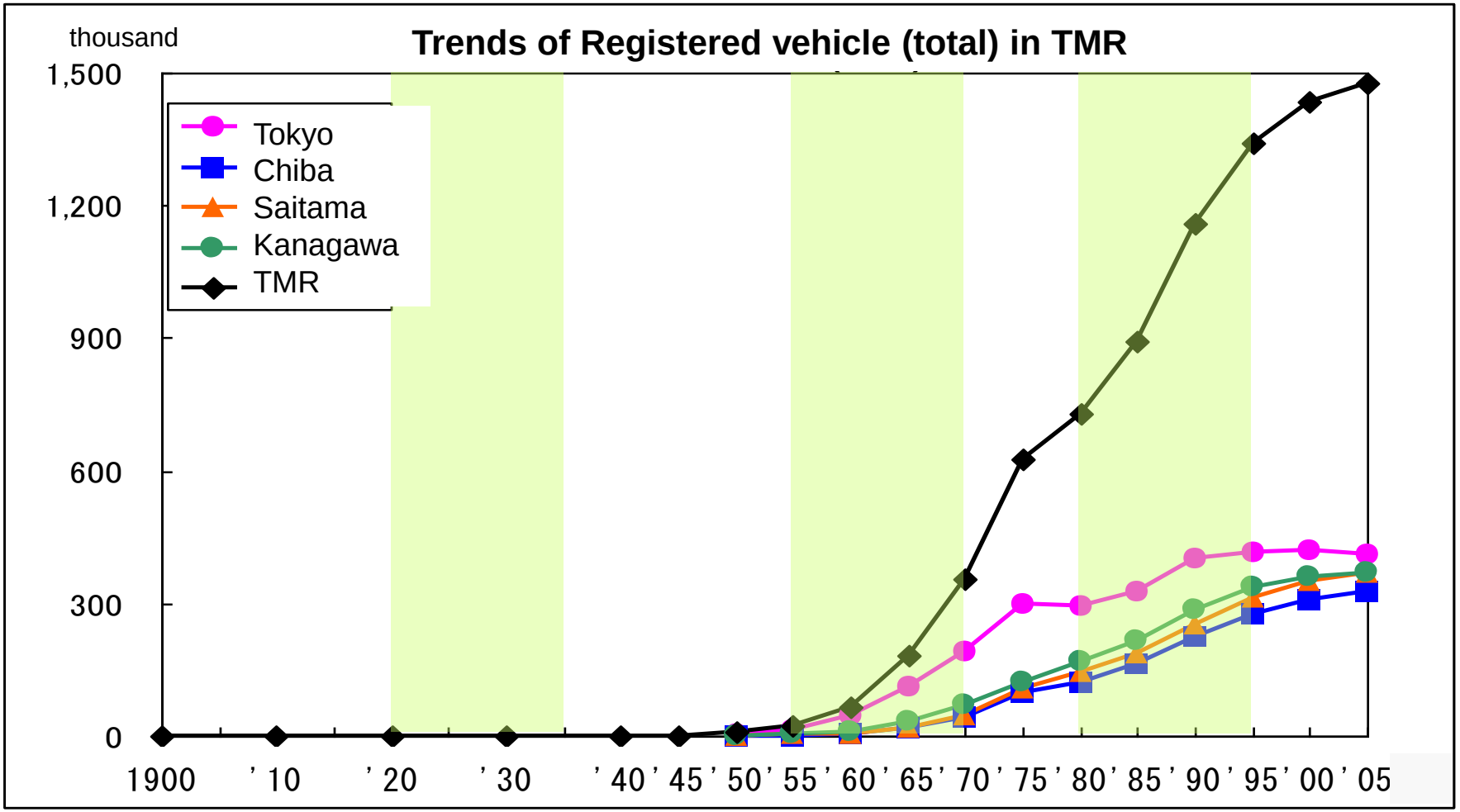
1-3 Trend of Population in TMR

Trends of population in TMR



Source: Population Census, “Long-term Statistical Series of Japan”

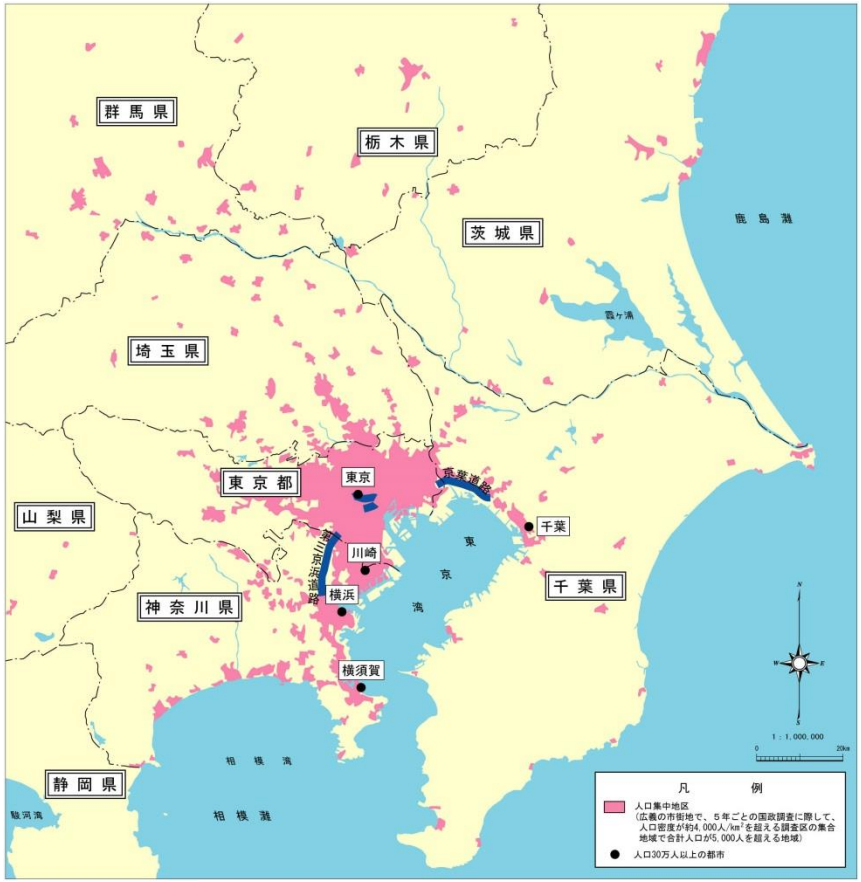
1-4 Trend of Motorization



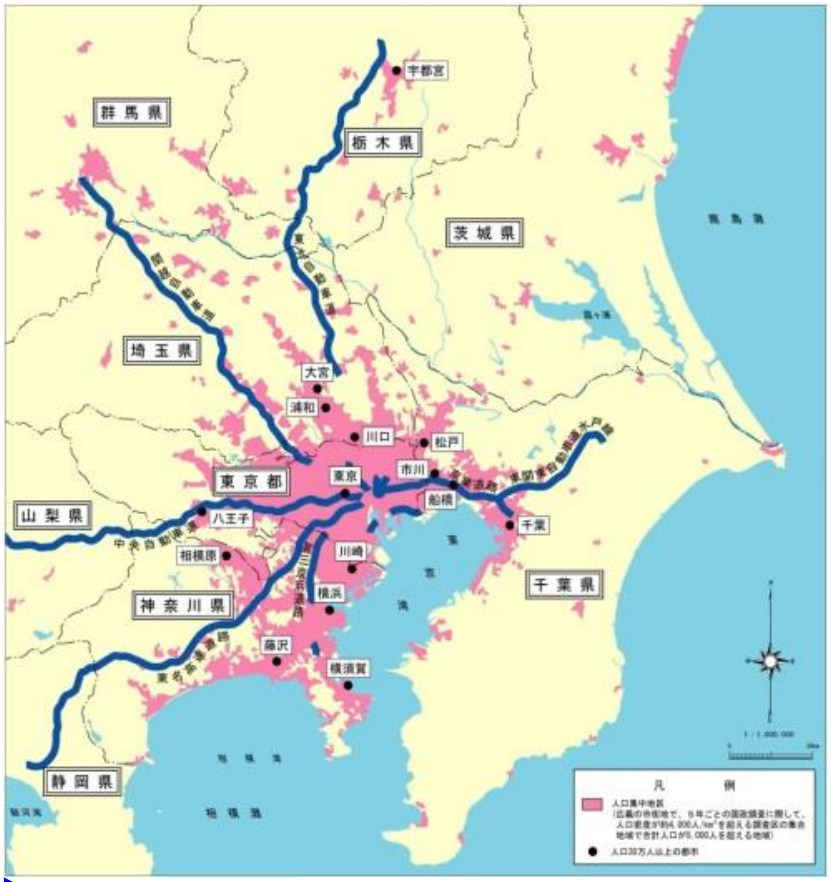
Source: Automobile Inspection & Registration Information Association

1-7 National Expressway Net. Dev.

From outskirts to center



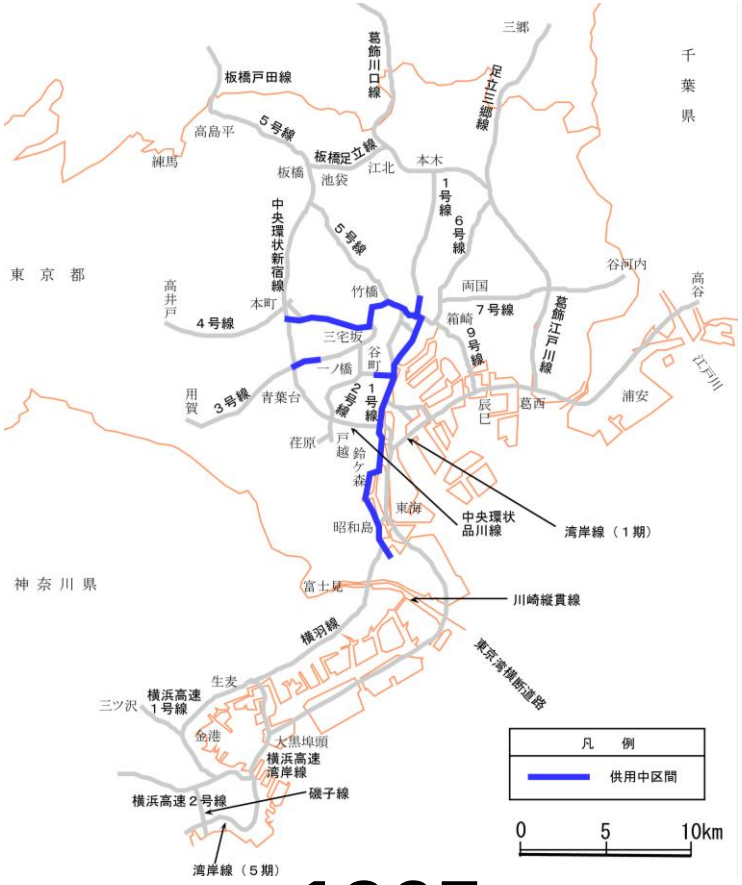
1965
(The Olympic)



1980

1-8 Urban Expressway Net. Dev.

From center to outskirts



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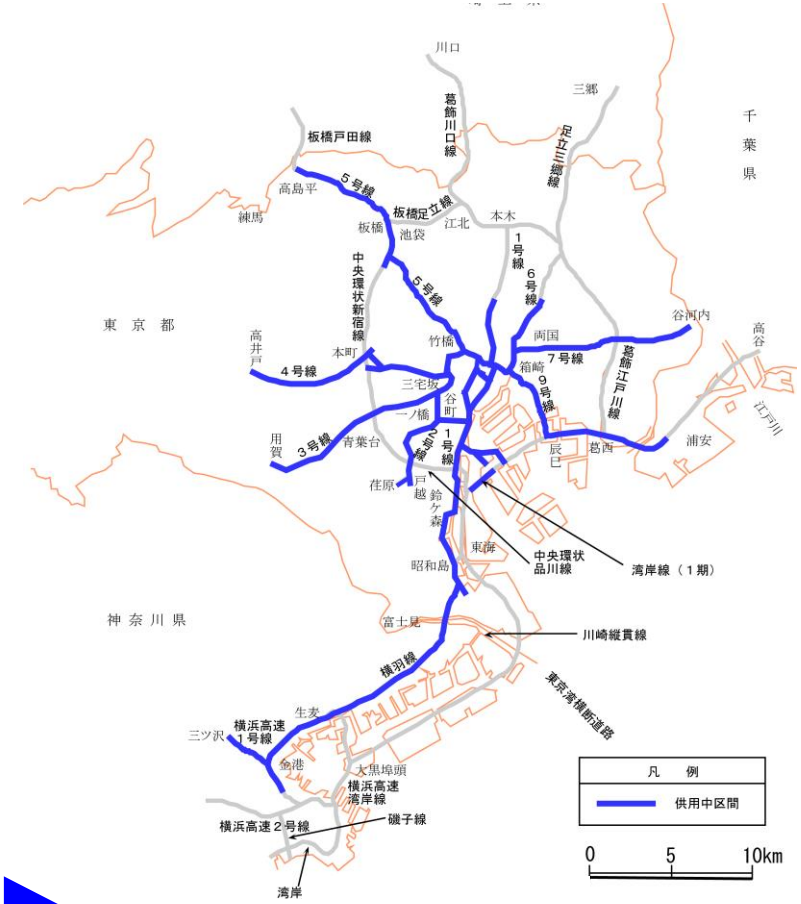
(The Olympic)



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

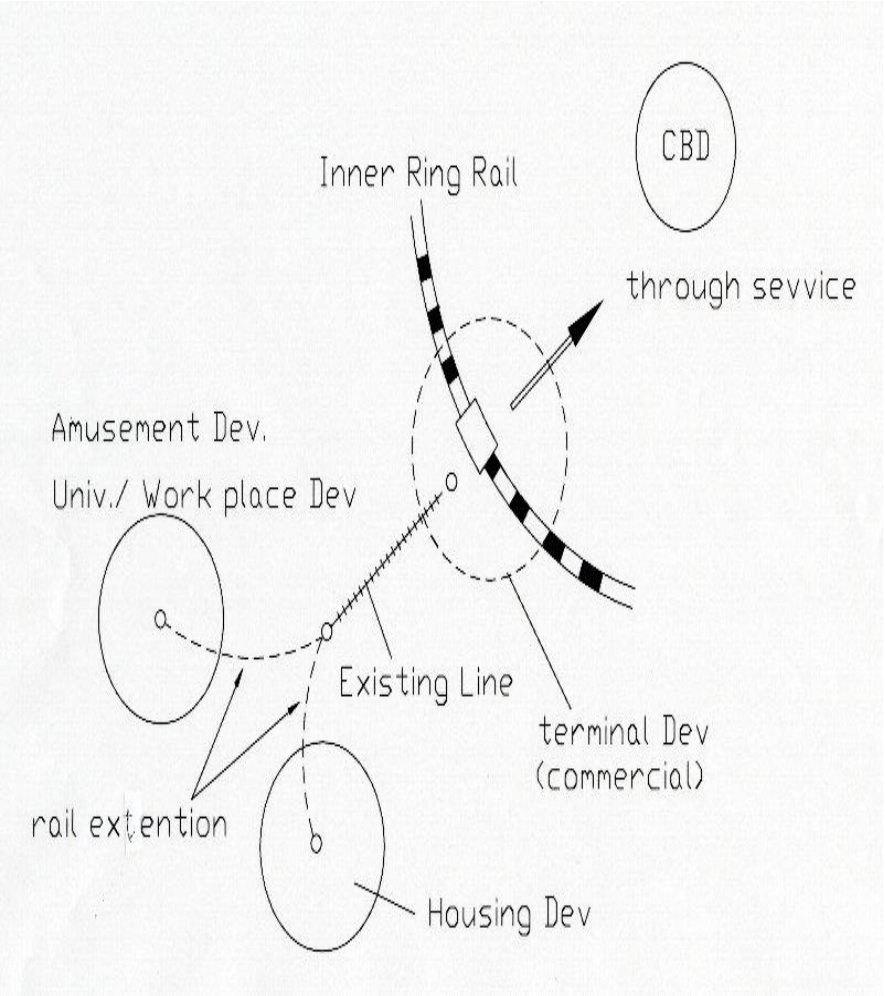
2-2 Private Rail Companies in Large Cities

- 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



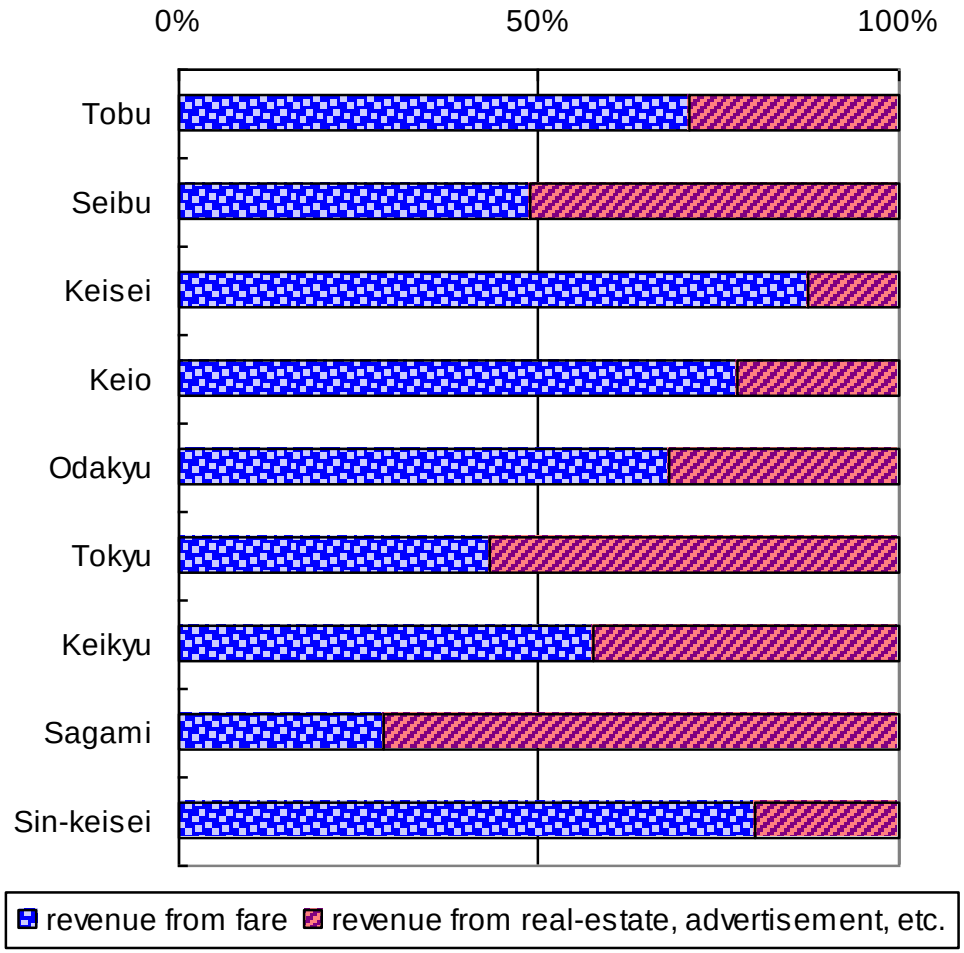
(1) Rail extension and/or new station coupled with piecemeal development (size and timing of development)

(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



Source: Ministry of Transport, “Transport Statistics”

2-6 Traditional Business Model

- 1910 Ikeda City (20km from central Osaka),
  by Hankyu Electric Rail Co. , Area 11ha

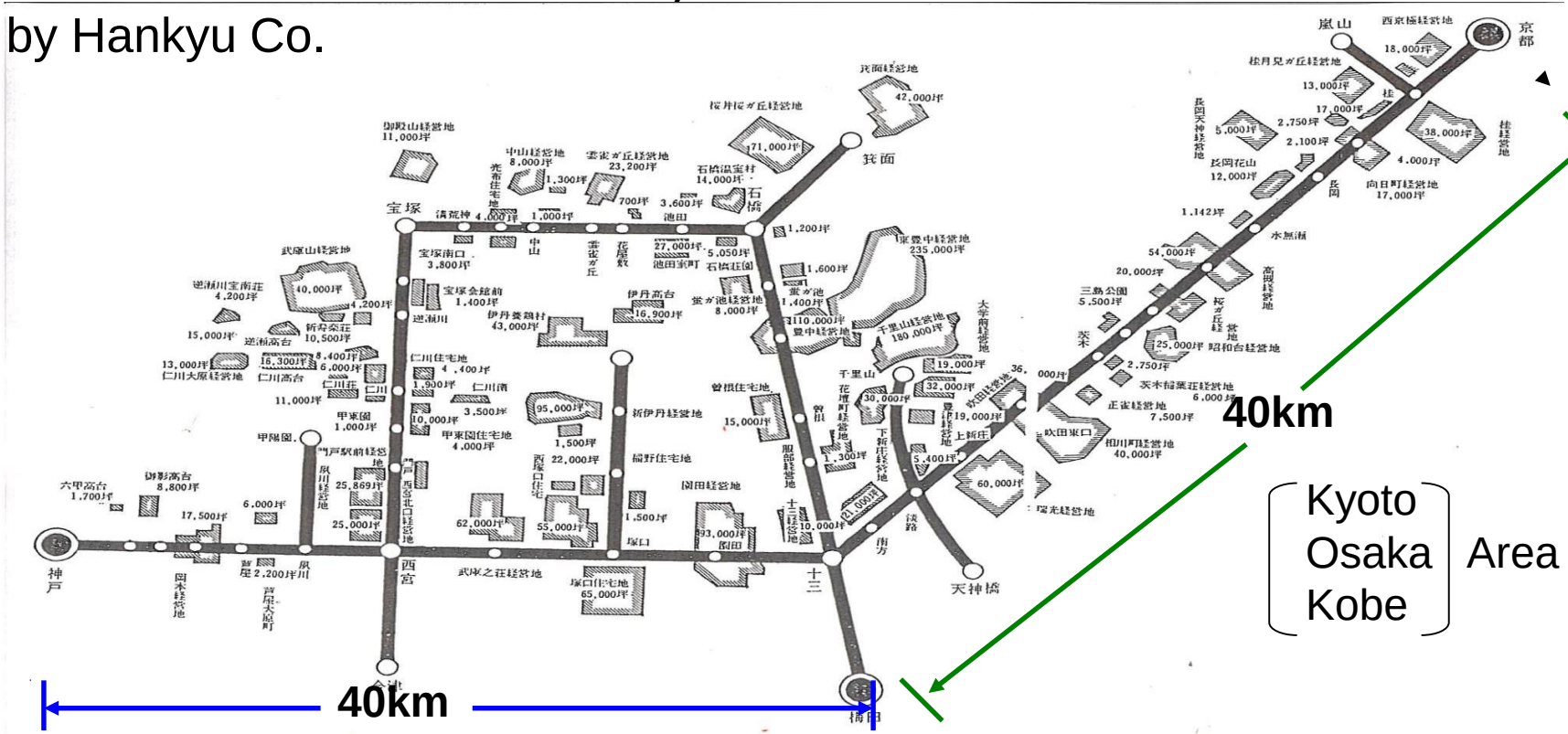
- Land acquisition and dev. works before rail opened, sales (ready-made house + lot) after rail opening

- Average lot area 330m^2, 248 lots
  two-storied wooden house
  floor area 66 - 99m^2

2-7 Tradition and Results

- 1920's - Similar dev. by the other private rail co.
- - 2000 Total area dev. by Hankyu Co.: 1,737 ha
- - 2000 Total area dev. by private rail co. in TMR: 14,720 ha

by Hankyu Co.



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

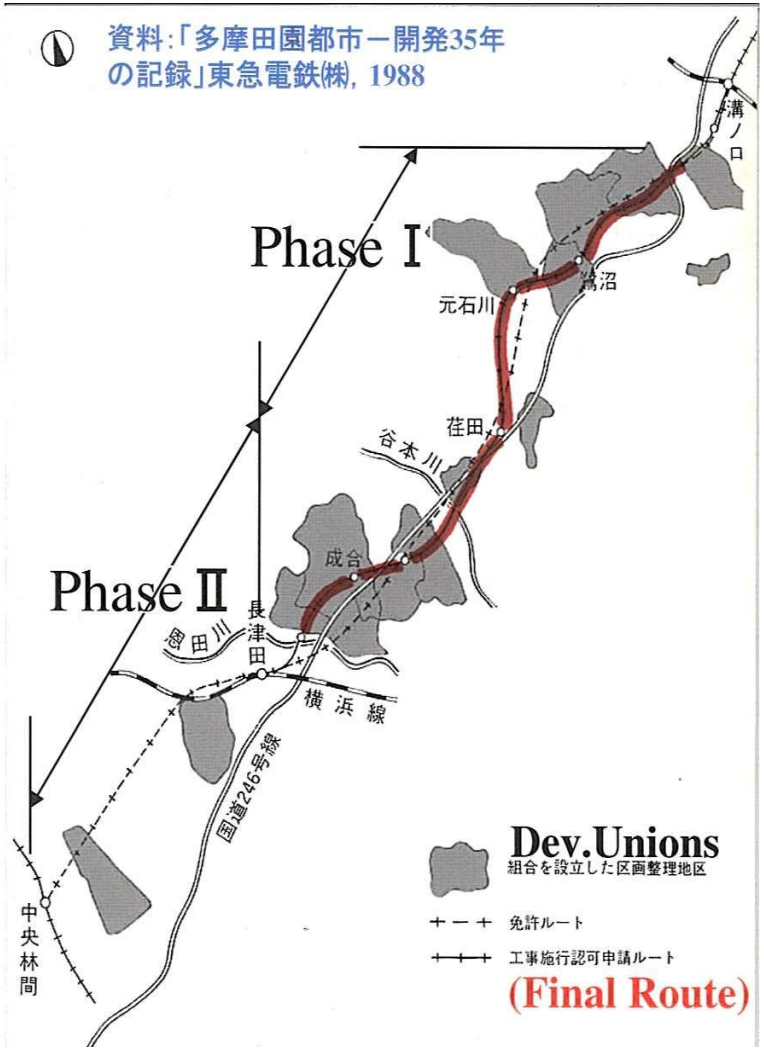
(2) Former land use: hilly forest and farm land

(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

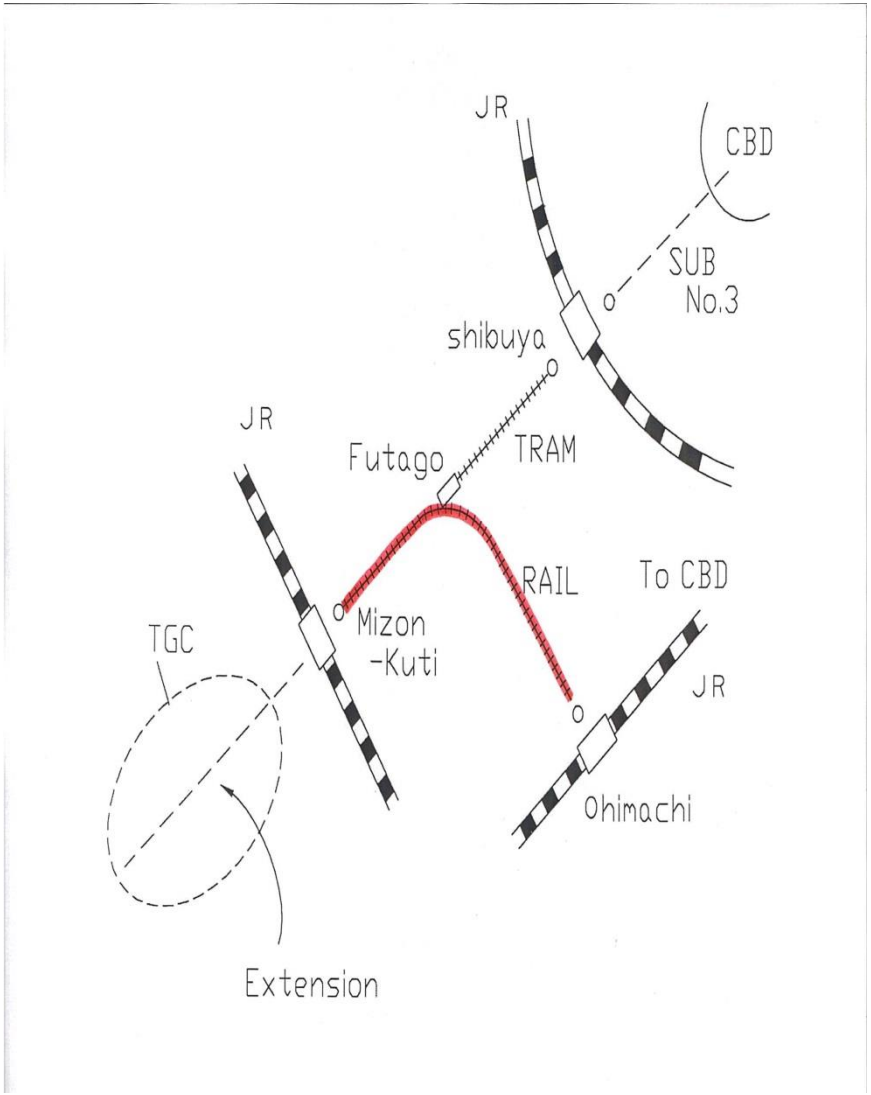
  A/D = 63%
- Dev. agreed prior to rail extension

  B/A = 38%

  (B+C)/A=98%

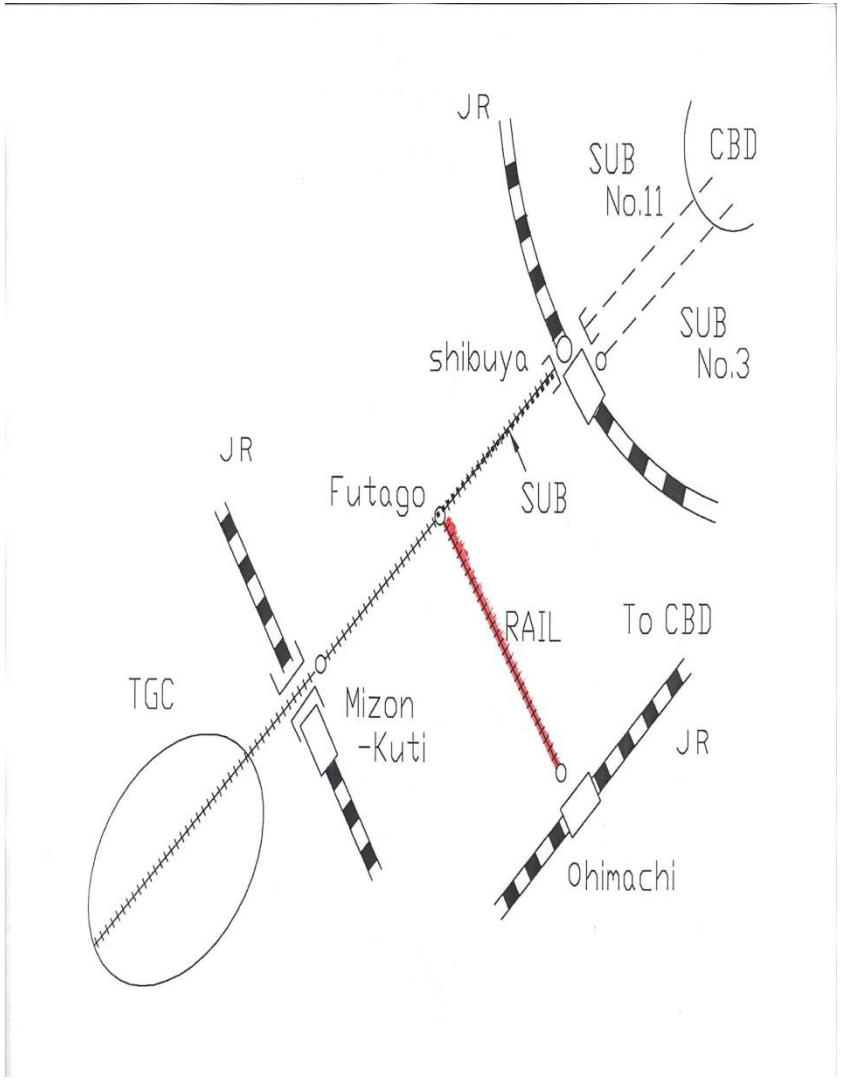
Source: Tokyu Corporation, "Tama Garden City – History of 35 years of Development" (1988)

3-5. Rail System before TGC Dev.



- 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.



- 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

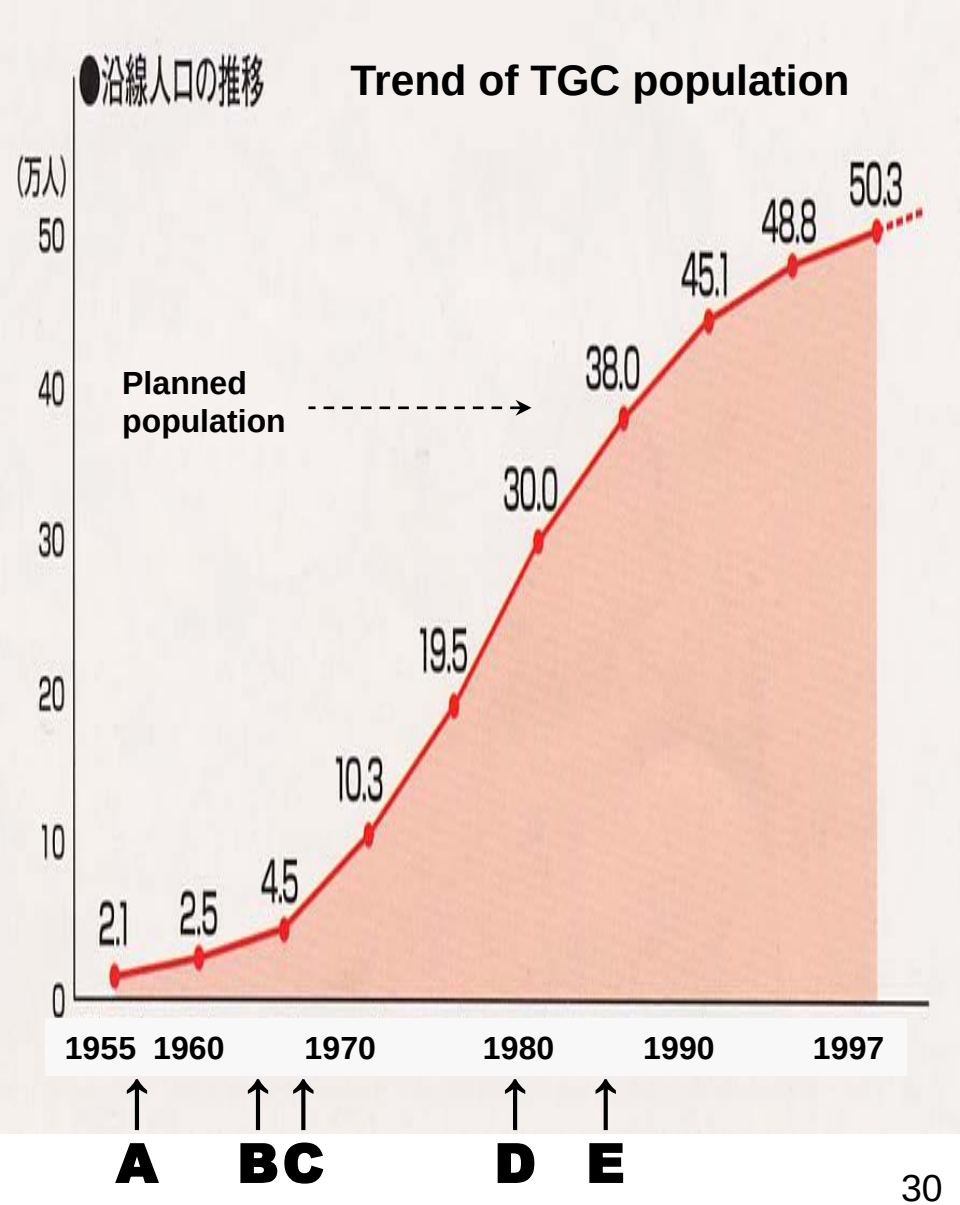
1956: Master plan announced
(A)

1963: Rail extension started
(B)

1966: Phase I extension completed
(C)

1979: Through service to CBD
(D)

1984: Extension completed
(E)



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

5. Japanese type of TOD and its characteristics

5-1 Types and players in Japanese TOD

A. Suburban Corridor type ・・・ Suburban rails

B. Terminal dev. type ・・・ Suburban rails

JRs(former JNR)

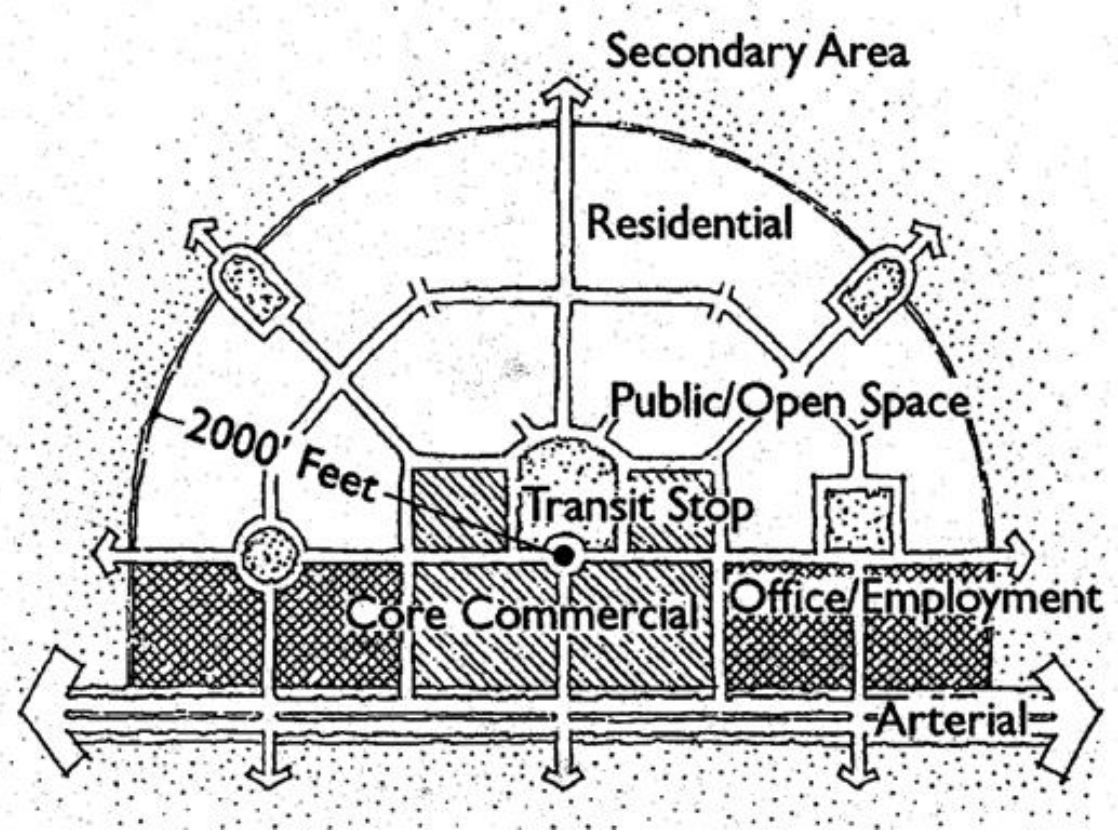
C. Newtown type(*) ・・・ Public corporations

(*) :off-rail Suburban rails

Note

Suburban rail operators(100% private) practiced A+B

5-2 TOD Diagram by P. Calthorpe(1993)



Source: P.Calthorp “The New American Metropolis”, 1993

5-3 Concept of TOD

- TOD has been defined generally as “a mixed-use community that encourages people to live near transit services and to decrease their dependence on driving.”
- Higher density ajacent to transit station
- Street design priority on pedestrians

Source: Ian Carlton “WP-2009-02, Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept”, University of California, Berkeley, Institute of Urban and Regional Development, fall 2007

5-4 Comparison with the other TODs

- Most TOD's are, simply, land use plans similar to the Calthorp diagram, and in many cases, do not incorporate means of implementation and finance either for rail nor development
- Jap. TOD incorporates the implementation and finance both of development and rail(transit)

5-5 Comparison with［R+P］in Hong Kong

- “R+P” scheme practice by the Hong Kong Rail also incorporates the implementation and finance.
- In “R+P”, land for development is(property), provided by the government with “green price”, which can be regarded as an alternative form of subsidy.
- In Jap. TOD, private rail operators obtain land without subsidy.

5-6 Long run effects of Jap. TOD

① Fostered multiple core structure and radial rail corridors in Metro Regions

- Major stations on the Inner-ring Line have been down-town terminals of suburban rails, since 1930’
- Around such stations, sub centers have been formed up by high-density, multiple landuse.
- Palm-and-finger urban pattern, with medium density radial rail corridor.

② Sustained Private rail operation in Metro Regions rail

- Private rail companies typically hold and operate both rail and development sectors.
- Gained development benefit has been invested into further rail extension / improvement.
- Thus, Strengthened financicl base of private rail companies over 80-100 years.

5-7 Background behind success of Jap. TOD

- Jap. TOD has been fit for mega trends through out the 20th century in Japan.
- Increasing population in urban areas (urbanization), growing economy, rising income, rising land value required suburbanization(medium den city).
- Rail network has been developed before 1930', when motorization was just in embryonic stage.
- Effort of Jap. TOD by private rail with support by public sector.

(END)