8th Urban Mobility India Conference & Expo 2015

Transforming Mobility for Liveability

JAPANESE EXPERIENCE IN HIGH SPEED RAIL

Atsushi KOIKE

KOBE University, Japan

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- Economic Effects of HSR in Japan
- About New HSR ‘MAGLEV’
- The Purpose of Japanese HSR Projects
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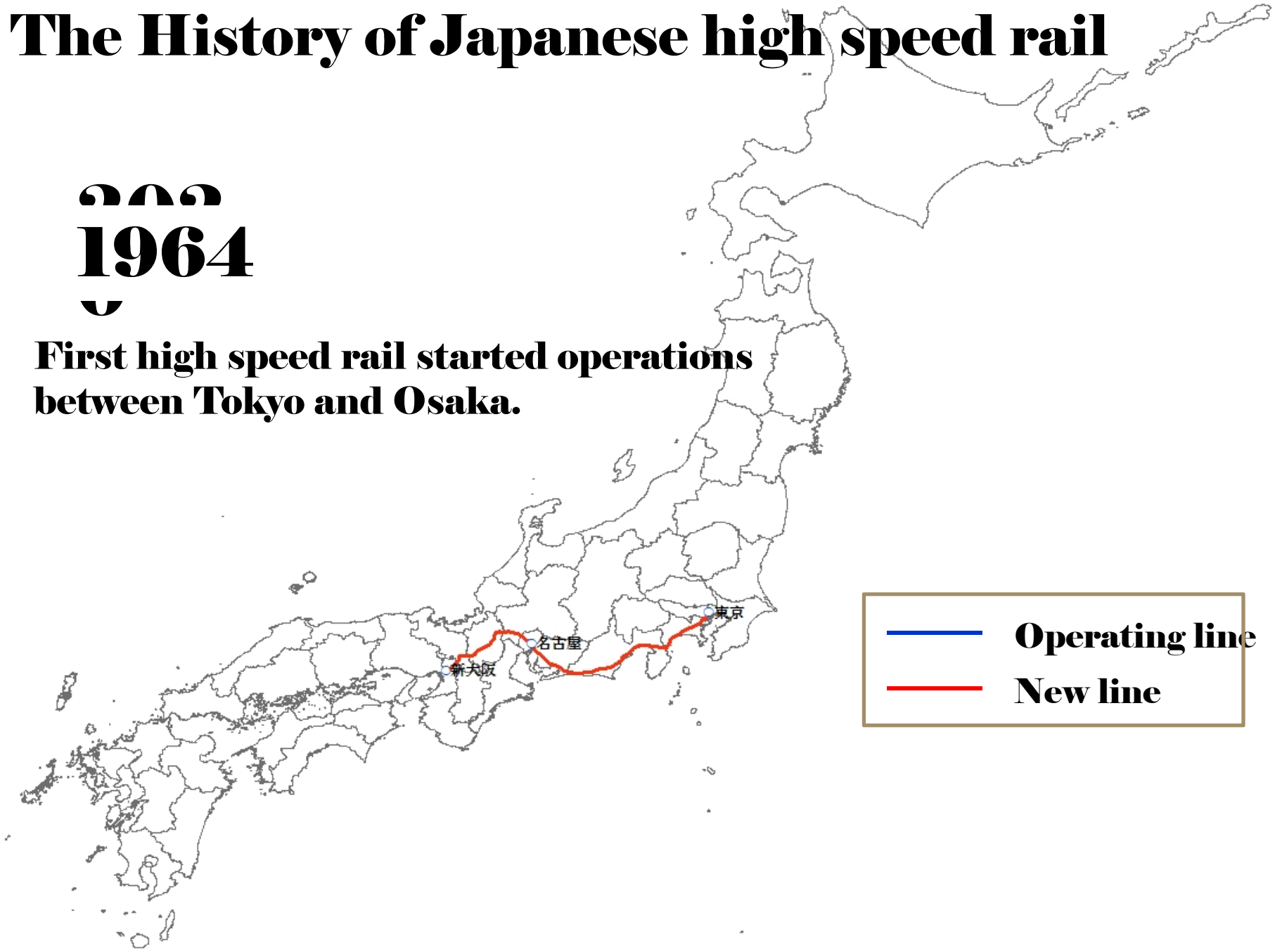
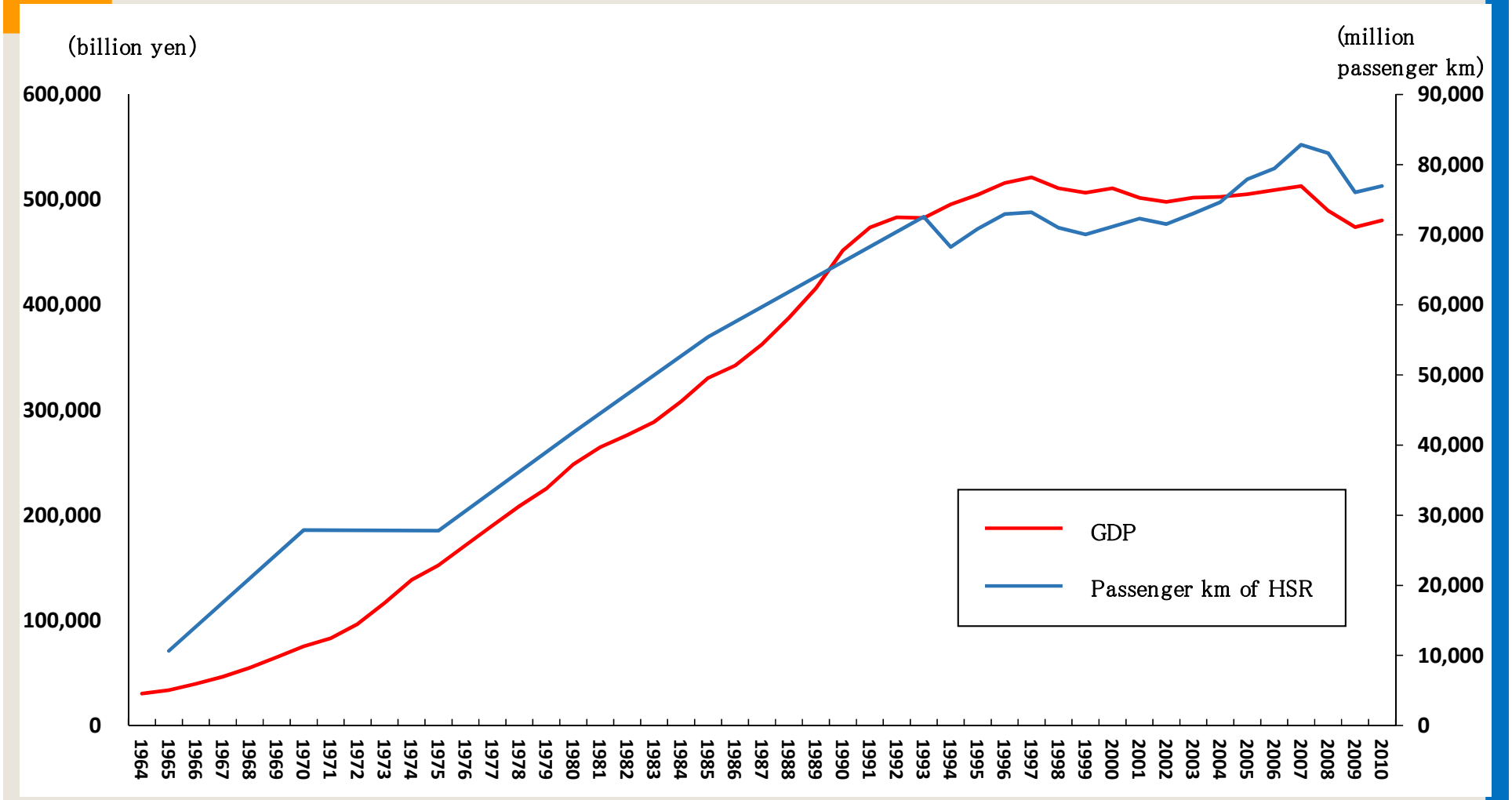
The History of Japanese high speed rail

1964

First high speed rail started operations between Tokyo and Osaka.



Economic Effects of HSR



About MAGLEV

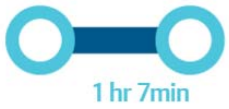
Japan's maglev train breaks world speed record with 600km/h test run

Seven-car 'magnetic levitation' train hits top speed of 603km/h less than a week after breaking the 2003 record of 581km/h

Yasukazu Endo, the head of the research centre run by Central Japan Railways, discusses the new maglev train.

Modern Shinkansen (bullet) trains run at up to 200mph, covering the Tokyo to Osaka journey in ...

By 2045 the planned Chuo Shinkansen Maglev will cut this journey time to ...



The Purpose of Japanese HSR Project

1. Economic Growth of Japanese economy

2. Regional Development for Regional Equity Issues

3. Environmental Friendly for Climate Change

Research Background

- High Speed Rail plays the role of interregional passenger transport.

- Regional benefits and regional economic effects are important issues of the HSR investment project assessment, sometimes more important than the efficiency of total benefits.

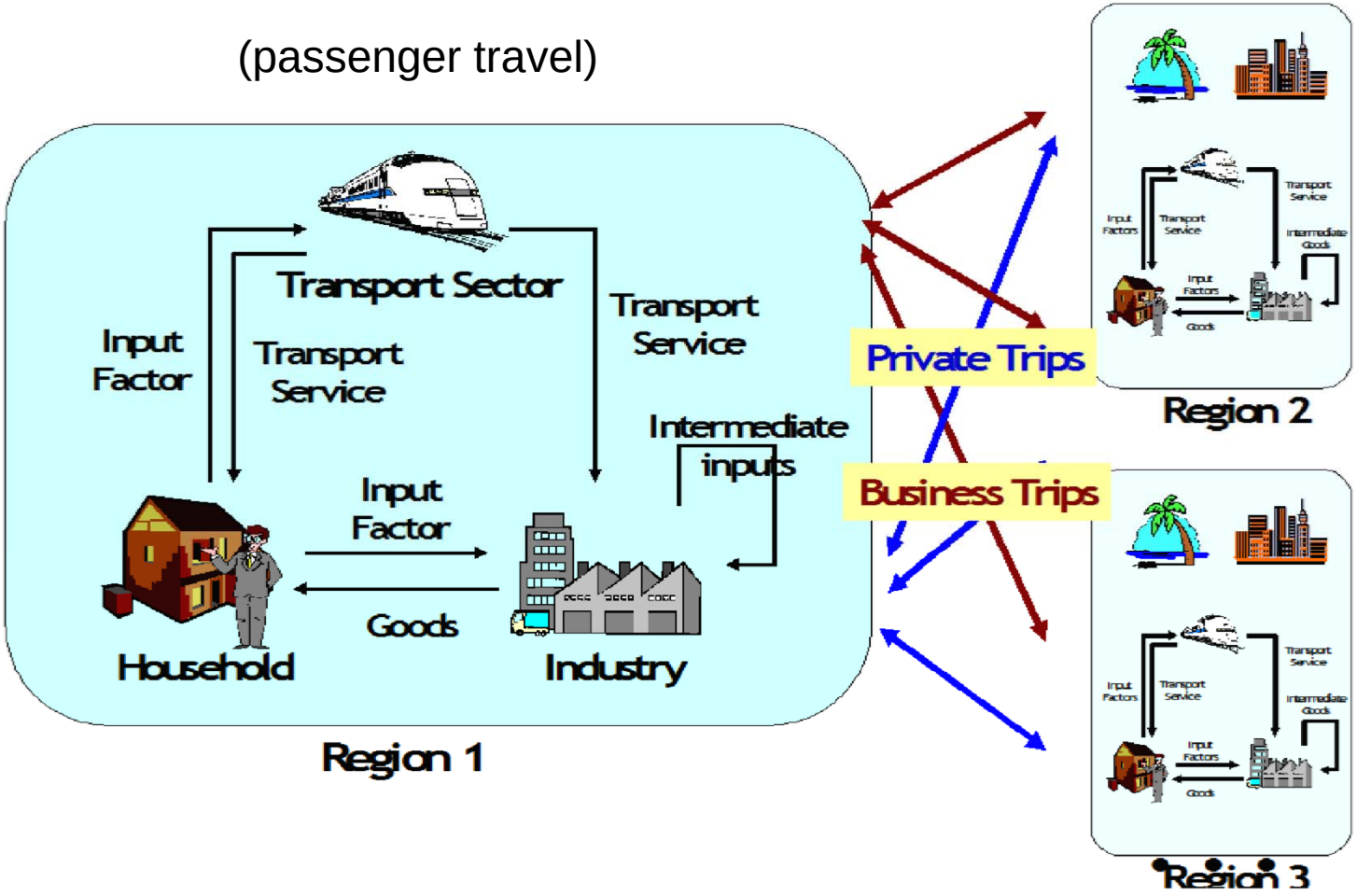
- The Spatial CGE models are able to provide the answer to above requests

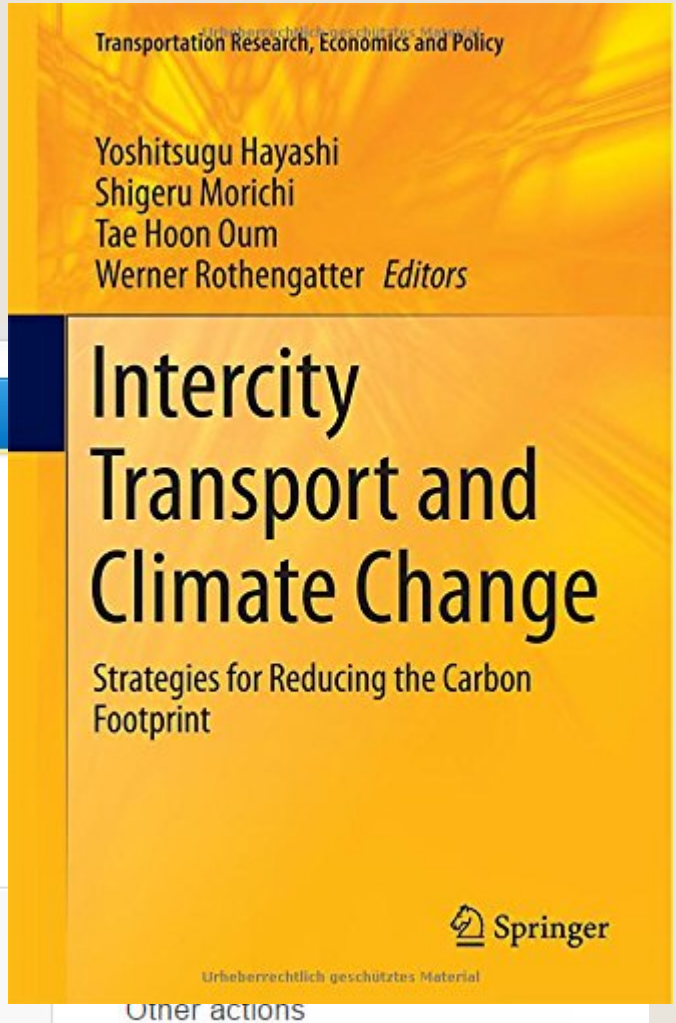
Model Assumptions of Spatial CGE

HSR: Interregional Passenger Transport System
Explicit transport service demand

multi-sectors and multi-regions

(passenger travel)





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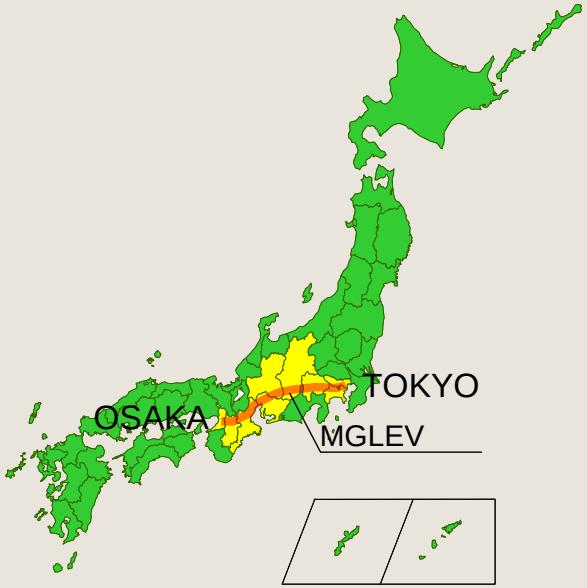
Assumptions

Transport Mode	High-speed Rail, air
Spatial Units	47 Prefectures
Industrial Sectors	7Sectors
Exogenous Variable	Generalized Transport Cost

Cases of Analysis



Case 1

■Scenario 1

★Benefit

★Change of GRP

★CO2emission

Results Scinario1:Benefit

■Benefit

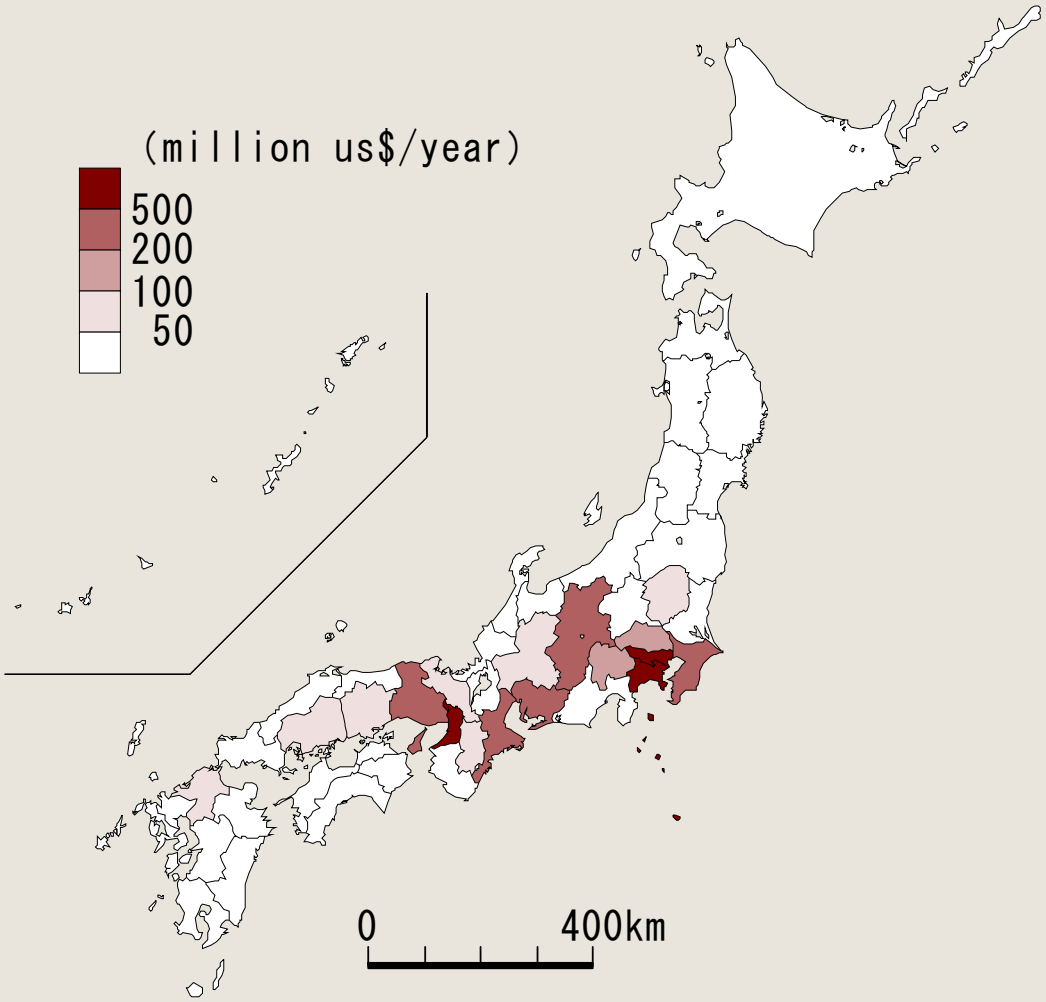
135.8 billion US$

14.6 trillion JPY

GDP（2000） 4.24%

※GDP（2000） 3,206 billion US$
503 trillion JPY

※Exchange rate：1US$ 107.62\（2000）



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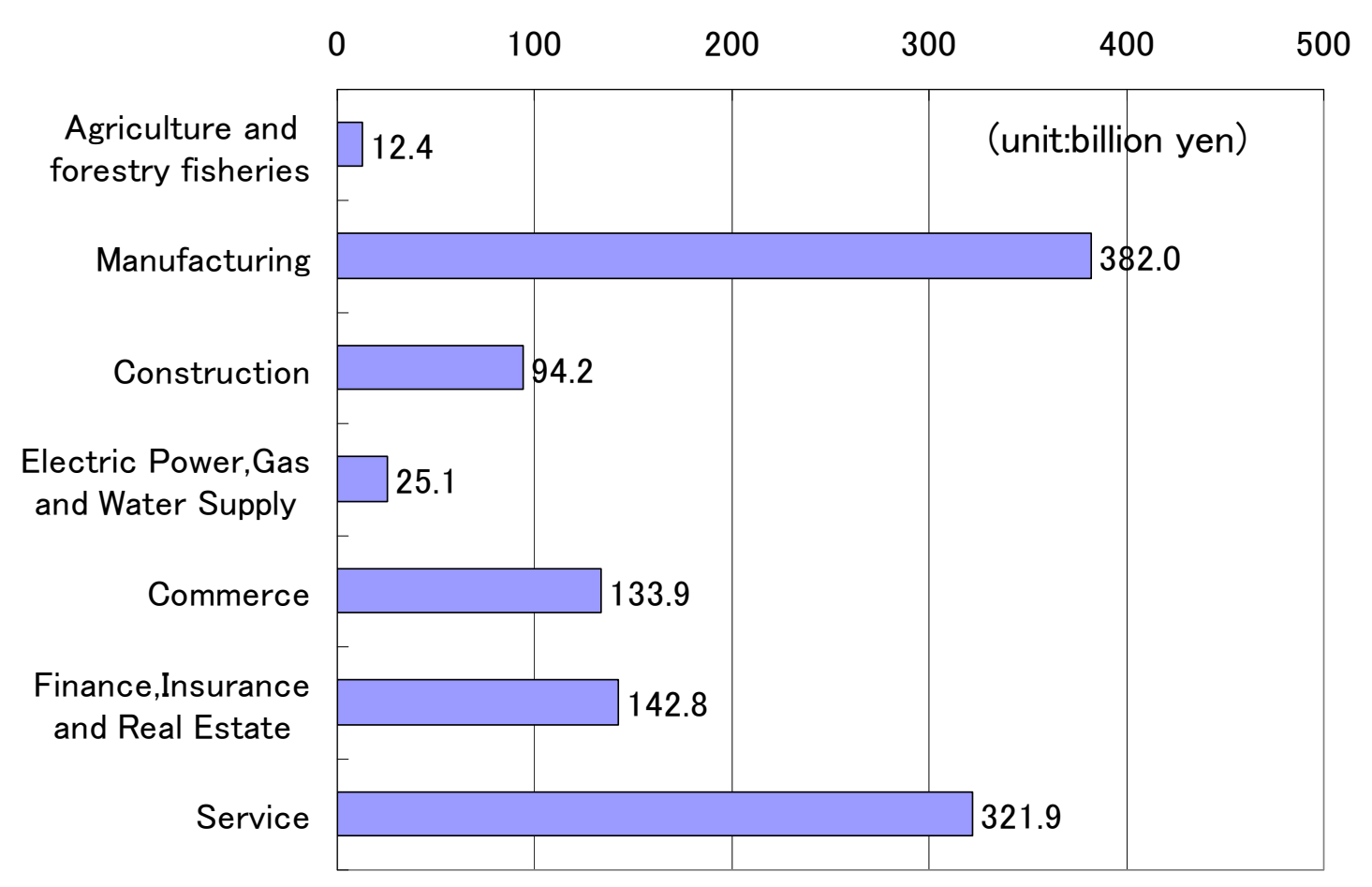
Results Scinario1:Change of GNP

■Change of GNP

10.3 billion US$ /year

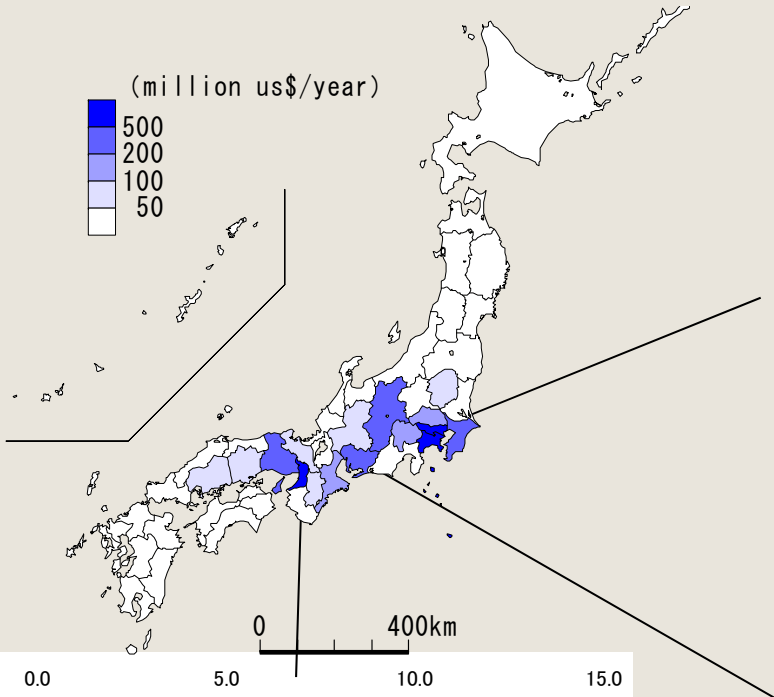
1,112 billion yen/ year

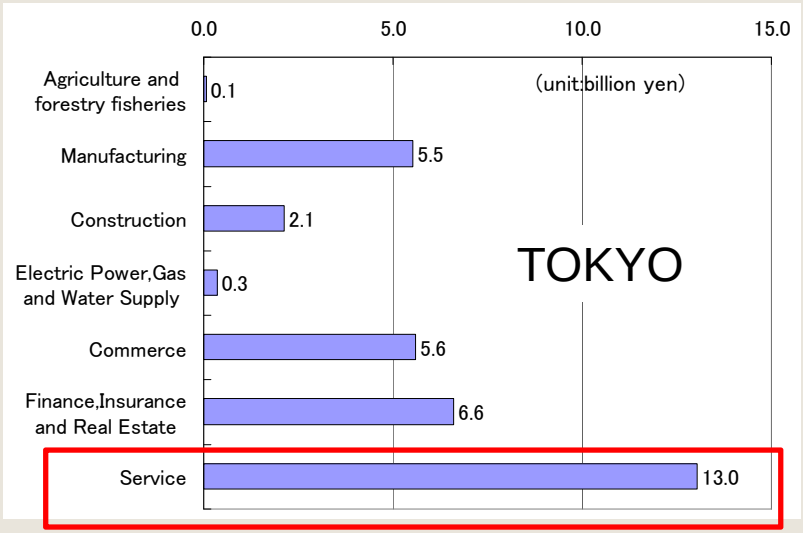
※Exchange rate：1US$ 107.62\(2000)

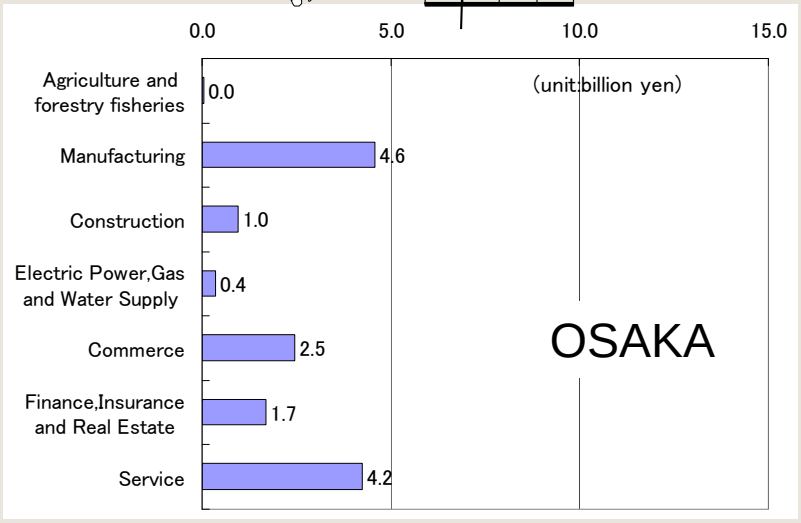


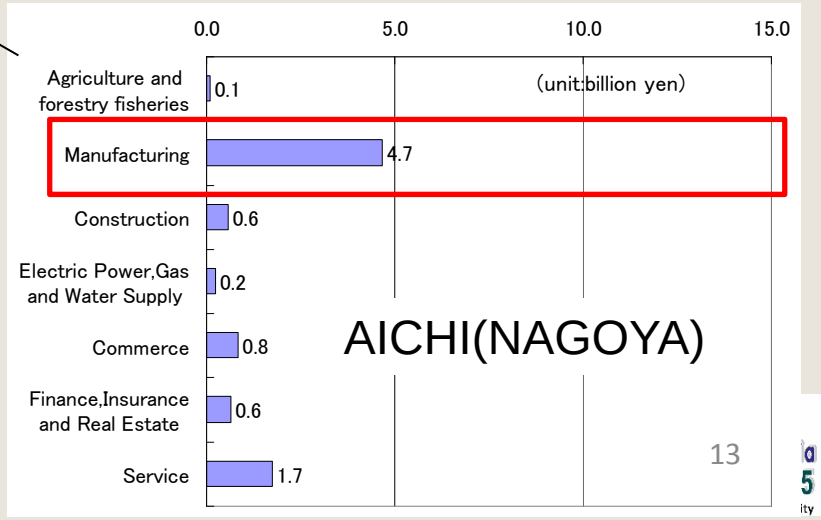
Results Scniario1:Change of GRP

Change of GRP





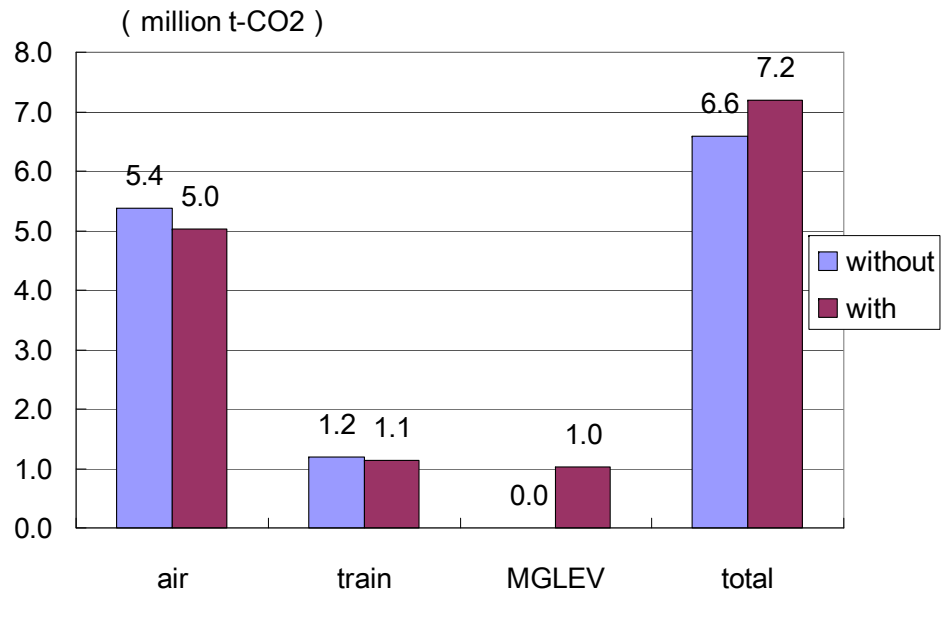




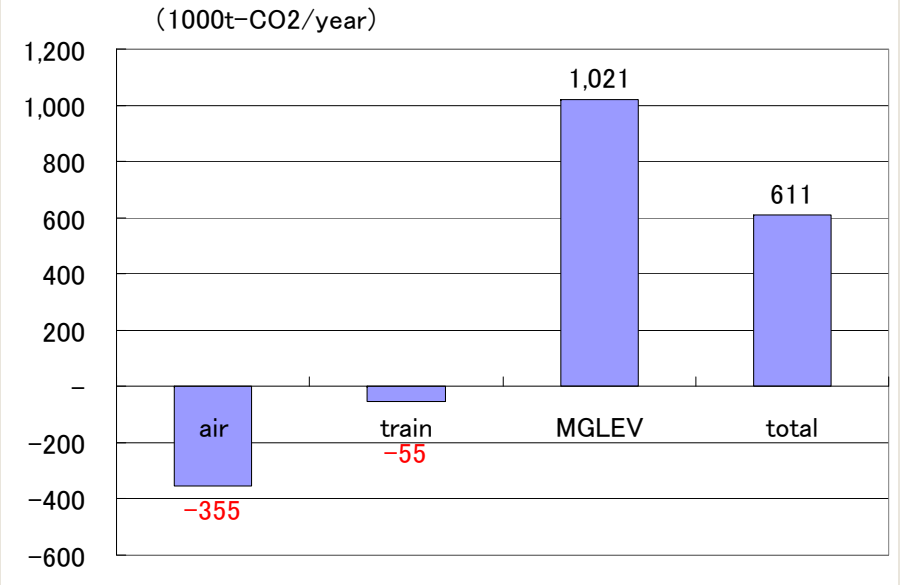
Results Scinario1:CO2 emission

Transport sectors

[CO2 emission]



[Change of CO2 emission]

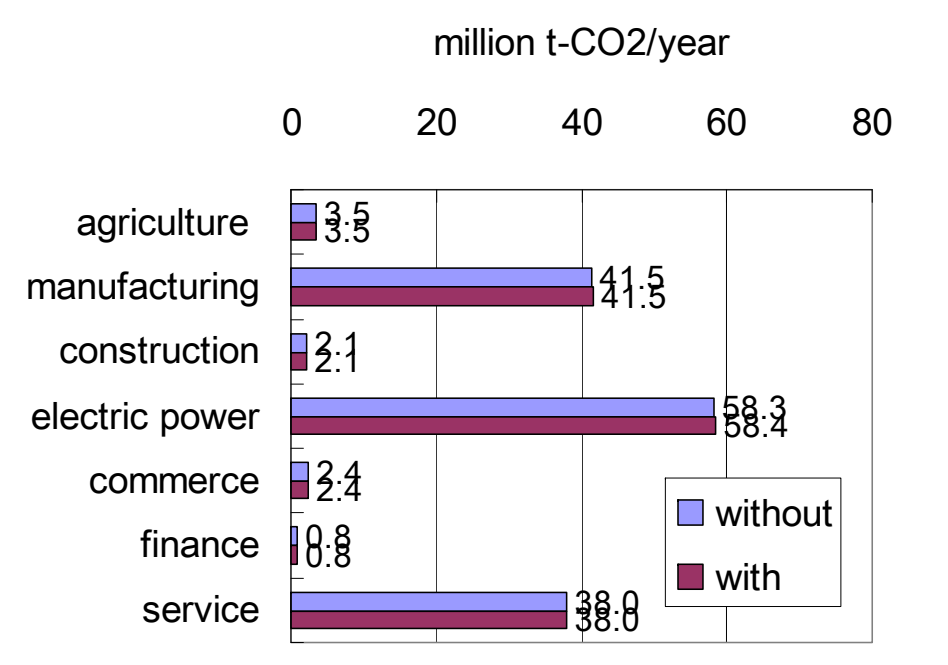


9.3 % increase of CO2 emission from transport sector

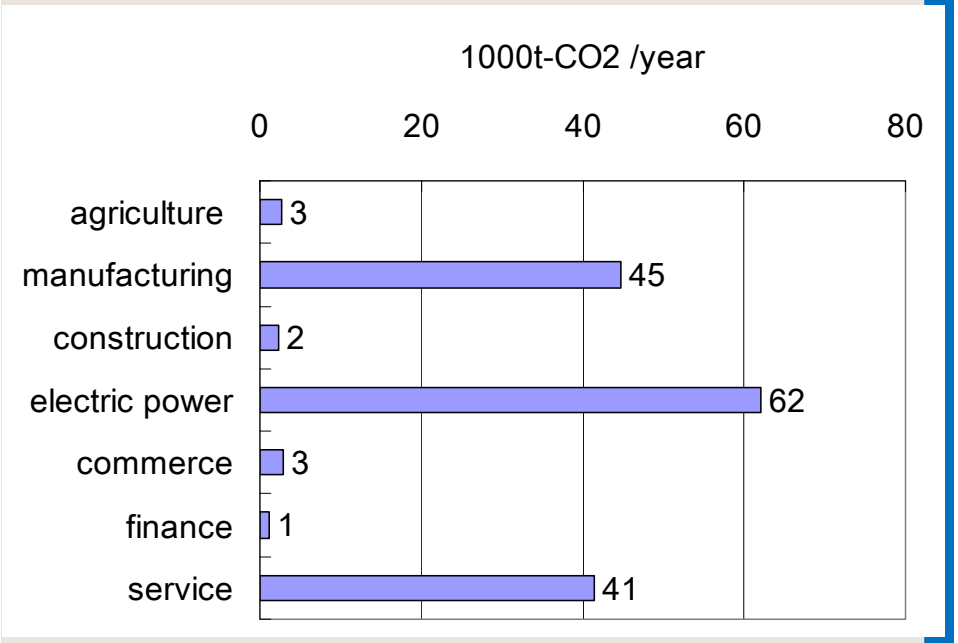
Results Sinario1:CO2 emission

- Industrial sectors

[CO2 emission]



[Change of CO2 emission]



0.11 % increase of CO2 emission from industrial sector

Korean KTX and Japanese MGLEV

Result :Comparison of KTX and MGLEV

scenario1

		KTX		MGLEV	
Benefit		40.9	billion US$	135.8	billion US$
		45.6	trillion won	14.6	trillion ¥
cost		19.7	billion US$	92.9	billion US $
		22.0	trillion won	10.0	trillion ¥
B/C		2.07		1.46	
Benefit/GDP		5.29	%	4.24	%
CO2 emission	transport	-257	t- co2/year	610,907	t- co2/year
		-0.00	million US$/year	16.02	million US$/year
		-3.5	million won/year	1,724.0	million ¥/year
	industrial	717,904	t- co2/year	327,722	t- co2/year
		8.78	million US$/year	8.59	million US$/year
		9,792	million won/year	925	million ¥/year

Conclusions

- High Speed Rail projects are effective investments not only nationally but also locally in East Asia

- HRS investments decrease CO2 emissions in transport sectors, however increase it in industrial sectors.

- The outputs of the SCGE models are useful in evaluating the projects from multiple viewpoints. (regionally, environmentally and so on)