

"Urbanization Control and Smart Growth Strategy towards Urban Resilience, Sustainability and Happiness"

「都市の韌性、持続性と幸福最大化のための都市化制御とスマートグロース戦略」

- Хугацаа: 2015 оны 5 дугаар сарын 15-ны өдөр, 11:00-13:00
日時 : 2015 年 5 月 15 日 11:00~13:00
- Газар: МУИС-ийн 1 дүгээр байр, 3 давхар, 320 тоот танхим
場所 : モンゴル国立大学 1 号館 3 階, 講堂 320 号室
- Ашиглах хэл: Англи, монгол хэл
使用言語 : 英語・モンゴル語



11:00~11:15 Нээлт (Opening Remarks)

Сүхээгийн Баттулга (МУИС), (BATTULGA Sukhee NUM, Mongolia)

11:15~12:15 Үндсэн илтгэл (Special Lecture)

Профессор Хаяаши Ёшицүгү (Нагоя Их сургууль), "Urbanization Control and Smart Growth Strategy Towards Urban Resilience, Sustainability and Happiness"

(Yoshitsugu HAYASHI, Professor, Nagoya University, Japan)

12:15~13:00 Хэлэлцүүлэг (Discussion)

Зорилго: *Resilience* бол үндэстний соёл, уламжлалыг хөгжүүлэх замаар тогтвортой аюулгүй-амар тайван нийгмийг бүтээн байгуулахад чухал ойлголт юм. Монгол, Япон зэрэг олон улс орон байгалийн гамшиг, дэлхийн хүрээлэн буй орчин, хотын асуудлуудтай тулгарсаар байна. Иймээс нийгмийн тогтолцоо - газар нутгийн зохион байгуулалтыг *Resilience* гэх ойлголтын үүднээс авч үзэх шаардлагатай байна. Энэ удаа Дэлхийн Зам Тээвэр судлалын Нийгэмлэгийн Ерөнхийлөгч, Нагоя Их сургуулийн профессор Хаяаши Ёшицүгү дэлхийн зам тээврийн асуудал эдийн засаг, хүрээлэн буй орчинд хэрхэн нөлөөлөх талаар *Resilience* ойлголтын үүднээс илтгэх болно.

(趣旨: レジリエンスは、民族固有の文化や伝統を生かし、持続的な安全・安心社会を構築する上で重要な概念である。モンゴルや日本をはじめ多くの国は、未解決の自然災害問題、地球環境および都市問題に直面し、レジリエンスの観点から今後の社会構造・国土構造のあり方を検討する必要がある。こうした観点からこのシンポジウムでは、世界の交通問題が経済や環境へ与える影響について、レジリエンスの立場から論じる。)

Холбоо: (問い合わせ先)

С.Баттулга S. バトルガ (МУИС, モンゴル国立大学教授, sbattulga@gmail.com, 9901-9977),
Сүзүки Ясүхиро 鈴木康弘 (Нагоя Их сургууль, 名古屋大学教授, ysz@nagoya-u.jp)

Энэхүү симпозиумыг GRENE (Япон, Нагоя ИС) судалгааны төслөөс санхүүжүүлэв.

(経費: GRENE 環境情報分野「環境情報技術を用いたレジリエントな国土のデザイン」(代表: 名古屋大学環境学研究科教授 林良嗣)

Lecture at National University of Mongolia
(15 May 2015)

Urbanization Control and Smart Growth Strategy towards Urban Resilience, Sustainability and Happiness

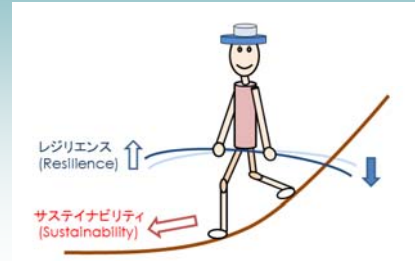
Yoshitsugu Hayashi

Director, Education and Research Center for Sustainable Co-Development, **Nagoya University**, Japan

President of **WCTRS**

(World Conference on Transport Research Society)

Resilience or Sustainability ?



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1.1 Unresilient Infrastructure - Land Use System

15 May 2015

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All housings and buildings swept in Sendai by 3.11.2011 Tsunami (once in 1,000 years)

The Great East Japan Earthquake

15 May 2015

Yoshitsugu Hayashi, Nagoya University Photo by Yoshitsugu Hayashi

Recognizing the Great East Japan Earthquake as Natural and Social Disasters

15 May 2015

Yoshitsugu Hayashi, Nagoya University
Source: New York Times Homepage

5

Requirements for Resilient Cities and Community

15 May 2015

Yoshitsugu Hayashi, Nagoya University
Source: New York Times Homepage

6

Crash of buildings in Kesen-numa caused by 3.11.2011 Tsunami



15 May 2015

Photo by Yoshitsugu Hayashi

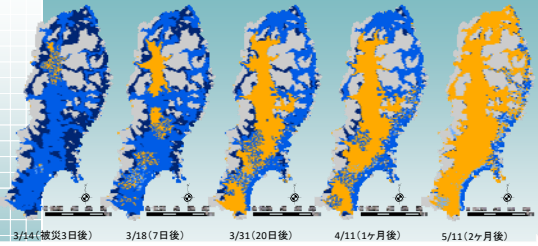
A drifting boat blocked a street in Kesen-numa caused by 3.11.2011 Tsunami



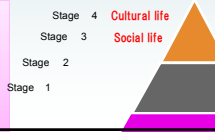
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Photo by Yoshitsugu Hayashi

Resilience: QOL Transition after Earthquake



- QOL indices have been recovered from inner areas, after roads and facilities were re-open
- Areas of QOL stage 2 are bigger than flooding areas from tsunami at 3/31 and 4/11



1.2 Unsustainable Urbanization & Motorization nexus
- Unresilient & Unsustainable City -

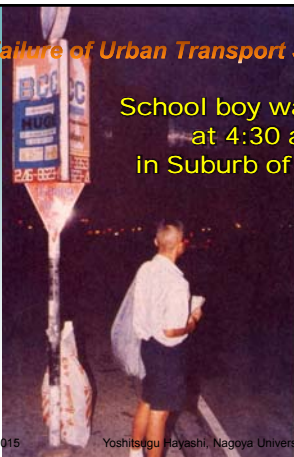
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Failure of Urban Transport System

School boy waiting for bus at 4:30 am in Suburb of Bangkok



Bangkok Post
4 Sept 1993

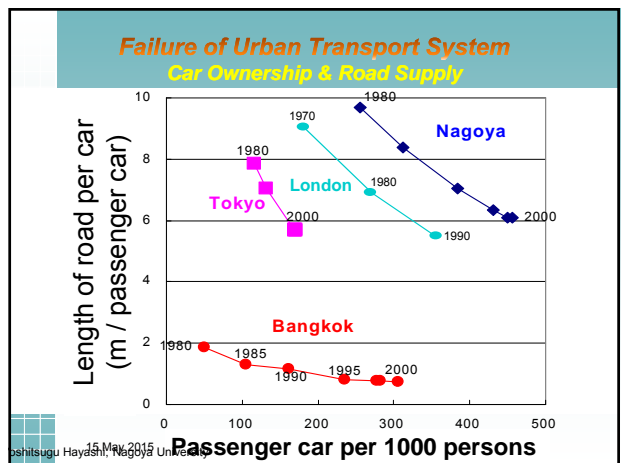
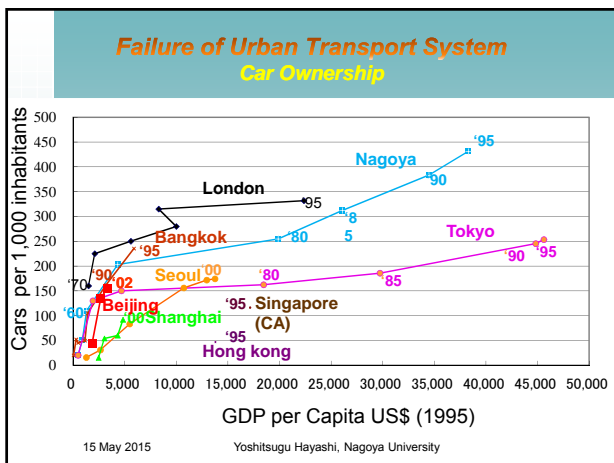
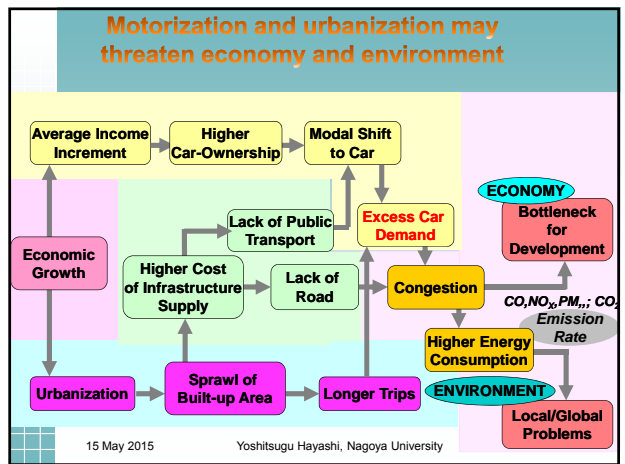
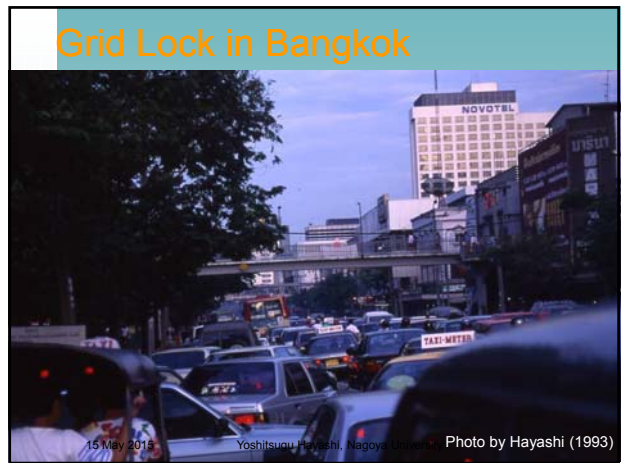
15 May 2015

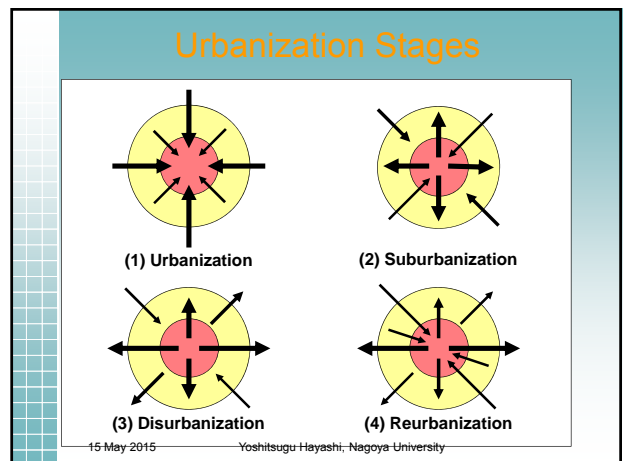
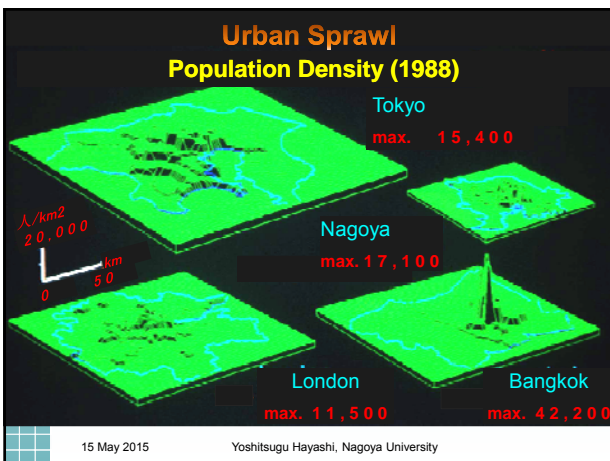
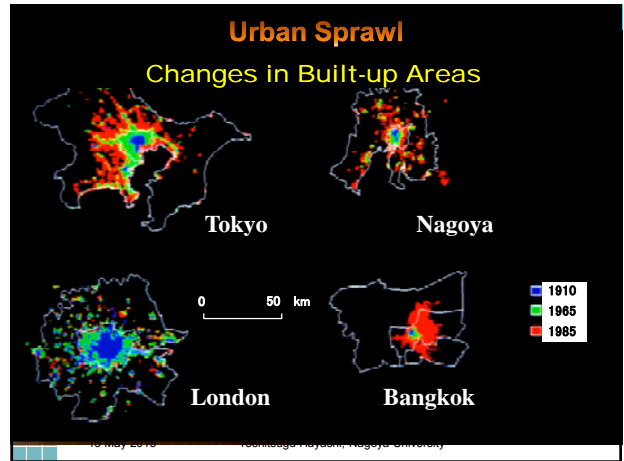
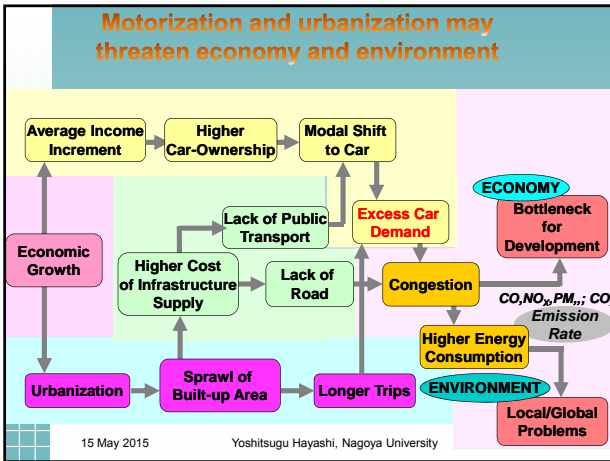
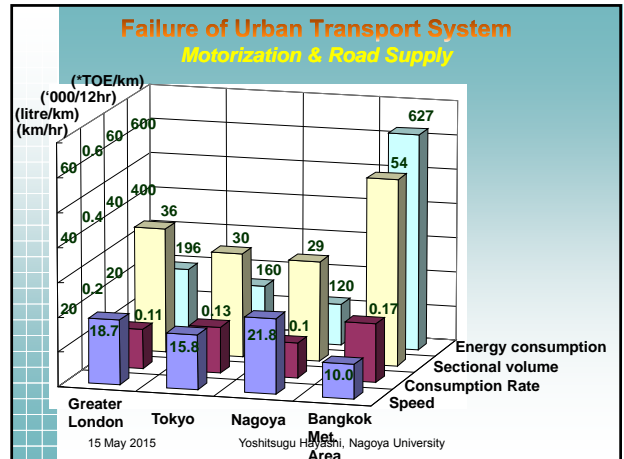
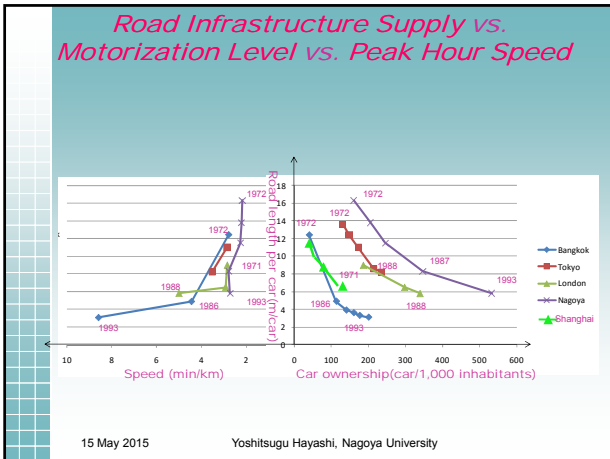
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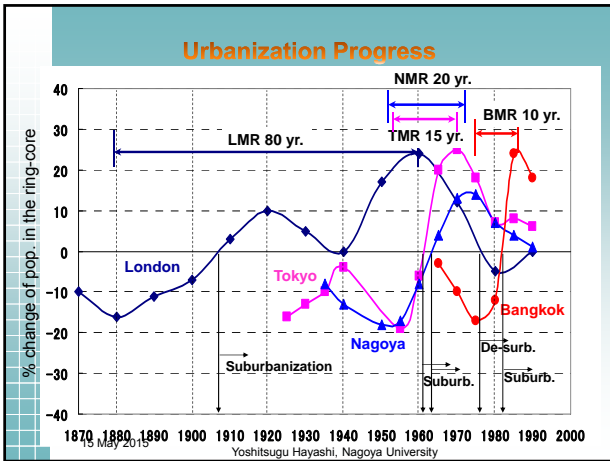
Failure of Urban Transport System
Slower than walkers in Sukunvit Rd, Bangkok



Photo by Hayashi(1993)

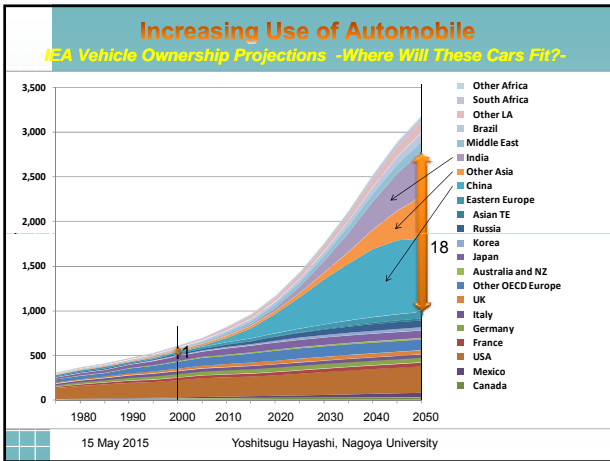






2. What will happen the next? - Unsustainable Future -

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- ### Increasing Cars with Poor Infrastructure in Asian Developing Countries
- **Skyrocketing Increase in Car Ownership** (20 times in 2050)
 - **Less Power to Self-finance Railways**
 - **Increasing Mega-cities** (50 or more in 2050) **without Railway Systems**
 - **Catastrophic Congestion** like 90's Bangkok
 - **Unacceptable Increase in CO₂** from Urban Transport
 - **Unlimited Urban Sprawl** and Infrastructure **Maintenance Cost**
- 15 May 2015
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Beijing and Huabei Plain: PM_{2.5} as a negative outcome of inter-regional land-use transport interaction

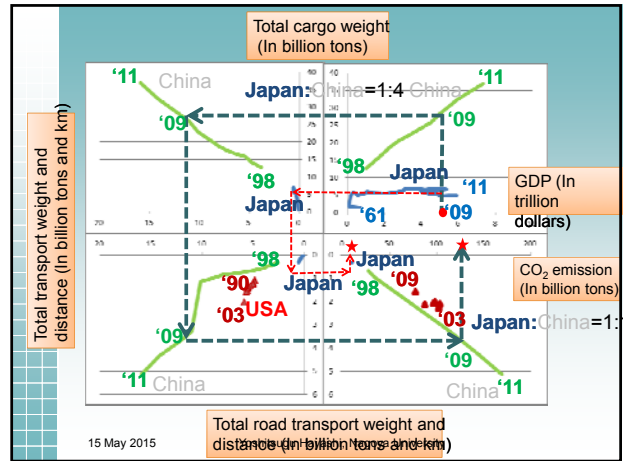
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Lorries transporting consumer goods back to Beijing
 → Moving emission source



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China: An Inconvenient Outcome of Investment in Industry and Motorways

- Drastically increasing air pollution **PM2.5** and **CO₂** emissions
- **Relocation of industries** from coastal rich zones to inland zones
- Induced heavy traffic which is ironically assisted by rapid improvement of **motorways**
- Inconvenient outcome of **land use - transport interactions**
- India: **Industrial complex** and freight transport innovation by **freight dedicated high speed railways**

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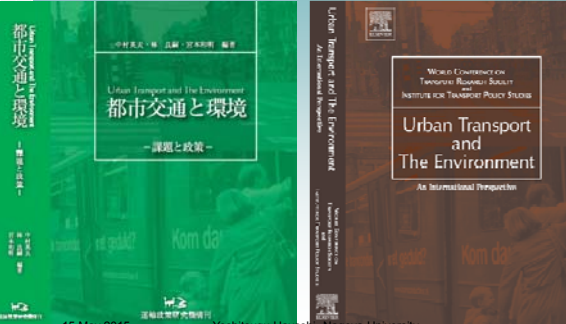
3. Strategies for Solution and the Policy/Technological Instruments for Resilient & Sustainable City

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**CUTE Project at WCTRS (2004)
 Menu of Policies and Technologies**

<Japanese>

<English>

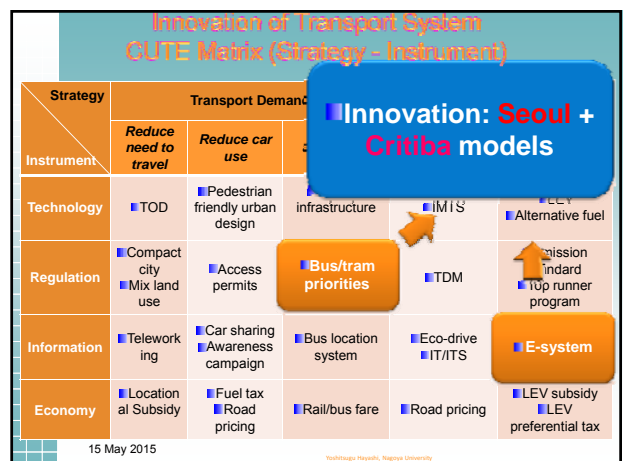
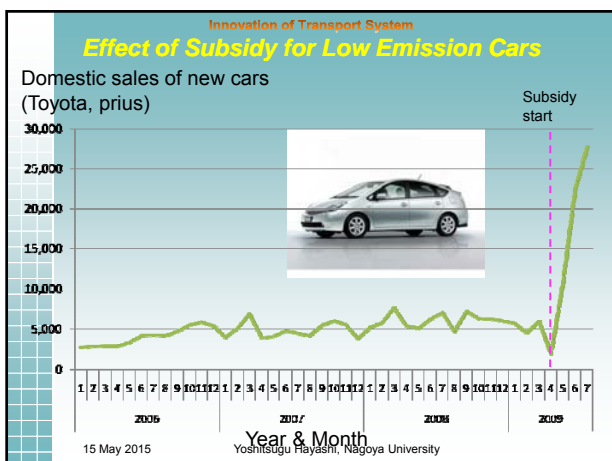
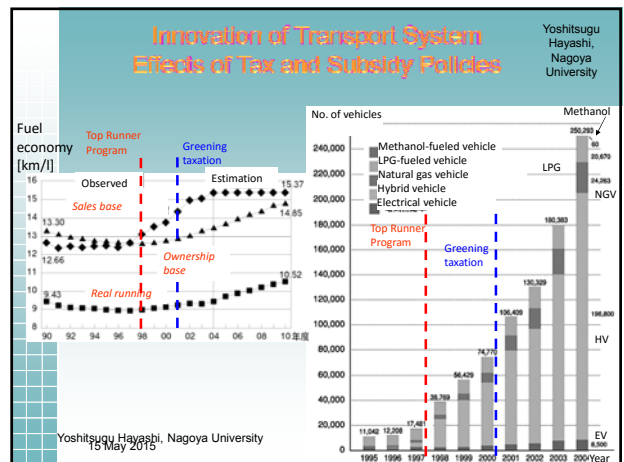
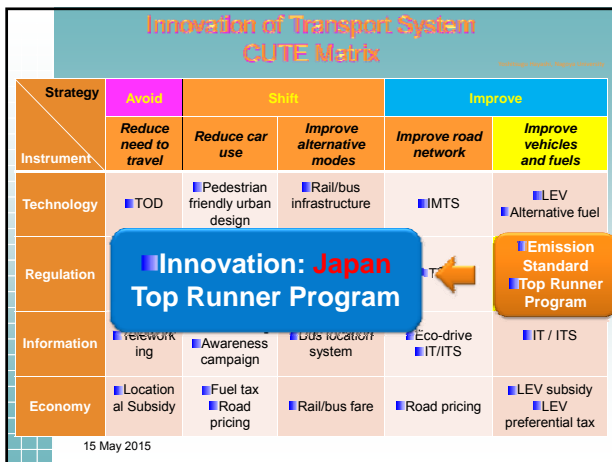
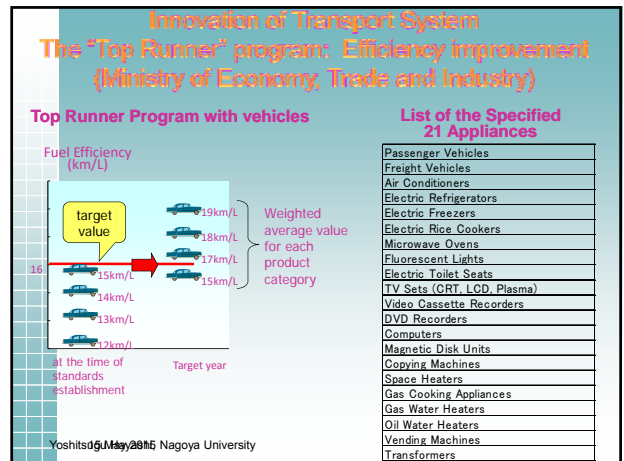
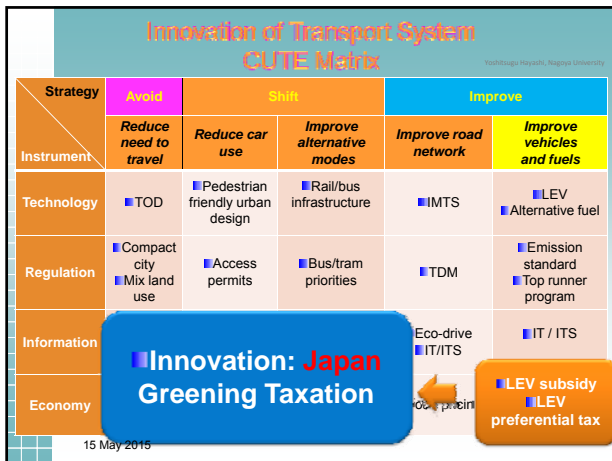


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Transport Strategy - Techno/Policy Instruments

		Strategy		
		Avoid	Shift	Improve
CUTE Matrix		Reduce traffic demand	Reduce emissions per unit transported	Reduce emissions per kilometer
	Technology	<ul style="list-style-type: none"> ■ Pedestrian Ort Dev't ■ Bicycle Ort Dev't ■ Transit Ort Dev't 	<ul style="list-style-type: none"> ■ Integrated Public Transport System ■ Highly Competitive Railway 	<ul style="list-style-type: none"> ■ LEV, EV ■ Alternative Energy ■ Advanced Infra- Tech ■ Logistic Efficiency
	Regulation	<ul style="list-style-type: none"> ■ TDM ■ Parking Regulation ■ Compact/Mix Land Use 	<ul style="list-style-type: none"> ■ Bus/Tram Priorities ■ Non-MT ■ Smarter Modal Evolution 	<ul style="list-style-type: none"> ■ Emission Standard ■ Top Runner Program ■ Eco-Drive
	Information	<ul style="list-style-type: none"> ■ ICT ■ Telework ■ Smart Choices for Workplace and Schools 	<ul style="list-style-type: none"> ■ Awareness Campaign 	<ul style="list-style-type: none"> ■ Knowledgebase ■ ITS ■ Labeling of Vehicle Performance
	Economic	<ul style="list-style-type: none"> ■ Fuel Tax ■ Road Pricing ■ Car Charge / Fee ■ Location Subsidy 	<ul style="list-style-type: none"> ■ Fuel Tax ■ Road Pricing ■ Car Charge / Fee 	<ul style="list-style-type: none"> ■ Fuel Tax ■ LEV Preferential Tax

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Growing City equipped with Land Use Control → Integrated Package for Guided Development

- **High-rise Development near Stations**
 - Center: Bus&Pedestrian Priority Zone
 - Value Capture
- **BRT (3-vehicles connected)**
 - Bus Hierarchical Network
 - Tube Bus Stop

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Innovation of Transport System - Bus Priority Lane (Seoul, 2005) -

Source: GyengChul Kim

- Expansion Plan (13 lines/192km)
- ※ Status of Existing Bus Lanes(2005)
 - ▷ Exclusive median bus lanes: 7 lines/ 84km
 - ▷ Curbside bus lanes: 293.6km

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Innovation of Transport System Changes Bus Routing

Source: GyengChul Kim

Increase - Network Capacity ← new Bus Route +BRT
- Bus ridership
- Bus Frequency(Keep Interval)

Decrease - Total Bus Operation Cost
→ Increase - Bus Company Revenue
→ Decrease - Subsidy of SMG

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Innovation of Transport System T- Money Card Data

Source: GyengChul Kim

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Innovation of Transport System CUTE Matrix

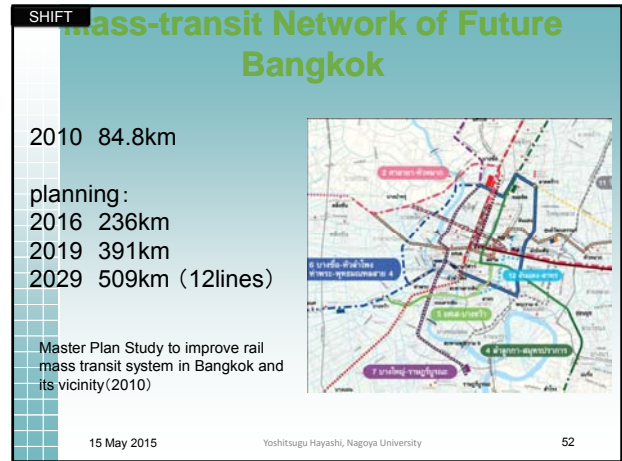
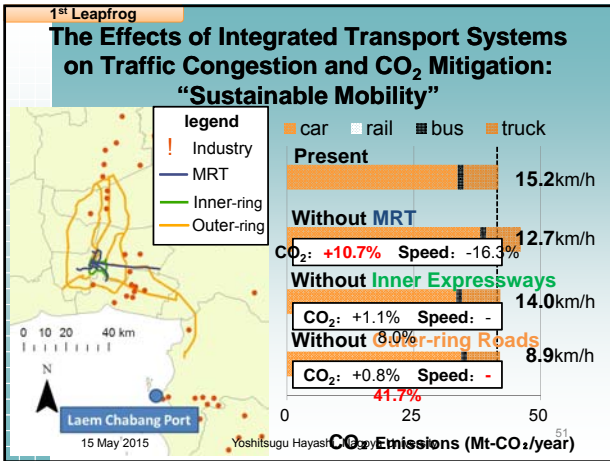
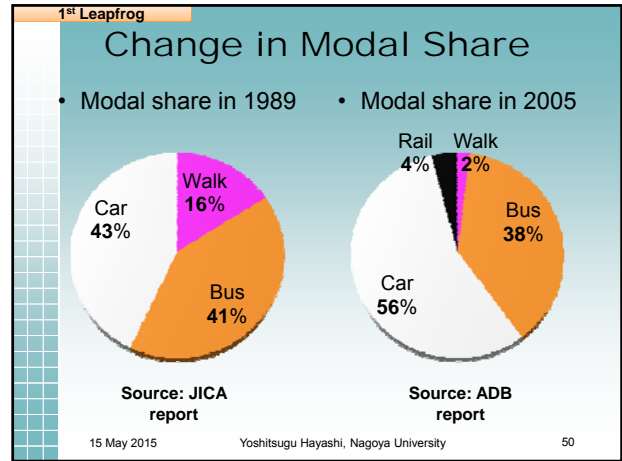
Strategy	Transport Demand		Traffic Flow	Emitting Resource
Instrument	Reduce need to travel	Reduce car use	Improve alternative modes	Improve road network
Technology	■ TOD	■ Pedestrian friendly urban design	■ Rail/bus infrastructure	■ IMTS
Regulation	■ Compact city ■ Mix land use	■ Access permits	■ Bus/tram priorities	■ TDM
Information	■ Teleworking	■ Car sharing ■ Awareness campaign	■ Bus	■ Emission standard ■ Top runner
Economy	■ Location al Subsidy	■ Fuel tax ■ Road pricing	■ Ra	

Innovation: Bangkok Sky Train

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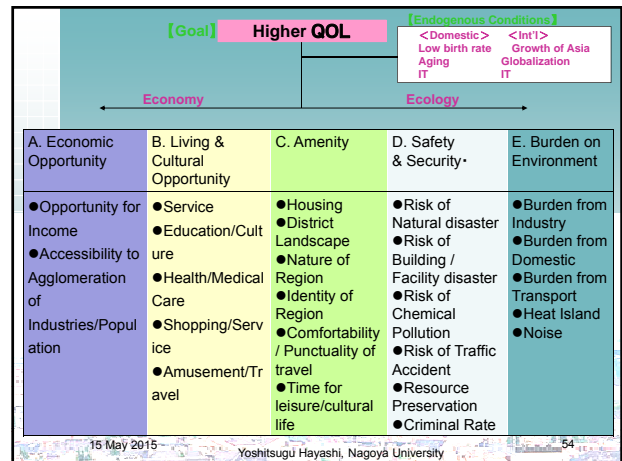
Innovation of Transport System - Sky Train (Bangkok, 2002) -

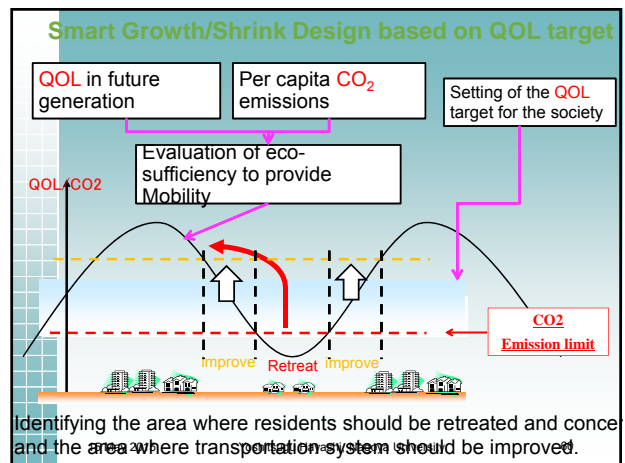
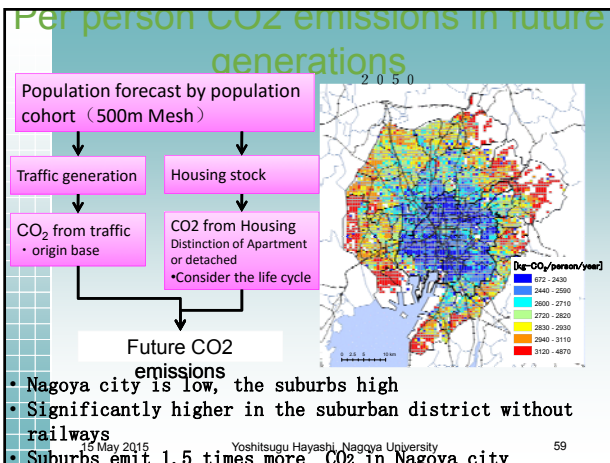
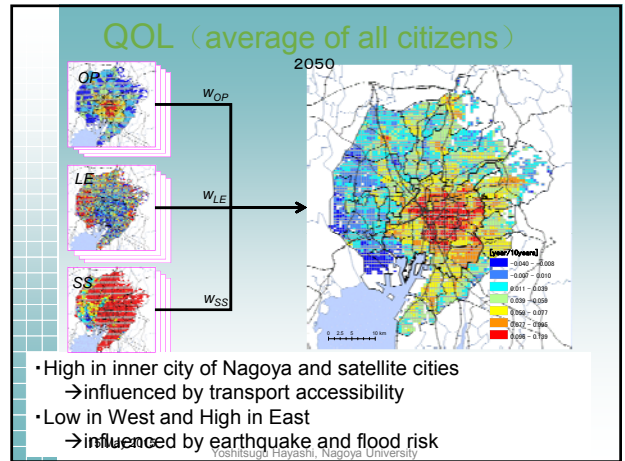
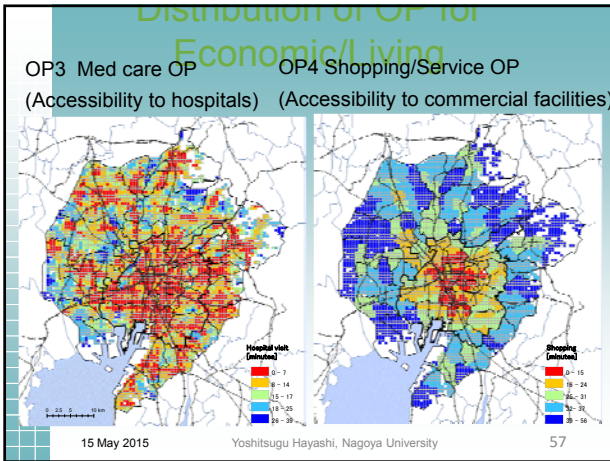
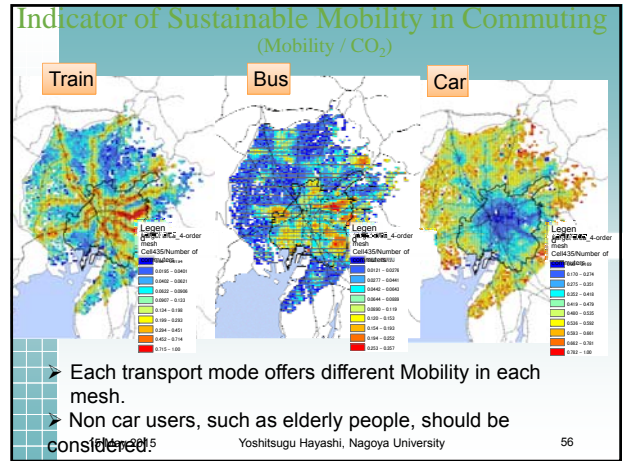
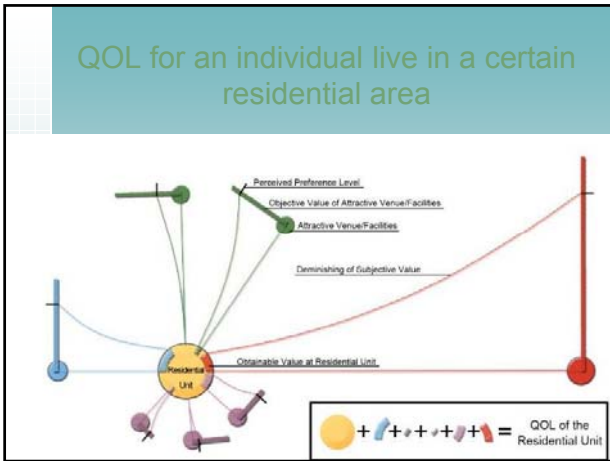
Photo by Hayashi

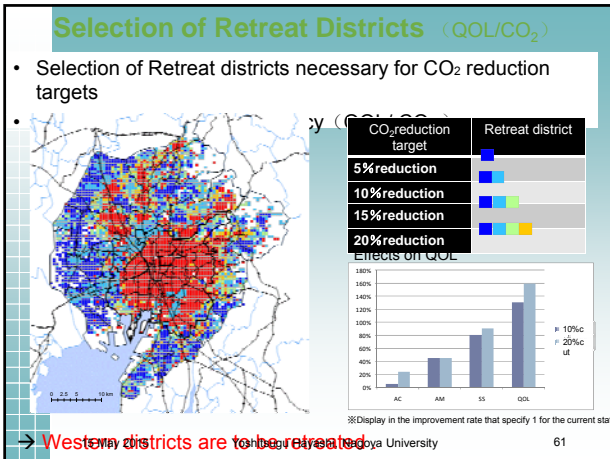


4. Smart Growth for Resilient & Sustainable City with Higher QOL

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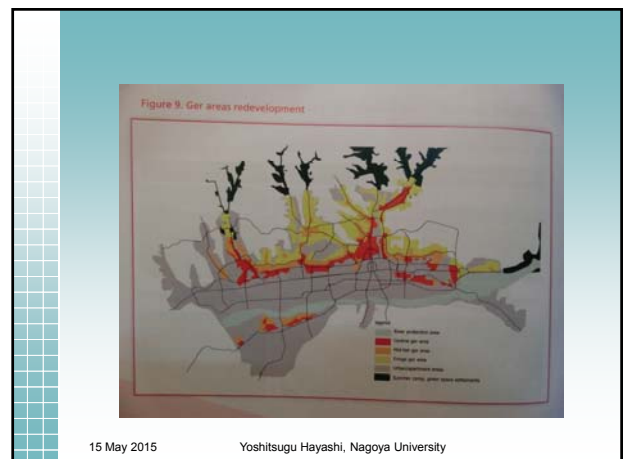
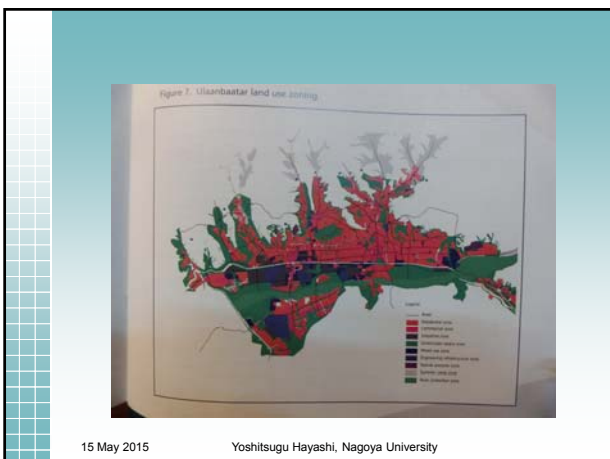






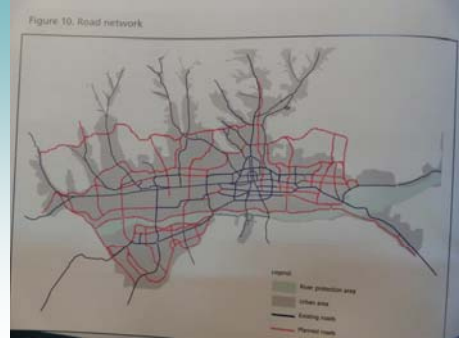
5. Strategies for Ulaanbaatar

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Recommendations for Ulaanbaatar

- **Integrated Land Use – Transport Plan**
 - **Livable & Resilient + Sustainable**
 - to maximize **QOL/Cost, QOL/CO₂**
- **Zoning Regulation**
 - **Hazard Maps**
 - Avoid **Disaster Risky Areas**
- **Redesigning Economic Mechanism**
 - **Preferential Car Registration Tax**
 - **Differentiated Land Tax**
- **Seamless Mass Rapid Transit System**
 - **Sky Train /Metro & LRT /BRT(Exclusive Lanes)**
 - **P&R** in the edge of central area
 - **Smart Card** system

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Thank you for your attention !

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