

Urban Freight in China and Asia Pacific

Leading the way to a smart, efficient
and sustainable freight

Boyong Wang, Smart Freight China

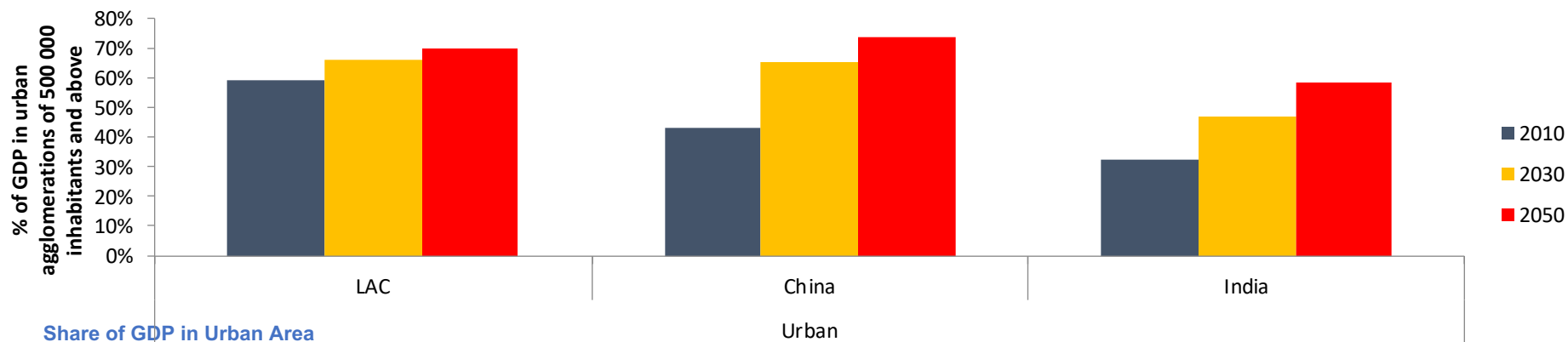
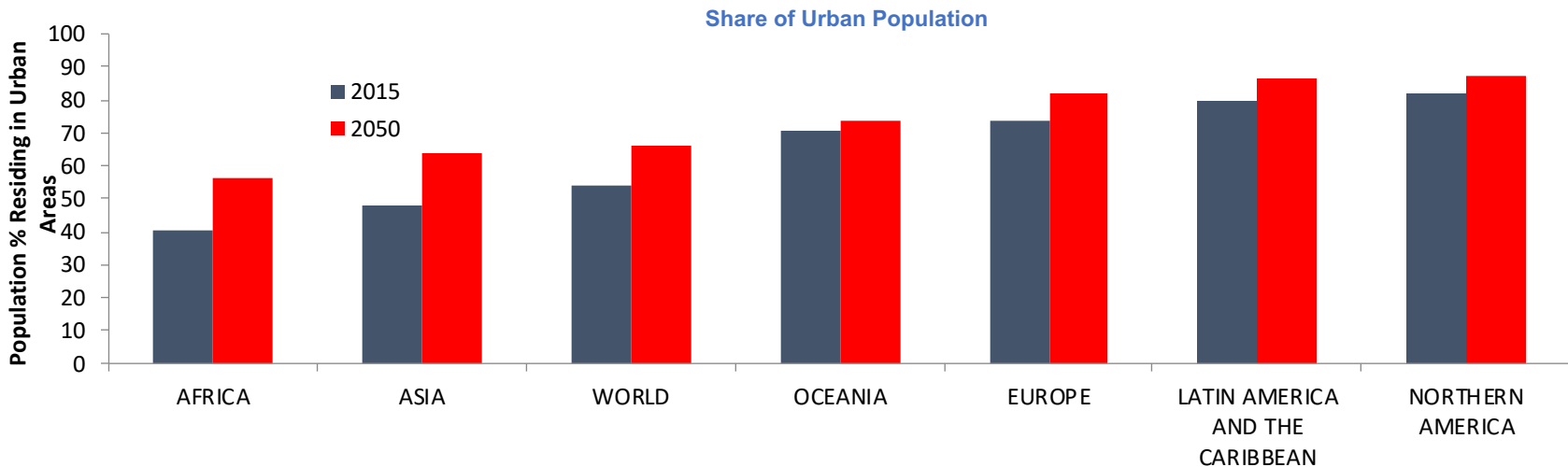
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Urban population and GDP

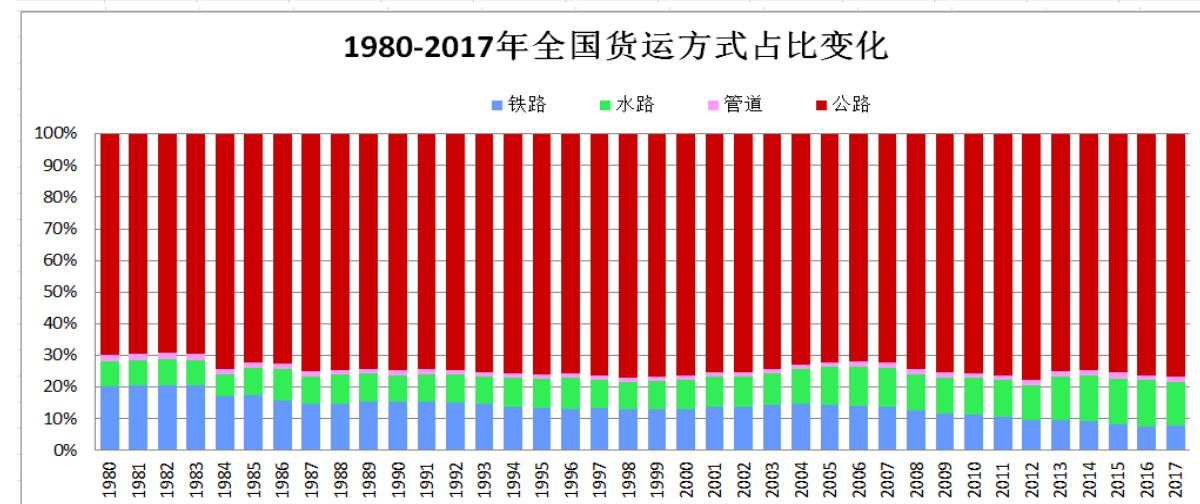
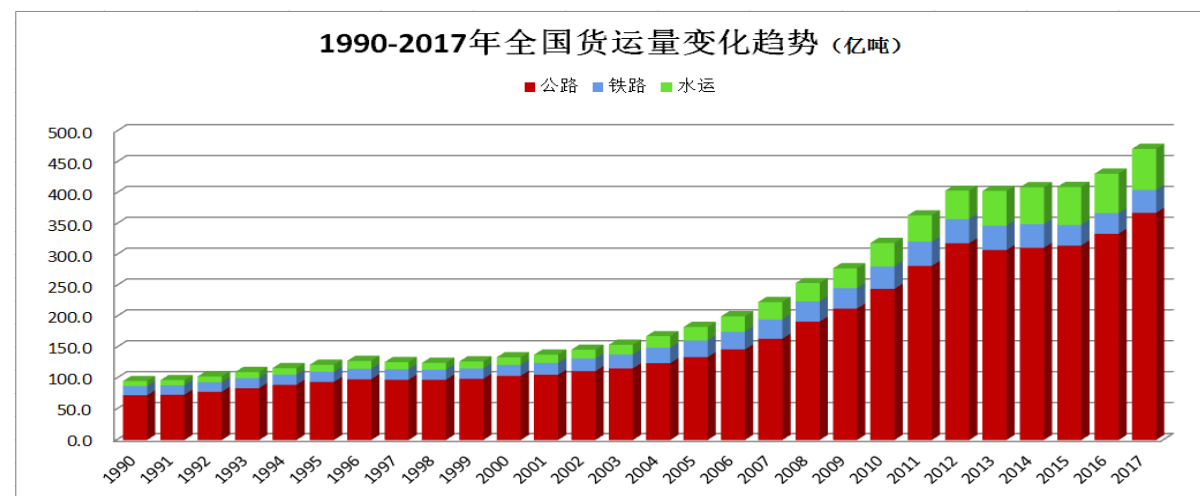


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Booming freight and logistics in China

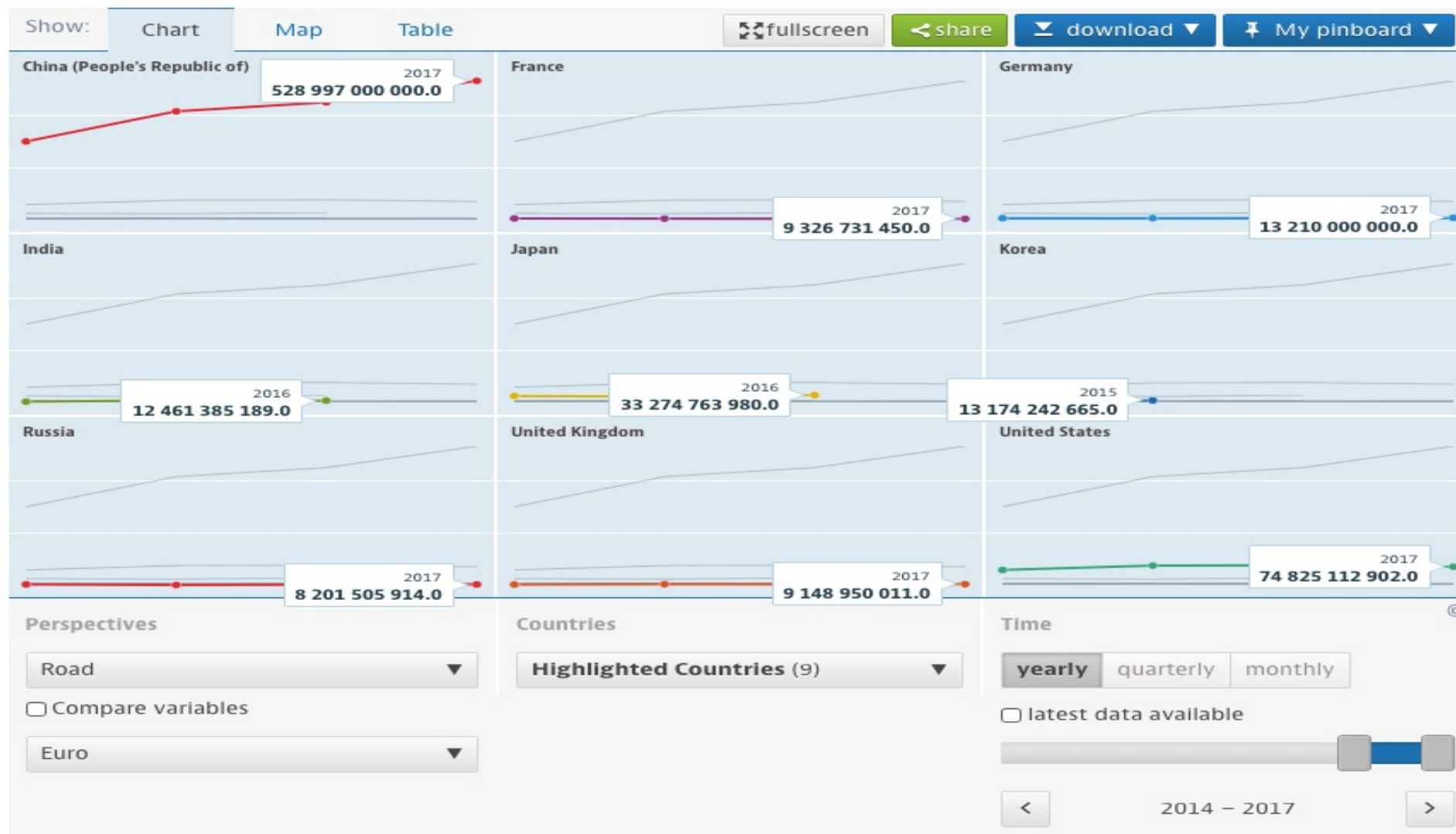
- Chinese freight volume turn over increase 14% to 15% annually. 87 times comparing with 1980 in ton-km
- Chinese road freight increase 6.3% annually from 1980 to 2017



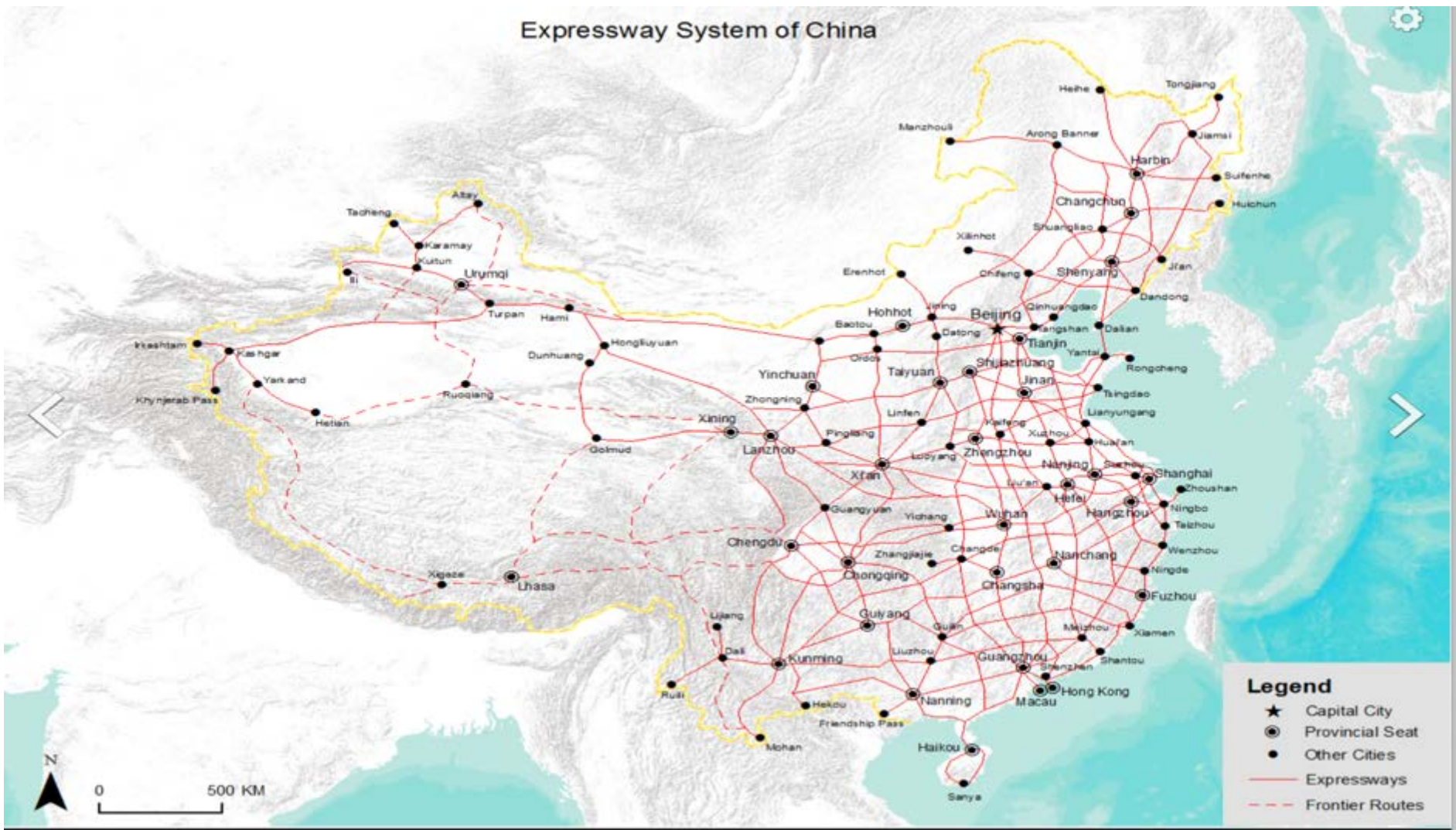
Large amount of investment in Asia transport infrastructure

Infrastructure investment Road, Euro, 2014 – 2017

Source: ITF Transport Statistics: Transport infrastructure investment and maintenance



Expanding Chinese Highway Network



Chinese high-speed rail 2/3 of the World

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Infrastructure second to no one



Urban freight face challenges



Large shippers often don't feel ownership of an outsourced service

Sector is considered complex and fragmented involving too many suppliers

Difficult to translate high-level goals to practical implementation

Lack of harmonized approaches and leadership

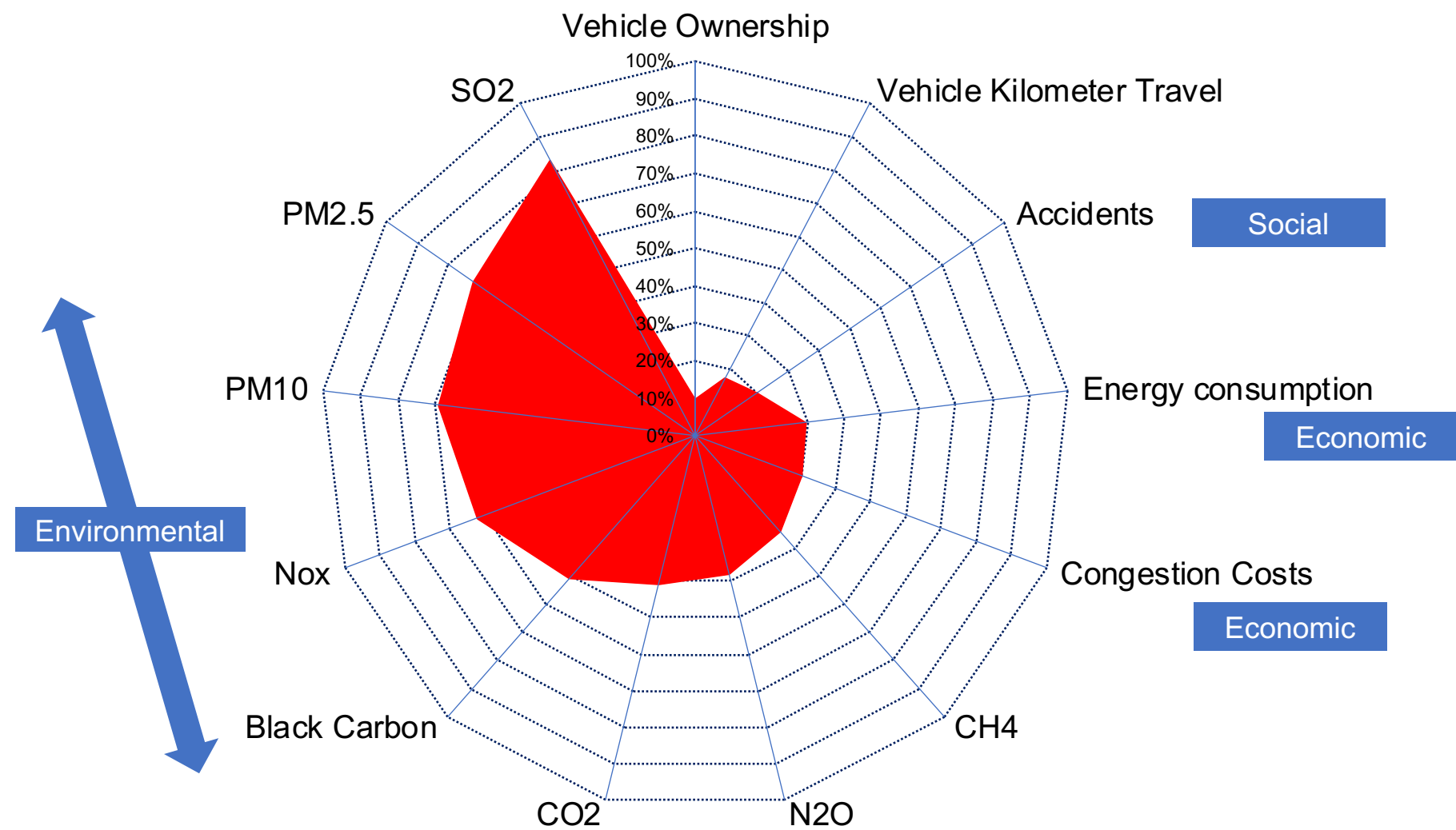
Limited awareness, knowledge, capacity and funding

Efforts and initiatives are scattered and lack coordination

Priorities for sustainability is given to passenger transportation

Overcapacity and Over competition

Freight Transport Externalities



Road Freight Transport ~ Disproportionate environmental and social impacts

Asia Logistics in Glance

- Logistics costs as a percentage of GDP range from 15-25% in Asia
- Freight transportation, with 35 to 60% of logistics costs in Asia, is the main contributor.
- Trucks constitute about 9 of the vehicle population in Asia but emit 54 of road transport CO2 emissions
- Asia also accounts for nearly one in two commercial vehicles sold worldwide mostly trucks
- 90% of trucks owned by individual owners, 0.1% are companies with more than 100 trucks in Asia



Source - Green Freight Asia

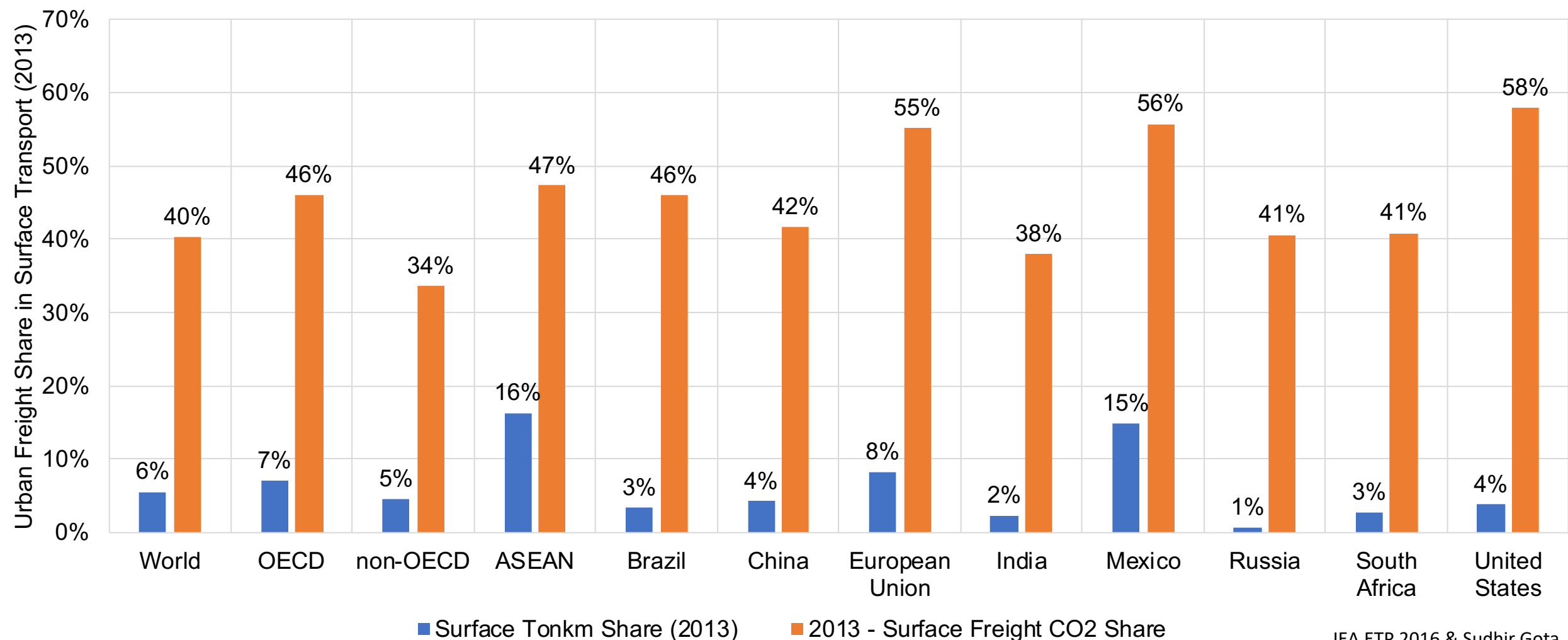
Urban freight movement in GMS countries

- Urban freight in South East Asian countries constitute only 16% of surface freight activity but generate 47% of CO₂ emissions
- Bangkok and Ho Chi Minh have been ranked 28 and 35 among top cities with transport-related air-pollution deaths



Source - UNCTAD, Sudhir Gota

Freight a big portion of CO2 emission



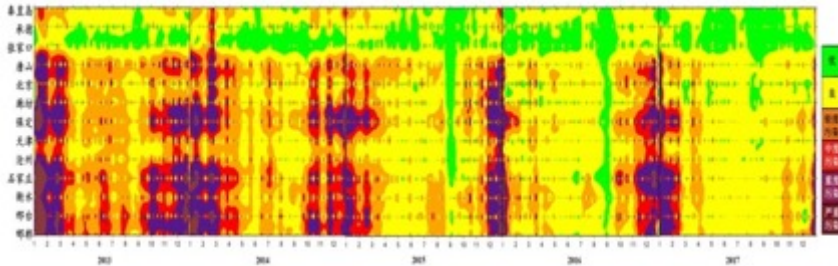
IEA ETP 2016 & Sudhir Gota

Urban Freight in China



Currently (2018)

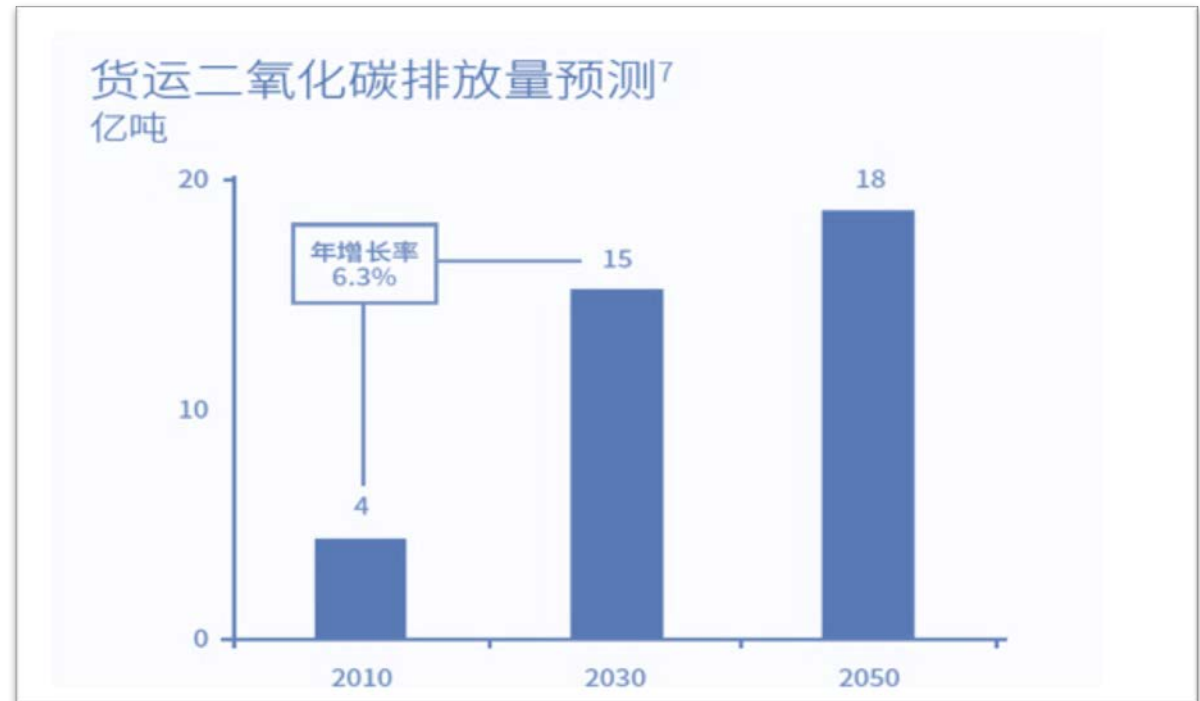
Chinese trucks takes 7.8% of the auto vehicles, but 78% of PM and 57% of NOX



Mobile source pollutants take 31.1 % , 29.2 % , 28.0 % 41% respectively in Beijing, Shanghai, Hangzhou and Shenzhen's pollutions

2050

Freight volume is expected to expand 4 times by 2050.
CO2 emission will increase from 4% to 16% on China's overall CO2 emission



Cities in Asia Pacific are threatened by congestion

- In 2016, 10 of the 25 most congested cities in the world were in mainland China^{*1}
- Travel Activities of heavy and medium truck in Asia is expected to increase by 645% from 2000 to 2050 (compared to 241 globally) and will then make up 29% of the global truck activities, compared 13% in 2000^{*2}

^{*1} - Chongqing, Chengdu, Beijing, Changsha, Guangzhou, Shenzhen, Hangzhou, Shijiazhuang, Shanghai and Tianjin (Source: TomTom)

^{*2} - Page 6, GIZ SUTP Sustainable Urban Freight in Asia



Logistic Sector Highly Inefficient



Source - Rocky Mountain Institute

Current status of Logistics China

- Structural Imbalance between freight service supply and demand
 - Transport overcapacity
 - Illegal retrofit
 - Large number of oversized trucks
 - Under developed driver skills and social welfare
- Low efficiency in logistic organization
 - Highly fragmented transport supply, lacking of consolidated logistic organization and strong leadership
 - Inefficient transport modal and poor interoperability
- Market rule, standards and procedure far from established
 - Contradiction and challenges between new sale and traditional transport
 - Industry safe operation facing great challenges
 - Poor enforcement of policy and regulation implementation, poor governance

Fragmented and high competition





Solutions and Best Practices

Smart solutions already exist

REDUCE FREIGHT TRANSPORT DEMAND



- supply chain restructuring
- Standardized modules/boxes
- 3D printing
- Dematerialization
- Consumer behavior

OPTIMIZE FREIGHT TRANSPORT MODES



- Modal shift
- Multi-modal optimization
- Synchromodality

INCREASE ASSET UTILIZATION



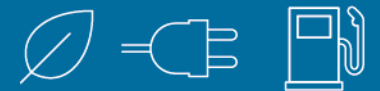
- Load optimization
- Load consolidation and asset sharing
- Logistics centers and warehouse management

IMPROVE FLEET ENERGY EFFICIENCY



- Cleaner and efficient technologies
- Efficient vehicles and vessels
- Driving behavior
- Fleet operation
- Fleet maintenance

REDUCE CARBON CONTENT OF ENERGY



- Cleaner and lower-carbon fuels
- Electrification
- Fuel management

- These solutions combined can reduce emissions by >80% by 2050

Solutions proposed for urban policy makers

Market access and regulations 市场准入及规则	Regulatory measures 政策性措施	Economic measures 经济性措施
<ul style="list-style-type: none">• Access to railway network 铁路网络的准入• Homologation requirements (emission standards) 同素化要求 (排放标准)• Harmonised rules on vehicle dimensions 车辆尺寸的统一• Abolishment of cabotage 取消航权限制	<ul style="list-style-type: none">• CO₂ targets for vehicle 车辆减排目标• Weekend/night lorry ban 周末/夜间的卡车限行• Environmental zones 环保区域• Speed limits 限速• Obligatory in-job training (e.g. eco-driving) 必须的职业培训 (如节能驾驶培训)• Advantages for user of low emission vehicles 对低排放车辆的优惠政策	<ul style="list-style-type: none">• Fuel and vehicle taxes 燃油及车辆税• CO₂ taxes 碳税• Road user charges or tolls (for roads or areas) 道路通行收费• Train path prices 铁路轨道使用费• Public private partnership (PPP) 公私合作伙伴• Emission trading system 碳排放交易系统
Financing of extension or new infrastructure 基础设施扩建的融资	Integrated land use and transport planning 整合土地使用及交通规划	Subsidy programmes 补贴项目
<ul style="list-style-type: none">• Extension of railway network (and waterways) 铁、水路网络的扩建• Building of new terminals for intermodal traffic 新建多式联运枢纽• Extension of railway sidings 专线铁路的扩建• Segregation of freight and passenger rail traffic 铁路货运、客运线路的分离	<ul style="list-style-type: none">• Federal transport planning 联邦交通规划• Strategic planning for freight distribution centres and intermodal terminals 货运分拨中心及多式联运站的战略规划• Alignment of roads 道路联网• Air pollution and noise protection plans 空气污染及噪音防护计划	<ul style="list-style-type: none">• Subsidies / low interest rate for advanced introduction of new emission standards or for purchase of new trucks 对引入新排放标准及购买符合该标准车辆的补贴/低利率贷款• Funding of alternative fuelled vehicles 对使用替代燃油车辆的补贴• Subsidies schemes for scrapping old vehicles 报废旧车辆的补贴计划

Government Policy and Regulations in China

- Scrappage of Yellow Label Vehicles, GB1589
- Tighter ” Action Plan on Air Pollution Control”
- Tight vehicle and fuel standards
- Banning of heavy duty vehicles downtown areas
- Structural change of transport mode
- Electrification of urban freight vehicles
- Promotion of “ cargo exchange platform” emphasizing logistic organization
- Urban freight strategy to streamline urban freight

Increasing Restrictions

just-style home News & insights

Driving ban in

By Jeremy Mullins | 19 April 2017

Myanmar apparel makers have w
trucks to seaport terminals throu
commercial capital Yangon has pl
country's growing clothing sector

Dr U Aung Win, a factory owner and
Garment Manufacturers Association
hard for bigger companies with thr
complicated logistics requirements.

Factories located in industrial zones
persuading labourers to work at nig
shifts, although it is somewhat easi
villages. His Maple Trading Co Ltd p
of Yangon.

Night-time operations "also decrea
transport", says Win, whereas previ
6am makes them less adaptable.

Costs have increased as a result, wi
shipments.

The idea of the ban, instituted by th

But the actual result was logistical c
downtown or in the eastern area of

through downtown Yangon. On the first day of the ban, traffic on major
with some drivers abandoning their vehicles. Businesses are adapting to the rules, but logistical problems and night time traffic jams remain.

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Bangkok Metro Poli

Breaking News October 09, 2017 09:16
By The Nation

All 88 police stations in Ba
Police commissioner to st
in the city.

Commissioner Pol Lt-General Chan
trucks in order to prevent traffic cor

Pol Maj-General Jiraphat Phumijit, c
continue to enter inner Bangkok du
ban on certain routes.

Trucks with 10 or more wheels are
Six-wheel trucks are banned from ir

Violators are subject to a fine of Bt1

All trucks are also banned from usi

Tuoi Tre News > Society

Ho Chi Minh City mulls over limitation of mini trucks in downtown areas

Mini trucks to be banned from the city center during the day, according to the plan

By Tuoi Tre News Wednesday, October 4, 2017, 14:18 GMT+7



Mini trucks travel on Tran Hung Dao Street in District 1, Ho Chi Minh City. Photo: Tuoi Tre

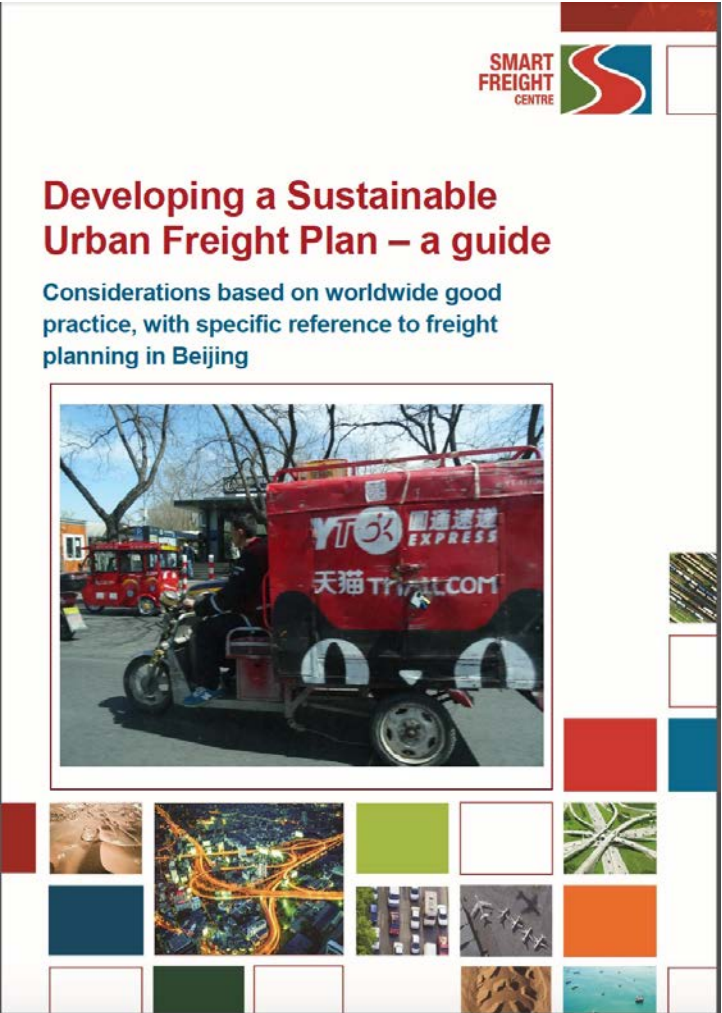
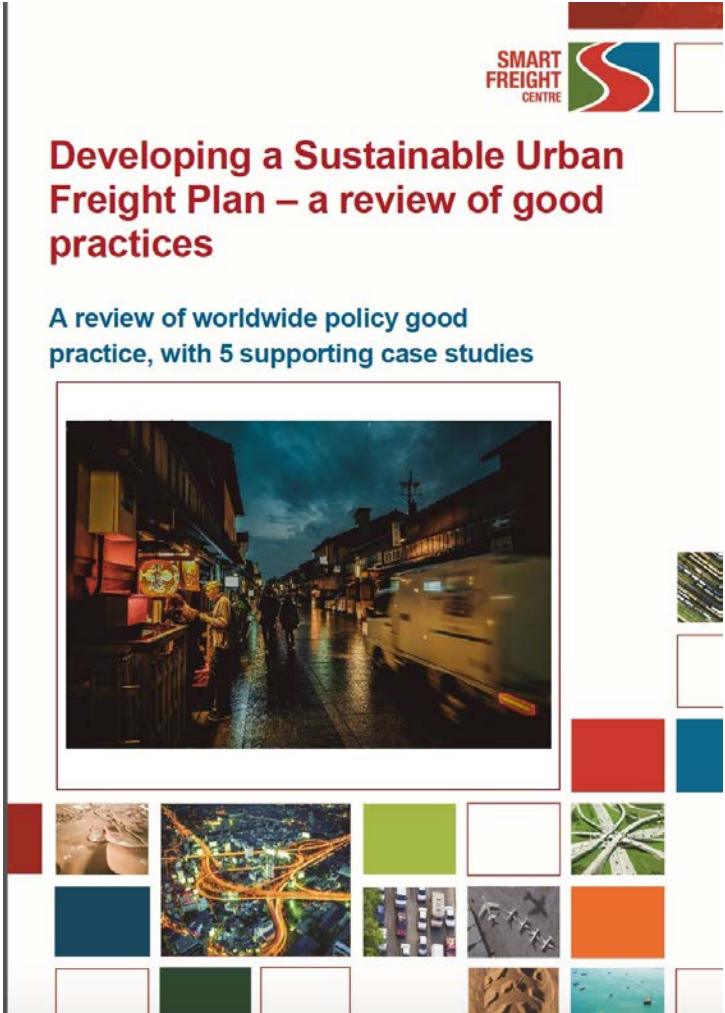
Authorities in Ho Chi Minh City are considering limiting the number of mini trucks allowed in downtown areas.

The municipal People's Committee has tasked the Department of Transport with planning

the rules, but logistical problems and night time traffic jams remain.

> US fashion sector mulls tactics to tackle tariffs

Develop an Urban Freight Plan



Take lessons from other cities



Study solutions and measures but tailor made to Asia cities

Strategy/Initiative	Type of Strategy	Time	Type of Instrument	Investment	Implementation by
<u>Designate a freight person at key agencies</u>	Awareness	Short	Co-operative	Low	Government
<u>Freight Parking and loading zones</u>	Improve	Short	Infrastructure	Low	Government
<u>Integrating freight into land use planning</u>	Avoid	Long	Regulatory	Low	Partnership
<u>Low emission zones</u>	Avoid	Medium	Regulatory	High	Government
<u>Mode Shift Program</u>	Shift	Medium	Infrastructure	Moderate	Partnership
<u>Non-motorized freight distribution</u>	Shift	Short	Infrastructure	Low	Partnership
<u>Time access restrictions</u>	Improve	Short	Regulatory	Low	Government
<u>Urban consolidation centers</u>	Avoid	Medium	Logistical	High	Partnership
<u>Urban freight information and maps</u>	Awareness	Short	Logistical	Low	Government
<u>Urban freight policy</u>	Awareness	Short	Logistical	Low	Partnership
<u>Using Capacity of Public Transport</u>	Shift	Short	Infrastructure	Low	Partnership
<u>Vehicle size and weight restrictions</u>	Avoid	Short	Regulatory	Low	Government
<u>Reserved land for multimodal logistics</u>	Avoid	Long	Infrastructure	Moderate	Government
<u>Partnership</u>	Awareness	Short	Co-operative	Low	Partnership
<u>Cleaner goods vehicles</u>	Improve	Medium	Logistical	Moderate	Partnership



Direct impacts of off-hour deliveries on urban freight emissions

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ABSTRACT

The most significant negative environmental impacts of urban trucking result largely from travel in congested traffic. To illustrate the potential of innovative solutions to this problem, this paper presents new research on the emission reductions associated with off-hour freight deliveries (OHD). The paper uses fine-level GPS data of delivery operations during regular-hours (6 AM to 7 PM), and off-hours (7 PM to 6 AM), to quantify emissions in three major cities in the Americas. Using second-by-second emissions modeling, the paper compares emissions under both delivery schedules for: reactive organic gases, total organic gases, carbon monoxide, carbon dioxide, oxides of nitrogen, and particulate matter. The results show that the magnitude of the emission reductions depends on the extent of the change of delivery time. In the case of the "Full" OHD programs of New York City and São Paulo—where the deliveries were made during the late night and early morning periods (7 PM to 6 AM)—the emission reductions are in the range of 45–67%. In the case of the "Partial" OHD used in Bogotá (where OHD took place between 6 PM and 10 PM), the reductions were about 13%. The emission reductions per kilometer are used to estimate the total reductions for the cities studied, and for all metropolitan areas in the world with more than two million residents. The results indicate the considerable potential of OHD as an effective—business friendly—sustainability tool to improve the environmental performance of urban deliveries. The chief implication is that public policy should foster off-hour deliveries, and all forms of Freight Demand Management, where practicable.

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1. Introduction


The threat of climate change and the health toll caused by air pollution have created enormous pressure to reduce greenhouse gases (GHGs) and local pollutants in urban environments. As one of the largest sources of such emissions, the transportation sector must play a leading role in finding technological, operational, and behavioral solutions to improve urban

- improve traffic conditions and lower travel times for road users during daytime hours,
- decrease environmental impacts,
- increase competitiveness for transportation companies,
- increase deliveries reliability for receivers,
- increase safety by reducing the conflicts between trucks, passenger cars, cyclers, and pedestrians, and
- enhance a city's livability and attractiveness


“The possibility of achieving reductions in the range of 45 – 67% in the case of a Full-OHD (7 PM – 6 AM), and about 13% for a Partial-OHD program (6 PM – 10 PM)”

Industry hold the key to changes

Only through the collaboration of businesses, governments, research and civil society can a sector transformation be realized.



However, in this highly commercial sector, the trigger lies predominantly with businesses, especially multinationals with global brands and value chains. As buyers or suppliers of freight services, they have the power to take action across their extensive supply chains.



We believe that increased transparency and collaboration will mobilize companies to reduce the climate and pollution impact and achieving efficient and sustainable freight sector



Smart Freight Alliance Drive the Change

- Our vision is ‘Smart Freight’: an efficient and sustainable Chinese freight and logistics sector.
- Our mission is to bring together and work with the logistics community towards this vision – contributing to China’s Commitment on Paris Climate Agreement targets, Sustainable Development Goals and Chinese government objective of achieving “Beautiful China”.
- Our role: Bridge shippers and their logistics partners with government policy implementation and provide input to the industry related policy and standardize, catalyze and accelerate their adoption of efficient logistic solutions, and collaborate with other shippers.



Linking industry with government and other key partners



Make MNCs take smart freight leadership



Conclusions and Take-aways

Make careful assessment and balance

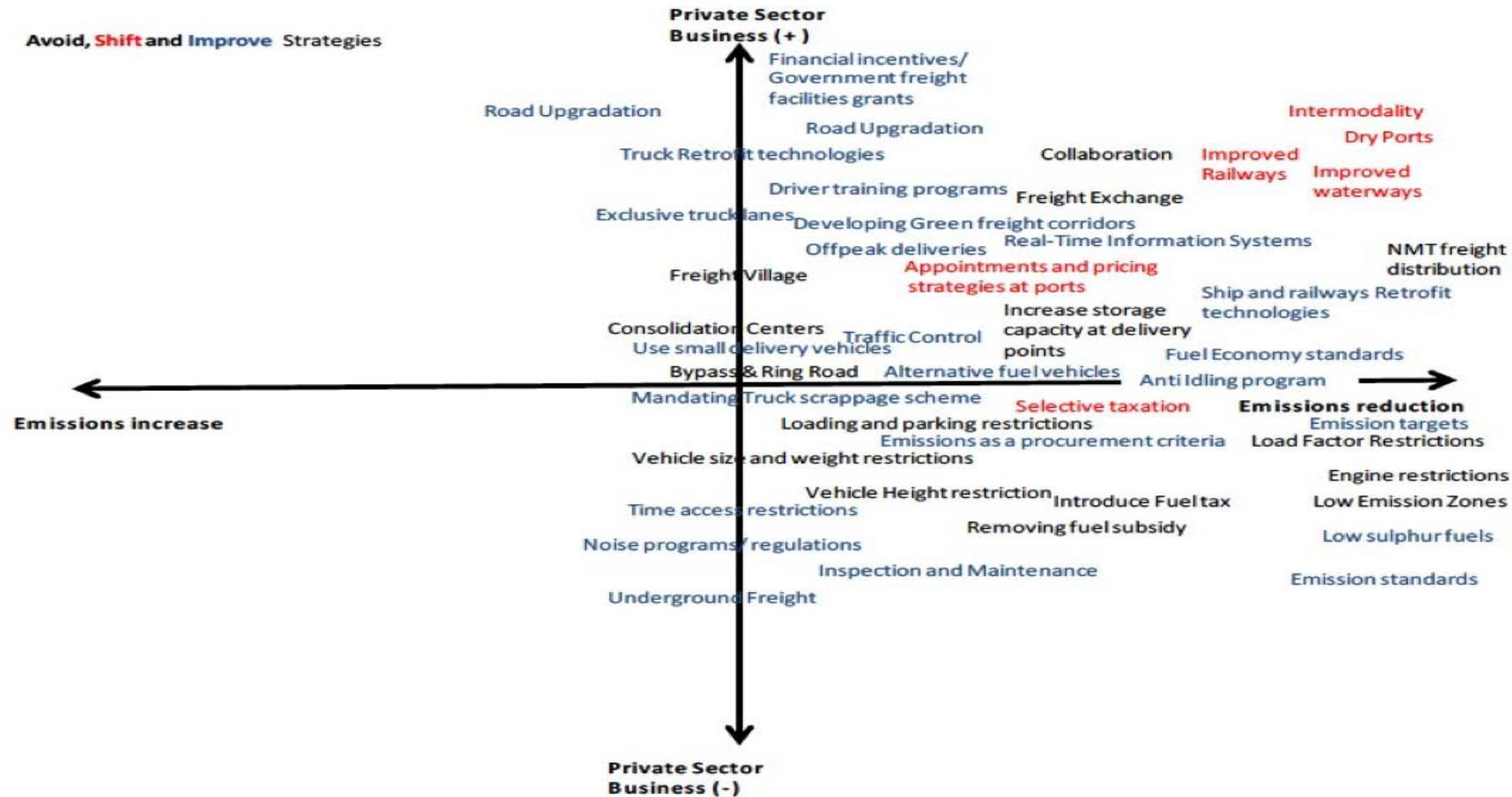


FIGURE 17 IMPACT OF GREEN FREIGHT MEASURES

ACTIONS

- Cleaner fuels/oils/lubricants
 - Low Sulfur diesel
 - Alternative fuels
 - Low viscosity lubricants
 - Oil by-pass filtration system
- Cleaner and efficient technologies
 - Tires
 - Aluminum wheels
 - Aerodynamics devices
 - Idling reduction technologies
- Cleaner and efficient vehicles
 - Truck replacement
 - Lighter weight trucks
 - Hybrid/Electric/LNG/CNG trucks
- Inspection and maintenance



GOVERNMENT INTERVENTIONS

- Standards
 - Vehicle emissions
 - Fuel economy
 - Fuel quality
 - Alternative fuels
- Legislation
 - Import restrictions
 - Technology mandates
- Programs
 - Inspection & maintenance
 - Technology verification
 - Emission labels
 - Truck replacement schemes
 - Driver / fleet manager training
- Economic instruments
 - Fines, taxes, fees, subsidies, rebates



And Team UP!

- Stakeholder engagement
- Building on existing efforts
- Balance quick gains and long term objectives
- Links with government recognition scheme
- Develop KPI, monitoring
- Urbanization and freight will evolve with economic growth
- Urban freight will increase with the externalities, health and pollution, emission, noise, congestion, etc.
- Climate change and pollution will drive change
- Diesel emission are causing increasing concerns

Join our journey towards zero-emissions freight



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