

# **Intelligent Freight System (IFS) for Improved Productivity and Energy Security in Asia**

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## Explosive growth in freight

- One of every two trucks worldwide sold in Asia
- Infrastructure improvement 30% faster than rest of world
- PR China and India 2050: 50% of new roads, 25% of new rail



## Freight sector is inefficient

- Logistics costs 15-25% of GDP in Asia (US & Europe <10%)
- About 90% of trucking companies are individual drivers
- Up to 40% of trucks trips are empty (US 28%, Europe 25%)



## High impacts from diesel vehicles

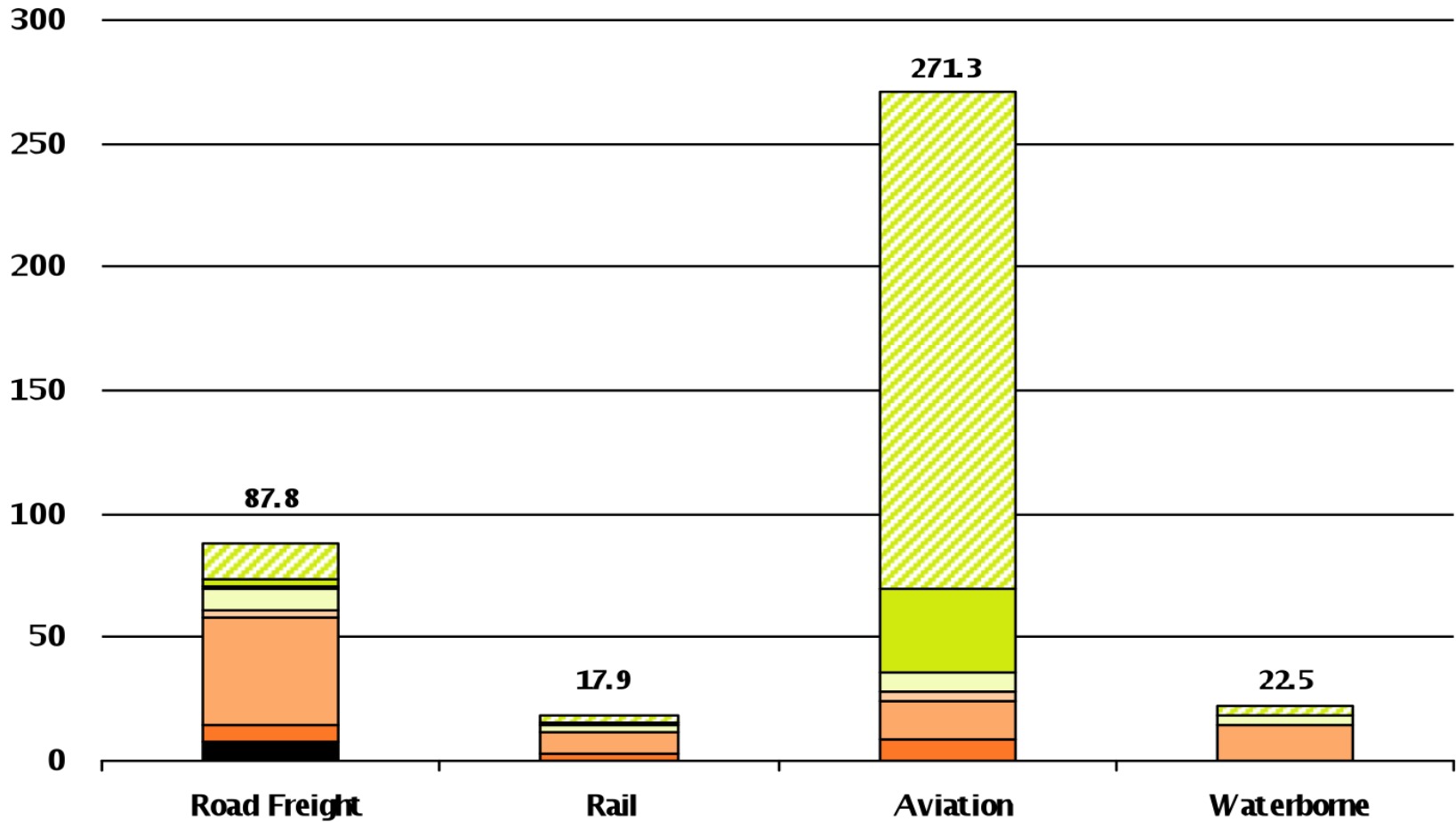
- Trucks 9% of vehicles, 54% of road transport CO<sub>2</sub> emissions
- PR China diesel vehicles: 90% of transport PM<sub>2.5</sub>
- India heavy-duty trucks: 50% of transport black carbon



## Significant improvement potential

- Fuel >40% of truck operational costs
- Truck tire technologies in PR China: 20 million tons CO<sub>2</sub> per year
- Winners: truck scrappage, light-weight vehicles, telematics

€ per 1000 tkm



- Accidents
- Air Pollution
- Up- and Downstream Processes
- Climate change low scenario

- Noise
- Nature & Landscape
- Urban Effects
- Climate change (difference low/high scenario)

Source: ADB and GIZ, 25-27th June 2014. "Green Freight and Logistics in Asia: Delivering the Goods, Protecting the Environment"

Major Challenges Matrix	Infrastructure - Roads	Intermodal & Other Infrastructure	Old Trucks	Technology	Poor Enforcement, I&M	IT	Capacity	Data	Fragmented Industry	Overloading	Institutional	Access to Finance	High Cost	Awareness	Urban Freight	Partnerships
Bangladesh		X	X		X					X				X		
Bhutan	X				X	X										
Cambodia	X						X									
India		X	X			X									X	
Indonesia	X					X	X	X		X						X
Laos					X	X			X							
Maldives		X														
Myanmar				X			X	X						X		
Nepal	X	X		X			X	X				X		X		
Philippines	X	X		X										X		
Sri Lanka														X		
Thailand														X		X
Viet Nam			X	X					X	X		X	X	X		
PR China, Central & West Asia	X	X		X	X	X			X		X					

- An **Intelligent Freight System** requires
  - Holistic view of processes in chains & freight transport as part of broader logistics
  - Inclusion of all technological and spatial dimensions
  - Consideration of private sector goals (energy/cost savings) and public goals (external/societal costs)
- Aligning **public and private sector goals** creates win-win
  - Private sector to take long term view and consider public goals
  - Public sector to align policy goals with private sector interests
  - However, many small owner-operators have short-term goals: survive economically in a market with excess supply

## Public goals

- Private consumer's and producer's surpluses
- Foster efficient production and trade through infrastructure networks, competitiveness of country and its regions
- Optimize use of transport, communication and energy networks, use network synergies
- Low external costs, congestion, accidents, environment, climate
- Good spatial balance of economic growth and income distribution

## Private goals

- Productivity of production processes
- Efficient global sourcing
- Efficient distribution and customer service
- Lean inventory holding
- Flexibility of the logistics system
- Reliability and resilience
- Control on the overall supply chains
- Low cost of the overall supply chains

Goals	Public	Private
Energy savings	Climate mitigation Energy security	Cost reduction
Reduced congestion	External cost reductions	Time and operation cost reductions
Reduced accidents	External cost reductions	Reduced costs and liability
Reduced noise and air pollution	External cost reductions	Public image / license to operate Legal compliance

## Strategies

## CUTE Matrix

### Avoid

### Shift

### Improve

#### Reduce Transport Demand

#### Reduce Emission per Unit Transported

#### Reduce Emission per Kilometer

### Technological

- Pedestrian Oriented Development
- Bicycle Oriented Development
- Transit Oriented Development

- Integrated Public Transport System
- Highly Competitive Railway

- Low Emission Vehicle
- Alternative Energy
- Advanced Infrastructure Technology
- Logistic Efficiency

### Regulatory

- Traffic Restriction/Bans
- Parking Regulation
- Compact City
- Mixed Land Use

- Bus/Tram Priorities
- Non-Motorized Transport
- Smart Modal Evolution

- Emission Standard
- Top Runner Program
- Eco-Drive

### Informational

- Information and Communication Technologies
- Telework
- Smart Choices for Workplaces and Schools

- Awareness Campaign

- Knowledgebase
- Intelligent Transport Systems
- Labeling of Vehicle Performance
- Information Service Improvement

### Economic

- Fuel Tax
- Road Pricing
- User Charges/Fees
- Location Subsidy

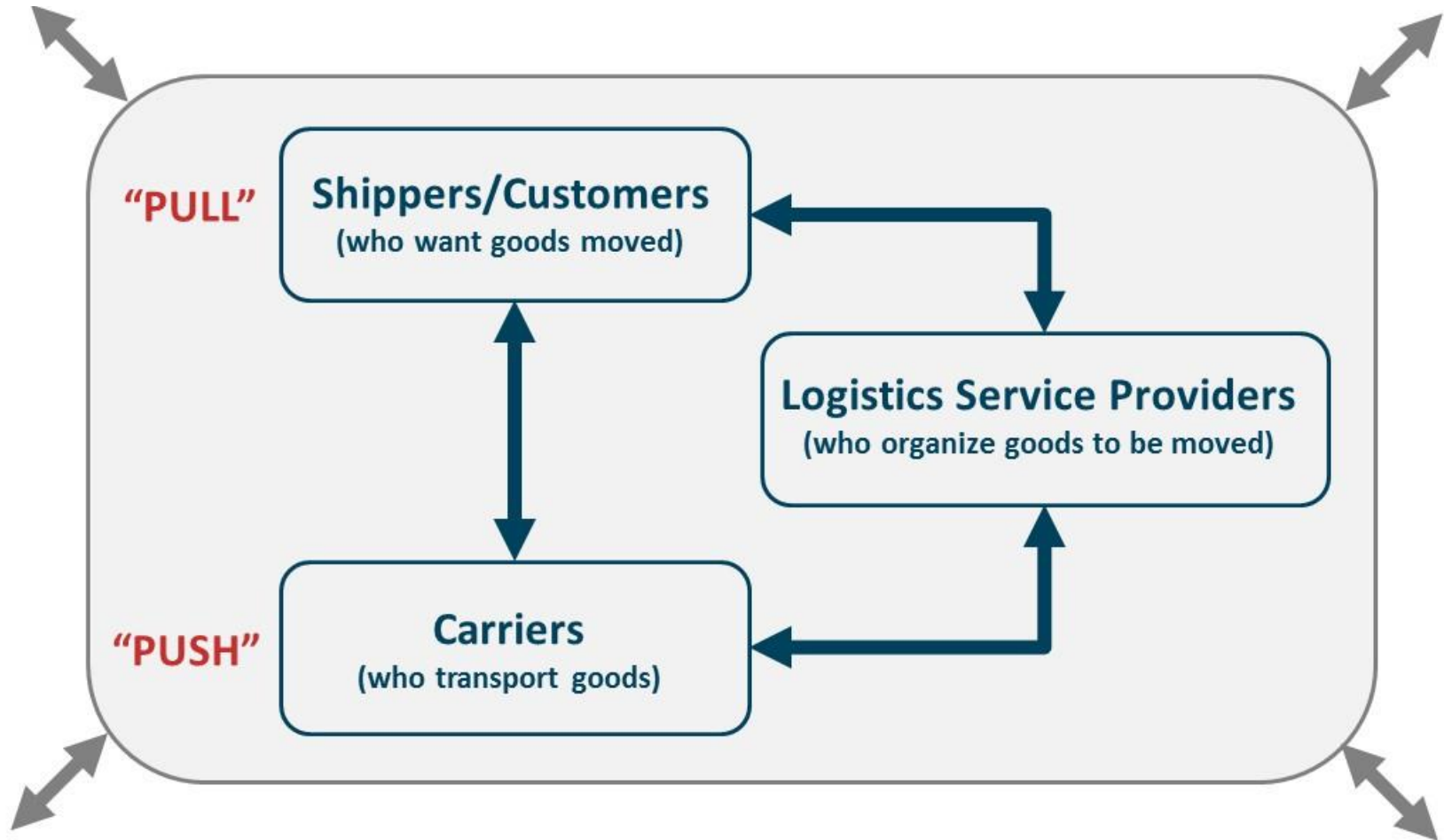
- Fuel Tax
- Road Pricing
- User Charges/Fees
- Energy Consumption

- Fuel Tax
- LEV Preferential Tax Subsidies



Government

Industry



Financing &  
development agencies

Civil society

**Policy makers set the “North” and let private sector work out how to get there in the cheapest and quickest way**

## **Three examples:**

- **Setting standards: vehicle emissions and fuel economy standards**
- **Pricing (taxes, charges, subsidies): fuel tax / remove fuel subsidies, rebates for truck scrappage**
- **Cap-and trade systems: creating a “market” for externalities**

## **Policies only work if they ensure**

- **Incentive-compatibility: tax incentive not income-generation**
- **Completeness: all roads, vehicles, modes etc (no exceptions)**
- **No discrimination: same standards within common markets**
- **No leakages: e.g. use of agricultural diesel for trucks**

## No brainers

- Truck technologies e.g. tires, propulsion technologies (Euro V etc.)
- Improved load factors
- Optimal vehicle size, weight
- Telematics/ICT

## Controversial

- Gigaliners
- Electric highway

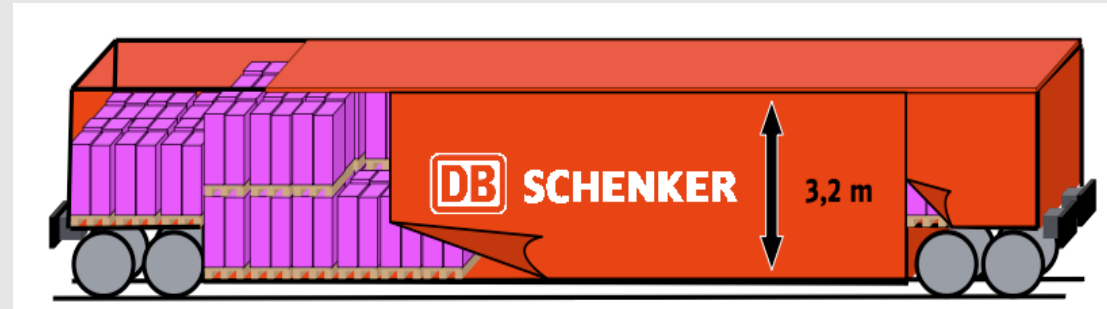
## Innovative

- Horizontal transshipment



## No brainers

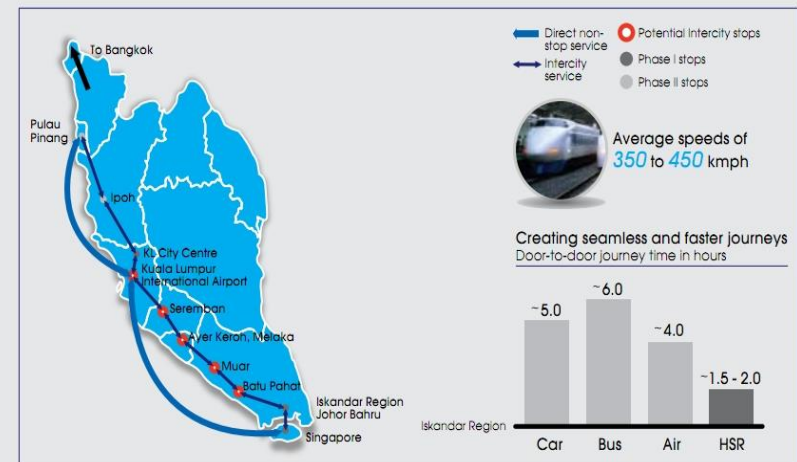
- Noise protection (vehicles or walls)
- Electrification
- “Pallet-flow rail car”



## Infrastructure

- High speed rail
- Rail corridors for seaport hinterland connections
- Technologies to facilitate international rail freight transport (“interoperability”)
- Efficient points of modal interchange
- Intelligent control systems (comparable to ETCS level 2 and better)
- Improve competitiveness for unitized and containerized cargo

High speed rail will provide non-stop services to major regional centres and intercity services



## Inland waterways

- Bring waterways to a sufficient standard for logistics, e.g. CEMT IV standard for waterways and locks
- Modern shipping technology
- Cleaner fuels
- Increase efficiency of ports (incl. communication system)
- Short and medium run: solid and liquid bulk
- Long-run: container transport and unitized goods

## Maritime

- Bring ports to a sufficient standard for logistics, e.g. facilities for container handling, ro-ro facilities
- Clean fuels
- Cold ironing (use of electricity while at berth)
- Modern port information systems to avoid idle time at ports
- Hinterland connections by inland waterways and freight rail

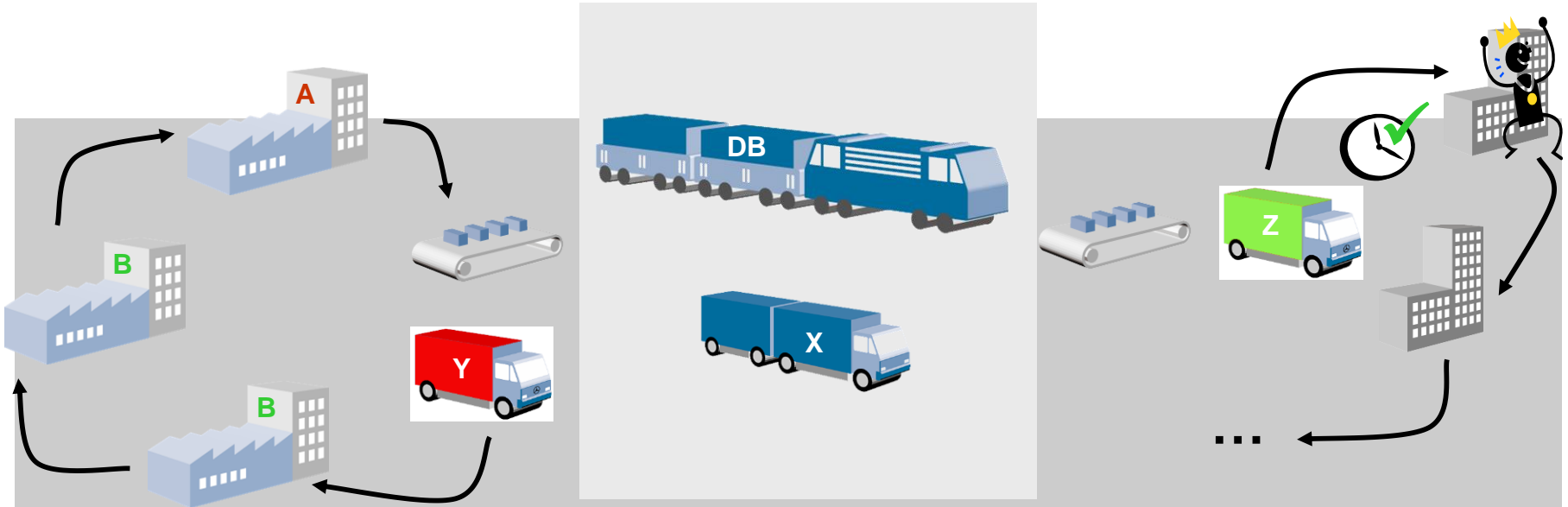
## Improving freight logistics

- Use of electronic tracking and tracing systems transport
- Urban logistics: optimization of delivery systems
- Synchronization of logistic processes
- Optimal tours and route guidance
- Combining milk runs with main runs
- Education of drivers and dispatchers

## Collaboration

- Shippers and forwarders
- Carriers (e.g. cross-docking, combining milk and main runs)
- 3 PL and 4 PL logistics (organizing logistics of several companies)
- Suppliers and holding company in larger supply networks

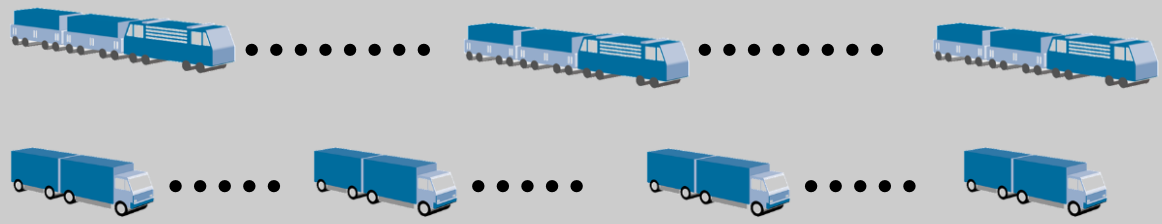
## Organization of freight centers



➔ Milk run sourcing

➔ Intermodal main run on long distance

➔ Milk run distribution



➔ Synchronized transport using intermodality and cross docking

- Intelligent Freight Systems are a necessity in a modern economy
- Aligning public and private sector goals creates win-win
- Policy makers set the “North” and let private sector work out how to get there in the cheapest and quickest way
- Ample improvement opportunities for a more efficient and environmentally sustainable freight sector in Asia: policies are critical to realize these



**THANK YOU**

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