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Efficiency and Organization of Port-Oriented International Supply Chains

Dr Tengfei WANG

Economic Affairs Officer
Transport Division

UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

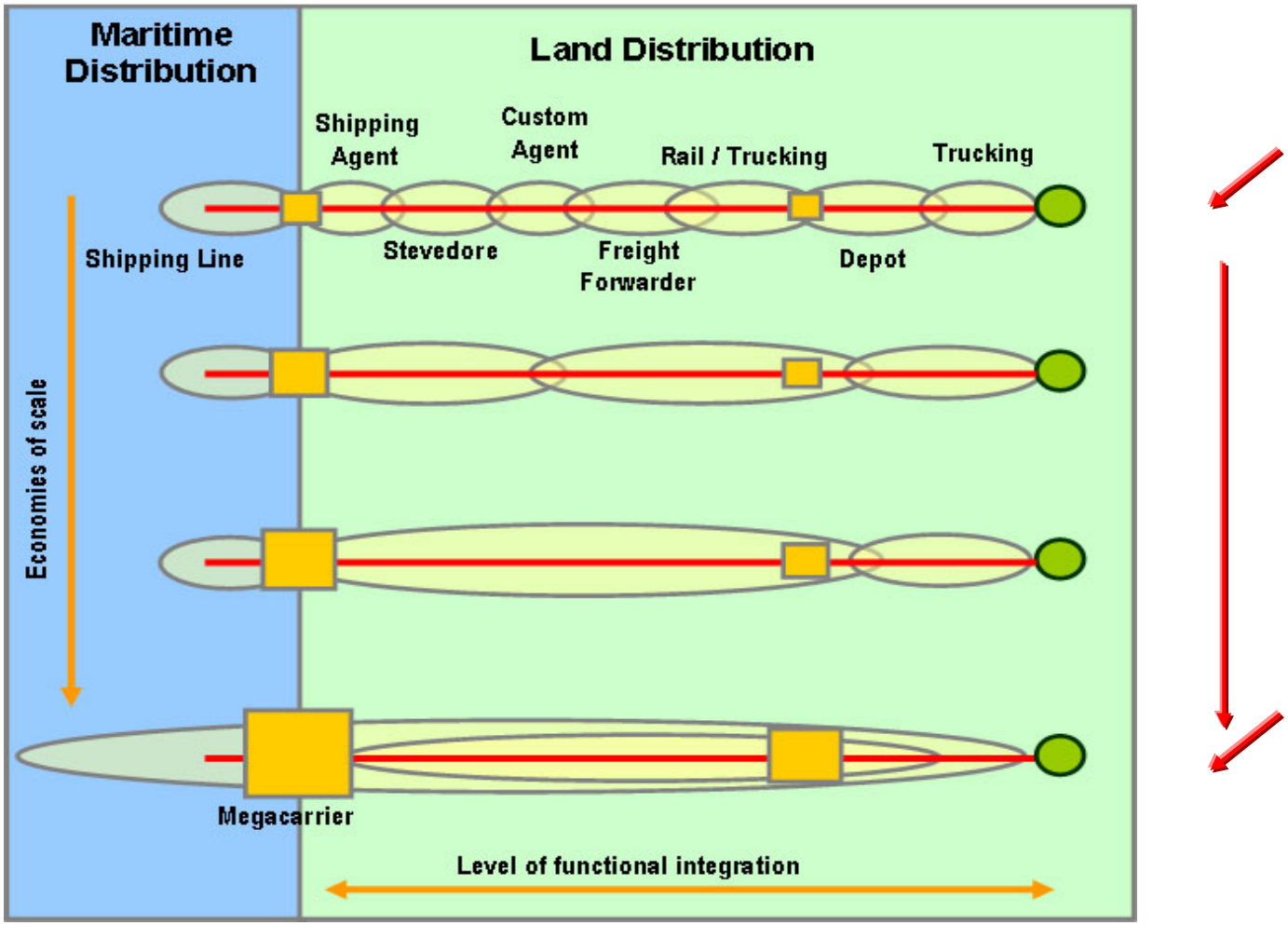
Outline of Presentation

- *To present a snapshot of the role of port in international supply chains*
- *To introduce ESCAP Time/Cost – Distance Methodology*

Background

- Although the importance of inland transportation and port operation to the efficiency of international supply chain has been discussed in existing studies, empirical analysis in this area is still insufficient and real data need to be collected for analysis.
- It has been widely agreed that the organization of supply chains including the organization relationship of the players in the supply chains can have impacts on the efficiency of supply chains, however, empirical study of port-oriented study supply chain is still inadequate.

Evolution of global supply chains



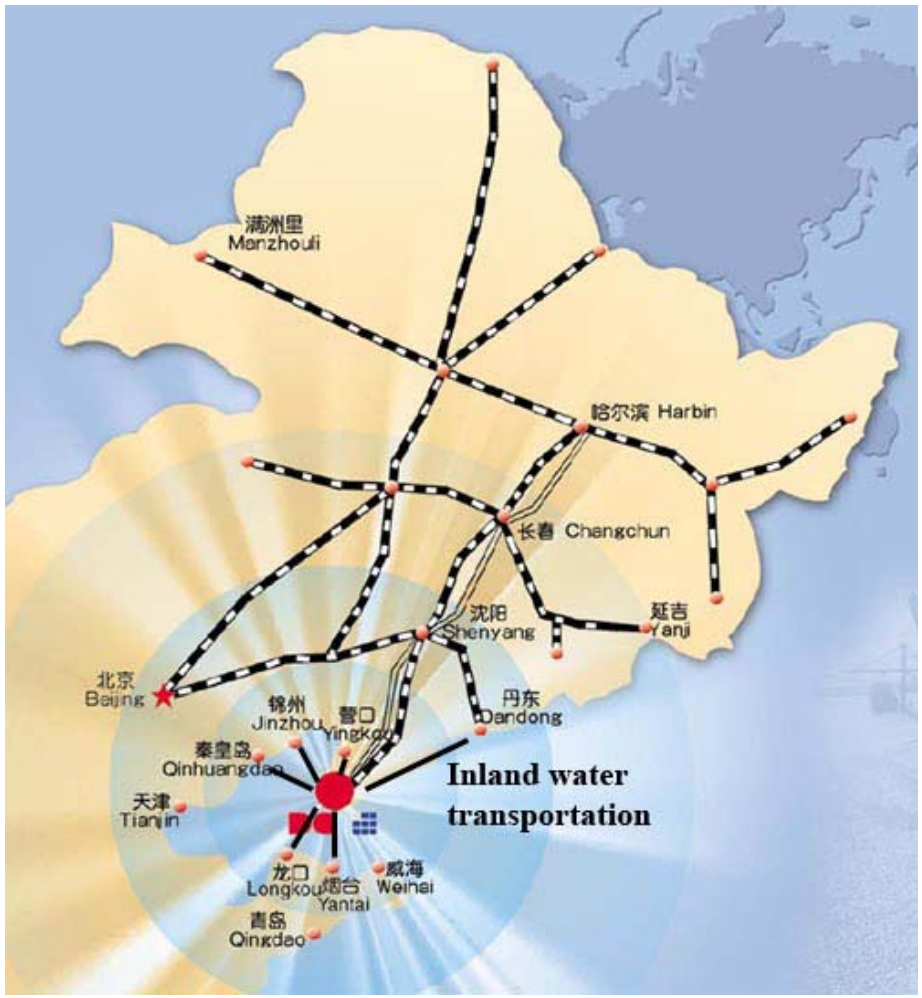
Source: Robinson, 2002

Research Objectives and Scope

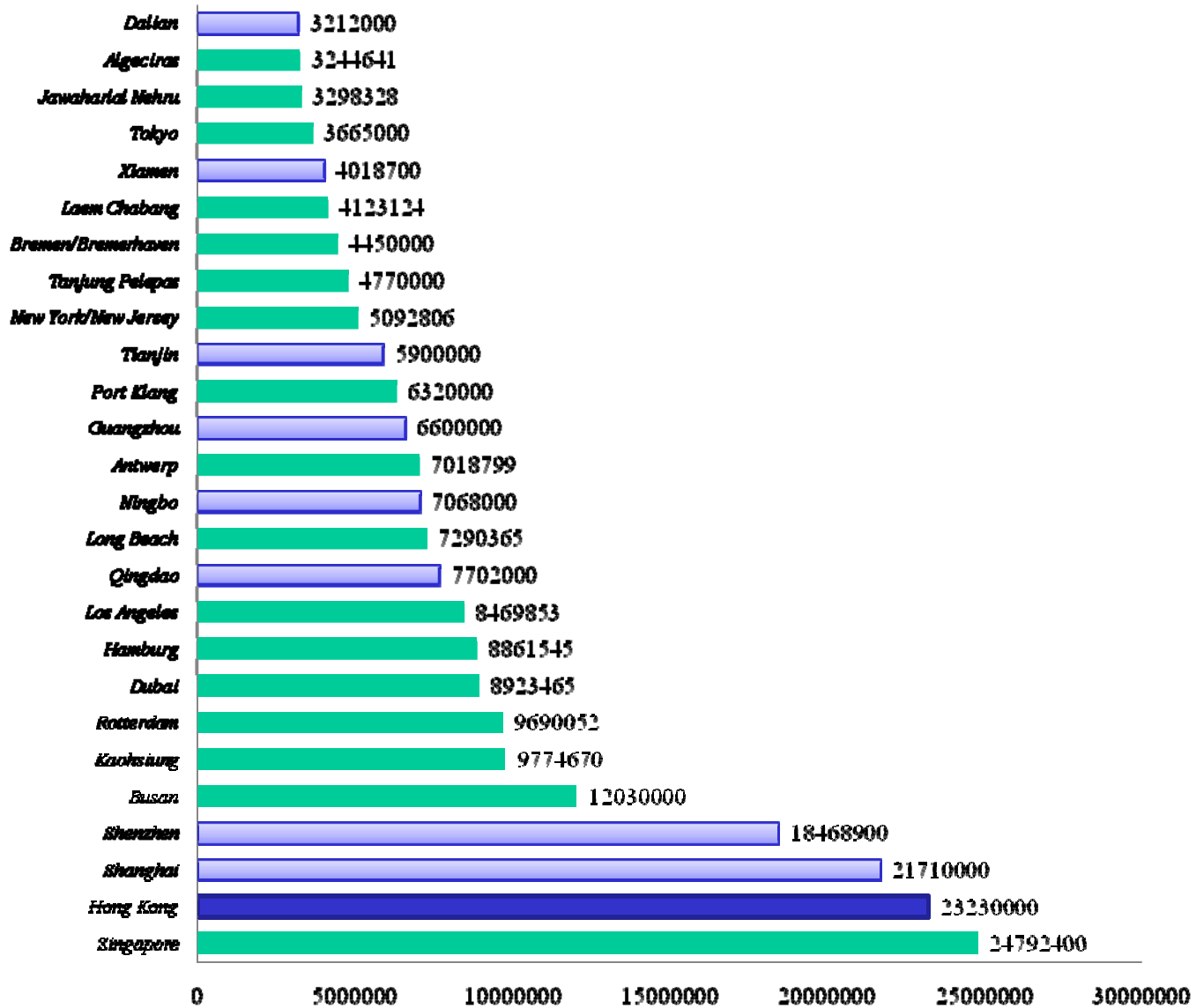
- This paper aims to study the efficiency and organization of port-oriented international supply chain originating from China.
- The port selected for this analysis is the Port of Dalian in northeast China.

Geographic location of Port of Dalian

The main hinterland of port of Dalian and the railway and inland waterway network



Globally: the 26th largest container port in the world in 2006 (CI online)



Questionnaire survey

- In order to study the lead time and cost associated with different processes and organization of supply chains, a questionnaire was designed and sent to 100 shippers who have frequently used DCT for cargo transshipment.
- 21 valid replies have been received. The following analysis is based on these 21 useful feedbacks.

Data analysis

Cost distribution in international supply chains

	Sea shipping		Inland Transportation		Port (including cargo handing and other costs	
	Costs (US$)	Percentage of the total costs	Costs (US$)	Percentage of the total costs	Costs (US$)	Percentage of the total costs
Average	1788	80%	259	11%	143	9%
Minimum	380	54%	50	3%	102	3%
Maximum	2950	91%	1225	30%	170	25%

Time distribution in international supply chains

	Sea shipping		Inland Transportation		Port	
	Time (days)	Percentage of the total time	Time (days)	Percentage of the total time	Time (days)	Percentage of the total time
Average	27.2	85%	1.2	5%	3.2	10%
Min	4	67%	1	2%	1	3%
Max	45	94%	2	17%	12	26%

Organization of supply chain

- Most shippers reported that they still needed to deal with different types of companies within the supply chains such as liner shipping companies, inland transportation and port companies.
- A few shippers reported that they rely upon the freight forwarders for logistics arrangement.
- Inland distribution of containers were conducted by different local companies which are small in scale.
- None of the fifteen liner shipping companies have been involved in inland cargo distribution.

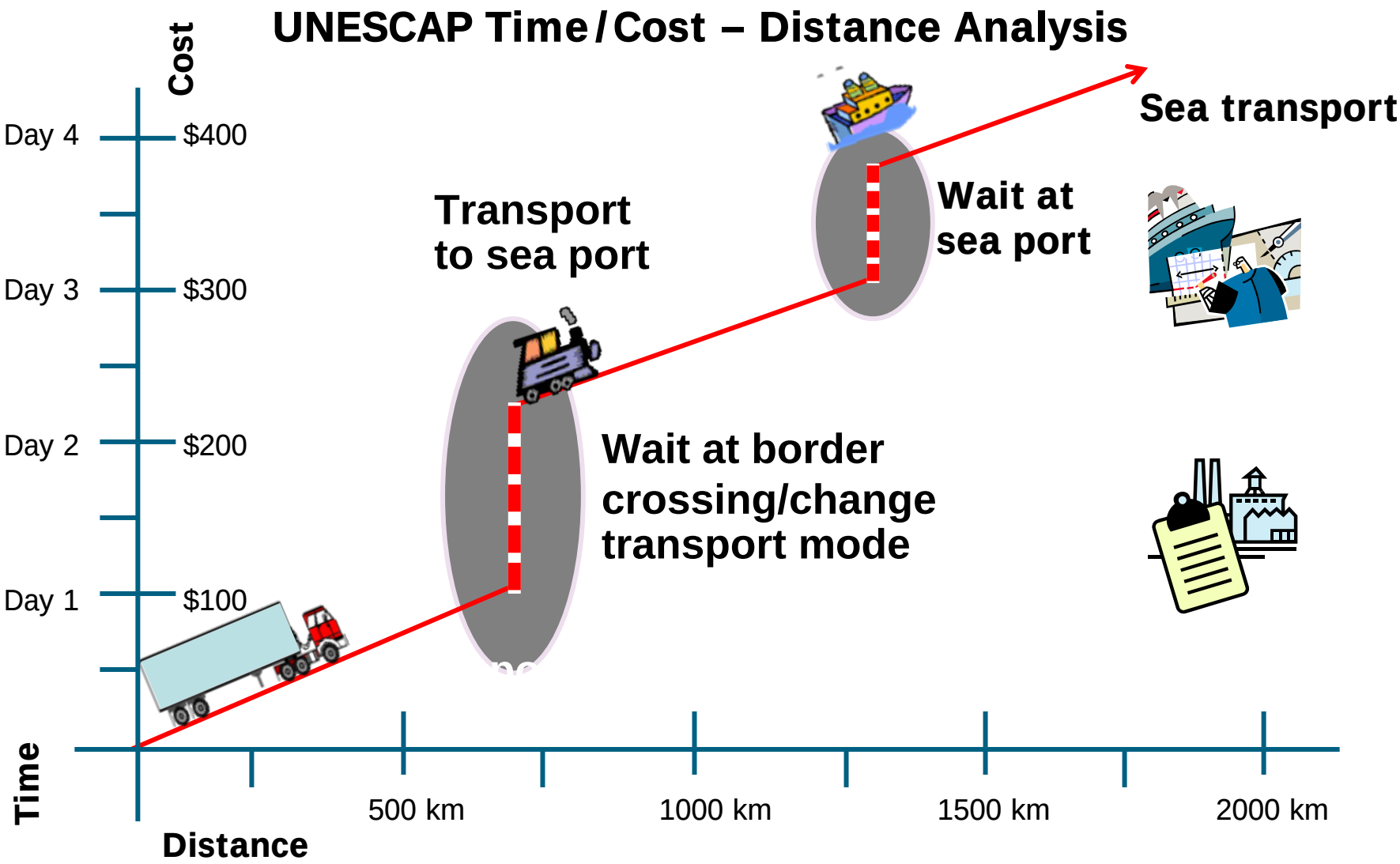
Discussions

- *In a traditional industrial society the transportation chain of goods from the producer to the final user was normally divided into several parts. Shippers rarely cared about onward transport matters in the receiver's country and receivers paid little attention to the pre-forwarding costs before their cargoes reached the ship's rail.*
- *This is no longer the way people look at their cargo transportation today.*
- *It is now the total or integrated transportation chain matters. From the buying of raw materials at the site of their production to the delivery of products to the warehouse of the receiver, production, transportation, storing, distribution, information are all integrated into one unique network. When arranging cargo movement within the network, only the cost and efficiency of the integrated transportation/distribution chain are taken into account.*" (UNCTAD, 1992)

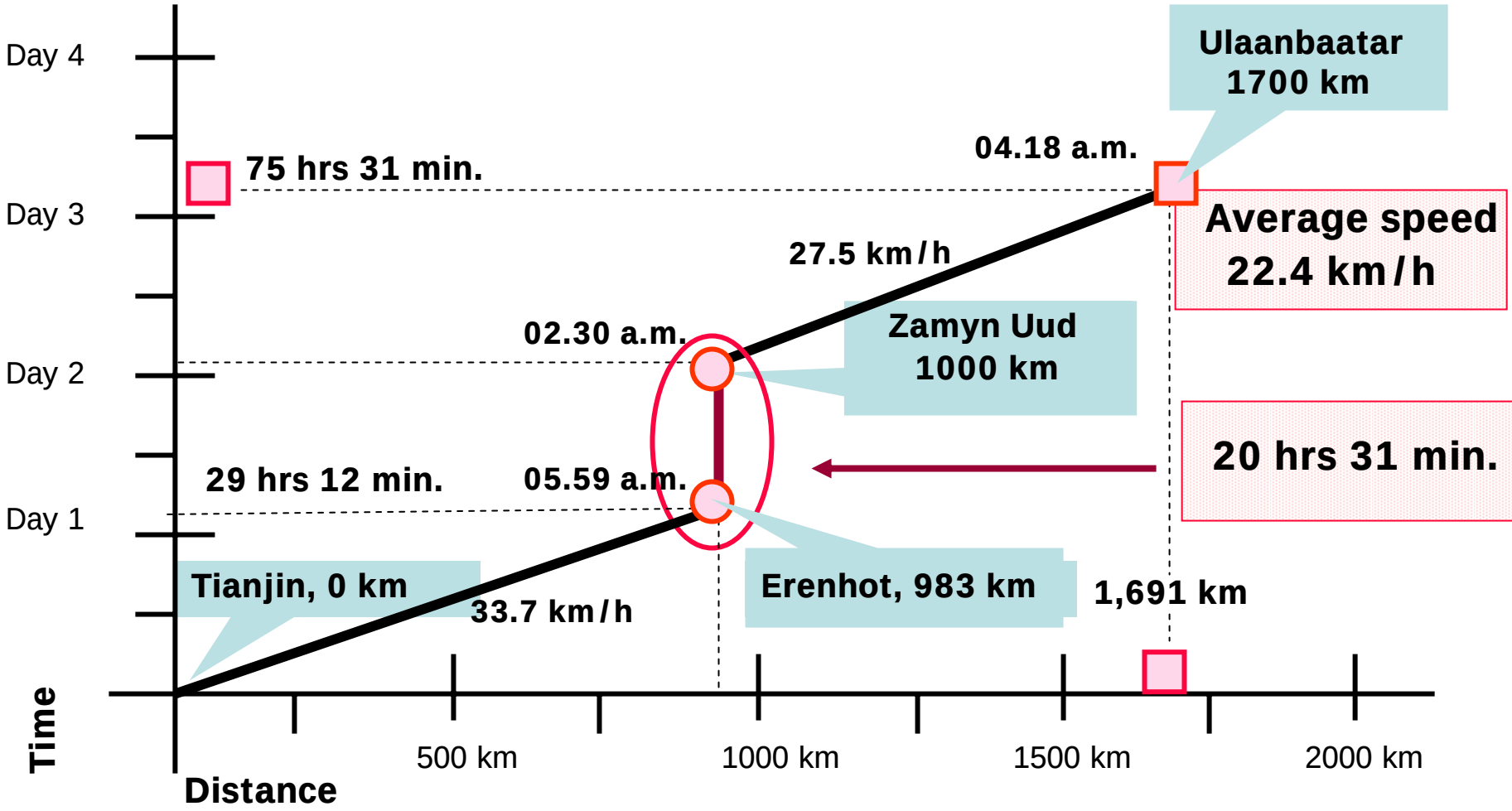
Assessing Efficiency of Major Routes

- The “UNESCAP Time/Cost – Distance Methodology” is the graphical and analytical representation of cost and time data associated with transport routes.

A Tool to Analyse Bottlenecks



Example: Tianjin-Ulaanbaatar Railway link



- Transshipment: 3 hrs. 20 min. *(3.5 min. per box)*
  Shunting + train formation: 3 hrs. 35 min.
- Customs: China, 3 hrs. 00 min.
  Mongolia, 4 hrs. 50 min.