Summary

Container traffic has been a growing mode of traffic for decades. Containerisation is a business with severe competition between shipping lines as well as container ports. This has led to a lot of secrecy in sharing information on port characteristics. This report provides an overview of the different characteristics of the container harbours and shows relationships between these characteristics.

The overview consists of 18 ports divided over 6 regions. The characteristics are categorised by local circumstances, management and operation and technical functions. With aid of this overview relations are found between local circumstances and the choice in transport systems at the container harbours.

The characteristics with regard to containerisation depend on global circumstances. The main global circumstance that has affected and given rise to containerisation is globalisation. Due to globalisation effects the shipping lines have consolidated in alliances, reshaped their service networks and employed larger vessels.

The local circumstances differ per region, country or port. Regions are characterised by their port and hinterland systems and by additional local circumstances. For instance, North America and North Europe both have highly developed hinterlands compared with China and the Rest of Asia. To compensate for this the regions in the Rest of Asia attract a large amount of transhipment cargo, for which no hinterland is needed.
The countries are characterised by the import/export relation and the wages of the workers. Most striking is the North American trade imbalance where the imports exceed the exports with a large difference. Mainland China shows relatively higher exports than imports. The countries in North Europe have the highest wages while in Mainland China and Malaysia the lowest wage levels are found.
The ports are characterised by yearly throughputs, harbour layout and modal split and transhipment. The highest throughputs and new harbour developments are found in Asia. The largest modality variation is found in North Europe. The selected ports in the Mediterranean and Middle East have a large part of transhipment trade.

At management and operation level the ports try to adjust themselves to the changes made by the shipping lines due to globalisation. They want to attract the shipping alliances,

accommodate an increase in vessel size and attract transhipment cargo in order to avoid the risk of being excluded by the shipping lines from their networks. At management and operation level this is established by privatisation, attract transhipment, develop a hinterland base, improve terminal facilities and offer extra services.

The technical functions of the container harbours are subdivided by the three main areas within a container terminal: quay area, storage area and gate area. The quay area consists of berths and quay cranes. When berth depths and crane sizes are quantified it is observed that river ports tend to have less berth depths and transhipment ports have relatively larger cranes. It is also observed that some ports have inadequate depths for their cranes sizes or vice versa.
The storage area consists of the storage yard and transfer equipment. This section researches with which transfer equipment the container terminals in the selected ports operate. Often a combination of transfer equipment is used. Six different combinations, called terminal concepts, are recognised and schematically provided with their respective properties.
The gate area consists of transfer equipment and facilities. Here containers are transferred onto three modalities of road, rail and inland waterways.

Direct relationships are found between the local circumstances and the choice in transport systems at the container harbours. The properties of the transport systems at the quay area that can be influenced are berth depth and crane size. These properties are e.g. influenced by natural conditions and the degree of transhipment cargo.
At the storage area the properties that can be influenced are the throughput capacity, space utilisation, technological advancement and flexibility. These properties are e.g. influenced by wages, environment and labour unions.
At the gate area the choice in equipment is influenced by the modal split at the selected ports.
Indirect relationships between local circumstances and choice in transport systems are found by efficiency parameters. Efficiency parameters show indirect relations between the local circumstances and the choice in transport systems. Three efficiency parameters are used: the Gross Throughput Density, the Average Crane Activity and the Crane-Depth Factor. These efficiency parameters show that most local circumstances are interconnected and that a combination of these circumstances leads to the final choice in transport equipment.