

CHAPTER X

**TRANSPORTATION
&
LOGISTICS**

10.1 Transportation

10.2 Suitable methods of transportation

10.3 Warehousing

10.4 Logistics



Concepts & Issues that emerge from the content

- ❖ Transportation
 - + Introduction
 - + Elements of transportation
 - + Methods of transportation
 - + Advantages & disadvantages of different methods
 - + Importance
- ❖ Suitable method of transportation
 - + Factors considered when selecting a method
 - + Characteristics of an efficient method
 - + Trends
- ❖ Warehousing
 - + Introduction
 - + Factors considered when locating one
 - + Storage of goods
 - + Movement of goods
- ❖ Logistics
 - + Introduction
 - + Necessity & benefits

"Transportation is the center of the world! It is the glue of our daily lives. When it goes well, we don't see it. When it goes wrong, it negatively color's our day, makes us feel angry & impatient & curtails our opportunities".

- Robin Chase





TRANSPORTATION - INTRODUCTION

What is a Transportation?

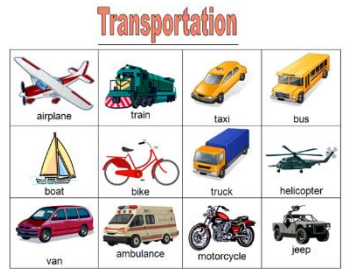
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Transportation today has become a vital & essential element in the business world, influencing major management decisions.

Note –



Why Transportation is so important?

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What are Elements / Components of Transportation?

1. Way

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2. Mode

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Ex –





3. Power

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Ex –

4. Terminal

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Ex –

5. Operation

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Ex –

What are the “Qualities” of a good transportation system?

1. Speed

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2. Safety

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3. Cost

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4. Capacity

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5. Availability

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6. Standards

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7. Legality

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What are the factors considered by a Businessman when selecting a suitable method of transportation?

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How can we compare benefits of each ways & its modes with qualities?

Rank	Cost	Speed	Safety	Capacity	Availability	Accessibility
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2						
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The options are; Pipelines, Railways, Highways, Airways & Waterways.

How is the transportation system in Sri Lanka working?

Being an island, Sri Lanka offers a diverse variety of transportation options, which can be given as follows;

1. Highway Transportation

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2. Waterway Transportation

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3. Airway Transportation

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4. Railway Transportation

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What is Highway Transportation?

This is a land based road network connecting many locations. The roads can be made of tar, concrete, gravel, bricks or any other means. Even though highways generally mean roads, in Sri Lanka highways are referred as the high speed expressways.

The majority of the transportation in Sri Lanka is done using highways & the system is comprised of the “Public” transport service & the “Private” transport service. Approximately 40% of the passenger transport in Sri Lanka is handled by the public sector mainly the “Sri Lanka Central Transport Board (SLCTB)” where the remaining 60% is provided by the private sector. In the goods transportation sector, above 80% is provided by the private sector.

The current percentage of modes contributing to the passenger transportation system in Sri Lanka can be given as follows as an estimate;

- + Busses –
- + Trains –
- + Personal vehicles & taxis –



Even though majority of transportation in Sri Lanka is done using highways, those road networks of most places are not at a satisfactory state due to;

- ✓ Increasing number of vehicles
- ✓ Increased usage of roads
- ✓ Non-maintenance of roads
- ✓ Non-expansion of roads
- ✓ Increased traffic congestions

What are the authorities responsible for Highway Transportation in Sri Lanka?

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What are reasons for SLCTB bus service in Sri Lanka to be inefficient?

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What suggestions can you make to improve SLCTB bus service in Sri Lanka?

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What are the advantages of highway transportation? (Reasons to be popular)

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What are the disadvantages / weaknesses of highway transportation?

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How will high-speed expressways contribute to the efficiency of the transportation system?

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What can be done to minimize the Traffic congestions in Highway transportation?

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What are improvements that have taken place in highway transportation in the recent years?

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WHOMYS



What is Railway Transportation?

This is the transportation done by a mode using a track placed on a road as its way, where the mode would move on that given track. The mode is called the train which comprises of an engine that pulls & compartments that carry passengers &/or cargo. The engine can be powered by steam, diesel, electricity, magnetic power etc.





Railways in Sri Lanka are a heritage than a transport system, which was built by the British. It has spread to quite a limited area of 1445km but whereas on about 1200km are being used at present. In Sri Lanka the 2 main authorities responsible for Railway transportation are;

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Railways in Sri Lanka contribute to about 5% of passenger transportation & sadly about 1% of goods transportation mainly due to competition from the highway transport options & lack of competitiveness of the department.

What are the reasons as to why Department of Railways in Sri Lanka are not doing well?

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What are the advantages of Railway Transportation?

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What are the disadvantages of Railway Transportation?

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What are improvements that have taken place in Railway transportation in the recent years?

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What is Waterway Transportation?

This is the transportation done by ships, vessels, boats etc using water as its way. The way can internal or external where the mode would travel on water transporting passengers & goods. This is considered to be the cheapest & widely preferred due to its loading capacity.



Being an island, Sri Lanka takes the liberty of enjoying waterway transportation while being gifted by some natural harbors like Colombo, trincomalee, galle, oluvil, kankasanturei etc. while hambantota is the latest addition.

Mostly waterways in Sri Lanka are used for international trade while domestic waterways serves at a small scale.

What are the authorities responsible for waterway transportation in Sri Lanka?

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What are the advantages of Waterway transportation?

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What are the disadvantages of Waterway transportation?

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What is Airway Transportation?

This is the transportation done by aircrafts using the airspace as its way. This is considered the fastest



& the most popular especially at international transportations. The national airline of Sri Lanka is "Sri Lankan Airlines" while the country has 2 international airports at Katunayake (BIA) & Mattala (MRIA).

Airway transportation is mostly used for international transportation while, used at a

very small scale domestically mainly by the Sri Lanka Airforce.

What are the responsible authorities for Airway transportation in Sri Lanka?

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What are the advantages of Airway Transportation?

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What are the disadvantages of Airway Transportation?

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What is Cableway Transportation?

This is a land based route network where two locations are connected by cables, where the mode would travel on this high capacity & heavy duty cable.

In Sri Lanka there are no major commercial scale cable car networks at present but there is evidence that it was used in tea estates during the British era to transport tea from the field to the factory. Even though this is the case in Sri Lanka, in many other countries it's used heavily mainly as a tourist attraction.



What are the advantages of Cableway transportation?

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What are the disadvantages of Cableway transportation?

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What is Pipeline transportation?

This is a system where the 2 terminals are connected by a pipeline where only goods are sent using pressure as the power. In Sri Lanka it's used by Ceypetco to transport crude oil & by Prima to transport wheat. Even though it has a huge initial setup cost, the benefits are derived in the long run.



What are the advantages of Pipeline transportation?

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What are the disadvantages of Pipeline transportation?

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What is a Courier Service?

A delivery service provided by a Courier company which delivers messages, packages & mail & is known for their speed, security, tracking service & specialization. A courier service was developed to offer a faster & more secure alternative to the usual postal mail service that had been the only delivery service for so many years.



It is used a lot today since it is Fast, door to door, local or international, pickup & delivery service for high-value goods or urgently required documents. The courier companies can be basically categorized as;

1. Domestic / Local Courier companies ~
2. International Courier companies ~





What are the reasons for the popularity of Courier service today?

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What are the disadvantages of a courier service to a user?

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WAREHOUSING – INTRODUCTION

What is Warehousing?

Warehousing is a process of storing & preserving stocks from the time of purchasing or manufacturing until they are sold, used or distributed. In other words; it is a planned space for the storage & handling of goods & materials. Warehousing is integrated with “Inventory Management”.



What are the steps in the Warehousing process?



1. Receipt of stocks
2. Identification
3. Inspection
4. Verification
5. Ensuring quality
6. Putting away
7. Retrieving for issue

What are the factors considered when selecting a Warehouse?

1. Storage capacity
2. Nature & type of items stored
3. Nature & type of machinery & equipment needed





4. Storage time period
5. Needs for sorting, packing, labeling etc
6. Road access & parking facilities
7. Loading & unloading platforms
8. Security of the surrounding

What are the factors considered when locating a Warehouse?

1. Cost – Setup & Maintain
2. Closeness / Proximity to the ports
3. Building layout & flow
4. Zoning & intensity of use
5. Nature of materials
6. Material holding & handling capabilities
7. Legal factors & issues
8. Level of security & protection & its assurance
9. Availability of labour
10. Floor weight capacity

What are the types of Warehouses found?

Private Warehouse

This type of warehouse is owned and operated by channel suppliers and resellers and used in their own distribution activity. For instance, a major retail chain may have several regional warehouses supplying their stores or a wholesaler will operate a warehouse at which it receives and distributes products.

Public Warehouse

The public warehouse is essentially space that can be leased to solve short-term distribution needs. Retailers that operate their own private warehouses may occasionally seek additional storage space if their facilities have reached capacity or if they are making a special, large purchase of products. For example, retailers may order extra merchandise to prepare for in-store sales or order a large volume of a product that is offered at a low promotional price by a supplier.

Automated Warehouse

With advances in computer and robotics technology many warehouses now have automated capabilities. The level of automation ranges from a small conveyor belt transporting products in a small area all the way up to a fully automated facility where only a few people are needed to handle storage activity for thousands of pounds/kilograms of product. In fact, many warehouses use machines to handle nearly all physical distribution activities such as moving product-filled pallets (i.e.,





platforms that hold large amounts of product) around buildings that may be several stories tall and the length of two or more football fields.

Climate-Controlled Warehouse

Warehouses handle storage of many types of products including those that need special handling conditions such as freezers for storing frozen products, humidity-controlled environments for delicate products, such as produce or flowers, and dirt-free facilities for handling highly sensitive computer products.

Distribution Center / Goods in Transit Warehouse

There are some warehouses where product storage is considered a very temporary activity. These warehouses serve as points in the distribution system at which products are received from many suppliers and quickly shipped out to many customers. In some cases, such as with distribution centers handling perishable food (e.g., produce), most of the product enters in the early morning and is distributed by the end of the day.

Government Warehouse

This is the warehouse owned & maintained by the government especially in Airports & Harbors adjoining the customs department. The 2 types of warehouses here can be normal warehouse & bonded warehouse

What are ways of storing items in a Warehouse?

- 1. Pallet Racking

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- 2. Block Stacking

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- 3. Pallet Flow

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- 4. Push-back Racks

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5. Mezzanine

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6. Automated Storage Systems

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What are the advantages of a well-organized Warehousing System?

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LOGISTICS – INTRODUCTION

What is Logistics?

Logistics is the process of planning and implementation of the flow of goods, services and relevant information forwards and backwards from the point of origin to the point of consumption efficiently and effectively with the aim of ensuring the fulfilment of consumer needs and wants.

A planned system of logistics is essential for the smooth flow of operational activities of a firm. There are two basic processes in such logistics systems.

- ✓ The movements of raw material or finished goods from the point of purchase to the point of production (Inbound logistics)
- ✓ The movement of supplying the products or relevant information from the end of the production process to the final consumers. (Outbound logistics)





What are the various types of logistics systems according to the nature of the firm or nature of the products?

Balanced
Logistics System

Heavy Inbound
Logistics System

Heavy
Outbound
Logistics System

Reverse
Logistics System

Why Logistics is very important in today's business world?

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What are the advantages of Logistics?

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TRANSPORTATION IN SRI LANKA

Transport in Sri Lanka is based on its road network, which is centred on the country's capital [Colombo](#). A rail network handles a portion of [Sri Lanka](#)'s transport needs. There are navigable waterways, harbours and two international airports: in [Katunayake](#), 22 miles (35 km) north of Colombo, and in Hambantota. Roads account for about 93 percent of Sri Lanka's land transport. In October 2013, there were 12,000 kilometres (7,500 mi) of A- and B-class roads and 151.8 kilometres (94.3 mi) of expressways.

Sri Lanka's roads are graded E, A, B and C.

Grade	Grade Description	Speed limit
E	High-speed, high-traffic expressways duplicating heavily-travelled A-Grade routes	100 km/h (62 mph)
A	The national highway network	70 km/h (43 mph) ^[1]
B	Major provincial roads used as feeders for A- and E-Grade roads	60 km/h (37 mph)
C	Local residential roads	50 km/h (31 mph)

Expressways

The [Colombo–Matara Expressway](#) is a 126-kilometre-long (78 mi) motorway linking [Colombo](#), [Galle](#) and [Matara](#) which was built in 2011 to develop the economy of the [Southern Province](#). Other expressways are under construction or proposed. The [Colombo–Katunayake Expressway](#), [Colombo–Kandy Expressway](#) and [Outer Circular Expressway](#) (Colombo bypass road) are under construction, and a Colombo–Padeniya expressway has been proposed. The Sri Lankan government has proposed three elevated highways connecting the three main expressways:

- From [Kirulapone](#) to [Kadawatha](#) (about 19 km), connecting the Outer Circular Expressway at Kadawatha and the Colombo–Katunayake Expressway at [Peliyagoda](#)
- From [Colombo Fort](#) to [Kottawa](#) (about 21 km), connecting the Colombo–Matara and Outer Circular Expressways at [Kottawa](#)
- From [Colombo Fort](#) to the Peliyagoda interchange on the Colombo–Katunayake Expressway (about 5 km)





Buses

[Buses](#) are the principal mode of public transport. Service is provided by the state-run [Sri Lanka Transport Board](#) (SLTB) and privately-owned buses. The SLTB has urban and rural routes; in many rural areas, it provides service which would be unprofitable for private operators.

Colombo has an extensive, bus-based public transport system, with the Central Bus Stand in [Pettah](#) as its hub. The city's road network consists of radial links (or arterial routes), which link the city and district centres, and orbital links intersecting the arterial routes. Most bus routes are on the radial links, without dedicated bus lanes due to high peak traffic volume. A [BRT](#) system for Colombo has been proposed but not yet implemented

Privately-operated Viking bus

Inter-city routes connect many of the country's major population centres. Some service is available on the E01 and E03 expressways, with modern [Lanka Ashok Leyland](#) buses.

In 2011, the SLTB began introducing new buses to replace part of its aging fleet. The Volvo 8400 buses, from Volvo India, run on major routes in Colombo. The most popular model is the Lanka Ashok Leyland Viking, which is operated by the SLTB and several private companies.



Rail

Rail transport in Sri Lanka consists of an [intercity network](#) connecting major population centres and [commuter rail](#) serving Colombo commuters. [Sri Lanka Railways](#) operates the country's railway network, which includes about 1,450 km (901 mi) of track. [Colombo](#) is its hub. Trains connect the main cities of the country's nine [provinces](#).

Most of the railways were developed during the British colonial period, with the first line (from Colombo to [Kandy](#)) opening on 26 April 1867. The railway was introduced as an economical means of transporting goods produced on the tea, rubber and coconut plantations to the main port in Colombo. After 1950s, the Sri Lankan economy became focused on industry rather than plantation agriculture. The road network also grew; with the introduction of lorries, a faster means of transporting goods, the amount of goods transported by rail declined. Since their network is more focused on plantation areas than on population and service centres, the railways have generated large losses.



Their potential for expansion was demonstrated when Minister of Transport [Leslie Goonewardena](#) extended the [coastal line](#) from Puttalam to [Aruvakalu](#) in 1974 to serve the cement factory there.^[19]

The railway is modernising and extending that line to facilitate faster trains and improved efficiency.^[20] [Electrification](#) of the network's busiest sections was proposed in 2010 to improve energy efficiency and sustainability, but no work was done. The railway is extending the coastal line from Matara to [Kataragama](#) via [Hambantota](#).

The Sri Lankan rail network passes scenic landscapes—particularly the Colombo-[Badulla](#) main line, which hugs the country's steep highlands. The railways connect the cities of Kandy, [Galle](#), [Matara](#), [Anuradhapura](#), [Gampaha](#), [Negombo](#), [Kurunegala](#), [Avisawella](#), [Kalutara](#), [Polonnaruwa](#), [Batticaloa](#),





[Trincomalee](#), [Badulla](#), [Gampola](#), [Nawalapitiya](#), [Matale](#), [Vavuniya](#), [Puttalam](#) and [Chilaw](#) with Colombo. Lines to [Jaffna](#), [Kankasanturai](#) and [Mannar](#) have been destroyed by [civil war](#).

The narrow-gauge [Kelani Valley Line](#), from Colombo to Avissawella, was converted to [broad gauge](#). The other [narrow-gauge](#) lines, from [Nanu Oya](#) to [Nuwara Eliya](#), [Avisawella](#) to [Yatiantota](#) and Avissawella to [Ratnapura](#) and [Opanayaka](#), were dismantled due to financial losses. In 2007, the Sri Lankan government announced plans for Matara-[Kataragama](#) (113 km), Padukka-[Hambantota](#)-Ratnapura (210 km), Kurunegala-Dambulla-Habarana (80 km) and Panadura-Horana (18 km) lines by 2014.

Air

Sri Lanka's international airports include [Colombo Bandaranaike International Airport](#), [Mattala Rajapaksa International Airport](#) and [Ratmalana International Airport](#), which is being renovated. [SriLankan Airlines](#) is the national airline. Founded in 1979 as Air Lanka, the airline changed its name when it received partial foreign ownership in 1998. It operates to Asia and Europe from its base at Bandaranaike International Airport in Colombo; the airline's main office is in the Airline Centre at the airport. The airline was scheduled to join the [Oneworld](#) alliance in 2013. SriLankan flies to 62 destinations in 34 countries.

Bandaranaike International Airport is in [Katunayake](#), 35 km (22 mi) north of Colombo. Mattala Rajapaksa International Airport is in Mattala, north of Hambantota. After its renovation, Ratmalana Airport will resume international flights after a half-century absence. Flights connect the airport in [Ratmalana](#) to domestic destinations. Domestic operators are [Deccan Aviation Lanka](#), Deccan Helicopters, Senok, Helitours and [Cinnamon Air](#). Sri Lanka has 19 airports.

Ports and harbours

Colombo Port

Sri Lanka has deep-water ports at [Colombo](#), [Hambantota](#), Galle and Trincomalee. Colombo has the highest cargo volume, with an estimated capacity of 5.7 million [TEUs](#). The port began a large-scale expansion project at a cost of US\$1.2 billion in 2008 to increase its capacity and capabilities. The project, headed by the Sri Lanka Ports Authority and built by the Hyundai Engineering and Construction Company, was expected to be completed by 11 April 2012. It consists of four new 1,200-metre-long (3,900 ft) terminals which can accommodate three berths each, alongside a depth of 18 m (59 ft) (which can be deepened to 23 m [75 ft]). The channel width of the harbour will be 560 metres (1,840 ft) and its depth 20 metres (66 ft), with a harbour-basin depth of 18 metres (59 ft) and a 600-metre (2,000 ft) turning circle. The project was expected to increase the annual container-handling capacity to about 12 million TEUs and accommodate 12,000-TEU container vessels.

Hambantota Port

Construction of [Magampura Mahinda Rajapaksa Port](#) (also known as the Port of [Hambantota](#)) began in January 2008. It will be Sri Lanka's second-largest largest port, after Colombo. The port will serve ships travelling along one of the world's busiest [sea lanes](#): the east-west route running 6 to 10 nautical miles (11 to 19 km; 6.9 to 11.5 mi) south of Hambantota. The first phase of the port will consist of two 600-metre (2,000 ft) general-purpose berths, a 310-metre (1,020 ft) bunkering berth and a 120-metre (390 ft) small-craft berth. The port will also contain a bunkering facility and tank farm, which will include eight tanks for marine fuel and three tanks each for aviation fuel and





liquefied petroleum gas (LPG). A 15-floor administrative complex will also be constructed as part of the project. Later phases will raise the port's annual capacity to 20 million TEUs, making it the largest port constructed on land in the 21st century.

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