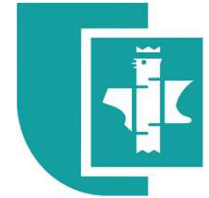




Zachodniopomorski Uniwersytet Technologiczny
w Szczecinie



West-Pomeranian University of Technology in Szczecin

Faculty of Maritime Technology and Transport

Department of Logistics and Transportation Economics

Lecture topic: *Intermodal transportation technologies*

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Content:

- Szczecin city
- Field of study: TRANSPORT
- Department of Logistics and Transportation Economics
- Container loading unit characteristics
- Intermodal transportation technologies
- Conclusions/discussion

Container loading unit characteristics



Logistics Challenges

How quickly and safely carry such products as bananas?

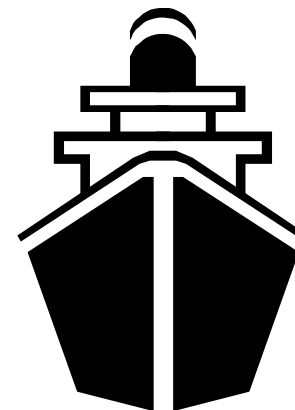
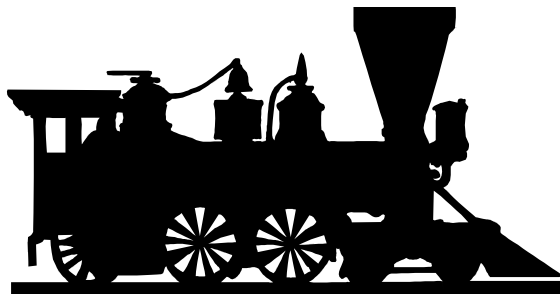
How to pack a product not lose its quality during transport?

How to transport the product cheaply as well as make the customer satisfied?



Intermodal transport

- *Intermodal transport* deals with carrying freight using specially designed units that can easily be overloaded between several transport modes: road, rail, inland waterways, open seas, air.



Intermodal Loading Unit (ILU)

There is a great variety of unit types available, allowing a wide choice of cargo to be carried:

- Containers,
- Standard lorries,
- Swap bodies,
- Standard height semi-trailers itp.



Dimensions of ISO containers

Typ kontenera	Długość		Szerokość		Wysokość		Maksymalny ciężar kontenera	
	stopy	mm	stopy	mm	stopy	mm	kg	
2AA	49	14953	8,6	2595	8,6	2691	30480	
2AAA	49	14953	8,6	2595	9,6	2896	30480	
1 A	40	12192	8	2438	8	2438	30480	
1AA	40	12192	8	2438	8,6	2591	30480	
1AAA	40	12192	8	2438	9,6	2896	30480	
1AX	40	12192	8	2438	<8	<2438	30480	
1B	30	9125	8	2438	8	2438	25400	30480a
1BB	30	9125	8	2438	8,6	2591	25400	30480a
1BBB	30	9125	8	2438	9,6	2896	25400	30480a
1BX	30	9125	8	2438	<8	<2438	25400	30480a
1C	20	6058	8	2438	8	2438	24000	30480a
1CC	20	6058	8	2438	8,6	2591	24000	30480a
1CX	20	6058	8	2438	<8	<2438	24000	30480a
1CY	20	6058	8	2438	9,6a	2896a	24000	30480a
1D	10	2991	8	2438	8	2438	10160	
1DX	10	2991	8	2438	<8	2438	10160	

Containers classification

In terms of functionality there are five basic types of containers:

- *general cargo containers,*
- *thermal containers (reefer containers),*
- *tank containers for liquids and gases,*
- *non-pressurized containers for dry bulk,*
- *platform containers.*



General cargo containers



FEU

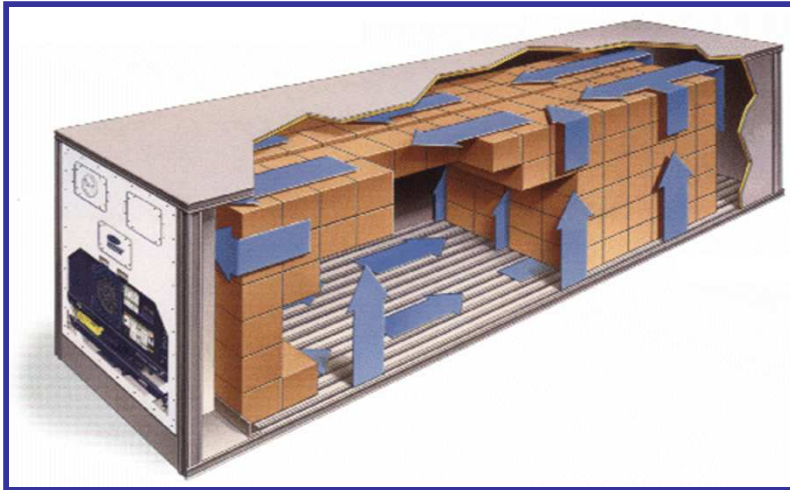
TEU



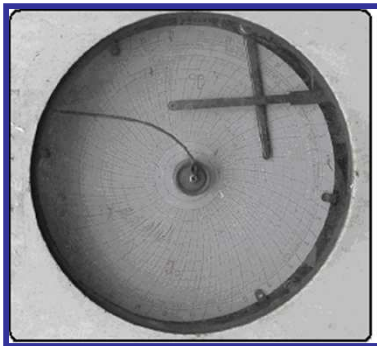
Types of universal containers



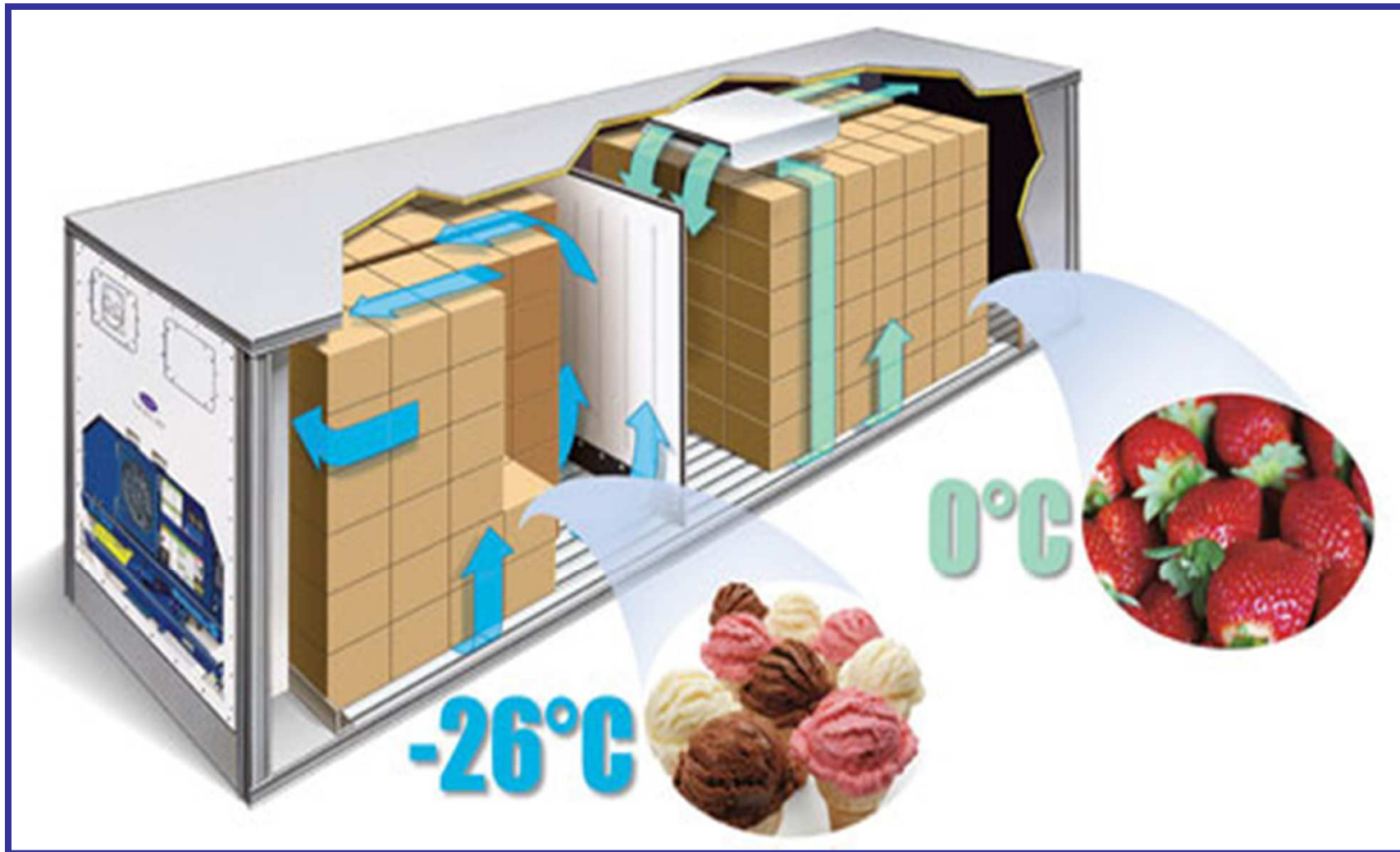
Refrigerated container



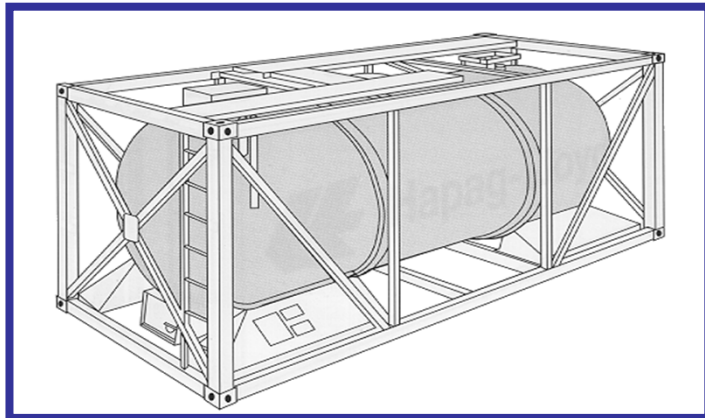
Thermographs: mechanical and electronic



Modern models of refrigerated containers

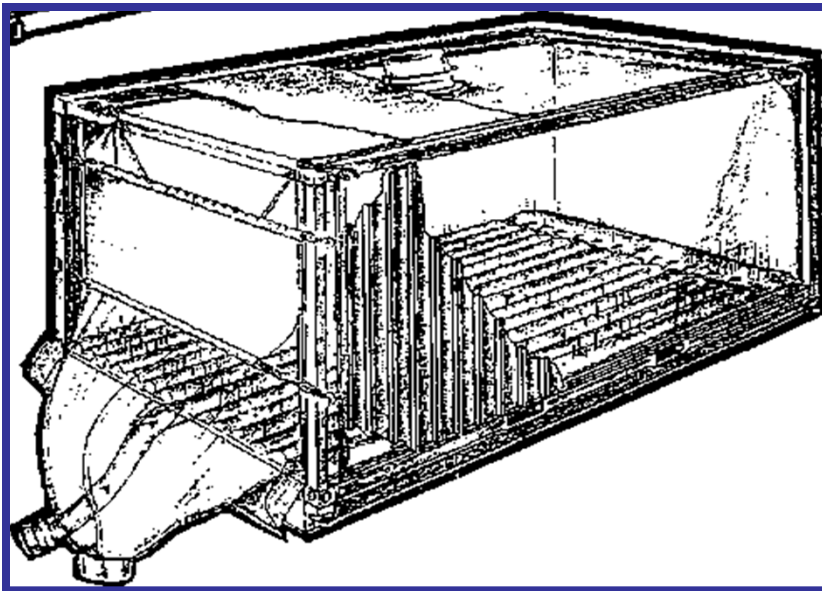
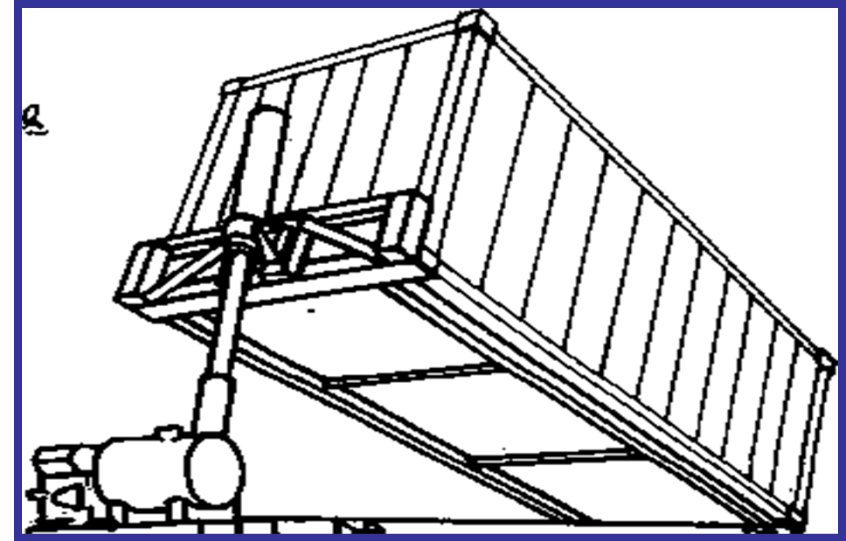


Tank containers



Containers for dry bulk

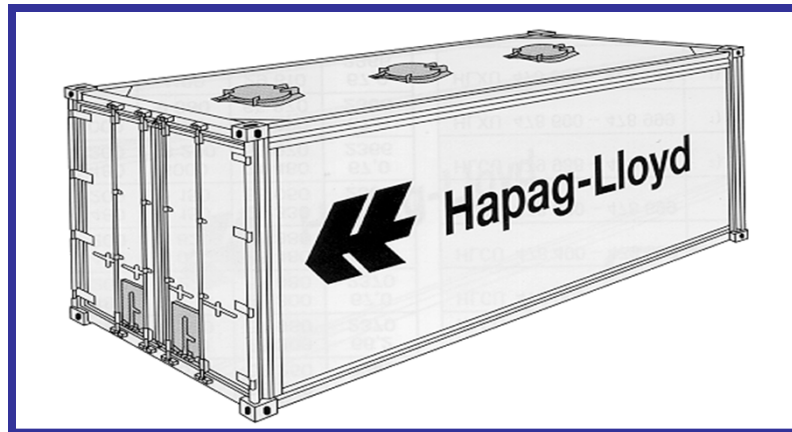
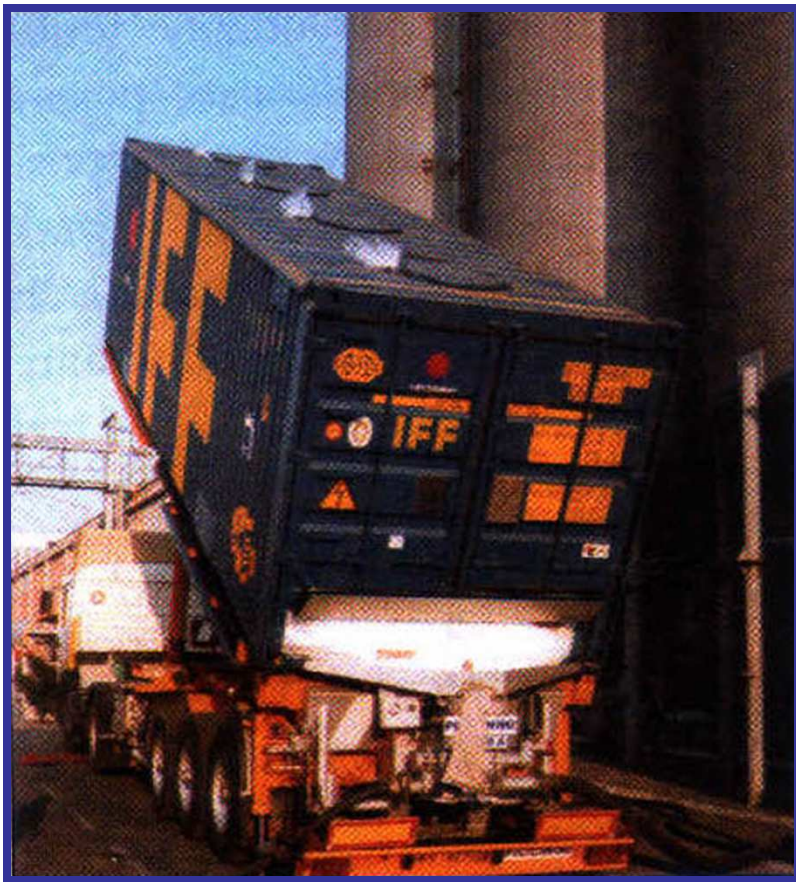
Unloading a container with a loose cargo using a hydraulic lift



Container with insert polyethylene fabric, facilitating unloading



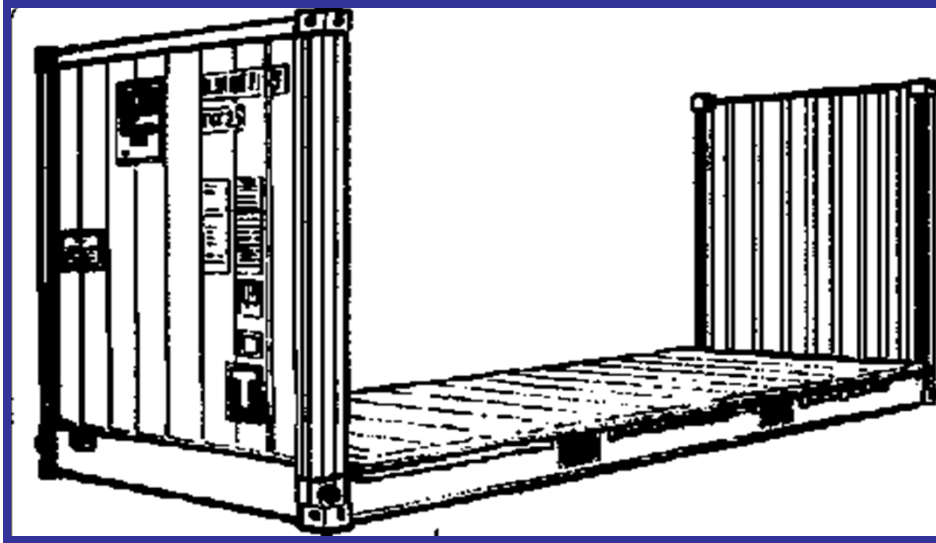
Containers for dry bulk



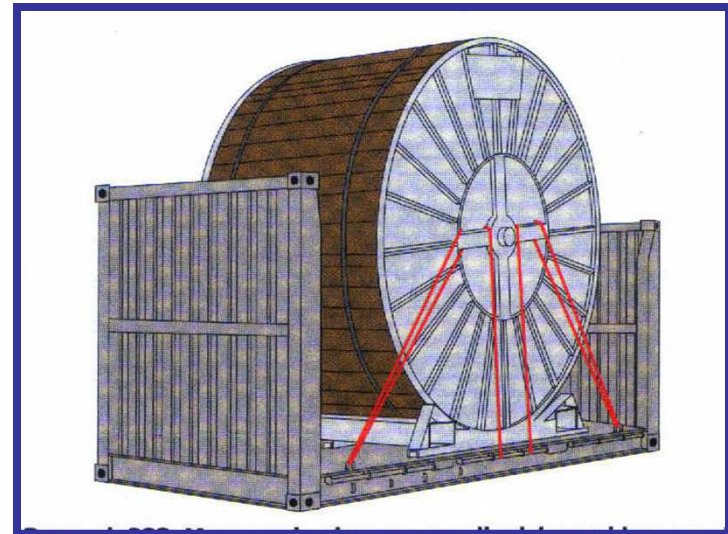
The container with loading holes in the roof and unloading openings in the bottom of the door



Platform containers



Container with base plate without a roof and side walls



Examples of loading and unloading a container

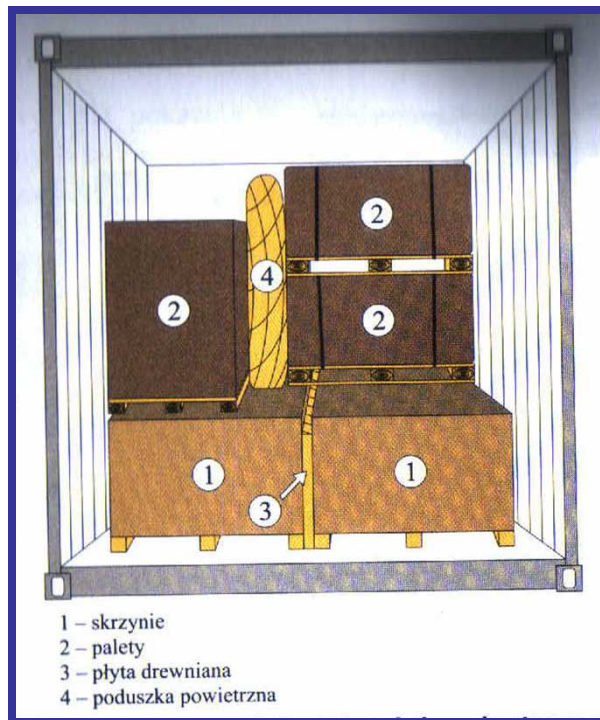


The cars unloading from the container

Steel pipe loading to the container

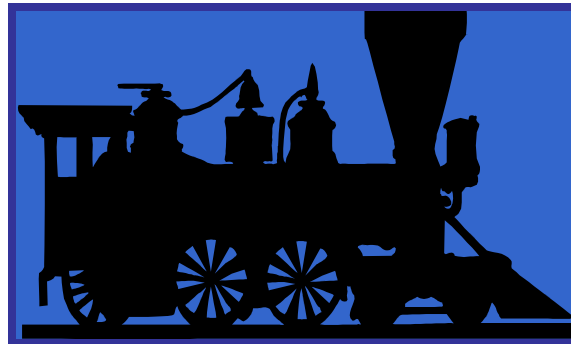


Arrangement of cargo in container



Intermodal transportation technologies

- *Sea – land container transportation*
- *Land – ferry transportation*
- *Rail – road transportation*



Sea – land container transportation

Main characteristic:

- Cargo: containers,
- Handling system: Lo-Lo (lift on- lift off),
- Place: container terminal in the port,
- Handling equipment: container overhead cranes ect.



Land – ferry transportation

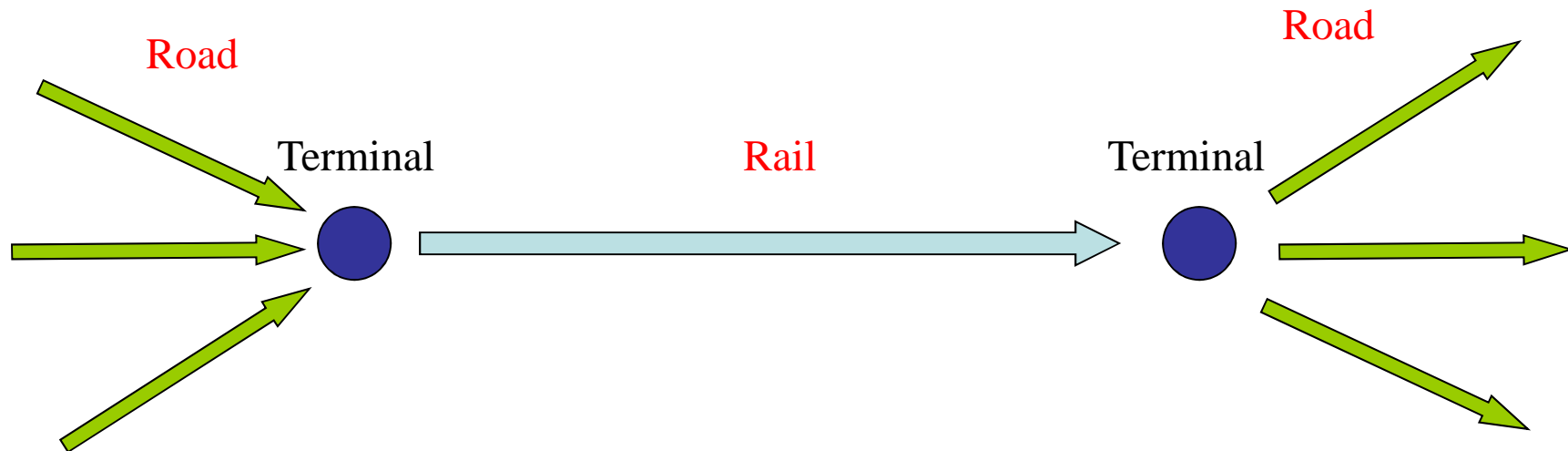
Main characteristic:

- Cargo: containers, lorries, swap bodies, semi-trailers, rail wagons etc.
- Handling system: Ro-Ro (roll on- roll off),
- Place: ferry or container terminal in seaport (or riverport) equiped with cargo handling ramp,
- Handling equipment: not needed.



Rail - road transportation

- *Rail - road transport technology* is based on the fact that during the main part of the route the transport mean, including cargo placed inside it, is carried on the railway platform, but delivery to and from handling terminals is provided by road transport.



Rail - road transportation

Main characteristic:

- Cargo: containers, lorries, swap bodies, semi-trailers etc.,
- Handling system: Lo-Lo and Ro-Ro,
- Place: different handling places, terminals, logistic centers equiped in road and rail infrastructure,
- Handling equipment: container overhead cranes, reachstackers etc.



Thank you for attention!



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