



Japan-ASEAN Cooperation



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# AFFA

## Project Transportation Management

### **PART I**

# Cargo Transportation

## Module Introduction and Objectives:

1. To understand the **concept of cargo transportation**;
2. To be able **to size up the project** and make necessary preparations to undertake the job;
3. To be able **to group the project into coherent segments** for the purpose of monitoring and control;

# Cargo Transportation

4. To be able to decide **on the Intermodal of land transport** over large land-mass or distances
5. To be able to decide on the types and variety of **equipment to be deployed**
6. To be able to work out the **costs of such project;**
7. To be able to take **necessary precautions on safety and related practices**



# Cargo Transportation

In this chapter we will discuss on understanding the concept of cargo transportation and also to understand the types of such cargo units;

Namely:

1. A **large single unit cargo**
2. A **combination of some “non-containerized” units plus some in containers;**
3. Cargo or container handling equipments;
4. To be able to identify all **necessary procedures and processes** involved – routings and reading road signs.

# Cargo Transportation

**An example of  
Single unit load on a  
Multi-modular chassis**



Courtesy: [balajicargo.com](http://balajicargo.com)

# Cargo Transportation

- **Typical heavy lift items** are generators, turbines, reactors, boilers, towers, casting, heaters, presses, locomotives, boats, satellites, military equipment and parts of oil rigs and production platforms.
- These items weight between **approximately 1 and 1000 tons** and can be **more than 50 meters high and wide.**

# Cargo Transportation

Or an  
assortment of  
such units in  
boxes or crates

Source: posey-intnl.com





# Cargo Transportation

Or a  
combination  
of such  
units



Source: DSDF Group

# Cargo Transportation

This used to be 'heavy unit' with the assistance of wheel-barrow





# Cargo Transportation

**Heavy lift items is sophisticated and expensive**, which means you can't just go to the warehouse and get another one. Heavy lift cargo is often customized orders that take months, sometimes even years, to produce.

**If the item is damaged** it will **cause serious problems** for all parties involved.

**Teamwork is absolutely necessary**. A well functioning team is highly motivated, flexible and can handle critical situations better and faster.

# Cargo Transportation

To **'size-up'** the cargo consignment:

Cargo type: a single very large and heavy item and such cargo may **come in all sizes and shapes**. Handling and moving this type of cargo will require **equipment** not normally utilized, for example:

- **Multi-axles trailer or chassis;**
- **Large high-powered prime movers;**
- **Heavy-lift cranes; or even a combination of them**



# Cargo Transportation

Cargo transportation may also be referred to as **cargo management within the concept of MTO or multimodal transport operation**

It involves the **gathering** of all the items, **packaging them** and then **delivering them** to a named destination;

It **may involve all modes** of transportation **or just one mode**

# Cargo Transportation

## Single large unit:

For example: Storage Tanks.



Courtesy: Klilcargo.com



# Cargo Transportation

**Self-propelled modular transporters (SPMTs)** are multi-axle trailers designed for the transportation of large and heavy cargos. **4 or more axle modules** can be coupled side-to-side and end-to-end to suit the weight or dimensions of the proposed cargo.

A **Diesel driven Power Pack (PPU)** is attached to the end of the SPMT group to supply hydraulic power to the drive and suspension systems. The capacity of each axle line is 32 Ton Net (36 Ton Gross including SPMT self weight).

The load is transferred through the chassis to 2 hydraulic suspension rams per axle line. Each ram is attached to a hinged elbow supported by 2 tires.

# Cargo Transportation

## Multi- Modular Unit

Source: [heavyliftspecialist.com](http://heavyliftspecialist.com)

## Video of SPMTs

Published on 24 Nov 2012(YouTube)

The Self Propelled Modular Transport being prepared to unload a 295 foot long 2.8 million lbs submarine in Port Burwell Ontario by Arnold Paul.





# Cargo Transportation

Equipment to handle such large heavy unit;  
A static shore crane may be needed.

Look at the counter-weight.



Courtesy: [wireropeexchange.wordpress.com](http://wireropeexchange.wordpress.com)

# Cargo Transportation

**Or Using 2 Mobile Cranes** to lift a Single Unit. What is the advantage?



Courtesy: [whytecranes.com](http://whytecranes.com)

# Cargo Transportation

**Other Lifting devices: Heavy Forklifts.**

**Advantage? Disadvantage?**



Courtesy: [asworcent.strafa.pl](http://asworcent.strafa.pl)

# Cargo Transportation

**Or even Heavier Fork-lift for lifting containers. All containers?**



Courtesy: [cargotec.com](http://cargotec.com)

# Cargo Transportation

## High Mast Forklifts with Clamps



Courtesy: [tjskl.org.cn](http://tjskl.org.cn)

# Cargo Transportation

**Top Loader:  
Advantages?  
Disadvantages?**



Courtesy; [taylormachineworks.com](http://taylormachineworks.com)

# Cargo Transportation

## Top-Loader used as Crane?

The spreader helps  
to relieve stress

on the cables used

Source: heavy-lift.UK

[Video on Front Loaders and  
Reach Stackers](#)

[Source: www.tito.com](http://www.tito.com)





# Cargo Transportation

## Why is certain equipment used?

The **availability** of each type of equipment may restrict the choices of option; hence improvisation may be needed;

Each equipment type may suit only certain environment of the location; e.g. the general ground condition is important;

Mobile cranes may be more commonly available because of their mobility and general utility;

Smaller capacity Fork-lifts may be easily available though not the heavy units; likewise the top-lifters;





# Cargo Transportation

In preparing to transport cargo from factory to loading port, having size up the **transport mode** & **study the route**; if particularly by road:

- distance of the journey;
- possible traffic obstructions;
- timing of cargo movement to avoid traffic congestion;
- study any other obstructions along the route;

# Cargo Transportation

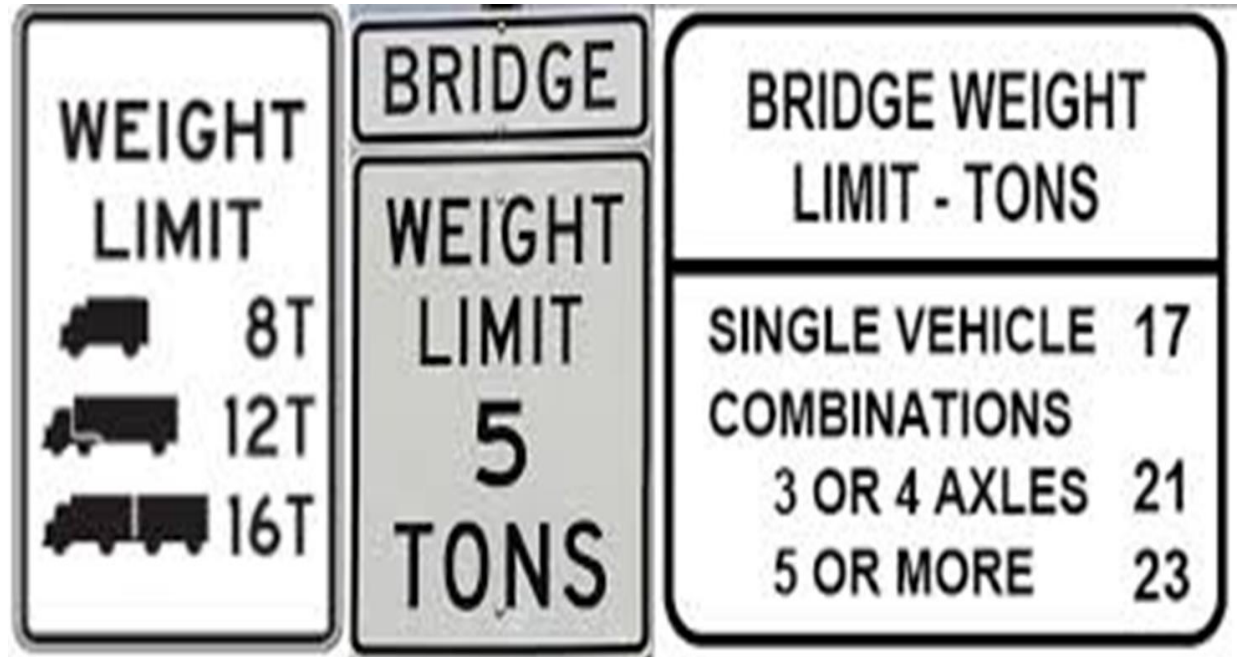
## Road Signage Showing Distances



Courtesy: [en.wikipedia.org](https://en.wikipedia.org)

# Cargo Transportation

## Looking Ahead On possible Obstructions



Courtesy: [illinoistruckcops.org](http://illinoistruckcops.org)



# Cargo Transportation

## Studying the route

- a) To avoid traffic congestion, select the **off-peak periods**; especially at night, after 22.00hrs to the early next morning;
- b) To survey the route to check on any obstructions:
  - over-head bridge/s with limited height clearance
  - narrow or limited load over bridge/s
  - overhead electrical or telephone cables
  - what procedures are required to temporarily remove them

# Cargo Transportation

## Unprepared for Height Limitation



Courtesy: [shippingandmoving.com](http://shippingandmoving.com)

# Cargo Transportation

## Height Limitations



Courtesy: [mrpoh.wordpress.co.uk](http://mrpoh.wordpress.co.uk)

# Cargo Transportation

## Time Restriction



Courtesy: [yorkpress.co.uk](http://yorkpress.co.uk)

# Cargo Transportation

## Overhead Electric Power Line

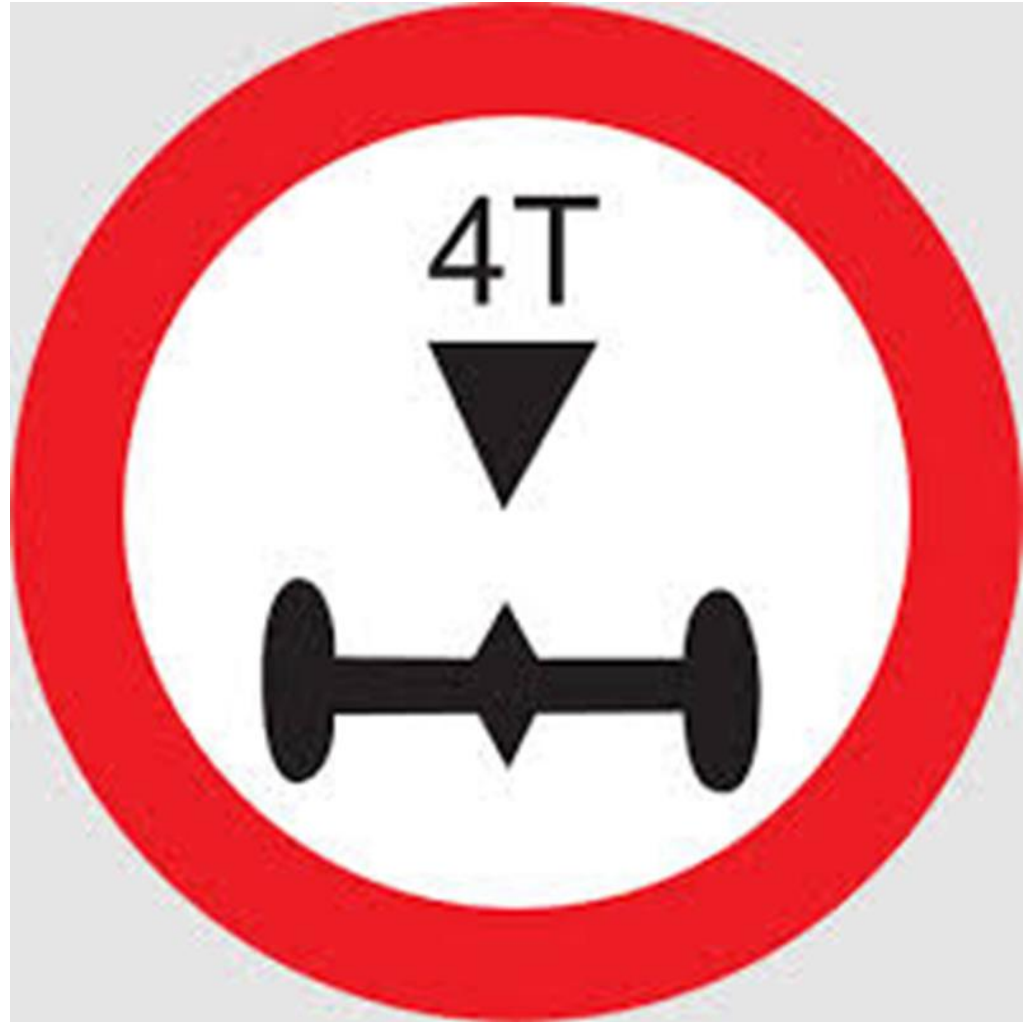
Courtesy: [ukma.org.uk](http://ukma.org.uk)





# Cargo Transportation

**Show road limitations**



Courtesy: [jhpolice.gov.in](http://jhpolice.gov.in)

# Cargo Transportation

**Show bridge  
limitations**

Courtesy; [nzta.govt.nz](http://nzta.govt.nz)





# Cargo Transportation

## Food for thought?

What **actions can be taken** to remove some of the above obstacles? Say, on a short span rural bridge with only 5T load permissible?

Can a sufficiently thick steel plate be laid across to allow the passage?

Instead of finding a longer route to travel, thus incurring extra costs and time and should be taken into consideration right from the start.