Loading and Transportation

Loading

- Loading is the function that
  - picks up timber products (trees, chips, logs, etc.) and
  - places them upon equipment that carries the product:
    - from within the woods to roadside or
    - from the forest to a processing or manufacturing facility
- Loading was one of the most hazardous activities in logging.
- Today it is one of the safest procedures:
  - due to the use of modern equipment
  - without people required to work under or near the products being loaded

Loading

(Activities affecting loading profitability)

- Sorting products during loading
- Loading a full, legal payload onto the haul truck

Loading (Sorting and payload size)

- Sorting decisions are critically important since the values of products vary widely.
- Once a small sawlog has been mixed into a load of pulpwood, its value can be cut by 50-75%.

- Loading a full, legal payload onto a haul truck is as equally important as sorting.
- Nearly all trucking is performed over public highways where the weight limits are set and enforced by the state governments.

Loading

- In an attempt to avoid overweight fines,
  - the loader operator may not fully load a truck.
  - however, underloaded trucks usually cost the logger far more than overloaded trucks.
- In addition, the length, height, and width of vehicles are also regulated by the government.

Loading

- Can be performed as a separate function from other activities.
- Can be integrated with other functions such as:
  - forwarding,
  - chipping/processing, or
  - trucking.

Loading as a Separate Function

- Is the most common loading approach used today.
- Is typically performed by:
  - Knuckleboom loader,
  - Front-end loaders, and
  - Others

Knuckleboom Loader

Knuckleboom Loader

Knuckleboom Loader

- the most common equipment used for loading
- lifting capacity from 20,000 to 40,000 pounds
- boom reach of 25 to 40 feet
- mounted on a trailer and positioned at a fixed location on landing, or
- mounted on a rubber-tired or tracked carrier to allow it to be self-propelled on a logging site

Front-end Loaders

- Are common sights at woodyards
- Are also sometimes used in the woods on logging sites
- Are best suited to handling logs with multiple sorts of products
- Require a larger landing (0.5-acre+) that should be relatively level and very well drained
- Are not widely used at landings

Other Loaders

- Crane loaders
- Crane loading booms
- Forklift loaders
- Grapples, etc.

Loading as Part of Another Function

In many logging systems, loading is integrated into the activities of another logging function.

- Self-loading trucks – these are regular highway haul trucks that have a small hydraulic knuckleboom loader attached to the truck body. This allows the truck to load wood without relying on a separate loader.
- Forwarding systems – since the forwarder must have a small loader in order to load the wood onto the machine in the forest, it is also available to unload the forwarder and load trucks or trailers at landing or roadside.

Transportation

Timber transportation may be done by:

- Truck
- Railroad
- Barge and ship

Transportation Cost

- is the significant source of the cost of wood delivered to manufacturing facilities because raw wood products:
  - are heavy and
  - have a relatively lower value per unit of weight

Trucks

- Truck delivery is by far
  - the most flexible transportation method, and
  - the most widely used
- Two general types of trucks are used for logging purposes:
  - Straight trucks
  - Tractor-trailers

Straight Truck

- Has a log buck on the rear frame of the truck and does not tow a trailer.
- Has a smaller payload than tractor-trailer but is shorter and maneuverable on roads.
- Was typically bought used and converted to use for logging.
- Can still be found for delivering wood, but is increasingly rare on dedicated logging jobs.

Tractor-trailers

- Tractor-trailers are the standard logging trucks in use today throughout North America.
- These rigs are typically allowed to haul 80,000 pounds of gross vehicle weight (GVW) in most states.
- Diesel engines are the norm.

Tractor-trailers

Tractor-trailer

Tractor-trailers

ATV – Small Trailer

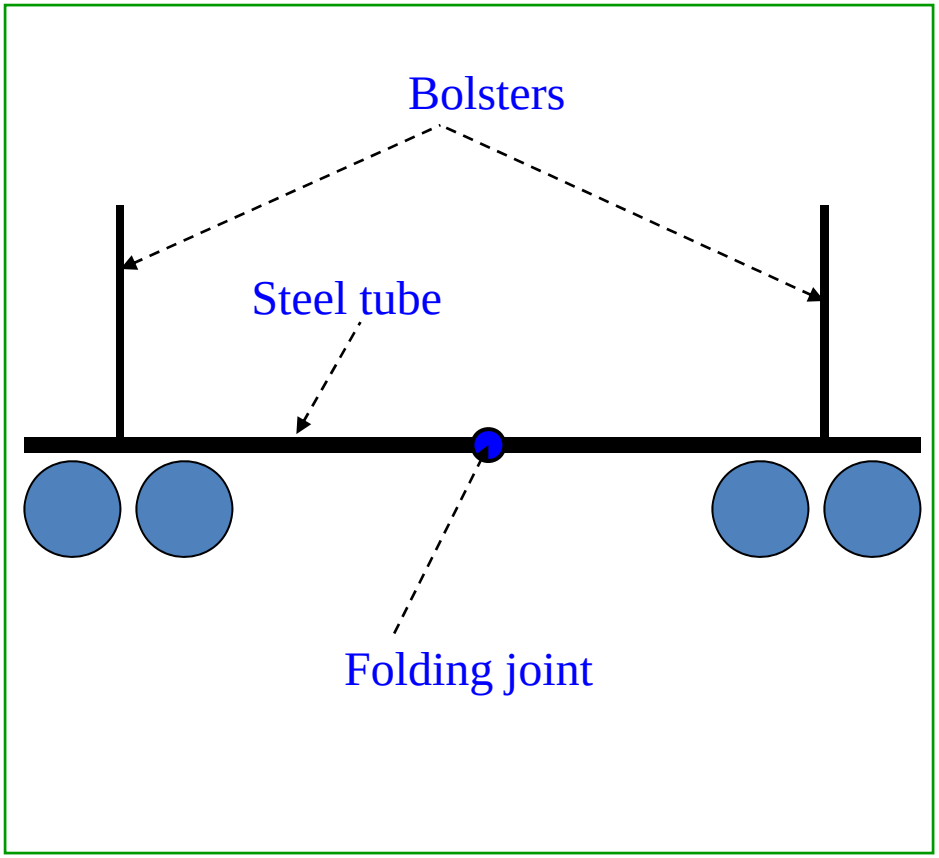
Trailers

- Trailers vary with
  - Type of products hauled,
  - Method of loading (direct or set-out trailers),
  - Size of wood
- Roundwood trailers are typically classified as:
  - Frame trailers
  - Pole trailers

Frame Trailer

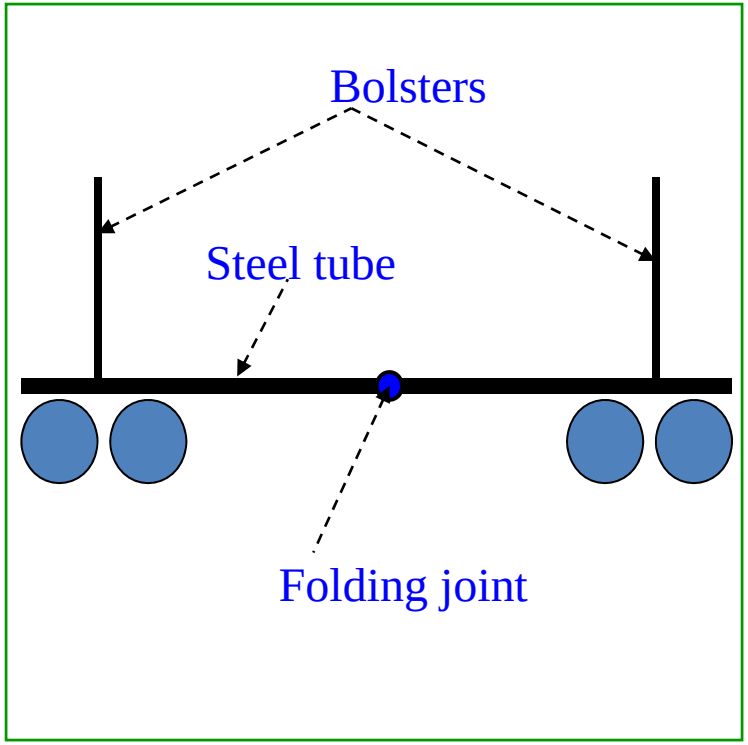
- Built around a pair of I-beams
- Heavy
- 4 sets of bolsters
- More options

Pole Trailer



- Built on a steel tube
- Light in weight
- Payload advantage
- Folding pole option
- 2 bolsters

Pole Trailer



- Two sets of bolsters connected by a steel tube.
- The position of the rear set of axles can be adjusted by sliding the axle set along the tube.
- This adjustment is often made to allow safer hauling as the wood length changes.

Pole Trailer

Pole Trailers

- Are only effective for hauling tree-length wood or long logs.
- Are becoming less common as the tree sizes harvested continue to decrease.

Chip Vans

- Chip vans are used to hold chips produced in the woods or at a mill facility. Two types:
  - **Open-top vans** are loaded from above by chip hoppers at mills or by conveyor at a mill or in the woods.
  - **Open-rear vans** are loaded by chipper blowing chips into the van as they are produced.
- Both types of vans are unloaded by lifting the entire tractor-trailer rig and allowing gravity to unload chips into a bin.

Chip Vans


MORB ARK
THE FLAIL DEBARKS 'EM
THE TRACTOR CUTS 'EM
APR 30 2004


MORB ARK

New Style Trailers

can move woody biomass efficiently

http://www.timberbuysell.com/Community/DisplayNews.asp?id=5173

- Stinger Steered or ForceSteer Trailer by Western Trailer Company of Boise Idaho.
- The trailer's design incorporates two readily available components.
- The trailer capitalizes on a unique logging trailer feature called the stinger, which allows the trailer to be more jointed for tighter turns.

Factors Affecting Trucking Production

- Hauling distance
- Payload
- Time spent on unloading and loading

Hauling Distance

- The longer distance the higher cost
- Longer hauling distance can be justified by:
  - Short mill or in-woods turnaround times and/or
  - High payload

Payload

- Payload = GVW – tare weight of the truck
  - To increase payload, the only way is to reduce the tare weight of the truck.
  - Many loggers in recent years have worked on reducing the tare weight of their trucks by:
    - buying lighter trailers,
    - using aluminum wheels and cab protectors,
    - using super-single tires instead of duals, and
    - removing landing gear when not needed.

Payload

An example of reducing the tare weight to increase the payload

- Assume a logger reduces the tare weight of a tractor-trailer by 2000 pounds or 1 ton.
  - If that truck makes three deliveries/day
  - Works 5 days/week and 50 weeks per year,
  - It will haul an additional 750 tons of wood/year
  - If the logger is paid $13/ton,
  - This provides $9,750 in additional revenue.

Truck Weight Laws

- The dimensions and weights of highway vehicles are regulated by both the Federal and State governments.
- Limits on the Federal Interstate Highway System are set solely by the Federal government.
- Limit on other highways within a state are set by the state government within the limits allowed by the Federal Dept. of Transportation.
- In addition, state and county governments often post size and/or weight limits to protect bridges, roads.

Truck Weight Laws

- Regulate gross vehicle weight (GVW) and limit the amount of weight borne by each axle or group axles.
- If the logging operations are carried out in two+ states, the most restrictive weight laws of the these states must be followed to ensure that a violation does not occur.

Truck Weight Laws

in West Virginia

- State Highways
  - Maximum Gross Vehicle Weight (GVW) **73,500 lb.**
  - Maximum Tandem-Axle Weight **34,000 lb.**
  - Maximum Single-Axle Weight **20,000 lb.**
  - Maximum Allowable Width 102 inches
  - Maximum Allowable Length 60 feet
  - Maximum Allowable Height 13’6”

Truck Weight Laws

in West Virginia

- Interstate Highways
  - Maximum Gross Vehicle Weight (GVW) **80,000 lb.**
  - Maximum Tandem-Axle Weight **34,000 lb.**
  - Maximum Single-Axle Weight **20,000 lb.**
  - Maximum Allowable Width **102 inches**

Truck Weight Laws

in West Virginia

- Tandem axles are defined as:
  - any set of axles, excluding the steering axle,
  - with axle centers within 216 inches of each other.
- Exception may have on some state or local highways.

Railroad

- A traditional method.
- It is well suited to moving heavy goods over long distances.
- With increasing mechanization in the woods and the shift to longwood systems, rail movement of wood began to seriously decline in the early 1970's.
- Rail shipment of longwood began in the 1980's and is a sizable source of wood fiber for many pulp mills today.

Water Transportation

- This practice is still used in some remote areas but has nearly disappeared elsewhere.
- Far more common today is the use of barges or ships.
- Barges used on river systems usually hold 500-1,000 tons of wood.