

Logging



Hauling Logs from Woodland Properties

J.J. Garland and D.J. Jackson

The success of your timber harvest depends on the efficiency of your loading and hauling activities. With proper planning and good contract supervision, you can help loading and hauling proceed smoothly. This publication covers log loading and transportation, including landing organization, road conditions, equipment, and costs. It also treats special concerns for woodland owners.

There are several reasons to think of log hauling as a separate but interrelated part of timber harvesting:

- If you do your own cutting and skidding, you may need to contract for hauling services.
- Even if you contract the entire harvest job, many loggers subcontract all or part of the hauling.
- Loading and hauling can be expensive, and inefficient landing arrangements or poor roads may substantially reduce your returns.
- If you load and haul timber from "cold decks" (logs stored in piles after the yarding operation is

complete), the logging contractor may move on to another job, leaving you to supervise the loading and hauling.

The principal objective of log hauling is to transport logs to market in a timely, efficient manner. Organize landing arrangements and log decks to assist, rather than hinder, loading operations. Make sure your roads are adequate for heavy traffic; permits may be required. Determine which loading and hauling equipment is needed for your operation. Be prepared to make financial and contractual arrangements with truckers hauling logs from your property.

Loading Plans

The first step in planning is to determine whether your logs will be cold-decked or loaded and hauled as soon as they are yarded into the landing (hot loading). Usually, logs from woodland properties are loaded and hauled from cold decks. A harvest operation capable of producing six or

more loads per day is needed for hot loading. Otherwise, the loader will be idle for part of the day.

Landing Considerations

Landings must be large enough to deck logs while allowing room for loader maneuverability. If you use a single landing, its surface should allow the truck and loader access to the logs. You'll need rocked landings for winter hauling; compacted dirt is adequate in summer. Grade on the landing should not be greater than 8 percent. Prepare a truck turnaround near each landing.

Normally, timber is decked at a central, strategically located landing, or at a series of landings along a road. Make sure you have at least one full load at each landing. Unless your plans include hauling short logs, each landing should contain an adequate supply of long logs (greater than 32 feet). In order to assemble a load, you need long logs to cover the bunk and stakes (called bunk logs and wing logs) of the log truck.



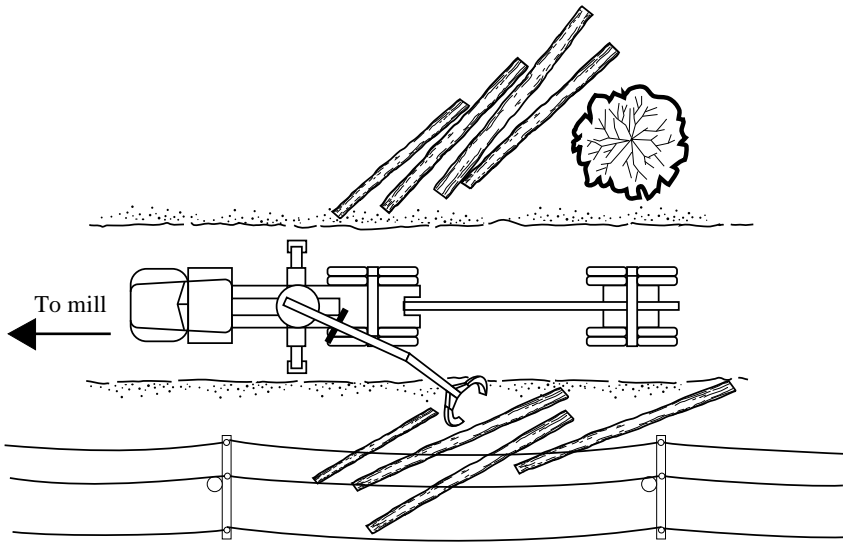


Figure 1.—Common problems of log decks are uneven ends, mixed lengths, obstacles, unseparated bunk and wing logs, and piles of logs in awkward angles for loading.

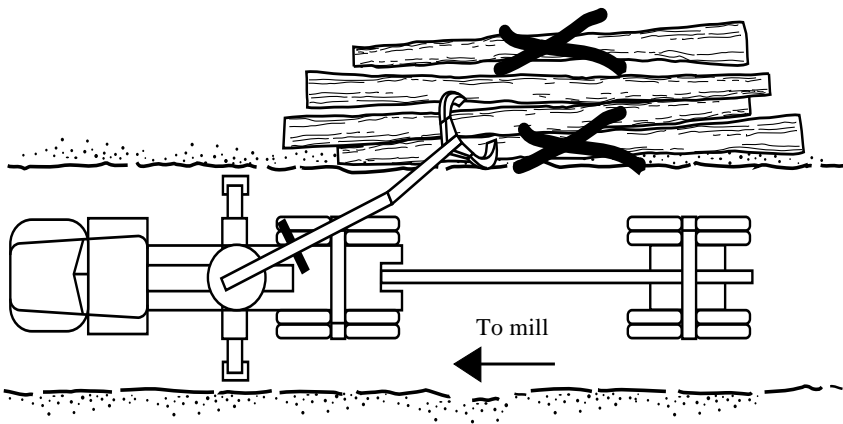


Figure 2.—Deck long, limber logs with butts toward the loader.

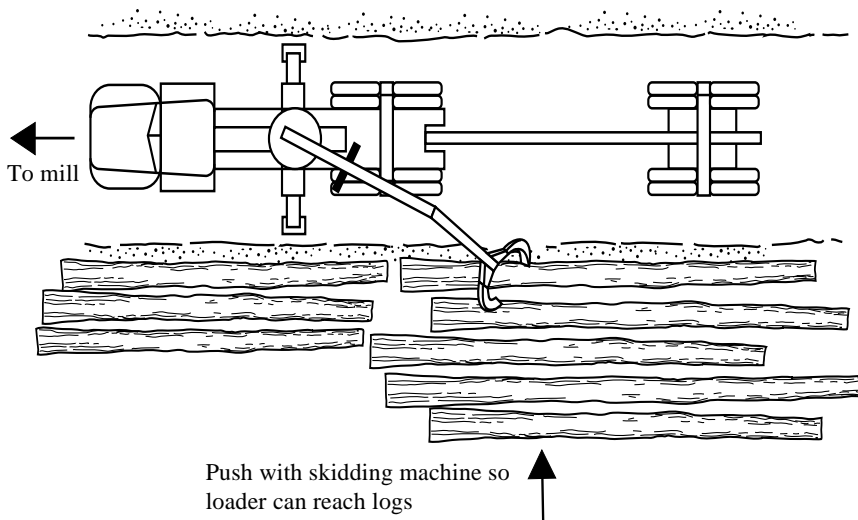


Figure 3.—Good deck arrangement for loading.

Log decks

Build log decks to facilitate loading (Figure 1). The list below offers some guidelines:

- Make sure all logs are bucked to a maximum length of 48 feet plus trim.
- Do not mix brush, tops, limbs, or cull logs in the deck.
- Buck logs so their size is suitable for the capacity of the loader; align the butts toward the loader.
- On sloping ground, deck on the uphill side; loader reach is limited below road level.
- Do not deck near obstacles such as standing trees or overhead wires; they could hamper the swing (or turn) of the loader or endanger the operator's safety.
- Deck logs so they can be reached from the loader's position—no more than 12–15 feet away for self-loaders.
- Log ends should be even when decked near the loader.
- Deck long, limber logs with butts toward the loader (Figure 2); otherwise, they may break when lifted.
- If appropriate, consider alternating butts and tops in the deck to build a more compact load.

If you must deck logs beyond the loader's reach, have a skidding machine available to push logs within reach. Logs intended for different markets, or short logs, should be decked separately. You can use short logs to "top off" a load (Figure 3).

Woodland Roads

Before loading or hauling begins, make sure your road is adequate for heavy traffic. Even though you can drive a pickup over the road, it does not mean that it is adequate for a loaded log truck. Truckers may refuse to haul your wood if they anticipate getting stuck or damaging their vehicles.

Surface conditions

For winter hauling, roads should be rocked. For summer hauling on a dirt road, a few loads of rock on soft spots or steep pitches are helpful. Keep truckers informed of road conditions.

Notify them if logs can be hauled after a rain shower, or if the road needs additional time to dry.

Clearances

Trucks need a minimum of 14 feet of overhead clearance and 10 feet of width (to clear mirrors). Buildings, fences, and power lines may be especially troublesome when harvesting timber on small woodland properties. Watch for limbs hanging out and down over the road. They destroy truckers' paint jobs and their pride in their equipment's appearance.

Curves and tailsweep

Trucks hauling poles and long logs need additional room to negotiate curves (Figure 4). Woodland roads are likely to have curves, but they are not a problem if truck speed is slow. However, if you expect truck speed to be 15 miles per hour or greater, curves can greatly increase hauling time.

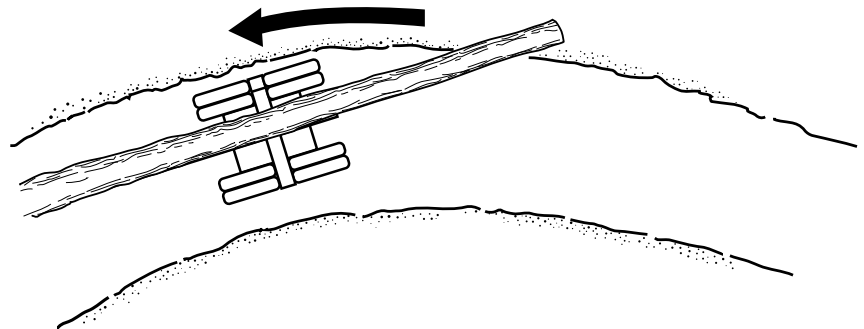
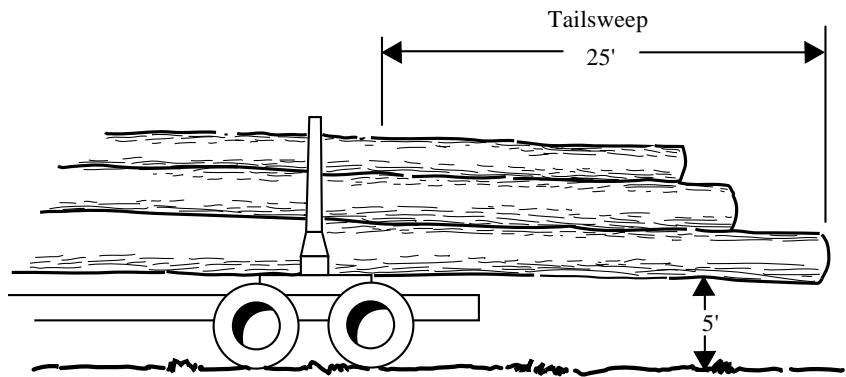


Figure 4.—Poles and long logs need room to negotiate curves and accommodate tailsweep.

Intersections

Where main roads and public roads intersect, maintain an angle of less than 90° (Figure 5). You must obtain approval from the Oregon Department of Transportation district engineer for roads that intersect public highways.

You will need a permit to load logs from a public highway. Check with your county engineer or the state district engineer to obtain this information. Warning signs must be erected indicating, "Watch Out For Log Trucks." Depending on the road's curvature and motorist visibility, place signs 250–600 feet on both sides of the intersection.

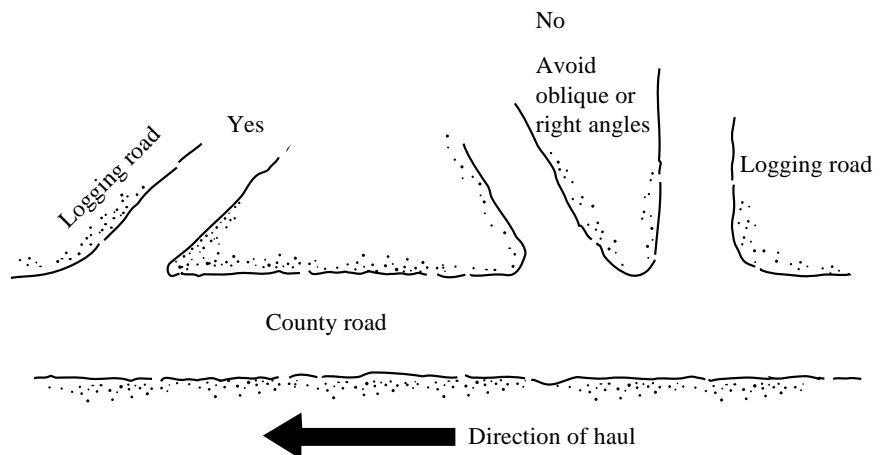


Figure 5.—Proper and improper road intersections.

Grades and vertical curves

If your woodland roads include steep grades, check with the hauler to be sure that a loaded log truck can navigate the grade. Where two different grades meet, use a vertical curve to smooth abrupt grade changes (Figure 6). If vertical movement is limited, make sure a loaded truck will not be in a bind. If a vertical curve is not used for steep grades going up over the top of the hill and down the other side, the truck and trailer connection (stinger and reach) will bind upwards into the load.

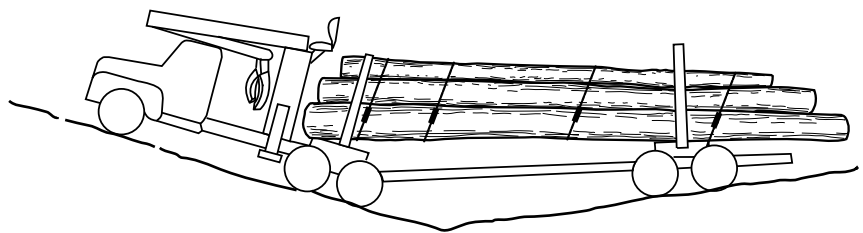


Figure 6.—Steep grades and abrupt grade changes can put a truck in a bind, limiting its vertical movement.

Weight limits

Check with the county engineer to determine if log hauling is permitted on public roads leading to your property. If necessary, arrange for hauling permits with the Department of Transportation. If your property has bridges that may lack sturdiness, have an engineer check them.

Loading Equipment

A variety of equipment is available for loading logs. The most appropriate selection will depend on its materials-handling capability, mobility, and operating cost.

Log loader configurations usually are front-end, heel boom, or self-loaders mounted aboard log trucks. Front-end and heel boom loaders may be mounted on tracked or rubber-tired carriers. Heel boom loaders are classified as either cable or hydraulic, depending on their operating mechanisms. Some forwarding operations use the loader on the forwarder to load trucks or separate trailers (Figure 7).

All loader types are adequate for most woodland loading jobs (see Table 1 for a comparison of loaders). However, to select the loader most appropriate for your situation, consider the overall price per unit volume loaded. (Loading and hauling costs usually are lumped together as a single cost or bid figure.)

Forest products other than logs often require special loading machinery. To improve wood utilization and reduce slash, large woody chunks often are accumulated at the landing and stored in piles or metal bins. Due to the material's shape and length, you will need dump trucks or gondola trailers for hauling. You'll also need a loader capable of handling uneven lengths and odd-shaped pieces.

Operating limits of loaders

Because a log loader's ability to reach and lift is limited, match the size of the machine to your timber and landing arrangement. Machine size and the load's distance from the machine center will affect the lifting capacity of loaders.

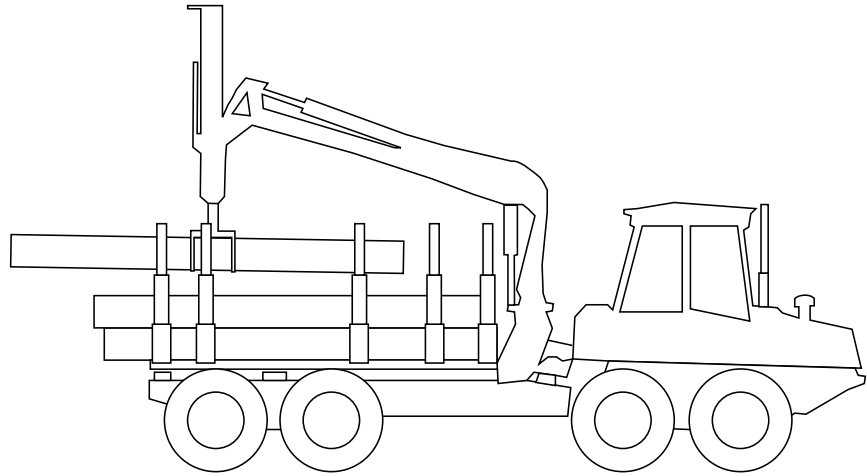


Figure 7.—Forwarder.

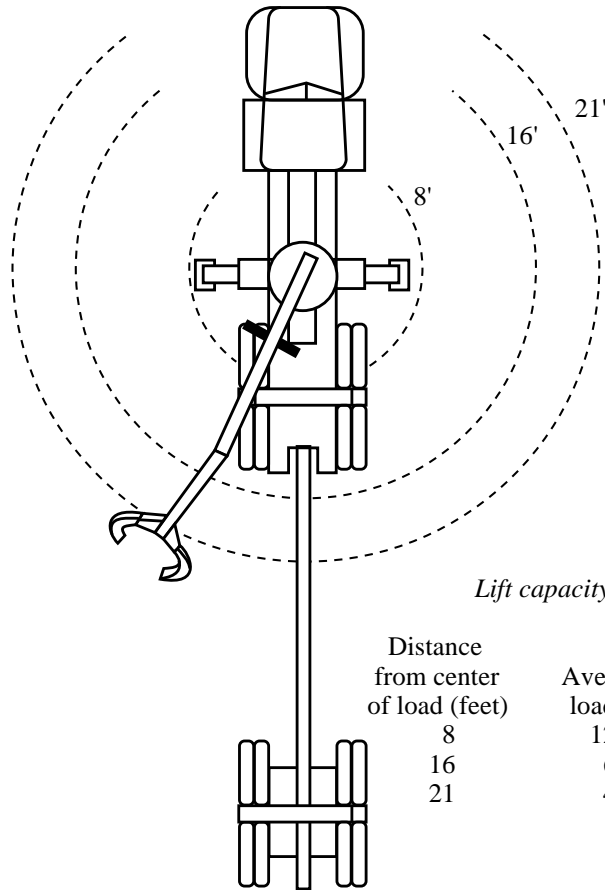


Figure 8.—Self-loaders have different lifting capacities depending on machine size and distance from loader.

Table 1.—*Loader comparison.*

Criteria	Front-end		Cable		Hydraulic			Forwarder loaders
	Tracked	Rubber	Tracked	Rubber	Tracked	Rubber	Self-loaders	
Materials handling capacity: timber size	Medium logs; long logs create problems	Medium logs; long logs create problems	Medium to very large logs	Medium to very large logs	Small to large logs	Small to large logs	Small to medium logs	Small to medium logs
Landing-to-landing mobility	Adequate	Excellent	Poor	Excellent	Poor	Excellent	Excellent	Excellent
Landing space needed	Medium, difficult to load in the road	Large, difficult to load in the road	Small	Small	Small	Small	Small	Small
Operating cost	Low	Low	Moderate to very high	Moderate to very high	Moderate	Variable	Buried in hauling cost	Buried in forwarding cost
Operating training requirements	Moderate	Moderate	High	High	Moderate	Moderate	Low	Moderate
Maintenance requirements	Moderate	High (because of flat tires)	Moderate	High	Moderate	High	Low	High
Special advantages and limitations	Good traction; versatile (e.g., buckets, debris handling)	May be traction limited; can carry logs to 500'; versatile (e.g., buckets, debris handling)	Moves slowly	Mobile on highway; can load on pavement	Moves slowly	Mobile on highway; can load on pavement	Can pick up small scattered volumes; reduces load volume by 20% or so	One machine can forward and load trucks or set-out trailers
Requirements for moving machine to property	Lowboy move required	Depending on distance, may not require lowboy move	Lowboy move required	Depending on distance, may not require lowboy move	Lowboy move required	Depending on distance, may not require lowboy move	No problems	May need lowboy.

Front-end loaders may tip vertically as they approach their maximum lifting capacity. (The load causes the rear of the machine to lift off the ground). Lifting capacity for heel boom loaders depends on counterbalance weight and whether they are lifting over the end or the side of the machine.

Loaders on self-loading log trucks have both weight and distance limits (Figure 8). The larger the self-loader, the less payload a truck can haul. Also, since self-loaders are mounted to trucks, and trucks must stay on smooth surfaces, self-loaders are constrained by being operable only from the road.

Loaders on forwarders are limited in lift capacity to what they originally loaded on the forwarder. Also, their reach is more limited than other loaders.

Self-loaders versus Separate Loaders

There are cost trade-offs in selecting self-loading trucks versus a separate loader and conventional trucks. Whether you intend to cold deck logs on your property, or haul them hot, the log loading operation must be in balance with yarding or skidding capacity.

The availability of self-loading log trucks or separate loaders will help determine which type of loader to use. During peak demand, it may be difficult to obtain self-loading trucks.

The decision analysis usually is limited to comparing moderately new equipment. However, some landowners and loggers maintain a depreciated loader for small jobs when high machine utilization is not required.

Self-loaders mounted to truck tractors having two-drive axles carry 15–20 percent less volume than a conventional log truck. Their high initial cost increases the hourly operating rate by 10–25 percent over conventional trucks. When you consider the reduced payload and higher operational cost, cost per unit volume loaded and hauled may be more than 20 percent higher than a separate loading and hauling operation. This is especially true for long hauls.

However, by adding a third drive axle to the tractor and obtaining special hauling permits, gross vehicle weight (GVW) increases. This practice allows self-loaders to haul volumes approximately equal to a conventional log truck.

Self-loaders are most efficient for picking up small or scattered volumes, for which it is not economically feasible to bring in a separate loader. Short hauls are better than long hauls because the trucker spends less time carrying the dead weight of the loader. A self-loader may be used to load first a conventional truck and then itself. If scheduling can be arranged, this combination improves loader utilization.

A small, mobile loader, mounted on a rubber-tired carrier, does not need a lowboy to move it to the site. To use the loader effectively, you need to keep two or more trucks hauling enough volume from the property. Operating cost for this machine is about two-thirds that of a self-loader. The combined loading and hauling cost can be less than that of a self-loader if sufficient trucks and log volume are available to keep the loader utilized.

On occasion, larger, more efficient loaders may be used on woodland properties. They usually require lowboy assistance and move-in time. Their use can be justified if sufficient volume and trucks are available to offset their relatively higher cost. It would be unusual to move a large loader to an area for less than 4 to 5 days of loading.

Cost Influences

Most bids for loading and hauling services are based on knowing the fixed and variable costs of the hauling activity. Divide these costs (including profit and risk) by the amount of volume that can be hauled during the day.

For example, if loading and hauling costs are \$450 per day, and two trips per day averaging 4,000 board feet (4 MBF) per haul are possible, the cost is \$450 divided by 8 MBF, or \$56.25 per MBF. If three trips per day are possible, the cost is \$450 divided by 12 MBF, or \$37.50 per MBF.

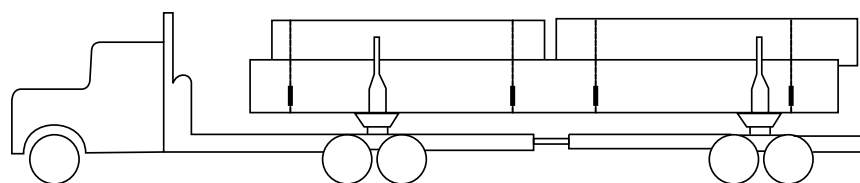
These figures are hypothetical and are not meant to suggest actual rates. Rates depend on market conditions, contractor requirements, and factors associated with each loading and hauling operation. They include:

- Haul distance, which translates into number of trips
- Loading time (loading efficiency and deck arrangement)
- Delays (from road conditions, scaling requirements, poor directions, etc.)
- Type of logs (species, diameters, and lengths—loads of small logs contain less volume than large logs, yet may be equivalent in weight and take more time to load)
- Type of truck (average volumes hauled are likely to be 3,500–5,000 board feet for conventional trucks; 2,500–4,000 board feet for self-loaders; and 4,000–6,000 board feet for short loggers—truck and trailer loads) See Figure 9. Volumes shown do not necessarily indicate truck capacity. Depending on many factors, load volumes will fluctuate. Specific information can be obtained from log haulers or neighbors who have had previous experience.

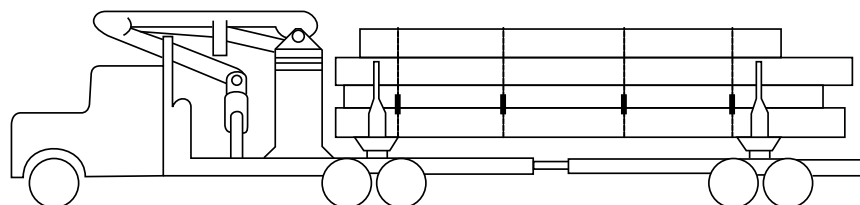
Payment by Weight

Many contractors bid hauling and logging costs using weight. Sample loads are scaled to estimate volume, but costs are on a per-ton basis. This method is most equitable for hauling because it removes the variation in volume from different log sizes and reduces the scaling delays in small logs.

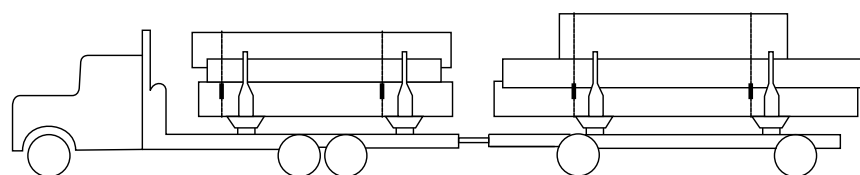
The state sets weight limits for highway hauling. Conventional trucks can carry about 26 tons. Dividing the cost per day by the number of tons hauled per day gives a consistent hauling price. Sample scaling provides volume measurement as needed. Make sure the hauler knows how and when payment will be made, how much the payment will be, and who is responsible for payment.



Conventional log truck



Self-loader



Short logger

Figure 9.—Types of trucks.

Special Concerns Resulting from Deregulation

In 1994, national motor carrier laws were rewritten so that prices, routes, and services can no longer be regulated by states. Since deregulation, trucking companies that purchase the proper permit, possess liability insurance, and pay registration fees are entitled to transport any type of forest product within Oregon.

The Public Utilities Commission (PUC) does not require cargo insurance for haulers who transport logs, lumber, and other Class B commodities. However, truckers are liable for the goods they haul. Commodity owners must be compensated by truckers if their goods are damaged or lost during hauling.

Drivers may not be on duty for more than 15 consecutive hours, or 70 hours in any consecutive 7-day period. Drivers who operate over a 100-air-mile radius must keep daily records and a time card. Consult the

Public Utilities Commission (PUC); other restrictions and regulations also may apply.

Truckers no longer are required to possess a log hauling contract. However, truck size and weight, insurance coverage limits, highway-use taxation, and hazardous materials routing remain unchanged. The PUC Motor Carrier Compliance Division can provide additional information.

Locating log haulers

The Oregon State University Extension forestry agent serving your county can help you locate a contractor. You also can call the Oregon Forest Products Transportation Association in Salem, Oregon to obtain a list of haulers in your area. In addition, your log purchaser or fellow woodland owners may suggest reputable log haulers.

If sufficient values are involved, get competitive bids and use a written contract or letter of agreement. Do not order truckers for less than a day's work, or for partial loads. Give good

directions and, if necessary, meet them for the first trip onto your property.

Load accountability

Register your log brand and make sure your logs are branded. Make out a load ticket in triplicate for each load. Indicate your name, the trucker, destination, date, and number of logs. Keep one copy, send one with the trucker, and provide the other to the purchaser. Oregon law requires anyone transporting forest products to have this information. You will receive a scale or weight ticket for each load plus your original load ticket from the log purchaser.

Traffic control

Control traffic when logs are being hauled from your property. Be sure the haulers have adequate vehicle liability insurance because woodland owners are particularly vulnerable to traffic accident claims.

Locked gates

Inform log haulers which gates should be open and which closed. Provide truckers with access to locked gates, and do not lock them until all trucks are gone for the day.

Summary

To efficiently plan and organize a hauling operation from your woodland property, you must attend to details and make key decisions.

Organize landing arrangements and log decks to help the loading rather than hinder it. Make sure your roads are adequate for heavy traffic; permits may be required. Decide which loading and hauling equipment you will need for your operation and be prepared to make financial and other arrangements with truckers hauling logs from your property.

Ordering instructions

If you would like additional copies of EC 1140, *Hauling Logs from Woodland Properties*, send \$1.50 per copy to:

Publication Orders
Extension & Station
Communications
Oregon State University
422 Kerr Administration
Corvallis, OR 97331-2119
Fax: 541-737-0817

We offer discounts on orders of 100 or more copies of a single title. Please call 541-737-2513 for price quotes.

World Wide Web

You can access our Educational Materials catalog and many of our publications through our Web page at <http://www.wagcomm.ads.orst.edu/>



The Woodland Workbook is a collection of publications prepared by the Oregon State University Extension Service specifically for owners and managers of private, nonindustrial woodlands. The Workbook is organized into separate sections, containing information of long-range and day-to-day value for anyone interested in wise management, conservation, and use of woodland properties. It's available in a 3-ring binder with tabbed dividers for each section.

For information about how to order, and for a current list of titles and prices, inquire at the office of the OSU Extension Service that serves your county.

This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.

Oregon State University Extension Service offers educational programs, activities, and materials—without regard to race, color, religion, sex, sexual orientation, national origin, age, marital status, disability, and disabled veteran or Vietnam-era veteran status—as required by Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University Extension Service is an Equal Opportunity Employer.
