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# *Lumber from Urban and Construction-Site Trees*

For many different reasons, more and more people in larger cities want to reuse urban trees scheduled for removal. First, people who are part of the “green movement” want to turn urban trees into something more valuable than firewood, mulch, or just trash for the local landfill. Second, homeowners who are emotionally attached to their trees want to keep that wood around in the form of furniture or other household products. Third, some consumers value locally produced agricultural products—and urban wood falls into this category. Fourth, construction projects that use locally sourced urban wood gain points for LEED (Leadership in Energy & Environmental Design) certification by the United States Green Build Council. Finally, dry wood used in furniture and construction is almost half

carbon by weight and that sequesters or isolates the carbon longer, aiding with issues related to climate change.

## **Pros and Cons**

For many reasons, urban trees usually are not marketable to traditional sawmills and veneer manufacturers. Typically, there are relatively small volumes of urban wood available at any one location. Embedded objects found in urban wood can cause costly and dangerous damage to equipment when it’s hit by the blade on the saw or veneer knife. Buildings, landscaping, and utility lines can be damaged or disrupted when trees are felled. Buried utility pipes and even septic systems can be damaged by heavy equipment (Fig. 1) used to remove the logs. Also, most tree-care companies





**Figure 1.** Heavy-duty boom loader and truck used to load, transport, and unload urban logs.

and professional arborists don't have experience in the valuation of standing timber and struggle to find buyers for this potentially valuable wood.

However, portable sawmills (Fig. 2) can process even a single tree in urban areas as well as forested settings. Portable sawmills are relatively lightweight, are generally mounted on a two-wheeled trailer, and can be pulled behind a pickup truck. There is no site damage from heavy equipment needed to load and move logs. To further limit damaging property during tree removal, hire a trained and qualified forester or Certified Arborist for oversight of the project or to remove the trees.

There are several important reasons to use urban trees for local lumber.

- First, there are many urban trees on the tremendous amount of forestland used for urban development. In 1998, the United States had an estimated 560,000 acres of urban, forest-covered land compared to 400,000 acres in 1986. By comparison, there are only about 4.5 million acres of forestland in the entire state of Indiana.
- Urban trees are often cut down. Homeowners remove trees that die, become too large, or present an unacceptable level of risk for an urban setting. Serious storms can result in the destruction and removal of many trees at once.
- Disposal of urban trees can be costly and difficult. When invasive pests such as emerald ash borer invade cities, those cities face economic disaster as they become responsible for tree removal and debris management



**Figure 2.** Larger size portable band mill sawing urban logs in Indianapolis, Ind. Photo courtesy of Wood-Mizer LLC, Indianapolis, IN.

costs. Cities incur substantial disposal costs when they are forced to remove hundreds of trees from street rights-of-way and public land each year. Landfills closed to yard waste are often a roadblock to disposal. Many states with known invasive pests have established quarantines that do not allow transportation of certain tree species debris, which limits movement of valuable wood.

- Some urban trees contain wood useable by artisans, craftsmen, and other woodworking enthusiasts. Many ornamental species contain beautiful, decorative wood not readily available from lumberyards and dealers who only handle the more common tree species.
- Finally, managed urban woodlots ranging in size from 2 to 10 acres may require some tree removal to cull out less favorable species, make the woodlot more sustainable, and meet overall planning goals. Trees that have reached their useful lifespan may have value if they are logged before they die. Logging mature trees also gives younger species space to thrive and mature.

### Economic Considerations

Based solely on wholesale hardwood lumber values, the cost of converting urban trees to lumber is generally not competitive with the cost of creating lumber from forest-grown trees. The logistics of harvesting one or a few trees at one time, the need to prevent site damage, and the need to remove all parts of a tree add greatly to the cost of any lumber produced. Therefore, traditional sawmills and veneer mills rarely show interest in urban trees.

That said, some lumber yards in larger cities, known as distribution yards, specialize in gathering and selling urban wood. Also, tree care companies that see the value

of urban wood are beginning to market their own wood products and materials as well. Much of this material will be produced by portable, thin kerf band mills. Contacting these yards could yield some interest in the harvested trees; however, while you probably will not receive much, if anything, for the logs, some disposal costs may be avoided.

To an individual consumer or homeowner who wants the lumber, but otherwise would purchase lumber at retail value from a distribution yard or big box store, urban trees can be quite valuable. An average urban tree about 20 inches in diameter at 4½ feet above the ground and with a 10-foot solid log should yield 150 to 200 board feet of lumber. On the wholesale market, green hardwood lumber ranges in value from about \$.40 per board foot for pallet grade stock to about \$1.10 per board foot for top grade ash to \$3.00 per board foot for top grade walnut (Table 1). From a good, 20-inch diameter log you should get about one-half top-grade material, one-quarter average stock, and the rest pallet stock. If you purchase a few kiln-dried boards at a distribution yard or big box store, you'll find prices that are easily double the green, wholesale price. Using your urban logs yourself is probably the best alternative. Selling a few boards to others is often difficult.

In addition, smaller, custom mills can produce unique items. They can cut boards from crotches and slabs 20 inches wide or more, depending on the equipment. Also, many urban woodlots contain minor or mostly noncommercial species such as Kentucky coffeetree and catalpa as well as non-native species such as Siberian elm, Paulownia, and others that yield beautiful lumber generally not available from other sources.

Custom sawing rates vary greatly. Some mills will charge by the board foot produced. Costs could range from \$.20 to \$.40 per board foot. Others might charge by the hour with rates ranging from \$40.00 to \$70.00 per hour. Since equipment capabilities vary greatly, ask about saw times, if you are paying by the hour. Be certain to ask about the cost of travel time and other costs such as blade damage from hitting foreign objects when sawing. Payment is usually expected upon completion of the job.

Only in the case of an exceptional tree or land clearing is it possible to receive a great deal of compensation for urban trees. In other cases, it might be difficult to give the material away except for use as firewood or wood chips, although you may be able to sell walnut, our highest value species (Table 1). Use local advertising to help determine if there is local interest. If you sell or make other arrangements for use of your urban logs, clearly identify who is responsible for personal injury, property damage, and removal of the top wood.

**Table 1.** Relative value of central states hardwood species. Prices can change quickly, but the relative order usually does not.

Very High	High	Medium	Low
Walnut	Cherry	Ash	Basswood
	White oak	Hickory	Beech
	Red oak	Yellow poplar	Cottonwood
	Hard maple		Aspen
	Soft maple		Hackberry
			Gum
			Sycamore

### Log Quality and Size

Thin kerf band mills can saw a straight log as small as about 8 inches in diameter (inside the bark). The lumber is likely to be knotty, but more individuals are beginning to appreciate “character” in finished wood products. Logs ranging from about 12 to 20 inches in diameter on the small end are ideal. Large logs up to 36 inches in diameter can be processed, but they take additional time in handling and getting the logs worked down to manageable sizes.

Logs as short as about 4 feet can usually be processed, but standard lengths are from 8 to 16 feet long. Longer logs reduce loading, turning, and, thus, saw time. Cutting longer stock and timbers is possible.

When cutting tree-length stems into logs or logs into boards, producing the clearest wood is usually the objective. Highly defective void areas or severe crooks in stems should be eliminated. If a stem provides for more than one log, consider bucking it to produce the straightest logs possible. It also helps to buck the stem through any major defects such as large limb knots. That puts these defects on the ends of the boards where they can be trimmed off. Butt logs typically produce the clearest lumber. Also, be certain that the lumber produced from the log lengths you select can be accommodated by any drying equipment.

Logs should be processed as soon as they are cut from live trees. The longer logs lie exposed during the warmer months, the greater the chance for stain, decay, and insect attack. These problems do not develop during cold winter months. Lumber from felled logs or from dead trees may have some uses. The heartwood in species such as oak, walnut, and cherry has some natural decay- and insect-resistance. The sapwood in these species is destroyed in a

year or less, but the heartwood may still be salvageable. For the other species mentioned above, a year of exposure will result in serious damage to the entire log.

Before cutting a tree down, locate and discuss your plans with a sawyer and make sure the arborist knows your intentions for the log portion of the tree. Without specific instructions, usable urban logs are often cut to firewood lengths on site to facilitate handling.

### Lumber Quality Considerations

There are three broad categories of trees that may become available in urban areas. These include

- trees planted around structures that have now matured,
- small trees that were naturally present when the site was developed that have grown into mature trees, and
- trees that need to be removed at the time of construction (or within a few years) due to root system damage.

Trees removed from a wooded area for home or building construction can be high-quality and well worth processing, if they are alive, relatively free of defects, and of sufficient size. These trees are essentially woods-grown trees. If several trees are available, they could be of interest to the traditional industry. In this case, be sure the person doing the site-preparation work has equipment to remove the stumps.

Many urban trees planted for shade or other benefits are open-grown and fast-growing. They are often not the most desirable for lumber and may contain embedded metal. They may be damaged around the base by lawn mowers, string trimmers, or other landscape equipment and may have wounds on the trunk caused by improper pruning. This damage usually results in localized decay and discoloration of the wood. Therefore, these trees are of no interest to the traditional industry, but, once again, could produce very usable wood with unusual character.

Trees that were present in a wooded lot when the site was first developed and have now matured could be of use. If, at the time of development, these trees were already 10 to 15 inches in diameter, the lower portion of the trunk should be free of limbs and annual wood growth should be clear of defects. Recent mechanical damage and the presence of metal objects may be apparent. Many of these trees could be evaluated and used.

### Working with Thin Kerf Portable Mill Operators

Thin kerf band mills range in size from very small, with motorized saws hand-cranked through the logs, to quite large, with much more power and with hydraulic log loaders and computerized networks. The larger mills can saw several hundred board feet constituting several logs in a few hours.

If you wish to hire a sawyer, remember, each mill is generally a small business, and the terms of any agreement can vary substantially with each owner. Most mills easily can be transported to a site, set up in a few minutes, and immediately put into action. Logs are processed into boards as directed by their owner. Sawing costs may be based on the number of board feet sawn or on the amount of time on the job. The landowner is generally expected to provide assistance, at least in the removal of lumber and waste wood, such as slabs and edgings. The slabs, edgings, sawdust, bark, and other debris are left onsite. The logs should be in an accessible site, with all branches, bumps, crotches, and large butt flares removed. The logs should be lined up in a neat row (Fig. 3). Remember, the logs are rolled onto the mill or the loader arms. Irregularities in the log will increase the difficulty of this job, and they may also prevent the log from lying flat on the mill bed.

Boards with bark on the edge are usually ripped to width on the portable sawmill. This works well when only a few logs are being processed. Portable edgers are available, and some operators may use them on larger jobs.



Figure 3. Well-prepared urban logs ready to be processed into lumber.

Some operators process logs at their mill site. This procedure eliminates travel time for the sawyer and the equipment, and it also gets the waste wood, sawdust, and other debris away from the original site. The log owner usually needs a way to load and transport the logs, as well as to pick up the lumber when processed. Anything the log owner can do to reduce sawyer efforts should help reduce costs.

## Use and Application

When just a tree or two are being processed, the lumber is generally used in the home woodshop for various projects. Where larger quantities are cut, the lumber can be used for general construction. For construction applications, use care.

Construction lumber available at the local lumberyard is graded at the producing mill and stamped. The “grade stamp” provides important information, and its presence is required by building codes. Before processing logs into construction lumber, be sure to check with local code officials to determine if your lumber is acceptable. Green lumber must also be air-dried. This is accomplished by stacking the lumber in courses. Several boards are usually used to make up one course of lumber about 4 feet wide. Stickers, which measure about  $\frac{3}{4}$  inch thick by  $1\frac{1}{2}$  inches wide by a uniform length, are placed at the very end of each course and on 2-foot or even 18-inch centers between the ends. A second course is added and another course of stickers is placed directly above the first course. When the stack is complete, it is best to cover it with tin sheets rather than plastic and with as much heavy weight as possible. Plastic tends to hold the water in the lumber and the weight helps keep the top course of lumber flat. The stack must be kept perfectly level with no twist from corner to corner and off the ground at least six inches.

For complete information on drying lumber, see

FNR-37 *Drying Small Quantities of Hardwood Lumber*.  
<https://www.extension.purdue.edu/extmedia/FNR/FNR-37.pdf>

## Locating Sawyers and Other Wood Use Specialists

Sawyers can be difficult to locate. They are small businesses and often do not advertise. Check with equipment manufacturers; some keep a list of individuals who do custom sawing ([www.woodmizer.com/us/ResourceCenter/FindaCustomSawyer.aspx](http://www.woodmizer.com/us/ResourceCenter/FindaCustomSawyer.aspx)). Check with local foresters, district foresters, Extension educators, and others associated with the growth and management of timber or other wood users. They will usually know who can help.

In summary, trees that are part of the urban landscape can be a valuable resource, especially if the landowner has a use for the lumber. Otherwise, it may be difficult to find someone who needs this resource. Even so, there is an increasing woodcrafters market, but it may take a bit of research on your part.

## Additional Readings

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