CAUTION: ROAD CONSTRUCTION

Forest roads provide access while enhancing recreational opportunities and wildlife habitat. But building an effective road requires forethought and planning.

By Andy Ferguson and Chris Manus

Road construction, though time consuming and expensive, can pay lasting dividends.

Forest roads serve many purposes for landowners. They provide access to the property for all activities including harvesting timber, recreation, and fire suppression. Keeping these activities in mind, while also understanding the objectives, are paramount when designing and building a forest road network.

The design of the road network should maximize access to the property while minimizing impact on the forest. This is to say, build as few roads as possible to access the property. Roads are considered non-productive as related to the forest; in addition, they need to be maintained to be useful. This article will begin to outline what is necessary to consider when designing and building forest roads.

During the design process, consideration needs to be given to several criteria. These include: type of vehicle use, water quality, proper placement, and permanence. The entry point should be located at right angles to the public road or property access and should have good visibility. The end of the road should be located where it provides adequate access to the property boundaries for desired activities.

Once these two points are located, the design of the road between them should be estimated and drawn out on a property map. Using a topographic map is helpful to understand the terrain and to provide a guide to walk the route and make adjustments. During this process, it is important to understand the grade or slope of the road, and to be sure it is not too steep for traffic. In addition, any curves in the road changing direction must be designed to allow for travel of the largest vehicle such as a log truck.

On a related note, stream crossings should be kept to a minimum. If they are needed, they should cross at right angles at the narrowest point possible. Stream crossings involve a design in addition to the road itself. This involves the approach to the stream, as well as the culvert or bridge sized correctly to cross the stream and handle the stream flow in a significant rain event. There are

guidelines available to size the culvert based on the acreageof the watershed upstream from the culvert location.

Each state has Best Management Practices (BMP) guidelines for designing and building roads. These should be consulted, along with expert advice to be sure water quality and road integrity are maintained. The location of a road is critical to construction costs and maintenance. A poorly located road serves little purpose.

Route Marking

After the design is complete, the center path of the road should be flagged and marked for the equipment operators to begin work. If the area is forested with merchantable trees, it might be beneficial to harvest the area before road construction. Harvesting will reduce the amount of debris left after road construction, and can offset the costs. It is wise to have someone with experience help you with this step. Engineers, consulting foresters, extension agents, and experienced equipment operators are excellent resources.

Construction

Before construction begins be sure the design and route will accomplish the objectives. Experienced equipment operators that have built forest roads will offer advice before they begin. They might suggest minor changes to accommodate water drainage and soil cut-and-fill requirements. Often the operator can find ways to reduce cost based on their experience.

Construction consists of shaping the roadbed by removing the vegetation, stumps, trees, and the topsoil, (organic layer). The road is shaped to allow water to run off the road into ditches on the side.

Forest roads also enhance hiking and improve the overall aesthetic of a property.

Effectively designed forest roads not only provide access but also enhance recreation and wildlife habitat.

There are different roadbed designs, and the terrain will determine which is best. The most common design in Southern forests is a road with a center crown to allow water to drain to each side.

An experienced operator will determine when other structures such as broad-based dips and water turnouts are needed to control the flow of water off the road. In addition, the road could need to be surfaced with gravel if the use will be heavy equipment or during wet weather. A gravel surface provides more stability of the road surface and reduces erosion. Sometimes only certain portions of the road may need surfacing. These might include stream crossings, sections with more slope, broad based dips, and the entrance.

In addition to surfacing, there will be areas that need stabilization to reduce erosion. These areas include stream crossings, ditch banks, and road sides. Stabilizing the roadbed and surrounding areas will minimize erosion and reduce maintenance costs over time. Stabilizing can involve seeding these areas, mulching, or the installation of large stone on the surface.

Road Maintenance

Ongoing maintenance is critical to having a good, usable road system. This typically consists of keeping the road borders open for sunlight to dry the road surface and keeping water control structures working properly.

A key to road longevity is keeping the water off the road surface. Culverts need to be open so water can flow, the roadbed needs to be the correct shape, and ditches need to be in place to move the water away from the road.

Minimizing use during wet weather also helps with maintenance. Vehicles driving on wet, saturated roads can cause wheel ruts that hold water. This creates an added maintenance problem and increases costs.

All forest roads need maintenance over time. Typically, this involves grading the surface to re-establish the correct shape and reducing irregularities such as ruts and depressions that hold water. Water bars or broad based dips might need to be repaired or replaced after a harvest. There might be a need to resurface certain areas after heavy use to keep the roadbed intact. Roads that are not built properly or maintained will erode over time and eventually may become unusable or fail. This can lead to significant repair expenses

In addition to maintenance, security is important. Erecting a gate at the entrance minimizes trespassing and unwanted visitors using your property without permission. Trespass traffic can cause significant damage to forest roads. A well-planned and established road network adds value to a property. In addition to providing access, they become part of the ecosystem of the forest when designed and established correctly. Roads provide corridors through the forest and are used by wildlife as well. Depending on the road design, wildlife food plots can be established along portions of the road to enhance the habitat.

Establishing a forest road network is no small task. It is best to seek advice and understand your state best management practices guidelines before beginning. Take the time to plan and design before construction begins. The results will be well worth it.

Andy Ferguson is President/CEO and Chris Manus is District Manager of American Forest Management, Inc., in Charlotte, N.C.