

# All weather roads

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Road establishment and maintenance is often a costly aspect of forest operations. To reduce operation costs, companies sometimes decide to cut on budgets for road construction and especially road maintenance. This is not always the best solution, as cutting on road maintenance budget might dramatically increase other costs.

Forest roads need to be established one year ahead of operations to allow the compacting of the road and hardening of the surface. If this is not taken seriously, this will result in road problems. It is proven that proper and timely road establishment significantly reduces the costs for road maintenance, let alone all the other advantages of good roads.



The following recommendations can assist in reducing road construction and maintenance costs:

- Ensure optimal planning of roads to keep them as short as possible;
- Keep roads as narrow as possible, but remove large shade trees to allow for proper drying after rainfall;
- Keep in mind the safety of road constructions;
- Apply appropriate techniques with regards to soil and terrain conditions. If gravel is available: use it. It reduces the need for drying, and roads can be kept small. Pay close attention to drainage, use culverts;
- Apply regular maintenance: keep under layers intact and refill of holes in surface layer, this reduces future maintenance costs or even road repair costs;
- Use the same roads as in the previous rotation, as long as these are relatively well planned and located. This reduces road establishment costs to almost zero.

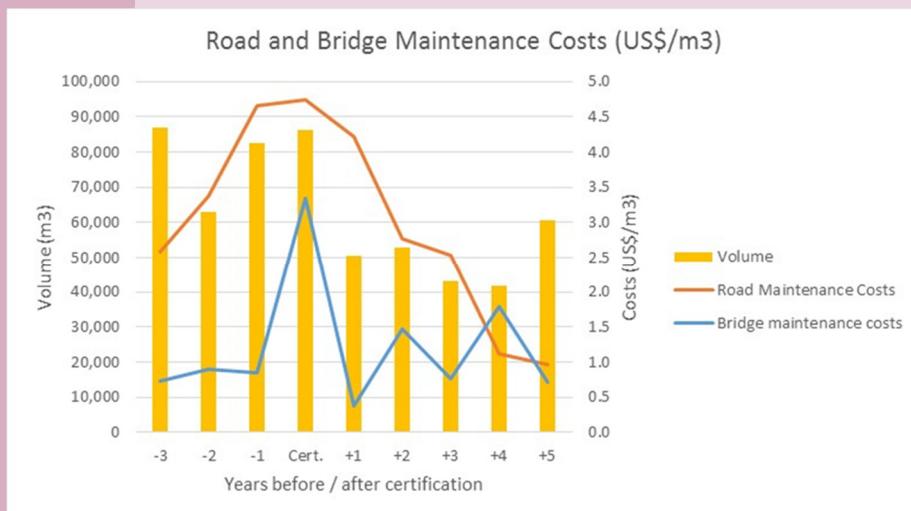
## Seasonal closed forest now open year round

A company in South America could not use its roads for 5 months per year. Since they applied appropriate road construction techniques, especially the placement of culverts, bridges and appropriate drainage systems, they could use their road system year round. This resulted in the following benefits:

- The road construction and maintenance activities could be spread to 12 instead of 7 months;
- To construct and maintain the same length of road networks per year, they only needed half of the equipment. The remaining equipment was sold or replaced by specific road maintenance equipment. This reduced the total costs for road maintenance and construction;
- Machinery needed for road construction and maintenance was used more efficiently – no work stoppages for 5 months, which added to the cost reductions;
- The year round open access to the forest, allowed a production increase of approximately 40%.

## Long term benefits of road construction

To obtain forest certification, an Asian company had to add approximately 3-5 US\$ per m<sup>3</sup> for road construction and maintenance, which was considered a quite huge additional investment. However, they now know better how to establish and maintain the roads. As a consequence the roads remain better, less road maintenance and repair is needed, total driving time is decreased and they even experience less maintenance and repair costs on vehicles. The graph below shows the costs developments for road and bridge maintenance for the years before and after certification. This graph does indicate that proper road construction might induce higher upfront costs, but will reduce the maintenance costs in the long term.



## From 10 to 2 months road construction

In the past, a certain African based company used to construct roads as they went, which resulted in almost year round road construction. After introducing RIL techniques, they switched to a system where road construction was planned and constructed one year ahead. Furthermore, they now differentiate between roads for the dry season (small) and wet season (wider). This reduced the number of months needed for road construction and maintenance from 10 months to 2 months a year.

## Gabon study

In Gabon a study was conducted by Medjibbe, Putz and Romero\* to compare the forest operations of certified and uncertified logging concessions. One of their study topics relates to the road network. The table below presents some of their outcomes.

	Conventional Logging	Certified
Secondary road length per harvested volume	0.7 m/m <sup>3</sup>	0.4 m/m <sup>3</sup>
Secondary road width Of which:	66.6 m	15.1 m
Road bed	7.9 m	4.1 m
Road clearing	29.3 m (one side)	5.5 m (one side)
Secondary road area per harvested volume	539.7 m <sup>2</sup> /m <sup>3</sup>	33.5 m <sup>2</sup> /m <sup>3</sup>

This case showed that when roads are properly planned, constructed and maintained:

- Almost half of secondary roads is needed whereas total skid trail length remains the same;
- Road width is more than four times smaller;
- Total secondary road surface is more than 15 times smaller.

\* Medjibe, V.P., F.E. Putz and C. Romero, 2013. *Certified and uncertified logging concessions compared in Gabon: changes in stand structure, tree species, and biomass*. In: Environmental Management (2013) 51:524-540.