

***TEMPORARY ROAD
COST ESTIMATING***

Temporary Road Cost Estimating

COST ESTIMATING FOR TEMPORARY ROADS

The decision to construct temporary roads for a timber sale or other activity is based on transportation planning and resource objectives that are documented in a NEPA decision. Temporary roads generally are built for one or two seasons of use for limited traffic. The National Forest Management Act (NFMA) requires that any temporary road built as part of a timber sale or other permit/lease shall be designed with the goal of reestablishing vegetative cover on the roadway and adjacent disturbed area within ten years after the termination of the contract, permit, or lease. In addition to this NFMA requirement, the timber sale contract requires outsloping, removal of culverts and ditches, and building water bars or cross ditches after the road is no longer needed. Obliteration costs shown in Table T-3 reflect a wide variation in required work.

For timber sales, the Timber Sale Appraisal Handbook FSH 2409.18, part 45.23a, outlines the general procedures for estimating the costs of temporary roads. Temporary road cost estimates shall be based on the data and procedures contained in the current Cost Guide for road construction. The responsibility for the accuracy of temporary road cost estimates rests with the Forest Engineer (See FSM 7721.04c). Following the example estimate in this section is a sample form for documenting temporary road costs estimates.

The following procedure, or an estimate by time and equipment, should be used to develop temporary road costs which will be included on Line 26 of FS 2400-17's. If time and equipment methods are used, the estimator should use the labor rates and equipment rental rates (for old equipment) contained in this Cost Guide. The labor rates need to be adjusted per section entitled Davis-Bacon/Purchaser Wage Rate Adjustments which appear earlier in this publication.

Step 1: Using Table T-1, determine costs for clearing and grubbing. Enter Table T-1 with State, sideslope (SS%), and right-of-way volume per acre. Move horizontally and read the clearing cost per mile (kilometer). The cost of felling, bucking, and skidding the right-of-way timber on temporary roads is considered a logging cost and not a road cost. Therefore it is included in the logging costs on FS 2400-17 and not in Table T-1. If additional clearing width is desired for windrow placement, etc make necessary cost allowance.

Step 2: Using Table T-1, determine excavation cost per mile (kilometer) by continuing horizontally on the same line used in Step 1. If turnouts or turn-arounds are desired, adjust excavation costs accordingly.

Step 3: Using Table T-1, determine seeding cost per mile by continuing horizontal on the same line used in Steps 1 and 2. The costs of seeding includes the road bed.

Step 4: Determine the cost of obliteration using Table T-3. This item should be included in every temporary road.

Step 5: Total the unit (per mile) (per kilometer) costs determined in Steps 1-4.

Step 6: Multiply unit cost from Step 5 by the length of the temporary road(s).

Step 7: Determine the total cost of drainage structures:

Dips: \$125 each

Culverts: See Table T-2

Step 8: Add the costs determined in Steps 6 & 7. Add the appropriate allowance for Mobilization (See Table T-4).

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Step 9: Remove Profit allowance by dividing the total in Step 8 by 1.06.
Enter the resulting figure on Line 26 of FS 2400-17.

Temporary Road Example: (US Customary - English Units)

Location: Idaho

Average side slope: 30 percent

Estimated length: 1.5 miles

Timber volume: 20 MBF/acre

Drainage structures: 3 dips

1 - 18" culvert, slope, 20%

1 - 24" culvert, slope, 20%

Average scarification needed for obliteration

Solution:

Step 1: Clearing and grubbing = \$2,450/mile

Step 2: Excavation = \$2,070/mile

Step 3: Seeding = \$770/mile

Step 4: Obliteration = \$1,500/mile

Step 5: (1) + (2) + (3) + (4) = \$6,790/mile

Step 6: \$6,790/mile x 1.5 miles = \$10,185

Step 7: Drainage structures:

3 dips x \$125/dip = \$375

1 18" culvert = 460

1 24" culvert = 500

\$1,335

Step 8: (6) + (7) = \$10,185 + \$1,335 = \$11,520

Mobilization = \$11,520 x 0.07 = \$806

Total = \$12,326

Step 9: \$12,214/ 1.06 (profit) = \$11,630 (rounded)

Enter \$11,630 on Line 26, FS 2400-17

Note: Temporary erosion control measures are not included in above example, refer to Section 157 for additional information. Also, this example did not include truck turnouts or turn-arounds or additional clearing for windrows.

Note: For metric cost estimating. At this time, timber volumes have not been converted to metric units, therefore, volume per acre will have to be used. The following conversions can be used for other values: to get cost/kilometer, divide cost/mile by 1.6093 to get road width in meters, multiply width in feet by 0.3048.

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**Table T-1 Idaho
Basic Temporary Road Costs**

SS %	R/W Vol/Ac	Temporary Road Clearing	Cost/Mile Excav	12 ft w/o ditch Seeding
0	0	\$2190	\$2070	\$700
10	0	\$2000	\$2070	\$700
20	0	\$2090	\$2070	\$700
30	0	\$2390	\$2070	\$770
40	0	\$2950	\$2820	\$950
50	0	\$4360	\$4230	\$1270
0	5	\$2180	\$2070	\$700
10	5	\$2000	\$2070	\$700
20	5	\$2060	\$2070	\$700
30	5	\$2410	\$2070	\$770
40	5	\$3060	\$2820	\$950
50	5	\$4690	\$4230	\$1270
0	10	\$2160	\$2070	\$700
10	10	\$2000	\$2070	\$700
20	10	\$2020	\$2070	\$700
30	10	\$2420	\$2070	\$770
40	10	\$3160	\$2820	\$950
50	10	\$5020	\$4230	\$1270
0	15	\$2140	\$2070	\$700
10	15	\$2000	\$2070	\$700
20	15	\$2000	\$2070	\$700
30	15	\$2430	\$2070	\$770
40	15	\$3260	\$2820	\$950
50	15	\$5360	\$4230	\$1270
0	20	\$2120	\$2070	\$700
10	20	\$2000	\$2070	\$700
20	20	\$2000	\$2070	\$700
30	20	\$2450	\$2070	\$770
40	20	\$3370	\$2820	\$950
50	20	\$5690	\$4230	\$1270
0	25	\$2100	\$2070	\$700
10	25	\$2000	\$2070	\$700
20	25	\$2000	\$2070	\$700
30	25	\$2460	\$2070	\$770
40	25	\$3470	\$2820	\$950
50	25	\$6020	\$4230	\$1270

Temporary Road Cost Estimating

Table T-1 Idaho (Continued)

Basic Temporary Road Costs

SS %	R/W Vol/Ac	Temporary Road Clearing	Cost/Mile Excav	12 ft w/o ditch Seeding
0	30	\$2080	\$2070	\$700
10	30	\$2000	\$2070	\$700
20	30	\$2000	\$2070	\$700
30	30	\$2480	\$2070	\$770
40	30	\$3580	\$2820	\$950
50	30	\$6350	\$4230	\$1270
0	35	\$2060	\$2070	\$700
10	35	\$2000	\$2070	\$700
20	35	\$2000	\$2070	\$700
30	35	\$2490	\$2070	\$770
40	35	\$3680	\$2820	\$950
50	35	\$6690	\$4230	\$1270
0	40	\$2040	\$2070	\$700
10	40	\$2000	\$2070	\$700
20	40	\$2000	\$2070	\$700
30	40	\$2500	\$2070	\$770
40	40	\$3790	\$2820	\$950
50	40	\$7020	\$4230	\$1270
0	45	\$2040	\$2070	\$700
10	45	\$2000	\$2070	\$700
20	45	\$2000	\$2070	\$700
30	45	\$2540	\$2070	\$770
40	45	\$3920	\$2820	\$950
50	45	\$7390	\$4230	\$1270
0	50	\$2010	\$2070	\$700
10	50	\$2000	\$2070	\$700
20	50	\$2000	\$2070	\$700
30	50	\$2530	\$2070	\$770
40	50	\$3990	\$2820	\$950
50	50	\$7690	\$4230	\$1270

Temporary Road Cost Estimating

Table T-1 Montana

Basic Temporary Road Costs

SS %	R/W Vol/ Ac	Temporary Road Clearing	Cost/Mile Excav	12 ft w/o ditch Seeding
0	0	\$2510	\$2070	\$730
10	0	\$2210	\$2070	\$700
20	0	\$2390	\$2070	\$730
30	0	\$2740	\$2070	\$880
40	0	\$3370	\$3220	\$1080
50	0	\$4980	\$4830	\$1450
0	5	\$2540	\$2070	\$730
10	5	\$2190	\$2070	\$700
20	5	\$2410	\$2070	\$730
30	5	\$2800	\$2070	\$880
40	5	\$3550	\$3220	\$1080
50	5	\$5410	\$4830	\$1450
0	10	\$2570	\$2070	\$730
10	10	\$2170	\$2070	\$700
20	10	\$2420	\$2070	\$730
30	10	\$2870	\$2070	\$880
40	10	\$3720	\$3220	\$1080
50	10	\$5850	\$4830	\$1450
0	15	\$2600	\$2070	\$730
10	15	\$2160	\$2070	\$700
20	15	\$2430	\$2070	\$730
30	15	\$2940	\$2070	\$880
40	15	\$3890	\$3220	\$1080
50	15	\$6280	\$4830	\$1450
0	20	\$2640	\$2070	\$730
10	20	\$2140	\$2070	\$700
20	20	\$2450	\$2070	\$730
30	20	\$3010	\$2070	\$880
40	20	\$4060	\$3220	\$1080
50	20	\$6720	\$4830	\$1450

Temporary Road Cost Estimating

Table T-1 Montana (Continued)

Basic Temporary Road Costs

SS %	R/W Vol/Ac	Temporary Road Cleaning	Cost/Mile Excav	12 ft w/o ditch Seeding
0	25	\$2670	\$2070	\$730
10	25	\$2120	\$2070	\$700
20	25	\$2460	\$2070	\$730
30	25	\$3080	\$2070	\$880
40	25	\$4240	\$3220	\$1080
50	25	\$7150	\$4830	\$1450
0	30	\$2700	\$2070	\$730
10	30	\$2110	\$2070	\$700
20	30	\$2480	\$2070	\$730
30	30	\$3150	\$2070	\$880
40	30	\$4410	\$3220	\$1080
50	30	\$7580	\$4830	\$1450
0	35	\$2730	\$2070	\$730
10	35	\$2090	\$2070	\$700
20	35	\$2490	\$2070	\$730
30	35	\$3220	\$2070	\$880
40	35	\$4580	\$3220	\$1080
50	35	\$8020	\$4830	\$1450
0	40	\$2760	\$2070	\$730
10	40	\$2070	\$2070	\$700
20	40	\$2500	\$2070	\$730
30	40	\$3290	\$2070	\$880
40	40	\$4760	\$3220	\$1080
50	40	\$8450	\$4830	\$1450
0	45	\$2820	\$2070	\$730
10	45	\$2070	\$2070	\$700
20	45	\$2540	\$2070	\$730
30	45	\$3380	\$2070	\$880
40	45	\$4960	\$3220	\$1080
50	45	\$8930	\$4830	\$1450
0	50	\$2830	\$2070	\$730
10	50	\$2040	\$2070	\$700
20	50	\$2530	\$2070	\$730
30	50	\$3430	\$2070	\$880
40	50	\$5100	\$3220	\$1080
50	50	\$9320	\$4830	\$1450

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Table T-2

Culverts

SS %	CMP Dia In. (mm)	Length Ft (mm)	Price per Foot (Meter)	Price per CMP
0	18 (457)	20 (6.10)	\$15.75 (51.67)	\$315
10	18 (457)	26 (7.92)	15.77 (51.74)	410
20	18 (457)	28 (8.53)	16.43 (53.90)	460
30	18 (457)	32 (9.75)	17.19 (56.40)	550
40	18 (457)	52 (15.85)	17.98 (58.99)	935
50	18 (457)	60 (18.29)	18.83 (61.78)	1130
60	18 (457)	80 (24.38)	21.31 (69.91)	1705
0	24 (610)	20 (6.10)	\$17.25 (56.59)	\$345
10	24 (610)	26 (7.92)	17.31 (56.79)	450
20	24 (610)	28 (8.53)	17.86 (58.60)	500
30	24 (610)	32 (9.75)	18.59 (60.99)	595
40	24 (610)	52 (15.85)	19.42 (63.72)	1010
50	24 (610)	60 (18.29)	20.33 (66.70)	1220
60	24 (610)	80 (24.38)	22.81 (75.84)	1825

Table T-3

Obliteration of Temporary Roads

Description

- (1) Surface scarification, outslope, revegetation for roads in \$500-700/mi (\$311-435/km) gentle terrain
- (2) Scarification, CMP removal, outslope, waterbars, rounding \$800-2000/mi (\$497-1243/km) of backslopes, revegetation, moderate terrain
- (3) Scarification, CMP removal, outslope, waterbars, rounding \$1200-2500/mi (\$746-1553/km) of backslopes, revegetation, steeper terrain
- (4) CMP removal, recontouring, revegetation, gentle terrain \$1800-3500/mi (\$1118-2175/km)
- (5) CMP removal, recontouring, revegetation, moderate & steep \$2500-5000/mi (\$1553-3107/km)

Note: Davis-Bacon/Purchaser Wage Rate Adjustment has been made for above costs. Obliteration requirements are highly variable, ranging from surface scarification and water bar placement to complete recontouring and revegetation of the former roadway. Costs may increase due to difficult or unique conditions. Costs shown above based on small dozer, excavator and sawyer.

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Table T-4
Mobilization for Temporary Roads
 Idaho: 7.0% Montana: 7.0%

COST ESTIMATE FOR TEMPORARY ROADS

Sale Name _____	Made by _____
Unit or Road No. _____	Checked by _____
Reference: Cost estimating procedures for temporary roads from Cost Guide - pages _____	
Average Side Slope:	
Length: _____	ft. (m) = _____ Miles (km)
Timber Volume: _____	MBF/Acre
Drainage Structures: _____	Dips
	_____ 18" (450 mm) CMP, _____ " CMP
 <i>Note: Do not adjust project costs for inflation or deflation.</i>	
(1) Clearing and Grubbing (Table T-1)	= _____ /Mile (km)
(2) Excavation (Table T-1)	= _____ /Mile (km)
(3) Seeding (Table T-1)	= _____ /Mile (km)
(4) Obliteration (Table T-2)	= _____ /Mile (km)
(5) Total Unit Cost (1)+(2)+(3)+(4)	= _____ /Mile (km)
(6) Basic Cost Total (5) x Length = _____/Mile (km) x _____	Mile(s) (km) =
(7) Drainage Structures	
_____ dips X _____/Dip	=
_____ 18" (450 mm) CMPs X _____/CMP	=
_____ CMPs x/CMP	=
Drainage Cost Total	=
(8) Subtotal Basic + Drainage Cost (6) + (7) Subtotal =	
Mobilization (Table T-4) = _____ X _____ % =	
Subtotal + Mobilization (6) + (7) + Mobilization = (8)	
(9) TOTAL COST = (8) _____ / 1.06 (Profit) = _____ *	

*Total Cost to be entered on Line 26, 2400-17

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End of Temporary Road Cost Estimating

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