

Appendix C: Maintenance Sustainability Calculator Instructions

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Step 1

Select your Forest from the pull down menu to auto-populate the calculator with your unit's mileage by maintenance level.

Step 2

Individual unit costs, quantities, and cycles can be modified by each Forest. The "Unit Costs and Maintenance Cycles" tab can be modified to fit each Forest's unique road maintenance needs. See example below:

PART 1 - Determine Estimated Additional Funds needed for Annual Road Maintenance				
ROUTE STATUS	EX - EXISTING			
JURISDICTION	(All)			
SYSTEM	(All)			
PRIMARY MAINTAINER	FS - FOREST SERVICE			
FOREST (SECURITY ID)	0504			
Objective Maintenance Level	Sum of Segment Length (Miles)	Cost to Maintain/Mile	Mtce Cycle	Total Annual Cost
1 - BASIC CUSTODIAL CARE (CLOSED)	0.217	\$103	Included	\$ -
2 - HIGH CLEARANCE VEHICLES	1,790.618	\$593	Included	\$ 1,061,500
3 - SUITABLE FOR PASSENGER CARS	53.488	\$2,355	Included	\$ 126,000
4 - MODERATE DEGREE OF USER COMFORT	32.075	\$9,078	Included	\$ 291,000
5 - HIGH DEGREE OF USER COMFORT	28.274	\$9,078	Included	\$ 256,500
(blank)	318.075			\$ -
Grand Total	2,222.746			\$ 1,735,000
Estimated Annual Funds Available for Road Maintenance by funding source				
Collected Trust Funds (KV and Agreements) (CWMV, CWC2, CWF5, CWF2)		\$	100	
Timber Sale Purchaser (PEPE, PE2 - typically improvement)		\$	100	
Stewardship Integrated Resource Contracts (SSOC)		\$	100	

Step 1: Select your Forest (Security ID) from drop down menu. Mileage by maintenance level will be populated from Test Forest Road Core Data

Step 2: Accept default Cost to Maintain/Mile, or modify in the Unit Costs tab. Accept or modify Maintenance Cycle in Column M of Unit Costs tab. Final values for both will be reflected here. Unit Costs and cycles shown are general estimates, not locally accurate.

Total Annual Road Maintenance Cost will be automatically calculated by multiplying Annual Cost/mile by Total Miles and summing the Maintenance Level.

Appendix_F_MaintenanceSustainabilityCalculator_03022012.xlsx [Read-Only]

Unit Costs and Maintenance Cycles by Maintenance Level													General Annual Maintenance Costs
TASK ID	Task ID1	Task ID2	Task ID3	Task ID4	Reason Code	Priority	Unit Cost	Unit of Measure	Per Mile QTY	Cost Per Mile	Maintenance Cycle	Comments	General Annual Maintenance Costs
R0301	Surface and Roadway	Condition survey			FOREST MISSION	CRITICAL	\$113	MILE	1	\$113	20	Annual, bi-Weekly	\$8
D020101	Drainage	Cross drain	General maintenance		RESOURCE PROTECTIC	CRITICAL	\$226	MILE	1	\$226	10	DH	\$23
D030202	Drainage	Round culvert	Repair/rehab		RESOURCE PROTECTIC	CRITICAL	\$373	EACH	1	\$373	20		\$19
D030201	Drainage	Round culvert	General maintenance		RESOURCE PROTECTIC	CRITICAL	\$85	EACH	5	\$424	20		\$21
TOTAL Unit Cost MIL 1													\$103
V01020102	Vegetation			2 shoulders	FOREST MISSION	NONCRITICAL	\$655	MILE	0.5	\$328	5		\$68
V010302	Vegetation			ing out	FOREST MISSION	NONCRITICAL	\$599	MILE	1	\$599	10		\$60
T010302	Signs and Traffic Cont			new (keep old po	Regulatory	HEALTH AND SAFETY	\$170	EACH	0.25	\$42	8		\$5
T020103	Signs and Traffic Cont			Route Marke	FOREST MISSION	NONCRITICAL	\$6.5	EACH	5	\$283	5		\$57
T030101	Signs and Traffic Cont			new	RESOURCE PROTECTIC	NONCRITICAL	\$283	EACH	0.2	\$57	5		\$11
T030104	Signs and Traffic Cont			new	RESOURCE PROTECTIC	NONCRITICAL	\$2147	EACH	0.1	\$215	10		\$21
R01020701	Surface and Roadway			1lane	RESOURCE PROTECTIC	NONCRITICAL	\$271	MILE	1	\$271	5		\$54
R01040101	Surface and Roadway			1lane	RESOURCE PROTECTIC	NONCRITICAL	\$1187	MILE	0.05	\$599	10	Remove all ML2 roadways with resource protection	\$68
R0301	Surface and Roadway	Condition survey			FOREST MISSION	CRITICAL	\$113	MILE	1	\$113	20		\$8
D020101	Drainage	Cross drain	General maintenance		RESOURCE PROTECTIC	CRITICAL	\$226	MILE	1	\$226	5		\$45
D030202	Drainage	Round culvert	Repair/rehab		RESOURCE PROTECTIC	CRITICAL	\$373	EACH	1	\$373	20		\$19
D030205	Drainage	Round culvert	Install new		RESOURCE PROTECTIC	NONCRITICAL	\$36	LALET	30	\$1085	10		\$108
D030201	Drainage	Round culvert	General maintenance		RESOURCE PROTECTIC	CRITICAL	\$85	EACH	5	\$424	5		\$85
TOTAL Unit Cost MIL 2													\$593

Forest decides that installing a new culvert every 10 years per mile of ML-2 road is excessive, and that a new culvert every 30 years is more realistic. Step 2 then changes the Maintenance Cycle from 10 to 30, changing the TOTAL Unit Cost MIL 2 from \$593/mile to \$521/mile. This new value auto populates in Calculator, cell C11.

Step 4

Step 4, like step 3, is unique to each forest. CMRD allocations to each Forest vary by year. It is a fair assumption that future CMRD allocations will either be similar to this fiscal year, or will be slightly less. Your Budget Office can give you a history of CMRD Budget Authority from the past 5 years to show the trending pattern for your Forest. It is not enough to say it is decreasing, but to be realistic about the rate of decrease.

It is highly unlikely that any Forest dedicates 100% of their CMRD budget to road construction and maintenance. Each Forest takes a percentage off the top before the remainder is dedicated to actual road maintenance. The resultant percentage of CMRD for road construction and maintenance gets entered here, and auto calculates to produce a value in Cell F25. Cell C31 displays the amount of the road system that can be maintained with the Forest's individual modifications in Steps 2-4 above.

In the perfect situation, a Forest's road system would be 100% sustainable, for all costs, not just maintenance. In order to get closer to 100% sustainability, the NFSR mileage would need to be pared down drastically from the existing mileage. Admittedly, that can run counter to a Forest's desire to provide for more uses of National Forest System lands associated with vehicle access.

Step 5

Because the result is significantly less than 100%, Step 5 of the calculator allows a Forest to explore sustainability by reducing road mileage, modifying maintenance levels (sometimes referred to as "downgrading"), or further modifying Cost to Maintain/Mile. Note that "Cost to Maintain/Mile" needs to change to reflect the results of Step 2 above. The other portions of the Travel Analysis Guidebook will assist Forests in analyzing existing roads for the benefits and risks of continued use, aside from maintenance. That analysis should influence the mileage adjustments in Step 5.

Adjusted Total by Objective Maintenance Level (miles)	Cost to Maintain / Mile	Forest's Projected Annual Road Maintenance Needs
0.217	\$ 20	\$ -
1790.618	\$ 200	\$ 358,000
53.488	\$ 1,000	\$ 53,500
32.075	\$ 1,500	\$ 48,000
28.274	\$ 2,000	\$ 56,500
1904.671		\$ 516,000
\$ 300,600		
is this sustainable? No, only		58% of the road system

After Mileages are adjusted, the road system becomes closer to being maintained on a sustainable level.

Adjusted Total by Objective Maintenance Level (miles)	Cost to Maintain / Mile	Forest's Projected Annual Road Maintenance Needs
0.217	\$ 20	\$ -
1200.000	\$ 200	\$ 240,000
45.000	\$ 1,000	\$ 45,000
25.000	\$ 1,500	\$ 37,500
15.000	\$ 2,000	\$ 30,000
1285.217		\$ 352,500
\$ 300,600		
is this sustainable? No, only		85% of the road system

Conclusion

The above exercises with the calculator can display an approximate composition of the National Forest Transportation System network of roads a Forest can realistically hope to maintain, one that is reflective of long-term funding expectations. Per Subpart A of the Travel Management Rule, 36 CFR 212.5(b) Road system :

“(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (Sec. 212.1), the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance. “