George Washington & Jefferson National Forests

Transportation System Analysis Process (TAP) Report

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George Washington & Jefferson National Forests
USDA Forest Service
Southern Region

George Washington & Jefferson National Forests

Unit Scale Transportation System Analysis Process (TAP) Report

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A. Executive Summary

Objectives of Forest-Wide Transportation System Analysis Process (TAP)

The objectives of Forest-Wide TAP were to:

- identify key issues related to the George Washington & Jefferson National Forests' transportation system, in particular affordability and cumulative effects;
- identify benefits, problems and risks related to the George Washington & Jefferson National Forests' transportation system;
- identify management opportunities related to the existing transportation system to suggest for future consideration as National Environmental Policy Act (NEPA) decisions. Examples included items such as:
    - changing maintenance jurisdictions where appropriate;
    - entering into cooperative maintenance agreements;
    - implementing seasonal restrictions;
    - closing routes;
    - modifying maintenance standards; and
    - road decommissioning within priority watersheds;
- create a map to inform the identification of the future Minimum Road System (MRS); and
- indicate the location of unneeded roads and possible new road needs.

(Note: Forest Service regulations at 36 CFR 212.5(b)(1) require the Forest Service to identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System (NFS) lands.)

Analysis Participants

The TAP was conducted by an interdisciplinary team with extensive internal participation, and limited participation by partners and the general public. The primary participants were:

- Scott F. Vandegrift, Team Lead, Engineering and Lands Staff Officer
- Steven Woods, Infra Data Steward
- Shamina Dillard, Forest Engineer
- Ken Landgraf, Planning Staff Officer
- JoBeth Brown, Public Affairs Staff Officer
- Ted Coffman, Recreation Staff Office
- Tom Bailey, Soil and Water Specialist(s)

- Ginny Williams & Pete Irvine, Recreation Program Specialist(s)
- Fred Huber and Dawn Kirk, Wildlife and Fisheries Specialist(s)
- Brian Webb, Law Enforcement
- Katie Donahue, Lee District Ranger
- Elwood Burge, North River District Ranger
- Patrick Sheridan, James River and Warm Springs District Ranger
- Annie Downing (Ret), Glenwood Pedlar District Ranger
- Cindy Schiffer, Eastern Divide District Ranger
- Beth Merz, Mount Rogers National Recreation Area Manager
- Jorge Hersel, Clinch District Ranger
- James O'Hear, GIS Specialist
- Beth Lament, Cartographic Technician
- Each District Ranger included their staff on road by road reviews

Overview of the George Washington & Jefferson National Forests' Road System

The George Washington & Jefferson National Forests' road system currently comprises 2,941 miles, providing access to approximately 1.8 million acres of national forest, as well as to interspersed private tracts and nearby local communities. The system supports both recreation and resource management. It is comprised of a combination of old "public" roads, roads constructed to access timber sales and subsequent silvicultural activities, roads constructed to access recreation areas, and a variety of other routes. These range from double lane paved roads to single lane gravel or native surface roads that may be useable by passenger cars, to high clearance routes, to travel ways that are closed for periods of time greater than one year. Funding for the construction or reconstruction of all types was generally provided either by congressional appropriations, or authorized as a component of a timber sale. Maintenance funding is primarily by congressional appropriations, although timber sales generally fund any maintenance required during the life of a particular sale operation.

Key Issues, Benefits, Problems and Risks, and Management Opportunities Identified

- **Current appropriations and supplemental revenue sources are not sufficient to adequately maintain the George Washington & Jefferson National Forests' 2,941 mile Road System as currently configured**. Without changes, the existing road system requires an annual expenditure of approximately $3,270,339. Only about $1,391,000 dollars are currently available, (FY12 road maintenance budget),

resulting in a shortfall of about $2,103,875. This means that the forest has only 57% of the total funding needed to manage the current road system.

- **There is substantial system mileage which primarily serves either as access to private inholdings, or as general access to adjacent communities** (approximately 139 miles, or 5% of the total). As opportunities allow, jurisdiction and maintenance costs should be considered for transfer to the most appropriate entity in order to allow the limited maintenance funding to be applied most effectively to the system roads of the George Washington & Jefferson National Forests.
- **Certain roads, particularly those located relatively low in the watersheds, may be causing undue stress to water quality** and associated aquatic organisms, especially if they cannot be regularly and properly maintained. This is particularly the case in watersheds that are classified as "impaired." There are 0 miles of forest roads located on impaired watersheds on the George Washington & Jefferson National Forests. In some cases there appear to be opportunities to decrease the total system maintenance costs, while at the same time better protecting water quality by decommissioning those roads with the highest risk and least benefit. 237 miles have been identified by the TAP to be considered for decommissioning.
- **There are a number of roads that will most likely be needed at some time in the future, but which do not appear to be needed for actions currently being proposed.** Storage of these roads (closure for at least a year, with only custodial maintenance provided) should be strongly considered. The TAP analysis suggests that about 154 miles should be considered for conversion to storage and custodial maintenance only until needed.
- **In order to meet budgetary limitations, some roads currently opened year round will need to be identified to be considered for seasonal closure** (1,225 miles); **and some roads currently maintained for passenger car use will need to be identified to be considered for conversion to high clearance use only** (32 miles).
- Relatively high road densities may be impacting some sensitive wildlife species in a few specific areas of the forest. Overall, however, road densities do not exceed those allowed by the forest plan. As configured the overall road density, exclusive of non-FS jurisdiction roads, is 1.05 miles/square mile, and the open road density is 0.94 miles per square mile.
- **Several roads or portions of roads may have to be closed due to insufficient bridge replacement funding.** There are 65 bridges on the Forest located on open roads, of which 9 appear to be load restricted or otherwise deficient.
- **Opportunities should be sought to increase road maintenance revenues** where possible through the use of stewardship contracts and partnerships, including

volunteer groups, such as hunters, equestrian organizations, ATV user groups and others.

Comparison of Existing System to Minimum Road System as Proposed by the TAP

Refer to Appendix D for a summary of proposed changes to the existing road system suggested by the TAP, as information available to frame future NEPA analysis and decisions.

Next Steps

- TAP recommendations will be used to inform NEPA decisions, many of which will eventually be implemented in conjunction with various restoration projects on the Forest.
- Prior to implementing these recommendations, NEPA determinations will be conducted at the appropriate scale, using the TAP to inform issues, particularly cumulative effects and affordability.
- The road system should be revisited with an updated forest-wide TAP, probably on about a 10 year cycle, with the next one due by perhaps the year 2025.

B. Context

Alignment with National and Regional Objectives

Sub-Part "A" Travel Analysis is required by the 2005 Travel Management Rule (36 CFR 212.5). Forest Service Manual 7712 and Forest Service Handbook 7709.55-Chapter 20 provide specific direction, including the requirement to use a six step interdisciplinary, science-based process to ensure that future decisions are based on an adequate consideration of environmental, social and economic impacts of roads. A letter from the Chief of the Forest Service dated March 29, 2012 was issued to replace a November 10, 2010 letter previously issued on the same topic. It reaffirms agency commitment to completing travel analysis reports for Subpart A of the travel management rule by 2015, and also provides additional national direction related to this work, addressing process, timing and leadership expectations. The letter requires documentation of the analysis by a travel analysis report, which includes a map displaying the existing road system and possible unneeded roads. It is intended **to inform future proposed actions** related to identifying the minimum road system. The TAP process is designed to work in conjunction with other frameworks and processes, the results of which collectively inform and frame future decisions executed under NEPA. This letter, including a

diagram which further illustrates the relationship between NEPA and TAP is included in Appendix F.

The document entitled "Sub-Part "A" Travel Analysis (TAP), Southern Region Expectations, Revised to align with 2012 Chief's Letter" and attached in Appendix F, supplements the national direction for Forest Scale TAPs developed for the Southern Region.

Coordination with Forest Plan

The current Forest Plan for the George Washington & Jefferson National Forests' was adopted in 2015. It provides specific direction for overall management of the George Washington & Jefferson National Forests. The Forest-wide TAP tiers to the George Washington & Jefferson National Forests' Forest Plan by informing future NEPA actions that implement the Forest Plan and have transportation components. The TAP has been informed by the Watershed Condition Framework, and likewise, the TAP is intended to inform future forest restoration activities, including watershed restoration.

Budget and Political Realities

The roads located on the George Washington & Jefferson National Forests are a combination of historic trails that have undergone improvement over the years, roads that were built in the decades of the sixties, seventies and eighties to access timber sales, roads constructed for access to communities, either internal or adjacent to the Forest, roads constructed by recreational users, and roads constructed or otherwise acquired through a variety of means to comprise the current system. As is the case for much of the rest of the infrastructure on the Forest, funding has been inadequate to properly maintain all of the Forest's roads and bridges. In some cases these roads and bridges have become superfluous to our administrative needs, and many no longer meet public needs either. Changes are becoming inevitable, being driven both by the budget as well as by the need to have the most efficient and effective transportation system on the ground as possible, and no more. The TAP process is an attempt to begin to identify a proposed "minimum road system" (MRS) which will only come into place as NEPA decisions are made and then actual on-the-ground decisions are implemented. The MRS will probably change over time as well, as public needs and financial resources change. Therefore it is expected that new Forest-wide TAP analyses will continue to be needed, probably on about a 10 year cycle.

Alignment with Watershed Condition Framework (WCF)

Along with the other national forests across the country, George Washington & Jefferson National Forests recently conducted an analysis of its watersheds, categorized them as to their condition and prioritized them for future efforts at improvement. Three categories were identified: Class 1 – Functioning Properly, Class 2 – Functioning at Risk, and Class 3 – Impaired Function. These classifications were performed on watersheds at the 6th order hydrologic unit classification (HUC) according to standard procedures described in the "Watershed Condition Framework" technical guide, found at http://www.fs.fed.us/publications/watershed/Watershed_Condition_Framework.pdf. It was determined that 87 watersheds on the George Washington & Jefferson National Forests are Class 1, 103 are Class 2 and 0 are Class 3. A map showing the location of these can be found in the Appendices. The Scotchtown Draft-Cowpasture River watershed, the Thompson Creek-Cowpasture River, and the Mill Creek-Cowpasture River watershed were selected as priority watersheds for focus work in the next decade. The priority watersheds may also be found on the map in the Appendix H.

The forest-wide TAP analysis was heavily informed by the WCF. For example, roads located near streams within impaired watersheds, and especially priority impaired watersheds, were particularly considered as possible decommissioning candidates. Similarly, continuing watershed improvement work is intended to be informed in the future by the TAP.

Miles by ML Proposed as Unneeded, by Watershed Condition Class

Appendix G lists roads proposed as "unneeded", sorted by the condition of the watershed in which they lie, and with an indication of which ones are located in priority watersheds. The total number of miles on the *George Washington & Jefferson National Forests* which have been suggested as "unneeded" by the TAP is 655. The number of un-needed miles in "at risk" and "impaired" watersheds is 410 and 0 respectively. The number of un-needed miles in priority watersheds is 11.

C. Overview of the George Washington & Jefferson National Forests and the supporting Transportation System

General Description of the George Washington & Jefferson National Forests Land Ownership Patterns, Land Use and Historic Travel Routes

The George Washington & Jefferson National Forests is comprised of 1,786,639 acres, occupying almost 52% of the proclamation boundary. Almost all is forested, with about

139,461 acres (or 8%) being Wilderness or otherwise classified as Roadless, and 700,000 acres (or 39 %) being available for active forest management. Interspersed within the proclamation boundary, and adjacent to the National Forest are several large tracts managed as TIMOs (Timber Investment Management Organizations) or REITs (Real Estate Investment Trusts) as well as some scattered large forest industry tracts, some small farms and a variety of other ownership types. There are a few small communities within the proclamation boundary as well, the larger ones being Blacksburg, VA, Harrisonburg, VA and Staunton, VA. When the land came under the ownership of the George Washington & Jefferson National Forests it was riddled with a legacy of historic travel routes that were primarily located low in the watersheds, alongside stream channels, presumably as these were the simplest locations on which to construct primitive travel ways. Over the past few decades the George Washington & Jefferson National Forests has been slowly working towards relocating many of these roads up the slopes and away from the streams.

The lands of the George Washington & Jefferson National Forests are administered by 6 ranger districts and one national recreation area. The number of acres administered by each district/area is indicated in the following Table:

District	Acres	Portion that is Roadless
Lee Ranger District	188,449	0
North River Ranger District	391,970	6,518
Glenwood-Pedlar Ranger District	223,093	31,636
James River-Warm Springs Ranger District	336,464	15,750
Eastern Divide Ranger District	363,650	63,822
Mount Rogers National Recreation Area	191,551	18,465
Clinch Ranger District	91,462	3,270
Totals	1,786,639	139,461

There are 4 major developed recreation areas on the Forest, including Bolar Mountain/Bolar Flats Recreation Area, Beartree Recreation Area, Sherando Lake Recreation Area and Trout Pond Recreation Area. In addition the Forest allows dispersed recreation on some 1,000,000 acres. Also there are 2165 miles of trails, supporting a variety of uses, including OHVs, equestrian, biking, pedestrian, and mixed use. Motor vehicles are restricted to those roads shown on the official Motor Vehicle Use Map (MVUM) included in Appendix B.

Description of the George Washington & Jefferson National Forests' Transportation System

Interstate Highways 81 and 64, several Federal and State highways, including US 42 and US 33, and quite a number of roads under county jurisdiction traverse various parts of the George Washington & Jefferson National Forests. Some of these roads comprise a portion of the 1231 miles of Forest Highway, which provides access to relatively large tracts of the Forest. Forest Highways are roads maintained under another agency's jurisdiction, which on occasion receive reconstruction project funding through the Highway Trust Fund.

There are 2,941 total miles of National Forest system road under the jurisdiction of the George Washington & Jefferson National Forests. This mileage is comprised of 930 miles suitable for passenger car use, almost all of which are open to the public on a year round basis, 1699 miles only suitable for high clearance vehicular traffic, of which 830 miles are opened to the public and 1056 miles which are at least seasonally closed. There are 279 miles on the system inventory that are closed for periods of time greater than one year, being in "storage" for future use when needed.

The Forest Service catalogs its roads in the official inventory, I-Web, by Maintenance Levels, loosely defined as follows:

- Maintenance Level 5 – Single or Double Lane Paved Roads w/ high degree of user comfort
- Maintenance Level 4 – Moderate User Comfort; primarily double lane aggregate roads with ditches
- Maintenance Level 3 – Lowest level maintained to accommodate passenger car traffic
- Maintenance Level 2 – Maintained primarily only to accommodate use by high clearance vehicles
- Maintenance Level 1 – Closed to all traffic for periods greater than one year.

Table 1 below shows the current break down of the George Washington & Jefferson National Forests' road system by maintenance level:

George Washington & Jefferson NFs Roads	Current Condition
Forest Service Road (FSR) - Maint Level 1	312
FSR - Maint Level 2	1,699
FSR - Maint Level 3	733
FSR - Maint Level 4	188
FSR - Maint Level 5	9
Special Use Maintained (FS needed)	
Total Minimum Road System	**2,941**

Table 1. George Washington & Jefferson National Forests' road system mileage by maintenance level.

Private and Coop Roads

Certain roads located on the *George Washington & Jefferson National Forests* are needed to provide access to private tracts of land, or by municipalities or large private landowners in cooperation with the Forest. The maintenance responsibility for and jurisdiction of these roads are identified in the official inventory. Generally costs for maintaining these roads are pro-rated to the appropriate benefitting entity, as further specified in the enabling agreements.

Unauthorized Roads

At any given time there may be roads found to be in existence on the landscape that are not shown in the inventory or on an official map. These roads are considered to be unauthorized roads, unneeded for use by the *George Washington & Jefferson National Forests*. They are subject to decommissioning at any time funding becomes available for that purpose.

Road Maintenance Funding

The *George Washington & Jefferson National Forests* maintains its road system primarily with funding provided through the annual Interior and Related Agency's budget, specifically the CMRD line item. The *George Washington & Jefferson National Forests* has a target budget of $1,391,000. See the following section for more information regarding how that figure was calculated. Another source of revenue available for certain types of maintenance on the *George Washington & Jefferson National Forests'* road system is CMLG. $526,665 of CMLG was received in FY 2012 (this includes $228,000 of special funding to respond to a 2012 flood event). Roads that support forest management operations may be maintained with timber sale

or stewardship dollars during the life of the operation, but that is not typically a long term solution. Finally, partners and user groups may provide some road maintenance support.

D. Process and Risk Benefits for Analysis

Process Plan:

TAP is conducted at the Forest and District level. Forest and District Interdisciplinary Teams (IDT) established that represent a comprehensive skill set able to analyze all aspects of the transportation system.

a) The Forest IDT established the process with 7 District Teams conducting road analysis on each road segment, applying risk / benefits, economics and recommending minimum roads.
b) Forest utilized skills of established George Washington Forest Plan IDT to determine process and risk / benefits, maximizing efficiency.

Risk / Benefit Determination:

1) Forest IDT utilized a science based approach prescribed by 36 CFR 212.5(b)(1), addressing questions at the forest level from publication FS-643, "Roads Analysis". See Appendix E.

2) Forest IDT analyzed results and identified critical areas that are most relevant to the George Washington and Jefferson National Forests to help determine what risks and benefits should be used to analyze each road.
3) Forest IDT identified the following Risks and Benefits to be used in analyzing each road:

   a) RISKS: Wildlife, Sediment Delivery, Invasive Plants, Aquatic Passage, Public Safety, Law Enforcement
   b) BENEFITS: Resource access, Recreation access, Fire / Emergency access, Wildlife / Plants

4) Forest IDT established criteria for each risk and benefit based on a high, medium, or low metric. See Appendix E.
5) Forest IDT established ratings of High, Medium and Low and scoring ranges to use, to help establish contrast between the road segments based on the risk and benefits. This contrast was set to a decision matrix which helped the District teams formulate their recommendations and identify risks that need to be mitigated.
6) District IDT's were afforded the opportunity to refine each risk or benefit based on local conditions.

E. Cost of Operating and Maintaining the George Washington & Jefferson National Forests' Roads and Bridges

Cost Determination

1) Capacity to afford Minimum Road System is being analyzed.
2) Engineer estimates by Forest IDT used for each maintenance activity per FS handbooks by maintenance level.
3) For purpose of the analysis, a contract based organization was assumed, using a fixed cost / overhead maximum of 20%, realizing all Districts are organized differently and may prove more or less efficient. Efficiency was not analyzed.
4) Costs include gross amounts to conduct minimum maintenance activities AND administrative costs (road management, fixed costs, program management)
   a) Actual overhead varies by District based on amount of in house, force account work conducted.
5) Costs field verified for accuracy.
6) For purpose of the analysis, all road segments are assumed to currently be at an acceptable maintenance standard, realizing deferred maintenance needs on the ground have not been met and vary by District.

Average Cost per Mile per Year table derived from Forest Service Maintenance Prescription Guidelines (FSH 7709.58)

Average Cost per Mile per Year									
Maintenance Activity	Contract or Est Unit Cost per Mile	Frequency	Assumptions	ML 1	ML 2	ML 3	ML 4 Aggregate	ML 4 Asphalt	ML 5
Grading / Ditching / Shoulders	$ 462	Once per year ML 2, Twice per year ML 3,4, Shoulders once per 5 years ML 5	Actual contract costs = $385/mi and $165/mi for surface grading. Add 20% OH.		$ 462	$ 924	$ 924	$ 92	$ 92
Aggregate Surface Replacement	$ 7,176	Spot surface 1/8 mile per year ML 3; 1/4 mile /yr ML 4	Replace all agg surfacing once every 8 yrs - 1'x8'x1mile = 130yd^3 = 260T - #3 agg = $26/T, #27 = $23/T			$ 897	$ 1,794		
Shoulder Replacement	$ 3,588	ML 5 only once per 8 years	Replace evry 5 yrs - 2'x2'x1mile=65yd^3 - 130T. Add OH - #3 agg = $26/T, #27 = $23/T						$ 449
Asphalt Repair	$ 37,110	Pot hole repair, crack sealing, chip sealing, re-surface 8yr cycle	Average contract cost 50% chip seal, 50% overlay contracts within last 5 years.					$ 4,639	$ 4,639
Drainage Repair/Replacement	$ 2,664	One >36" CMP per mile per 3.5 years (forest replacement need 360/yr)	Avg culvert 45' length, 48" cost = $1260, $600 equip time, 8 people hours = $360; total replacement = $2220		$ 350	$ 761	$ 761	$ 761	$ 761
Drainage Repair/Replacement	$ 1,104	One<36" CMP per Mile per 5 years ML 3-5; - ML 2 dips 1/2 culvert costs; ML 1 random.	Avg culvert 45' length, 24" cost = $540, $200 equip time, 4 people hours = $180; total replacement = $920; contract costs = $30/lf 24" pipe	$ 50	$ 110	$ 221	$ 221	$ 221	$ 221
Sign Replacement/Repair	$ 300	1 per mile per 10 yrs ML 2; 1 per mile per 5 yrs ML 3-4; 1 per mile per year ML5	Average single sign replacement cost = $250		$ 30	$ 60	$ 60	$ 60	$ 150
Gate Install / Repair	$ 3,500	Once per 5 years per 5 mile road segment lvl 3; every 2 yrs for lvl 2	Gate vandalism is higher on lvl 2 remote roads. Gate can include earthen berm		$ 350	$ 140			
Vegetation Removal, Mech	$ 1,170	Mechanical - once per 5 years ML 3,4 &5, once per 8 years ML 2	Contract costs avg = $965/mi		$ 146	$ 234	$ 234	$ 234	$ 234
Vegetation Removal	$ 306	Herbicide once per 4 years	Force Acct Herbicide cost = $75/mi, 4 person hours per mile = $175, equip cost = $0.82 / mile		$ 77	$ 77	$ 77	$ 77	$ 77
Hazard Tree Removal	$ 318	Annual	Force Acct Crew - 6 person hours per mile = $262; equip cost = $3.40 / mile			$ 318	$ 318	$ 318	$ 318
Mitigation to Higher Maintenance Standards needed to mitigate higher traffic or environmental degradation		Cost per mile assumed at $1,419, difference between a 3 and a 2 for drainage and spot surfacing activities. Roads needing mitigation analyzed at 40% of total maint level 2 roads.			$ 568				
TOTALS				$ 50	$ 2,093	$ 3,632	$ 4,389	$ 6,402	$ 6,940

Notes:

- Maintenance activity, frequency and costs adapted to local conditions on the GWJ
- Cost figures are gross amounts and account for all costs to operate a maintenance program on a Forest, including overhead.
- Actual overhead varies by District based on amount of force acct work conducted; most efficient execution assumed
- Forest program overhead rate = 20%.

Target Budget Determination:

1) Assumed Forest maintenance funding by chart below, based on historical averaged Road Construction and Maintenance (CMRD) budget on the GWJ.
2) Annual Maintenance Budget by District distributed by usage based on size of land area management (acres less wilderness)

A. Usage assumed to have equal impacts across land area, realizing impacts can vary widely based on varied use and existing conditions.

B. GWJ current roads program withholds ~$200k to develop forest priorities to offset these impacts, directing funding / maintenance where needed. Deferred maintenance needs and forest priorities were not analyzed.

3) Add 30%, based on average 3 year expenditures, to account for road maintenance that gets conducted by the following:
   - Vegetation management projects - Maintenance deposits
   - Capital Investments that reduce deferred maintenance and help eliminate annual maintenance for that project area
   - Stewardship Contracting
   - Cooperative maintenance agreements (permits, communication sites, private property)
   - Grants and other (Resource Advisory Committees, Partnerships, volunteers)
   - Potential funding for high level maintenance roads through transportation bill

Forest Roads Budget	**$**	**1,250,000**
Forest Bridge Maintenance	$	180,000
Forest Road Maintenance	$	1,070,000

Forest Road Maint by District		% of Forest Road Maint	CMRD Budget	Target Budget
George Washington NF	Lee	11.44%	$ 122,408	**$ 159,130**
	Deerfield	10.53%	$ 112,671	**$ 146,472**
	Dry River	12.87%	$ 137,709	**$ 179,022**
	Warm Springs	9.89%	$ 105,823	**$ 137,570**
	James River	9.58%	$ 102,506	**$ 133,258**
	Pedlar	7.21%	$ 77,147	**$ 100,291**
			GW Total	$ 855,743
Jefferson NF	Glenwood	4.42%	$ 47,294	**$ 61,482**
	Eastern Divide	18.20%	$ 194,740	**$ 253,162**
	Mount Rogers	10.51%	$ 112,457	**$ 146,194**
	Clinch	5.35%	$ 57,245	**$ 74,419**
			Jeff Total	$ 535,257
			Forest Total	**$ 1,391,000**

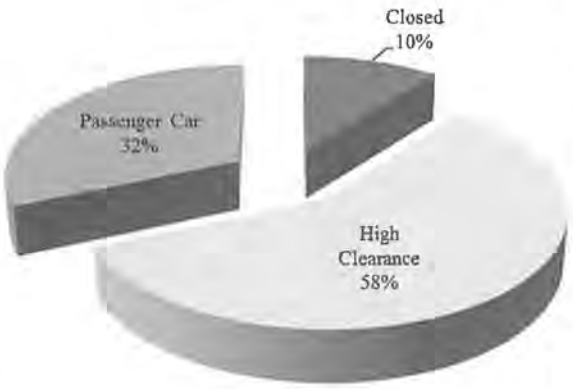
F. Findings, Recommendations, and Strategies to Reduce Costs and Mitigate Risks

Findings - Road Composition

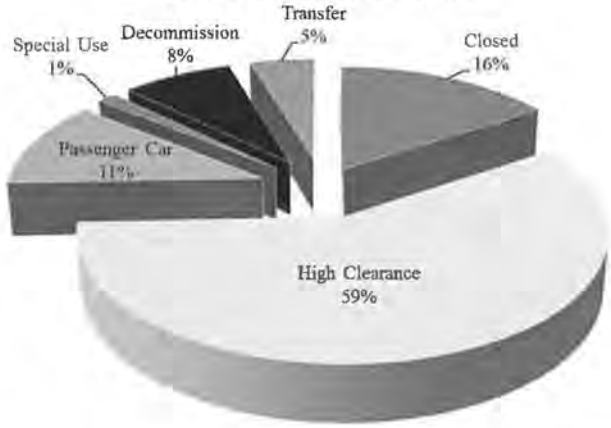
TAP Recommendations to changes in road composition as summarized below:

George Washington & Jefferson NFs Roads	Current Condition	TAP Recommendations	Change from Current	% Change from Current
Forest Service Road (FSR) - Maint Level 1	312	466	154	49%
FSR - Maint Level 2	1,699	1,731	32	2%
FSR - Maint Level 3	733	285	(448)	-61%
FSR - Maint Level 4	188	55	(133)	-71%
FSR - Maint Level 5	9	-	(9)	-100%
Special Use Maintained (FS needed)		21	21	0%
Total Minimum Road System	**2,941**	**2,558**	(383)	**-13%**
Special Use Maintained (Not needed by FS)		20		
Decommission		237		
Transfer Jurisdiction		139		

Current Road System



TAP Recommendation



Findings - Economics

Current road system is funded at 43% of total maintenance funds needed in order to fully maintain to objective standards.

Implemented TAP recommendations would meet budget expectations for funding maintenance to objective standards as summarized below:

MRS Summary	Min Road System Budget	Current Miles	Current Maint Need	Current % Need Funded	Minimum Road System	Min Road System Maint Need	TAP % Need Funded	% Miles Reduced	% Costs Reduced	Total Cost Reduction
GWJ Totals	$ 1,391,000	2,941	$ 3,270,339	43%	2,558	$ 1,400,306	99%	13%	57%	$ 1,870,033
	Total Reduction in Mileage			383						

Mitigating Risk

Recommendations and strategies identified to mitigate risks and reduce costs and implementation status (listed in order of most significant impact to reducing maintenance burden):

1) Change maintenance jurisdiction where appropriate.
   a) Change high use roads that serve commercial interests or private residences to public roads maintained by the State.
      i) TAP findings used to initiate meetings with Virginia Dept of Trans and Fed Highways to add new Public Roads / Forest Highways (Forest Access Roads).
      ii) Submitted 12 new roads for transfer to Forest Highway program - one approved in 2012 by VDOT and FedHwys, others put on hold under new transportation bill. One project submitted and funded in FYs 14 and 15.
   b) Shift maintenance responsibilities to long term commercial special use permittees where appropriate.
   c) Enter into cooperative maintenance agreements where appropriate based on needs of the agency.
      i) Private roads: Issue Special Use Permits
      ii) Roads open to the public with private property owners: Negotiated agreements with standards and liability clauses.
         (1) i.e. Forest Service maintains to Level 2 standard while maintenance agreement permits maintenance to higher levels performed by others.
2) Seasonal restrictions - reduce potential for resource damage and actual expenditure of funds.
3) Close routes for future use.
4) Modify Maintenance Levels.
   a) Lower standards: Passenger car routes to high clearance.
   b) Raise standards: Increase maintenance level to mitigate high risks.
5) Decommission roads.
6) Schedule maintenance activities and costs over 3 years on lower used routes or higher quality roadbeds.
   a) Recognizes that we don't need to perform all maintenance activities each year to keep routes open and / or safe.
   b) Schedule maintenance activities over shorter time on high risk roads part of minimum road system to mitigate environmental degradation.

c) This strategy can be construed as accepting lower quality roads and deviating from current manual direction.
d) This is happening with or without the TAP either by design or neglect due to lack of resources.

G. Identifying Issues

1) Keeping roads well maintained at a higher standard may be more economical than downgrading where traffic is high.
   a) This needs further study and may not be realized in a spreadsheet or PowerPoint.
   b) Once drainage is compromised more costly repairs are required to re-establish road prism.
   c) A policy of retreat to lower road standards needs to be balanced with a demand for higher maintenance efficiencies.

2) Potential loss of ERFO funds – All level 2 roads are technically NOT eligible to receive emergency repair funding through Federal Highways (ERFO).
   a) Recent storm events in 2013 were approved for level 2 roads that are open to the public. Interpretation of the regulations by FedHwys is inconsistent and depends solely on one individual reviewing the sites.
   b) The RO/WO needs to resolve this issue with FedHwys prior to pushing a comprehensive downgrade strategy.

3) All passenger car routes (ML 3 and up) are subject to the Highway Safety Act.
   a) Act requires roads designed and maintained at minimum standards for accident prevention
      i) Signing may be our biggest issue as all level 3 roads and higher are subject to the Manual on Uniform Traffic Control Devices.
   b) The Forest Service and Line Officers may be held liable for accidents on level 3 roads and higher where the road is not maintained at the appropriate standard.

4) Cost reductions strategies increase potential resource damage risks. Reduction in Maintenance level may increase sedimentation.
   a) This strategy needs further study, i.e. Is it more economical to keep higher standards for roads that need to be open?
   b) Is it more economical to pull culverts and replace with dips and fords? What is impact to watershed?
   c) High risk roads can have higher priority for project and maintenance funding and may need to be higher ML.

d) High risk roads need to be surveyed to apply best management practices for drainage features (see FS guide for implementing the lowering of National Forest System Roads to Maintenance Level 2 - San Dimas TDC.)
e) Decreasing road standards without reducing traffic can cause more significant and costly repairs.

5) Increased vegetation management costs with lower road maintenance standards. Need to use vegetation management projects to upgrade roads.

(We are simply shifting the financial burden to another program area.)

a) Strategies could directly conflict in timber sale areas and result is less marketable sales more costly management activities.

6) Many roads are recommended at higher standards than need indicates. Identifying Perceived Political Realities (PPR) surrounding road levels - perceived because it is CHANGEABLE.
   a) This analysis and report BEGINS the process to change realities on the ground that shape perception.
   b) Obtain internal buy in to complete analysis divorced from PPR and "need creep".
      i) Roads that are only needed at a level 2, but recommended higher based on PPR.
   c) Use findings to develop communication plans and get the word out. Communicate, communicate, and communicate.

7) INFRA road data is not adequately integrated with GIS - INFRA IS CURRENTLY A BUST to do this work
   a) All databases should be "spatial centric" - i.e. FACTS/FSVeg.
   b) At a minimum, segment lengths and begin and end mile posts need to match to use GIS road layer as a useful tool.
   c) Recommend use of user created fields in infra with TAP analysis column data to be able to map ALL.
   d) Better yet: Recommend new module or expand RMO with TAP data.
   e) THEN develop and use of ArcMap toolbar to dynamically link GIS/Infra.
   f) Allows IDTs to graphically conduct analysis and create/edit records.

8) Units need road maintenance funding innovation and agreement support.
   a) More flexibility to waive liability or permit private maintenance - Manual direction is outdated and largely "selectively neglected".
   b) New funding Mechanisms - stamps, permits, fees.

9) Units need support transferring maintenance jurisdiction.
   a) Obstacles at National and State level could be chased by RO/WO.

10) Maintenance Organizational Efficiency and Effectiveness.

a) Focus of TAP is on capacity to maintain size of infrastructure based on organizational assumptions and efficiencies.
b) The Forest Service needs to be approaching our maintenance capabilities in terms of infrastructure size AND our organizational efficiency. The GWJ established a 22% overhead rate which is far lower than 2012 actual level of 55%. TAP is a trigger for this Forest to examine its road maintenance organization and implement changes.
c) Sub-units that are currently efficient in their maintenance activities can demonstrate a greater capacity to maintain a larger infrastructure.
d) Recommend Washington Office (WO)/Regional Office (RO) establish parameters for Forests on maintenance efficiencies - Focus TAP on both capacity and efficiency.

    i) Establish policies to minimize forest and regional risk during budget downturns.
    ii) Analyze effectiveness of force account vs. contract work by maintenance activity
    iii) Cap fixed costs at 22-40%.
    iv) Minimize program requirements outside of actual maintenance activities.
    v) Regional or Multi-Forest program positions - INFRA, GIS, Bridge & Maintenance Engineers.
    vi) Maximize maintenance funding to the roads.
    vii) Make budget targets meaningful - Use TAP as the catalyst to change.
        (1) 1 mile maintained = ALL activities conducted to standard.
        (2) Tie funding allocations to meaningful targets.

11) IMPLEMENTATION IS HARD TO DO

a) Some items are staff intensive (agreements / permits), and end up as lower priority.
b) MUST be driven by Line.
c) Forests may not have the staff or time to adequately implement .
d) Recommend region / nationwide staff teams or Process Improvement Projects (PIPs) to fund implementation strategies.
e) Sample costs for the GWJ implantation:

Draft Costs for Implementation Summary 2014-2020 Listed in priority of execution	Unit Cost	Units	Total Cost	Notes
Schedule Maint Activities	na	na	-	Part of annual maintenance planning
Change in ML - Surveys	na	na	-	Phase in with random road surveys
Mapping / public mtgs	na	na	-	Part of routine program of work
Change in ML - PC to HC	600	196	117,600	Mitigation of safety & environmental issues
Seasonal Restrictions	500	200	100,000	New gates and signing, admin / contracts
Transfer Jurisdiction - admin	400	120	48,000	Scope and engineer reports
Change in ML - HC to PC	1,500	66	99,000	Upgrade to higher std to mitigate environ risk
Transfer Jurisdiction - constr	45,000	120	5,400,000	Average cost to upgrade roads @45k per mile
Decommissioning	1,500	120	180,000	Cost per mile to design and contract
Special Uses	1,000	51	51,000	Lands admin costs per mile
Totals			$ 5,995,600	
Annual costs averaged out till 2020			$ 856,514	

Cost to implement based on this analysis would have a 3-5 year payback with savings realized. However, costs would need to be funded outside normal maintenance program for most items.

12) Reduction from passenger car to high clearance roads impacting public safety and user comfort and increasing maintenance costs.
   a) Accept some lower user comfort as a consequence. Maintain historical use of road as much as possible.
   b) Changes in user comfort can be slowly phased in. Examples:
      i) Maintain roadway at highest standard possible as budget and resources allow.
      ii) Phase surface blading out over multiple years. If a route is bladed twice a year, lower to once for multiple years or as dictated by available resources. This is already happening to a large degree - 2013 blading miles are 78% lower than 2010 with lower CMRD budgets.
      iii) Develop sign plans and install where appropriate to mitigate potential safety issues, change expectations.
      iv) Drainage structures would be maintained through their life cycle, and then instead of replacing culverts in kind, drainage dips would be installed.

   c) Maintain some drainage features to mitigate high risk sedimentation issues where warranted.
   d) Actively discourage or prohibit passenger car traffic to mitigate safety issues if they arise through roadway deterioration - proactively install dips or change road prism at road entrance to physically restrict car traffic.

13) Recreational use - Our roads are under increasing pressure to support more recreational use including RV's and stock trailers which cannot negotiate high clearance road standards.
   a) The TAP has identified many of these roads based on FS need for level 2.
   b) Public need should be accounted for within reason or based on past usage, shown as developed recreation use in TAP and noted - Analysis is inconsistent here, with some districts having budget discretion to make these decisions.

c) This will be a more contentious issue on units without as much funding discretion, able to meet target budgets.

Appendices

A. Map of Existing Road System & Proposed Unneeded Roads
B. Motor Vehicle Use Map(s) MVUMs (http://www.fs.usda.gov/main/gwj/maps-pubs)
C. Road by Road Analysis Process, Definitions and Instructions
D. Full GWJ Forest Road by Road Analysis, Including Comparison of Existing and Suggested Minimum Road Systems (miles by ML) with Comparison of Existing and Suggested Minimum Road System and Associated Costs
E. Road Analysis Process Interdisciplinary Team Findings
F. Chief's Letter of Direction
G. Southern Region Expectations
H. Table of Non-Minimum Roads by Watershed Class (Functioning Properly vs. Functioning At Risk)
I. Map of Watersheds