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Rio Grande National Forest Forest-wide Travel Analysis Process Report

Rio Grande National Forest

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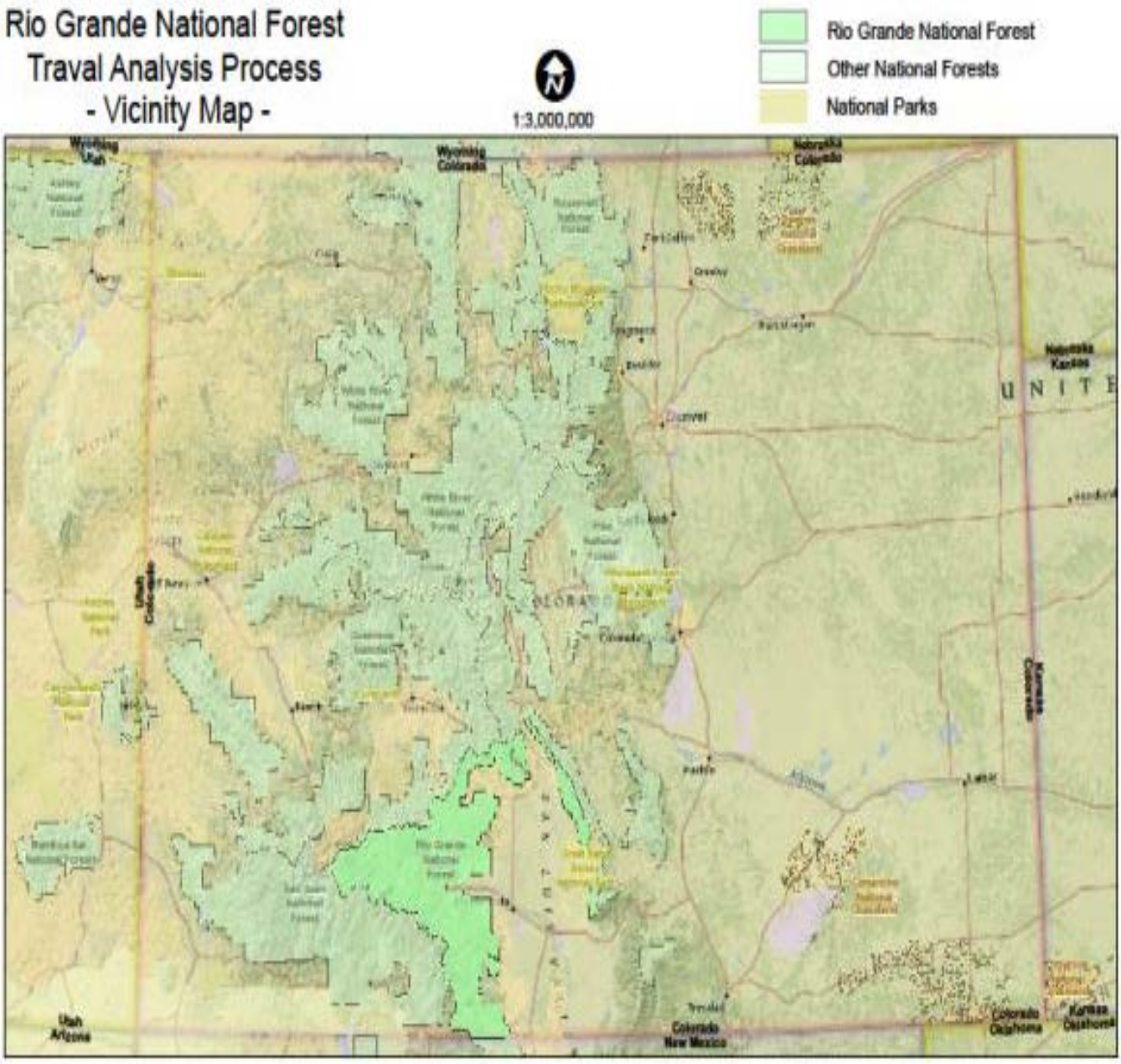

Figure 1. Travel Analysis Process, Rio Grande National Forest vicinity map

Executive Summary

This report documents the Rio Grande National Forest transportation analysis process (TAP). This analysis is designed to provide decision-makers with information to develop a safe road and motorized trail system, determined by Forest Plan objectives, that is responsive to public needs and desires, affordable and efficiently managed with negative ecological effects on the land, and in balance with available funding for needed management actions. This report is not a decision document. Road and motorized trail-related decisions may be addressed by means of the National Environmental Policy Act (NEPA) process incorporating public involvement.

The outcome of the TAP is a set of science-based recommendations for the forest transportation system, and is intended to inform subsequent National Environmental Policy Act (NEPA) processes, allowing individual projects to be site-specific and focused, while addressing cumulative impacts. The TAP neither produces decisions nor allocates National Forest System lands for specific purposes; it provides the analytical framework from which to make recommendations that may then be examined in the NEPA process. TAP describes current conditions, risks, benefits, opportunities (needs for change), and priorities for action. Future NEPA analysis that includes public involvement may carry forward, reject or change the recommendations in this report, and make project-specific decisions related to the Forest transportation system.

The travel analysis process is not a NEPA process, rather it is an integrated ecological, social, and economic approach to transportation planning, addressing both existing and future roads, motorized trails and motorized recreation areas. The travel analysis process is a comprehensive road and trail specific inventory that offers management recommendations to match the transportation system to the desired future condition, determined through the existing Rio Grande Forest Plan direction, public input, and agency resource guidelines. This TAP report provides a comprehensive review with technical recommendations for changes to the existing road system.

This travel analysis process is intended to identify management opportunities for the Rio Grande National Forest Transportation System to meet current and future management objectives, and to provide information that allows integration of ecological, social, and economic concerns in future decisions. The travel analysis process is tailored to local situations and landscape conditions identified by forest staff members, coupled with public input.

Forest Service Manual 7712.4 directs responsible officials to use the travel analysis process (TAP), formerly known as the Roads Analysis Process or RAP, as the science-based approach for identifying the transportation system for a national forest.

Subpart 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 provides 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.

Transportation analysis is a six-step process described in Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA 1999). The steps are designed to be sequential, with an understanding that the process may require feedback and iteration among steps over time.

1. Setting up the analysis
2. Describing the situation
4. Assessing benefits, problems and risks
5. Describing opportunities and setting priorities

3. Identifying the issues 6. Reporting

The process provides a set of possible issues and analysis questions with answers that can help managers make choices about road system management.

Analysis Performed

A roads analysis with detailed Roads Analysis Report (RAP) was completed for the Rio Grande National Forest in 2004. In the 2004 RAP process 180 miles of roads (140 roads), were missed, and were not included in that analysis. The missed roads were not included in INFRA (an Oracle Database containing information on all roads and improvements on National Forest lands) at that time. This transportation analysis and report incorporates the Rio Grande National Forest 2004 RAP documents.

In the 2004 RAP road evaluation process, the IDT determined that approximately half of the road system is considered high value and low risk, about 17 percent of the road system has high value and high risk; and only a small portion of the road system (750 miles) was found to be low value. This indicates that the RGNF has developed a road system that meets most access needs, although there are opportunities to reduce resource impacts, annual and deferred maintenance costs.

In October 2013 a travel analysis process was started to evaluate and rate benefits and risks for all NFS roads, including the roads missed in the 2004 RAP, and motorized trails on the Forest. Resource evaluation criteria used in the 2004 RAP were reviewed, updated where needed and used for rating each road and motorized trail. Road benefits were rated for recreation, range, timber, and fire and fuels. Resource risks were evaluated and rated for watersheds, soil erosion, soil mass movement, terrestrial wildlife, aquatic and riparian and archeologic (cultural) resources for each road. Resource rating scores for each road and motorized trail are displayed in Appendix A (RGNFTAP_RdsCoreAttributeResourceRanking - spreadsheet).

As in the 2004 analysis process, this TAP, followed the six-step process described in FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA 1999) and FSH 7709.55 (USDA FSH 7709.55).

The Watershed Condition Framework (WCF) was used to the maximum extent possible to estimate the watershed risk ratings. Rating criteria was developed using the *Watershed Condition Framework Road and Trail Condition Rating Rule Set*, specifically the overall *Road and Trail Condition Indicator,* the *Open Road Density,* and a modification of the *Proximity to Water* attributes. Site-specific road information and professional judgment were used to adjust the rating when appropriate.

Sixth-level watersheds were evaluated for risks from road and motorized trail related impacts. The watershed assessment identified potential effects from roads and motorized trails that can impact watershed condition and aquatic habitat. Each 6th-level watershed was assigned a high, moderate, or low risk rating. This information was used to determine watershed and aquatic risk for each 6th-level watershed and is intended to guide sub-forest-scale analysis. Sub-forest-scale analysis would be prioritized to focus on watersheds with the greatest resource risks.

The IDT reviewed questions appropriate for their specialty (USDA 1999) to build issue statements suitable for analysis and evaluation criteria to determine a high, moderate, or low numeric benefit or risk rating for each road and motorized trail. Resource evaluation descriptions are included in Step 4 with additional information in Appendix J. INFRA road attribute data was used for basic road descriptions.

Key Results and Findings

Four resource benefits and six resource risk criteria were applied to all National Forest System roads, including roads missed in the 2004 RAP, and motorized trails to evaluate and rate each road.

Benefits

- Recreation access
- Range management access
- Timber management access (vegetation management)
- Fire and fuel management, public safety, and agency access

Risks

- Watershed (soil and water)
- Soil erosion
- Soil mass movement concerns
- Aquatic, riparian area
- Terrestrial wildlife
- Cultural resources

Each resource specialist developed evaluation criteria to rate each road and motorized trail for high, moderate, or low benefit and risk. Resource benefit and risk scores were then combined (totaled) for each road and motorized trail to determine miles displayed in the four cell matrix below.

Resource benefit and risk rating scores were based on a point system where a high rating equaled 3 points, a medium rating - 2 points, and a low rating - 1 point. Roads and motorized trails with no identified benefit or risk were scored zero or left blank. Combined resource scores for risk range from 0 to 18 (3 possible points for each criteria) and from 0 to 12 for benefits. To determine miles in each of the four matrix cells, a high benefit score ranged from 7.6 to 12 points, low benefit roads and trails scored 0 to 7.5 points. A combined high risk score ranged from 6.6 to 18 points, low risk roads and motorized trails scored 0 to 6.5 points.

Detailed descriptions of specialist's evaluations and rankings and management recommendations are described in Step 4. Scores for each road and motorized trail are shown on spreadsheets in Appendix A.

The IDT developed the point distribution to group road and motorized trail miles in each matrix cell to identify routes with high and low benefit and high and low risk ratings groups (details are displayed in Step 4, tables 8 and 9). The road and motorized trail matrix provides total road miles in each cell and general management recommendations to define the potential minimum road system, identify roads that pose high risk to other resources, and prioritize sub-forest-scale projects.

Table 1 displays road and motorized trail miles and general management recommendations for each matrix category.

Table 1. Road and motorized trail Benefit/Risk Matrix

Road and Motorized Trail Benefit/Risk Matrix				
High potential for investment		**Low potential for investment**		
Risk				
	18			
	Category 2 High benefit, high risk Priority for investment (CIP, PFSR, etc.) Focus on resource concerns 639 miles roads 73 miles trails	**Category 3** Low benefit. High risk Priority for risk analysis Consider reducing maintenance level Consider decommissioning Focus on resource concerns 194 miles roads 40 miles trails		
12	**Category 1** High benefit low risk Ideal condition Maintain to standard Review for potential resource concerns 893 miles roads 83 miles trails	**Category 4** Low benefit low risk Consider reducing maintenance level Consider decommissioning Review for potential resource concerns 1093 miles roads 105 miles trails	0	**Benefit (Value)**
	0			

Benefit, (value) 4 - recreation, range, timber, fire fuels management maximum value = 12
Risk (concerns), 6 – watershed, soil erosion, soil movement, terrestrial wildlife, riparian aquatic, archeology, maximum risk = 18
Horizontal, benefit of 7.5 or less = low potential for investment (low value)
Benefit of 7.6 or more = high value for investment (high value)
Vertical, risks, less than 6.5 = low concern, 6.6 or higher = high concern

The IDT total benefits and risks rating scores for each road were used to make general road management recommendations based on the four management categories developed from benefit and risk numeric ratings in each matrix cell:

- Matrix category 1, 893 miles, 31%, rated high benefit, low risk
- Matrix category 2, 639 miles, 23%, rated high benefit, high risk
- Matrix category 3, 194 miles, 7%, rated low benefit, high risk
- Matrix category 4, 1,093 miles, 39%, rated low benefit, low risk

This indicates that the RGNF has developed a road system to meet most access needs, although there are opportunities to reduce resource impacts as well as annual and deferred maintenance costs. Road and motorized trail management recommendations are described in Step 4, opportunities are included in Step 5.

The low benefit/high risk management category 3 includes 194 road miles with these maintenance levels:

- 53 miles of ML1
- 131 miles of ML2
- 10 miles of ML3

- (0.0) miles of ML4
- (0.04) miles of ML5

Roads in this group should be considered high priority for sub-forest-scale roads analysis to identify high-risk reduction needs and confirm use value. Reducing maintenance levels on ML 2 and ML 3 roads, decommissioning, or conversion to motorized trails or other suitable options for mitigation are possible opportunities.

The low benefit/low risk management category 4 includes 1,093 road miles with these maintenance levels:

- 541 miles of ML1 Roads
- 495 miles of ML2 Roads
- 57 miles of ML3 Roads
- 0 miles of ML4 Roads
- (0.3) miles of ML5 Roads

These roads should be considered lowest priority for expending annual road maintenance funding. They hold moderate potential for decommissioning or reducing maintenance level or, where there is a recreational demand, conversion to trails.

The remaining roads (1,532 miles in categories 1 and 2) would be mitigated to reduce resource risks where needed and maintained at existing ML.

- Focus road maintenance funds on these roads to keep them in, or get them to, the low risk category.
- Category 2 roads are a high priority for sub-forest scale roads analysis to identify high risk reduction needs.
- Both categories are a high priority for capital improvement funding, PFSR designation, road improvement, and road relocation where needed.
- Shift road maintenance funds to these roads to keep resource risks from increasing.

These roads are part of the minimum road system for the Forest.

Total road miles and percent of miles by management category, and maintenance level miles with management recommendations for each matrix cell category are described in Step 4.

Appendix B map displays the current NFS roads by maintenance level. Appendix C map displays the road system recommended by the IDT by maintenance levels. The map in Appendix D displays the minimum road system with likely needed and likely not needed roads.

Motorized trail management recommendations are described in Step 4.

A complete list of roads and motorized trails with benefit and risk ratings for each road and motorized trail is included in Appendix A.

Travel Analysis Process

Introduction

Areas included for analysis under the Forest-wide Travel Analysis Process include the entire Rio Grande National Forest (Saguache, Divide and Conejos Peak Ranger Districts). The total area covered by the Forest is about 1.85 million acres (USDA 1996).

The Rio Grande National Forest Line Officers will use this travel analysis process results when planning future projects where laws, regulations, manual and handbook direction require that a travel analysis process be completed prior to project inception. This TAP analyzed all 2,819 National Forest System road miles and 301 miles of motorized use trails on the Forest. The forest leadership team elected not to include motorized use areas in this analysis (Appendix I).

This Forest travel analysis examined 2,819 existing National Forest System road miles identified with the following operational maintenance levels:

- Maintenance Level 5 passenger car roads – 20 mile
- Maintenance Level 4 passenger car roads – 1 mile
- Maintenance Level 3 passenger car roads – 787 miles
- Maintenance Level 2 high clearance roads – 1,319 miles
- Maintenance Level 1 long term storage roads (closed) - 692 miles
- Motorized NFS trails – 301 miles

In evaluating and assigning management recommendations to roads, the IDT elected not to determine road or trail-specific management proposals, but to focus on general opportunities for transportation system adjustments in this TAP assessment. Specific road conversion to trails would be decided at project level analysis (Appendix I). Road and trail management decisions will be made under future NEPA projects.

Process

Current agency policy revision combines the accepted roads analysis process (RAP) with motorized trails and motorized areas analysis as the TAP process. The Travel Management Rule requires each administrative unit (National Forest, National Grassland, Ranger District, etc.) to designate areas on National Forest System (NFS) lands as well as NFS roads and NFS trails that are open to motor vehicle use by class of vehicle and, if appropriate, by time of year (36 CFR 212.51). Travel analysis is intended to complement and integrate existing laws, policy, guidance, and practice in roads analysis and management on the national forests.

Travel analysis is a tool that provides data for subsequent site-specific project environmental analysis. The TAP is a comprehensive inventory and offers road and trail specific recommendations to match the transportation system to the desired future condition, as determined through existing direction, public input, and agency resource specialist guidelines.

The outcome of TAP is a set of recommended changes to the forest transportation system. A thorough, more site-specific travel analysis would be completed during project-level NEPA planning that addresses site-specific direct, indirect, and cumulative effects.

A Project Initiation Letter (PIL) requested Forest resource specialists to participate in the Rio Grande National Forest Travel Analysis Process. This letter provided the framework for an interdisciplinary, science-based analysis and established guidelines for the interdisciplinary team during the analysis process (Appendix I). The initiation letter assigned the working group to the Rio Grande transportation analysis project.

To identify the minimum road system and unneeded roads requires a travel analysis process that is dynamic, and integrated with all resource areas. The team was directed to use the travel analysis process described in Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA 1999), Forest Service Manual 7712 and Forest Service Handbook (FSH) 7709.55, Chapter 20, to complete the applicable sections of Subpart A. TAP is a science-based process that ensures future travel-management decisions include evaluation of environmental, social, and economic impacts.

In 2004 a roads analysis and detailed roads analysis report (2004 RAP) were completed for the Rio Grande National Forest. The 2004 analysis and report followed the six-step process described in Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA 1999). This transportation analysis and report incorporates the Rio Grande National Forest 2004 roads analysis and documents the forest-wide roads and motorized trails analysis on the Rio Grande National Forest. This analysis includes all National Forest System roads and motorized trails within the Rio Grande National Forest (USDA 1996).

The public was notified of the 2004 analysis in the fall quarterly SOPA. A notice of the 2004 RAP report availability and a request for comments was mailed to the SOPA mailing list and published in a public notice in The Valley Courier. The 2004 RAP report was posted on the Rio Grande National Forest website.

How the TAP Report Will Be Used

The outcome of the travel analysis process is a set of science-based recommendations for the forest transportation system, intended to inform subsequent National Environmental Policy Act (NEPA) processes, allowing individual site-specific projects to focus and address direct, indirect and cumulative effects. The TAP neither produces decisions nor allocates National Forest System lands for specific purposes; it merely provides the analytical framework from which to make recommendations that may then be examined in the NEPA process. It describes current conditions, risks, benefits, opportunities (needs for change), and priorities for action. Future, project level, NEPA analysis that includes public involvement may carry forward, reject or change the recommendations in this report, and make project-specific transportation system decisions.

Step 1: Setting up the Analysis

Purpose

The purpose of this section is to:

- Identify the project area and state objectives
- Develop a process and analysis plan
- Address information needs
- Clarify technical specialists roles

This travel analysis process was developed to inventory, analyze, evaluate benefits and risks identified by Forest resource specialists and recommend management strategies for National Forest System roads and motorized trails.

Project Area and Objectives

The travel analysis process (TAP) was conducted for all National Forest System roads (maintenance level (ML) 1 to 5) and motorized trails on the Rio Grande National Forest. The purpose of the analysis is to provide information for managing roads that are safe and responsive to public needs and desires, conform to the Rio Grande Forest Plan (USDA 1996), are efficiently administered, have minimal negative ecological effects on the land, and are in balance with funding available for needed management actions.

The TAP is intended to be a broad-scale comprehensive look at the transportation network. The main objectives of TAP (USDA 1999) are to make recommendations that:

- Balance the need for access while minimizing risks by examining important ecological, social, and economic issues related to roads.
- Develop maps, tables, and narratives that display transportation management opportunities and list strategies that address current and future access needs, and environmental concerns.
- Identify needed changes by comparing the existing road system to the desired future road system.
- Make travel management recommendations for future NEPA analysis and decisions.
- Identify the minimum road system needed for safe efficient travel, administration, use and protection of National Forest System (NFS) lands directed in 36 CFR 212.5(b)(1).

The analysis area for this TAP encompasses the entire Rio Grande National Forest (USDA 1996) (Figure 1).

Process Plan

The TAP followed the six-step process described in FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA 1999, FSH 7709.55).

Travel Analysis requirements are further described in:

- FSM 7700 Travel Management;
- FSM 7710 (Travel Planning);
- FSM 7730 (Road Operations);
- FSM 2350 (Motorized trails);
- FSH 7709.55 (Travel Analysis);
- FSH 7709.59 (Road Operations);
- FSH 2309.18 (Motorized trail Operations);
- 36 CFR 212, 251, 261 Travel Management Final Rule
- National Environmental Policy Act of 1969

- Executive Order 11644 - Use of Off-Road Vehicles on Public Land – Feb. 8, 1972;
- Executive Order 11989 - May 24, 1977 Amends EO 11644 setting forth an exclusion from the definition of off-road vehicles for any fire, military, emergency, or law enforcement vehicle when used for emergency purposes and Sec. 9 Special protection of the public lands.

Planning units are directed to use an authorized science-based analysis process conducted by an interdisciplinary team to inform planners and decision makers of road system opportunities, needs, and priorities that support land and resource management plan objectives. Roads analysis includes opportunities for public participation and emphasizes interdisciplinary team identification and evaluation of road issues and opportunities.

Interdisciplinary Team Specialists

An interdisciplinary team (IDT) of Forest specialists were assigned to the TAP. Team members and their primary analysis role are listed below (also see Appendix I). Assignments, roles and responsibilities, assigned to the interdisciplinary team during this project:

Core Interdisciplinary Team

Gary Frink	IDT Leader
Vaughn Thacker	Soils and Water
Crystal Powell	Recreation & Travel Management

Supporting Resource Specialists

Randy Ghormley	Wildlife & TES
Kirby Self	Timber Management
Gary Snell	Range Management & Invasive Species
Sid Hall	Fire & Fuels
Joe Pacheco	Roads Engineering
Angie Krall	Archaeology
Kelly Ortiz	Scenic Resources
Barry Wiley	Fisheries
Dave Dyer	Social / Economics
Chris Ortiz	Law Enforcement
Mike Blakeman	Public Affairs
Matt Custer	Lands / ROW
Helen Dyer	GIS / INFRA
Jeremiah Martinez	Conejos Peak District Representative
Steve Brigham	Divide District Representative
David Hosack	Saguache District Representative

Other specialists were consulted to adequately address issues.

Travel Analysis is intended to be based on science. Team members located, interpreted, and used relevant scientific literature in the analysis, disclosed assumptions made before and during analysis, and described the criteria on which the analysis is based.

The team was formed to provide the responsible official with important resource information needed to identify and manage a minimum transportation system as directed by 36 CFR.

36 CFR provides direction in 212.55-Criteria for Designation of Roads, Trails, and Areas.

> "(a) General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands.
>
> In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the responsible official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration.
>
> (b) Specific criteria for designation of trails and areas. In addition to the criteria in paragraph (a) of this section, in designating National Forest System trails and areas on National Forest System lands, the responsible official shall consider effects on the following, with the objective of minimizing:
>
> (1) Damage to soil, watershed, vegetation, and other forest resources;
>
> (2) Harassment of wildlife and significant disruption of wildlife habitats;
>
> (3) Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and
>
> (4) Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands.
>
> In addition, the responsible official shall consider:
>
> (5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.
>
> The transportation system should be safe and responsive to public needs and desires, affordable and efficient, produces minimal adverse effects on ecological processes and ecosystem health/diversity, does not reduce productivity of the land, and is in balance with available funding for needed management actions."

Analysis Plan

The IDT followed these steps for the analysis:

- Review and assemble existing data.
- Verify accuracy of NFS road locations on maps.
- Identify and document discrepancies between on-the-ground conditions, the Forest's INFRA database, and current management direction.
- Where possible, verify existing road conditions, and associated features including surface type and impacts on other resources.
- Identify preliminary access and resource issues, concerns, and opportunities.
- Identify road safety issues.
- Identify additional issues, concerns, and opportunities brought forth through previous public involvement and internal resource specialists.
- Recommend changes to the road system based on this analysis to identify the minimum road system.

Information Needs

The following information is required to proceed with the analysis:

- Accurate location of all National Forest System roads and motorized trails within the analysis area
- For each road, the following information is needed:

    1. Existing public, permittee, or agency use
    2. Rights-of-way dedication to the Forest Service
    3. Additional rights-of-way required
    4. Maintenance responsibility for the road or motorized trail (Forest Service or other agency, State, County, City, permittees or contractor, or volunteer group)

- Assessment of problems and risks caused by all roads and motorized trails in the analysis area
- Assessment of current opportunities for all roads and motorized trails in the analysis area
- The location of soil, water resources, invasive species, environmental issues, and biological communities
- Public access and recreational needs and desires in the area, including access for nearby landowners
- Current observed road uses and vehicle volume
- Current road management objectives
- Areas of special or sensitivity resource values
- Best management practices for the roads and motorized trails
- Current forest plan and other management direction for the roads and motorized trails
- Agency objectives and priorities

- Interrelationship with other governmental jurisdictions for roads
- State laws that regulate motor vehicle use on and off public roads
- Applicable federal, state, and local laws
- Public and user group values and concerns
- Forest scale and any project level roads analysis
- Physical, social, and cultural resources

Step 2: Describe the Situation

Purpose

The purpose of this step is to:

- Describe the existing management direction.
- Summarize Colorado OHV/All-Terrain Vehicle (ATV) Laws.
- Describe road maintenance levels.
- Describe the existing road system.

Existing Direction for Road Management

A. General

The Rio Grande National Forest has 2,819 miles of National Forest System roads in INFRA (an Oracle Database containing information on all roads and improvements on National Forest System lands). This TAP reviewed and analyzed all National Forest System roads shown on the Existing Roads by Maintenance Level Map in Appendix B. Attributes for each road are included in Appendix A.

Travel analysis is focused on identifying needed changes to the forest transportation system and existing direction is an important first step. National Forest System road direction for restrictions, prohibitions, and closures to motor vehicle use are included in the Forest Plan (USDA 1996).

Existing laws and regulations, official directives, forest plans, forest orders, and forest-wide or project-specific roads decisions dictate motorized routes and areas open to public motorized travel. Road and motorized trail management objectives are shown on forest maps, recreation opportunity guides, tabular databases, and other sources. Road and motorized trail management attributes are identified and documented in the INFRA database. The Forest Plan describes existing and planned road densities.

B. Road Attribute Descriptions

Designated Roads

National Forest System roads designated for public motorized use are currently documented in the Forest's INFRA database (an Oracle Database containing information on all roads and improvements on National Forest lands). The data tables include the following categories:

- System - National Forest System Road
- Jurisdiction - Forest Service
- Route Status - Existing
- Operational Maintenance Level – 2 through 5

Closed Roads

Closed roads are not designated for public motor vehicle traffic and have been placed in storage for at least 1 year but are necessary for future management activities. They appear in the Forest's INFRA database with the following attributes:

- System - National Forest System Road
- Jurisdiction - Forest Service
- Route Status - Existing
- Operational Maintenance Level - 1

Decommissioned Roads

Decommissioned roads may have some type of physical closure at their entrance (berm, etc.), or may be completely obliterated or recontoured. They are put back into resource production. They appear in the Forest's INFRA database under the following categories:

- System - National Forest System Road
- Jurisdiction - Forest Service
- Route Status - Decommissioned
- Operational Maintenance Level – 1 through 5

To return a decommissioned road to service as a system road (or as a temporary use road) the NEPA process must be followed even when no physical work is required to allow motorized traffic back on the road.

Unauthorized Road

Unauthorized roads are existing roads on the forest, but are not included in a forest transportation system, atlas or database. They were not planned, designed, or constructed, but were usually established by various users over time (unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a road or trail). They also include roads developed under a special use permit or other authorization and were not decommissioned upon termination of the authorization.

Unauthorized roads on National Forest System lands are identified in the field and often mapped during project analysis. The RGNF has not completed an inventory of all unauthorized roads. Inventory and mapping unauthorized roads is an ongoing GIS process. Unauthorized roads are not included in this analysis. Analysis of unauthorized routes is not a requirement of the travel management rule. Unauthorized roads would be inventoried and analyzed under project-level NEPA planning.

C. Motorized Trails

There are 301 miles of NFS motorized trails on the RGNF. Designated motorized trails on the Forest are shown on the Rio Grande National Forest Motor Vehicle Use Map that is updated annually. The forest ID team included, analyzed and rated motorized trails in this TAP (table 6 in step 4). Trail evaluation ratings for each resource are included in Appendix A and Appendix G.

D. Motorized Use Areas

The RGNF leadership team decided not to analyze or include motorized use areas in this TAP (Appendix I).

E. Previous Travel Management Documents

The RGNF Forest Plan, 2004 Rio Grande National Forest Roads Analysis (RAP) and other project-level roads analysis were used by specialists and Forest line officers to evaluate the transportation system and to assess road benefits and risks. The 2004 RAP data was used to evaluate road benefits and risks and used to define the minimum roads system management in this TAP. The 2004 RAP is incorporated in this TAP analysis.

All NFS roads— including the 180 road miles that were missed in the 2004 RAP— and motorized trails are included in this TAP.

F. Forest Plan Objectives

The national objectives for the Forest transportation system (FSM 7702) are incorporated into the Forest Plan by reference. These objectives are:

1. To provide sustainable access in a fiscally responsible manner to National Forest System lands for administration, protection, and utilization of these lands and resources consistent with forest plan guidance.
2. To manage a Forest transportation system within the environmental capabilities and restrictions of the land.
3. To manage Forest transportation system facilities to provide user safety, convenience, and efficiency of operations in an environmentally responsible manner and to achieve road related ecosystem restoration within the limits of current and likely funding levels.

G. State OHV and ATV Laws

Colorado state laws govern OHV use on roads in Colorado. Applicable sections of the Colorado State OHV laws can be found at:

http://cpw.state.co.us/thingstodo/Pages/OHVsLaws.aspx

Additional motorized trail information is included in Appendix G.

H. Maintenance Budget

The RGNF budget allocation for planning, construction, and road maintenance has averaged $688,860 per year from 2008 to 2012.

However, the annual cost to conduct maintenance on the entire road system is considerably higher than the amount allocated for maintenance (Appendix F). Therefore, we have incorporated a rotating pod system where maintenance is conducted on most roads on average every 3-5years.

In prior years, congressionally appropriated road funding was supplemented by road construction and maintenance work performed by timber purchasers through commercial timber sales. The timber program has declined to a fraction of what it was in the past. Appropriated funds have diminished through the years.

Cooperators will share road maintenance and resurfacing costs under suitable agreements to perform, arrange for performance by others, or by making deposits with the Forest Service that would be used to pay the cost of work necessary to keep those roads in satisfactory condition commensurate with use requirements of each cooperator. Other users will bear costs in accordance with Sec. 212.5(d).

The Forest conducted road condition surveys to determine the actual cost of maintaining the road system to standard. Work items were recorded to determine cost of road maintenance deferred in previous years due to lack of funding. Road improvement work necessary to bring the road system up to the desired maintenance level standard was identified and documented. Collected data analysis showed that the Forest is substantially under-funded for the road maintenance (2004 RAP Report page 23).

Road Maintenance Levels

Roads in a national forests are categorized into five maintenance levels, which define the level of service and maintenance required. Appendix K includes a maintenance level description.

National Forest System roads are maintained to varying standards depending on the level and type of use and management objectives. There are five maintenance levels used by the Forest Service to determine the standards of maintenance to preserve the investment in the road. These maintenance levels are described in FSH 7709.58, Chapter 60, Road Maintenance – Transportation System Maintenance Handbook. Maintenance levels 3, 4, and 5 provide access for passenger car traffic and comprise the main transportation system. Maintenance level 2 roads provide access for high clearance vehicles. Maintenance level 1 roads are closed.

Road Maintenance Level 5 (ML5) – roads are managed and maintained for a high degree of user comfort. These roads are generally paved and are suitable for passenger vehicles.

Road Maintenance Level (ML 4) – roads are managed and maintained for a moderate degree of user comfort. These roads are generally aggregate or gravel surfaced and are suitable for passenger vehicles.

Road Maintenance Level (ML3) – roads are managed and maintained for a moderate degree of user comfort. These are native surface roads suitable for passenger vehicles.

Road Maintenance Level 2 (ML2) – roads are managed and maintained for use by high-clearance vehicles; passenger car traffic is not recommended.

Road Maintenance Level 1 (ML1) – roads that are closed to vehicular traffic intermittently for periods that exceed 1 year.

Existing Road and Motorized Trail System

The transportation system on the Rio Grande National Forest serves a variety of resource management and access needs. Most roads on the Forest were originally constructed for commercial access purposes, including grazing, timber, and mineral extraction. Others resulted from construction of gas pipeline and power transmission projects. Over the past 100 years, an extensive road network has been developed and continues to serve commercial, recreation, and administrative purposes and provide access to private lands.

There are currently 2,819 miles of inventoried National Forest System roads on the Rio Grande National Forest transportation inventory. The three Ranger Districts: Conejos Peak, Divide, and Saguache, share management of the road system. The Colorado counties of Conejos, Rio Grande, Alamosa, Saguache, Mineral, San Juan and Hinsdale have roads that are within or provide access to the National Forest. There are 301 miles of motorized trails on the Forest.

Twenty-eight percent (780 miles of ML 3, 4 and 5)) of NFS roads on the Rio Grande NF are managed and maintained for public use with low clearance vehicles (passenger cars). These roads receive the highest traffic and are the most costly to maintain to standard.

This TAP reviewed and analyzed all ML1 through ML5 roads and motorized trails on the Forest. Existing roads are shown on Existing Road System by Maintenance Level map in Appendix B. Attributes for each NFS road and trail are included in Appendix A.

Table 2 displays road miles by maintenance level under Forest Service jurisdiction.

Table 2. Existing road miles by maintenance level within analysis area (Oct. 2015)

Maintenance Level	Miles of Road
1 – Basic Custodial Care (Closed)	692
2 – High Clearance Vehicles	1,319
3 – Suitable For Passenger Vehicles	787
4 – Moderate Degree of User Comfort	1
5 – High Degree of User Comfort	20
Totals	**2,819**

Road miles are from, O-drive file, RankingSortTotals.xlsx (10-07-15).

There are 301 miles of motorized trails on the Forest.

Step 3: Identify Issues

Purposes

The purpose of this step is to:

- Identify resource concerns
- Identify key issues related to the existing road system

Resource Concerns

Maintenance needs and costs on the Rio Grande National Forest have increased while allocated maintenance funds have remained static or reduced. This has caused a disproportionate shift of maintenance funds to ML 3-5 roads. Increased use coupled with decreased maintenance has resulted in degraded soil, water, vegetation, and wildlife habitat conditions in some areas.

Maintenance Level 3-5 roads are generally used by local and out of area visitors in passenger cars. Maintenance Level 2 roads are primarily used by high clearance vehicles and ORVs where permitted. Maintenance Level 1 roads are closed to all motor vehicle use.

Roads and road use effects were identified and evaluated for geomorphic instability, sediment production, riparian and aquatic habitat, wildlife disturbance or displacement, habitat fragmentation, habitat loss and reduced habitat productivity, heritage sites, invasive plants and threatened, endangered and sensitive plants.

Public Involvement (Issues)

Public involvement for roads analysis is directed by - 36 CFR 212.5 (B) (1),

> "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."

Public scoping efforts related to road and travel management preceded this TAP and the 2004 RAP analysis. Public input for the Forest Plan revision and amendments, along with comments received since the Forest Plan revision on specific roads were considered in defining issues and opportunities.

Public issues were also identified in the travel management subpart B and project level panning. Public scoping related to road and travel management on site specific project areas preceded this analysis. Social and resource issues identified during earlier NEPA project planning were also reviewed and used to evaluate and rate benefits and risks, road management concerns and opportunities.

Through the Rio Grande Forest's 2004 roads analysis process, Forest Plan revision and Travel Management Subpart B process, public, tribal government, and outside state and federal agencies are aware of the current Forest Service transportation system planning.

As noted above, the public was notified of the 2004 analysis in the fall quarterly SOPA. A notice of the availability of this report and a request for comments was mailed to the SOPA mailing list and published in a public notice in The Valley Courier. The 2004 RAP report was posted on the Rio Grande National Forest website. The 2004 Roads Analysis is considered a living document and will be revised as needed. It is a part of the RGNF public road atlas.

This Roads Analysis is not a NEPA analysis with an action proposal resulting in a decision. Future road actions with road-specific decisions will require additional public scoping and involvement.

The National Forest System roads on the Rio Grande NF connect to or have jurisdictional overlap with other governments and agencies. The 2004 RAP report was available to tribal governments, local county governments including the County Commissioners and County Road and Bridge Superintendents, the Park Service, Bureau of Land Management, and the US Fish and Wildlife Service. Many of these governments and agencies have mutual shared road related opportunities and issues.

Key Issues

The IDT identified 18 key forest-scale issues from public involvement in the Forest Plan revision, in the 2004 RAP analysis and project-level planning that were carried forward to the 2004 RAP and the 2015 TAP analysis. Many issues identified in scoping are site-specific and would be addressed at project-level roads analysis (NEPA scale).

1. Some roads may not be under the appropriate jurisdiction, and the right-of-way atlas may not reflect current jurisdiction.
2. Road maintenance funding may not be adequate to maintain existing roads and signs to a desirable standard.
3. Road access may not be adequate for future management needs.
4. Right-of-way across private land may not be adequate to access the Forest as ownership and land uses change. Historic access across some of these lands is being closed off to the public. While this is not a change in legal status, it gives the appearance of shutting off large tracts of public land.
5. There are increased demands for year-round access across Forest to private inholdings which may affect the road system and resources.
6. There are potential adverse environmental impacts from the current road system. Roads causing adverse impacts should be prioritized for evaluation at the sub-forest scale.
7. Higher road densities have greater potential to adversely affect resources and encourage illegal use.
8. Ineffective closures may have adverse effects on resources, and can encourage illegal use.
9. Management of the road system may be affecting big-game movement during hunting seasons.
10. Both off-highway vehicles (OHVs) and highway vehicles are used on the same roads and occasionally at the same time. This can be a safety problem.
11. Roads may be promoting illegal motorized use into wilderness areas.
12. Road management objectives (RMOs) are not current and need to be updated.
13. Roads are important to fulfill public recreational needs.
14. Roads are an important factor in the compatibility of recreational experiences.
15. Road management may not be compatible between different agencies with road jurisdictions such as the Forest Service, BLM, Park Service, the State and counties.
16. Unclassified road management

17. Off Highway Vehicles (OHV) - OHV use on trails is an issue brought up by the public.
18. Access to the forest is needed by the agency for vegetation and other resource management and monitoring.

Step 4: Assess Benefits, Problems and Risks

Purposes

The purpose of Step 4 is:

- Describe the analysis process
- Describe the criteria used in the risk and benefit analysis process
- Describe scoring and rating
- Summarize the risk and benefit of existing motorized routes
- Discuss the numeric distribution of risk and benefit assessment
- Identify road management recommendations
- Develop guidelines for mitigating road risks

Resource evaluation questions in Step 4 identify the effect each road issue has on each resource and the method used to score each road for benefits and risks. Step 5 provides management opportunities to set priorities and mitigate risks.

The Analysis Process

Issues were identified in Step 3 by the interdisciplinary team. Risk and benefit criteria categories (Step 4) were developed by considering issues from Step 3 and suggested resource questions for roads analysis described in FS-643 Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (RAP) (USDA 1999). The IDT reviewed these resource questions (Appendix J) to develop criteria for ranking risks and benefits of each road. Resource risks and benefits rating scores were then totaled and summarized for each road (Appendix A spreadsheets).

Criteria Used in the Risk and Benefit Analysis Process

Roads provide access for management, administration and use of National Forest System Lands. However, their presence has possible negative effects on natural and cultural resources. Resource risks and benefits categories were identified by the IDT to evaluate and recommend transportation system management options.

Benefit and risk categories were developed from the question/answer format described in the 2004 RAP and in FS-643 Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (RAP) (USDA 1999). Detailed answers to each resource question are included in the 2004 RAP Report and RAP Appendices A, B, C and D.

Current Road System Benefits, Problems, and Risks

Each resource specialist developed criteria for rating roads as high, medium, or low benefit or high, medium, or low risk. Benefit and risk rating scores for each road are included in Appendix A spreadsheets.

The 2004 RAP analysis process was presented in a question/answer format following guidelines in the 2002 version of the R-2 Roads Analysis Supplement to FSM-643 which provides direction and suggestions for different scale analysis for each question. The IDT followed the overall guidance, and answered questions at the forest scale to provide background information for each question for referencing and citing purposes during future project scale roads analyses.

The same analysis process was used to evaluate and score all roads, including roads missed in the 2004 process and motorized trails. The 2004 report question/answer data would help expedite and support project level planning. A detailed analysis process description is also included in the 2004 RAP Report.

Over the years roads and road-related activities have led to many management issues on the Rio Grande National Forest. These issues have been documented in various project environmental analyses, environmental impact statements, the Rio Grande Land Management Plan, and other planning projects.

Other plans and analyses, that are in process or have been completed, provided additional information to better define benefits and/or environmental risks for specific road segments.

The forest scale issues identified in Step 3 in this analysis are integrated with opportunities and guidelines to develop road management recommendations in Step 5. Issues and opportunities that address road benefits and risks are described below.

The Watershed Condition Framework (WCF) was used to the maximum extent possible to estimate the watershed risk ratings. The WCF "Road and Trail Condition Rating Rule Set", specifically the overall "Road and Trail Condition Indicator" and the "Open Road Density" and a modification of the "Proximity to Water", attributes were used to develop rating criteria. Site-specific road information and professional judgment were used to adjust the rating when appropriate.

Aquatic, Riparian Zone, and Water Quality (AQ)

Analysis of the aquatic questions in this forest scale roads analysis focused on identifying watersheds where there is a high risk of watershed function and/or aquatic species being affected by the road system. This analysis will help prioritize watersheds to focus project analyses. All inventoried roads were considered (maintenance levels 1-5). Looking at all of the inventoried roads allowed a broad scale assessment of the risk to watershed function associated with the entire road system rather than just the arterials and collectors. The broad forest scale analysis provides the basic framework for watershed or project level analyses. Map analysis was used to determine which roads are at the highest risk of affecting watershed function and aquatic habitat.

AQ 1: How and where does the road system modify the surface and subsurface hydrology of the area?

AQ 2: How and where does the road system generate surface erosion?

AQ 3: How and where does the road system affect mass wasting?

AQ 4: How and where do road-stream crossings influence local stream channels and water quality?

AQ 5: How and where does the road system create potential for pollutants, such as chemical spills, oils, deicing salts, or herbicides, to enter surface waters?

AQ 6: How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity?

AQ 7: What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?

AQ 8: How and where does the road system affect wetlands?

AQ 9: How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migration, and the movement of large wood, fine organic matter, and sediment?

AQ 10: How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what degree?

AQ 11: How does the road system affect shading, litterfall, and riparian plant communities?

AQ 12: How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

AQ 13: How and where does the road system facilitate the introduction of nonnative aquatic species?

AQ 14: To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique aquatic species or species of interest?

Terrestrial Wildlife (TW)

TW 1: What are the direct and indirect effects of the road system on terrestrial species habitat?

TW 2 and TW 3: How does the road system facilitate human activities that affect habitat? How does the road system affect legal and illegal human activities? What are the effects on wildlife species?

TW 4: How does the road system directly affect unique communities or special features in the area?

Ecosystem Functions and Processes (EF)

EF 1: What ecological attributes, particularly those unique to the region, would be affected by road construction in currently unroaded areas?

EF 2: To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

EF 3: To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

EF 4: How does the road system affect ecological disturbance regimes in the area?

EF 5: What are the adverse effects of noise caused by developing, using, and maintaining roads?

Economics (EC)

EC 1: How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

EC 2: How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

EC 3: How does the road system affect the distribution of benefits and costs among affected people?

Commodity Production (TM, MM, RM, SP, SU, WP)

Timber Management

TM 1: How does the road spacing and location affect logging system feasibility?

TM 2-3: How does the road system affect managing the suitable timber base and other lands? How does the road system affect access to timber stands needing silvicultural treatment?

The existing road system provides access for commercial timber harvest.

Minerals Management

MM 1: How does the road system affect access to locatable, leasable, and salable minerals?

Range Management

RM 1: How does the road system affect access to range allotments?

Nearly all level 3-5 roads have a direct and positive effect upon the livestock industry on the Rio Grande National Forest. These roads have provided grazing permittees easier access to their allotments. Efficient access has lowered operating costs by reducing travel time to the allotments and improved overall allotment management. Level 2 roads provide permittees travel routes to move livestock from one pasture to another or to access range improvements for maintenance.

Special Products (SP)

SP 1: How does the road system affect access for collecting special forest products?

The road system provides access for individuals to collect and transport special forest products such as Christmas trees, posts, poles, firewood, transplants, mushrooms, ferns and other products. The existing road system provides sufficient access for collecting special forest products.

Special Use Permits (SU)

SU 1 –How does the road system affect managing special-use permit sites (concessionaires, communication sites, utility corridors, and so on)?

The existing road system is adequate to serve the needs of existing or anticipated recreational and non-recreational special uses. The current road system provides good access for recreation special use permits (outfitter/guides and recreation residences). Access for non-recreation special uses (private property) is adequate for most uses.

Water Production (WP)

WP 1: How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes.

WP 2: How does road development and use affect water quality in municipal watersheds?

WP 3: How does the road system affect access to hydroelectric power generation?

General Public Transportation (GT)

GT 1: How does the road system connect to public roads and provide primary access to communities?

GT 2: How does the road system connect large blocks of land in other ownership to public roads?

GT 3: How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS2477, cost share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)

GT 4: How does the road system address the safety of road users?

Administrative Use (AU)

AU 1: How does the road system affect access needed for research, inventory, and monitoring?

AU 2: How does the road system affect investigative or enforcement activities?

Protection (PT)

PT 1: How does the road system affect fuels management?

PT 2: How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

PT 3: How does the road system affect risk to firefighters and to public safety?

PT 4: How does the road system contribute to airborne dust emission resulting in reduced visibility and human health concerns?

Recreation (UR and RR)

UR 1 & RR 1: What are the supply and demand relationships for motorized and or non- motorized recreation opportunities?

UR 2 and RR 2: Part 1) Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded (or roaded) recreation opportunities? Part 2) How do user-created routes affect the management of the road system?

UR 3 and RR 3: What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality, and type of unroaded (and roaded) recreation opportunities?

UR 4 and RR 4: Who participates in unroaded recreation and road-related recreation in the areas affected by constructing, maintaining, and decommissioning roads?

UR 5 and RR 5: What are these participants' attachment to the area, how strong are their feelings, and what alternative opportunities and locations are available?

UR 6 and RR 6: How does the road system affect the Scenic Integrity? How is developing new roads, decommissioning of existing roads, or changing the maintenance of existing roads into unroaded areas affecting the Scenic Integrity?

RR 7: How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

Social Issues (SI), Cultural/Heritage Issues (CH), Civil Rights (CR), and Environmental Justice

SI 1: Who are the direct users of the road system and of the surrounding area? What activities are they directly participating in on the Forest? Where are these activities taking place on the Forest?

SI 2: Why do people value their specific access to national forest and grasslands? What opportunities does access provide?

SI 3: What are the broader social and economic benefits and costs of the current Forest road system and its management?

SI 4: How does the road system and road management contribute to or affect people's sense of place?

SI 5: What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource development, etc?

CH 1: How does the road system affect access to paleontological, archaeological, and historical sites and the values people hold for these sites?

CH 2: How does the road system and road management affect the exercise of American Indian treaty rights?

CH 3: How does road use and road management affect roads that constitute historic sites?

CR 1: Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations?

Winter Use (WU)

WU 1 Rio Grande NF Supplemental Analysis Question: What are the potential effects of using the road system during winter, including authorizing snow removal?

Evaluation Criteria

The IDT reviewed the evaluation criteria used in the 2004 RAP to determine if the criteria was still applicable for all roads including roads missed in the 2004 analysis. Numeric benefit or risk values developed in the 2004 analysis were applied to all roads including roads missed in the 2004 analysis.

Road risks and benefits were identified by the team specialists for their resource area. Specialists described issues and developed an analysis strategy and criteria used to rank the risk or benefit of each road for that resource.

The interdisciplinary team identified the following benefits and risks by resource area for each road. Table 3 lists benefit and risk categories.

Table 3. Resource categories evaluated

Benefit Motorized use provides these forest management benefits	Risk Motorized use present risks associated with these categories
Recreation	Watershed
Range	Terrestrial Wildlife
Timber	Soil Erosion
Fire and Fuels	Soil Mass Movement
	Aquatic - Riparian
	Cultural

Evaluation Rating

Each road was rated high, medium or low for each resource risk and each resource benefit. High risk roads and high benefit roads were rated 3, medium were rated 2 and low were rated 1. Roads with no risk or no benefit, for that resource) were rated zero or left blank. Risk and benefit score for each resource and combined total resource risks and benefits for all roads and motorized use trails are include in Appendix A.

Aquatic Road Ratings

Aquatic evaluation criteria identifies the potential risk of all roads as they connect to the hydrologic system and affecting watershed health and aquatic species. Individual roads were rated in three categories: (1) percentage of their total length within 200 feet of a stream; (2) number of road crossings/mile; and (3) percentage of their length within sensitive soils. For each category, a value was assigned as follows:

- **High value:** A substantial portion of the road segment (50% or greater) is within 200 feet of a stream so that it is hydrologically connected, road crossings/mile are 4 or greater, or 50% or more of the road lies within sensitive soils.
- **Medium value:** 20-50% of the road segment is within 200 feet of the stream system, road crossings/mile are greater than or equal to 2 but less than 4, 20-50% of the road lies within sensitive soils.
- **Low value:** Less than 20% of the road segment is within 200 feet of the stream system, road crossings/mile are less than 2, less than 20% of the road lies within sensitive soils

Values were assigned to each category and a total derived. Roads were assigned a low to high rating based on these totals: 1-3 (Low rating), 4-6 (Moderate rating), 7-9 (High rating).

All the factors identified in AQ 1-4, and AQ 9 were used to develop an overall watershed rating. The overall rating represents the potential for hydrologically connected areas which can affect both water quality and water quantity.

A second overall risk rating was developed for watersheds where Rio Grande native cutthroat trout (RGCT) were present. These watersheds were considered more sensitive to the effects of roads even if the physical factors alone did not place them in the high risk category. One watershed was upgraded due to the presence of Rio Grande cutthroat trout.

Aquatic Risks Scoring

This rating focused on aquatic TES species. The aquatic species considered included Rio Grande cutthroat trout, boreal toad, northern leopard frog, Rio Grande chub, and Rio Grande sucker.

- Criteria used to evaluate roads effects on aquatic TES species included:
  - Road density
  - Number of stream crossings
  - Location within the water influence zone (WIZ)
  - Sensitive soils
  - Presence of TES species or TES habitat
- HIGH – Roads are rated high risk (3)
  - If they create potential migration barriers at road-stream crossings for fish or amphibians,
  - The road is located within the WIZ (or within 200 feet of the stream), or
  - A relatively high percentage of the road is located on sensitive soils and have high surface erosion potential or increased potential for mass movement.
- MEDIUM - Roads were given a moderate risk rating (2)
  - Located within a drainage containing TES species and has connection to TES species habitat via ephemeral drainages
  - Or some segment of the road is within the WIZ,
  - Or is located on sensitive soils where surface erosion and mass movements could occur.
- LOW - Low risk ratings (1)
  - Were given to roads located outside of the WIZ but TES species present in the watershed,
  - Relatively low road density in the watershed,
  - No stream crossings, and
  - No sensitive soils present.

Cultural Resources

Access to Traditional Cultural Properties is important to the tribes. Access supports the Ute Tribe's ability to exercise its rights under the Brunot Treaty, applicable on the west side of Rio Grande NF near the Continental Divide.

- HIGH - High benefit road or motorized use trail accesses a Traditional Cultural Property and route was highlighted by tribe(s) because it is valued or needed by tribe to access a Traditional Cultural Property or traditional use area.
- MEDIUM - Medium benefit road or motorized use trail which is a known access and/or parking area for accessing Traditional Cultural Property or an area where traditional use is known to occur. Location of TCP may or may not have been identified.
- LOW - Low benefit road or motorized use trail that accesses an area with no identified Traditional Cultural Properties or traditional use, or access for traditional cultural activities has not been identified as important to tribe.

Public access to Traditional Cultural Properties can result in damage to these properties. Access across public lands to tribal ownership properties contributes to trespass problems. Near equates to causing interference with Traditional Cultural Properties. This is a subjective term, not a set distance. It means that motorized use on a given route is having an impact upon a traditional practitioner's use of a TCP or use area.

- HIGH - High risk road or motorized use trail is on or near an identified Traditional Cultural Property, and was identified as a concern by tribe(s) during consultation because of its proximity to Traditional Cultural Property.
- MEDIUM - Medium risk road or motorized use trail is in the general vicinity of an area known as a Traditional Cultural Property and/or for traditional cultural use. Specific location of Traditional Cultural Property may or may not have been identified.
- LOW - Low risk road or motorized use trail is in area with no identified Traditional Cultural Properties, and for which no traditional cultural use has been identified.

Cultural resources can be impacted by the transportation system. Use and maintenance of roads which cross sites can impact the cultural resources. Access to areas with cultural resources increases the chance that these resources could be disturbed by the public.

- HIGH – High risk road has been surveyed for cultural resources and identified sites are impacted by the road, or the road has not been surveyed but is located in an area with high or moderate site density.
- MEDIUM – Medium risk road has not been surveyed but is located in a low site density area and is in an area with little to no previous survey.
- LOW – Low risk road has been surveyed for cultural resources and no sites are impacted by the road.

HIGH RISK Roads and Trails

A "High risk road has been surveyed for cultural resources and identified sites are impacted by the road".

There are approximately 200 intersection events between Road_System_FS_03282013 and RGNF Cultural Resources with a 20m buffer. Nine roads intersect with two cultural resources. There are 32 intersection events between Trail_Events and RGNF Cultural Resources with a 20m buffer. Twelve of these are on ATV or motorcycle trails and are a high risk for potential negative impacts.

This analysis shows some approximate potential "hotspots" with regards to Cultural Resources and roads. Further zooming in will show all intersection events.

Caveats: Not all of these Cultural Resources are "Sites." Many may be Isolated Finds. Furthermore, not all of them are considered Eligible for the National Register. Therefore, to truly analyze if a road has the potential to impact a significant site, more in-depth analysis will be necessary. As our data stands this is not a quick query.

Further research will be needed to establish which Eligible sites being intersected by roads, and which sites are being negatively impacted by roads. This will require examining the hardcopy site files for each intersected site.

Terrestrial and Riparian Wildlife Species

Appendix J ties together the information discussed in Chapter 4 Resource Questions TW 1 through TW 4 into a spreadsheet to display the relationship between roads on the RGNF and terrestrial and riparian wildlife species.

Terrestrial and riparian wildlife species evaluation focuses on, (1) potential population fragmentation and disturbance associated with individual roads within hydrological units, (2) roads passing through deer and elk winter range, (3) roads located within identified lynx linkage areas, (4) roads in areas providing habitat for TES/MIS species, and (5) the percentages of individual roads located within 200 feet of riparian areas.

Potential Population Fragmentation and Disturbance Risk

The road density within each Hydrological Unit Code or HUC (6th level watersheds) was determined by dividing the square miles of each HUC by the total miles of road contained in each HUC. Each individual road contained within the HUC was then assigned a number in the spreadsheet (1-3) depending upon the road density of each HUC. A "1" designation means the particular road contributes to a low road density within the HUC, a "2" designation means the particular road contributes to a medium road density within the HUC and a "3" designation means the particular road contributes to a high road density within the HUC.

Road Density Value

Less than 0.50 mile/mi^2 = 1 (Low Road Density)

Greater than or equal to 0.50 -.1.00 mile/mi^2 = 2 (Medium Road Density)

Greater than 1.00 mile/mi^2 = 3 (High Road Density)

Deer and Elk Winter Range

Roads passing through deer or elk winter range were assigned a rating of "1" in the spreadsheet.

Lynx Linkage Areas

Roads passing through lynx linkage areas were assigned a rating of "1" in the spreadsheet.

TES / MIS Nest or Den Sites

Roads within 0.50 mile of known nest or den sites were assigned a rating of "1". (Collecting and maintaining this information is useful to managers to help conserve these species and is usually not in the best interest of the species for this information to be widely distributed. For this reason, the specific locations and identification of the species are not displayed in the spreadsheet. Adding additional TES/MIS information into the GIS database as it becomes available and overlaying those sites into the Roads Database will be an ongoing project.

Percentage of Individual Roads within 200 feet of Riparian Areas

For this analysis, a buffer of 200 feet around every riparian area was created. Each road segment within this buffer was then identified and displayed as a percentage of the entire road length. Each road was then given a value. A value of "1" means the particular road has a relatively small percentage of its entire length within 200 feet of a riparian area. A value of "2" means the particular road has a medium percentage of its entire length within 200 feet of a riparian area and a value of "3" means the road has a relatively high percentage of its entire length within 200 feet of riparian area.

Road Riparian Value - Percent of Total Road Length within Riparian

0-25% = 1 (Low Riparian Rating)

26-50% = 2 (Moderate Riparian Rating)

51-100% = 3 (High Riparian Rating)

Overall Terrestrial and Riparian Wildlife Species Risk Rating

The total of the rating numbers for the 5 columns are summarized in Table D-1 to demonstrate the overall relative potential of each road to impact terrestrial and riparian wildlife. The higher the overall number, the higher the potential and the higher the need to assess and mitigate for wildlife impacts. The maximum number of points is nine.

The following scale is used to determine the overall wildlife risk for each individual road. Appendix A, Road evaluation spreadsheet, assigned a rating of 1-3 to each specific resource.

The following numeric rating was used:

1-3 points in the Wildlife Table D-1 = Low Concern = Rating 1 in spreadsheet

4-6 points in the Wildlife Table D-1 = Medium Concern = Rating 2 in spreadsheet

7-9 points in the Wildlife Table D-1 = High Concern = Rating 3 in spreadsheet

Soil

Roads not included in the original 2004 TAP were analyzed using the same matrix framework as that used previously. These categories are 1 = High Value Low Risk, 2 = High Value High Risk, 3 = Low Value High Risk, and 4 = Low Value Low Risk.

Risks were assessed by the soil erosion hazard, mass movement potential and proximity to a water source. Value was determined by “is it a major road” and is its presence important to public/forest service operations. Value was also attributed to whether the current road configuration minimized resource damage or prevents damage in other locations.

Where risk is more defined, value was judged on relative competing factors.

Of the 142 road segments reviewed 20 or 14 percent were considered High value, Low Risk, 3 or 2 percent were considered High Value High Risk. Category 3 (Low Value, High Risk) included 41 or 29 percent of segments analyzed, these are the segments of greatest concern. Seventy-eight segments (55 percent) were Low Value Low Risk.

Recreation

Roads provide access to developed recreation sites (i.e., trails, campgrounds, picnic areas, recreation residences, and river accesses), and to the general forest area where uses (dispersed camping, recreational driving, etc.) can vary. Recreation: rated value based upon recreation use-days of route-based vehicle usage and that of accessed facilities, features, and general areas.

- HIGH (3)- A high benefit road provides the most direct access to developed recreation sites such as trailheads, campgrounds, picnic areas, river accesses, recreation residences and roads that are main access routes to heavily recreated areas.

- MEDIUM (2) - A medium benefit road that provides indirect or alternative access to the types of places listed above or direct access to undeveloped areas, local recreation attractions or travel corridors identified in the Forest Recreation Niche.
- LOW (1) - any open road not listed above

Fire and Fuels

Fire and fuels rated value is based on maintaining blanket access to all of the Forest; using entry into or general vicinity to fuel area concentrations. Position and value of holding-features for prescribed and wildland fire was used with slightly less emphasis. No roads were identified that were a concern to fire/fuels access or use.

Range

Range evaluation based road value on access corridors for trucking and driving cattle and sheep, direct or near access to range features, and general area access. Roads were ranked high if they were the most common, easily accessible to the permittees. Medium rankings were given to roads that would be more convenient but the facility could be accessed by an alternate route or means (horse, longer route, ATV). Low rankings were given to roads that were not used by range permittees.

Timber

Timber based road benefit evaluation on need to access timber stands shown on the 10-year action plan and for salvage of easy-access high-value dead timber.

Scoring and Rating Roads and Motorized Trails

The IDT identified four benefit criteria and six resource risk criteria for each road and motorized trail analyzed. Overall risk and benefit assessment was based on scores aggregated from separate risk and benefit assessments, for each road and motorize trail, completed by resource specialists on the interdisciplinary team (IDT).

Each road and motorized trail was rated as high, moderate, or low (high = 3, moderate = 2 and low = 1) based on resource criteria.

Scores for each road and motorized trail were then totaled and summarized for benefits and risks (Appendix A). Total benefit and risk scores were then sorted to fit the four cell matrix. Benefit scores for each road and motorize trail could range from a high of 12 to a low of 0. Risk scores for each road and motorize trail could range from a high of 18 to a low of 0. Roads and motorized trails with no identified risks or benefits were scored zero or left blank.

Distribution of Benefit and Risk Assessment

The IDT preparing the travel analysis process (TAP) set the inclusive numeric rating for each matrix cell.

Table 4 displays the score (point) range for high and low benefit, road miles score results and percent of miles in each score group.

Table 4. Benefit score range, miles distribution and percent of road miles by score group

BENEFIT	Point Range	Overall Score	Roads Miles	Percent of Total Miles
	0 – 7.5	Low Benefit	1,287	46

	7.6 – 12.0	High Benefit	1,532	54
	Total		**2,819**	**100**

Table 5 displays the risk score range for high and low, road miles score results and percent of miles in each score group.

Table 5. Risk score range, road miles distribution and percent of road miles by score group

	Point Range	Overall Score	Roads Miles	Percent of Total Miles
RISK	0 – 6.5	Low Risk	1,986	70
	6.6 – 18.0	High Risk	833	30
	Total		**2,819**	**100**

The same benefit and risk numeric score range used for road distribution miles was also used for motorized trails shown in table 7 below.

Benefit and Risk Matrix for all ML 1 to ML 5 Roads

Of the 2,819 miles of existing National Forest System Roads (ML1 – ML5), approximately 1,532 miles, 54 percent, rated high benefit. These high benefit roads are important for Forest Service management and public use. Of those roads that ranked high benefit, 639 miles, 23 percent of total miles, rated high risk due to resource concerns. These high risk/high benefit roads should be the focus of road maintenance funds to mitigate adverse effects and lower impacts of the forest transportation system on surrounding natural resources. The Forest team then developed rules for the matrix cells (table 9) to apply management recommendations to each road. Matrix categories include:

Category 1, HL, high benefit, low risk

Category 2, HH, high benefit, high risk

Category 3, LH, low benefit, high risk

Category 4, LL, low benefit, low risk

Table 6 is the summary risk and benefit matrix with miles and percent of miles for all roads analyzed with general management recommendation.

Table 6. Existing system road miles benefit and risk matrix and general recommendations

ROADS - OPERATIONAL ML1 TO ML5			
	BENEFITS [2]		
RISKS [1]	Scores	High 7.6 - 12	Low 0 - 7.5
	High 6.6 - 18	(HH, category 2) Mitigate – Maintain, or Close Highest Priority **(639) or (23 %)**	(LH, Category 3) Mitigate, Lower ML, or Close Third Priority **(194) or (7%)**
	Low 0 - 6.5	(HL, Category 1) Maintain – Mitigate, or Decommission Second Priority **(893)[3] or(31%)[4]**	(LL Category 4) Mitigate or Lower ML, Decommission, or Close Low Priority **(1,093) or 39%)**
TOTAL OPERATIONAL ML1 TO ML5 = 2,819 MILES			

[1] Risks represent the range of total risk scores assigned to each category.

[2] Benefits represent the range of total benefit scores assigned to each category.

[3] Road miles assigned to each cell in the matrix.

[4] Percent of road miles in this cell.

Table 7 displays motorized trail miles for each benefit/risk category.

Table 7. Existing motorized trail miles benefit and risk matrix and general recommendations

MOTORIZED USE TRAILS			
	BENEFITS [2]		
RISKS [1]	Scores	High 7.6 - 12	Low 0 - 7.5
	High 6.6 - 18	(HH, category 2) Mitigate – Maintain, or Close to motorized use Highest Priority **(73) or (24 %)**	(LH, Category 3) Mitigate, Close to motorized use or Decommission Third Priority **(40) or (13%)**
	Low 0 - 6.5	(HL, Category 1) Maintain – Mitigate, Second Priority **(83)[3] or(28%)[4]**	(LL Category 4) Mitigate, Close to motorized use or Decommission, Low Priority **(105) or 35%)**
TOTAL: 301 MILES MOTORIZED USE TRAILS			

[1] Risks represent the range of total risk scores assigned to each category.

[2] Benefits represent the range of total benefit scores assigned to each category.

[3] Trail miles assigned to each cell in the matrix.

[4] Percent of trail miles in this cell.

Road Management Recommendations

Management recommendations for roads were identified through risk/benefit rating evaluation for each resource. Road groups by maintenance level in each matrix cell were evaluated by the IDT for management recommendations based on the combined total benefit and risk rating score.

Final management decisions would be done after ground-truthing with site-specific NEPA analysis. A complete roads list, overall rankings, and specific maintenance level management recommendation are located in Appendix A.

Table 8 displays maintenance level road miles that were summarized in table 6 for each matrix cell. Road miles are subdivided by maintenance level with applicable management recommendations.

Table 8. Road management recommendations or opportunities for benefit/risk categories

Benefit/ Risk/	Management Recommendations
High Benefit /Low Risk/ (HL Category 1) 893 miles 69 miles of ML1 453 miles of ML2 354 miles of ML3 (0.25) miles of ML4 17 miles of ML5	**Maintain – Second Priority** Focus road maintenance funds on these roads to keep them in this category. High priority for the Public Forest Service Road designation. • These roads form part of the potential minimum road system for the Forest. • The Forest Service should work with cooperating agencies to provide adequate maintenance for roads in this category that are important for public access. • Low risk associated with these routes indicates low need and priority for mitigation.
High Benefit /High Risk (HH Category 2) 639 miles 29 miles of ML1 240 miles of ML2 366 miles of ML3 0.47 miles of ML4 3 miles of ML5	**Maintain, and Mitigate, or Close - Highest Priority** Most of these routes are needed for resource management or general public access to the Forest. Some routes may be open for administrative use only, to control access to sensitive cultural or biological resources. High risks associated with these routes may require mitigation. Mitigation depends upon specific risks and may include, but is not limited to: drainage structure improvement, spot surfacing, additional maintenance, reconstruction, relocation, or seasonal road closure. The scale and frequency of these activities would depend on risk severity and available funds. • High priority for sub-forest scale roads analysis to identify high risk reduction needs. • High priority for capital improvement funding, such as PFSR designation, road improvement, road relocation, funding, capital improvement program, etc. • Shift road maintenance funds to these roads to keep their resource risks from increasing. • These roads are also part of the minimum road system for the Forest. Roads that are ranked in this High Risk/High Benefit category may be allocated for high priority mitigation and maintenance funding.

Benefit/ Risk/	Management Recommendations
Low Benefit /High Risk/ (LH Category 3) 194 miles 53 miles of ML1 131 miles of ML2 10 miles of ML3 0 miles of ML4 (0.04) miles of ML5	**Mitigate, Lower Maintenance Level, Close, or Decommission – Third Priority** Vehicle access is not recommended on some of these roads based on the benefit-risk analysis results. Roads in this category should be considered for closure or decommissioning. If benefits are sufficiently high to retain the road as open or maintenance level 1 (closed), it is a high priority for mitigating risks. Coordinate with county government or private landowners to determine maintenance responsibility on roads needed for access to private lands. If a road is needed exclusively for access to private land or needed to manage activities under special use permits, consider issuing a permit for the road that places maintenance responsibilities on the permittee If roads or road segments are not open to the public and not under permit, consider decommissioning. • High priority for sub-forest scale roads analysis to identify high-risk reduction needs and confirm use value. • Potential for reducing maintenance level. • High potential for decommissioning.
Low Benefit /Low Risk (LL Category 4) 1,093 miles 541 miles of ML1 495 miles of ML2 57 miles of ML3 0 miles of ML4 (0.3) miles of ML5	**Mitigate, Lower Maintenance Level, Close, or Decommission – Low Priority** Public road access is not recommended based on risk/benefit analysis. If there is no long-term administrative or public need for a road, consider decommissioning. If there is a future need for the road but no immediate need, consider retaining on the system as a closed (ML1) road. ML 1 roads are closed for at least 1 year, but can be re-opened for future administrative or public access needs. The low risk associated with these routes indicates low need and priority for mitigation. • Lowest priority for expending annual road maintenance funding. • Moderate potential for decommissioning or reducing maintenance level. • Where there is a recreational demand, consider conversion to trails.

As noted above, the IDT developed matrix cell benefit and risk score group numbers to identify road management recommendations and to distribute road miles by rating values, and rules for each matrix cell to apply management recommendations. Table 9 displays maintenance level road miles (summarized in table 6 with recommendations in table 8) for each matrix cell. Road miles are subdivided by maintenance level with applicable management recommendation rules that apply to individual roads for each matrix cell. Management recommendations for each road (by road number) are included in Appendix A. Table 9 displays road management recommendations or opportunities, total road miles and road miles by maintenance level for each benefit/risk category.

Table 9. Road management recommendations for benefit/risk categories for all NFS roads

ROADS - OPERATIONAL ML1 TO ML5			
	BENEFITS [2]		
	Scores	**High 7.6 - 12**	**Low 0 - 7.5**
RISKS [1]	**High 6.6 - 18**	**Category 2, HH[1]** Maintain, mitigate at current ML – high priority ML1 (29 miles) ML2 (240 miles) ML3 (366 miles) ML4 (0.47 miles) ML5 (3 miles) **Total miles 639 (23%)[2]**	**Category 3, LH[1]** Maintain, lower ML or decommission – low priority ML1 (53 miles) Decommission 53 ML 1 roads ML2 (131 miles) Road with benefit rating 5 or greater change to ML 1 (106 miles) Road with benefit rating 4 or less decommission (25 miles) ML3 (10 miles) Change to ML 2 (10 miles) **Total miles 194 (7%)**
	Low 0 - 6.5	**Category 1, HL[1]** Maintain at current ML – Second priority ML1 (69 miles) ML2 (453 miles) ML3 (354 miles) ML4 (0.25 miles) ML5 (17 miles) **Total miles 893 (31%)[2]**	**Category 4, LL[1]** Maintain, mitigate, lower ML o decommission – Third priority ML1 (541 miles) Decommission road with benefit rating less than 5 (86 miles) Mitigate and maintain road with benefit rating of 5 or greater (455 miles) ML2 (495 miles) Roads with benefit rating 5 or greater, change to ML 1 (434 miles) Roads with benefit rating 4 or less, decommission (61 miles) ML3 (57 miles) Roads with benefit rating 5 or greater retain at ML 3 (38 miles) Roads rated less than 5 benefit change to ML 2 (19 miles) ML4 (no miles) ML5 (0.3 miles) Less than 1 miles, retain at ML 5 **Total miles 1,093 (39%**
TOTAL OPERATIONAL ML1 TO ML5 = 2,819 MILES			

[1] First letter is benefit, second letter is risk. [2] Percent of total road miles

Guidelines for Mitigating Road Risks

General guidelines for mitigating risks discussed in previous sections are listed below.

- Maintain, improve or reconstruct drainage structures
- Close or seasonally restrict road use to minimize adverse effects on water, soil, wildlife and other resources
- Continue inventory and evaluate extent of invasive plant species, spray or cut to prevent seed development and spread
- Incorporate nonnative invasive species prevention and control in road maintenance plans
- Eradicate nonnative invasive species before roads are decommissioned; monitor and follow-up treatment where needed

Road Management Guidelines

- For roads where maintenance condition have decreased, consider the need for the road and historic use, as well as alternative roads in the area, before permanently changing the maintenance level. Use the Road Management Objectives (RMOs) to document any changes.
- Reduce the maintenance level on identified low-value level 3, 4, and 5 roads and those roads where access needs would be adequately met by a maintenance level 1-2 road. Consider this option during sub-forest scale roads analyses, as this can be a cost effective alternative. Reduced maintenance of these roads should not result in any increased watershed risks as the most basic road maintenance will focus on maintaining road drainage. The reduced maintenance should only result in reduced user comfort. Less use due to reduced user comfort will further decrease the potential for road-related watershed risks.
- Provide travelers with sufficient information necessary to decide which road(s) they will travel.
- When appropriate, use entrance treatments, warning signs, route markers, and information bulletin boards to advise travelers of conditions ahead.
- Do not post speed limit and other regulatory signs on roads under Forest Service jurisdiction without a Forest Supervisor’s order and a law enforcement plan.
- Consider prohibiting OHV use on Forest system roads when one or more of the following conditions exist:
    - The road is maintained at level 3, 4, or 5 and connects to a state, county, or other public agency road that is similarly regulated.
    - Traffic volumes exceed 100 vehicles per day (SADT) on single-lane roads.
    - Average traffic speed on the road exceeds 25 mph.
- To reduce annual maintenance costs, implement seasonal travel restrictions on roads susceptible to damage during wet or thawing conditions.
- Collect road maintenance and surface replacement deposits, as appropriate, on all road use permits and special use permits.

Capital Improvement Guidelines

- This analysis shows a need to reconstruct some existing roads to reduce risks and correct deferred maintenance work items or improve some roads to meet the increasing use and traffic requirements. Funding limitations require prioritizing roads for improvements or reconstruction work. The road benefit risk matrix (table 6) provides a starting point for developing priorities. The following guidelines can be used with management recommendations in table 8 when selecting, prioritizing, and implementing road reconstruction and construction projects.
- Conduct road location reviews prior to all new construction and road relocations. Ensure the location meets public and agency needs while mitigating environmental impacts identified in the analysis. Responsible line officers, resource and engineering specialists should participate in the review.
- Establish a traffic counting program to identify high-use roads and traffic patterns.
- Consider reconstruction to two lanes for roads with seasonal average daily traffic volumes exceeding 400 vehicles per day.
- Use motor vehicle accident safety investigations and reports to help identify road safety hazards.
- Use the following categories to prioritize road investments planned to reduce deferred maintenance backlog on roads: 1 – Critical Health and Safety; 2 – Critical Resource Protection; 3 - Critical Forest Mission. Data for these work items can be found in the Infrastructure database.
- Coordinate reconstruction and construction work with other agencies whenever possible. Use interagency agreements to develop investment and maintenance partnerships.

General Guidelines

The following are general road-related guidelines:

- Require authorized permitted operations, utilizing NFS roads, to share road maintenance costs.
- Consider road decommissioning when planning projects that involve the construction and use of short-term, single-resource roads: for example, roads planned for mineral projects that undergo exploration, development, and abandonment phases. Incorporate decisions to decommission single-resource roads during the initial stages of project planning to help move the Forest toward the potential minimum road system. Document planned decommissioning when developing road management objectives.
- Develop an annual maintenance plan to prevent deferred maintenance costs from accruing on high value rated roads
- Update the road system database and keep it current.
- Use an interdisciplinary process to develop, update, and implement road management objectives for all system roads. Ensure that information in the transportation atlas and inventory conforms to approved road management objectives.
- At appropriate intervals, update data contained in the Road Matrix. Analyze changes to determine new opportunities that may have developed as new information is collected.

- Require use of the Rio Grande National Forest Roads Analysis for all sub-forest scale roads analysis through a Forest supplement to the 7700 Manual.
- Conduct road condition surveys on all level 3, 4, and 5 roads at least once every 2 years.

Guidelines for Converting Roads to Trails

Give careful consideration to the specific route identified for change. For site specific adverse and favorable resource analysis effects and public involvement this would be done under project level NEPA planning. Proper evaluation needs to be done when converting a road to a trail to assure adverse effects are addressed. In particular, consideration should be given to financial capability of the trail program to maintain potential trails, and also the suitability of using a road as a trail in terms of recreation experience, environmental effects, and needed improvements or mitigation.

A recommendation should be made to the responsible official regarding whether or not a particular road should be considered for conversion to a trail. To support a recommendation for conversion of a road to a trail the following criteria should be met:

- The converted route would meet the TMO (travel management objectives) and provide the desired recreation experience
- Adequate funding is available to cover costs to convert and maintain the route
- Environmental effects of the potential trail are acceptable

Motorized Trail Management Recommendations

Management recommendations for motorized use trails were identified through the same risk/benefit rating evaluation for each resource as was done for roads. Trails were evaluated by resource specialists, scored and grouped in the four matrix cell categories in table 7 with management recommendations based on the combined total benefit and risk rating score.

- Category 1, high benefit and low risk, (HL), 83 miles, 28 percent of total motorized trail miles. These trails should have second priority for maintenance and any mitigation for resource protection if needed
- Category 2, high benefit and high risk, HH, 73 miles, 24 percent of total motorized trail miles. These trails should have the highest priority to mitigate risks and for maintenance. Closure to motorized use should be considered due to high resource risks.
- Category 3, low benefit and high risk, LH, 40 miles, 13 percent of total motorized trail miles. These trails should have third priority to mitigate resource risks, closed to motorized use or decommissioned.
- Category 4, low benefit and low risk, LL, 105 miles, 35 percent of total motorized trail miles. These trails should have low priority to mitigate resource risks where needed, closed to motorized use or decommissioned

Step 5: Describe Opportunities and the Minimum Road System

Purpose

The purpose of this step is to:

- Define the Minimum Road System
- Describe actions that would implement the minimum road system
- Describe actions that respond to issues

Actions that Would Implement the Minimum Road System

Minimum Road System

Travel Management Rule, 36 CFR 212.5 (b) states:

> "…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 (MRS) 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 travel 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."

The interdisciplinary team recommended the minimum road system for the project area using direction in 36 CFR 212.5 (b). The IDT recommendation is to decommission 225 miles (139 miles of ML1 and 86 miles of ML2 roads). Close, change to ML 1, 540 miles of existing ML2 roads. Lower maintenance level on 29 miles of ML 3 roads to ML 2. Change 0.04 miles of ML 4 to ML 3. Appendix A spreadsheets display all roads with miles, current maintenance level, benefit and risk scores, management recommendations (recommended maintenance level) for each road. The benefit - risk rating process was used to develop the minimum road system.

The minimum road system in this document is the IDT's recommendation only. Prior to any roads being added or deleted from the system, site-specific analysis would be completed through the NEPA process.

Actions that Respond to the Issues

The following section describes strategies that the Forest may choose to employ in project planning (Step 3, issues). The scale at which these actions may be implemented depends on site and compatibility of the action along with overall management direction for the surrounding area. The list below is intended to provide options that project leaders and decision-makers may consider when implementing changes to the road system.

Insufficient resources for maintaining existing system roads

Action: Reduce the number of road miles that need to be maintained or reduce the maintenance level to reduce maintenance costs. Reducing road miles that need to be maintained by converting closed roads to motorized trails would increase trail maintenance costs and is not a recommended action to reduce maintenance costs.

Action: Leverage funds to increase maintenance capabilities. Continue to seek opportunities with other Forests, counties and private individuals to increase the amount of maintenance through cooperative funding. Work with volunteers to maintain trails to free up more funding for road maintenance.

Action: Prioritize roads that could be transferred to county jurisdiction for county maintenance. NFS roads that provide access to private inholdings could be transferred to county jurisdiction or maintained by private parties.

Need for access to private lands for landowners and state lands

Action: Maximize cooperation from landowners by proposing to issue a reciprocal easement.

Action: Transfer road jurisdiction to the county.

Action: Enter into a special use agreement with landowners, stipulating that the permittee has maintenance responsibilities.

Human-caused fire and need for evacuation routes during wildfires.

Action: Close roads (rather than decommission) in high fire risk areas, for use as fire control lines during prescribed burns and wildfires.

Restrict motorized vehicle use on the forest to designated system roads through travel management.

Action: Install travel control signs, physical barriers or other devises that discourage using unauthorized roads. Use natural material to prevent use (downed trees, boulders, etc.) where feasible. In areas where previous decommissioning efforts have been unsuccessful, more aggressive means may be needed.

Action: Monitor unauthorized roads after barriers are installed and other mitigation measures are implemented. Keep records of successful and unsuccessful strategies for discouraging travel to improve restoration actions.

Need for access to firewood and other forest products gathering areas.

Action: Identify areas with suitable firewood or other forest products along open system roads, and provide maps to the public. Periodically or seasonally open closed roads with firewood supplies (recent tree mortality) to reduce use of closed or unauthorized roads.

Road effects on wildlife habitat

Action: Reduce the number of roads located in occupied habitat for species-of-concern and species-of-interest

Action: Place seasonal restrictions on roads through key nesting and roosting areas.

Action: Reduce road width and maintenance level to minimum needed for safe vehicle passage and to meet the intended need in sensitive wildlife areas.

Roads effects on watershed conditions.

Action: Implement guidelines (BMPs) for mitigating road risks to reduce soil and water impacts from roads.

Action: Provide information and education about motor vehicle regulations and responsible use of motorized vehicles on the National Forest. Install information boards at area trailheads, recreation sites, and parking areas.

Action: Install route numbers on system road junctions and at unauthorized routes to assist users with compliance of motor vehicle use regulations.

Action: Use education material to create public understanding of problems created by off road driving. Inform users of the motorized travel policy.

Action: Use enforcement to curtail off-road driving. Implement patrols and field presence at appropriate times of year (such as hunting season, holidays, weekends, etc.) in identified use areas. Inform users of the travel policy.

Action: Rehabilitate areas damaged by off-route driving. State recreation trail programs, EPA's Clean Water Act 319 grant program, and state OHV funds are potential outside funding sources to rehabilitate and re-vegetate damaged areas in addition to federal appropriations.

Roads provide access to the public for recreational purposes

Action: Maintain access to developed recreational sites.

Action: Maintain and update the Motor Vehicle Use Map.

Action: Maintain road signs in accordance with handbook direction.

Roads provide access for general forest management.

Action: Identify infrequently used roads, and effectively close ML 1 roads to reduce road maintenance costs (change to ML1).

Action: Maintain and update the Motor Vehicle Use Map if roads are closed.

Action: During the NEPA process for management activities, consider closing (change to ML1) open roads or reducing maintenance level in the project area to reduce maintenance costs.

Step 6: Reporting

Purpose

The purpose of this step is to report key findings of the analysis.

Key Findings of the Analysis

All system roads and motorize trails are included in this travel analysis process. The Forest leadership team recommended not including motorized use areas, or future roads. The IDT ranked roads and motorize trails based on risks to watershed, soil erosion, soil mass movement, aquatic environment, terrestrial wildlife and cultural resources. Benefits were evaluated and rated for recreation use, fire protection and suppression, range and timber access needs. The IDT made the following recommendations:

- Decommission 225 miles (roads likely not needed), 8 percent of NFS road miles (139 miles of ML 1 roads and 86 miles of ML 2 roads).
- Close or change 540 miles of ML 2 to ML 1, 20 percent of current total road miles.
- Reduce or lower maintenance level on 29 miles of ML 3 roads to ML 2.
- Mitigate to reduce resource risks and maintain 2,025 miles, about 72 percent of existing road system, at current maintenance levels.

Financial Analysis

Road maintenance funding needs were included when developing the minimum road system. Based on the 5-year average funding level, the Rio Grande National Forest is currently only funded to maintain approximately 7.2 percent of the road system needs. A road system that is economically in balance with available maintenance funds would not meet public or administrative access needs. Maintenance funding needs to increase for resource protection.

Road Maintenance Costs

With funds far below what is necessary to keep the road system properly maintained, many roads are not maintained on schedule and are falling into disrepair.

> **Deferred Maintenance** is defined as, "…maintenance that was not performed when it should have been or when it was scheduled and or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value" (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).
>
> **Annual Maintenance** is defined as, "…work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur" (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

Annual maintenance funding is inadequate to maintain all system roads on the Forest. Over time, roads that are not adequately maintained could incur additional deferred maintenance costs and degrade if additional maintenance funding is not available to insure drainage features are functioning. The road analysis matrix results in table 6 can be used to prioritize roads for available maintenance funds. The Forest should continue to pursue formal road maintenance agreements with counties and other users interested in sharing maintenance.

A roads analysis helps identify ways to more efficiently spend the limited road maintenance dollars allocated to the Forest. One approach is to reduce or eliminate expenditures on roads not needed or not needed at their current maintenance level. Maintenance level road groups described in table 8 along with the roads list spreadsheet in Appendix A identify management recommendations maintenance levels for all NFS roads. Appendix A also includes a list of likely not needed roads, roads that should be considered for decommissioning, and a list of roads that could have maintenance level lowered.

Financial Analysis Results

Using Rio Grande maintenance costs/mile, without cyclical items necessary to replace gravel surfacing, pavement overlays, bridges/structures, and major culverts on schedule, the current estimate for annual maintenance needs to keep the existing Rio Grande National Forest transportation system fully maintained to standard would be about $9.558 million per year. On average, the Rio Grande National Forest receives about $689,000 per year for road maintenance work.

Table 10 displays existing and recommended road management maintenance level miles.

Table 10. Existing road miles, recommended miles, ML change miles and decommission miles (08-11-15)

Maintenance Level	Existing Miles	Recommended Miles	ML Change Miles	Decommission Miles
ML 1	692	1,093		139
ML 2	1,319	722	540	86
ML 3	787	758	29	
ML 4	1	1		
ML 5	20	20		
Total	**2,819**	**2,594**	**-**	**225**

Estimated maintenance fund needs are based on maintenance level road miles in spreadsheet RioGrande_RoadsWithCoreAttributesRanking.xlsx located in Appendix A. This attribute table includes some roads on private and other government agency administered lands outside of the Forest boundary.

Maintenance cost per mile by maintenance level are based on costs in spreadsheet CostsPerMileTbl.docx located in Appendix F. Five-year average maintenance funding, 2008 to 2012, is from 5yrsRAR_Budget.docx also located in Appendix F. Maintenance funding is about 7.2 percent of the estimated annual needs to fully maintain the road system (Financial Analysis, Appendix F).

The economic analysis shows that the Rio Grande National Forest's current routine annual maintenance costs needed to keep up the existing road system would be about $9.558 million dollars per year. By making IDT recommended adjustments to the current road system; reducing total system road miles by decommissioning 225 miles (139 ML 1 and 86 miles ML 2), changing 540 miles of ML 2 to ML 1 (closing 540 miles that are currently open), and lowering the maintenance level on 29 miles of ML 3 to ML 2, the overall maintenance cost needs could be reduced by $1,300,600 to $8,257,200 per year. This reduced maintenance cost is $7,568,200 above the 5-year average funding rate. More road maintenance funding is needed to support the transportation system infrastructure and protect natural and cultural resources. Financial analysis data is included in Appendix F.

Table 11 compares the existing road system maintenance costs to the IDT recommended system.

Table 11. Comparison of existing and TAP recommended (proposed) road system maintenance needs

OPML[3]	Current[1]			Proposed		
	Miles	% of system	Cost $[2]	Miles	% of system	Cost $[2]
5	20	1	214,000	20	1	214,000
4	1	-	9,800	1	-	9,800
3	787	28	6,689,500	758	29	6,443,000
2	1,319	47	2,506,100	722	28	1,371,800
1	692	24	138,400	1,093	42	218,600
Total	**2,819**	**100**	**9,557,800**	**2,594**	**100**	**8,257,200**

[1]Current maintenance level road miles are based on miles in "RGNFTAP_RdsCoreAttributesResourceRanking.xlsx", Appendix A. includes road miles outside the Forest boundary.

[2]Maintenance cost per mile by maintenance level are based on costs in "CostsPerMileTbl.docx", in Appendix F

[3]OPML – Operator maintenance level.

Capital Investments

The section above only considers road maintenance needs and costs, but there are also costs associated with any proposed road decommissioning, road closures, and road improvements necessary to address risks and environmental concerns that are identified in the TAP analysis. These costs are not included in balancing road maintenance funds because funding for these activities is not appropriated along with the normal road maintenance funds used in the calculations. Funding for this type of work generally comes though other programs such as capital investment programs, Legacy Roads and Trails funding, Federal Highway programs, partnerships with outside groups and agencies, etc. Estimated costs for these type of funds associated with the minimum road system are shown in the following table.

Table 12. Estimated capital improvement costs and decommissioning work

Category	Miles	Cost / Mile	Total Cost
Estimated Cost to put roads in storage	540	$3,500	$1,890,000
Estimated Cost to decommission roads	225	$6,000	$1,350,000
Estimated Cost for improvement work	639	$2,800	$1,789,200
Total			**$5,029,200**

The cost to prepare 540 miles of road for storage as ML 1 roads is estimated at $1.89 million dollars. The cost to decommission 225 miles of road would be about $1.35 million and the cost to perform a variety of road improvement work to mitigate concerns identified in the risk analysis of the TAP report would cost about $1.79 million. Total costs not included in maintenance funding would be about $5,029,200.

The existing 2,819 mile road system would be reduced by 225 miles, 2,594 miles would be retained for the minimum roads system. The estimated annual maintenance cost saving is $1,300,600.

A complete list of individual rankings of each resource category for each road is included in Appendix A. A list of roads likely not needed that can be considered for decommissioning is included

in Appendix A. A list of roads recommended to lower maintenance level is also included in Appendix A.

The road benefit risk rating attribute spreadsheet in Appendix A was used to develop the minimum road system map in Appendix D displaying recommended roads likely not needed, i.e., roads that could be removed from the road system. Existing road maintenance levels are shown on the map in Appendix B. Recommended maintenance levels for roads likely needed are shown on the map in Appendix C. The minimum road system is shown on the map in Appendix D.

Based on funding levels over the previous 5 years, the Rio Grande National Forest can only afford to maintain approximately 7.2 percent of the road system. A road system that is economically in balance with available maintenance funds will not meet public and administrative access needs.

This travel analysis report will be posted on the Rio Grande National Forest website.

http://www.fs.usda.gov/projects/riogrande/landmanagement/projects

The minimum road system in this document is the IDT's recommendation. Prior to any roads being added or deleted from the system, site-specific analysis, including public involvement, and road management decisions would be completed through the NEPA process.

Travel analysis is considered a living document and will continue to be revised as needed. It is a part of the Rio Grande National Forest public road atlas. This travel analysis is not a NEPA analysis with an action proposal resulting in a decision. Future project level road actions with road-specific decisions will require additional public scoping and involvement.

Literature Cited

USDA Forest Service. 1999. Roads Analysis: Informing decisions about managing the National Forest Transportation System. Misc. Rep. FS-643. Washington, D.C.: U.S. Dept. of Agriculture Forest Service. 222 pp.

USDA Forest Service, 2004, Roads Analysis Report, Rio Grande National Forest

USDA Forest Service Handbook, National Headquarters, WO, Washington DC, FSH 7709.55 Travel Planning Handbook (Amended 01-08-2009)

USDA Forest Service Infrastructure Application, Travel Routes Data Dictionary and Business Rules for Roads, July 2013

USDA Forest Service, Rocky Mountain Region, Land and Resource Management Plan, Final Environmental Impact Statement, Rio Grande National Forest 1996

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USDA, Forest Service, 36 CFR Parts 212, 251, 261, and 295, RIN 0596–AC11, Travel Management Final Rule, Travel Management; Designated Routes and Areas for Motor Vehicle Use (2005)

USDA, Forest Service, 36 CFR Parts 212, 261, and 295, RIN 0596–AB67,Administration of the Forest Development Transportation System; Prohibitions; Use of Motor Vehicles Off Forest Service Roads (2001)

USDA Forest Service, Transportation Atlas Records and Analysis 7712.13b

List of Appendices with Descriptions of Documents

Appendix A: Existing System Roads Benefit and Risk Assessment, and Management Recommendations (7 Spreadsheets)

RGNFTAP_RdsCoreAttributeResourceRanking

Road list with resource ranking and summary miles pivot tables.

RGNFTAP_RdsMilesForMatrixCoreAttributeResourceRanking

Displays likely needed and likely not needed roads, road list and summary miles pivot tables.

RGNFTAP_RecommendedMLChangeRdList

Lists road with recommended maintenance level changes

RGNFTAP_DecommissionRoadsList

Lists likely not needed roads, candidates for decommissioning

RioGrandeRoadsJuly2015

Lists of roads with attributes on the RGNF

TAPGIS071515RdDataListBenefitRiskScoresDecommissionRoadsList

Displays resource benefit Risk rating for each road

2004RAP_Rds_2015TAP_Rds_Trails043015

Separate lists of 2004 RAP roads, 2015 TAP roads and motorized trails with resource benefit and risk ratings

Appendix B: Existing Road System by Maintenance Level Map

Appendix C: Road Management Recommendations by Maintenance Level Map

Appendix D: Minimum Road System, Road Risk/Benefit assessment Map

Minimum road system, likely needed, likely not needed roads

Appendix E: R2 TAP Directions, (Travel Analysis Process) and Directions (7 documents)

Travel Management Implementation of 36 CFR, Part 202, Subpart A (36 CFR 212-5 (b)) - Travel Analysis Process

R2 Directions

Travel Analysis Briefing, April 12 – 14, 2010

Regional Guidance & Expectations Subpart A Travel Analysis Rocky Mountain Region December 21, 2012 – pdf

Appendix F: Financial Analysis (7 documents)

Five year RAR Budget

- Average road maintenance cost per mile per year
- Deferred maintenance backlog
- 10-22-15 Existing and recommended road system maintenance estimated costs – spreadsheet
- Motorized Trail Cost – spreadsheet
- Road maintenance costs by FY - spreadsheet

Appendix G: Motorized Trails Information (6 documents)

- Colorado OHV Laws
- Colorado Parks and Wildlife Off-Highway Vehicle Registrations
- DRAFT Potential Conversion of A Road to A Trail
- OHV Definition
- Motorized Trail Costs, spreadsheet
- Motorized Trail List, spreadsheet

Appendix H: Rio Grande National Forest Directions (1 document)

- Project initiation letter (PIL)

Appendix I: WO Directions (5 documents)

- Travel Management, Implementation of 36 CFR, Part 202, Subpart A (36 CFR 212.5(b))
- Subpart A Base Map Guidelines 12/13/2013
- Example map - pdf

Appendix J: Resource Benefit Risk Evaluation Descriptions (3 subfolders)

- Subfolder - Archeology evaluation data (9 documents)
- Subfolder - Fisheries evaluation data (3 documents)
- Subfolder - Wildlife evaluation data spreadsheets (4 documents)

Appendix K: Glossary (2 documents)

- Glossary
- INFRA definitions and directions

Appendix L: Roads Analysis Process Summary (1 document)

- Travel Analysis Process Summary