

Appendices

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Appendix A. Maps of Forest Roads

State, County, and ML-3, 4, and 5 Forest Service Roads

(See separate electronic document for these seven maps).

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Appendix C. County Road Coop Agreements

Sabine National Forest County Road Coop Agreements

Road ID	Road Name	Miles
San Augustine County		
SAA-12	Bill Ponder Road	2.0
SAA-13	Bud Knight Road	1.5
SAA-14	Curtis Lane Road	1.9
SAA-15	John Harper Road	0.7
SAA-16	Higginbotham	1.1
SAA-17	White Rock Road	1.5
SAA-18	North Black Ankle Road	1.3
SAA-28	Dwire Lane	0.3
Sabine County		
SAB-01	Bill Lowe	4.0
SAB-02	Bradshaw	0.6
SAB-03	Crowell	2.0
SAB-04	M.L. Chance	1.0
SAB-05	Scrapping Valley	5.3
SAB-06	Marcus Hyden	0.3
SAB-07	Clarktown	1.3
SAB-08	Clark Cemetery	0.8
SAB-09	Tram Road	0.7
SAB-10	Madie Duhan	0.3
SAB-11	Rice Creek	3.7
SAB-11A	Yellowpine Lane	1.7
SAB-12	R.E. Smith	1.8
SAB-13	Mason Town	0.4
SAB-14	Gateway Meadow	1.6
SAB-15	Lakeview	3.1
SAB-16	Dixon	0.7
SAB-17	Hammock's #1	0.4
SAB-18	Hammock's #2	0.3
SAB-19	Gilley	2.0
SAB-20	McDaniel	0.6
SAB-21	Albert Arthur	2.0
SAB-22	Camp Springs Church	1.0
SAB-23	Hives McGown	0.3
SAB-24	Ladner	0.5
SAB-25	Rathburn	0.2
SAB-26	Kinsey Daniel	0.2
SAB-27	Dayton Godwin	1.1
SAB-28	Harper's Ridge	3.0
SAB-29	El Camino Bay	1.5
SAB-30	Howard Low	0.8
SAB-32	Sabinetown	2.5
SAB-33	Landfill	0.4
SAB-34	Davidson	1.3
SAB-35	Jack Wilson	1.2
SAB-36	Mary Williams	4.5
SAB-37	Gellatly	1.3
SAB-38	June Smith	3.1
SAB-39	Boggy	2.4
SAB-40	Minton	0.2
SAB-41	Speights Cemetery	0.9
Shelby County		
SHB-01	Cox Road	1.2
SHB-02	Carroll Cemetery	0.9
SHB-03	Wilson Road	1.4

SHB-04	Billy Joe O'Rear	0.2
SHB-05	Elzie O'Rear	1.6
SHB-06	Leo Miller Fork	2.2
SHB-07	Pate Elliot	3.4
SHB-08	Claimon Raymond	0.7
SHB-09	Jack Vaughn	2.6
SHB-10	Brown Shull	2.2
SHB-11	Cruse	0.6
SHB-12	Beck Road	1.6
SHB-13	Louis Cartwright	8.0
SHB-14	Homer Brown	3.4
SHB-15	Carl Smith	2.4
SHB-16	Webb Road	1.2
SHB-17	Joe Dover	4.3
SHB-18	Hawthorne Road	0.4
SHB-19	Patroon to Goober Hill	4.0
SHB-20	Main Goober Hill	1.3
SHB-21	Carpenter Road	1.6
SHB-22	Sholmire Road	3.2
SHB-23	Dick Parker	2.4
SHB-24	Alexanders Road	1.0
SHB-25	Half Branch	0.7
SHB-26	Church Road	1.1
SHB-27	Little North Siep	0.2
SHB-28	Tenaha South	4.8
SHB-29	Little West Siep	1.0
SHB-30	Strong School	1.0
SHB-31	Sample Cemetery	1.6
SHB-32	Creeks Road	0.7
SHB-33	Ridge Road	2.2
SHB-34	Blue Road	1.1
SHB-35	Bivens Creek	0.4
SHB-36	Hollow Spring Cemetery*	0.7
SHB-37	Big Branch	1.6
SHB-38	Pleasant Hill Church Road*	0.8
SHB-39	Mushotuba	3.9
SHB-40	East Liberty Church Road	0.4
SHB-41	Silvie Bend	0.3
SHB-51	Big Woods Road	9.0
SHB-52	Lone Cedar	0.8
SHB-53	Pink Jeanes	3.6
SHB-54	Cut-Off Road	0.4
SHB-55	Ashton Road	4.3
SHB-56	Cooter Road	4.0
SHB-57	Flat Fork	0.5
SHB-59	Woodland Shores	1.0
SHB-60	Royal Ridge Road	1.2

Appendix D. Forest Service ML-3, 4, and 5 Roads

Sabine National Forest
Forest Service ML-3, 4, and 5 Roads

<u>Road ID</u>	<u>Road Name</u>	<u>Length</u>	<u>Functional Class</u>	<u>Operational Maintenance Level</u>	<u>Primary Maintainer</u>	<u>Surface Type</u>	<u>Traffic Service Level</u>	<u>Remarks</u>
100	Haley's Ferry	1.5	Local	3	FS	Aggregate	C	PFSR
100B		0.2	Local	3	FS	Paved	C	
100B1		< 0.1	Local	3	FS	Paved	C	
116A		0.4	Local	4	FS	Paved	B	
101	Boles Field	0.4	Local	4	FS	Paved	B	
126	Ragtown	8.5	Collector	3	FS	Aggregate	C	Forest Hwy/PFSR
126A	Ranzy	1.9	Local	3	FS	Aggregate	D	
126B	Shofner	1.0	Local	3	FS	Improved Dirt	D	
126C	Easley	0.7	Local	3	FS	Dirt	D	
126C	Easley	1.0	Local	3	FS	Aggregate	C	
126D	Domingo	2.8	Local	3	FS	Improved Dirt	D	
1265	Aunt Clara	1.1	Local	3	FS	Aggregate	C	
126F		0.8	Local	3	FS	Aggregate	C	
171	Mark	0.8	Local	3	FS	Aggregate	D	
142	Wagstaff	2.4	Local	3	FS	Improved Dirt	D	
147	Fish Camp	1.3	Local	3	FS	Aggregate	D	
1201		0.6	Local	3	FS	Dirt	D	
196B		0.6	Local	3	FS	Aggregate	D	
137	Leggett	3.8	Collector	3	FS	Aggregate	D	
136	Briscoe	1.5	Local	3	FS	Aggregate	D	
121A	Martinez	2.3	Local	3	FS	Aggregate	D	
121	Patroon Bayou	6.7	Collector	3	FS	Aggregate	D	
109C	Lickety Split	1.2	Local	3	FS	Aggregate	D	
1108	Miles Creek	0.9	Local	3	FS	Aggregate	D	
111A	Elliot	0.8	Local	3	FS	Aggregate	D	
108	Forse Mountain	3.1	Collector	3	FS	Aggregate	C	PFSR
185	Snake	1.5	Local	3	FS	Aggregate	D	
152	Moore Plantation	3.7	Collector	3	FS	Aggregate	C	
152	Moore Plantation	1.3	Collector	3	FS	Improved Dirt	C	
154	Walnut Creek	0.8	Local	3	FS	Improved Dirt	D	
1311	Brouchs Creek Spur	0.8	Local	3	FS	Aggregate	D	
103A		0.4	Local	3	FS	Dirt	D	
1781		0.2	Local	3	FS	Aggregate	D	
184C		1.0	Local	3	FS	Dirt	D	
	SAB-Paul's Trail	0.8	Local	3	County	Aggregate	D	
145	Hamilton Ferry	0.2	Local	4	FS	Paved	B	

131		3.7	Local	3	FS	Aggregate	C	
131		0.5	Local	3	FS	Dirt	D	
122	Dodd	1.1	Local	3	FS	Aggregate	C	
111B	Matthew	0.8	Local	3	FS	Aggregate	D	
104	Norsworthy	0.6	Local	3	FS	Aggregate	D	
106A	Phantom	1.0	Local	3	FS	Aggregate	D	
187	McRae	0.8	Local	3	FS	Aggregate	C	
181	Brawley Creek	1.5	Local	3	FS	Improved Dirt	D	
165	Elaine	2.4	Local	3	FS	Aggregate	D	
1612		1.2	Local	3	County	Dirt	C	
146	White Rock	0.9	Local	3	FS	Aggregate	C	
146C		0.6	Local	3	FS	Dirt	D	
150	Bouland	1.0	Local	3	FS	Aggregate	C	
144	Bowie	6.7	Collector	3	FS	Aggregate	C	PFSR
144A	Bowie Spur	0.3	Local	3	FS	Aggregate	D	
144A	Bowie Spur	0.2	Local	3	FS	Dirt	D	
144B	Spike	0.5	Local	3	FS	Aggregate	D	
134D		0.9	Local	3	FS	Dirt	D	
139	Fredieu	1.0	Local	3	FS	Aggregate	D	
140	Gay	0.7	Local	3	FS	Aggregate	D	
132	Anderson	3.1	Local	5	FS	Paved	A	Forest Hwy/PFSR
133A	Pace	0.9	Local	3	FS	Aggregate	D	
134	Chan	1.3	Local	3	FS	Aggregate	D	
127	Yellowpine Work Center	0.2	Local	4	FS	Paved	B	
131D		1.2	Local	3	FS	Dirt	C	
1266	Polley Point	1.0	Local	3	FS	Aggregate	D	
117	South Boundary	6.0	Arterial	3	FS	Aggregate	C	Forest Highway
114	Gum Springs	5.9	Collector	3	FS	Aggregate	C	PFSR
114A	Little Creek	1.8	Local	3	FS	Dirt	D	
114B	McElroy	1.9	Local	3	FS	Aggregate	D	
114C	McElroy Cemetery	0.8	Local	3	FS	Aggregate	C	
114D		0.6	Local	3	FS	Dirt	D	
115A	Harper	1.8	Local	3	County	Aggregate	D	
SAB-Bayou Rd S		5.7	Collector	3	FS	Aggregate	C	
109	Yellow Pine	1.7	Collector	3	FS	Aggregate	C	
109A	Sulphur Lick	0.3	Local	3	FS	Aggregate	D	
109B	Lick Branch	1.9	Local	3	FS	Aggregate	C	
1092	Lick Br Spur	0.2	Local	3	FS	Dirt	D	
109E		0.8	Local	3	FS	Dirt	D	
107	Tenaha	4.7	Collector	3	FS	Aggregate	C	PFSR
107A	Steve	1.1	Local	3	FS	Improved Dirt	D	
105	Willow Oak	1.1	Local	4	FS	Paved	B	PFSR
103	Blue Jack	0.3	Local	3	FS	Improved Dirt	D	
197	Doles	1.6	Local	3	FS	Aggregate	C	
197	Doles	1.7	Local	3	FS	Aggregate	D	

184	Crooked Creek	0.8	Local	3	FS	Aggregate	D	
192		0.5	Local	3	FS	Aggregate	D	
1782		0.4	Local	3	FS	Aggregate	D	
1785		0.6	Local	3	County	Dirt	D	
179	Tower	0.7	Local	3	FS	Aggregate	D	
	SAB-Creek View	1.2	Local	3	FS	Dirt	D	
176	Minton	1.5	Local	3	FS	Aggregate	D	
148	Wilson Creek	1.0	Local	3	FS	Aggregate	D	
159	Cooper	1.1	Local	3	FS	Aggregate	D	
137A	Watery Creek	1.1	Local	3	FS	Improved Dirt	D	
137B	Blankenship	1.2	Local	3	FS	Dirt	D	
141	Hector	5.5	Collector	3	County	Improved Dirt	C	Forest Hwy/PFSR
130	Harvell	1.8	Local	4	FS	Paved	B	PFSR
133	Turkey	2.6	Collector	3	FS	Aggregate	C	
130	Harvell	1.8	Local	4	FS	Paved	B	
124	Moyle	0.5	Local	3	FS	Aggregate	D	
116	Red Hills	1.3	Local	4	FS	Paved	B	
113	Fox Hunt Hill	1.7	Local	3	FS	Paved	D	
112	Monroe	2.5	Local	3	FS	Aggregate	D	
117Z		3.7	Local	3	FS	Aggregate	---	
106	East Hamilton	5.2	Collector	3	County	Aggregate	C	
114Z		0.1	Local	3	FS	Aggregate	---	
198	Carl Smith	0.5	Local	3	FS	Aggregate	D	
198	Carl Smith	0.5	Local	3	FS	Dirt	D	
196G		1.3	Local	3	FS	Aggregate	D	
196H		0.6	Local	3	FS	Aggregate	D	
196H		0.3	Local	3	FS	Dirt	D	
194		1.0	Local	3	FS	Dirt	C	
194		1.4	Local	3	FS	Dirt	D	
196	Stark	5.4	Local	3	FS	Aggregate	C	
193	Oak Hill Church	0.8	Local	3	FS	Aggregate	D	
182	Friendship	1.9	Local	3	FS	Aggregate	C	
182A	Friendship Spur	1.1	Local	3	FS	Aggregate	D	
182B		0.5	Local	3	FS	Aggregate	D	
169	Sander's Spur	0.7	Local	3	FS	Aggregate	D	
SAB-Causey Dr		1.4		4	C	Dirt	D	
152A	Hamby	2.1	Local	3	FS	Aggregate	C	
152A	Hamby	0.7	Local	3	FS	Dirt	D	
143	Carter Road	1.4	Local	3	FS	Aggregate	D	
135	Charley	1.6	Local	3	FS	Aggregate	D	
135	Charley	1.0	Local	4	FS	Dirt	D	
125	Sanders Creek	3.0	Collector	3	FS	Aggregate	D	
119	Ener	1.0	Local	3	FS	Improved Dirt	D	
118	Curry Creek	2.3	Local	3	FS	Aggregate	C	
117E	Chinquapin Spur	0.5	Local	3	FS	Aggregate	D	

117F	Big Sandy	1.1	Local	3	FS	Dirt	D	
SAB-Busby Pt		2.6	Local	3	County	Aggregate	D	
111	Ross Youngblood	4.2	Collector	3	FS	Aggregate	C	
1114	TDC1	0.6	Local	3	FS	Aggregate	D	
110	Driggers Rd	6.1	Collector	3	FS	Aggregate	C	
110A	Henson Spur	1.0	Local	3	FS	Improved Dirt	D	
177	Shelby	0.4	Local	3	FS	Aggregate	D	
177	Shelby	0.4	Local	3	FS	Dirt	D	
165C	Chambers Cr Road	1.4	Local	3	FS	Aggregate	D	
175		0.8	Local	3	FS	Aggregate	D	
152D		0.1	Local	3	FS	Aggregate	D	
156	Blue	0.9	Local	3	FS	Dirt	D	
131A	Bourghs Creek	1.4	Local	3	FS	Improved Dirt	D	
102A	South Bayou	1.1	Local	3	FS	Aggregate	D	
103A		0.3	Local	3	FS	Aggregate	D	

Appendix E. Maintenance Levels

PARAMETERS	1	2	3	4	5
Service Life	Intermittent Service-Closed Status	Constant Service or Intermittent Service - Open Status (Some uses may be restricted under 36 CFR 261.50)			
Traffic Type	Open for non-motorized uses. Closed to Motorized traffic traffic.	Administrative, permitted, dispersed recreation, specialized, commercial haul.	All National Forest Traffic - General Use and Commercial		
Vehicle Type	Closed-N/A	High clearance, pick-up, 4x4, log trucks, etc.	All types - passenger cars to large commercial vehicles		
Traffic Volume	Closed-N/A	Traffic volume increases with maintenance level			
Typical Surface	All types	None, Native, or Aggregate (may be dust abated)		Aggregate (usually dust abated) or Paved	
Travel Speed	Closed-N/A	Travel speed increases with maintenance level			
User Comfort and Convenience	Closed-N/A	Not a consideration	Low Priority	Moderate Priority	High Priority
Functional Classification	All Types	Local Collector	Local Collector Arterial	Local Collector Arterial	Local Collector Arterial
Traffic Service Level	Closed-N/A	D	A, B, C Traffic Service Level increases with Maintenance Level		
Traffic Management Strategy	Prohibit or Eliminate	Discourage or Prohibit cars. Accept or Discourage high clearance vehicles.	Encourage, Accept	Encourage	Encourage

Appendix F. Traffic Service Levels

	A	B	C	D
Flow	Free flowing with adequate parking facilities.	Congested during heavy traffic such as during peak logging or recreation activities.	Interrupted by limited passing facilities, or slowed by the road condition.	Flow is slow or may be blocked by an activity. Two-way traffic is difficult and may require backing to pass.
Volumes	Uncontrolled; will accommodate the expected traffic volumes.	Occasionally controlled during heavy use periods.	Erratic; frequently controlled as the capacity is reached.	Intermittent and usually controlled. Volume is limited to that associated with the single purpose.
Vehicle Types	Mixed; includes the critical vehicle and all vehicles normally found on public roads.	Mixed; includes the critical vehicle and all vehicles normally found on public roads.	Controlled mix; accommodates all vehicle types including the critical vehicle. Some use may be controlled to vehicle types.	Single use; not designed for mixed traffic. Some vehicles may not be able to negotiate. Concurrent use traffic is restricted.
Critical Vehicle	Clearances are adequate to allow free travel. Overload permits are required.	Traffic controls needed where clearances are marginal. Overload permits are required	Special provisions may be needed. Some vehicles will have difficulty negotiating some segments.	Some vehicles may not be able to negotiate. Loads may have to be off-loaded and walked in.
Safety	Safety features are a part of the design.	High priority in design. Some protection is accomplished by traffic management.	Most protection is provided by management.	The need for protection is minimized by low speeds and strict traffic controls.
Traffic Management	Normally limited to regulatory, warning, and guide signs and permits	Employed to reduce traffic volume and conflicts.	Traffic controls are frequently needed during periods of high use by the dominant resource activity.	Used to discourage or prohibit traffic other than that associated with the single purpose.
User Costs	Minimize; transportation efficiency is important.	Generally higher than "A" because of slower speeds and increased delays.	Not important; efficiency of travel may be traded for lower construction costs.	Not considered.
Alignment	Design speeds is the predominant factor within feasible topographic limitations.	Influenced more strongly by topography than by speed and efficiency.	Generally dictated by topographic features and environmental factors. Design speeds are generally low.	Dictated by topography, environmental factors, and the design and critical vehicle limitations. Speed is not important.
Road Surface	Stable and smooth with little or no dust, considering the normal season of use.	Stable for the predominant traffic for the normal use season. Periodic dust control for heavy use or environmental reasons. Smoothness is commensurate with the design speed.	May not be stable under all traffic or weather conditions during the normal use season. Surface rutting, roughness, and dust may be present, but controlled for environmental or investment protection.	Rough and irregular. Travel with low clearance vehicles is difficult. Stable during dry conditions. Rutting and dusting controlled only for soil and water protection.

Appendix G. Road Management Objectives



United States
Department of
Agriculture

Forest
Service

National Forests and
Grasslands in Texas
SO

701 N. First Street
Lufkin, TX 75901
Phone 936-639-8501
TDD# 936-639-8560

File Code: 7730

Date: July 7, 1999

Route To:

Subject: Road Maintenance Objectives (RMOs)

To: District Rangers

Enclosed are the RMOs for the Forest. They have been approved for use Forestwide. If you have a project that requires an exception to these generic RMOs, then you can develop and approve a new RMO that meets the specific project requirements. Specific project RMOs can be approved by the District Ranger.

s/ Glenn P. Donnahoe

GLENN DONNAHOE
Acting Team Leader
Heritage, Recreation, Lands,
Engineering and Information Systems

cc: R. Graves
S. Lewis
J. White
N. Snoberger
L. Felts
B. Rasbeary
B. Breland
G. Bible
D. Benner
D. Phillips
G. Weick
L. Bonner
D. Peterson
G. Ippolito

NATIONAL FORESTS & GRASSLANDS IN TEXAS
ROAD MANAGEMENT OBJECTIVES (RMO)
Maintenance Level 4 and 5 Roads

I. DESIGN, OPERATION AND MAINTENANCE CRITERIA

MAINTENANCE LEVEL: ML 4: Moderate degree of user comfort

ML 5: High degree of user comfort

Recreation roads are subject to seasonal closure

TRAFFIC SERVICE LEVEL: ML 4: TSL C & B

ML 5: TSL B & A

FUNCTIONAL CLASS:	ML 4: Local – 57.1 miles	ML 5: Local – 38.6 miles
	Collector – 25.7 miles	Collector – 0 miles
	Arterial – 0 miles	Arterial – 0 miles

A. Design Criteria

Primary Road Users:

Mixed traffic including public, recreational, commercial, suburban, mail, medical and law enforcement travel needs.

B. Traffic Requirements – Traffic consists of cars, pickups, school buses, mail carriers, local law enforcement and rescue squad emergency vehicles and touring buses. Some tractor trailer, commercial and industrial carriers.

1. Design Vehicle – Cars and tractor-trailers operating at the maximum legal weight of 85,000 pounds.
2. Design Speed – Speed limits should be determined based upon road alignment and geometry and meeting state requirements.
3. Safety – Provide for surfacing material to support design vehicles within the approved design speed limit for each road. Provide for minimum 8 foot safety zones on each side of the road. Signing shall conform to the latest edition of the TX MUTCD.
4. Environmental – Design criteria and standards are consistent with the Standards and Guidelines contained in the Revised Forest Land and Resource Management Plan, 1996. A project Environmental Analysis and Decision Memo shall be consistent with the Forest Land Management Plan and the RMO.
5. Economics – The cost of the proposed road project should be evaluated with environmental requirements and its value to the overall transportation system. Service life for crushed aggregate surfacing should be a minimum of 10 years. Culverts should provide a service life of 20 years.

II. DESIGN STANDARDS

- A. Design Class – Double lane, including minimum 8-foot safety zones.
- B. Right-of-way – 50 feet
- C. Design width – 26 feet includes 22 foot riding surface with 2 foot shoulders.
- D. Design Profile & Grade – Road cross section includes cut and fill sections with ditches and drainage structures. Maximum centerline grade of 4% with short road sections of up to 8% for distance of 500 feet or less.
- E. Slopes – Front slopes 4:1, Back slopes 3:1
- F. Surfacing – ML 4: Minimum of 6 inches of crushed aggregate. ML 5: Minimum of 3 inches of hot mix asphalt or two coats of bituminous chip seal.
- G. Sub-grade – Improve structural strength with lime or cement treated sub-grade. Minimum depth to be determined by engineering design.
- H. Drainage Structures – Designed to meet 50 year flood events, structural and environmental needs.
- I. Sign – Provide regulatory, informational, directional, and warning signs according to the TX MUTCD.
- J. Erosion Control – Provide temporary and permanent erosion control to minimize the loss and damage of roadway and areas.

III. OPERATION AND MAINTENANCE STANDARDS

- A. Operation – Maintenance Level 4 and 5 roads will remain open and are subject to the Highway Safety Act. Emergency repairs of damaged roads and signs must be completed in a timely manner to respond to public traffic needs.
- B. Maintenance – Current and Preventative – Provide routine maintenance activities necessary to prevent damage to the roadway and surrounding s. Frequent monitoring and maintenance repairs are needed to ensure the safety of the traveling public and Forest Service employees. Monitor frequently and provide as a minimum road maintenance inspection on roads that have a high ADT and accident history. Take corrective action on any critical safety need.

C. The Maintenance Level 4 and 5 roads listed in the NFGT Infra Transportation System are subject to the design criteria, standards and operation and maintenance requirements of this "RMO – Maintenance Level 4 & 5".

PREPARED BY:	<u>s/ <i>Richard Graves</i></u>	<u>6/29/99</u>
	Richard Graves	Date
REVIEWED BY:	<u>s/ <i>Glenn P. Donnahoe</i></u>	<u>7-6-99</u>
	Glenn Donnahoe	Date
APPROVED BY:	<u>s/ <i>Ronnie Raum</i></u>	<u>7/7/99</u>
	Ronnie Raum Forest Supervisor	Date

NATIONAL FORESTS & GRASSLANDS IN TEXAS
ROAD MANAGEMENT OBJECTIVES (RMO)
Maintenance Level 3 Roads

I. DESIGN, OPERATION AND MAINTENANCE CRITERIA

MAINTENANCE LEVEL 3: Suitable for passenger cars

TRAFFIC SERVICE LEVEL: TSL C

FUNCTIONAL CLASS: Local – 231 miles

Collector – 201 miles

Arterial – 37 miles

A. Design Criteria

Primary Road Users:

Mixed traffic including public, recreational, commercial and other National Forest resources, suburban, mail routes, medical and law enforcement travel needs.

B. Traffic Requirements – Traffic consists of cars, pickups, log trucks, oil and gas heavy duty trucks, school buses, mail carriers, local law enforcement and rescue squad vehicles and local farming equipment and trucks.

1. Design Vehicle – Cars and tractor-trailers operating at the maximum legal weight of 85,000 pounds.
2. Design Speed – Speed limits should be determined based upon road alignment and geometry and meeting state requirements.
3. Safety – Provide for surfacing material to support design vehicles within the approved design speed limit for each road. Signing shall conform to the latest edition of the TX MUTCD.
4. Environmental – Design criteria and standards are consistent with the Standards and Guidelines contained in the Revised Forest Land and Resource Management Plan, 1996. A project Environmental Analysis and Decision Memo shall be consistent with the Forest Land Management Plan and the RMO.
5. Economics – The cost of the proposed road project should be evaluated with environmental requirements and its value to the overall transportation system. Service life for crushed aggregate surfacing should be a minimum of 10 years. Culverts should provide a service life of 20 years.

II. DESIGN STANDARDS

- A. Design Class – Single lane, with turnouts, includes some double lane roads.
- B. Right-of-way – 40 feet
- C. Design width – 14 foot riding surface with 1 foot shoulders

- D. Design Profile & Grade – Road cross section includes cut and fill sections with ditches and drainage structures. Maximum centerline grade of 6% with short road sections of up to 10% for distance of 500 feet or less.
- E. Slopes – 3:1
- F. Surfacing – Roads shall maintain a minimum of 4 inch depth of crushed aggregate surfacing with improved sub-grade.
- G. Drainage Structures – Designed to meet minimum 25 year flood events, structural and environmental needs. Provide for protection of culvert and bridge inlets and outlets, including rip rap or reinforced concrete protection.
- H. Sign – Provide warning, directional and regulatory signs complying with the TX MUTCD.
- I. Erosion Control – Provide temporary and permanent erosion control to minimize loss and damage of roadway and areas.

III. OPERATION AND MAINTENANCE STANDARDS

- A. Operation – Maintenance Level 3 roads can be closed. They are subject to the Highway Safety Act. Emergency repairs of damaged roads and signs must be completed in a timely manner to respond to public traffic needs. Use proper closure devices and signing, meeting Texas MUTCD and Forest Service requirements.
Maintenance – Current and Preventative
Provide routine maintenance activities necessary to prevent damage to the roadway and surrounding s. Frequent maintenance repairs are needed to ensure the safety of the traveling public and Forest Service employees. Monitor frequently and provide as a minimum road maintenance inspection on roads that have a high ADT and accident history. Take corrective action on any critical safety need.
- B. The Maintenance Level 3 roads listed in the NFGT Infra Transportation System are subject to the design criteria, standards and operation and maintenance requirements of this “RMO – Maintenance Level 3”.

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	Ronnie Raum, Forest Supervisor	Date

NATIONAL FORESTS & GRASSLANDS IN TEXAS
ROAD MANAGEMENT OBJECTIVES (RMO)
Maintenance Level 2 Roads

I. DESIGN, OPERATION AND MAINTENANCE CRITERIA

MAINTENANCE LEVEL 2: High Clearance Vehicles

TRAFFIC SERVICE LEVEL: TSL C and TSL D

FUNCTIONAL CLASS: Local - 1483 miles

A. Design Criteria

Primary Road Users:

- Commercial Timber Haul
- Dispersed Recreation
- Hunting and Trails
- Forest Service Administration
- Contact Administration
- Environmental Monitoring
- Resource Protection

B. Traffic Requirements

Traffic primarily consists of commercial haul vehicles with related high clearance service and administrative type vehicles.

1. Design Vehicle – Tractor trailers operating at the maximum legal weight of 85,000 pounds.
2. Safety – Provide for structural materials (riprap, geotech fabric) to reinforce poor subgrades, minimize rutting and to increase traction on grades greater than 6%. Provide for proper signing.
3. Environmental – Design criteria and standards are consistent with the Standards and Guidelines contained in the Revised Forest Land and Resource Management Plan, 1996. A project Environmental Analysis and Decision Memo shall be consistent with the Forest Land Management Plan and the RMO.
4. Economics – The cost of the proposed road project should be evaluated with environmental requirements and its value to the overall transportation system. Service life for crushed aggregate surfacing should be a minimum of 10 years. Culverts should provide a service life of 20 years.

II. DESIGN STANDARDS

- A. Design Class – Single lane with turnouts and curve widening as needed for safety.
- B. Right-of-way (ROW) – 20 to 28 feet
- C. Design width – 12 foot riding surface with 1 foot shoulders.

- D. Design Profile & Grade – Road cross section includes cut and fill sections with ditches and drainage structures. Maximum centerline grade of 8% with short road sections of up to 14% for distances to 500 feet or less.
- E. Slopes – 3:1
- F. Surfacing – Spot surfacing and surfacing of sections of roads or entire lengths of roads depending upon volume and type of traffic, soil type and strength and erosion control requirements. Some roads with existing native surfacing that prevents rutting do not need crushed aggregate.
- G. Drainage Structures – Design to meet minimum 10 year flood events, structural and environmental needs.
- H. Erosion Control – Provide temporary and permanent erosion control to minimize loss of surfacing, roadbed, and roadway components.

III. OPERATION AND MAINTENANCE STANDARDS

- A. Operation – Maintenance Level 2 roads can be closed. Use proper closure devices and signing meeting Texas MUTCD and Forest Service requirements.

Maintenance Level 2 roads are not subject to the Highway Safety Act.
- B. Maintenance – Provide maintenance activities necessary to protect the environment and resources that the transportation facility serves. Provide for spot surfacing and erosion control repair or replacement as needed. Utilize a road maintenance condition survey to identify maintenance needs.
- C. The Maintenance Level 2 roads listed in the NFGT Infra Transportation System are subject to the design criteria, standards and operation and maintenance requirements of this
“RMO – Maintenance Level 2”.

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	Ronnie Raum, Forest Supervisor	Date

NATIONAL FORESTS & GRASSLANDS IN TEXAS
ROAD MANAGEMENT OBJECTIVES (RMO)
Maintenance Level 1 Roads

I. DESIGN, OPERATION AND MAINTENANCE CRITERIA

MAINTENANCE LEVEL 1: Basic Custodial Care

Road Closed

TRAFFIC SERVICE LEVEL: TSL D

FUNCTIONAL CLASS: Local – 444 miles

A. Design Criteria

Primary Road Users:

Commercial Haul

Dispersed Recreation

Hunting and Trails

Forest Service Administration

Contact Administration

Environmental Monitoring

Resource Protection

B. Traffic Requirements – Traffic primarily consists of commercial haul vehicles with related high clearance service and administrative type vehicles.

1. Design Vehicle – Tractor-trailers operating at the maximum legal weight 85,000 pounds.
2. Safety – Provide for structural materials (riprap, geotech fabric) to reinforce poor subgrades, minimize rutting and to increase traction on grades greater than 8%. Provide for proper signing.
3. Environmental – Design criteria and standards are consistent with the Standards and Guidelines contained in the Revised Forest Land and Resource Management Plan, 1996. A project Environmental Analysis and Decision Memo shall be consistent with the Forest Land Management Plan and the RMO.
4. Economics – The cost of the proposed road project should be evaluated with environmental requirements and its value to the overall transportation system. Service life for crushed aggregate surfacing should be a minimum of 10 years. Culverts should provide a service life of 20 years.

II. DESIGN STANDARDS

A. Design Class – Single lane, only add turnouts where needed for safety.

B. Right-of-way – 20 feet.

C. Design width – 12-foot travelway.

- D. Design Profile & Grade – Usually flat grades with dips and ditches as needed to reduce sediment runoff. Pitch grades can be between 8% and 15% for distances of 500 feet or less. Use culverts in perennial streams and intermittent streams.
- E. Slopes – 3:1
- F. Surfacing – Provide surfacing to protect resources including stream approaches, dips and other drainage structures.
- G. Drainage Structures – Design to meet structural and environmental needs. Provide for a minimum hydraulic design for a 10-year flood event.
- H. Erosion Control – Provide temporary and permanent erosion control to minimize loss of soil.

III. OPERATION AND MAINTENANCE STANDARDS

- A. Operation – Maintenance Level 1 roads will be closed permanently or seasonally. Use proper closure devices and signing meeting Texas MUTCD and Forest Service manual requirements.

Maintenance Level 1 roads are not subject to the Highway Safety Act.

- B. Maintenance – Provide maintenance activities necessary to protect the environment and resources that the transportation facility serves. Annual and routine maintenance is not required. Repair washed out road sections to prevent further loss of roadway and drainage structures. Road condition surveys should be performed to identify maintenance needs.
- C. The Maintenance Level 1 roads listed in the NFGT Infra Transportation System are subject to the design criteria, standards and operation and maintenance requirements of this “RMO – Maintenance Level 1”.

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Appendix H. Summary of Current *Plan* Direction

The Revised Land and Resource Management Plan for the National Forests and Grasslands in Texas (the *Plan*) was approved in March 1996. This appendix summarizes the desired future conditions in the *Plan* related to roads and the *Plan's* standards and guidelines that apply to road management.

1.1 The Plan's Desired Future Condition for Roads

The discussion of the desired future conditions and management objectives in Chapter 4 of the *Plan* provide the general direction to consider in the management of roads and access to the forest. The goals, desired future conditions, and objectives relative to roads were developed to respond to the Roads and Trails issue that arose during the public involvement process during preparation of the *Plan*.

The *Plan* contains the following direction specific to roads:

Roads will exist to provide access to the NFGT, however, some of these roads will be for administration and management only, with limited vehicular use by the public (the *Plan*, p. 44).

Forest-wide objectives relative to roads include the following (the *Plan*, p. 47):

Acquire rights-of-way that facilitate efficient management.
Manage the transportation system for increased cost-effectiveness and efficiency.

1.2 Plan Standards and Guidelines Applicable to Roads

1.2.1 Forest-wide Standards and Guidelines

FW-051

Develop the Forest Road System, as needed, to respond to resource and travel management objectives while providing for the appropriate movement of people and products to and through National Forest System lands.

Road and trail construction, reconstruction, and maintenance related activities will occur to support timber management, minerals exploration and development, recreation access, special uses, Forest administration and other management activities.

FW-052

Establish and maintain vegetative cover on slopes and areas outside the driving surface or trail head that were disturbed during road and trail construction and reconstruction activities.

FW-053

Design and construct roads and trails to minimize siltation and maintain to provide surface drainage away from streams and into vegetated buffer strips or other filtering system.

FW-054

Follow Scenic Resource Standards according to FSH and FSM guidelines for road location planning.

FW-055

Provide road and trail design and construction that allows unrestricted fish passage.

FW-056

Provide appropriate maintenance, operational management and reconstruction of existing dams, roads and trails.

The use of EPA approved herbicides following appropriate site-specific environmental analysis is permitted.

FW-057

Maintain Forest Development Roads to appropriate maintenance level standards for the planned use and traffic.

The appropriate maintenance level for roads are:

Arterial Roads - Level 4 or 5

Collector Roads - Level 3,4, or 5

Local Roads - Level 1,2,3,4, or 5

Level 1 - Custodial care with road use restrictions.

Level 2 - Limited traffic with brush control for high clearance vehicle.

Level 3 - Limited traffic with rough surface, passenger vehicle use possible with user comfort and convenience a low priority.

Level 4 - Moderate traffic with surface maintenance, passenger vehicle use provided with a moderate degree of user comfort and convenience

Level 5 - High traffic possible with surface maintenance, passenger vehicle use provided with a high degree of user comfort and convenience.

FW-058

Obliterate existing roads not needed for current or future use and have vegetative cover reestablished on all disturbed areas.

FW-059

Apply road use restrictions to protect other resource values.

a. Transportation routes inventoried in the Forest Transportation Information System (Infrastructure) should remain open for public travel unless restrictions are implemented in response to resources or program including but not limited to wildlife, recreation, minerals, fire, soil and water, and road maintenance reduction

b. A site specific analysis will be prepared for each proposed travelway closure or restriction. This analysis shall consider the effects on developed and dispersed recreation including the needs of people with disabilities

c. Restrictions shall conform to the requirements of 36 CFR 261

FW-214

Design roads according to Best Management Practices (BMP's). Implementation of construction and maintenance conforms to BMP's to meet State Water Quality Standards.

1.2.2 Management Area 1 – Upland Forests Ecosystems Standards and Guidelines

MA-1-11

New trails and roads are developed as necessary to provide access for recreation and other compatible multiple uses.

New trails, trailheads, or parking facilities may be built where needed to improve recreation opportunities Provide facilities and access to key attractions such as recreational fisheries Provide access for handicapped users in the design and construction of the facilities.

MA-1-12

All system roads shall be planned, located, designed, constructed, and reconstructed to provide the road density necessary to meet commodity production needs.

Other criteria considered are

- * *Resource management objectives,*
- * *Environmental needs and requirements,*
- * *Safety,*
- * *Traffic requirements,*
- * *Vehicle characteristics;*
- * *Road users, including users with disabilities;*
- * *Use seasons, and*
- * *Economics.*

MA-1-13

Develop a total road density, including temporary roads, for timber sales using a maximum skid distance of approximately 1300 feet.

MA-1-14

Construct and reconstruct Forest Development Roads (FDR) to standards appropriate for Traffic Service Levels B through D.

MA-1-15

Provide appropriate maintenance and operational management for the FDR System to accommodate commodity production, other access needs, safety, and resource protection.

This includes the use of Environmental Protection Agency (EPA) approved pesticides where approved through site-specific environmental analysis.

MA-1-16

Require commercial users of system roads to contribute to road maintenance commensurate with their level of use.

Contributions will be in the form of reimbursement or actual work performed.

MA-1-17

Local roads constructed or reconstructed in conjunction with timber sale or special use activities may be closed or remain open for secondary purposes.

These special use roads may be managed as linear wildlife openings, open for limited use if needed for recreation or administrative uses, or available for non-motorized travel.

MA-1-18

Obliterate and revegetate temporary roads as part of the project work.

Methods used, timing, and mitigation measures shall be in accordance with the site-specific project plan. Such roads shall be designed to reestablish vegetative cover on the disturbed area as soon as practicable.

MA-1-81

Spot treat roads, skid trails, and log landings with mulch as needed to provide a protective cover according to specifications in appropriate R8-CT provisions as provided in timber sale contracts.

1.2.3 Management Area 2 – Red-cockaded Woodpecker Emphasis Standards and Guidelines

MA-2-11

New trails and roads are developed as necessary to provide access for recreation and other compatible multiple uses.

New trails, trailheads, or parking facilities may be built where needed to improve recreation opportunities, Provide facilities and access to key attractions such as recreational fisheries Access for people with disabilities shall be provided in the design and construction of facilities.

MA-2-12

All system roads shall be planned, located, designed, constructed, and reconstructed to provide the road density necessary to meet resource management and commodity production.

Other criteria considered are

- * Resource management objectives,*
- * Environmental needs and requirements,*
- * Safety,*
- * Traffic requirements,*
- * Vehicle characteristics;*
- * Road users, including users with disabilities;*
- * Use seasons, and*
- * Economics.*

MA-2-13

Develop a total road density, including temporary roads, for timber sales using a maximum skid distance of approximately 1300 feet.

MA-2-14

Construct and reconstruct Forest Development Roads (FDR) to standards appropriate for Traffic Service Levels B through D.

MA-2-15

Provide appropriate maintenance and operational management for the FDR System to accommodate commodity production, other access needs, safety, and resource protection.

This includes the use of Environmental Protection Agency (EPA) approved pesticides, where approved through site-specific environmental analysis.

MA-2-16

Require commercial users of system roads to contribute to road maintenance commensurate with the levels of use.

Contributions will be in the form of reimbursement or actual work performed.

MA-2-17

Local roads constructed or reconstructed in conjunction with timber sale or special use activities may be closed or remain open for secondary purposes.

These special use roads may be managed as linear wildlife openings, open for limited use if needed for recreation or administrative uses, or available for non-motorized travel.

MA-2-18

Obliterate and revegetate temporary roads as part of the project work.

Methods used, timing, and mitigation measures shall be in accordance with the site-specific project plan. Such roads shall be designed to reestablish vegetative cover on the disturbed area as soon as practicable. (not to exceed ten years after the termination of the contract, permit, or lease).

MA-2-80-3.3.5 Construction of Rights-of-way

Construction of linear right-of-way, such as roads, powerlines, or pipelines is prohibited within clusters, replacement or recruitment stands.

MA-2-80-3.3.6 Existing Rights-of-way

Reconstruction or maintenance of existing roads, powerlines, or pipelines through clusters, replacement or recruitment stands is allowed if the activities are scheduled outside the nesting season. Such activities shall be closely monitored to ensure protection of cavity trees and potential cavity trees.

Light maintenance of high standard open roads, such as road grading or mowing of rights-of-way, and emergency maintenance of powerlines and pipelines, may be allowed during the nesting season.

MA-2-80-4.6

Permanent clearings for nontimber purposes may not occur if the loss of habitat would reduce the capability of the HMA to support its identified RCW population objective.

1.2.4 Management Area 4 – Streamside Management Zones Standards and Guidelines

MA-4-22

Limit new road construction only to stream crossings or recreation facilities except where valid existing rights would allow.

Stream crossings should be constructed at right angles to the stream or riparian areas.

MA-4-23

Bridges are constructed so as to not constrict clearly defined stream channels.

- a. Design permanent bridges for 100-year flood levels to extent practicable*
- b. Bridge approaches should be constructed to prevent erosion, use of culverts or box culverts that adversely restrict flow and native fisheries should be avoided.*
- c. Limit the use of construction equipment in streams to the amount of time absolutely essential for completion of the project*

MA-4-24

Require appropriate structures at all designated trails, permanent and temporary road system stream crossings.

- a. Design these structures to permit fish passage.*
- b. Consider bridges on all perennial streams.*
- c. Use culverts, anchored corduroy, bridges, gravel and/or concrete fords at intermittent and certain ephemeral streams that are determined during site specific analysis to require protective measures.*
- d. Conforms with mandatory BMP for Section 404 for roads constructed for silvicultural purposes and Section 404 nationwide, general and individual permits for facility construction and maintenance when facilities are not for silvicultural purposes.*
- e. Minimize or avoid crossings for roads and trails with deeply-incased stream banks.*

MA-4-25

Protect road and trail approaches to and from perennial streams with anchored corduroy, gravel, or concrete for a minimum distance of 20 feet from the edge of stream channel.

Re-enforced approaches to bridges may be necessary and the need for these will be determined on a case-by-case basis. Extend the protection to the gradient break to include nearby transitions between the stream floodplain and other landforms.

MA-4-26

Construction of physical structures within stream channels will be designed and engineered.

Construction will consider physical stream systems, including fishery habitat improvement structures, through coordination with other resource specialists.

MA-4-27

Roads and trails will be constructed and maintained as per section 404 of the Clean Water Act.