

Appendix 4: Summary of Dual Use Analysis Recommendations, Estimated Costs, and 5-year Reconstruction Strategy *Eastern Off-Highway Vehicle Connector Route Project*

The following table displays the summary of the Motorized Mixed Use Analysis (MMUA) reports prepared for all Operational Maintenance Level (OML) 3 and 4 roads (higher level roads designed for passenger vehicles) being considered for OHV use (in accordance with Forest Service Manual 7715.77). The MMUA was completed by a certified engineer based on current road conditions (as of summer 2012). This analysis determined what types of activities may be needed to provide safe driving conditions on those roads where OHVs and highway vehicles may be traveling at the same time. In some instances, this includes design criteria such as hazard tree removal, branch trimming (limbing), brushing, and mowing of the shoulders and ditches. In other areas, maintenance (improvement of the road surface, resurfacing, or removal of loose rock) and reconstruction (to wider widths or improved condition) is needed to provide a safe environment (Definitions are provided at the end of the document for reference). In addition to this work, placement of “Share the Road” and “Narrow Road” signs are proposed to improve safety in the dual use situation. Table 1 below summarizes recommendations for use and the design criteria, maintenance, and reconstruction needs for the roadways proposed for dual use. The full MMUA reports are attached for reference.

In addition to the MMUA, a 5-year Reconstruction Strategy has been prepared to phase in the reconstruction work based on the highest safety needs. Those items that are high priority would be completed prior to the road being opened for mixed use (planned for Spring/Summer 2013). In some cases, lower priority items may be completed after opening the roads for mixed use, as it is deemed to be safe to do so below. The 5-year Reconstruction Strategy accounts for the variability in levels of crash probability and proposes to address the High risk segments immediately upon decision (prior to open the routes), and the moderate and low risk segments to be corrected in phases encompassing a five year plan. High risk segments include curves that due to conditions such as radius, degree of curvature, roadside brush, or other sight distance issues, are estimated to have a higher risk than other, more moderate curves identified as moderate (see Project Record). The reconstruction of these high risk curves will be completed by the Forest road maintenance crew upon decision. Moderate to low risk segments, which includes moderate curves and straighter road segments where width is under 18', will be reconstructed in phases. The identified moderate curves, due to their lesser degree of curvature or radius, do not present as severe sight distance or other safety considerations. The identified road segments under 18' that are straighter are also flatter or otherwise present better sight distance conditions than other <18' areas present a lesser risk.

See Table 2 for the maintenance and Reconstruction Schedule. See Tables 3 and 4 for and Map 1 for the site-specific (mile post by mile post) maintenance and reconstruction schedules for the two highest priority roads (FR 3500 and FR 2127).

Table 1: Summary of Dual Use Recommendations and Estimated Costs

Road #	Road Name	OML	District	Recommendations for Types of Use	Needs	Cost
FR1100	Connors/Mass	3	Kenton/Ont	<ul style="list-style-type: none"> Acceptable for MMU Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming. Limbing not required now (Limbing Approx. \$10K FY16) 	\$1000 \$9600
FR1460	Bob-Connors	3	Ontonagon	<ul style="list-style-type: none"> Acceptable for MMU Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming Limbing not required now (Limbing Approx. \$7K FY16) 	\$1000 \$3400
FR1300	Markey Lk West	4	Kenton	<ul style="list-style-type: none"> Acceptable for MMU Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming. C&M¹ mow & reclaim shoulders & turnouts spring 2013. Limbing not required now. 	\$1000 \$4000
FR2009	Smith Creek	3	Kenton	<ul style="list-style-type: none"> Acceptable for MMU Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming. Limbing not required now (Limbing Approx. \$5K FY16) 	\$1000 \$2600

¹ C&M = Construction and Maintenance Crew. The C&M crew are the Forest Service employees who conduct regular road maintenance activities. Work conducted by the C&M crew is not an additional cost to the agency unless materials need to be purchased. The Forest also contracts out road maintenance work (such as limbing, mowing, and reconstruction) to private contractors if the C&M crew does not have capacity. This results in additional costs to the agency which are funded with appropriated dollars.

Summary of Dual-Use Analysis Recommendations, Estimated Costs, and 5-year Maintenance and Reconstruction Strategy

Road #	Road Name	OML	District	Recommendations for Types of Use	Needs	Cost
FR3500	E. Br. Holmes Lake	4	Kenton	<ul style="list-style-type: none"> Not Recommended for MMU at current Useable Roadway Width. High risk curve repair will make acceptable for MMU. Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming Reconstruct to 18 foot roadway width per prioritization in Phase 1 and Phase 2 reconstruction plans below. Reconstruction of High Risk curves by C&M 2013 	\$1000 \$11700 \$210,000
FR2127	Lake LaCrosse	3	Kenton	<ul style="list-style-type: none"> Not Recommended for MMU at current Useable Roadway Width. High risk curve repair will make acceptable for MMU. Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming Limbing not required now (Limbing Approx. \$7K FY16) Reconstruct to 18 foot Min. roadway width per prioritization in phase 1 and 2 reconstruction plans. Reconstruction of High Risk curves by C&M 2013 	\$1000 \$3500 \$160,000
FR3270	McAllister Cr	4	Iron River	<ul style="list-style-type: none"> Acceptable for MMU Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming 	\$1000 \$14000
FR3660	Stony Cr.	3	Kenton	<ul style="list-style-type: none"> Not Recommended for MMU at current Useable Roadway Width Prohibit or Limit mixed use with commercial Traffic Require additional signing during commercial timber operations 	<ul style="list-style-type: none"> Install “Share the Roads” signs Complete mowing/brushing/branch trimming. Limbing not required now. Reconstruct to 18 foot Min. roadway width. According to Summary below FR3660 will not be widened until 2017. It will not be opened until reconstruction. 	\$1000 \$1000 \$30,000

TABLE 2 – Summary of 5-year Maintenance and Reconstruction Strategy

Year	Activities	Estimated Costs
2013	<ul style="list-style-type: none"> • Complete Recommended Mowing/Brushing/Limbing - All roads (by contract) • Install “Share the Roads” and “Narrow Road” signs – All Roads • Correct all high risk areas on FR2127 and FR3500 by the C&M crew • C&M mow and reclaim shoulders and turnouts on FR1300 spring 2013. • Survey FR2127, FR3500, and FR3660 for reconstruction designs, start designs (Forest staff) 	<ul style="list-style-type: none"> • \$49,800 • \$8,000 • No additional cost • No additional cost • No additional cost <p style="text-align: right;">TOTAL = \$57,800</p>
2014	<ul style="list-style-type: none"> • Complete designs for FR2127, FR3500, and 3660 (Forest staff) • Advertise & award reconstruction contract package for FR2127 phase I² • Advertise & award reconstruction contract package for FR3500 phase 1 if funding allows 	<ul style="list-style-type: none"> • No additional cost • \$103,000 • \$115,000 <p style="text-align: right;">TOTAL=\$103,000 - \$218,000</p>
2015	<ul style="list-style-type: none"> • Advertise & award reconstruction contract package for FR3500 phase 1 <u>if not completed 2014</u> • Advertise & award reconstruction contract package for FR3500 phase 2 if funding allows 	<ul style="list-style-type: none"> • \$115,000 • \$95,000 <p style="text-align: right;">TOTAL=\$95,000 - \$210,000</p>
2016	<ul style="list-style-type: none"> • Advertise & award reconstruction contract package for FR3500 phase 2 <u>if not completed 2015</u> • Advertise & award reconstruction contract package for FR2127 phase 2 if funding allows • Recommended limbing on roads where limbing was deferred. 	<ul style="list-style-type: none"> • \$95,000 • \$57,000 • \$29,000 <p style="text-align: right;">TOTAL = \$29,000-\$181,000</p>
2017	<ul style="list-style-type: none"> • Advertise & award reconstruction contract package for FR2127 phase 2 <u>if not completed 2016</u> • Advertise & award reconstruction contract package for FR3660 • Re-mow/brush all roads 	<ul style="list-style-type: none"> • \$57,000 • \$30,000 • \$65,000 <p style="text-align: right;">TOTAL = \$95,000-\$152,000</p>

² Note that Phase 1 is items of medium priority, Phase 2 are additional items of moderate and low priority (see Map 1 and Tables 3 and 4)

Table 3 – Forest Road 3500 Dual Use Reconstruction Prioritization Strategy by Mile Post (L=Low Priority, M= Medium Priority, H=High Priority)

MP	MP	MOW	LIMB	RECONSTRUCT PRIORITY	COMMENTS
0.0	0.68	M	M	L -M	START @ 2127
0.68	0.76	M	M	H	CURVE WIDENING NEEDED C&M 2013
0.76	0.94	M	M	L	
0.94	1.03	M	M	H	CURVE WIDENING NEEDED C&M 2013
1.03	1.23	M	M	M	SERIES CURVES
1.27	1.33	M	M	H	CURVE WIDENING NEEDED C&M 2013
1.33	1.63	M	M	M	SERIES CURVES, TURNOUTS PRESENT.
1.63	2.03	M	M	L-M	SERIES CURVES, TURNOUTS PRESENT.
2.03	2.34	M	M	L	STRAIGHT SEGMENT
2.34	2.66	M	M	M	SERIES CURVES & INTERSECTION
2.66	2.80	M	M	L	STRAIGHT SEGMENT
2.80	3.07	M	L	H	CURVE WIDENING NEEDED & REESTABLISH TURNOUTS C&M 2013
3.07	3.23	M	L	L	STRAIGHT SEGMENT. PHASE 2 RECONSTRUCTION 0.0 – 3.32. SURVEY DESIGN FY13. CONSTRUCTION 14 OR 15. THIS SECTION MAY BE ABLE TO BE CONSTRUCTED WITHIN EXISTING CLEARING LIMITS. ESTIMATE \$25K-30K/MILE.
3.23	3.32	M	M	M	CURVE PHASE 1 RECONSTRUCTION 3.32 – 5.63. SURVEY DESIGN FY 2013. CONSTRUCTION FY13 OR 14. RECOMMEND FULL RECONSTRUCTION. NOT GOOD PROJECT FOR C&M DUE TO EQUIPMENT NEEDS & VOLUME OF EARTHWORK. ESTIMATE \$45-50/MILE. THE 1 MILE STRAIGHT SECTION MAY LOWER PER MILE COST.
3.32	3.55	M	H	M	STEEP OUTSIDE SLOPE. NO TURNOUTS.
3.55	3.74	H	H	M	STEEP OUTSIDE SLOPE. NO TURNOUTS.
3.74	4.75	H	H	L-M	STRAIGHT SECTION. TURNOUTS PRESENT.
4.75	5.20	M	H	H	SERIES CURVES. CURVE WIDENING AND REESTABLISH TURNOUTS NEEDED
5.20	5.63	M	H	M	SERIES CURVES, TURNOUTS PRESENT. CHANGES TO COUNTY JURISDICTION. WIDER ROAD WIDTH
5.63	END @ LK 13				

Table 4 -Forest Road 2127 Dual Use Reconstruction Prioritization Strategy by Mile Post (L=Low Priority, M= Medium Priority, H=High Priority)

MP	MP	MOW	LIMB	RECONSTRUCT PRIORITY	COMMENTS
0.0	0.25	L	L	L	
0.25	0.50	L	L	M	<18' MODERATE HORIZONTAL CURVE
0.50	0.65	L	L	L	
0.65	0.80	L	L	M	<18' MODERATE HORIZONTAL CURVE
0.80	1.00	M	L	L	
1.00	1.25	M	L	M	<18' MODERATE HORIZONTAL CURVE
1.25	1.45	M	L	M	<18' MODERATE HORIZONTAL CURVE
1.45	1.70	M	L	L	
1.70	1.95	M	L	H	HOR CURVE. C&M WIDEN CURVE/ADD TURNOUTS FY13 CONSTRUCTION SEASON
1.95	2.03	M	L	M	PHASE 1 RECONSTRUCTION 0.0 – 2.03. SURVEY DESIGN FY 2013. CONSTRUCTION FY14. RECOMMEND FULL RECONSTRUCTION. ESTIMATE \$45K-50K/MILE
2.03	2.15	M	L	L	
2.15	2.54	M	L	M	
2.54	3.89	M	L	L	PHASE 2 RECONSTRUCTION 2.03 – 3.89. SURVEY DESIGN FY 2013. CONSTRUCTION FY14 OR 15 AFTER PHASE 1 ON FR3500. THIS SECTION MAY BE ABLE TO BE RECONSTRUCTED WITHIN EXISTING CLEARING LIMITS SIMILAR TO FR6320. ESTIMATE \$25K-30K/MILE

Definitions:

Maintenance – Activities performed to existing roads to maintain the road at Operational Maintenance Level. These activities may include grading, blading, ditch and culvert cleaning, minor culvert repairs or replacement, mowing, and sign replacements.

Reconstruction – Construction activities that are beyond the scope of routine maintenance. These activities may include major culvert replacements, horizontal and/or vertical realignment of roadbed, clearing and grubbing, widening, major surfacing, and major ditch work.

Widening – Reconstruction activity which increases road width. This can be performed along an entire road segment change road designation from single lane to double lane or can be done at selected road segments to increase safety such as in curves by increasing sight distance and increasing useable road width within curve segments to allow opposing traffic to safely pass within the curve.

Brushing – Maintenance activity which usually involves tractor type mower cutting grass, small diameter brush, and small diameter trees within the existing clearing limits. Generally improves safety by allowing for increased sight distances and helps maintain drainage in the existing ditches and culverts.

Branch Trimming (Limbing) – Maintenance activity that involves trimming branches that protrude into the clearing limits from larger diameter trees that grow outside the clearing limits. Generally improves safety by increasing sight distances and allows for increased sunlight on roadbed which aids in roads thawing and drying quicker during spring thaw.

Hazard Tree Removal – Maintenance activity that involves cutting larger diameter dead, dying, or defective trees adjacent to the roadway that are identified to have greater potential to fall into roadway either causing damage to vehicles or block roadway.

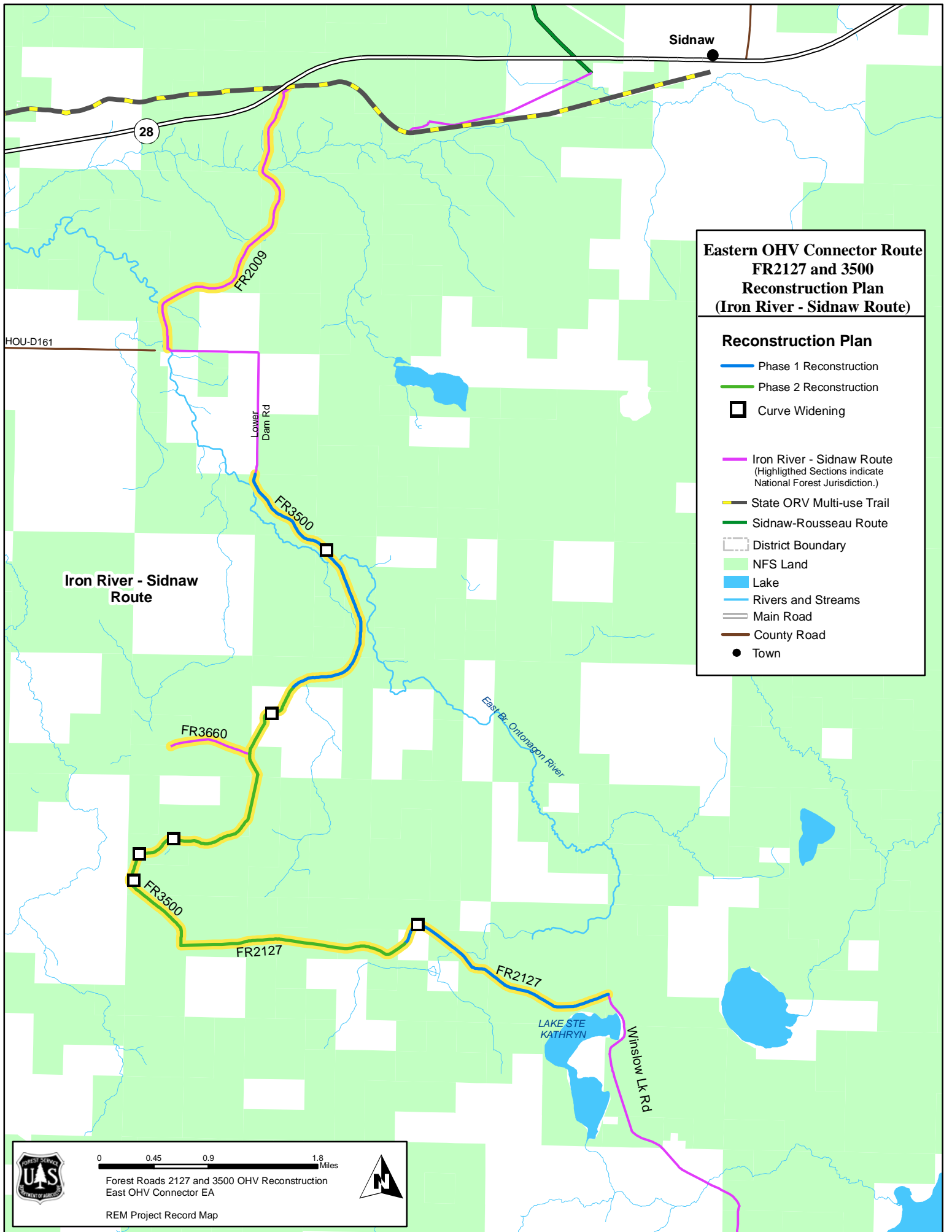
C&M = Construction and Maintenance Crew. The C&M crew are the Forest Service employees who conduct regular road maintenance activities. The Forest also contracts out road maintenance work (such as limbing, mowing, and reconstruction) to private contractors if the C&M crew does not have capacity.

Crash probability is the estimated likelihood of a crash on a road resulting from exposures to factors affecting traffic safety. Factors include Primary Use, Crash History, Traffic Volume and Type, speed, Road Surface Type, as well as others. Examples of High, Medium, Low would be as follows:

- High – Road with a documented or known history of crashes or near misses, high traffic volume, higher speeds (>40mph), inconsistent roadway where drivers will encounter unexpected conditions, and poor visibility through many or all areas.
- Medium – Road with either no known or infrequent or isolated crashes, moderate traffic volume, moderate speeds (25-40mph), few inconsistent segments or unexpected conditions, poor visibility in few segments.
- Low - Road with no known or documented crashes, low traffic volume, consistent roadway where drivers and operators do not encounter unexpected conditions, low speeds (<25mph), good visibility throughout.

Crash severity is the probable degree of property damage or personal injury resulting from a crash on the road.

Map 1



Eastern OHV Connector Route FR2127 and 3500 Reconstruction Plan (Iron River - Sidnaw Route)

Reconstruction Plan

- Phase 1 Reconstruction
- Phase 2 Reconstruction
- Curve Widening
- Iron River - Sidnaw Route
(Highlighted Sections indicate National Forest Jurisdiction.)
- State ORV Multi-use Trail
- Sidnaw-Rousseau Route
- District Boundary
- NFS Land
- Lake
- Rivers and Streams
- Main Road
- County Road
- Town

0 0.45 0.9 1.8
Miles

Forest Roads 2127 and 3500 OHV Reconstruction
East OHV Connector EA

REM Project Record Map

**Iron River - Sidnaw
Route**

LAKE STE
KATHRYN

Sidnaw

28

FR2009

Lower
Dam Rd

FR3500

FR3660

FR3500

FR2127

FR2127

Winslow Lk Rd

East Br. Ontonagon River

HOU-D161

Motorized Mixed Use Analysis Reports

Engineering Report

Ottawa National Forest Service

Kenton & Ontonagon Ranger Districts

Analysis of Road # FR1100

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton & Ontonagon

Road Number: FR1100

Road Name: Connors/Mass

Beginning Mile Post: 0.0

Ending Mile Post: 7.4 (End proposed MMU route, total road length – 10.8 mi.)

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a safe travelway for standard passenger cars driven by a prudent driver. User comfort and convenience are low priorities. Potholing and washboarding may occur. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 30 – 35 mph

5. Road surface type: Aggregate surfacing

6. Intersections with other roads and trails:

Pori Rd (North End) – Good Visibility

Major Intersections w/ FR1460 & FR1180 (Mtc Level 3 Rds) – Intersection improvements not necessary.

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Narrow Clearing limits and winding road from MP 3.3 to 7.4

Useable Roadway = 18 feet

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

Low hanging limbs - Branch Trimming recommended to improve visibility and provide increased daylight on roadway to dry surface quicker.

Hazard Trees – Removal recommended to reduce potential blowdown and reduce roadside collision potential.

Minimal ditches and shoulders – Rehabilitating ditches and providing shoulders would provide more opportunity for vehicles to safely get off roadway in oncoming traffic situations. Spot surfacing would be needed after ditching activities to finish restoration of roadway where the ditching occurs.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Crash severity of high based on OHV/Commercial hauling vehicle collision.

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR1100:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Require additional signing be placed by commercial operators during hauling operations.

- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing and branch trimming work - \$10K

Other mitigation measures for consideration:

- Remove hazard trees (200 each) - \$6K
- Rehab roadside ditches and shoulders (1000 LF) - \$20K
- Spot surfacing after ditching (2000 cyd) - \$45K

Conclusion:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$20,000.

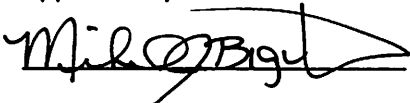
Prepared by:

Michael J. Bigelow, P.E.

Date: June 22, 2012

Forest Engineer

Approved by:



Date: June 22, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Kenton Ranger District

Analysis of Road # FR1300

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton

Road Number: FR1300

Road Name: Markey Lk West

Beginning Mile Post: 0.0

Ending Mile Post: 6.2

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a moderate degree of user comfort and convenience at moderate travel speeds for a standard passenger car. Usually a collector road. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 30-35 mph

5. Road surface type: Aggregate surfacing

6. Intersections with other roads and trails:

Major intersection with FH-16 – Good Visibility (OHV use not anticipated at this intersection due to current proposed route)

Intersections w/ FR1300– Where road becomes county jurisdiction @ MP 6.2

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Narrow clearing limits and winding road from MP 2.3 to 3.0 and MP 4.0 to 4.7

Sharp horizontal curve from MP3.6 to 3.8

Useable Roadway = 18 feet

Useable Roadway = 16 feet w/ turnouts from MP 5.6 to 6.2 (Not recommended for mixed use)

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR1300:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing and branch trimming work - \$4K

Conclusion:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Motorized Mixed Use is not recommended in the segment where useable roadway is less than 18 feet. The recommended measures would be up to \$11,000.

Prepared by:

Michael J. Bigelow, P.E.

Date: June 22, 2012

Forest Engineer

Approved by:

A handwritten signature in black ink, appearing to read 'Michael J. Bigelow', is written over a horizontal line.

Date: June 22, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Ontonagon Ranger District

Analysis of Road # FR1460

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Ontonagon

Road Number: FR1460

Road Name: Bob-Connors

Beginning Mile Post: 0.0

Ending Mile Post: 3.8

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a safe travelway for standard passenger cars driven by a prudent driver. User comfort and convenience are low priorities. Potholing and washboarding may occur. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 25-30 mph

5. Road surface type: Worn-out aggregate surfacing

6. Intersections with other roads and trails:

Major intersection w/ FR 1470 – Good Visibility

Major Intersections w/ FR1100– Vertical curve on 1460. Intersection improvements not necessary.

Several intersections w/ Level 1 & 2 Forest Roads

Five segments of roadway have recurring erosion problems in area w/ steeper grades

7. Other roadway factors:

Limited site distance coupled with recurring roadway erosion problems @ MP 2.1 to 2.2 (Sharp horizontal curve) and MP 2.4 to 2.8 (steep grade)

Useable Roadway = 18 feet

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

Low hanging limbs - Branch Trimming recommended to improve visibility and provide increased daylight on roadway to dry surface quicker.

Five segments of roadway have recurring erosion issues due to sandy subgrade material

Minimal ditches and shoulders – Rehabilitating ditches and providing shoulders would provide more opportunity for vehicles to safely get off roadway in oncoming traffic situations. Spot surfacing would be needed after ditching activities to finish restoration of roadway where the ditching occurs.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR1460:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing and branch trimming work - \$4K

Other mitigation measures for consideration:

- Rehab steep grade and roadside ditches and shoulders (1000 LF) - \$70K

Conclusion:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$11,000.

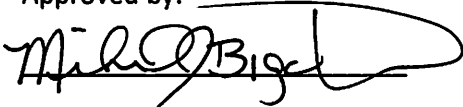
Prepared by:

Michael J. Bigelow, P.E.

Date: June 22, 2012

Forest Engineer

Approved by:

A handwritten signature in black ink, appearing to read "Michael J. Bigelow", written over a horizontal line.

Date: June 22, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Kenton Ranger District

Analysis of Road # FR2009

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton

Road Number: FR2009

Road Name: Smith Creek

Beginning Mile Post: 0.0

Ending Mile Post: 2.8

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances? Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a safe travelway for standard passenger cars driven by a prudent driver. User comfort and convenience are low priorities. Potholing and washboarding may occur. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 30-35 mph

5. Road surface type: Worn-out aggregate surfacing

6. Intersections with other roads and trails:

Major intersection w/ M-28 – Good Visibility (Intersection not within current proposed route)

Intersections w/ Lake Thirteen Road – Intersection improvements not necessary.

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Useable Roadway = 18 feet

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR2009:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing work - \$3K

Conclusion:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$6,000.

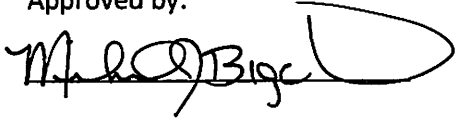
Prepared by:

Michael J. Bigelow, P.E.

Date: June 22, 2012

Forest Engineer

Approved by:

A handwritten signature in black ink, appearing to read "Michael J. Bigelow", written over a horizontal line.

Date: June 22, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Kenton Ranger District

Analysis of Road # FR2127

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton

Road Number: FR2127

Road Name: Lake LaCrosse

Beginning Mile Post: 0.0

Ending Mile Post: 4.0

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances? Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a safe travelway for standard passenger cars driven by a prudent driver. User comfort and convenience are low priorities. Potholing and washboarding may occur. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 30-35 mph

5. Road surface type: Worn Aggregate surfacing

6. Intersections with other roads and trails:

FR3500 (West End)

Ponozzo Rd (County, East End)

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Useable Roadway = 16 feet without turnouts – Not recommended for Motorized Mixed Use

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR2127:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Reconstruct to double-lane standard (18 ft minimum) - \$160K
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs - \$1K
- Complete mowing/brushing work - \$4K

Conclusion:

Allowing motorized mixed use on FR2127 in the current condition is not recommended due to narrow useable roadway width. Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The highly recommended measures would be up to \$205K.

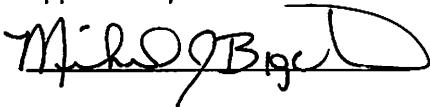
Prepared by:

Michael J. Bigelow, P.E.

Date: July 3, 2012

Forest Engineer

Approved by:

A handwritten signature in black ink, appearing to read "Michael J. Bigelow", written over a horizontal line.

Date: July 3, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Iron River Ranger District

Analysis of Road # FR3270

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Iron River

Road Number: FR3270

Road Name: McAllister Creek

Beginning Mile Post: 0.0

Ending Mile Post: 6.8

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a moderate degree of user comfort and convenience at moderate travel speeds for a standard passenger car. Usually a collector road. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 35-40 mph

5. Road surface type: Aggregate surfacing

6. Intersections with other roads and trails:

FH-16 (West End – Not within current proposed OHV Route)
East – West ATV Grade (west end of proposed route)
FR3320 – Major Intersection w/ ML-3 road
County Road 657 – Major Intersection
Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Useable Roadway = 18 feet
Single Lane Bridge @ S. Br. Paint River

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR3270:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing work - \$14K

Conclusion:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$15K.

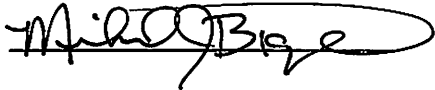
Prepared by:

Michael J. Bigelow, P.E.

Date: July 3, 2012

Forest Engineer

Approved by:

Handwritten signature of Michael J. Bigelow in black ink, enclosed in a large, loopy oval.

Date: July 3, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Kenton Ranger District

Analysis of Road # FR3500

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton

Road Number: FR3500

Road Name: E. Br. Holmes Lk

Beginning Mile Post: 0.0

Ending Mile Post: 5.8

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances? Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a moderate degree of user comfort and convenience at moderate travel speeds for a standard passenger car. Usually a collector road. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 30-35 mph

5. Road surface type: Aggregate surfacing

6. Intersections with other roads and trails:

FR2127 (South End)

FR3500 (County Portion – North End)

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Horizontal and vertical alignment poor with respect to visibility

Useable Roadway = 16 feet with turnouts – Not recommended for Motorized Mixed Use

Useable Roadway = 14 feet @ E. Br. Ontonagon River Bridge (Single Lane)

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR3500:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Reconstruct to double-lane standard (18 ft minimum) - \$210K
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs (12 identified) - \$1K
- Complete mowing/brushing work - \$12K

Conclusion:

Allowing motorized mixed use on FR3500 in the current condition is not recommended due to narrow useable roadway width. Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$310K.

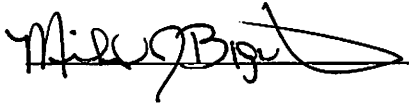
Prepared by:

Michael J. Bigelow, P.E.

Date: July 2, 2012

Forest Engineer

Approved by:

A handwritten signature in black ink, appearing to read "Michael J. Bigelow", written over a horizontal line.

Date: July 2, 2012

Qualified Engineer

Engineering Report

Ottawa National Forest Service

Kenton Ranger District

Analysis of Road # FR3660

for Motorized Mixed Use Designation

Forest: Ottawa

District(s): Kenton

Road Number: FR3660

Road Name: Stony Creek

Beginning Mile Post: 0.0

Ending Mile Post: 0.8

Traffic Service Level:

A B C D

Objective Maintenance Level:

1 2 3 4 5

Operational Maintenance Level:

1 2 3 4 5

Maintenance by: Forest Service

Non-Forest Service ROW or Jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances: N/A

Subject to Highway Safety Act? Yes No

Non-Highway-Legal Vehicles currently permitted? Yes No

Is motorized mixed use consistent with State and local laws? Yes No

Description of road management objectives, existing use, and proposed use:

RMO: General Management Direction. Provide a safe travelway for standard passenger cars driven by a prudent driver. User comfort and convenience are low priorities. Potholing and washboarding may occur. Used for recreation, hunting, administrative use, wood product haul and fire protection.

Existing Use: Highway Legal Vehicles Only

Proposed Use: Motorized Mixed Use

Summary of Findings:

Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. Allowing motorized mixed use with commercial hauling traffic would raise anticipated crash severity.

Factors Considered:

1. Operator considerations:

State OHV Regulations allow:

Operators as young as 16 years old to ride unsupervised.

Operators as young as 10 years old to ride under adult supervision.

2. Crash History:

Crash records not available.

No evidence of crash sites observed.

3. Traffic Volume and Type:

Non-highway-legal vehicles:

<12 inch tread width <50 inch tread width >50 inch tread width

Highway-legal vehicles:

Passenger Cars Commercial Vehicles Recreation Vehicles (RV's)

Non-highway-legal vehicles have not previously been allowed on this road.

4. Speed – Anticipated average speed (85th percentile): 25-30 mph

5. Road surface type: Native surface – poor condition

6. Intersections with other roads and trails:

FR3500 (West End)

FR3660 (County jurisdiction, East End)

Several intersections w/ Level 1 & 2 Forest Roads

7. Other roadway factors:

Useable Roadway = 16 feet without turnouts – Not recommended for Motorized Mixed Use

8. Roadside conditions:

Brush along roadway - Mowing/Brushing needed to improve visibility.

Limbing – Improve visibility

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Mitigation Measures:

Recommended measures necessary for motorized mixed use on FR3660:

- Prohibit or limit motorized mixed use when commercial hauling activities occur by either closing segments where hauling is actively taking place or by placing temporary restrictions such as 'No hauling activities on weekends' or 'No OHV's weekdays'.
- Reconstruct to double-lane standard (18 ft minimum) - \$30K
- Require additional signing be placed by commercial operators during hauling operations.
- Install "Share the Road" Signs - \$1K
- Complete mowing/brushing work - \$2K

Conclusion:

Allowing motorized mixed use on FR3660 in the current condition is not recommended due to narrow useable roadway width. Allowing motorized mixed use on this road may be acceptable if the Mitigation Measures are implemented prior to designation. The recommended measures would be up to \$35K.

Prepared by:

Michael J. Bigelow, P.E.

Forest Engineer

Date: July 17, 2012

Approved by:

Michael J. Bigelow

Qualified Engineer

Date: July 17, 2012