

TABLE OF CONTENTS – VOLUME 1

SUMMARY

A.	INTRODUCTION	S-1
1.	<i>Program Agencies and The National Environmental Policy Act (NEPA) Process</i>	S-1
2.	<i>Description of the Proposed Action</i>	S-2
3.	<i>Other Federal Actions Required</i>	S-4
4.	<i>Reasonably Foreseeable Major Actions</i>	S-5
5.	<i>Unresolved Issues</i>	S-5
6.	<i>Areas of Controversy</i>	S-6
B.	NEEDS AND OBJECTIVES OF THE PROJECT	S-6
C.	ALTERNATIVES CONSIDERED	S-7
D.	KEY ISSUES.....	S-10
E.	MAJOR ENVIRONMENTAL IMPACTS.....	S-10
1.	<i>Beneficial Impacts</i>	S-10
2.	<i>Adverse Impacts</i>	S-11
3.	<i>Environmental Impacts Summary</i>	S-11
F.	MITIGATION OF IMPACTS	S-12

I. PURPOSE AND NEED

A.	INTRODUCTION	I-1
B.	PROJECT HISTORY.....	I-1
1.	<i>Project Development</i>	I-1
2.	<i>Project Scoping and Public Involvement</i>	I-5
3.	<i>Draft Environmental Impact Statement</i>	I-6
4.	<i>Development of New Alternative – Supplemental DEIS</i>	I-6
5.	<i>Alternative Surface Test Strips</i>	I-8
6.	<i>New Considerations</i>	I-8
C.	PURPOSE OF AND NEED FOR THE PROJECT	I-9
1.	<i>Transportation Needs</i>	I-9
1a.	Increased Traffic Volumes.....	I-9
1b.	Inadequate Surface Condition.....	I-10
1c.	Safety	I-10
1d.	Local Access	I-13
2.	<i>Environmental Needs</i>	I-14
2a.	Sensitive Environmental Setting	I-14
2b.	Soil Erosion and Sedimentation	I-15
3.	<i>Maintenance Needs</i>	I-16
3a.	Roadway Maintenance Cost	I-16
3b.	Drainage	I-16
3c.	Untreated Roadway Surface Conditions	I-17
D.	PROJECT OBJECTIVES	I-18

II. ALTERNATIVES

A.	INTRODUCTION	II-1
B.	DESCRIPTION OF ALTERNATIVES	II-1
1.	<i>Alternative 1 – No Action Alternative</i>	II-1
2.	<i>Alternative 2</i>	II-2
3.	<i>Alternative 3</i>	II-2
4.	<i>Alternative 4</i>	II-5
5.	<i>Alternative 5</i>	II-7
6.	<i>Alternative 6 – The Preferred Alternative</i>	II-7
6a.	Surfacing Options	II-12
(i)	Magnesium Chloride/PennzSuppress D	II-13
(ii)	Macadam Construction.....	II-15

<i>(iii)</i>	Road Oyl.....	II-16
<i>(iv)</i>	Permazyme.....	II-16
<i>(v)</i>	Recycled Asphalt.....	II-17
<i>(vi)</i>	Chip Seal over Asphalt	II-17
C.	SELECTION OF THE PREFERRED ALTERNATIVE	II-18
D.	COMPARISON OF ALTERNATIVES	II-19
1.	<i>Proposed Improvements by Segment</i>	II-19
2.	<i>Percentage of Pavement Sections</i>	II-21
3.	<i>Percentage of Rehabilitation and Reconstruction</i>	II-22
4.	<i>Design Criteria and Typical Cross Section</i>	II-22
4a.	Functional Classification	II-23
4b.	Design Speed	II-23
4c.	Design Vehicle.....	II-24
4d.	Design Grade	II-25
4e.	Typical Cross Sections.....	II-25
	<i>(i)</i> Rehabilitation	II-27
	<i>(ii)</i> Light Reconstruction	II-28
	<i>(iii)</i> Full Reconstruction.....	II-30
	<i>(iv)</i> Summary of Typical Sections	II-31
5.	<i>Special Sections</i>	II-31
5a.	Guardrail Sections	II-31
5b.	Mechanically Stabilized Earth Retaining Wall Sections	II-32
5c.	Paved Ditch Sections	II-33
5d.	Cut-Side Retaining Wall	II-34
5e.	Concrete Wall	II-34
5f.	Rockfall Ditch	II-36
5g.	Georgetown Area	II-36
5h.	Summary of Special Sections	II-38
6.	<i>Management Responsibilities</i>	II-38
E.	OPTIONS COMMON TO ALL BUILD ALTERNATIVES.....	II-38
1.	<i>Parking Areas</i>	II-39
2.	<i>Material Source Locations</i>	II-40
3.	<i>Winter Closure</i>	II-41
3a.	Background.....	II-41
3b.	Assumptions about Winter Closure	II-42
4.	<i>Equestrian Trail Segments</i>	II-42
5.	<i>Minor Road Realignments</i>	II-43
F.	OTHER ALTERNATIVES CONSIDERED AND ELIMINATED	II-43
1.	<i>Permanent Road Closures</i>	II-43
2.	<i>Remove All Pavement</i>	II-43
3.	<i>Designate Road as a 4-Wheel Drive Road Only</i>	II-43
4.	<i>Additional Widening for Pedestrians and Bicycles</i>	II-44
5.	<i>Use Federal Funds for Maintenance and Repair</i>	II-44
6.	<i>Silver Plume Bypass Realignment</i>	II-44
7.	<i>Passing Lanes</i>	II-45
8.	<i>Sierra Club Alternative</i>	II-45
9.	<i>Realignment Options Considered and Eliminated</i>	II-45
9a.	Realignment Option A: Duck Creek Realignment.....	II-46
9b.	Realignment Option B: Upper Clear Creek	II-46
9c.	Realignment Option D: Cabin Creek Realignment.....	II-46
9d.	Realignment Option E: Green Lake Bypass Realignment.....	II-47
9e.	Realignment Option Fa: Georgetown Side-Hill Bypass Realignment.....	II-47
9f.	Realignment Option Fb: Georgetown Tunnel Bypass Realignment.....	II-47
9g.	Realignment Option Fc: Georgetown Through-Cut Bypass Realignment	II-48
9h.	Realignment Option G: Naylor Creek Realignment	II-48
10.	<i>Temporary Construction Bypass Bridge</i>	II-49
11.	<i>Material Sources</i>	II-49

G. ISSUES FOR FINAL DESIGN	II-49
1. <i>Retaining Wall Design and Slope Treatments</i>	II-49
1a. Concrete form-liners – stained.....	II-50
1b. Modular blocks	II-50
1c. Dry-Stack.....	II-50
1d. Stone façade – mortared rock	II-51
1e. Shot-crete – sculpted and stained.....	II-51
2. <i>Drainage Structures</i>	II-51
2a. Major Stream Crossings.....	II-51
2b. Runoff from Leavenworth Mountain	II-52
3. <i>Guardrail Design and Materials</i>	II-52
3a. Timber beam, steel-backed.....	II-52
3b. W-shaped steel beam – galvanized and acid-stained to darken.....	II-52
3c. W-shaped steel beam Cor-ten – corrosion-resistant steel	II-53
3d. Guardwall	II-53
4. <i>Other Design Issues</i>	II-53

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION	III-1
B. KEY ISSUES	III-5
1. <i>Social Environment</i>	III-6
1a. Community Character.....	III-6
1b. Traffic Volumes.....	III-10
1c. Population and Demographics	III-12
1d. Local Economy	III-13
1e. Land Use.....	III-19
1f. Consistency with Local Plans	III-22
1g. Cultural Resources	III-28
1h. Traditional Cultural Properties	III-34
2. <i>Water Resources</i>	III-36
2a. Water Quality.....	III-36
2b. Wetlands	III-52
2c. Riparian Communities	III-55
2d. Other Waters of the U.S.....	III-56
3. <i>Visual Quality</i>	III-56
4. <i>Recreational Resources</i>	III-80
4a. Recreational Activities.....	III-80
4b. Parking.....	III-86
4c. Pedestrian and Bicyclist Use.....	III-92
5. <i>Plants and Animals</i>	III-94
5a. General Wildlife	III-94
5b. Threatened, Endangered, and Sensitive Species	III-96
5c. Management Indicator Species	III-108
5d. Colorado Natural Heritage Program Species	III-111
5e. Parking Area Impacts on Plants and Animals.....	III-111
5f. Fisheries	III-112
6. <i>Construction Impacts</i>	III-115
6a. General Construction	III-115
6b. Construction Cost	III-115
6c. Hauling	III-116
6d. Materials Source Locations and Staging Areas	III-118
6e. Construction Noise	III-120
6f. Vibration	III-125
6g. Traffic Delays	III-125
6h. Economic Impacts.....	III-127
6i. Reducing Construction Impacts	III-130

C. OTHER RESOURCES.....	III-131
1. Air Quality.....	III-131
2. Noise	III-133
3. Hazardous Materials	III-134
4. Section 4(f) Resources	III-144
5. Right-of-Way.....	III-151
6. Utilities	III-151
7. Floodplains.....	III-151
8. Farmlands	III-153
9. Environmental Justice	III-153
10. Services.....	III-153
11. Maintenance Cost.....	III-156
11a. General Maintenance	III-156
11b. Maintenance Costs of the Alternative Surface Types	III-158
12. Cumulative Impacts	III-160
13. Relationship of Local Short-Term Uses Vs. Long-Term Productivity	III-165
14. Irreversible and Irretrievable Commitment of Resources	III-166
15. Permits and Approvals Required.....	III-166
D. ENVIRONMENTAL IMPACTS OF WINTER CLOSURE	III-167
E. COMPARISON OF ALTERNATIVES TO THE PROJECT OBJECTIVES	III-168
1. Objective I: Provide a Roadway Width and Surface Capable of Accommodating Anticipated 2025 Traffic Volumes	III-170
2. Objective II: Improve Safety by Providing a Consistent Roadway Geometry and Providing Reasonable Protection from Unsafe Conditions	III-170
3. Objective III: Accommodate and Control Access to Forest Service Facilities Located along the Road.....	III-171
4. Objective IV: Reduce the Anticipated Costs to the Counties of Maintaining the Road.....	III-171
5. Objective V: Repair Roadway Drainage Problems	III-172
6. Objective VI: Repair Existing Unvegetated Slopes	III-173
7. Objective VII: Avoid, Minimize, or Mitigate Adverse Impacts to the Environment by Considering Key Issues Identified Through the Public and Agency Involvement Process.....	III-174
8. Objective VIII: Maintain the Scenic and Rural Character of the Road.....	III-175
F. SUMMARY OF ENVIRONMENTAL IMPACTS	III-175
G. ISSUES ADDRESSED FOR CLEAR CREEK COUNTY AND THE TOWN OF GEORGETOWN	III-176
1. Issues	III-176
1a. Clear Creek County	III-176
1b. The Town of Georgetown	III-181
2. Continuing Coordination.....	III-182

IV. MITIGATION

A. CULTURAL RESOURCES.....	IV-1
B. TRADITIONAL CULTURAL PROPERTIES	IV-1
C. WATER QUALITY	IV-2
D. WETLAND AND RIPARIAN COMMUNITIES.....	IV-3
E. VISUAL.....	IV-3
F. RECREATIONAL RESOURCES	IV-4
G. PLANTS AND ANIMALS	IV-4
H. FEDERALLY LISTED AND OTHER SENSITIVE SPECIES.....	IV-5
I. CONSTRUCTION.....	IV-8
1. General Construction Mitigation Measures	IV-8
2. Hauling.....	IV-9
3. Water Quality Control Measures.....	IV-10
4. Town of Georgetown – Construction Impact Mitigation.....	IV-14
J. HAZARDOUS MATERIALS.....	IV-15
K. SECTION 4(F) RESOURCES.....	IV-15

V. LIST OF PREPARERS

VI. AVAILABILITY OF TECHNICAL REPORTS

A. DEIS REPORTS	VI-1
B. SDEIS REPORTS	VI-2
C. FEIS REPORTS	VI-3
D. REPORT LOCATIONS.....	VI-5

VII. PROJECT COORDINATION

A. PROJECT COORDINATION CHRONOLOGY AND HISTORY	VII-1
B. CORRESPONDENCE.....	VII-6

VIII. INDEX

Note: The Appendices are included in Volume 2 of this FEIS, but are shown here for reference.

APPENDIX A: INTERAGENCY CORRESPONDENCE

APPENDIX B: ADDRESSING COMMENTS

APPENDIX C: RATIONALE FOR THE DESIGN CRITERIA AND THE PROPOSED IMPROVEMENTS FOR ALTERNATIVE 6 (THE PREFERRED ALTERNATIVE)

APPENDIX D: LOCATIONS OF SPECIAL CROSS SECTIONS

APPENDIX E: MAILING LIST

LIST OF FIGURES

Figure S-1 Guanella Pass Road Vicinity Map	S-3
Figure I-1 Regional Context Map	I-2
Figure I-2 Guanella Pass Road Corridor.....	I-3
Figure I-3 Distressed Pavement Conditions	I-10
Figure I-4 Pot-holes and Ruts on a Gravel Section.....	I-10
Figure I-5 Accident Locations on Guanella Pass Road 1991 – 2001	I-12
Figure I-6 Unprotected Hazard	I-13
Figure I-7 Stream Encroachment	I-15
Figure I-8 Steep Cut Slopes and Heavy Rockfall	I-15
Figure I-9 Inadequate Drainage	I-16
Figure I-10 Spreading and Erosion of Road Materials into Sensitive Habitats	I-17
Figure II-1 Alternative 2	II-3
Figure II-2 Alternative 3	II-4
Figure II-3 Alternative 4	II-6
Figure II-4 Alternative 5	II-8
Figure II-5 Alternative 6 (The Preferred Alternative)	II-9
Figure II-6 Level of Construction	II-11

Figure II-7 Magnesium Chloride/PennzSupress D	II-15
Figure II-8 Macadam	II-15
Figure II-9 Road Oyl.....	II-16
Figure II-10 Permazyme	II-16
Figure II-11 Recycled Asphalt.....	II-17
Figure II-12 Chip Seal	II-17
Figure II-13 Design Vehicle – Class C Recreational Vehicle	II-24
Figure II-14 Cross Section Elements	II-26
Figure II-15a Typical Rehabilitation Section	II-28
Figure II-15b Typical Light Reconstruction Section for Alternative 6	II-29
Figure II-15c Typical Full Reconstruction Section	II-30
Figure II-16a Guardrail Special Section	II-32
Figure II-16b MSE Wall Special Section	II-33
Figure II-16c Paved Ditch Special Section.....	II-34
Figure II-16d Cut-Side Retaining Wall Special Section.....	II-35
Figure II-16e Paved Ditch & Cut-Side Retaining Wall Special Section	II-35
Figure II-16f Concrete Wall Special Section.....	II-36
Figure II-16g Rockfall Ditch Special Section.....	II-37
Figure II-16h Georgetown Switchbacks Special Section	II-37
Figure II-17 Equestrians	II-42
Figure II-18-22 Retaining Walls And Slope Treatments.....	II-50, II-51
Figure II-23-27 Guardrail/Guardwall	II-52, II-53
 Figure III-1 Vegetation Zones	III-2
Figure III-2 Mount Bierstadt and the Sawtooth Range.....	III-3
Figure III-3 Map of Georgetown	III-20
Figure III-4 Land Ownership Along Guanella Pass Road	III-23
Figure III-5a Unvegetated, unstable cut slope with toe of slope undercut.....	III-42
Figure III-5b Roadway Maintenance Effects.....	III-42
Figure III-5c Hanging Culvert	III-42
Figure III-5d Guanella Pass Road where the roadbed erodes directly into Geneva Creek.....	III-42
Figure III-6 Identification of Short Buffer Zone, Steep Slopes, and Culvert Input.....	III-44
Figure III-7a Alternative 2 or 3 Wetland Impacts	III-57
Figure III-7b Alternative 4 or 5 Wetland Impacts	III-59
Figure III-7c Alternative 6 Wetland Impacts.....	III-61
Figure III-8 Realignment Areas Stations 18+900 - 19+200 and 19+447 – 19+622	III-69
Figure III-9 Realignment Areas Station 24+500 – 25+235	III-70
Figure III-10 Station 3+900 Rehabilitation, Macadam Surface.....	III-72
Figure III-11 Station 5+900 Rehabilitation, Gravel Surface	III-73
Figure III-12 Station 22+900 Light Reconstruction, Macadam Surface	III-74
Figure III-13 Station 36+200 Rehabilitation, Paved Surface.....	III-75
Figure III-14 Station 38+320 Rehabilitation and Light Reconstruction, Paved Surface.....	III-76
Figure III-15 Station 38+740 Rehabilitation, Paved Surface.....	III-77
Figure III-16 Station 37+700 Chip Seal Surface	III-78
Figure III-17 Station 16+500 Full Reconstruction, Paved Surface, MSE Retaining Wall	III-79
Figure III-18 Trip Purpose During Summer and Peak Aspen-Viewing Seasons, 1994	III-81
Figure III-19 Existing and Proposed Parking Areas	III-89
Figure III-20 Proposed Guanella Pass Parking Areas.....	III-91

Figure III-21 Permanent Hauling Bridge	III-119
Figure III-22 Noise Analysis Locations.....	III-122
Figure III-23 Audibility of Construction Noise.....	III-123
Figure III-24 Comparison of Traffic Noise at 12 meters (40 feet) from Centerline.....	III-136
Figure III-25 Comparison of Traffic Noise at 60 meters (200 feet) from Centerline	III-136
Figure III-26 Site Location 5: Abandoned Geneva Basin Ski Area	III-141

LIST OF TABLES

Table S-1 Objectives of the Guanella Pass Road Improvement Project.....	S-7
Table S-2 Summary of Environmental Impacts.....	S-13
Table I-1 Guanella Pass Road Traffic Volumes	I-9
Table I-2 Accidents Reported on Guanella Pass Road	I-11
Table I-3 Comparison of Annual Accident Rates (per million vehicle-miles) on Similar Roadways.....	I-11
Table I-4 Objectives of the Guanella Pass Road Improvement Project.....	I-18
Table II-1 Roadway Surfacing – Alternative 6.....	II-13
Table II-2 Roadway Surfacing Alternatives	II-14
Table II-3 Identification of Proposed Improvements.....	II-19
Table II-4 Percentage of Paved/Chip Seal, Gravel, and Alternative Surface Types	II-22
Table II-5 Mix of Improvement Work	II-23
Table II-6 Percentage of Route of Typical Sections	II-31
Table II-7 Percentage of Route for Each Special Section Type	II-38
Table II-8 Management Responsibilities	II-39
Table III-1 Guanella Pass Road Weekend Seasonal Average Daily Traffic (SADT)	III-11
Table III-2 Population – Past and Projected	III-13
Table III-3 Employment by Type of Work for Park and Clear Creek Counties – 1993.....	III-14
Table III-4 Gross Sales per Capita	III-14
Table III-5 Estimated ADT Volumes Traveling Through Communities as a Result of Guanella Pass Road-Year 2025	III-15
Table III-6 Estimated Number of Vehicles Per Day Stopping in Through Communities as a Result of Guanella Pass Road, Year 2025	III-16
Table III-7 Estimated Daily Taxable Retail Sales for Each Community as a Result of Guanella Pass Road, Year 2025	III-18
Table III-8 Water Quality Criteria – Chloride/MgCl ₂ /NaCl.....	III-46
Table III-9 Comparison of Alternatives by Water Quality-Related Roadway Characteristics.....	III-49
Table III-10 Potential Leaching and Runoff Impacts of the Alternative Surface Types	III-51
Table III-11 Wetland Impacts by Alternative.....	III-54
Table III-12 Road Character Elements	III-71
Table III-13 Developed Recreational Sites Within the Project Area.....	III-80
Table III-14 1994 Recreational Activities Along Guanella Pass Road Within Pike NF	III-84
Table III-15 Trail Use in the Guanella Pass Road Area, Summer 1995.....	III-84
Table III-16 Existing and Proposed Parking Area Disturbance.....	III-88
Table III-17 Threatened, Endangered, and FS Sensitive Species	III-98
Table III-18 Potential Impacts to Boreal Western Toad Habitat	III-101

Table III-19 Total Estimated Construction Cost for each Alternative.....	III-116
Table III-20 Estimated Truck Trips Required to Build Each Alternative (Round Trips)....	III-117
Table III-21 Background Noise Levels Along Guanella Pass Road.....	III-120
Table III-22 Predicted Construction Noise Levels Along Guanella Pass Road	III-121
Table III-23 Construction Blasting Noise Simulations.....	III-124
Table III-24 Back-Up Noise Alarm Modeling.....	III-124
Table III-25 Summary of Peak Particle Velocities	III-126
Table III-26 Swiss Standard for Vibrations in Buildings	III-126
Table III-27 Vibration Study Conducted Along Loop Drive on 7/19/01	III-127
Table III-28 Commerce Prior to and During Construction Activities – Cody, Wyoming...	III-129
Table III-29 FHWA Noise Abatement Criteria	III-133
Table III-30 Existing and Projected Future Noise Levels Along Guanella Pass Road	III-135
Table III-31 Potential Haz. Mat. Sites within the Guanella Pass Road Study Area	III-138
Table III-32 Section 4(f) Impacts	III-147
Table III-33 Twenty Year Maintenance Cost Comparison by Alternative.....	III-157
Table III-34 Unit Costs of Maintenance	III-158
Table III-35 20-Year Maintenance Cost per Kilometer (per Mile) Section	III-159
Table III-36 Amount of Maintenance Required Over a 20-Year Period	III-159
Table III-37 Total 20-Year Maintenance Cost per Kilometer (per Mile).....	III-160
Table III-38 Objectives of the Guanella Pass Road Improvement Project.....	III-169
Table III-39 Project Objective Status by Alternative	III-169
Table III-40 Summary of Environmental Impacts.....	III-177