List of Tables

Table ES.1 Summary of Rail Freight Tonnage and Revenue by Trip Type...... ES-3
Table ES.2 Montana Railroad Statistics ................................................................. ES-5
Table ES.3 Summary Information for Tier 1 Route ........................................... ES-11
Table 2.1 Summary of U.S. Shipments by Mode .................................................. 2-2
Table 2.2 Summary of U.S. Shipments by Mode .................................................. 2-3
Table 2.3 U.S. Shipments by Mode and Weight .................................................. 2-4
Table 2.4 U.S. Shipments by Mode and Value .................................................. 2-4
Table 2.5 Montana Shipments by Weight .............................................................. 2-6
Table 2.6 Montana Shipments by Value ............................................................... 2-7
Table 2.7 Shipments via Pipeline and Unknown Modes in Montana ............... 2-9
Table 2.8 Summary of Rail Freight Tonnage and Revenue by Trip Type........ 2-14
Table 2.9 Montana Industry Information by Industry Classification .............. 2-28
Table 2.10 U.S. Class I Railroad Statistics .............................................................. 2-32
Table 3.1 Montana Railroad Statistics ............................................................... 3-1
Table 3.2 Union Pacific Operating Statistics in Montana ............................... 3-8
Table 3.3 BNSF Operating Statistics Summary ................................................. 3-9
Table 3.4 BNSF Operating Statistics ................................................................. 3-9
Table 3.5 Central Montana Rail Operating Statistics ....................................... 3-36
Table 3.6 Montana Rail Link Operating Statistics ............................................. 3-37
Table 3.7 Mission Mountain Rail Operating Statistics ..................................... 3-52
Table 3.8 Yellowstone Valley Railroad Operating Statistics .......................... 3-54
Table 3.9 Dakota, Missouri Valley, and Western Railroad Operating Statistics ................................................. 3-55
Table 3.10 Butte, Anaconda, and Pacific Railway Operating Statistics ............. 3-57
Table 4.1 Aviation and Rail Passengers in Montana Cities with Essential Air Service and Amtrak Service .......................................................... 4-6
Table 4.2 Capital and Up-Front Costs for Tier 1 Route .................................... 4-10
Table 4.3 Tier 1 Station Improvement Cost Estimates ..................................... 4-15
<table>
<thead>
<tr>
<th>Table No.</th>
<th>Table Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 4.4</td>
<td>Amtrak Schedule Assumption for a Billings-Missoula Route</td>
<td>4-16</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Summary Information for Tier 1 Route</td>
<td>4-17</td>
</tr>
<tr>
<td>Table 4.6</td>
<td>North Coast Hiawatha Capital Costs by Segment</td>
<td>4-22</td>
</tr>
<tr>
<td>Table 4.7</td>
<td>Capital and Up-Front Costs for North Coast Hiawatha</td>
<td>4-22</td>
</tr>
<tr>
<td>Table 4.8</td>
<td>Farebox Recovery Ratios for NCH and Long-Distance Trains</td>
<td>4-23</td>
</tr>
<tr>
<td>Table 4.9</td>
<td>Comparison of Tier 1 and NCH Passenger Rail Proposed Services</td>
<td>4-24</td>
</tr>
<tr>
<td>Table 4.10</td>
<td>Federal Funding Programs for Passenger Rail Improvements</td>
<td>4-26</td>
</tr>
<tr>
<td>Table 5.1</td>
<td>Montana International Exports by Product</td>
<td>5-2</td>
</tr>
<tr>
<td>Table 5.2</td>
<td>Current Grain Shuttle Facility Locations</td>
<td>5-9</td>
</tr>
<tr>
<td>Table 6.1</td>
<td>Historic Montana Rail Freight Loan Awards</td>
<td>6-2</td>
</tr>
<tr>
<td>Table 7.1</td>
<td>Montana Mines by County</td>
<td>7-24</td>
</tr>
<tr>
<td>Table 7.2</td>
<td>Coal Distribution by Mode, Montana and United States</td>
<td>7-25</td>
</tr>
<tr>
<td>Table 7.3</td>
<td>Fuel Efficiency Measures, Rail and Truck</td>
<td>7-33</td>
</tr>
</tbody>
</table>
List of Figures

Figure ES.1 U.S. Combination Truck Vehicle-Miles and Train-Miles .............. ES-2
Figure ES.2 Projected Population Change 2005-2030.................................. ES-4
Figure ES.3 Montana Rail System............................................................ ES-6
Figure ES.4 Amtrak Analysis .................................................................. ES-11
Figure ES.5 Wheat Exports from Pacific Northwest Ports ....................... ES-13
Figure ES.6 Wheat Production by County................................................. ES-14
Figure ES.7 County-Level Effects of Market Structure Variables in Wheat Pricing Models on Real Revenue per Ton-Mile ...................... ES-17
Figure 2.1  Growth in Value of Imports and Exports from 1860 to 2004 ...... 2-5
Figure 2.2  Montana Freight Weight by Mode ........................................... 2-8
Figure 2.3  Montana Freight Value by Mode .............................................. 2-9
Figure 2.4  Commodities Originating in Montana by Weight .................. 2-10
Figure 2.5  Value of Commodities Originating in Montana by Mode ....... 2-11
Figure 2.6  Tonnage of Freight Commodities Terminating in Montana .... 2-12
Figure 2.7  Value of Commodities Terminating in Montana .................... 2-13
Figure 2.8  Total Rail Revenue by Trip Type .............................................. 2-15
Figure 2.9  Total Rail Tonnage by Trip Type ............................................. 2-15
Figure 2.10 Top Originating Commodities by Revenue .......................... 2-17
Figure 2.11 Top Originating Commodities by Tonnage ............................ 2-17
Figure 2.12 Total Tonnage by Destination State ........................................ 2-18
Figure 2.13 Total Revenue by Destination State ........................................ 2-19
Figure 2.14 Originating Tonnage by County ............................................ 2-19
Figure 2.15 Top Terminating Commodities by Revenue ......................... 2-20
Figure 2.16 Top Terminating Commodities by Tonnage .......................... 2-21
Figure 2.17 Total Tonnage by Origin State .............................................. 2-21
Figure 2.18 Total Revenue by Origin State .............................................. 2-22
Figure 2.19 Terminating Tonnage by County ........................................... 2-23
Figure 2.20 Through Trip Commodities by Revenue .............................. 2-24
Figure 2.21 Through Trip Commodities by Tonnage ............................................ 2-24
Figure 2.22 Through Trip Revenue by Route ......................................................... 2-26
Figure 2.23 Through Trip Tonnage by Route ......................................................... 2-26
Figure 2.24 Projected Population Change 2005-2030 ............................................. 2-28
Figure 2.25 Montana Gross State Product by Industry ........................................... 2-29
Figure 2.26 U.S. Combination Truck Vehicle-Miles and Train-Miles ................. 2-30
Figure 2.27 Average Annual Daily Truck Traffic (AADTT) ...................................... 2-31
Figure 3.1 Montana Rail System ............................................................................... 3-2
Figure 3.2 Montana Rail Density .............................................................................. 3-4
Figure 3.3 Union Pacific – Montana Subdivision .................................................... 3-7
Figure 3.4 BNSF Statewide System Overview ......................................................... 3-11
Figure 3.5 BNSF – Kootenai River Subdivision ..................................................... 3-12
Figure 3.6 BNSF – Hi-Line Subdivision ................................................................... 3-13
Figure 3.7 BNSF – Milk River Subdivision .............................................................. 3-14
Figure 3.8 BNSF – Glasgow Subdivision ............................................................... 3-15
Figure 3.9 BNSF – Sweet Grass Subdivision ......................................................... 3-16
Figure 3.10 BNSF – Great Falls Subdivision ........................................................... 3-17
Figure 3.11 BNSF – Valier Subdivision ................................................................. 3-18
Figure 3.12 BNSF – Choteau Subdivision .............................................................. 3-19
Figure 3.13 BNSF – Fairfield Subdivision ............................................................... 3-20
Figure 3.14 BNSF – Fort Benton Subdivision ......................................................... 3-21
Figure 3.15 BNSF – Big Sandy Subdivision ............................................................ 3-22
Figure 3.16 BNSF – Helena Subdivision ................................................................. 3-23
Figure 3.17 BNSF – Copper City Subdivision ........................................................ 3-24
Figure 3.18 BNSF – Laurel Subdivision ................................................................. 3-25
Figure 3.19 BNSF – Lewistown Subdivision .......................................................... 3-26
Figure 3.20 Casper Subdivision .............................................................................. 3-27
Figure 3.21 Big Horn Subdivision .......................................................................... 3-28
Figure 3.22 BNSF – Forsyth Subdivision ............................................................... 3-29
Figure 3.23 BNSF – Sarpy Line Subdivision .......................................................... 3-30
Figure 3.24 BNSF – Colstrip Subdivision ................................................................. 3-31
Figure 3.25 BNSF – Hettinger Subdivision ............................................................. 3-32
Figure 3.26 BNSF – Dickinson Subdivision .......................................................... 3-33
Figure 3.27 Circle Subdivision .............................................................................. 3-34
Figure 3.28 Central Montana Rail ......................................................................... 3-35
Figure 3.29 MRL Statewide System Overview .................................................... 3-38
Figure 3.30 MRL Subdivision 1 ........................................................................... 3-39
Figure 3.31 Subdivision 2 .................................................................................. 3-40
Figure 3.32 MRL Subdivision 3 ........................................................................... 3-41
Figure 3.33 Subdivision 4 .................................................................................. 3-42
Figure 3.34 Subdivision 5 .................................................................................. 3-43
Figure 3.35 MRL Subdivision 6 ........................................................................... 3-44
Figure 3.36 Subdivision 7 .................................................................................. 3-45
Figure 3.37 Subdivision 9 .................................................................................. 3-46
Figure 3.38 Subdivision 10 ............................................................................... 3-47
Figure 3.39 Subdivision 11 ............................................................................... 3-48
Figure 3.40 MRL Subdivision 13 .................................................................... 3-49
Figure 3.41 Mission Mountain Railroad System .............................................. 3-51
Figure 3.42 Yellowstone Valley Railroad System ............................................. 3-53
Figure 3.43 Dakota, Missouri Valley, and Western Railroad System .............. 3-55
Figure 3.44 Butte, Anaconda, and Pacific Rail System ...................................... 3-56
Figure 3.45 Tongue River Railroad (Proposed) ................................................ 3-58
Figure 3.46 Global Rail Spur .............................................................................. 3-59
Figure 4.1 Montana Station Ridership on the Empire Builder ......................... 4-3
Figure 4.2 Montana Amtrak Ridership Calendar Year ...................................... 4-4
Figure 4.3 Amtrak Analysis ............................................................................... 4-8
Figure 4.4 Station Photos ................................................................................ 4-11
Figure 4.5 Station Photos ................................................................................ 4-12
Figure 4.6 Station Photos ................................................................................ 4-13
Figure 4.7 Station Photos ................................................................................ 4-14
Figure 4.8 Station Photos ................................................................. 4-15
Figure 4.9 Potential Southern Montana Passenger Rail Route via Helena and Butte ................................................................. 4-19
Figure 4.10 North Coast Hiawatha Study Route ........................................ 4-21
Figure 5.1 Wheat Production by County ................................................ 5-2
Figure 5.2 Wheat Exports from Pacific Northwest Ports .......................... 5-3
Figure 5.3 PNW Wheat Distribution .................................................... 5-4
Figure 5.4 Montana Wheat Shipments by Mode ..................................... 5-5
Figure 5.5 Montana Barley Shipments by Mode ...................................... 5-6
Figure 5.6 Wheat Excess Supply Over Demand, U.S. and Foreign .......... 5-7
Figure 5.7 Relative Storage Capacities of Transportation Modes ........... 5-8
Figure 5.8 Montana Grain Loading Facilities ....................................... 5-10
Figure 5.9 Rail Grain Transportation Survey Respondents Reporting Lengths of Haul ................................................................. 5-12
Figure 5.10 Type of Roadways Used to Transport Grain to Elevators ....... 5-13
Figure 5.11 Estimated Average Throughput of Large Grain Elevators ..... 5-14
Figure 5.12 Predicted ESALs for Shuttle and Unit-Sized Grain Elevators .... 5-15
Figure 5.13 Montana Grain Elevator Operators ..................................... 5-16
Figure 5.14 Montana Grain Elevator Operators ..................................... 5-17
Figure 7.1 U.S. Freight Rail Performance Post-Staggers Rail Act ............ 7-2
Figure 7.2 Example of Reciprocal Switching ........................................ 7-7
Figure 7.3 Example of Terminal Agreement .......................................... 7-8
Figure 7.4 Example of Trackage Rights ................................................ 7-9
Figure 7.5 Example of Bottleneck Rates .............................................. 7-10
Figure 7.6 Example of Paper Barriers .................................................. 7-11
Figure 7.7 R/VC Averages by Origin County for Wheat Shipments .......... 7-18
Figure 7.8 County-Level Effects of Market Structure Variables in Wheat Pricing Models on Real Revenue per Ton-Mile ....................... 7-19
Figure 7.9 BNSF Intermodal Network ................................................... 7-21
Figure 7.10 Total Montana Intermodal Shipments by Industry and Subregion ................................................................. 7-22
Figure 7.11 Intermodal Shipments Destined for Pacific Northwest Ports ...... 7-22
Figure 7.12 Volumes and Distribution for Domestic Intermodal Shipments ....7-23
Figure 7.13 Montana Coal Mines and Designated Coal Impact Area ...........7-26
Figure 7.14 Current Rail Level of Service ..................................................7-29
Figure 7.15 2035 Rail Level of Service without Improvements ...............7-30
Figure 7.16 2035 Rail Level of Service with Improvements .....................7-31
Figure 7.17 Number 2 Diesel Costs, Rocky Mountains and U.S. ...............7-34