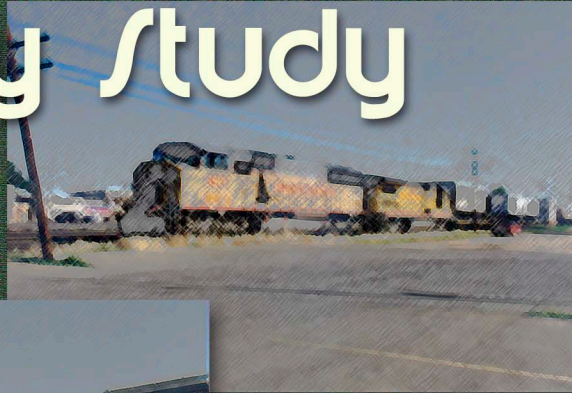




Final Report

Eastern Colorado Mobility Study



April 2002

Felsburg Holt & Ullevig

In association with:

DMJM+Harris

Jacobs Civil, Inc.

Cambridge Systematics, Inc.

Infrastructure Management Group, Inc.



FINAL REPORT

EASTERN COLORADO MOBILITY STUDY

Prepared for:

Colorado Department of Transportation

Prepared by:

Felsburg Holt & Ullevig

In association with:

DMJM+Harris
Jacobs Civil, Inc.
Cambridge Systematics, Inc.
Infrastructure Management Group, Inc.

April 2002

Acknowledgements

This study was conducted with the input of many individuals representing the Colorado Department of Transportation, local governmental entities, the freight industry and the consulting team, and with substantial input from the general public. However, special recognition should go to the following members of the Steering Committee who spent considerable time and energy in helping to direct and review the planning efforts.

Randy Grauberger, CDOT Project Manager
Jack Baier, Colorado Public Utilities Commission
Mike Bailey, South Central TPR
Nancy Bogenhagen, Eastern TPR
Chuck Brown, Pikes Peak Area Council of Governments
Perry Buck, Colorado Office of Economic Development
Rick Dykstra, Progressive 15
Dutch Eikenberg, Southeast TPR
Lucille Fehn, Central Front Range TPR
Greg Fulton, Colorado Motor Carriers Association
Karla Harding, CDOT Region 4
Mike Harms, Upper Front Range TPR
Richard Hartman, Union Pacific Railroad
Verlin Hopkins, Action 22
Jeff Kullman, CDOT Region 1
Craig Larson, Federal Highway Administration
Bill Moore, Pueblo Area Council of Governments
Donald Morrison, Transportation Commission of Colorado
John Muscatell, CDOT Region 6
Brant Ring, Burlington Northern & Santa Fe Railway Company
George Scheuernstuhl, Denver Regional Council of Governments
Lucia Smead, Colorado Department of Local Affairs
George Tempel, Transportation Commission of Colorado
Lora Thomas, Colorado State Patrol
Bob Torres, CDOT Region 2
Glen Vaad, North Front Range Transportation & Air Quality Planning Council
Travis Vallin, CDOT Division of Aeronautics
Quentin Vance, Colorado Counties, Inc.

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	S-1
I. INTRODUCTION	I-1
A. Background	I-1
B. Study Process	I-3
C. Public Outreach	I-4
II. INVENTORY OF EXISTING CONDITIONS	II-1
A. Highway System	II-1
B. Rail/Intermodal System	II-14
C. Aviation System	II-20
D. Land use, Environmental, and Socio-Economic Conditions	II-23
III. COMMODITY FLOWS IN EASTERN COLORADO	III-1
A. Existing Commodity Flows	III-1
B. Projected Commodity Flows	III-4
C. Projected flow Patterns	III-9
IV. HIGHWAY SYSTEM ANALYSIS	IV-1
A. Identification of Alternative Corridors	IV-1
B. Evaluation of Alternatives	IV-7
C. Recommendations	IV-33
V. RAIL/INTERMODAL SYSTEM ANALYSIS	V-1
A. Identification of System Needs	V-1
B. Detailed Evaluation of Rail/Intermodal Alternatives	V-3
C. Recommendations	V-12
VI. AVIATION SYSTEM ANALYSIS	VI-1
A. Overview of Air Cargo Operations	VI-1
B. Initial Screening of Aviation/Air Cargo Facilities	VI-2
C. Detailed Evaluation of Aviation/Air Cargo Alternatives	VI-3
D. Recommendations	VI-9
VII. RECOMMENDED POLICIES/STRATEGIES	VII-1
A. General Freight Policies/Strategies	VII-1
B. Highway Freight Policies/Strategies	VII-1
C. Rail Freight Policies/Strategies	VII-2
D. Intermodal Freight Policies/Strategies	VII-2
E. Aviation/Air Cargo Policies/Strategies	VII-3
VIII. OPTIONS FOR FUNDING	VIII-1
A. Colorado Highway Programs	VIII-1
B. Federal Highway Programs	VIII-2
C. Rail Improvement Assistance	VIII-3
D. Aviation Funding Sources	VIII-4
E. Complementary State and Federal Programs	VIII-5
IX. APPROACH TO IMPLEMENTATION	IX-1
A. General Approach	IX-1
B. Next Steps	IX-3

LIST OF FIGURES

	<u>Page</u>
Figure I-1. Study Area-----	I-2
Figure I-2. Study Process-----	I-3
Figure II-1. Existing Traffic Volumes-----	II-2
Figure II-2. Existing Truck Volumes-----	II-3
Figure II-3. Congested Roadways-----	II-5
Figure II-4. Surface Conditions-----	II-6
Figure II-5. High Accident Locations-----	II-7
Figure II-6. Shoulder Widths-----	II-9
Figure II-7. Rest Areas-----	II-10
Figure II-8. Ports of Entry-----	II-11
Figure II-9. Hazardous/Nuclear Materials Routes-----	II-12
Figure II-10. Scenic Byways-----	II-13
Figure II-11. Railroad Lines and Intermodal Facilities-----	II-15
Figure II-12. Railroad Traffic Volumes-----	II-16
Figure II-13. Airport Operations-----	II-22
Figure II-14. Public Lands-----	II-24
Figure II-15. Colorado Natural Heritage Conservation Sites-----	II-25
Figure II-16. Population Density-----	II-27
Figure II-17. Projected Average Annual Population Growth Rate-----	II-28
Figure II-18. Primary Employment Sector by County-----	II-30
Figure III-1. Comparison of Existing & Projected Commodity Flows (Truck & Rail)-----	III-6
Figure III-2. NAFTA Projected Truck Traffic on US Highway Network - 2020-----	III-8
Figure III-3. Primary Truck Flows Through Eastern Colorado-----	III-10
Figure IV-1. Heartland Expressway South Alternatives-----	IV-3
Figure IV-2. Heartland Expressway South: SH 71 Alt. and Alternative Corridor Connectors-----	IV-4
Figure IV-3. Heartland Expressway South: SH 113 Alt. and Alternative Corridor Connectors-----	IV-5
Figure IV-4. Other Freight Corridor Alternatives-----	IV-6
Figure IV-5. Year 2025 Daily Traffic Volumes Heartland Expressway South: SH 71 Alt. ----	IV-11
Figure IV-6. Year 2025 Daily Traffic Volumes Heartland Expressway South: SH 113 Alt.---	IV-12
Figure IV-7. Year 2025 Daily Traffic Volumes: SH 71 Corridor Connector-----	IV-13
Figure IV-8. Year 2025 Daily Traffic Volumes SH 59/63 Corridor Connector-----	IV-14
Figure IV-9. Year 2025 Daily Traffic Volumes: SH 59 Corridor Connector-----	IV-15
Figure IV-10. Year 2025 Daily Traffic Volumes US 385 Corridor Connector-----	IV-16
Figure IV-11. Primary Corridor Recommendation-----	IV-34
Figure IV-12. Support Corridor Recommendations-----	IV-37
Figure V-1. Railroad Fixed Plant Deficiencies-----	V-4
Figure V-2. Recommended Rail/Intermodal Projects-----	V-15
Figure VI-1. Aviation/Air Cargo Alternatives-----	VI-4

LIST OF TABLES

	<u>Page</u>
Table II-1	Large Grain Elevators in Eastern Colorado ----- II-19
Table II-2	Pipeline Terminals in Eastern Colorado ----- II-20
Table II-3	Major and Intermediate Airports in the Study Area ----- II-20
Table II-4	Existing and Projected Population ----- II-26
Table II-5	Existing and Projected Employment ----- II-29
Table III-1	1998 Commodity Tonnage By County ----- III-1
Table III-2	1998 Commodity Tonnage by Commodity Type ----- III-3
Table III-3	2025 Commodity Tonnage by County ----- III-5
Table III-4	2025 Commodity Tonnage By Commodity Type ----- III-7
Table IV-1	Corridor Evaluation Criteria and Measures ----- IV-8
Table IV-2	Summary Data – Need Based on Traffic ----- IV-17
Table IV-3	Summary Rating – Need Based on Traffic ----- IV-18
Table IV-4	Summary Data – Travel Efficiency: Trip Length ----- IV-20
Table IV-5	Summary Data – Travel Efficiency: Travel Time ----- IV-20
Table IV-6	Summary Data – VMT, VHT, Accidents and User Costs ----- IV-20
Table IV-7	Summary Rating – Travel Efficiency: Trip Length, Travel Time, VMT, VHT, Accidents and User Costs ----- IV-22
Table IV-8	Summary Data – Engineering/Cost Feasibility ----- IV-24
Table IV-9	Summary Rating – Engineering/Cost Feasibility ----- IV-24
Table IV-10	Summary Data – Environmental/Land Use Impacts ----- IV-26
Table IV-11	Summary Rating – Environmental/Land Use Impacts ----- IV-27
Table IV-12	Summary Data – Socio-Economic/Economic Impacts ----- IV-29
Table IV-13	Summary Rating – Socio-Economic/Economic Impacts ----- IV-31
Table IV-14	Summary Data – Financial Feasibility ----- IV-32
Table IV-15	Summary Rating – Financial Feasibility ----- IV-32
Table IV-16	Summary of Primary Corridor Deficiencies ----- IV-36
Table IV-17	Summary of Support Corridor Deficiencies ----- IV-38
Table V-1	Options for Relocating Intermodal Facilities ----- V-11
Table V-2	Recommended Rail/Intermodal Projects ----- V-13
Table VI-1	Summary of Airport Development Costs ----- VI-9

Executive Summary



EXECUTIVE SUMMARY

I. INTRODUCTION

A. Background

Colorado, historically rich in natural resources and with an economy based in large part on agriculture, has a need to transport large quantities of commodities. The rapidly growing urban areas in the state also need many products and goods to support the growth. Thus, there are considerable volumes of goods and commodities being transported within the state. Furthermore, Colorado is strategically located as a “bridge” state in the national and international infrastructure system for movement of freight, resulting in large quantities of goods flowing through the state. Although this is predominately in the east-west direction today, the potential of NAFTA suggests that there may be opportunities for Colorado to also become a more significant player in the movement of goods in north-south corridors.

At the national level, the Transportation Equity Act for the 21st Century (TEA-21) designated 43 “High Priority Corridors” on the nation’s highway system as a focus for improvements to enhance mobility for trade (both domestic and international) and to promote economic development. Three of these corridors penetrate Colorado:

- ◆ *Camino Real – Mexico to Canada via I-25 in Colorado*
- ◆ *Ports to Plains – Laredo, Texas to Denver*
- ◆ *Heartland Expressway – Denver, through Scottsbluff, Nebraska, to Rapid City, South Dakota*

In July, 2001 representatives of the Colorado, Oklahoma, Texas and New Mexico Departments of Transportation agreed to designate the specific route for the Ports to Plains Corridor as identified on Figure S-1. Through several studies conducted in the mid-1990’s, a route for the Heartland Expressway from Rapid City to Scottsbluff has been designated. However, no designation has been made for the segment from Scottsbluff to Denver.

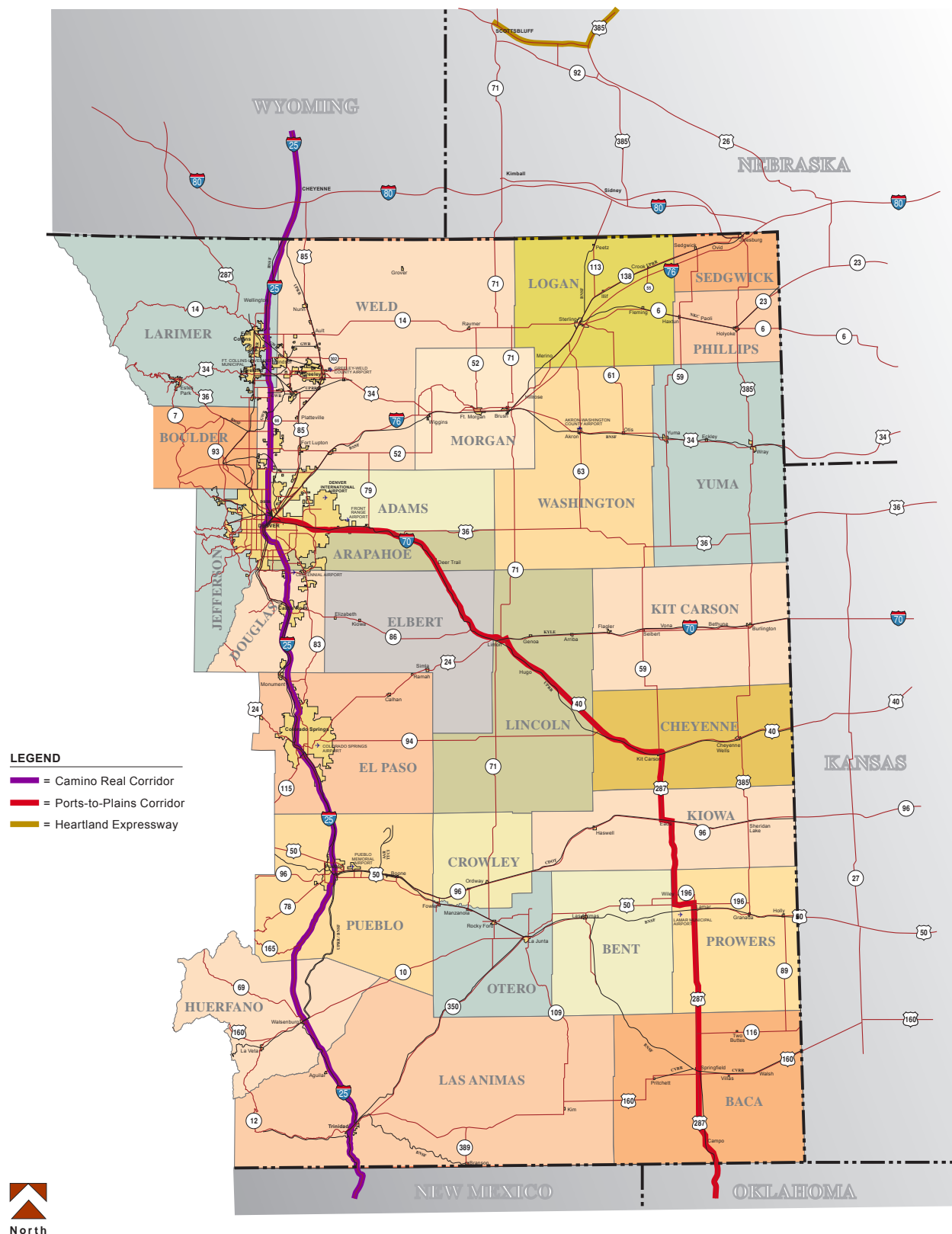
Even with these corridor planning efforts, to date freight mobility has not been a major focus within the statewide transportation planning process or the identification of strategic projects in the Colorado Department of Transportation’s (CDOT) funding process. But CDOT recognizes the importance of an efficient freight transportation system to the economy of the state.

Thus, this Eastern Colorado Mobility Study has been undertaken to assist the Transportation Commission of Colorado in making investment decisions regarding infrastructure improvements to enhance freight mobility in a large part of the state. As illustrated by Figure S-1, the study area includes all of eastern Colorado, extending to the I-25 corridor on the west and Colorado’s borders on the north, east and south.

The study purpose has been clearly defined:

“To evaluate the feasibility of improving existing and/or constructing future transportation corridors and intermodal facilities to enhance the mobility of freight services within and through eastern Colorado.”

Figure S-1

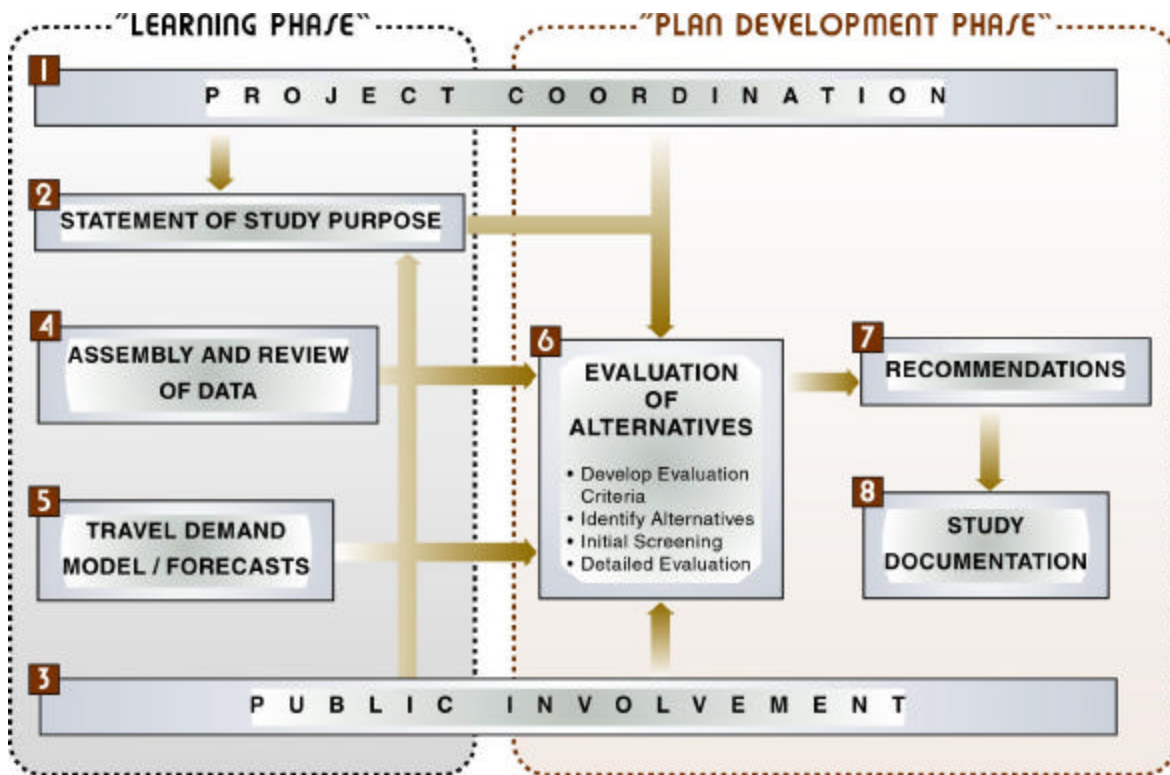


B. Study Process

The process for the conduct of this study is illustrated by Figure S-2. As shown, the planning effort was comprised of two phases: a “learning phase” and a “plan development phase”. Although these two phases appear to be distinct phases, the study involved considerable interaction between the phases. The learning phase involved such tasks as an inventory of the existing transportation systems (all modes), compilation of commodity flow data, and development of a travel demand model to project future demands on the transportation system.

The plan development phase was the portion of the study in which alternative improvements were identified and evaluated. The evaluation process was structured with a preliminary screening of alternatives and a subsequent detailed analysis of the remaining alternatives. On the basis of these analyses, recommendations for improvements, as well as related policies/strategies, were made for the highway, rail/intermodal, and aviation systems.

Figure S-2. Study Process



C. Public Outreach

As shown on Figure S-2, public involvement was a key element throughout both phases of the project. The primary public involvement goals of the Eastern Colorado Mobility Study were to create public awareness of the many aspects of the study and to gather meaningful public input regarding issues identification and potential solutions. To achieve these goals, the extensive public outreach program incorporated several mechanisms into the process.

Steering Committee

A Steering Committee with 28 members representing a wide range of interests was formed to be the primary advisory group for the study. The committee was comprised of the following representation:

- ◆ Transportation Commission
- ◆ CDOT Regional Directors
- ◆ Transportation Planning Regions
- ◆ Colorado State Patrol
- ◆ Colorado Division of Aeronautics
- ◆ Colorado Public Utilities Commission
- ◆ Colorado Office of Economic Development
- ◆ Colorado Department of Local Affairs
- ◆ Federal Highway Administration
- ◆ Colorado Counties, Inc.
- ◆ Railroads
- ◆ Colorado Motor Carriers Association
- ◆ Progressive 15
- ◆ Action 22

The role of the Steering Committee was to guide the direction of the study, to provide access to data and data sources, to review and comment on study materials, to facilitate two-way information dissemination, and to provide a forum to develop recommendations.

Thus, the Steering Committee was active throughout the study process; it met eight times at locations dispersed around the study area.

Freight Working Group

A Freight Working Group was formed to provide a forum for obtaining input from the freight industry. Representatives from the trucking, rail, and aviation modes of freight transportation, as well as shippers and other major users of the industry, met three times during the study to discuss a wide range of issues and to review and comment on the planning efforts.

Public Open Houses

The primary means of gathering input from the general public was the conduct of thirteen open houses at varying locations throughout the study area. The first round of open houses was conducted in May, 2001; the primary focus of these open houses was on the study purpose and process, the inventory of the existing transportation systems, and the identification of issues and concerns. In November, 2001 the second series of open houses focused on the identification of alternatives and preliminary analyses. The final set of open houses, held in February, 2002, centered on the preliminary findings and recommendations of the study. A total of over 400 persons participated in the open houses. In addition to their verbal comments, the public was also encouraged to submit written comments.

The public awareness program also included two newsletters which were mailed to over 1,000 residents and businesses in the study area. Furthermore, news releases were provided to newspapers and radio and television stations.

II. COMMODITY FLOWS IN EASTERN COLORADO

In order to identify potential improvement projects for freight movement in eastern Colorado, it is important to first understand the quantity and types of commodities being transported to, from and through the study area, both now and in the future.

A. Existing Commodity Flow

Based on the 1998 TRANSEARCH database, a national database of the origins and destinations of commodity flows via truck or rail compiled by Reebie Associates, Table S-1 summarizes the tonnage of commodities either originating or terminating (or both) within the study area.

Table S-1. 1998 Commodity Tonnage Originating or Terminating in Eastern Colorado

	<i>Front Range Counties (Tons)</i>	<i>Eastern Plains Counties (Tons)</i>	<i>Total Study Area (Tons)</i>
Inbound	105.0M	14.7M	119.7M
Outbound	75.5M	15.8M	91.3M
Total	180.5M	30.5M	211.0M
Source: TRANSEARCH Database, Reebie Associates			

As shown, the total tonnage in 1998 was approximately 211 million tons. About 85 percent (180.5 million tons) of these commodities were associated with the ten Front Range counties (those along the I-25 corridor). The remaining 30.5 million tons were related to the 17 Eastern Plains counties in the study area. In the Front Range counties more commodities flowed into the area (60%) than those which originated in the area. On the other hand, in

the Eastern Plains counties, the flows were nearly balanced, with slightly more originating in the area. These data are also depicted on Figure S-3.

The data also provide insight to the types of commodities being transported in and out of the Counties in the study area. In the entire area, approximately one-half of the total tonnage is comprised of products in the Bulk Materials commodity group, including minerals, petroleum, and concrete products. However, in the Eastern Plains counties, almost two-thirds of the commodities fall into the Farm Products group.

Data also suggest that nearly all of these commodities are transported by either truck or rail, or a combination of the two modes. Truck transportation accounts for approximately three-fourths of the commodity flow, and rail transportation represents the other one-fourth. Hence, these two modes are most important to eastern Colorado.

Figure 1-3

FRONT RANGE COUNTIES

Adams
Arapahoe
Denver
Douglas
El Paso

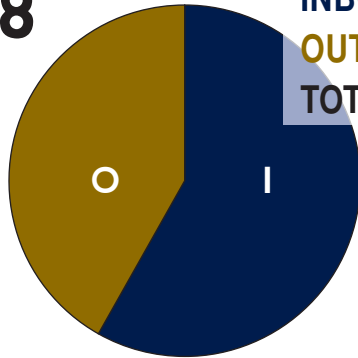
Huerfano
Jefferson
Larimer
Pueblo
Weld

EASTERN PLAINS COUNTIES

Baca
Bent
Cheyenne
Crowley
Elbert
Kiowa
Kit Carson
Las Animas
Lincoln

Logan
Morgan
Otero
Phillips
Prowers
Sedgwick
Washington
Yuma

1998



TONS

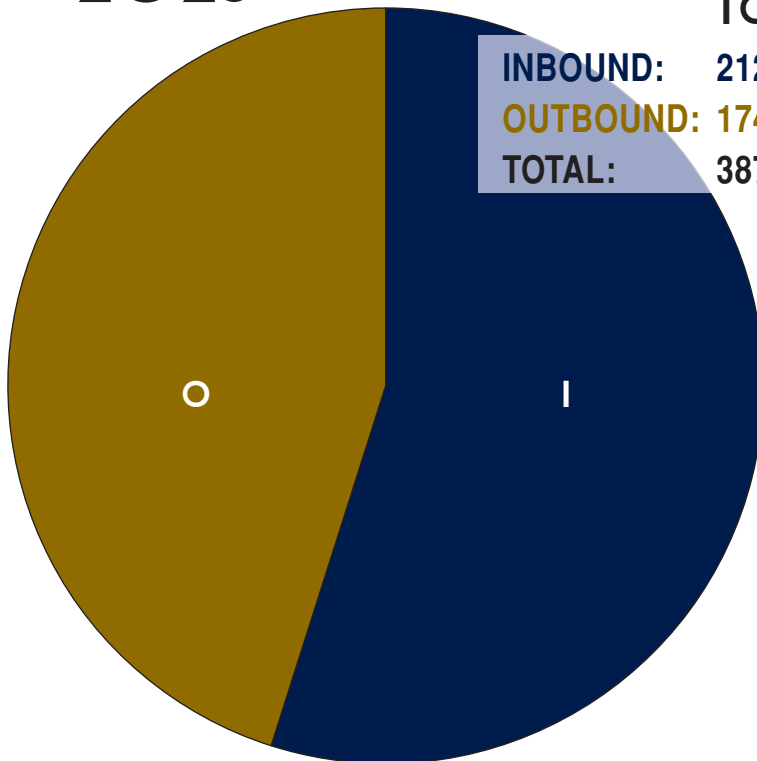
INBOUND: 105.0M
OUTBOUND: 75.5M
TOTAL: 180.5M



TONS

INBOUND: 14.7M
OUTBOUND: 15.8M
TOTAL: 30.5M

2025



TONS

INBOUND: 212.7M (+103%)
OUTBOUND: 174.7M (+131%)
TOTAL: 387.4M (+115%)



TONS

INBOUND: 31.2M (+113%)
OUTBOUND: 26.3M (+67%)
TOTAL: 57.5M (+89%)

B. Projected Growth in Commodity Flows

Originating/Terminating in Eastern Colorado

By the year 2025 the commodities originating or terminating within the study area are projected to increase to nearly 445 million tons, reflecting more than a doubling of existing commodity totals. Figure S-3 illustrates how these projected commodity flows are expected to be distributed among the Front Range counties and the Eastern Plains counties. This figure also provides a comparison of the projected and the existing commodity flows. As shown, the commodities associated with the ten Front Range counties are projected to grow by 115 percent, while the commodities of the Eastern Plains counties are estimated to grow by nearly 90 percent.

Through Truck Flow

One of the issues to be considered in projecting future commodity flow needs is growth in commodities flowing through the state, with neither an origin or a destination within Colorado. With the implementation of NAFTA in 1994, the potential for Colorado being significantly impacted by increased international trade flows was explored in this study. Figure S-4 illustrates two maps prepared by the Federal Highway Administration to depict the projected NAFTA truck traffic volumes on the nation's highway network in the year 2020. These maps suggest that, while some increase in truck traffic in Colorado may be experienced, for the most part the largest volumes of NAFTA-related traffic will not bisect Colorado. I-80 north of Colorado is a key route, and I-76 to I-70 through Colorado also will experience some growth due to NAFTA.

However, other growth in domestic commodity flows will affect Colorado. It has been projected in the travel demand model for the Eastern Colorado Mobility Study that through truck movements will more than double by the year 2025.

Truck Flow Patterns

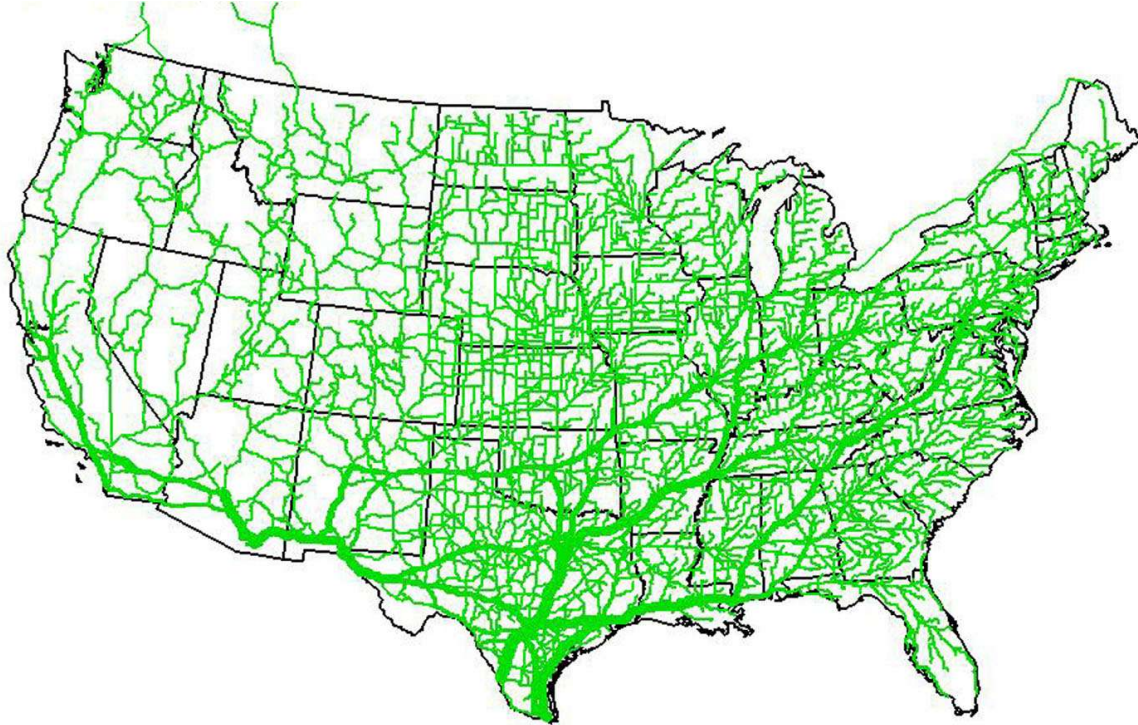
The travel demand model has shown that, when evaluating potential highway corridor alternatives in eastern Colorado, there are varied traffic flow patterns which must be considered. Figure S-5 illustrates the variety of patterns to be served in the study area.

Clearly, one movement is between Denver and the Nebraska Panhandle, the Dakotas, and points farther north; this is the flow pattern which would be served by the Heartland Expressway.

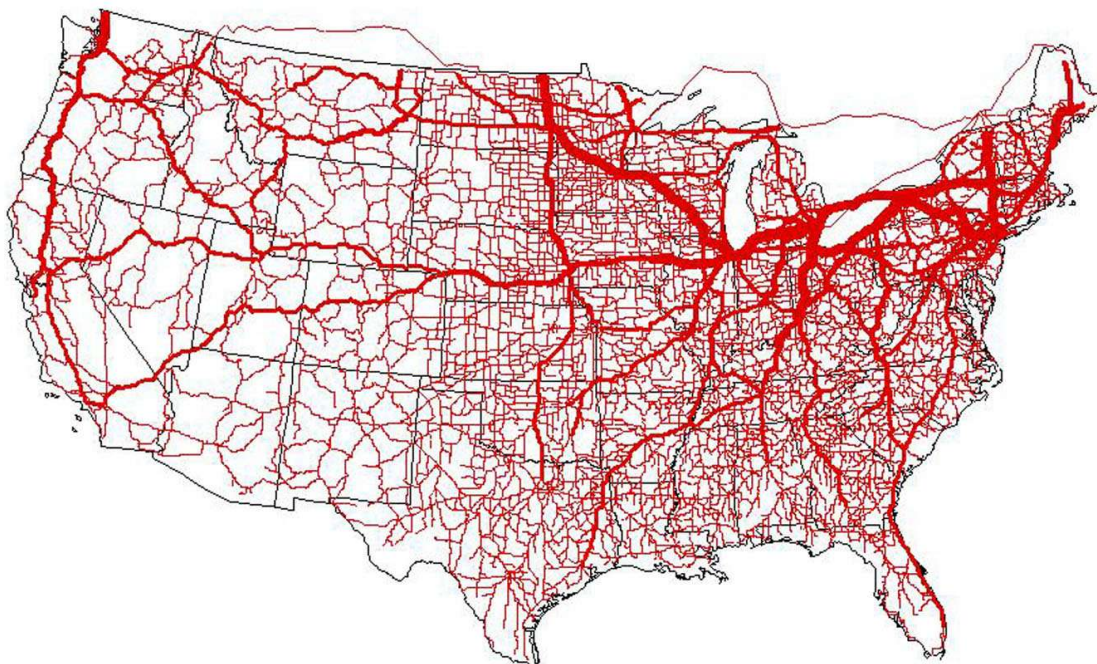
The other patterns shown reflect movements to and from the south (via either I-25 or US 287). The movement between Denver and these points would be well served by the Ports to Plains Corridor. The north-south movements, if not destined for Denver, go to multiple points. Some diverts to I-70 to head to the Midwest, but the larger volumes are destined to I-76 (and then to I-80) to head to the Upper Midwest or to I-80 to travel to the West Coast and the Northwest. These two demand patterns appear to be nearly equal in size. Finally, some, although considerably less than the other two movements, continue to points farther north.

Figure J-4

US/Mexico



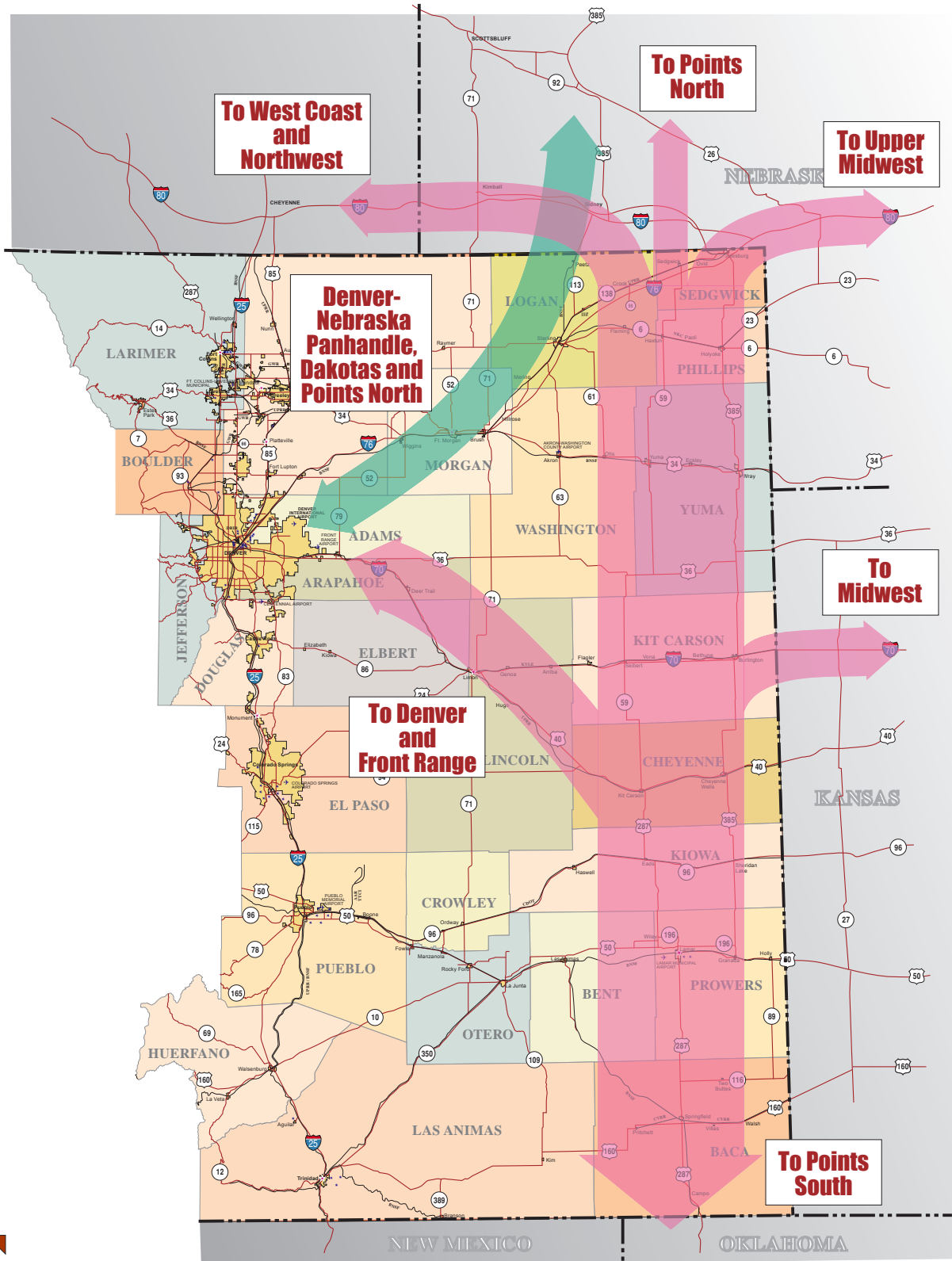
US/Canada



SOURCE: Federal Highway Administration

PRIMARY TRUCK FLOWS THROUGH EASTERN COLORADO

Figure 1-5



III. HIGHWAY SYSTEM ANALYSIS

A. Identification of Alternative Corridors

The analysis of the commodity flow patterns and the results of previous corridor planning efforts in Colorado suggest that there are two primary corridor planning issues to be addressed by the Eastern Colorado Mobility Study:

- ◆ Designating a corridor for the continuation of the Heartland Expressway from its current terminus in Scottsbluff to Denver (also referred to in this study as Heartland South).
- ◆ Identifying a corridor to serve as a connector route between the Heartland Expressway and the Ports to Plains Corridor.

Recognizing a resolution adopted by the Transportation Commission of Colorado which would discourage additional truck traffic on congested segments of I-25, two alternative routes were identified for the extension of the Heartland Expressway south of the already designated segment in Nebraska. One alternative would be routed along SH 71 south from Scottsbluff to I-76 at Brush, Colorado and then via I-76 into Denver. The second alternative would include a routing along US 385 south to Sidney, Nebraska, then along SH 113 to I-76 at Sterling, Colorado, and onto Denver via I-76.

Based on input from the public open houses, four alternative routes connecting the Heartland Expressway and the Ports to Plains Corridor were identified: SH 71, SH59/63, SH 59, and US 385. Each of these routes could connect with either of the Heartland Expressway alternatives.

Because eastern Colorado would best be served if these two corridors worked together as a system, the two Heartland South alternatives were combined with the four corridor connector alternatives, resulting in eight scenarios to be assessed in the evaluation process. These eight scenarios are graphically depicted on Figures S-6 and S-7.

B. Evaluation of Alternatives

Evaluation Criteria/Measures

Once the alternative corridors were identified, a detailed analysis of the alternatives was completed utilizing six basic criteria and a number of measures within each criterion. The corridor evaluation criteria and measures are presented in Table S-2.

Figure S-6

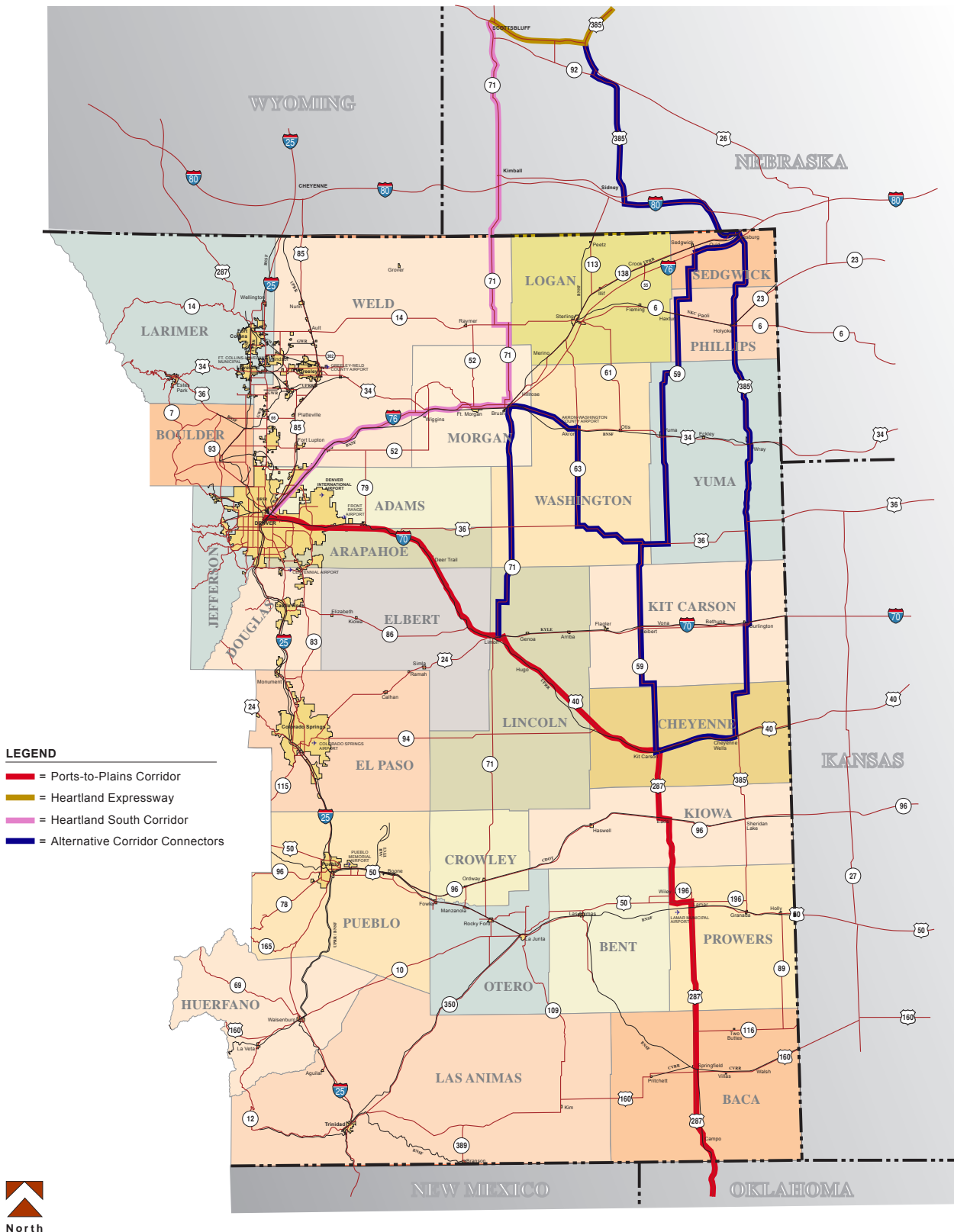


Figure S-7

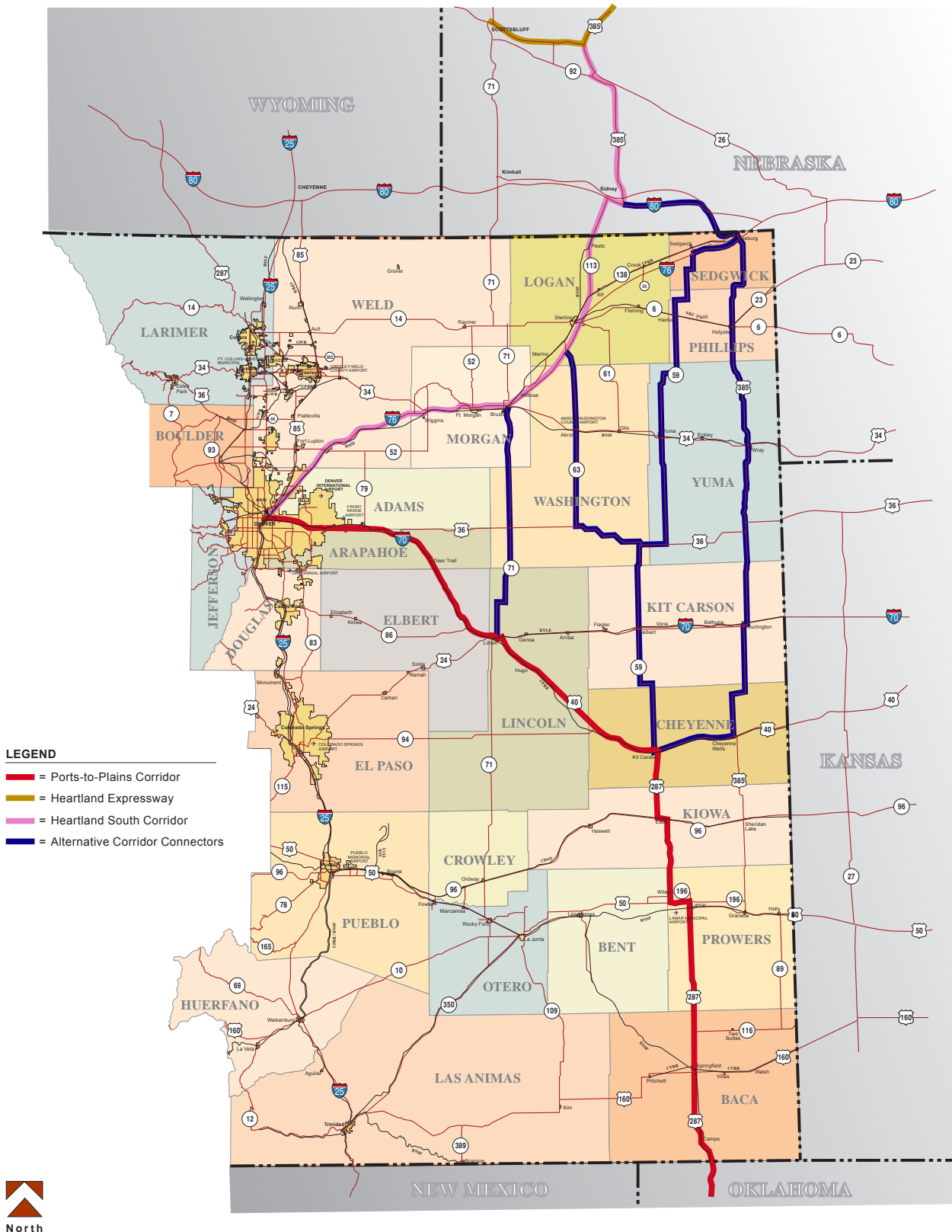


Table S-2. Corridor Evaluation Criteria and Measures

<i>Evaluation Criterion</i>	<i>Description</i>	<i>Evaluation Measure</i>
Need Based on Traffic	Evaluation determines if alternative improvements need to be built to handle current and future traffic volumes.	<ul style="list-style-type: none"> ♦ Truck Utilization (avg. daily truck volume along corridor) ♦ Traffic Utilization (avg. daily traffic volume along corridor) ♦ Daily Trucks Diverted from I-25 (2025)
Travel Efficiency	Evaluation determines how well each alternative would improve travel, resulting in user benefits.	<ul style="list-style-type: none"> ♦ Trip Length between termini (measured for several key truck patterns) ♦ Trip Travel Time between termini ♦ Change in Daily Vehicle Miles Traveled (VMT) in Study Area (2025) ♦ Change in Daily Vehicle Hours Traveled (VHT) in Study Area (2025) ♦ Change in Annual Number of Accidents in Study Area (2025) ♦ Annual User Cost Savings
Engineering/Cost Feasibility	Evaluation identifies any unusual engineering difficulties and the costs associated with each alternative.	<ul style="list-style-type: none"> ♦ Length of Reconstruction Required in Colorado ♦ Length of Reconstruction in Developed Areas ♦ Right-of-Way Acquisition in Colorado ♦ Project Cost (including construction, engineering, right-of-way)
Environmental/Land Use Impacts	Evaluation identifies the potential level of impacts on the environment caused by the implementation of the alternative.	<ul style="list-style-type: none"> ♦ Air Quality ♦ Noise ♦ Major Streams ♦ Endangered Species ♦ Public Lands ♦ Hazardous Materials ♦ Cultural Resources
Socio-Economic / Economic Impacts	Evaluation determines the potential for positive economic and development impacts on the communities along the corridor and within the study area.	<ul style="list-style-type: none"> ♦ Number of Communities along Corridor ♦ 2000 Population ♦ 2025 Population ♦ 1990 Poverty Status ♦ 1990 Minority Population ♦ Median Household Income ♦ Employment Growth – User Benefits ♦ New Disposable Income – User Benefits ♦ Employment Growth – Construction ♦ New Disposable Income - Construction
Financial Feasibility	Evaluation measures the relative comparison of the project-related benefits with the costs of the alternative.	<ul style="list-style-type: none"> ♦ Cost Effectiveness Ratio

Summary of Findings

The detailed evaluation of the two Heartland alternatives with each of the four corridor connector options resulted in the following findings related to each of the criteria:

- ◆ **Need Based on Traffic**
The SH 71 Heartland alternative is projected to serve about twice as many trucks (about 450 per day in the year 2025) as the SH 113 Heartland alternative (approximately 240 per day). The SH 71 and US 385 connectors are projected to serve more trucks and autos than the other alternatives. The truck volumes projected on either SH 71 (Brush to Limon) or US 385 are as high as 600 trucks per day.
- ◆ **Travel Efficiency**
The SH 71 connector would result in the greatest annual user cost savings with either Heartland alternative, at approximately \$79 million. The next closest alternative would be the US 385 connector, at about \$76 million.
- ◆ **Engineering / Cost Feasibility**
The SH 71 connector would be the least costly alternative with either Heartland alternative, ranging from approximately \$280 to \$340 million. The eastern alternatives would be the most costly, ranging from approximately \$560 to \$650 million. These cost estimates assume a concrete “Super 2” cross-section.
- ◆ **Environmental / Land Use Impacts**
The western connector alternatives would have fewer impacts, generally because they are shorter and they traverse fewer communities.

◆ **Socio-Economic / Economic Impacts**

The US 385 connector alternative would likely create the greatest economic benefits because it would directly serve more communities and the largest population. However, it's greatest economic benefits (an increase in employment and disposable income) would occur during the construction period and would be directly attributable to the fact that it would involve the greatest construction investment.

◆ **Financial Feasibility**

The SH 71 connector would create higher user benefits and would cost less than other alternatives, thereby resulting in the highest cost effective ratio.

C. **Primary Corridor Recommendations**

Based on the many benefits exhibited by the findings of the analysis, it is recommended that SH 71 from the Colorado/Nebraska stateline to Brush and I-76 from Brush to Denver be designated the Heartland Expressway as a federal “High Priority Corridor”. To round out the “High Priority Corridor” system in the area, it is also recommended that the same designation be sought for SH 71 from Brush to Limon as part of the Heartland Expressway. In addition to the factors cited in the summary of findings, it should also be noted that designation of the SH 71 alternative would be consistent with a recent Nebraska Highway Commission resolution focusing on the SH 71 corridor.

Understanding the varied truck flow patterns depicted earlier on Figure S-5 and recognizing that no one alternative would serve all of these flows well, the corridor of US 40 and US 385 from Kit Carson to Julesburg should be recognized as a corridor important to eastern Colorado and also requiring improvement. As such, it is recommended that this corridor be designated as the primary Colorado corridor connecting the Ports to Plains Corridor with the Heartland Expressway. Such a designation would be consistent with the fact that US 385 has always been identified as a priority project by the Eastern TPR and that it had been identified as a State Significant Corridor in earlier statewide transportation planning processes.

These primary corridor recommendations are illustrated on Figure S-8.

The ultimate goal for improvement of these corridors should be a “Super 2” cross-section, which would include two 12-foot travel lanes with minimum 8-foot shoulders (10-foot desirable). Truck climbing lanes and additional passing lanes should be constructed where needed, and access management strategies should be implemented to the highest feasible level. All design standards, including the pavement design, should be sufficient to handle over-size/over-weight loads. The truck volumes projected in this study may not warrant concrete pavement; however, the decision to utilize concrete or asphalt pavement will be made during the design process. Although the year 2025 traffic volume projections on these roadways clearly indicate that two lanes would be sufficient within that time frame, the improvements should be designed to allow expansion in the future if needed and acquisition of sufficient right-of-way to accommodate expansion should be considered.

Because no funds are currently programmed for either of these corridors, the improvements will need to be phased as funding becomes available, with a focus on pavement condition, lane width, shoulders and safety improvements. For example, about 85 percent of each of these corridors has inadequate shoulders, and approximately 40 percent of each corridor currently has a surface condition rated “poor”. Thus, the first step toward implementation should be a more detailed assessment of each corridor to identify and prioritize the inadequacies of the existing roadway.

D. Support Corridor Recommendations

In addition to the primary corridors, there are other corridors in eastern Colorado which are also important for freight mobility in the area and which should be considered for improvement. A number of support corridors which are key because they provide access to and connections between the primary freight corridors have been identified, as illustrated on Figure S-9. Many of these have already been included in the statewide transportation plan, in either the fiscally constrained or the unfunded portion of the plan. Those projects should continue to be pursued. However, as shown on the figure, there are also some obvious gaps which should be included in future versions of the plan.

Figure 1-8

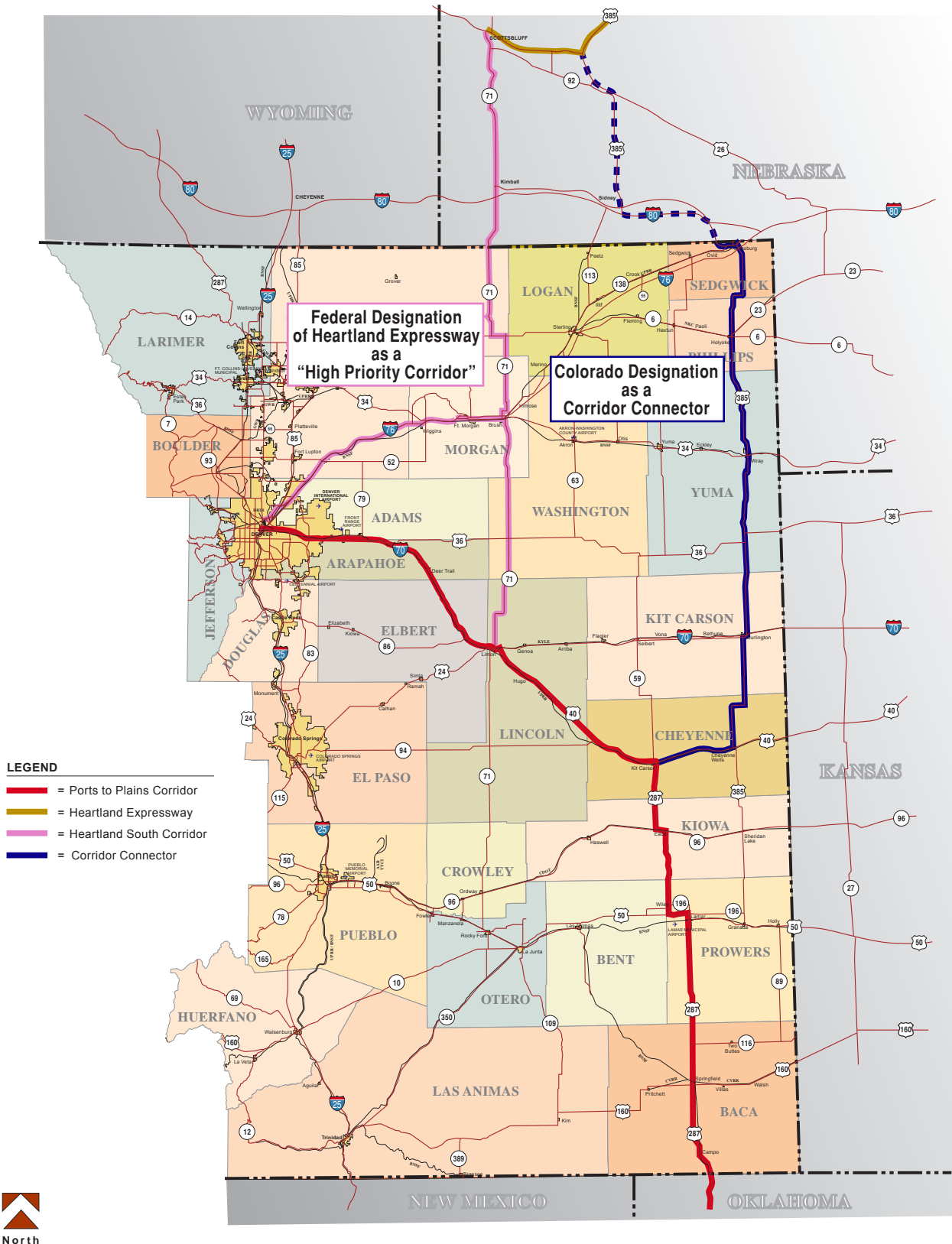
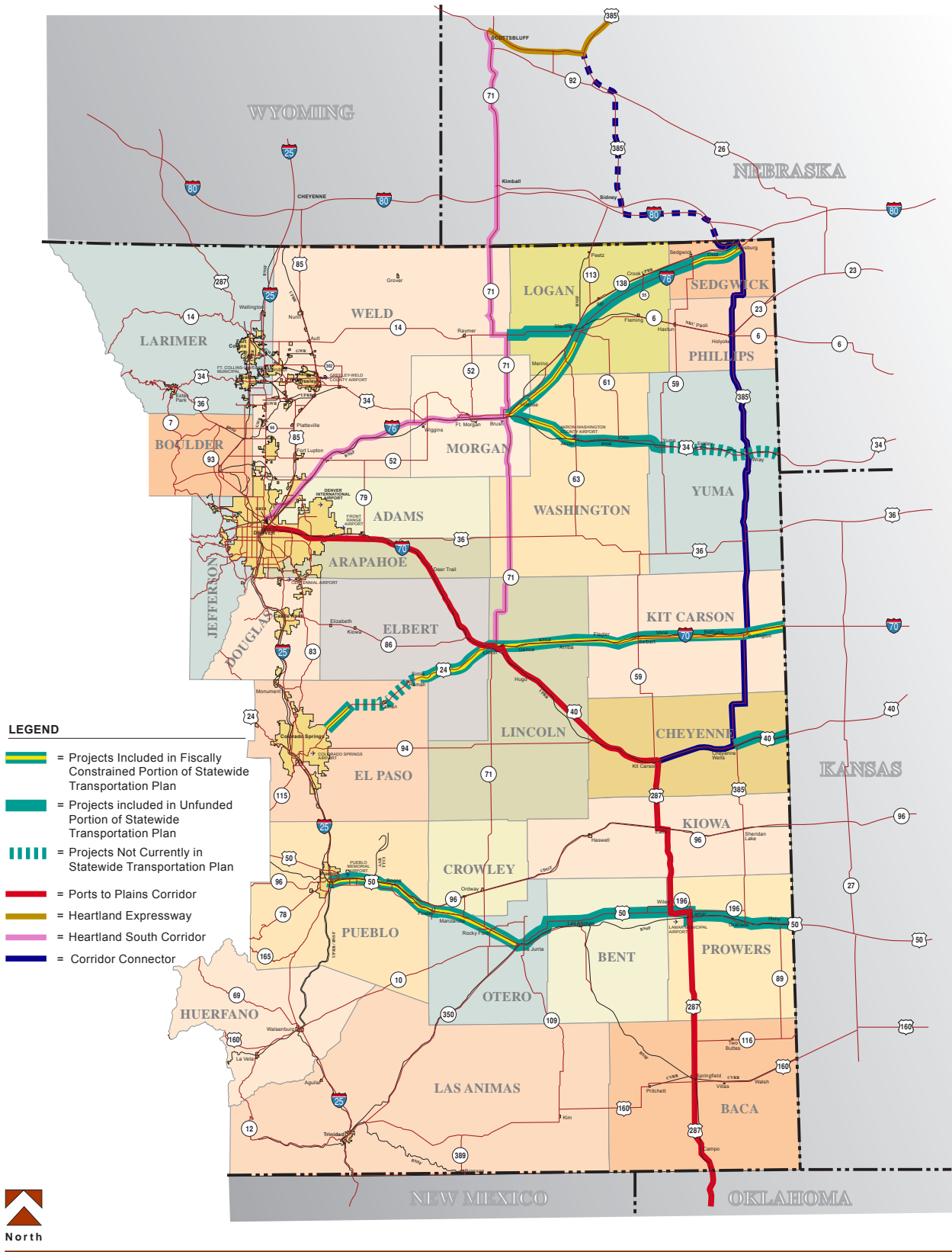


Figure 1-9



The deficiencies in these corridors vary widely. For example, SH 14 between Sterling and SH 71 exhibits inadequate shoulder widths for 85 percent of its length and substandard lane widths for about one-fourth of its length. I-76 from Brush to the stateline and US 24 from Limon to Colorado Springs both have poor pavement conditions for about two-thirds of their length. These deficiencies should be prioritized and addressed as funding becomes available.

E. Other Site Specific Improvement Projects

Beyond the overall corridor improvements suggested for the primary and support corridors, other site specific improvement projects will certainly be beneficial for freight mobility from a capacity and a safety standpoint. A review of the statewide transportation plan identified four such projects on primary or support corridors. These projects include two intersection improvements, an interchange reconstruction, and a new rest area (in the vicinity of SH 14/SH 71 near Stoneham); all of these projects were included in the unfunded portion of the plan. It is recommended that other such projects continue to be identified and championed by local entities through the regional transportation planning process.

IV. RAIL/INTERMODAL SYSTEM ANALYSIS

A. Identification of System Needs

Railroads

There are twelve railroads serving the Eastern Colorado Mobility Study area. There are two Class I railroads in Colorado: Burlington Northern & Santa Fe Railway Company (BNSF) and Union Pacific Railroad (UP). There are also two regional railroads and eight shortline/industrial railroads, operating in the study area.

The approach for analyzing and improving rail freight transportation included an understanding of several elements: 1) how Colorado fits into the overall national rail freight movement pattern; 2) rail freight movement to and from, as well as within, Colorado; 3) the quality and capacity of rail within Colorado; and 4) an understanding of current events within the railroad industry. From this analysis, an inventory of needs to enhance freight rail mobility was developed, which resulted in the study recommendations.

On a national level, the BNSF operates over major north-south routes through Colorado to serve freight needs in the Wyoming Powder River Basin, Northwest, Midwest, Southwest, and South. The UP operates over major north-south and east-west routes in Colorado serving the Wyoming Powder River Basin, Northeast, South, Midwest, Southwest, and Northwest. The regional and shortline railroads operating in eastern Colorado are essentially east-west feeder lines to the BNSF and the UP.

Major freight movement by rail in Colorado includes commodities such as coal, food products, farm products, lumber and wood products, and general merchandise. Coal represents the largest volume of both originated and terminated traffic.

The quality of rail in Colorado is sufficient on the Class I railroads to serve a wide variety of freight rail needs. Class I railroad issues are predominantly capacity and safety. Quality of rail is an issue for shortline and regional railroads, as it limits the speed, type of rail cars, and tonnage allowed over those lines.

Current events within the railroad industry include such topics as the use of new high-horsepower locomotives to handle longer coal trains, increased movements of high-priority intermodal and automotive traffic, locomotive fuel costs, grade crossing safety, hazardous materials shipments, and residential growth and congestion along many rail lines.

Intermodal Facilities

Improvement needs for intermodal facilities in Colorado are related to capacity. The predominant restriction for the facilities is location, as all of the facilities have maximized their current land and are bound by adjacent development.

B. Recommendations

Table S-3 lists the recommended rail and intermodal projects, and they are also illustrated on Figure S-10. These improvements fall into four basic categories:

- ◆ **Highway/Railroad At-Grade Crossing Improvements**
These projects are on Class I rail lines and are aimed at improving safety by grade separating or closing select crossings.
- ◆ **Class I Railroad Projects**
These projects focus on increasing capacity through the construction of new lines, second main tracks, or siding tracks.
- ◆ **Shortline Railroad Projects**
These projects focus on upgrading the existing track structure to accommodate heavier carloadings and upgrading outdated or deficient rail lines with new rail and/or new roadbed materials.
- ◆ **Intermodal Facility Projects**
These projects involve the relocation of existing facilities to new sites to provide additional land area for expansion.

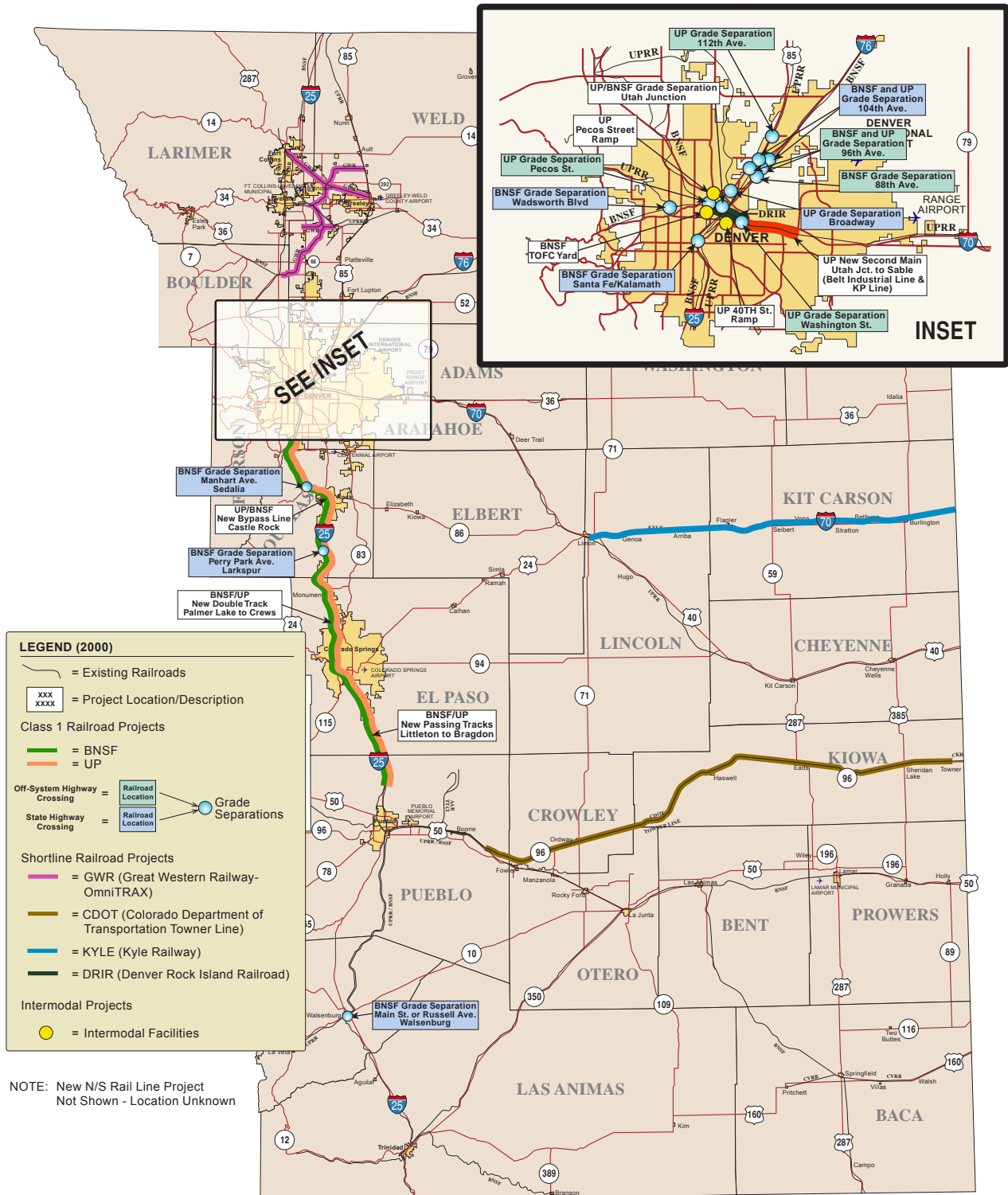
Table S-3. Recommended Rail/Intermodal Projects

Project	Description	Est. Project Cost (2001 dollars)
Highway/Railroad At-Grade Crossing Improvements - State Highway Crossings		
1. Safety / Crossings	Safety / Crossing improvements; Statewide Transportation Plan - Constrained Plan	\$6.73 million
	Safety / Crossing improvements; Statewide Transportation Plan - Unconstrained Plan	\$26.74 million
2. UP at 104th Avenue (SH 44)	Grade separation near US - 85	\$8 million
3. BNSF at 104th Avenue (SH 44)	Grade separation near SH-2 and Peoria St.	\$8 million
4. BNSF at Larkspur (SH 60)	Grade separation	\$6 million
5. BNSF at Sedalia (SH 67)	Grade separation	\$6 million
6. BNSF at Santa Fe/Kalamath (SH 85)	Grade separation	\$18 million
7. BNSF at Walsenburg (SH 85 / 87)	Grade separation	\$6 million
8. BNSF at Wadsworth Blvd (SH 121)	Grade separation	\$8 million
9. UP at Broadway (SH 53)	Grade separation on Belt Line	\$7 million
10. State Program to Eliminate Crossings	Eliminate a number of railroad/ highway crossings per year (Cost subject to number of crossings)	\$12 million
Subtotal		\$112.47 million
Highway/Railroad At-Grade Crossing Improvements - Off-System Crossings		
1. BNSF at 88th Avenue	Grade separation	\$6 million
2. UP at 96th Avenue	Grade separation near US-85	\$7 million
3. BNSF at 96th Avenue	Grade separation near SH-2 and Havana St.	\$6 million
4. UP at 112th Avenue	Grade separation near US-85 and Hazeltine siding (possible candidate for closure)	\$7 million
5. UP at Washington Street	Grade separation on Belt Line	\$7 million
6. UP at Pecos Street	Grade separation (Include with Utah Jct separation)	\$6 million
Subtotal		\$39 million
Class I Railroad Projects		
1. New N/S Rail Line	Relocate Front Range through freight rail operations; estimated length = 165 miles	\$650 million
2. BNSF/UP Joint Line - Double Track	Construct 32.4 miles of new double-track between Palmer Lake and Crews (Not necessary if new N/S line or new sidings are constructed)	\$130 million
3. BNSF/UP Joint Line	Construct new passing tracks between Littleton and Bragdon; 7 sidings, 2 miles each (Not necessary if new N/S line or double track is constructed)	\$56 million
4. UP/BNSF Joint Line - Castle Rock	Construct new 18-mile rail line for freight trains to bypass downtown Castle Rock (Not necessary if new N/S line is constructed)	\$63 million
5. UP/BNSF Utah Jct	Grade separate railroad lines (UP over BNSF). Include with Pecos St separation and Belt Line improvements	\$21 million
6. UP Belt Industrial Line	Construct new second main track between Utah Jct and Pullman Jct (5.8 mi.: Belt = 4; Greeley Line = 1.8), including other related and necessary improvements	\$24 million
7. UP KP Line	Construct new second main track between Pullman Jct and Sable (7.7 miles). Include with Belt Line	\$23 million
Subtotal	(As noted, not all projects would be necessary. Includes only items # 1, 5, 6 and 7).	\$718 million

Table S-3. Recommended Rail/Intermodal Projects (Continued)

<i>Project</i>	<i>Description</i>	<i>Est. Project Cost (2001 Dollars)</i>
Shortline Railroad Projects		
1. NA Junction - Towner Line (CKP)	<i>Improve track and bridges for heavier carloadings (Statewide Transportation Plan - Unconstrained Plan)</i>	\$1.27 million
2. Great Western Railway (OmniTRAX)	<i>Improve track and bridges for heavier carloadings (72 route miles)</i>	\$7.2 million
3. KYLE Railroad	<i>Improve track and bridges for heavier carloadings (90 route miles)</i>	\$9 million
4. Denver Rock Island Railroad	<i>Improve track and bridges for heavier carloadings (3.5 route miles)</i>	\$0.40 million
Subtotal		\$17.87 million
Intermodal Facility Projects		
1. UP 40th Street Ramp	<i>Relocate facility to new, larger site (may include Rolla auto facility)</i>	\$70 million
2. UP Pecos Street Ramp	<i>Relocate with 40th Street Ramp</i>	\$0
3. BNSF TOFC Yard	<i>Relocate facility to new, larger site</i>	\$70 million
Subtotal		\$140 million
<i>Note: The UP and the BNSF could discuss the potential for a jointly owned intermodal facility.</i>		
TOTALS	(All Projects)	\$1,027.34 M

Figure J-10



V. AVIATION SYSTEM ANALYSIS

A. Preliminary Screening

A total of 39 public access airports serve the eastern Colorado study area. Of these 39 airports, four currently provide regularly scheduled commercial service, 31 are General Aviation (GA) Airports, and 4 are classified as Reliever Airports. Reliever Airports provide GA services to aircraft that might otherwise land at congested Commercial Airports.

Several factors are considered to be determinants of the viability of significant air cargo facilities. They include:

- ◆ Strong local production and consumption within a 180 mile radius.
- ◆ Additional markets within 400 miles.
- ◆ Interlining capabilities with connecting passenger carriers, charters and motor carriers.
- ◆ Strong local market for air service.
- ◆ Strong presence of a freight forwarder in the local market.
- ◆ Warehouse distribution services
- ◆ Appropriate airside and landside infrastructure.

A Preliminary Alternatives Analysis resulted in the identification of ten airports to extend to the next level of analysis. Those airports are:

- ◆ Centennial Airport
- ◆ Colorado Plains Regional Airport
- ◆ Colorado Springs Airport
- ◆ Denver International Airport
- ◆ Front Range Airport
- ◆ Greeley – Weld County Airport

- ◆ Kit Carson County Airport
- ◆ Lamar Municipal Airport
- ◆ Perry Stokes Trinidad Airport
- ◆ Pueblo Memorial Airport

The exclusion of other airports does not imply that smaller airports are not capable of handling, or do not currently accommodate, cargo-carrying aircraft. However, smaller airports in smaller markets are limited in both the size of aircraft served and supporting commercial activity.

B. Recommendations

The ten airports identified through the preliminary screening are recommended for further development through implementation of their capital improvements programs and other long range transportation plans in the region.

The detailed alternatives analysis resulted in the identification of three airports in the study area that either operate as significant regional centers for air cargo or have the potential market to develop as significant regional centers. These airports are recommended for improvements to support the development of air cargo in the region. The three airports are as follows:

- ◆ Denver International Airport
- ◆ Front Range Airport
- ◆ Colorado Springs Municipal Airport

VI. RECOMMENDED POLICIES / STRATEGIES

In addition to the improvements-oriented recommendations previously outlined, the following policies/strategies are also recommended to enhance freight mobility in the highway, rail, intermodal, and aviation transportation modes in eastern Colorado.

A. General Freight Policies/Strategies

1. Increase CDOT involvement in, and coordination of, freight related transportation improvement programs by establishing a statewide freight advisory council to provide input on issues related to all modes involved in the movement of goods.

B. Highway Freight Policies/Strategies

1. Initiate a program with CDOT involvement to improve truck parking opportunities along primary freight routes.
2. Involve the freight industry in the review of the CDOT Design Guide in order to address the concerns of the industry in the planning and design processes.
3. Develop a program to review each CDOT improvement project on freight corridors to ensure that freight-enhancing components are included when feasible.
4. Encourage steady state traffic flow through such strategies as minimum speeds in left lanes; climbing lanes,

passing lanes, and acceleration/ deceleration lanes at specific problem locations; and ramp metering.

5. Identify and fund safety improvements (such as horizontal, vertical, and intersection sight distance improvements; shoulder widening; and emergency parking areas) along key freight corridors.
6. Evaluate effectiveness of existing freight truck weight laws and address disparity of allowable weight limits on roadways of varying classification.
7. Expand program to improve enforcement of, and to encourage compliance with, existing truck weight and safety laws.
8. Encourage stricter access management standards along primary freight corridors.

C. Rail Freight Policies/Strategies

1. Enhance the institutional environment in Colorado to encourage railroad investment in the state by continuing improved communications with the railroads through railroad participation on the statewide freight advisory council. Although the primary focus of the advisory council should be on the improvement of freight mobility, the council should provide a structure which also allows a forum for the railroads and other affected parties to discuss a wider range of rail-related issues.

2. Reinstate the State sponsorship of federal grants or low-interest loans for rail enhancement (e.g., CDOT could sponsor, but not be signatory to, Railroad Rehabilitation and Improvement Financing (RRIF) applications by private parties). Examples would be the assistance previously provided to rehabilitate the line now operated by Kyle from Limon to the Kansas State line and the San Luis Central line northeast of Monte Vista in the San Luis Valley.
3. Encourage public investment in railroad improvement projects through the use of programs such as RRIF or TIFIA (Transportation Infrastructure Finance and Innovation Act). Projects should be limited to those which provide public benefits in the areas of improved mobility, economic development, and improved public safety.
4. Encourage an increased level of state and federal funding for the purpose of improving highway/railroad grade crossings, and preferably constructing grade separations or otherwise eliminating crossings.
5. Consider utilizing the rail account of the State Infrastructure Bank, along with the State Rail Bank, for funding potential projects related to the State Rail Corridor Preservation Policy.

D. Intermodal Freight Policies/Strategies

1. Provide State sponsored or administered low interest loans to support facilities which would encourage

the use of intermodal transportation (e.g. truck/rail, truck/air, and truck/rail/air) by either establishing an intermodal account in the State Infrastructure Bank or making intermodal projects eligible for highway and rail SIB accounts.

2. Encourage participation by the State in public/private funding of intermodal facilities and intermodal connectors through the use of programs in which intermodal projects are eligible, such as NHS, STP, and CMAQ.

E. Aviation/Air Cargo Policies/Strategies

1. Support airport development at all ten airports identified in the preliminary alternatives analysis through the implementation of individual airport capital improvement programs and long range transportation plans as funds are available.
2. Expand the aviation account in the State Infrastructure Bank to assist in providing low interest loans specifically for air cargo improvements at Denver International, Front Range, and Colorado Springs Municipal Airports.
3. Recognizing that Front Range Airport may become a larger component of the air cargo industry at some time in the future, particularly with the possible creation of a major intermodal center at the airport, encourage the participation of air cargo carriers in planning efforts with DIA and Front Range Airport regarding long term needs to support air cargo operations.

VII OPTIONS FOR FUNDING

A. General Approach

To support the recommendations of this study, funding should be sought from a broad array of Federal, State, local, and private sources. While it is important to recognize that freight mobility can often be improved as an adjunct to the State's regular highway improvement program, budgetary constraints at both State and Federal levels will be a major factor in the short-term. To be successful in obtaining incremental funding for enhanced freight mobility, it will be necessary for community representatives to have early and ongoing involvement in the transportation planning processes coordinated by CDOT.

B. Priority Funding Options

The study team identified the following funding options for priority attention that could most readily support freight mobility improvements.

Colorado Highway Program

- ◆ Seek priority in CDOT's "Regional Priorities" funding categories through consultation with the Transportation Planning Regions (TPRs).
- ◆ Continue to advance the Ports to Plains (US 287) strategic corridor, already part of CDOT's 7th Pot.
- ◆ Include the designated Heartland Expressway in the next round of strategic projects (the proposed 8th Pot).

- ◆ Include the recommended corridor connector (US385 & US40) in the next round of strategic projects (8th Pot).
- ◆ Expand utilization of the existing State Infrastructure Bank (SIB) highway account for freight mobility purposes; possibly create a separate account.
- ◆ Develop Public-Private Initiatives applications for freight improvements.

Federal Highway Program

- ◆ Apply funds from TEA-21 programs, including National Highway System (NHS), Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), and Transportation Enhancements for freight and intermodal infrastructure improvements.
- ◆ Continue use of STP set-asides for elimination of railroad-highway crossing hazards.
- ◆ Seek Federal discretionary funds such as Corridors and Borders (CORBOR) for designated corridors.
- ◆ Develop action plan to position Eastern Colorado priorities into "Next TEA" reauthorization.

Rail Improvement Assistance

- ◆ Develop an operational State Rail Bank to support freight rail, initially based on an on-going revolving fund supported by existing lease payments.
- ◆ Use flexibility of Federal highway programs to support intermodal and rail-related improvements.
- ◆ Develop action plan to access Federal support provided by the Railroad Rehabilitation & Improvement Financing (RRIF) program.
- ◆ Support creation of a Colorado Aviation State Infrastructure Bank (SIB). CDOT is authorized to fund an aviation SIB up to \$4 million that could be used for low interest loans to airports.
- ◆ Seek participation by regional airports in FAA's Small Community Airport Service Development Pilot Program.
- ◆ Assure eligibility of aviation opportunities through CDOT's Public-Private Initiatives program.

Aviation Funding Sources

- ◆ Utilize State funds administered through the Colorado Aeronautical Board (CAB), which channels aviation fuel taxes back into the airports of origin in the form of regular entitlement funds.
 - ◆ Apply for funding available through the Colorado Discretionary Aviation Grant Program (CDAG), which can be used for pavement maintenance, pavement rehabilitation, weather/navigation, safety needs and to match federal funds.
 - ◆ Compete for federal funding available for airports included in the National Plan for Integrated Airport System (NPAIS) administered by the Federal Aviation Administration in the form of grants. Each of the ten airports included in the study recommendations is eligible for this program.
- ### Complementary State and Federal Programs
- ◆ Colorado's Office of Economic Development provides grants and revolving loans for roadways, railroad spurs, and other infrastructure projects.
 - ◆ Colorado's Energy & Mineral Impact Assistance Fund assists communities with construction and maintenance of public roads where energy and mineral development-related impacts exist.
 - ◆ USDA Rural Business Cooperative Service has limited funding to support infrastructure development.

I. Introduction



I. INTRODUCTION

A. BACKGROUND

Colorado, historically rich in natural resources and with an economy based in large part on agriculture, has a need to transport large quantities of commodities. The rapidly growing urban areas in the state also need many products and goods to support the growth. Thus, there are considerable volumes of goods and commodities being transported within the state. Furthermore, Colorado is strategically located as a “bridge” state in the national and international infrastructure system for movement of freight, resulting in large quantities of goods flowing through the state. Although this is predominately in the east-west direction today, the potential of NAFTA suggests that there may be opportunities for Colorado to also become a more significant player in the movement of goods in north-south corridors.

At the national level, the Transportation Equity Act for the 21st Century (TEA-21) designated 43 “High Priority Corridors” on the nation’s highway system as a focus for improvements to enhance mobility for trade (both domestic and international) and to promote economic development. Three of these corridors penetrate Colorado:

- ◆ *Camino Real – Mexico to Canada via I-25 in Colorado*
- ◆ *Ports to Plains – Laredo, Texas to Denver*
- ◆ *Heartland Expressway – Denver, through Scottsbluff, Nebraska, to Rapid City, South Dakota*

In July, 2001 representatives of the Colorado, Oklahoma, Texas and New Mexico Departments of Transportation agreed to designate the specific route for the Ports to Plains Corridor as identified on Figure I-1. Through several studies conducted in the mid-1990’s, a route for the Heartland Expressway from Rapid City to Scottsbluff has been designated. However, the studies did not result in a designation of a route for the segment from Scottsbluff to Denver.

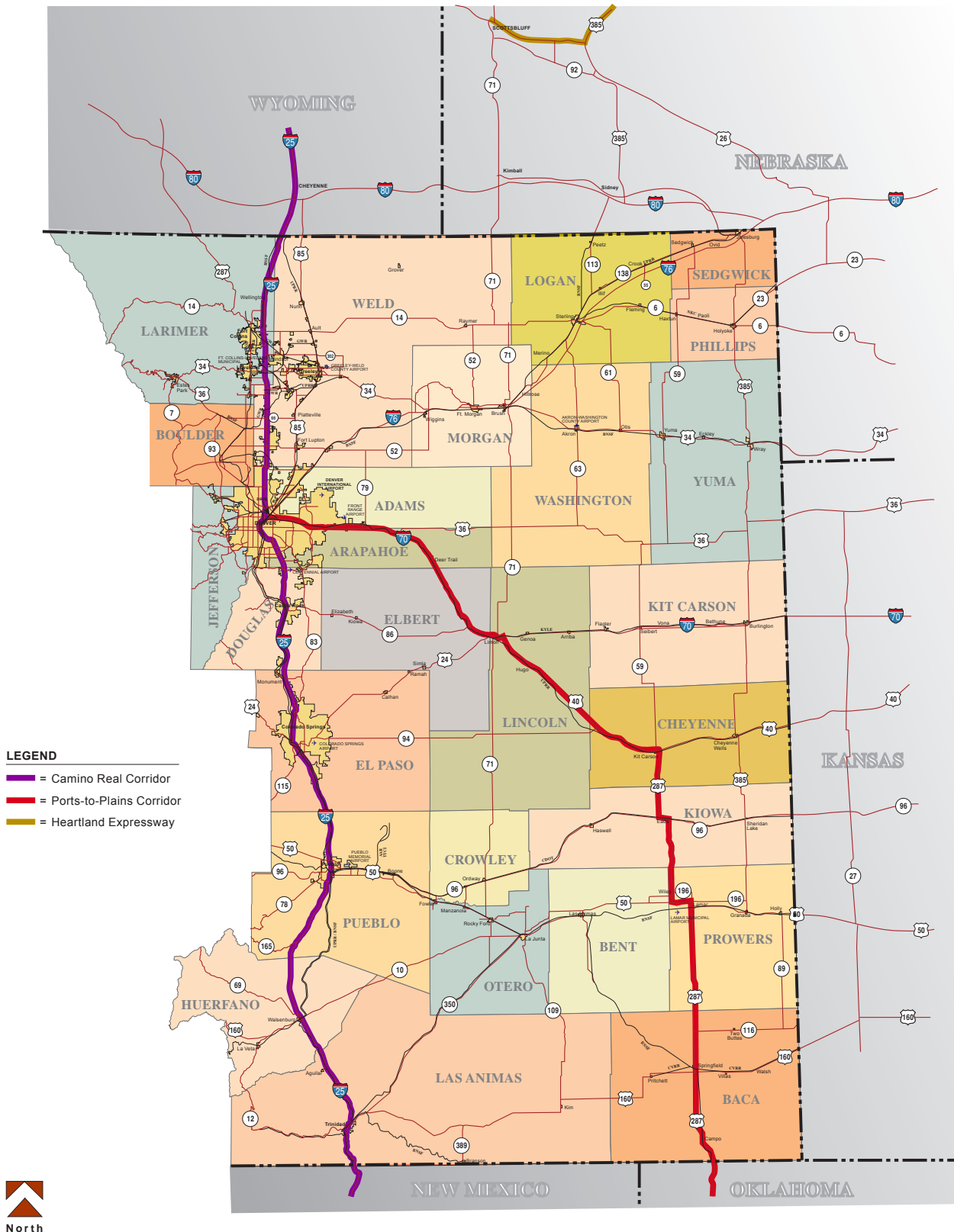
Even with these corridor planning efforts, to date freight mobility has not been a major focus within the statewide transportation planning process or in the identification of strategic projects in the Colorado Department of Transportation’s (CDOT) funding process. But CDOT recognizes the importance of an efficient freight transportation system to the economy of the state.

Thus, this Eastern Colorado Mobility Study has been undertaken to assist the Transportation Commission of Colorado in making investment decisions regarding infrastructure improvements to enhance freight mobility in this large part of the state. As illustrated by Figure I-1, the study area includes all of eastern Colorado, extending to the I-25 corridor on the west and Colorado’s borders on the north, east and south.

The study purpose has been clearly defined:

“To evaluate the feasibility of improving existing and/or constructing future transportation corridors and intermodal facilities to enhance the mobility of freight services within and through eastern Colorado.”

Figure I-1



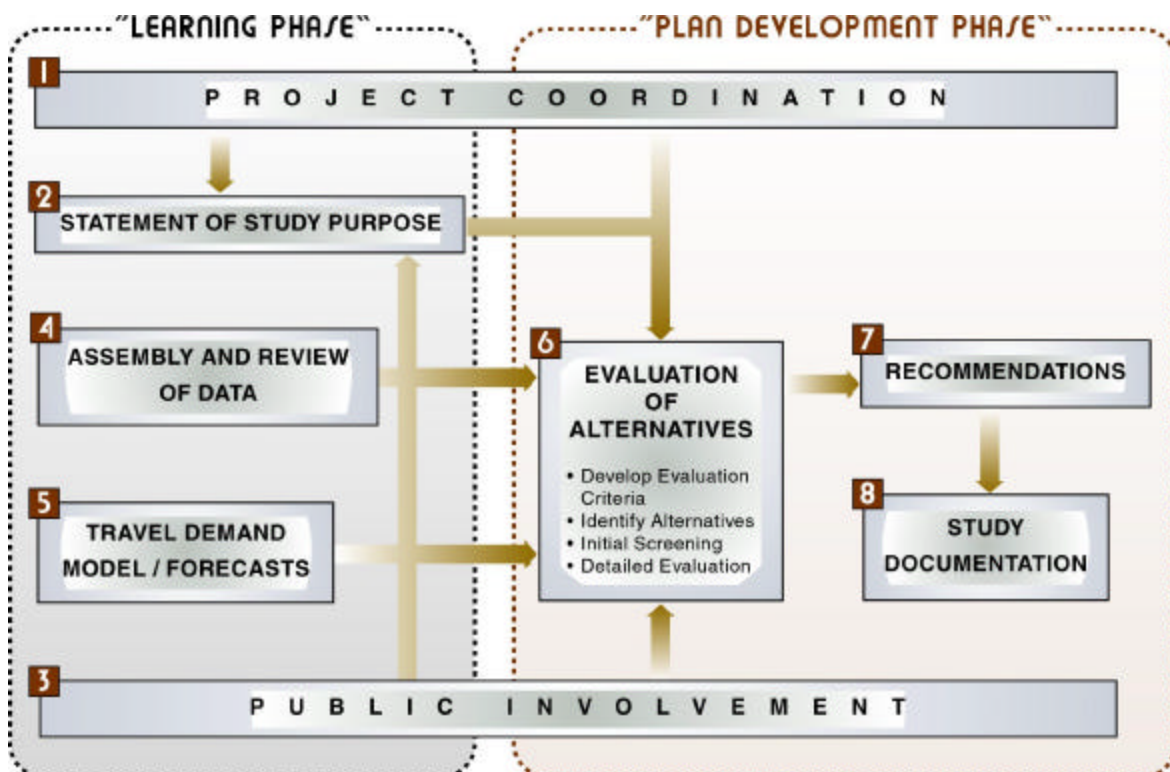
B. STUDY PROCESS

The process for the conduct of this study is schematically illustrated by Figure I-2. As shown, the planning effort was comprised of two phases: a “learning phase” and a “plan development phase”. Although these two phases appear to be distinct phases, the study involved considerable interaction between the phases as the efforts evolved.

The learning phase involved such tasks as an inventory of the existing transportation systems (all modes) and land use, environmental, and socio-economic conditions; compilation of commodity flow data; and development of a travel demand model to project future demands on the transportation system.

The plan development phase was the portion of the study in which alternative improvements were identified and evaluated within each mode of freight movement. The evaluation process was structured with a preliminary screening of alternatives and a subsequent detailed analysis of the remaining alternatives. On the basis of these analyses, recommendations for improvements, as well as related policies/strategies, were made for the highway, rail/intermodal, and aviation systems.

Figure I-2 Study Process



C. PUBLIC OUTREACH

As shown on Figure I-2, public involvement was a key element throughout both phases of the project. The primary public involvement goals of the Eastern Colorado Mobility Study were to create public awareness of the many aspects of the study and to gather meaningful public input regarding issues identification and potential solutions. To achieve these goals, the extensive public outreach program incorporated several mechanisms into the process.

1. Steering Committee

A Steering Committee with 28 members representing a wide range of interests was formed to be the primary advisory group for the study. The committee was comprised of the following representation:

- ◆ Transportation Commission
- ◆ CDOT Regional Directors
- ◆ Transportation Planning Regions
- ◆ Colorado State Patrol
- ◆ Colorado Division of Aeronautics
- ◆ Colorado Public Utilities Commission
- ◆ Colorado Office of Economic Development
- ◆ Colorado Department of Local Affairs
- ◆ Federal Highway Administration
- ◆ Colorado Counties, Inc.
- ◆ Railroads
- ◆ Colorado Motor Carriers Association
- ◆ Progressive 15
- ◆ Action 22

The role of the Steering Committee was to guide the direction of the study, to provide access to data and data sources, to review and comment on study materials, to facilitate two-way information dissemination, and to provide a forum to develop recommendations.

Thus, the Steering Committee was active throughout the study process; it met eight times at locations throughout the study area.

2. Freight Working Group

A Freight Working Group was formed to provide a forum for obtaining input from the freight industry. Representatives from the trucking, rail, and aviation modes of freight transportation, as well as shippers and other major users of the industry, met three times during the study to discuss a wide range of issues and to review and comment on the planning efforts.

3. Public Open Houses

The primary means of gathering input from the general public was the conduct of thirteen open houses at varying locations throughout the study area.



The first round of open houses was conducted during the first two weeks of May, 2001. There were five separate open house opportunities at Greeley, Lamar, Pueblo, Akron and Burlington. The primary focus of these open houses was on the study purpose and process, the inventory of existing transportation systems, and the identification of issues and concerns. There were over 125 attendees at the five open houses. Comments focused on traffic volumes, safety issues, roadway conditions, alignments and connections, and economic development items.

In November, 2001 the second series of open houses were held at Sterling, Fort Morgan, Limon, Cheyenne Wells, and Las Animas. This series of open houses focused on the identification of alternatives and results of preliminary analyses. There were over 150 attendees at this series of open houses. Comments focused on the data and the alternatives presented. Generally, the public was interested in economic benefits to be gained from the potential corridor designations.

The final set of open houses were held in February, 2002 in Julesburg, Brush and Kit Carson. This last round of open houses centered on the findings and preliminary recommendations of the study. Approximately 100 people attended. Comments focused on the potential highway improvement corridors and on funding issues.

The public awareness program also included two newsletters which were mailed to over 1,000 residents and businesses in the study area in May and December, 2001, providing updated project information. Furthermore, news releases were provided to newspapers and radio and television stations on a regular basis.



II. Inventory of Existing Conditions



II. INVENTORY OF EXISTING CONDITIONS

In order to better understand the many issues involved in this study, it was first necessary to compile and review a wide range of information about the study area and specifically about elements which affect freight movement in the study area. Data were collected on the systems serving each mode of freight movement, and data were also compiled on land use, environmental, and socio-economic factors which affect these systems. This section summarizes the data which were compiled.

A. HIGHWAY SYSTEM



The primary means of travel in the study area, for the movement of both goods and people, is via highways. Highways in eastern Colorado include three major interstate highways, I-25, I-70 and I-76. A network of state highways connects the interstates and serves as the primary skeleton of roadways providing access to the rural portions of eastern Colorado. The state highway system is predominantly 2-lane roadways with narrow shoulders. To establish an inventory of existing highway conditions, a number of elements were researched, including types and volumes of

traffic, roadway geometric characteristics, safety issues, and roadside amenities. The following subsections summarize the findings of this research.

1. Existing Traffic Volumes

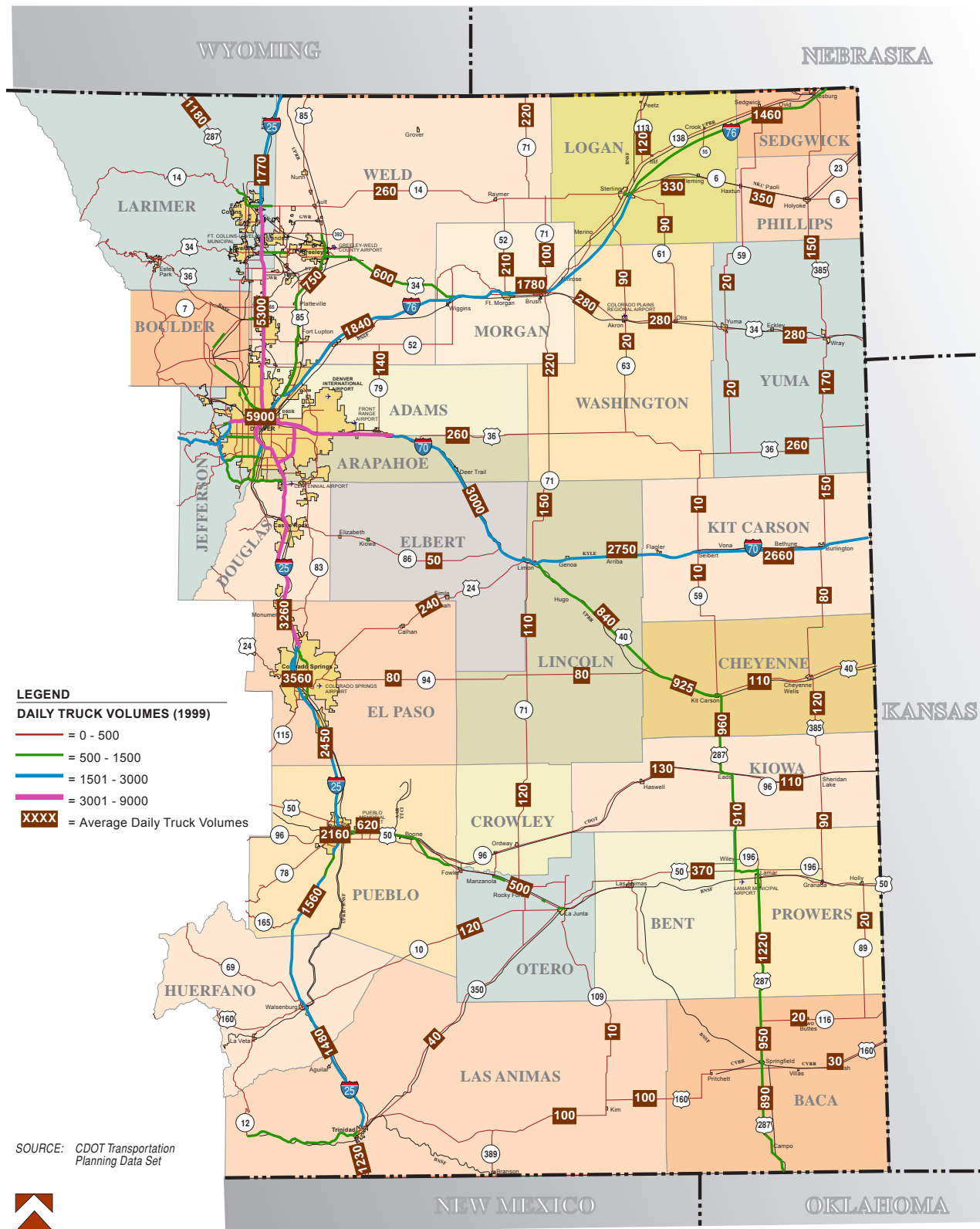
Existing traffic volumes reflect total volumes of trucks and other vehicles in both directions throughout the entire day. Compiled from the CDOT database, Figure II-1 illustrates these daily traffic volumes on the state highway system in the study area. Not surprisingly, I-25 experiences some of the heaviest traffic volumes in the state. Outside of the metropolitan areas, I-25 from Pueblo to Fort Collins carries between 24,000 and 56,000 vehicles per day (vpd). In Colorado Springs daily volumes reach nearly 100,000 vpd, and in Denver the volumes are as high as 220,000 vpd. Once away from the Front Range, all roads carry less than 10,000 vehicles per day. I-76, I-70, and US 50 serve between 5,000 and 10,000 vpd. Nearly all other roads in eastern Colorado carry less than 2,500 vpd.

2. Existing Truck Volumes

Figure II-2, illustrating existing daily truck volumes, highlights the primary corridors that are currently being used for freight movement in the study area: I-25, I-70, I-76, US 287, US 40, US 85, and segments of US 34 and US 50. A comparison of the truck volumes and the traffic volumes shows that it is not unusual for roadways in eastern Colorado to experience truck volumes that comprise 30 to 50 percent of the total traffic on the road.



Figure II-2



3. Roadway Congestion

Congested roadways were determined by reviewing volume to capacity (v/c) ratios. The Colorado Department of Transportation Planning Data Set was used as the resource for the v/c ratios. A v/c ratio of 1.0 or higher means that the traffic volume has reached or exceeded the capacity of the roadway. Roadways with volumes in excess of 70 percent of their capacity are identified as “nearing capacity”. As shown on Figure II-3, the congested areas are in and around the population centers, predominantly Denver and Colorado Springs. The roadways in eastern Colorado generally have sufficient capacity for the current volumes.

4. Surface Conditions

Roadway surface condition is an indicator of how well a roadway is wearing, given the traffic and truck volumes. The Colorado Department of Transportation regularly surveys the surface condition of roadways and rates them as “good”, “fair”, or “poor”, primarily on the basis of cracking and rutting. As part of this study, data regarding surface conditions were gathered from the Colorado Department of Transportation Planning Data Set (last updated in 2000). As shown on Figure II-4, fair and poor surface conditions are currently experienced on both the interstate and the state highway systems throughout eastern Colorado.



5. High Accident Locations

High accident locations were determined by comparing the accident rate being experienced on a specific section of highway with the statewide average for that type of roadway. For example, a Federal-Aid Primary (Rural) roadway had a statewide average accident rate of 1.38 accidents per million vehicle-miles of travel and a Federal-Aid Primary (Urban) roadway had an average accident rate of 3.16. As shown on Figure II-5, the high accident locations are generally in the vicinity of intersections or interchanges and within the cities and towns.

Figure II-3

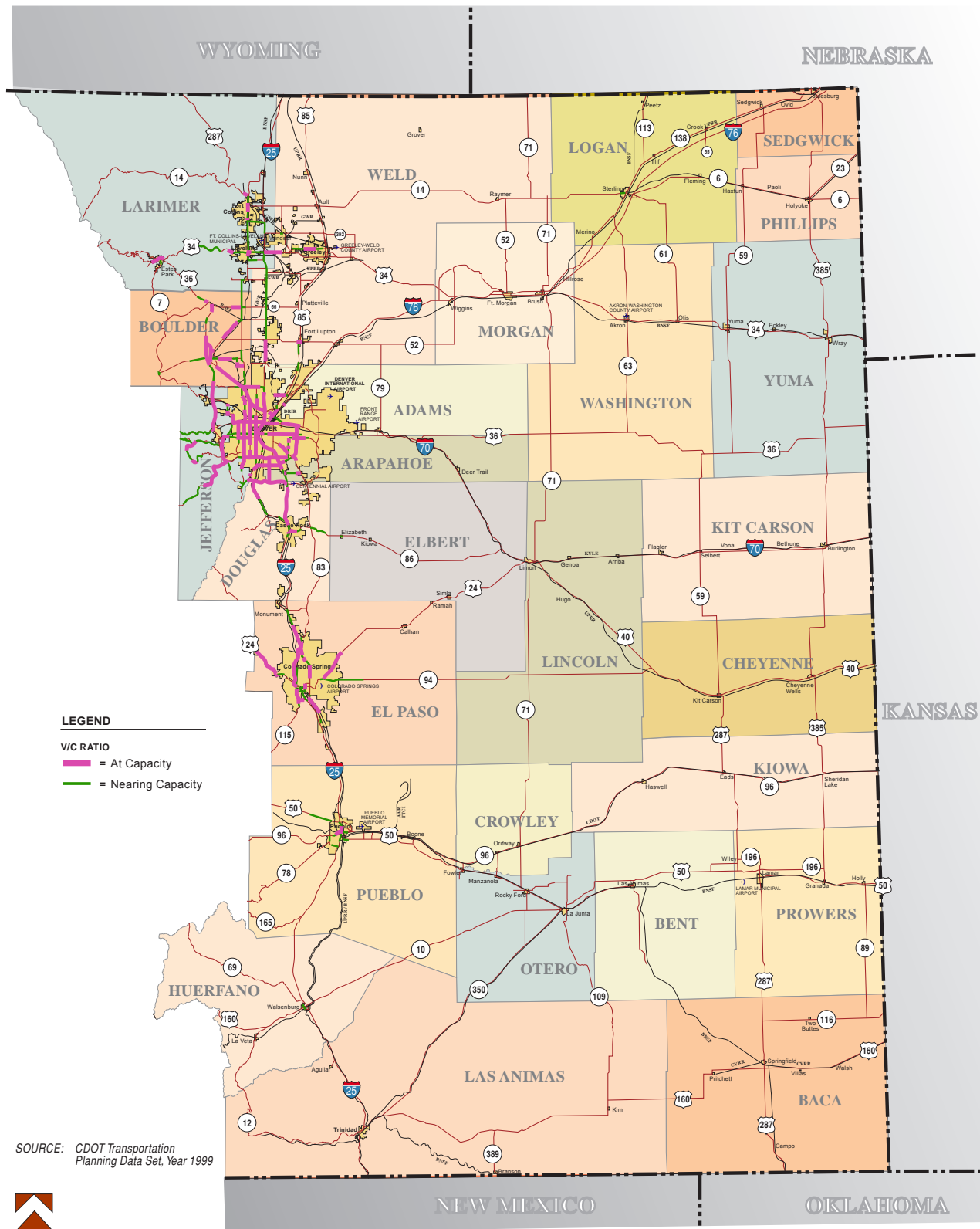


Figure II-4

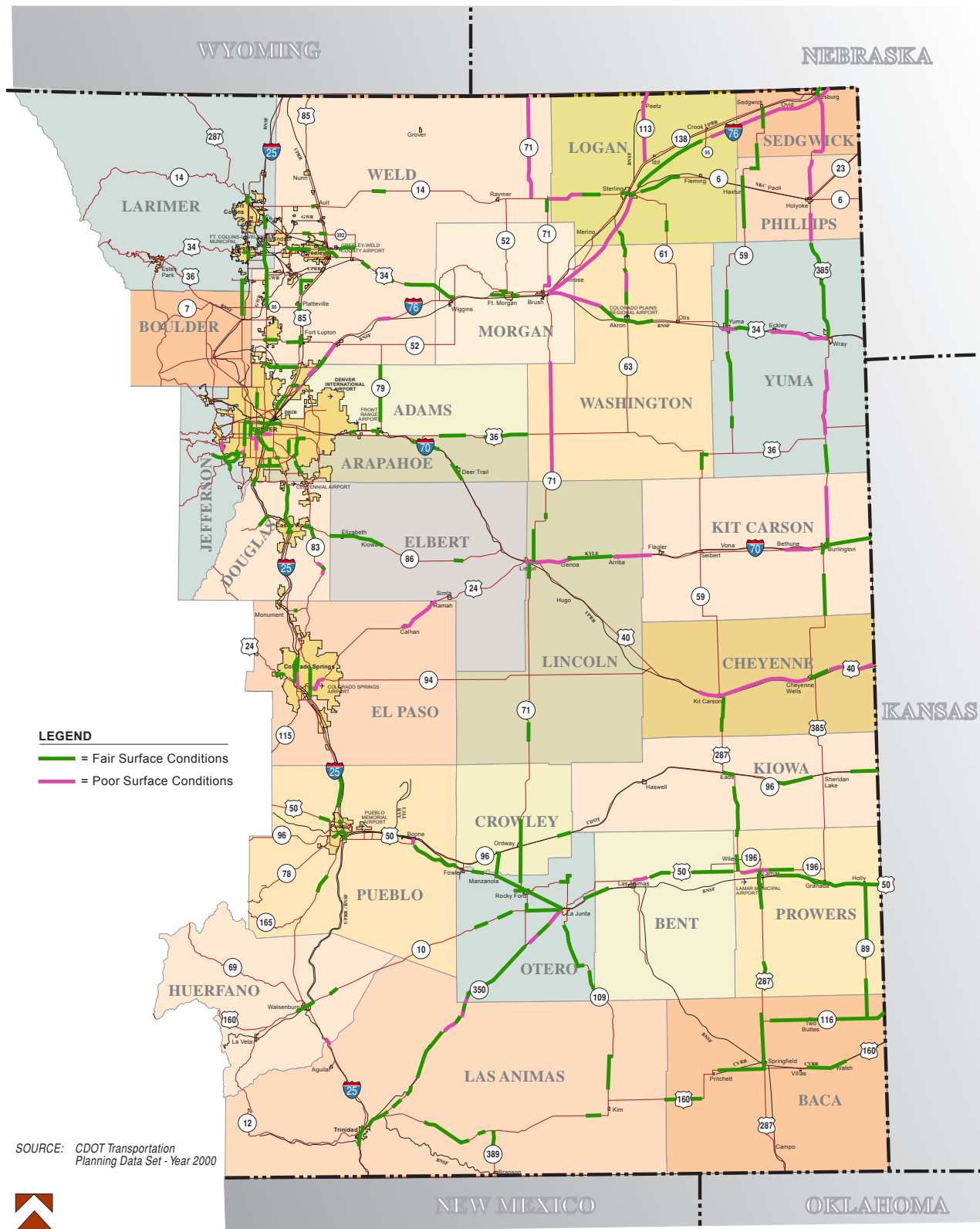
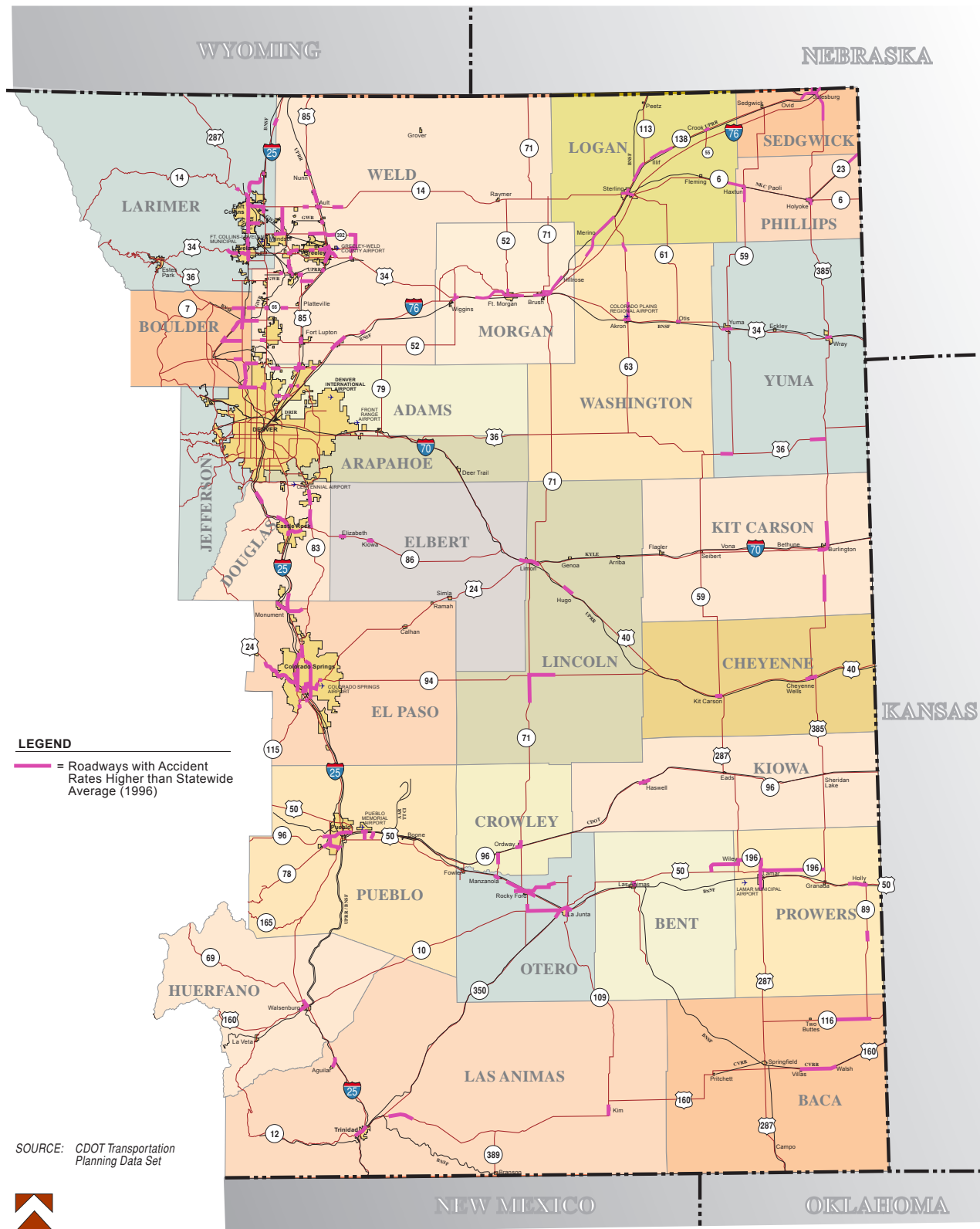


Figure II-5



6. Shoulder Widths

Throughout the study, many attendees at the public open houses emphasized the importance of adequate shoulders. For this study, shoulder widths along state highways in the study area were obtained from the Colorado Department of Transportation Planning Data Set (last updated in 2000). Figure II-6 illustrates the recorded shoulder widths along the state highway system in eastern Colorado. As reflected in the legend, there is a wide range of existing shoulder conditions. Several sections of roadway in eastern Colorado fall in the 0 to 2 foot shoulder width category, and much of the system has shoulders with widths of 4 feet or less. In general, the major freeways have shoulder widths of 8 feet or more.

7. Rest Areas

Rest areas within the study area are shown on Figure II-7. They are indicated by location and condition of each existing facility in eastern Colorado. The condition ratings were based on a study by the Colorado Department of Transportation called the *Colorado Rest Areas Management & Maintenance Study*. The study looked at the physical conditions of the rest areas, the number of parking spaces, the truck driver accommodations, the accessibility/visibility, the proximity to competing services, and several other criteria to rate each of the rest areas. The graphic shows that the major roadways have rest areas, but there are some roadways, especially in the north-south direction that do not have a rest area for the entire length.

8. Ports of Entry

There are seven ports of entry in the study area. Figure II-8 illustrates the locations of the ports and their relative level of activity. The volumes represented on the figure reflect year 2000 annual truck volumes serviced by each port of entry, as obtained from the Colorado Department of Revenue. As shown, the Fort Collins, Fort Morgan, Monument, and Limon ports of entry service the largest volumes of trucks, at greater than 600,000 trucks per year.

9. Hazardous/Nuclear Materials Routes

The Hazardous/Nuclear Materials Route designations were obtained from the Colorado Department of Public Safety and the Colorado State Patrol. The nuclear routes follow I-25, I-70, and I-76. The hazardous materials routes extend to more of the state highways and are illustrated on Figure II-9.

10. Scenic Byways

There are seven Scenic Byways in the study area, as shown on Figure II-10. The four byways in the north portion of the study area include the Peak to Peak across Boulder County, the Cache la Poudre – North Park in Larimer County, the Pawnee Pioneer Trails in portions of Weld, Logan and Morgan Counties, and the South Platte River Trail near Julesburg. The three byways in the south portion of the study area include the Frontier Pathways in Pueblo County, the Scenic Highway of Legends in Huerfano and Las Animas Counties, and the Santa Fe Trail which runs from Trinidad to the Colorado/Kansas stateline along Highways 350 and 50.

Figure II-6

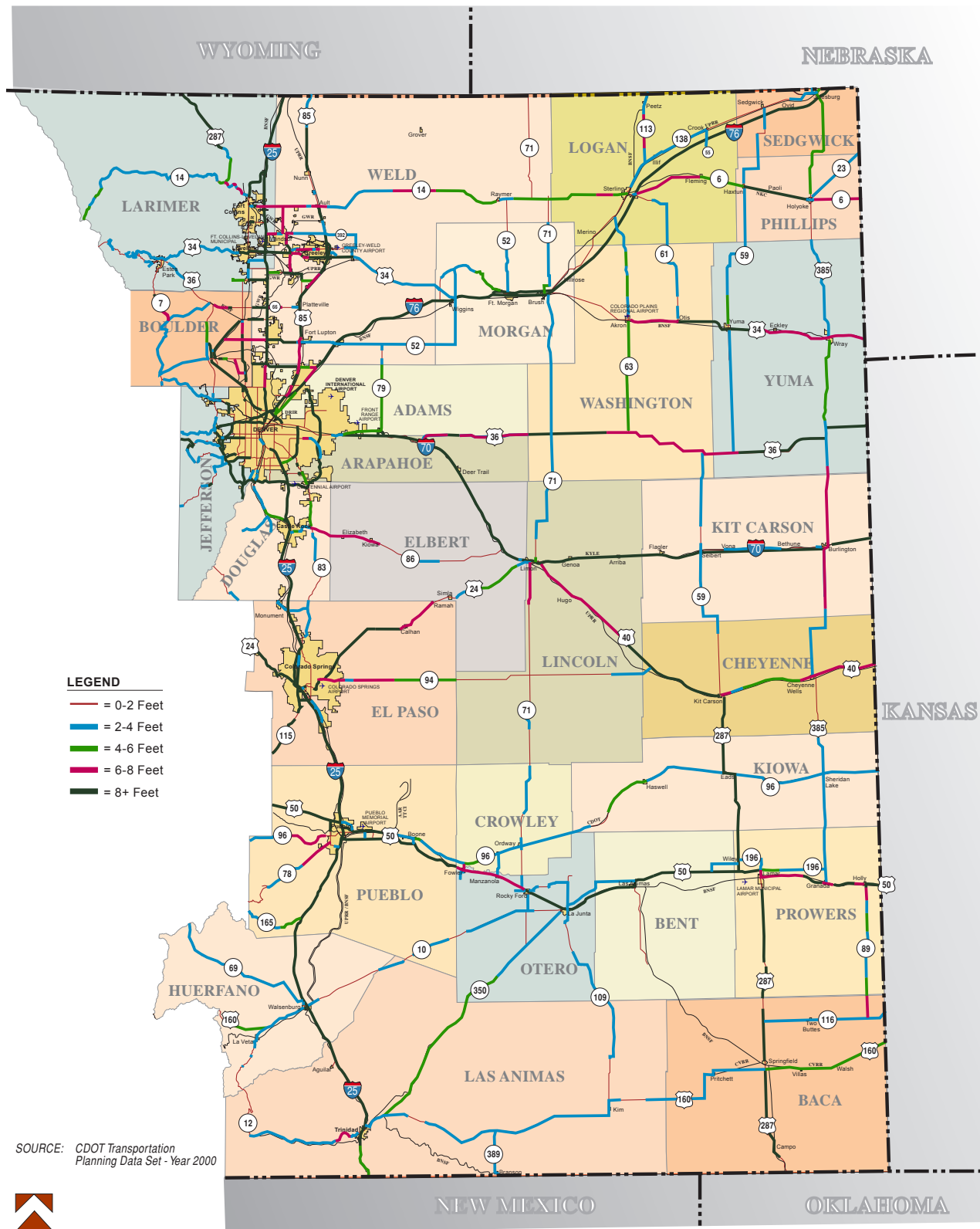


Figure II-7

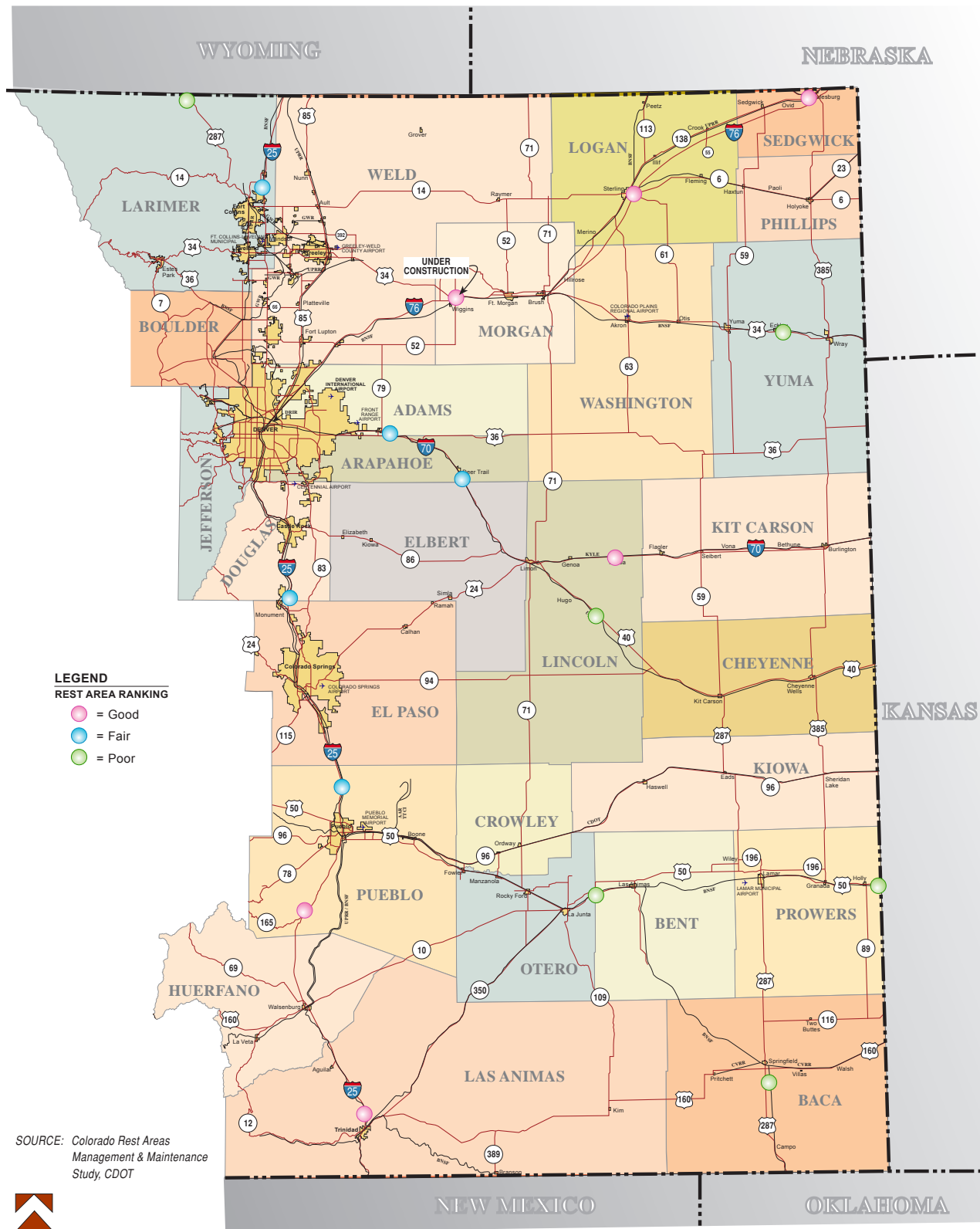


Figure II-8

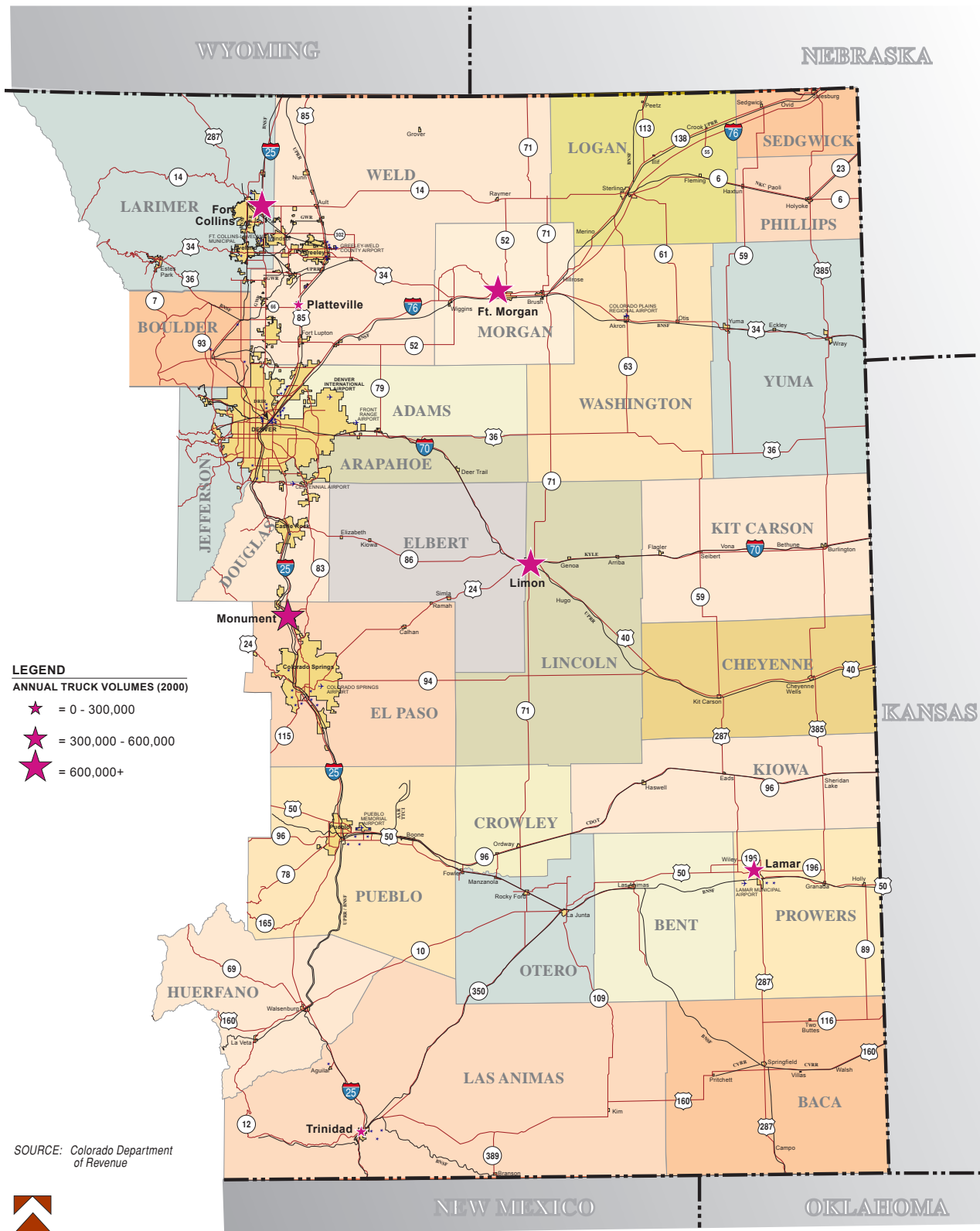


Figure II-9

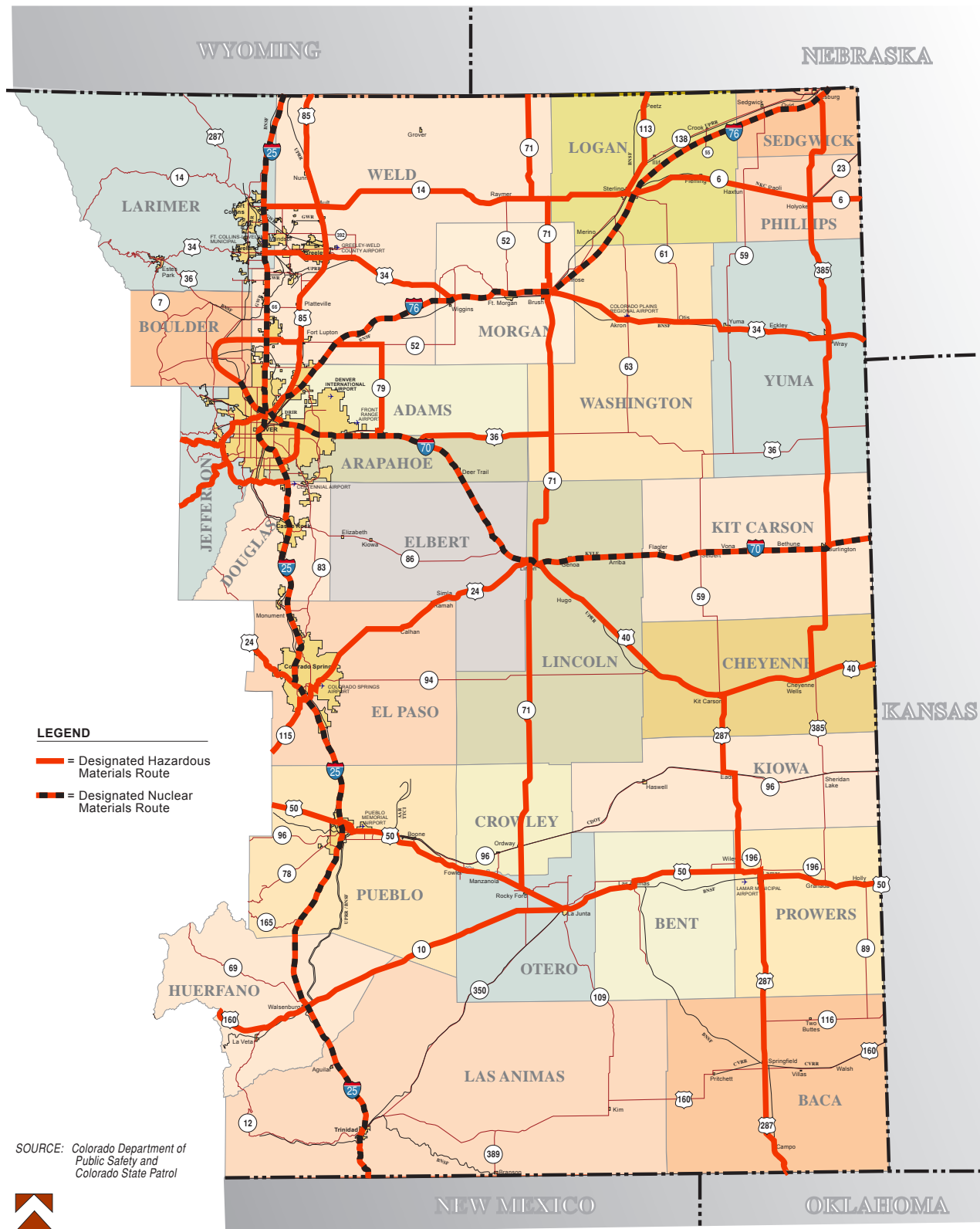
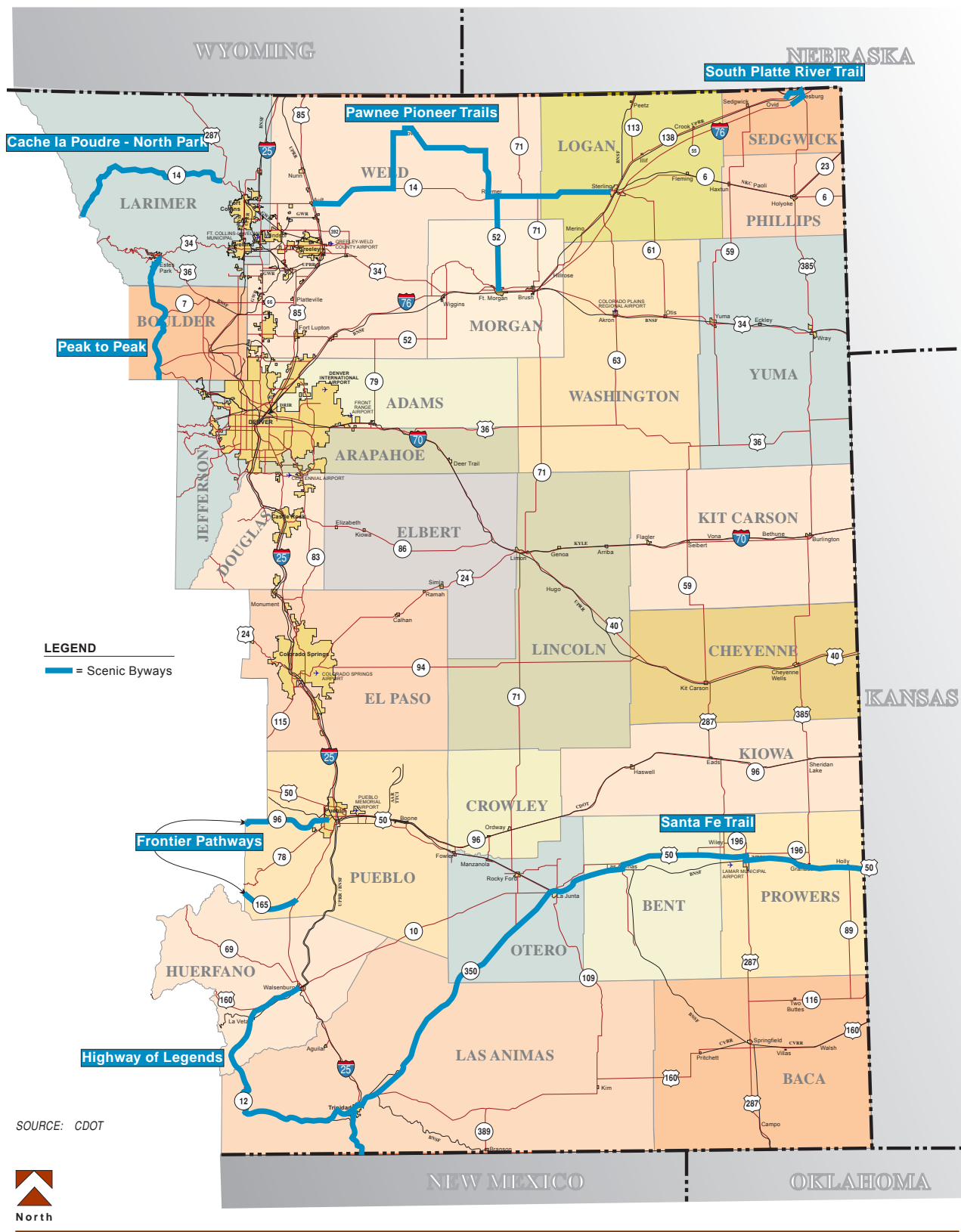


Figure II-10



B. RAIL/INTERMODAL SYSTEM

1. Railroad Lines and Usage

Currently there are twelve railroads serving the study area. The twelve railroads consist of two Class I railroads, two regional railroads, and eight local shortline/industrial railroads. The Surface Transportation Board (STB) defines Class 1 carriers as those with average annual operating revenues of \$261.9 million or more. Regional carriers are those with average annual operating revenues of between \$40 million and \$261.9 million and at least 350 miles of trackage. Local, or shortline/industrial, carriers are those with average annual operating revenues less than \$40 million and less than 350 miles of trackage. There are 2,042 miles of railroad routes in the study area. Class I railroads account for about 1,585 miles, regional railroads represent 153 miles, and shortline railroads operate on nearly 304 miles.

The railroads serving eastern Colorado are shown on Figure II-11. Figure II-12 depicts the level of activity on each line. Each of the railroads is briefly described below.

Class 1 Railroads

- ◆ The Burlington Northern and Santa Fe Railway Company (BNSF) operates over major north-south routes and an east-west route in Colorado. North of Denver, the Front Range Subdivision runs between Denver and Cheyenne, Wyoming via Boulder, Loveland, and Fort Collins. The Brush Subdivision runs between Denver and Sterling. South of Denver, the BNSF utilizes the Joint Line which is operated

jointly with the UP, between Denver and Pueblo. South of Pueblo, the Spanish Peaks Subdivision runs between Pueblo and Trinidad. The Raton Subdivision is BNSF's east-west line that runs between Kansas and New Mexico via La Junta and Trinidad. The BNSF operates on a total of 965 miles of route in eastern Colorado.

- ◆ The Union Pacific Railroad (UP) operates over major north-south and east-west routes in Colorado. North of Denver, the Greeley Subdivision runs between Denver and Cheyenne, Wyoming. South of Denver, the UP operates over the Joint Line in conjunction with the BNSF. UP's major east-west routes consist of the Limon Subdivision (also known as the Kansas Pacific or KP Line) between Denver and Kansas, the Moffat Tunnel Subdivision between Denver and Winter Park and Phippsburg on the Craig Subdivision, and the currently inactive Tennessee Pass Subdivision between Pueblo and Dotsero. The UP also operates the Alamosa Subdivision between Pueblo, Walsenburg, and South Fork. The UP operates about 620 route miles in the study area.

The two Class I railroads clearly are the most active railroads in Colorado and haul the most freight. The Joint Line south of Denver experiences an average of 35 trains per day. Most of the other BNSF or UP lines experience between 10 and 20 trains per day.

Figure II-II

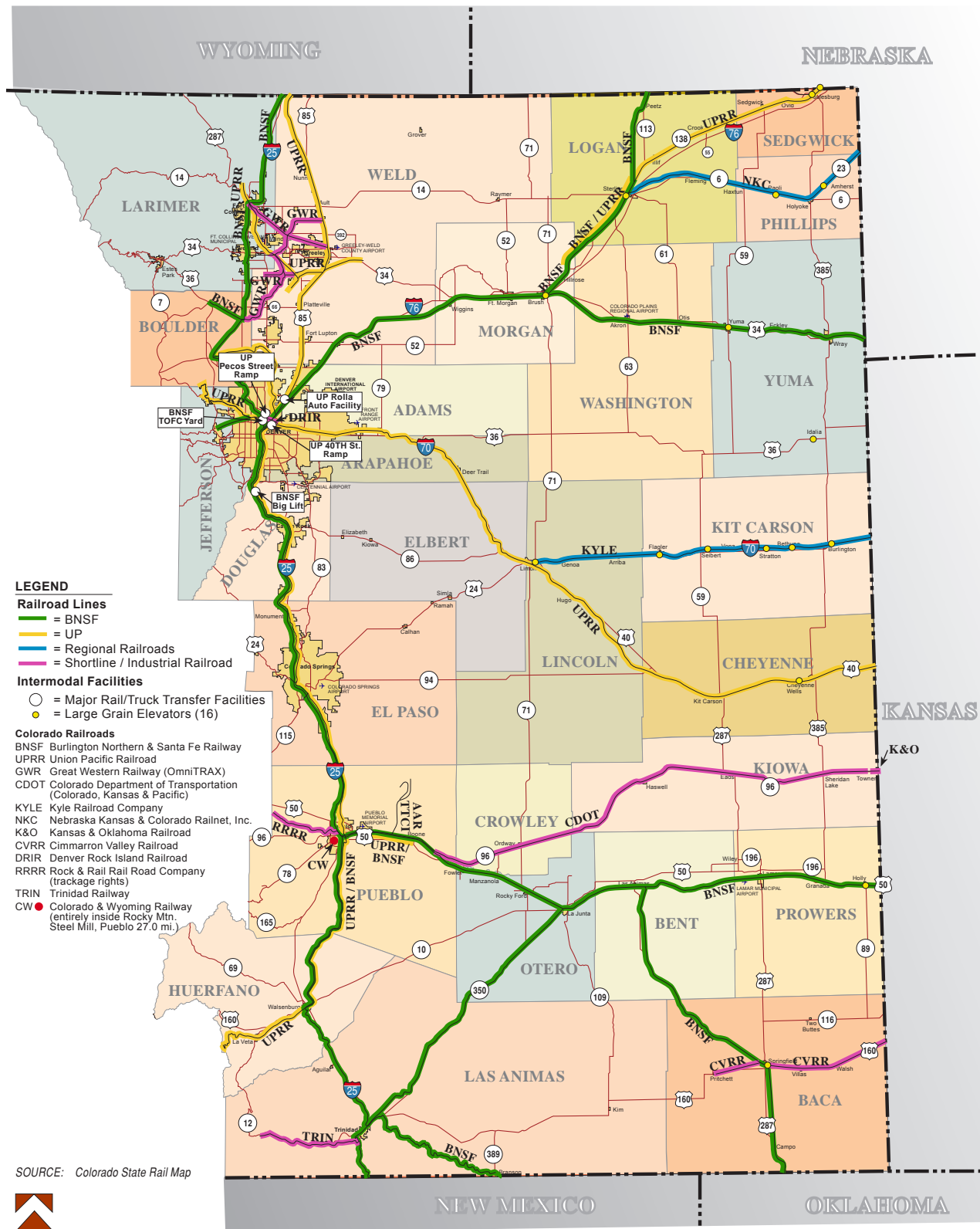
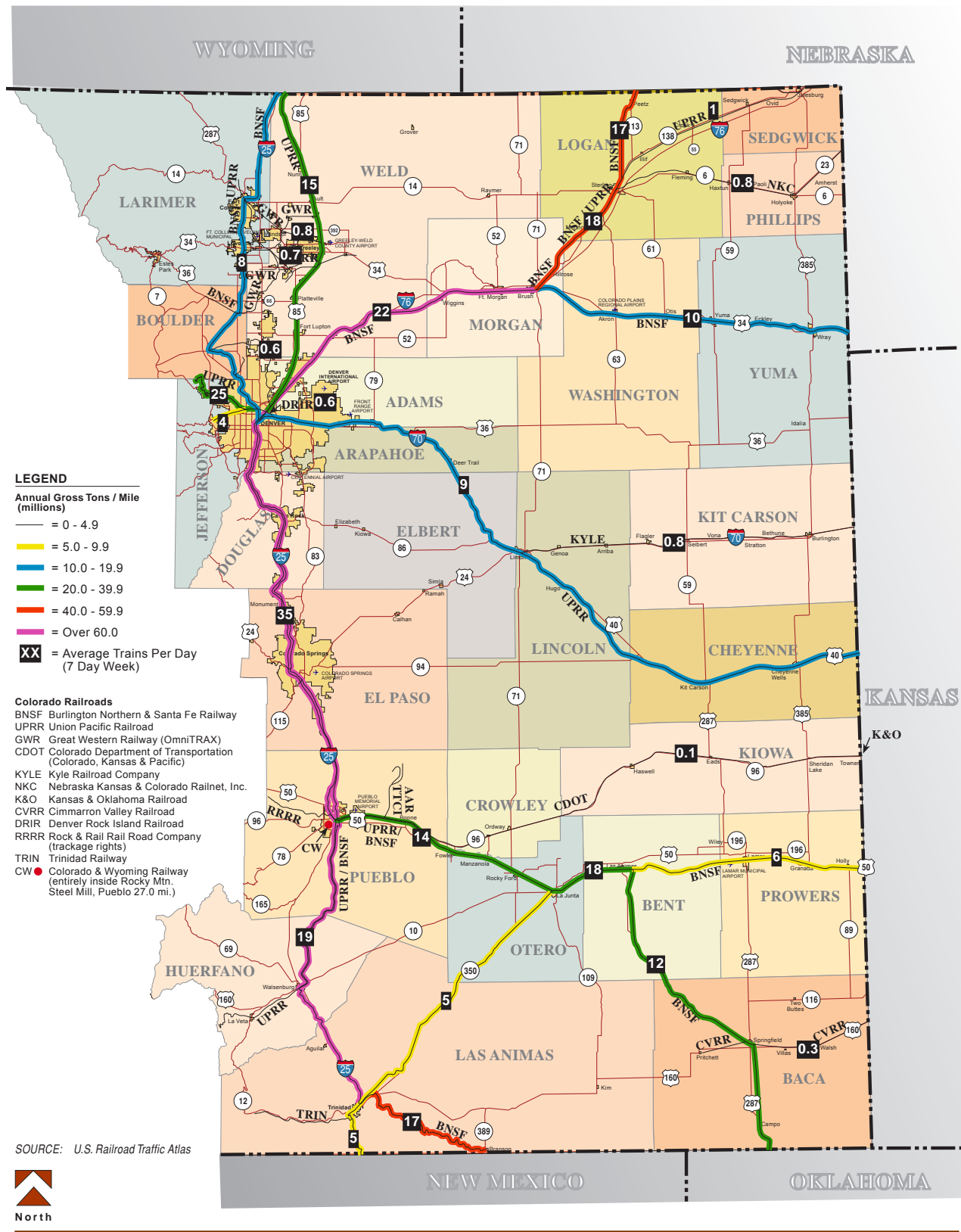


Figure II-12



Regional Railroads

- ◆ The Kyle Railroad Company (KYLE) operates between Limon and Kansas via Burlington over an ex Rock Island Railroad line (about 89 miles). It was recently purchased by Rail America. This line carries an average of about one train per day.
- ◆ The Nebraska, Kansas & Colorado Railnet, Inc. (NKC) operates in northeastern Colorado between Sterling and Kansas via Holyoke and Amherst (approximately 64 miles). It also carries an average of almost one train per day.

Shortline Railroads

- ◆ The Great Western Railway (GWR) is owned by OmniTRAX and operates in the vicinity of Fort Collins, Loveland, Longmont, and Greeley. It operates over 72 miles of track and generally carries two to four trains per day.
- ◆ The Kansas & Oklahoma Railroad (K&O) operates into Colorado as far as Towner, a distance of about 5 miles. K&O was an OmniTRAX line, but has been owned by WATCO since June 1, 2001.
- ◆ The Colorado, Kansas & Pacific (CK&P) operates over the ex UP Towner Line between NA Junction and Towner (about 122 miles). The Towner line has been owned by CDOT since July 15, 1998. It currently carries an average of about one train per week.

- ◆ The Cimarron Valley Railroad (CVRR) operates in southeastern Colorado between Pritchett and Kansas via Walsh. This 44-mile line experiences several trains per week.
- ◆ The Colorado & Wyoming Railway (CW) operates approximately 27 miles of track within the Rocky Mountain Steel Mill near Pueblo.
- ◆ The Denver Rock Island Railroad (DRIR) operates over 3.5 miles of track in the Denver and Commerce City area. One train per day utilizes this track.
- ◆ Rock & Rail Rail Road Company (RRRR) is a gravel quarry operation in Parkdale that shares 11.8 miles of trackage with the Royal Gorge & Canon City excursion railroad and has trackage rights over the UP and BNSF into Pueblo.
- ◆ The Trinidad Railway (TRIN) has been abandoned, but operations have recently been restarted over 29.9 miles of trackage southwest of Trinidad.

In addition, a couple of entities operate passenger service through parts of the study area. Amtrak operates regularly scheduled passenger service over the UP via the Moffat Tunnel line and the BNSF via Brush and Akron as well as via La Junta and Trinidad. The Ski Train operates weekend service during the ski season and a portion of the summer season between Denver and Winter Park. On occasion, special passenger movements such as the American Orient Express and the Denver Post Cheyenne Rodeo Days train are operated in the Denver area.

2. Intermodal Facilities

Intermodal transportation involves the transfer of freight between rail, truck, and/or pipeline modes of transportation at least once during the movement from the point of origin to its destination. In this study, intermodal transportation is not intended to include every facility at every location where freight is transferred from one mode to another. Instead, it is intended to include the major facilities where a significant volume of freight is transferred between modes.

The five major rail/truck transfer facilities located in eastern Colorado and sixteen of the larger grain elevators are shown on Figure II-11. Each category of intermodal facilities is discussed below.

Rail/Truck Transfer Facilities

UP 40th Street Ramp - UP's intermodal yard is located at 1851 40th Avenue in Denver. Access to the facility is from I-70 via Colorado Boulevard and 40th Avenue. The facility occupies approximately 35 acres. There are four operating tracks totaling approximately 8,000 feet in length. Four storage tracks also exist adjacent to the main line on the north side of the facility. Approximately 750 parking spaces are provided for trailers, containers, and related equipment. Four side lift machines are used for loading and unloading rail cars. A private contractor handles the lifting operations at the facility. The facility has a capacity of approximately 150,000 units per year. It currently handles two intermodal trains per day, for a total volume of 120,000 units of domestic and international trailers and containers per year.



UP Pecos Street Ramp - This facility is located at the north end of UP's North Yard near Utah Junction. One inbound UPS train and one outbound UPS train are handled five days per week at this facility. The facility consists of a dirt and gravel surface and utilizes a side-loader for approximately 250 lifts per week.

UP Rolla Automotive Facility - This facility is located south of Brighton, Colorado adjacent to U.S. Highway 85 and Interstate 76 between 96th Avenue and 104th Avenue on approximately 78 acres. The facility serves as a distribution center for automobiles. The automobiles are received from various manufacturing plants via rail and are loaded onto trucks for distribution to dealerships in Colorado and adjacent states. The facility handles approximately 250,000 automobiles per year. A private contractor handles the unloading and loading operations.

BNSF TOFC Yard - BNSF's Trailer on Flat Car (TOFC) Intermodal Yard is located at 585 West 53rd Place just north of downtown Denver in unincorporated Adams County. The facility was constructed in the late 1980's and occupies approximately 29 acres. The facility has two tracks totaling approximately 9,500 feet in length. There are about 1,000 parking spaces for trailers, containers, and related equipment. Loading and unloading of the rail cars is accomplished with one overhead crane and four side lift machines. The facility has a capacity of approximately 190,000 units per year. The current volume is 175,000 to 180,000 units per year. A private contractor handles the lifting operations. Access to the facility from I-70 is via Pecos Street, 48th Avenue, and Fox Street and from I-25 via 58th Avenue. The I-25 route seems to be preferred because it is more direct.

BNSF Big Lift - This facility was originally constructed by the Santa Fe as a rail/highway intermodal facility that would serve the Denver and populated Front Range areas. Traffic congestion in and through Denver made operations inefficient. When the BN and the Santa Fe merged, the BN's TOFC Facility located in Denver had the capacity to accommodate the business from the Big Lift. Big Lift has since become a truck/rail transfer facility for dry and liquid bulk commodities on a somewhat limited scale.

Grain Elevators

There are a total of 69 grain elevators located in the State of Colorado. Of the total, 66 of the facilities are located in eastern Colorado. Based on available data, sixteen of these elevators are known to handle a bulk volume of 1,000,000 or more bushels, as shown in Table II-1.

Table II-1 Large Grain Elevators in Eastern Colorado

Name	Location	Volume
Amherst Cooperative Elevator Inc.	Amherst	5,861,000 bu
Bethune Grain Co.	Bethune	1,100,000 bu
Cargill, Inc.	Burlington	4,100,000 bu
Cargill, Inc.	Cheyenne Wells	1,700,000 bu
Flagler Equity Cooperative Co.	Flagler	2,100,000 bu
Cargill Inc.	Holly	2,700,000 bu
Great Plains Coop Elevator	Idalia	3,200,000 bu
Amherst Cooperative Elevator	Julesburg	1,146,000 bu
Farmers Grain Co.	Julesburg	1,800,000 bu
Cargill Inc.	Limon	1,800,000 bu
Paoli Farmers Coop Elevator	Paoli	1,830,000 bu
Seibert Equity Coop Assn.	Seibert	3,204,000 bu
Springfield Coop Sales Co.	Springfield	2,464,000 bu
Lousberg Grain & Feed, Inc.	Sterling	2,150,000 bu
Stratton Equity Coop Co.	Stratton	2,000,000 bu
Yuma Farmers Milling & Mercantile Coop	Yuma	2,680,000 bu
Source: 2001 Directory, Colorado Grain & Feed Association.		

Pipeline Terminals

Pipeline terminals are locations where liquids such as diesel fuel and gasoline are transferred between pipeline, rail, and/or truck. Based on input from the Freight Working Group, the five pipeline terminals listed in Table II-2 were identified as locations serving significant volumes.

Table II-2 Pipeline Terminals in Eastern Colorado

Operator	Location	Volume
Conoco	Denver	53 million barrels/day
Total	Denver	28 million barrels/day
Phillips	Denver	Not Available
Sinclair	Fountain	Not Available
Diamond Shamrock	Colorado Springs	Not Available

With these measures, it is possible to place each airport into an appropriate level of importance to the state airport system. Each airport has been assigned to one of three functional levels: Major, Intermediate, or Minor. Table II-3 summarizes the 27 airports in the study area which have been classified as either Major or Intermediate.

Table II-3 Major and Intermediate Airports in the Study Area

Airport	Category	Functional Level
Boulder	GA	I
Burlington - Kit Carson County	GA	M
Centennial	GA/R	M
Colorado Plains Regional	GA	I
Colorado Springs Municipal	C	M
Denver International	C	M
Eads	GA	I
Fort Morgan	GA	I
Front Range	GA/R	M
Ft Collins Downtown	GA	I
Ft. Collins - Loveland	GA	M
Greeley - Weld County	GA	M
Holyoke	GA	I
Jefferson County	GA/R	M
La Junta	GA	I
Lamar Municipal	GA	M
Limon	GA	I
Meadow Lake	GA/R	I
Perry Stokes - Trinidad	GA	M
Pueblo Memorial	C	M
Spanish Peaks	GA	I
Springfield	GA	I
Sterling	GA	I
Tri-County	GA/R	I
Vance Brand	GA	M
Wray	GA	I
Yuma	GA	I
Legend: C - Commercial GA - General Aviation R - Reliever M - Major I - Intermediate		

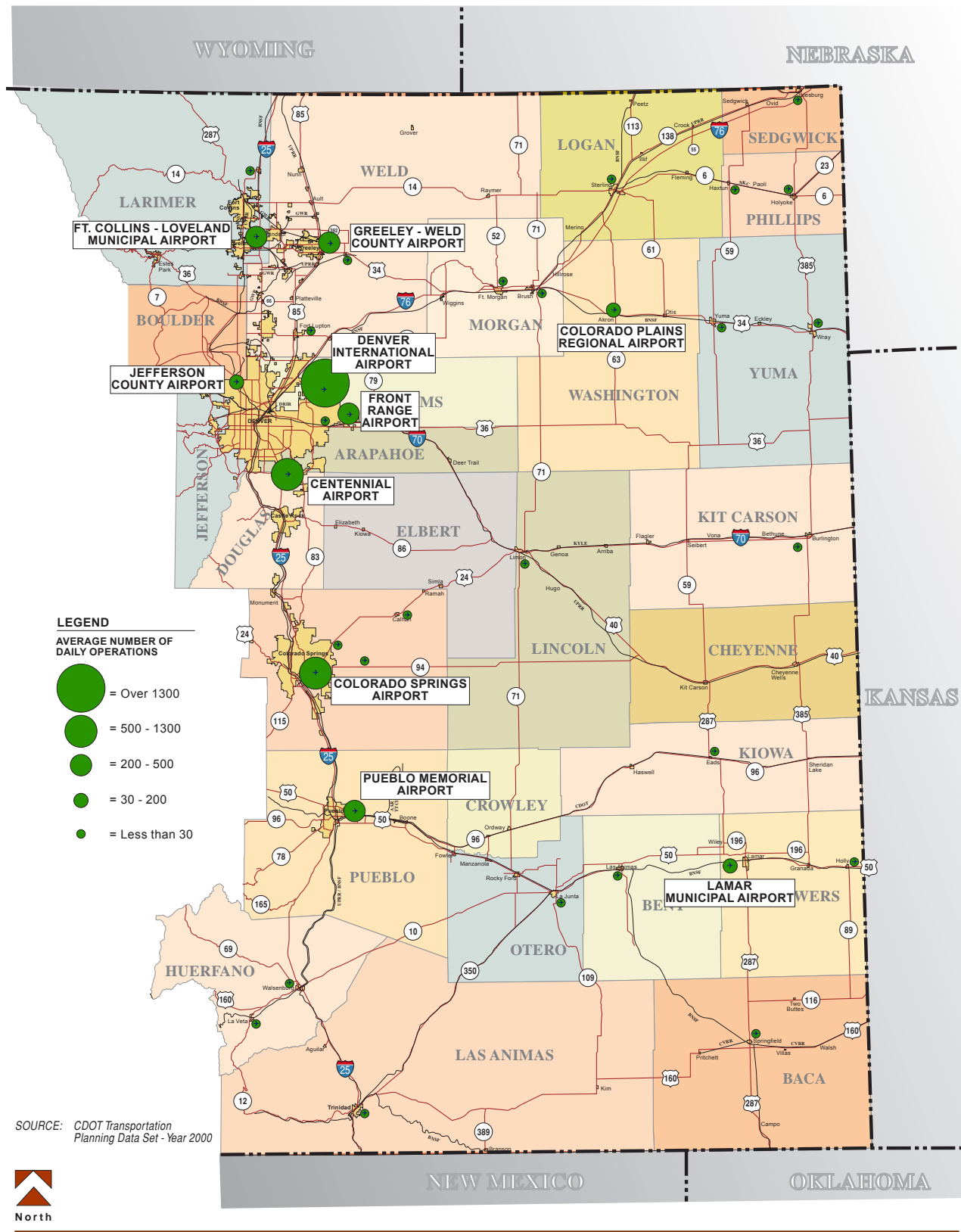
C. AVIATION SYSTEM

A total of 39 public access airports are located in counties within the eastern Colorado study area. Of these 39 airports, three currently provide regularly scheduled commercial service, 31 are General Aviation (GA) Airports, and five are classified as Reliever Airports. Reliever Airports provide GA services to aircraft that might otherwise land at congested Commercial Airports. Figure II-13 indicates the location and average number of daily operations at each airport in the study area.

Using the goals established for the state's airport system, the *Colorado Statewide Airport Inventory & Implementation Plan (2000)* identified five system performance measures to be used to determine the contribution that each airport is currently making to the airport system. These measures include:

- ◆ Activity Accommodation
- ◆ Expansion Potential
- ◆ Economic Support
- ◆ Emergency and User Coverage
- ◆ Prior Investment Maximization

Figure II-13



D. LAND USE, ENVIRONMENTAL, AND SOCIO-ECONOMIC CONDITIONS

In order to gain a better understanding of other types of influences which could affect either the need for or the impacts of freight mobility improvements in eastern Colorado, research was also conducted into the basic land use, environmental, and socio-economic characteristics of the study area. The purpose of these efforts was to establish an overview of these conditions; more detailed data in specific areas of interest were developed during the alternatives analysis phase of the study.

1. Land Use

Probably the most prevalent characteristic of the land use in the study area is the high percentage of lands in agricultural use. On the basis of the entire study area, 74 percent of the total land area is used for agricultural purposes. In the eastern portion of the study area, all of the counties have at least 70 percent of their area in agricultural use and a number of the counties have over 90 percent in this use. It is along the Front Range, the western part of the study area, where development pressures are causing significant decreases in the availability of land for agricultural purposes.

The other prevalent characteristic of the land use in the study area is the significant amount of public lands. This is important because special environmental concerns may need to be addressed when considering transportation improvements on or adjacent to public lands. As illustrated on

Figure II-14, there are substantial federal and state lands in portions of the study area. In fact, federal lands comprise 8 percent of the total land area; in some counties, over 20 percent of the land area is represented by federal lands. State lands cover about 7 percent of the total land area; in six counties, state lands comprise 11 to 15 percent of the county.

2. Environmental

When evaluating potential corridor alternatives or improvement strategies along these corridors, it is important to recognize where environmentally sensitive areas are situated in relation to the alternative. Colorado National Heritage Conservation Sites are areas where field surveys have found rare and imperiled plants and animals, and, therefore, they can serve as a good indicator of sensitive areas. A list of Conservation Sites was obtained from the National Directory Information Source (NDIS), and they have been plotted on Figure II-15.

Figure II-14

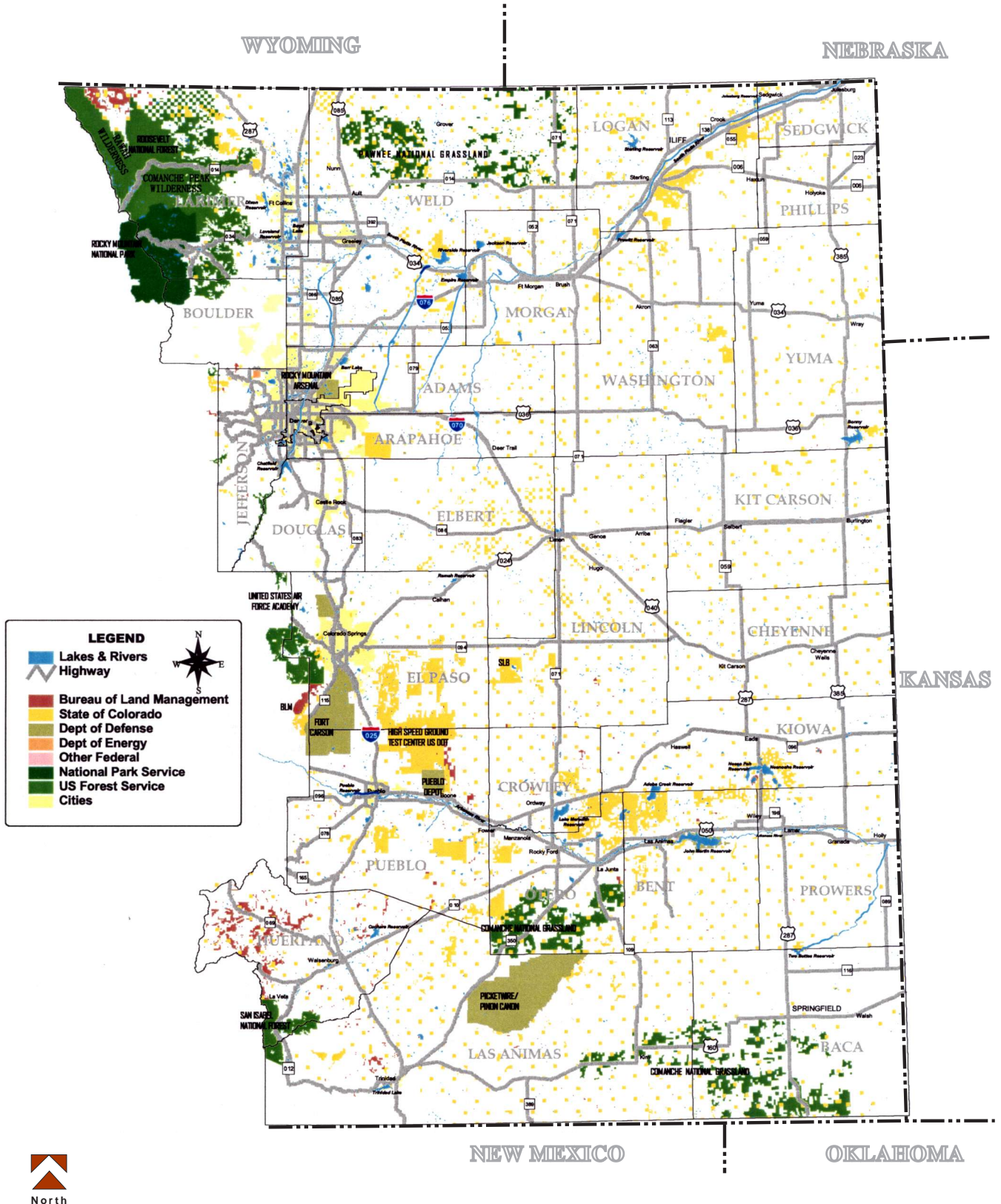
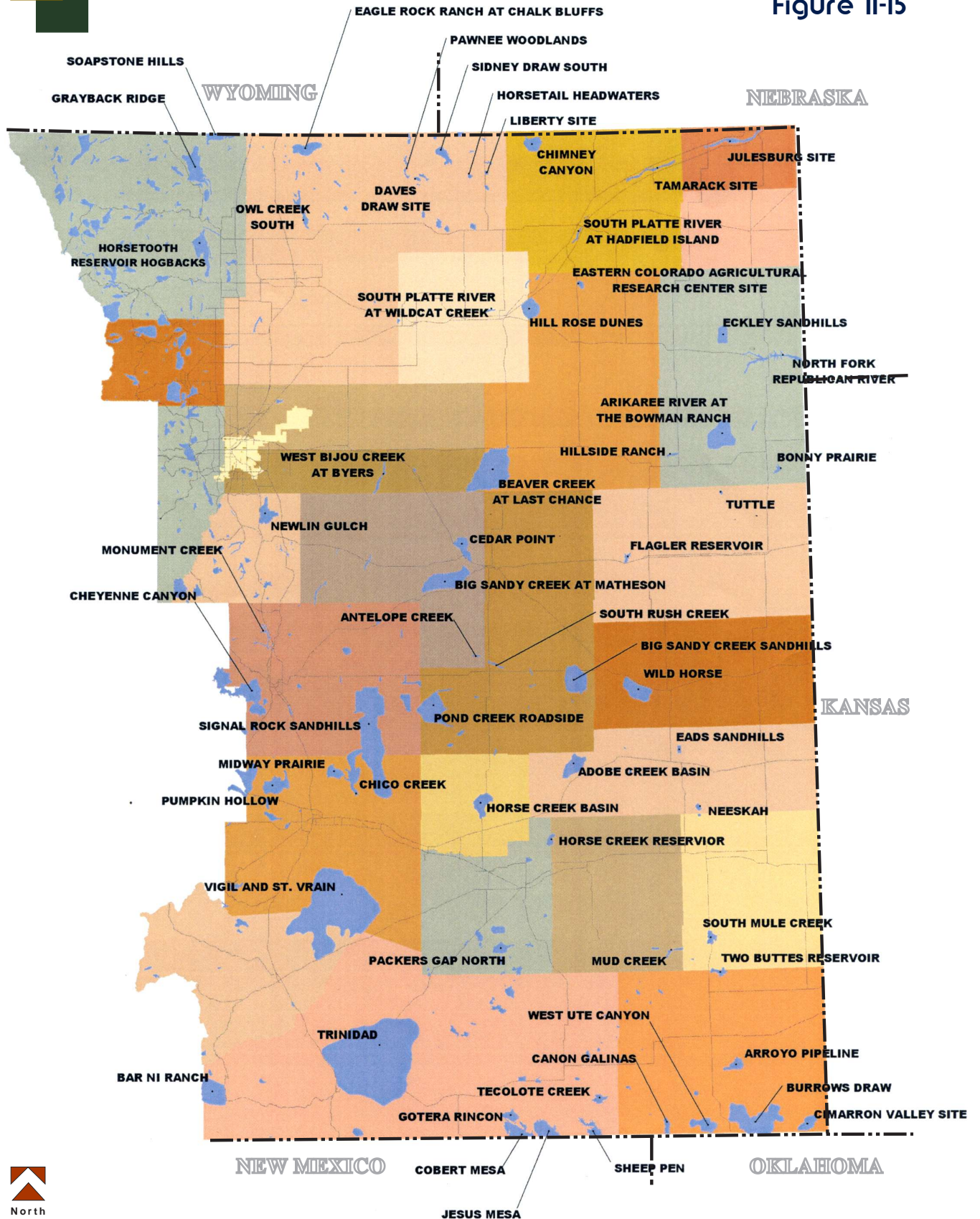


Figure II-15



3. Socio-Economic

Population

Population data were obtained from the Colorado Department of Local Affairs and are summarized by county in Table II-4. In year 2000 the total population in the study area was about 3.6 million persons. However, a very large portion of this population resided in counties along the Front Range. With a few exceptions, most of the counties in the eastern part of the study area had a population of less than 10,000 persons.

Figure II-16 depicts the 2000 population density per square mile for each county. As shown, the majority of counties with the highest density are located in the western part of the study area, while the agricultural areas to the east are much more sparsely populated.

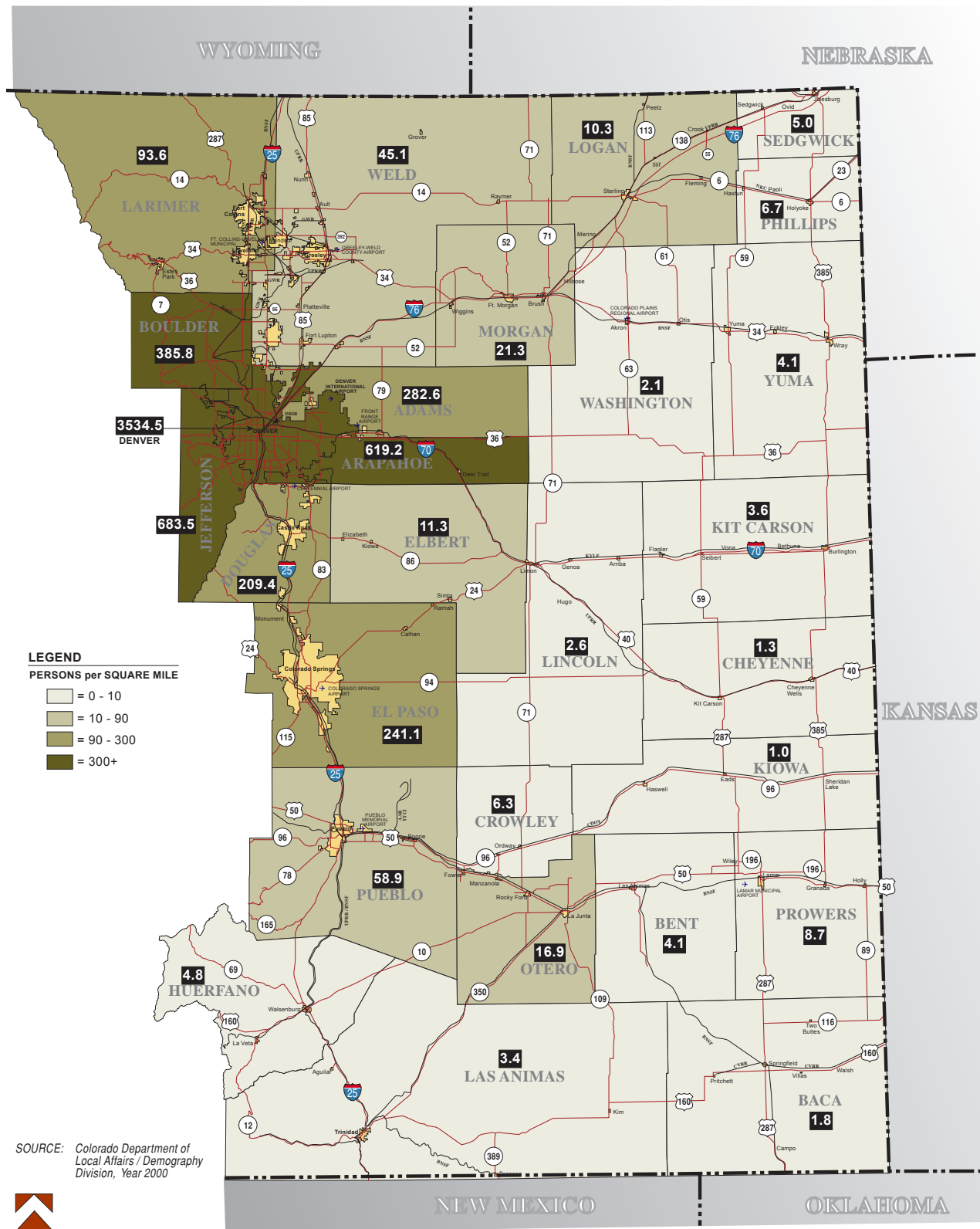
Table II-4 also summarizes year 2025 population estimates and annual average growth rates for each county, as projected by the Colorado Department of Local Affairs. As shown, the total population is projected to grow to nearly 5.3 million persons in this time frame, reflecting an overall average growth rate of about 1.5 percent. Figure II-17 graphically depicts these projected growth rates. As can be readily seen from this figure, the higher growth rates are expected to occur in the western part of the study area; the eastern counties are generally expected to grow at a rate of less than 1 percent per year.

Table II-4 Existing and Projected Population

County	2000 Population	2025 Population	Average Annual Growth Rate (%)
Adams	336,911	602,567	2.4
Arapahoe	497,309	612,447	0.8
Baca	4,561	5,066	0.4
Bent	6,260	7,191	0.6
Boulder	286,458	409,142	1.4
Cheyenne	2,393	2,632	0.4
Crowley	4,940	5,192	0.2
Denver	541,836	671,015	0.9
Douglas	175,935	396,679	3.3
Elbert	20,947	55,648	4.0
El Paso	512,830	739,124	1.5
Huerfano	7,658	11,597	1.7
Jefferson	527,789	634,847	0.7
Kiowa	1,786	1,999	0.5
Kit Carson	7,822	8,856	0.5
Larimer	243,414	368,467	1.7
Las Animas	16,321	22,193	1.2
Lincoln	6,704	8,016	0.7
Logan	18,851	32,448	2.2
Morgan	27,378	40,251	1.6
Otero	21,292	24,987	0.6
Phillips	4,632	5,584	0.8
Prowers	14,222	17,096	0.7
Pueblo	140,785	194,549	1.3
Sedgwick	2,755	3,267	0.7
Washington	5,205	6,008	0.6
Weld	179,963	394,260	3.2
Yuma	9,811	12,032	0.8
Totals	3,626,768	5,293,160	1.5

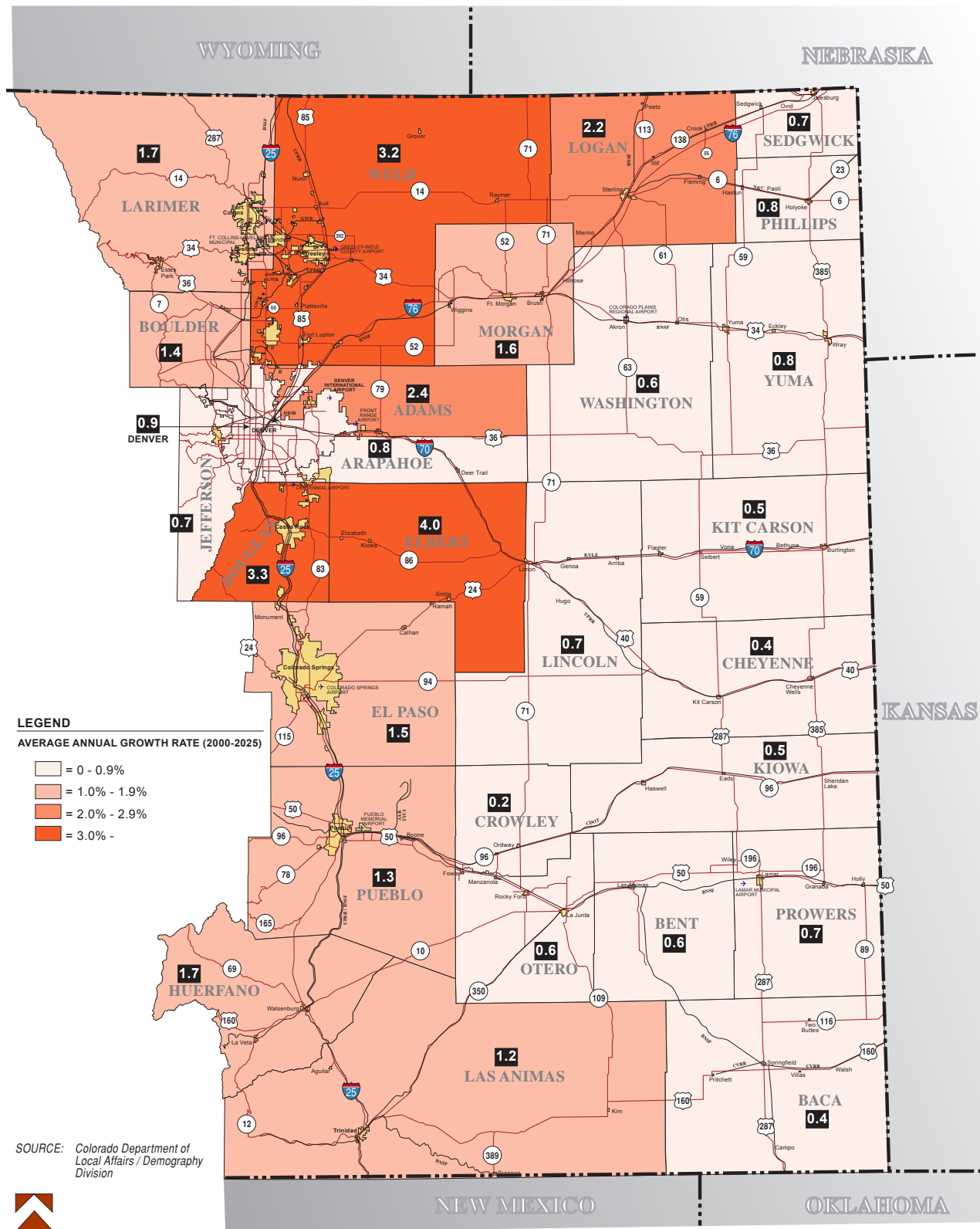
Source: Colorado Department of Local Affairs

Figure II-16



PROJECTED AVERAGE ANNUAL POPULATION GROWTH RATE

Figure II-17



Employment

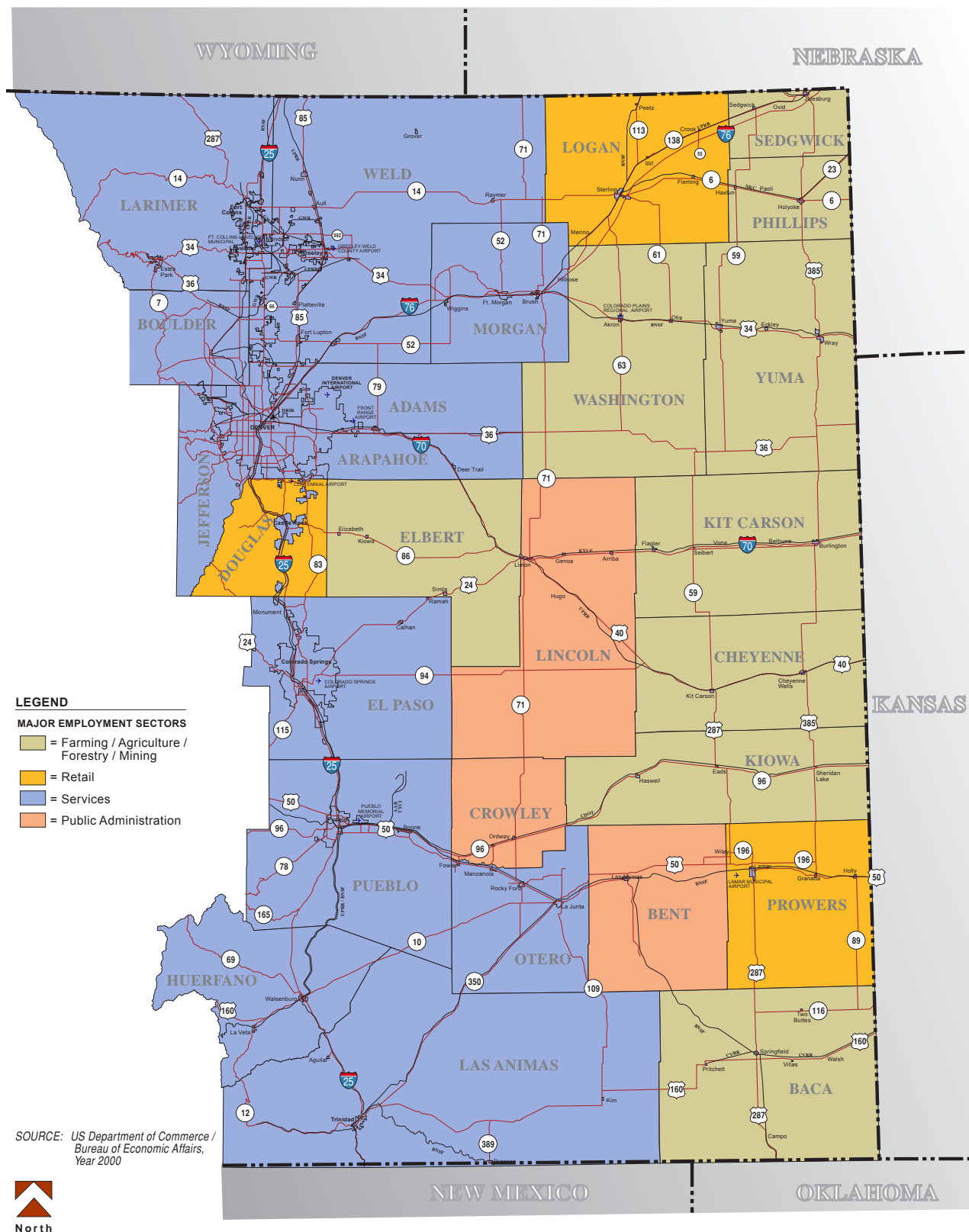
Employment statistics for each county are summarized in Table II-5. As shown, there were about 1.9 million jobs in the study area in 2000; again most of the jobs were located in the western part of the study area. The projections for the year 2025 estimate that there will be approximately 2.8 million jobs, reflecting an average annual growth rate of 1.5 percent for the study area. Individual counties are projected to experience employment growth rates ranging from 0.3 percent to as high as 3.3 percent per year.

It is also interesting to understand the sectors within which these employment opportunities exist. Figure II-18 illustrates the employment sector which represents the greatest number of jobs available in each county. The current largest employment sector for the counties in the western part of the study area is Services, while the major sector for the counties in the eastern part of the study area is Agricultural. It should be noted, however, that many counties have secondary employment sectors nearly as large as the identified primary sector.

Table II-5 Existing and Projected Employment

<i>County</i>	<i>2000 Employment</i>	<i>2025 Employment</i>	<i>Average Annual Growth Rate (%)</i>
Adams	140,710	221,702	1.8
Arapahoe	288,269	370,508	1.0
Baca	1,988	2,133	0.3
Bent	1,891	2,063	0.3
Boulder	170,371	273,909	1.9
Cheyenne	1,119	1,590	1.4
Crowley	1,136	1,515	1.2
Denver	473,211	627,018	1.1
Douglas	54,396	121,350	3.3
Elbert	3,350	7,536	3.3
El Paso	267,556	473,540	2.3
Huerfano	2,699	4,094	1.7
Jefferson	212,435	256,506	0.8
Kiowa	777	921	0.7
Kit Carson	3,870	4,874	0.9
Larimer	121,823	188,323	1.8
Las Animas	5,345	7,717	1.5
Lincoln	2,373	3,599	1.7
Logan	8,601	18,764	3.2
Morgan	12,718	20,625	2.0
Otero	8,276	11,420	1.3
Phillips	2,155	2,704	0.9
Prowers	7,340	9,502	1.0
Pueblo	58,780	88,184	1.6
Sedgwick	1,145	1,549	1.2
Washington	2,007	2,491	0.9
Weld	73,277	101,606	1.3
Yuma	4,610	5,733	0.9
Totals	1,932,228	2,831,476	1.5
Source: Colorado Department of Local Affairs			

Figure II-18



III. Commodity Flows in Eastern Colorado



III. COMMODITY FLOWS IN EASTERN COLORADO

In order to identify potential improvement projects for freight movement in eastern Colorado, it is important to first understand the quantity and types of commodities being transported to, from and through the study area, both now and in the future. It is also useful to understand both existing and projected truck flow patterns.

A. EXISTING COMMODITY FLOWS

The primary source of data regarding existing commodities originating or terminating (or both) within the study area was the 1998 TRANSEARCH database, a national database of the origins and destinations of commodity flows via truck or rail compiled by Reebie Associates. This database includes county-to-county commodity flow data both inside and outside (e.g., other U.S. states, western Colorado counties) the study area and Canadian provinces and Mexican states. These data were supplemented by additional information provided in *the 2001 Annual Agriculture Profile* published by the Colorado Department of Agriculture and through other sources suggested by the Steering Committee.

Table III-1 provides a summary of all commodities either originating or terminating in each county of the study area in 1998.

Table III-1 1998 Commodity Tonnage By County

County	Inbound Tonnage (thousands)	Outbound Tonnage (thousands)	Total Tonnage (thousands)
Front Range Counties			
Adams	11,253.4	5,838.5	17,091.9
Arapahoe	6,609.0	17,534.9	24,143.9
Denver	44,270.1	13,989.3	58,259.4
Douglas	1,170.3	795.9	1,966.2
El Paso	8,324.0	16,857.5	25,181.5
Huerfano	34.7	179.4	214.1
Jefferson	12,215.9	8,300.8	20,516.7
Larimer	6,056.6	3,057.4	9,114.0
Pueblo	8,937.7	3,358.2	12,295.9
Weld	6,085.8	5,638.9	11,724.7
Subtotal	104,957.5	75,550.7	180,508.2
Eastern Plains Counties			
Baca	485.1	513.2	998.3
Bent	220.8	376.5	597.3
Cheyenne	457.8	694.7	1,152.5
Crowley	122.4	403.7	526.1
Elbert	123.3	246.6	369.9
Kiowa	287.2	300.3	587.5
Kit Carson	1,159.2	1,638.5	2,797.7
Las Animas	237.4	305.3	542.7
Lincoln	381.8	417.4	799.2
Logan	1,151.7	1,511.4	2,663.1
Morgan	3,933.5	2,058.4	5,991.9
Otero	736.5	708.1	1,444.6
Phillips	956.0	1,418.9	2,374.9
Prowers	1,003.5	1,188.2	2,191.7
Sedgwick	469.4	601.4	1,070.8
Washington	936.4	1,063.6	2,000.0
Yuma	2,005.4	2,336.9	4,342.3
Subtotal	14,667.5	15,783.3	30,450.8
Total Study Area	119,625.0	91,334.0	210,959.0
Source: TRANSEARCH Database, Reebie Associates			

As shown, the total tonnage for the study area was approximately 211 million tons. About 85 percent (180.5 million tons) of these commodities were associated with the ten Front Range counties (those along the I-25 corridor). The remaining 30.5 million tons were related to the 17 Eastern Plains counties in the study area. Denver County, with 58.3 million tons, accounted for more than twice as much as any other county. Among Eastern Plains counties, Morgan and Yuma Counties were the most active with 6.0 million tons and 4.3 million tons, respectively. In the Front Range counties more commodities flowed into the area (60 percent) than those which originated in the

area. On the other hand, in the Eastern Plains counties, the flows were nearly balanced, with slightly more originating in the area.

The Reebe data also provided insight to the types of commodities being transported in and out of the counties in the study area. For purposes of compiling this information, commodities were aggregated into a commonly used and smaller set of commodity type categories, as defined below.

Commodity Categories

- ◆ **Bulk Materials** consisting of metallic ores, coal, crude petroleum, natural gas, nonmetallic minerals (i.e. gravel, sand, quarry/dimension stone, and clay, ceramic or refractory minerals), ordnance or accessories, petroleum or coal products, and clay, concrete, glass, or stone products.
- ◆ **Farm Products** consisting of poultry, livestock, vegetables, fruit, grain, and seeds. These are raw agricultural products. Outbound products were those generally shipped from points of production (farms and ranches) to storage and processing locations where the products are either transformed (canning, freezing, preparations) or packaged for shipment to market. Some agricultural products (fresh fruits and vegetables) shipped to market from packaging locations were classified as “Farm Products” when shipped from these secondary locations.
- ◆ **Food** consisting of a variety of processed goods, such as pet food, liquors, bakery products, milled goods, food preparations, oils and oil by-products, fresh or chilled meat and poultry, meat products, dairy products, food or kindred products, grain mill products, canned foods, as well as fresh fish or marine products and fish hatcheries.
- ◆ **Manufacturing** consisting of non-durable, or “soft”, manufacturing goods and durable, or “hard”, manufacturing goods such as tobacco products, textiles, apparel, leather goods, furniture and fixtures, pulp and paper products, printed matter, chemicals or allied products, rubber, plastics, primary metal products, fabricated metal products, machinery, electrical equipment, transportation equipment, and photo or optical equipment.
- ◆ **Wood** consisting of forest products, crude barks or gums, lasts and related products, woodenware or flatware, plywood or veneer, wooden containers, lumber or dimension stock, millwork or cabinetwork, lumber/wood products, and primary forest materials.
- ◆ **Other Miscellaneous Freight** consisting of waste or scrap materials, shipping containers, mail or contract traffic, mixed and small packaged freight shipments, secondary traffic (i.e. warehouse and distribution centers, rail intermodal drayage, and air freight drayage), and waste products.

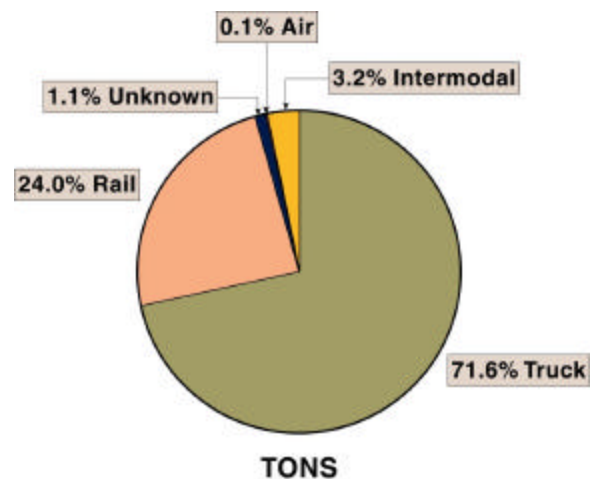
Table III-2 provides a summary of the 1998 tonnage by these commodity types. In the entire area, approximately one-half of the total tonnage is comprised of products in the Bulk Materials commodity group, including minerals, petroleum, and concrete products. In the Front Range counties, this category accounts for nearly 60 percent of all commodities, and the Manufacturing category is the next largest at over 11 percent. However, in the Eastern Plains counties, about two-thirds of the commodities fall into the Farm Products group. The Bulk Materials category is the second largest in these counties, at nearly 21 percent.

Table III-2 1998 Commodity Tonnage by Commodity Type

Commodity Type	Tonnage To / from Front Range Counties (thousands)		Tonnage to / from Eastern Plains Counties (thousands)		Tonnage to / from Study Area (thousands)	
Bulk Materials (Minerals / Petroleum / Concrete)	108,236.4	59.9%	6,307.3	20.7%	114,543.7	54.3%
Farm Products	13,372.1	7.4%	20,699.9	68.0%	34,072.0	16.2%
Food	14,029.1	7.8%	1,348.4	4.4%	15,377.5	7.3%
Manufacturing	20,499.0	11.4%	345.6	1.1%	20,844.6	9.9%
Wood	6,705.2	3.7%	124.4	0.4%	6,829.6	3.2%
Other Misc. Freight	17,666.4	9.8%	1,625.2	5.4%	19,291.6	9.1%
Total	180,508.2		30,450.8		210,959.0	

Source: TRANSEARCH Database, Reebie Associates

Data also suggest that nearly all of these commodities are transported by either truck or rail, or a combination of the two modes. Based on statistics published in the Colorado Commodity Flow Survey conducted by the U.S. Census Bureau as part of the 1997 Economic Census, truck transportation accounts for nearly three-fourths of the commodity flow in Colorado. Rail transportation represents the other one-fourth. Hence, these two modes of freight transportation are most important in eastern Colorado.



B. PROJECTED COMMODITY FLOWS

Projected freight commodity flows were developed using locally based economic growth factors to represent expected future transportation demands in the study area. This forecasting process was implemented to identify the change in freight travel demand from 2000 to 2025. In order to develop forecasts of commodity flows for 2025, the following data inputs were used:

- ◆ Base Year Commodity Flows;
- ◆ Employment Data from 2000 to 2025;
- ◆ Regional Economics Model, Inc. (REMI) U.S. Forecast Data; and
- ◆ Bureau of Economic Analysis (BEA) Input/Output Tables.

Using the data specified above, the forecasting process included the development of three growth factors to accurately predict 2025 commodity flows by type, county, and direction (inbound and outbound):

- ◆ ***Employment-Based Initial Growth Factors for Inbound and Outbound Commodities*** – Employment data were used as the basis for developing an initial set of growth factors for all commodity types by county. The difference in employment between 2000 and 2025 for each related commodity category was computed and used to create an initial growth factor by category and county for commodities originating or terminating in the study area. Woods & Poole employment data for the nation as a whole were also used to create initial

growth factors for commodity movements with origins or destinations outside of the study area.

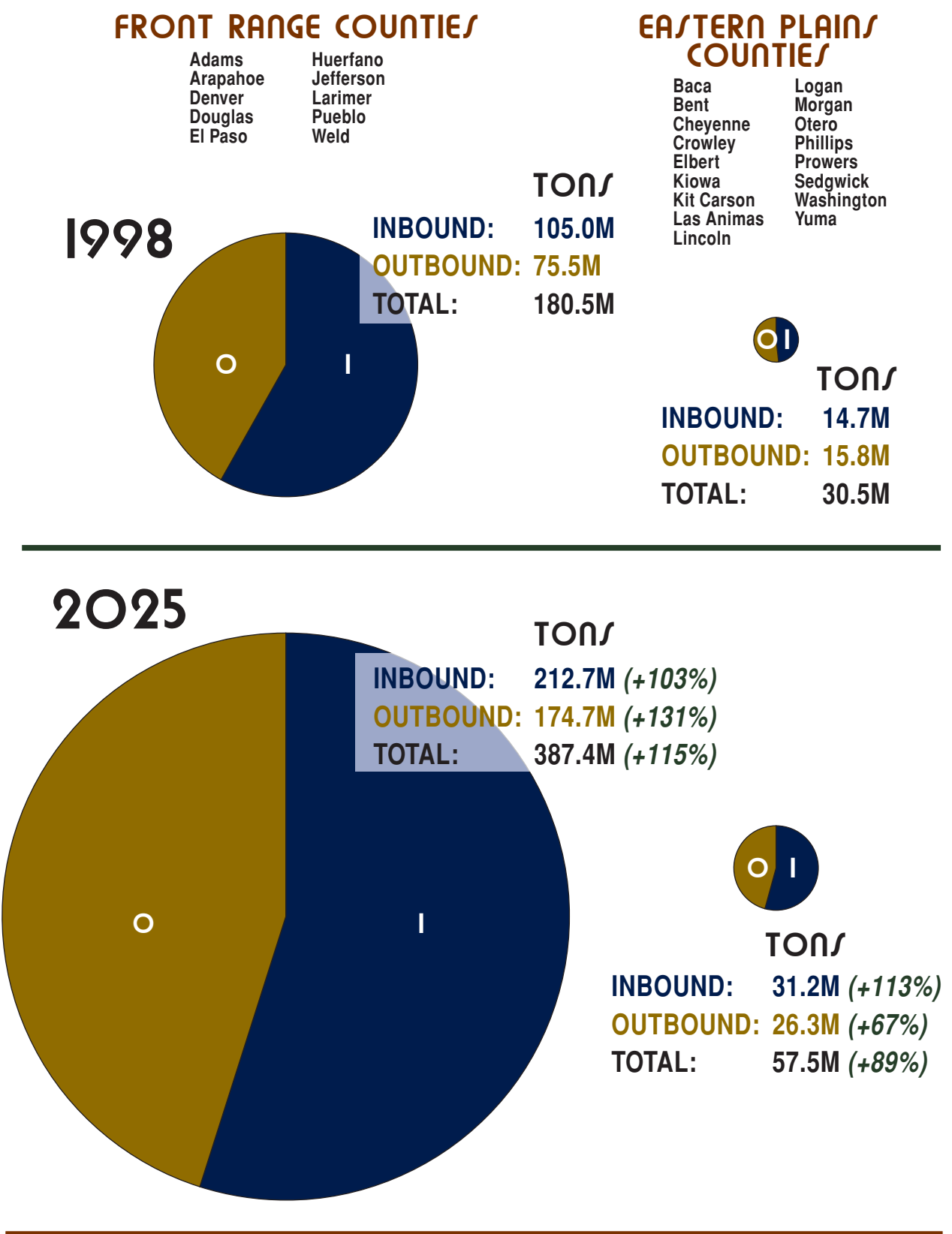
- ◆ ***Productivity-Based Adjusted Growth Factors for Outbound Commodities*** – In order to more accurately reflect growth in commodity output (outbound), it was necessary to adjust the initial growth factors for changes in productivity over time. The REMI U.S. Forecast Data for productivity by employment category were used to calculate these changes. The changes in productivity between 2000 and 2025 were computed and then multiplied by the initial growth factors to create an adjusted commodity flow growth factor by category and county.
- ◆ ***Consumption-Based Adjusted Growth Factors for Inbound Commodities*** – The BEA data were used to provide input/output tables indicating the amount of each commodity type consumed by each industry. The productivity-based growth factors were then multiplied with these tables to create consumption-based growth factors by county for each commodity for inbound flows.

1. 2025 Commodities Originating/Terminating in Eastern Colorado

Application of this forecasting process to the existing commodity flow data resulted in the projections of 2025 commodity flows summarized in Table III-3. As shown, the commodities originating or terminating within the study area are projected to increase to nearly 445 million tons, reflecting more than a doubling of existing commodity totals. The tonnage in and out of the Front Range counties is projected to grow to over 387 million tons, while the Eastern Plains counties are expected to experience an increase to about 57.5 million tons. Figure III-1 depicts a comparison of these commodity projections with the existing commodity flows. As shown, the commodities associated with the ten Front Range counties are projected to grow by approximately 115 percent, while the commodities of the Eastern Plains counties are estimated to grow by nearly 90 percent.

Table III-3 2025 Commodity
Tonnage by County

County	Inbound Tonnage (thousands)	Outbound Tonnage (thousands)	Total Tonnage (thousands)
Front Range Counties			
Adams	26,331.2	13,987.8	40,319.0
Arapahoe	15,446.4	39,831.9	55,278.3
Denver	74,521.8	28,297.3	102,819.1
Douglas	3,289.1	1,769.3	5,058.4
El Paso	21,320.8	45,390.1	66,710.9
Huerfano	70.6	523.2	593.8
Jefferson	25,969.3	18,506.3	44,475.6
Larimer	15,512.1	8,666.1	24,178.2
Pueblo	15,516.5	7,468.4	22,984.9
Weld	14,717.7	10,261.1	24,978.8
Subtotal	212,695.4	174,701.4	387,396.8
Eastern Plains Counties			
Baca	929.9	687.9	1,617.8
Bent	428.0	601.3	1,029.3
Cheyenne	883.7	1,073.0	1,956.7
Crowley	242.9	762.9	1,005.8
Elbert	280.4	547.0	827.4
Kiowa	699.4	450.2	1,149.6
Kit Carson	2,453.4	2,387.8	4,841.2
Las Animas	491.9	708.0	1,199.9
Lincoln	734.9	520.2	1,255.1
Logan	2,005.4	2,354.8	4,360.2
Morgan	9,496.7	3,886.1	13,382.8
Otero	1,385.4	1,176.1	2,561.5
Phillips	2,137.0	2,612.3	4,749.3
Prowers	2,417.0	2,242.8	4,659.8
Sedgwick	803.0	936.2	1,739.2
Washington	1,905.2	1,582.2	3,487.4
Yuma	3,931.8	3,793.8	7,725.6
Subtotal	31,226.1	26,322.7	57,548.8
Total Study Area	243,921.5	201,024.1	444,945.6
Source: Estimates by Cambridge Systematics, Inc.			



This projection process also provided estimates of the future tonnage by commodity type. As Table III-4 shows, overall there is projected to be a slight increase in the percentage of Bulk Materials and a slight decrease in the percentage of Farm Products. This trend is true in both the Front Range and the Eastern Plains counties.

Table III-4 2025 Commodity Tonnage By Commodity Type

Commodity Type	Tonnage to / from Front Range Counties (thousands)		Tonnage to / from Eastern Plains Counties (thousands)		Tonnage to / from Study Area (thousands)	
Bulk Materials (Minerals / Petroleum / Concrete)	241,107.6	62.2%	14,067.4	24.4%	255,175.0	57.3%
Farm Products	23,596.5	6.1%	35,069.5	60.9%	58,666.0	13.2%
Food	28,248.5	7.3%	3,378.8	5.9%	31,627.3	7.1%
Manufacturing	42,690.4	11.0%	733.6	1.3%	43,424.0	9.8%
Wood	13,932.8	3.6%	345.0	0.6%	14,277.8	3.2%
Other Misc. Freight	37,821.0	9.8%	3,954.5	6.9%	41,775.5	9.4%
Total	387,396.8		57,548.8		444,945.6	

Source: Estimates by Cambridge Systematics, Inc.

two maps prepared by the Federal Highway Administration to depict the projected NAFTA truck traffic volumes on the nation's highway network in the year 2020. These maps suggest that, while some increase in truck traffic in Colorado may be experienced, for the most part the largest volumes of NAFTA-related traffic will not bisect Colorado. I-80 north of Colorado is a key route, and I-76 to I-70 through Colorado also will experience some growth due to NAFTA.

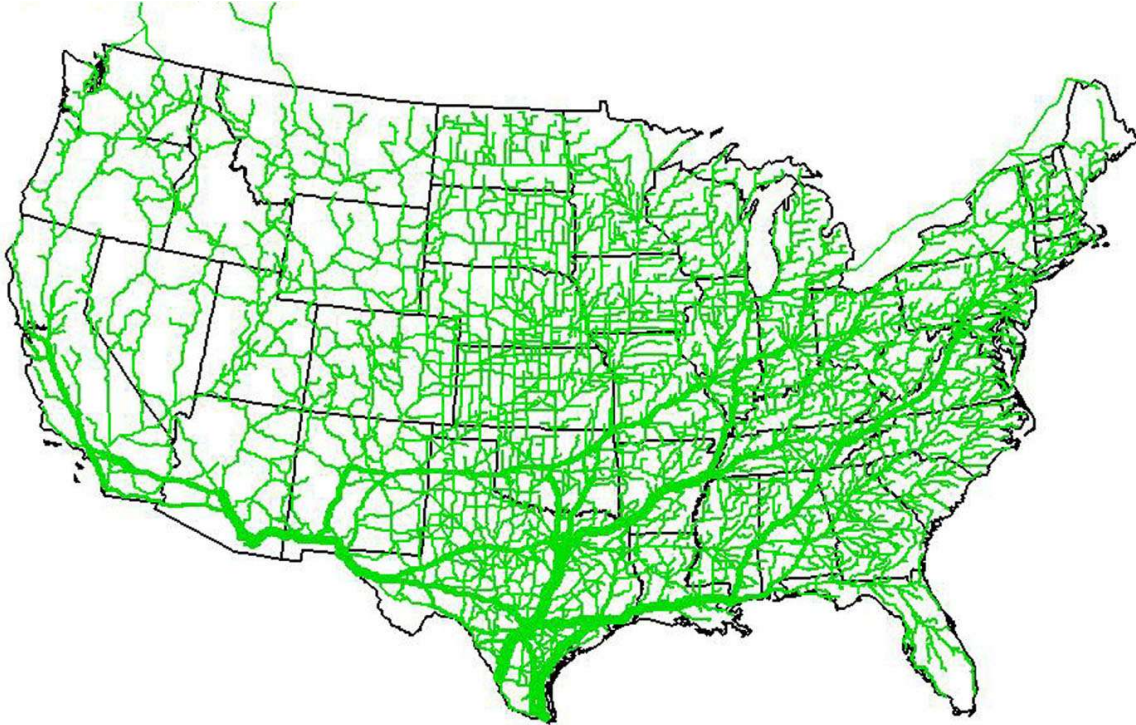
As previously noted, however, Colorado is considered to be a "bridge" state in the national infrastructure system for the movement of freight, resulting in substantial quantities of domestic goods flowing through the state. It is expected that this will continue to grow as economic development expands throughout the nation. It has been projected in the travel demand model for this study that through truck movements will more than double by the year 2025.

2. Through Truck Flows

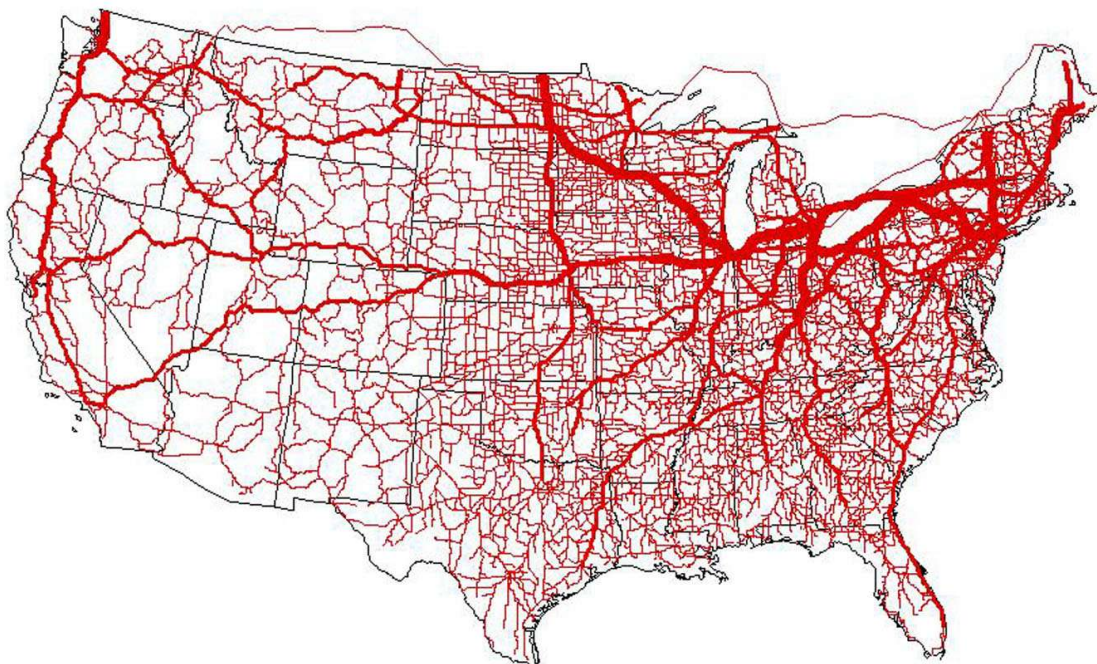
One of the issues to be considered in projecting future commodity flow needs is growth in commodities flowing through the state, with neither an origin nor a destination within Colorado. With the implementation of the North American Free Trade Agreement (NAFTA) in 1994, the potential for Colorado being significantly impacted by increased international trade flows was explored in this study. Much of this trade is expected to be transported by truck. Figure III-2 illustrates

Figure III-2

US/Mexico



US/Canada



SOURCE: Federal Highway Administration

C. PROJECTED FLOW PATTERNS

1. Travel Demand Model Development

To project 2025 vehicular travel demand on the roadway system in eastern Colorado, separate freight and passenger demand models were developed and then combined. The eastern Colorado model was developed in TransCAD transportation modeling software and was based on available transportation, socio-economic, and travel behavior data obtained from the Colorado Department of Transportation (CDOT), the Denver Regional Council of Governments (DRCOG), the North Front Range Transportation and Air Quality Planning Council (NFRT & AQPC), and the Pikes Peak Area Council of Governments (PPACG). Essentially, the available Front Range models were combined and then expanded to include the remainder of the study area.

The model was first calibrated with year 2000 travel data. The passenger vehicle travel demand was estimated to identify background network traffic volumes, which were important to understand and assess the potential truck movements, route diversions, and traffic congestion impacts related to the alternative freight corridor improvements to be evaluated in this study. This portion of the demand was estimated through the traditional four-step travel demand modeling process (trip generation, trip distribution, mode choice, and trip assignment). The truck element of the travel demand was estimated by using the commodity flows previously outlined. These commodity flow estimates were converted to daily truck trips by using average cargo

weights per truckload for each commodity type.

Once calibrated, the model was used to project year 2025 travel volumes and patterns. Future employment and population forecasts were instrumental in the passenger element, and the projected commodity flow data were used to develop growth factors for the truck volumes. The future passenger and truck trips were assigned within the TransCAD software to the 2025 network. By appropriately modifying the network, the effects of alternative corridor improvements on congestion and diversion could be assessed.

2. Primary Truck Flow Patterns

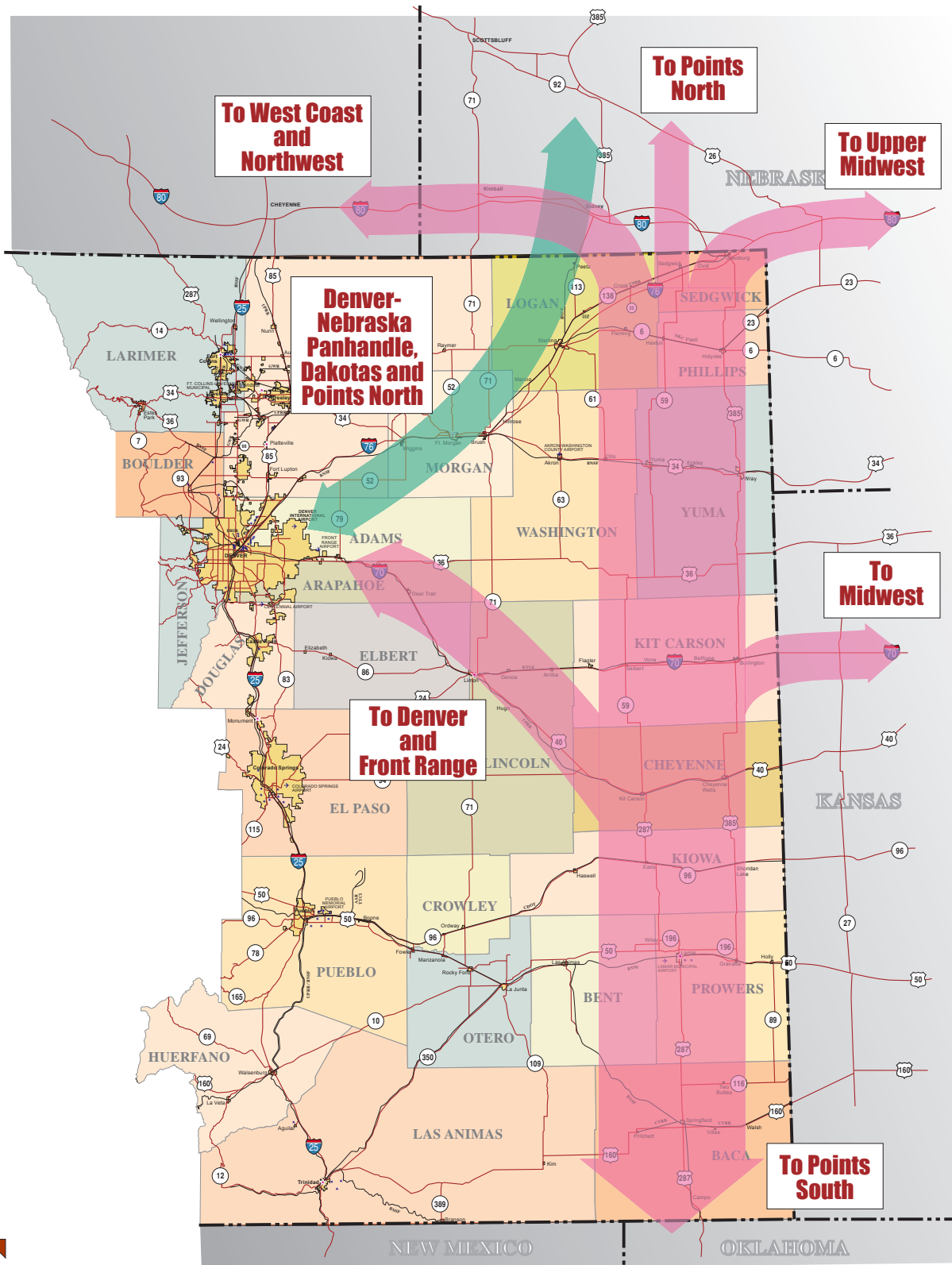
The travel demand model showed that, when evaluating potential highway corridor alternatives in eastern Colorado, there are varied truck traffic flow patterns which must be considered. Figure III-3 illustrates the variety of patterns to be served in the study area.

Clearly, one movement is between Denver and the Nebraska Panhandle, the Dakotas, and points farther north; this is the flow pattern intended to be served by the Heartland Expressway.

Eastern Colorado Mobility Study



North



The other patterns shown reflect movements to and from the south (via either I-25 or US 287). The movement between Denver and these points would be well served by the Ports to Plains Corridor. The other north-south movements, if not destined for Denver, are projected to go to multiple points. Some truck traffic will divert to I-70 to head to the Midwest, but the larger volumes will be destined to I-76 (and then to I-80) to head to the Upper Midwest or to I-80 to travel to the West Coast and the Northwest. These two demand patterns are

projected to be nearly equal in volume. Finally, some, (although considerably less than the other two movements)+ truck trips will continue to points farther north.

This variety in the truck patterns to be served will be a significant factor in the evaluation of potential alternative corridor improvements.

IV. Highway System Analysis



IV. HIGHWAY SYSTEM ANALYSIS

A. IDENTIFICATION OF ALTERNATIVE CORRIDORS

As noted in Section I of this report, the Transportation Equity Act for the 21st Century (TEA-21) designated three “High Priority Corridors” in Colorado which are part of a nationwide system of 43 such corridors. The Camino Real Corridor was specifically designated as I-25 through the state. Specific routes for the other two corridors were not designated by the Act.

The Ports to Plains Corridor, running from Laredo, Texas to Denver, was the subject of an extensive planning effort in recent years. In June, 2002 Wilbur Smith Associates published the *Ports to Plains Feasibility Study*, which evaluated a wide range of alternative corridors. Subsequently, in July, 2001 representatives of the Colorado, Oklahoma, Texas and New Mexico Departments of Transportation agreed on the designation of a specific route for the Ports to Plains Corridor. In Colorado, the designated route includes US 287 from the Colorado/ Oklahoma stateline to Limon and I-70 from Limon to Denver.

The Heartland Expressway has also been the subject of considerable study over the years. In 1993 Wilbur Smith Associates completed the *Heartland Expressway Economic and Engineering Feasibility Study, Scottsbluff, NE – Rapid City, SD* for the Nebraska Department of Roads and the South Dakota Department of Transportation. As a result of this study, a route was designated along US 385 south

from Alliance, Nebraska and on US 26 into Scottsbluff.

The segment of the Heartland Expressway from Scottsbluff to Denver was the subject of a study completed in 1995 for the Wyoming Department of Transportation, the Colorado Department of Transportation, and the Nebraska Department of Roads (*Heartland Expressway South Economic and Engineering Feasibility Study*, Wilbur Smith Associates). This study did not, however, result in a designated route for this segment.

The analysis of the commodity flow patterns and the results of these previous corridor planning efforts in Colorado suggest that there are two primary highway corridor planning issues to be addressed by the Eastern Colorado Mobility Study:

- ◆ Designating a corridor for the continuation of the Heartland Expressway from its current terminus in Scottsbluff to Denver (also referred to in this study as Heartland Expressway South).
- ◆ Identifying a corridor to serve as a connector route between the Heartland Expressway and the Ports to Plains Corridor.

Additionally, this study should identify those other corridors which are important to freight mobility in eastern Colorado by providing support to these primary north-south corridors.

1. Heartland Expressway South Alternatives

In November, 1999 the Transportation Commission of Colorado adopted a resolution stating that “CDOT is committed to diverting traffic from congested segments of I-25”, thus discouraging any additional truck traffic on I-25. Recognizing this resolution, two alternative routes were identified for the extension of the Heartland Expressway south of the already designated segment in Nebraska. As illustrated on Figure IV-1, one alternative would be routed along SH 71 south from Scottsbluff to I-76 at Brush, Colorado and then via I-76 into Denver. The second alternative would include a routing along US 385 south to Sidney, Nebraska, then along SH 113 to I-76 at Sterling, Colorado, and onto Denver via I-76.

2. Corridor Connector Alternatives

By definition as established in TEA-21, both the Ports to Plains Corridor and the Heartland Expressway are to terminate in Denver. However, because the analysis of truck flow patterns suggests that not all trucks need to go to or through Denver and because of congestion issues already experienced in Denver, the objective of a corridor connector would be to provide an attractive route to connect between the Ports to Plains Corridor and the Heartland Expressway without having to travel through Denver.

Based on a review of the state highway system, input from the Steering Committee, and input from the initial public open houses, four alternative routes connecting the Heartland Expressway and the Ports to Plains Corridor were identified: SH 71,

SH 59/63, SH 59, and US 385. Each of these routes could connect with either of the Heartland Expressway South alternatives.

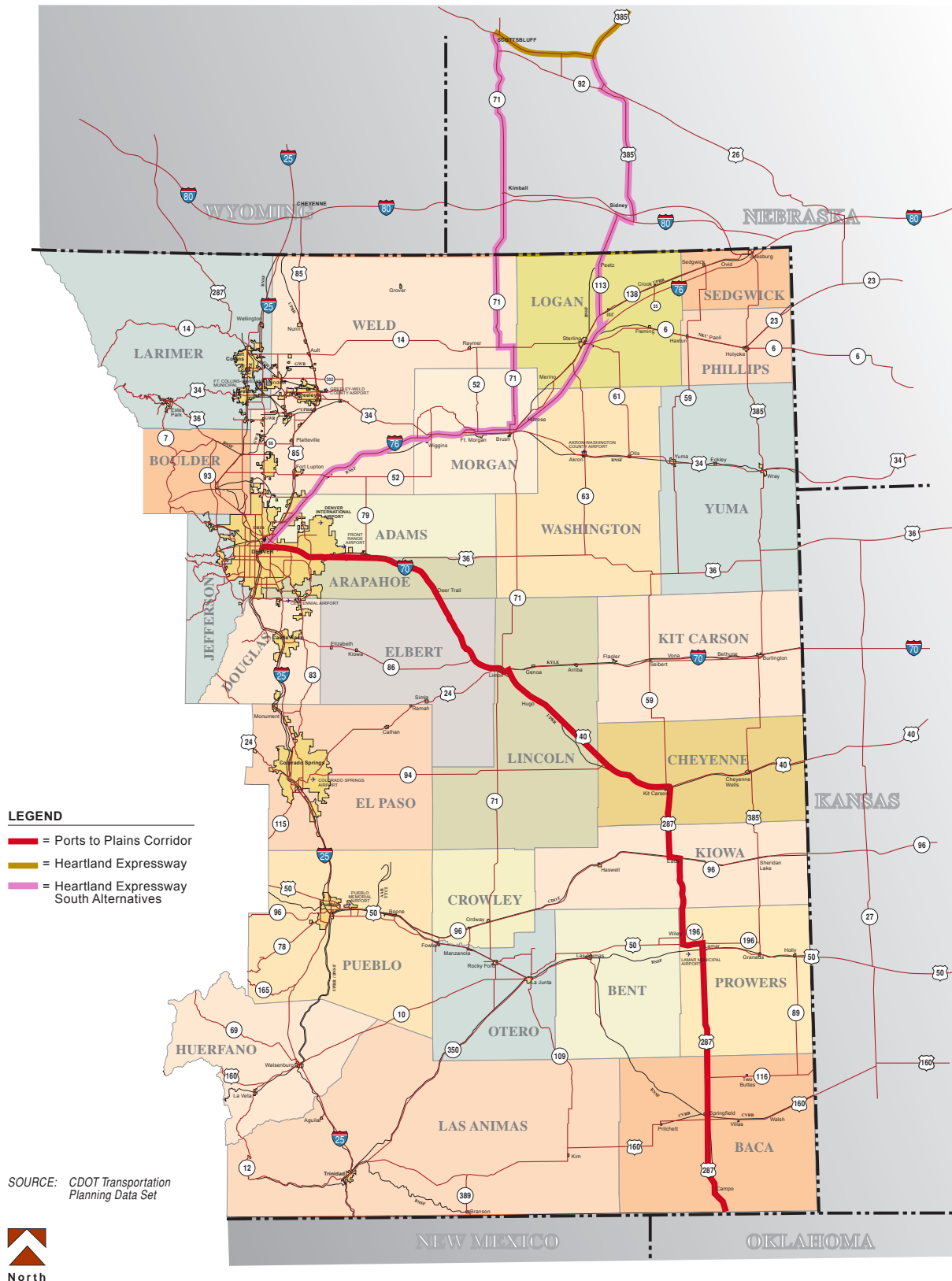
Because eastern Colorado would best be served if these corridors worked together as a system, the two Heartland Expressway South alternatives were combined with the four corridor connector alternatives, resulting in eight scenarios to be assessed in the evaluation process. These eight scenarios are graphically depicted on Figures IV-2 and IV-3.

3. Other Freight Corridor Alternatives

Potential Support Corridors

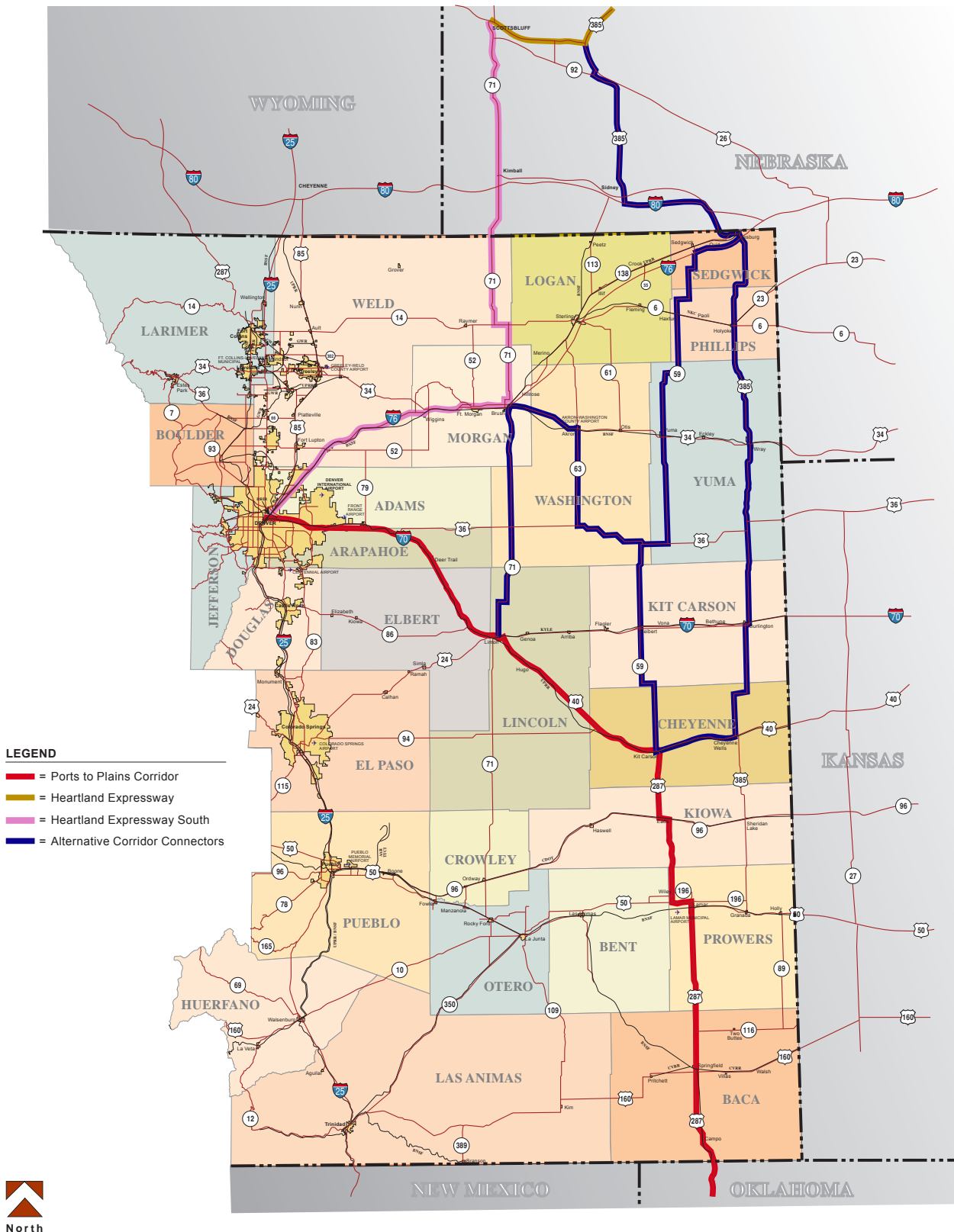
Identification of the potential support corridors began with a review of the entire state highway system in eastern Colorado. The initial screening of all alternatives was based on an assessment of whether the corridor currently carries a significant volume of trucks, whether the corridor would have the potential to serve a key freight movement if it were improved and whether improvements to the corridor would likely provide significant economic benefit to the region or state. Based on this initial assessment, the corridors illustrated on Figure IV-4 were identified for further consideration as corridors worthy of improvement to enhance freight mobility in eastern Colorado.

Figure IV-1



HEARTLAND EXPRESSWAY SOUTH: SH71 ALTERNATIVE and ALTERNATIVE CORRIDOR CONNECTORS

Figure IV-2



HEARTLAND EXPRESSWAY SOUTH: SHI3 ALTERNATIVE and ALTERNATIVE CORRIDOR CONNECTORS

Figure IV-3

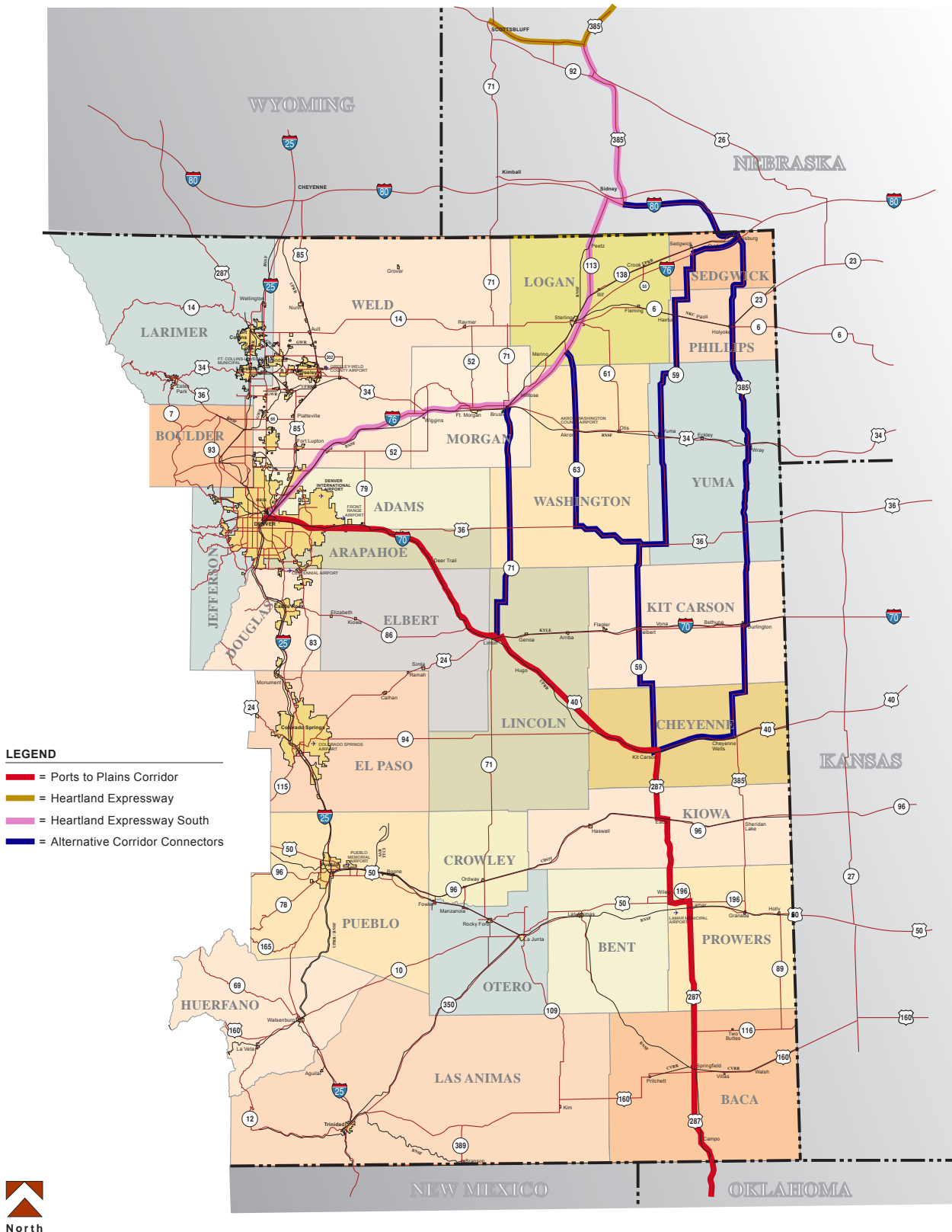
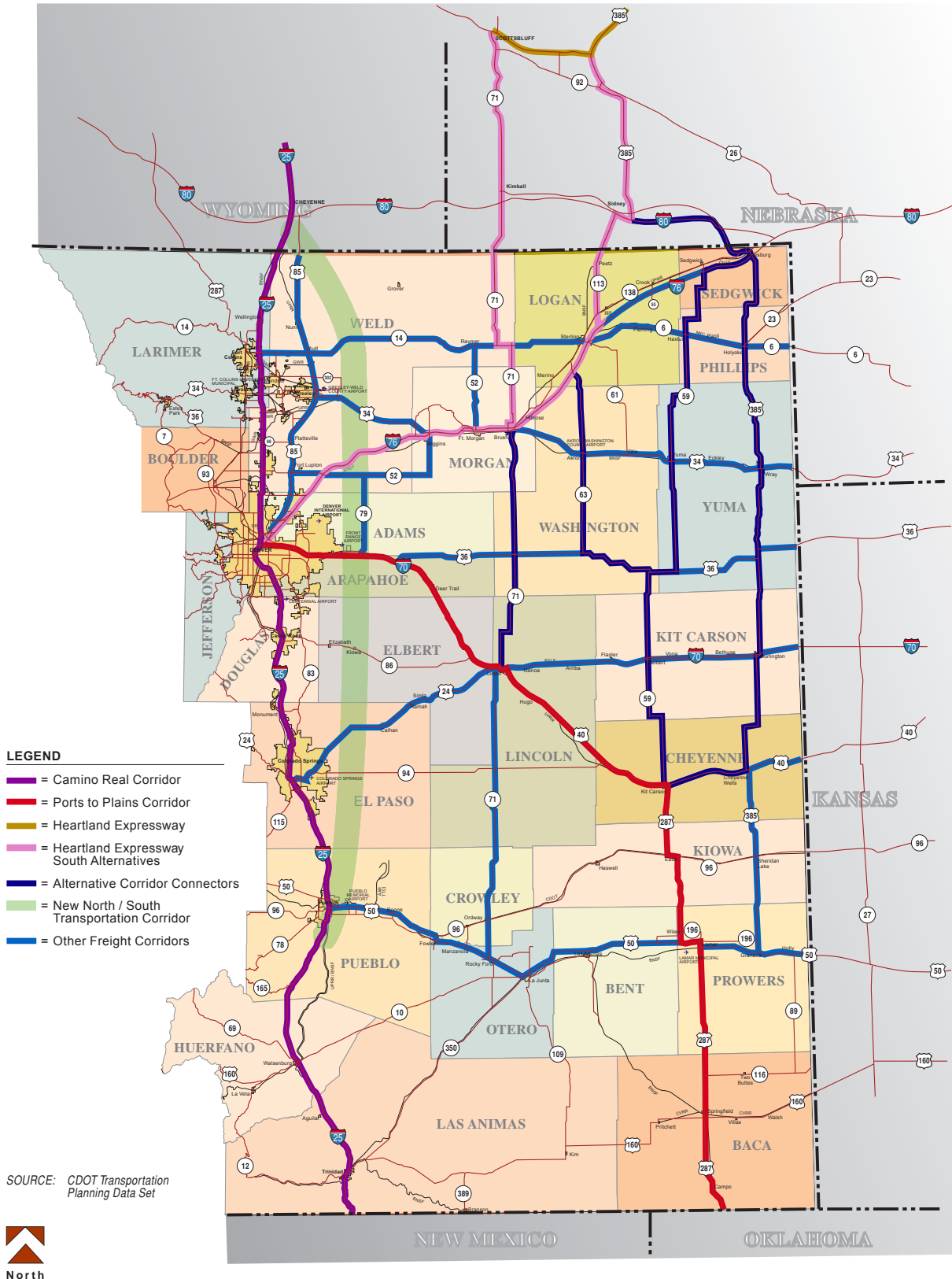


Figure IV-4



New North/South Transportation Corridor

In 1986 the Front Range Toll Road Company was created to assess the feasibility of a new rail/highway freight corridor bypassing the major population centers along the Front Range. This concept was considered in this study as the New North/South Transportation Corridor. As shown on Figure IV-4, this corridor would leave I-25 at a point south of Pueblo, and would then run east of Pueblo, Colorado Springs, Denver (in the vicinity of Front Range Airport and DIA), and Greeley. The Front Range Toll Road Company's plan would connect back to I-25 in the vicinity of Wellington, Colorado. However, the concept shown on the graphic would extend this corridor to Speer, Wyoming, where it is believed that the rail portion of the corridor could better connect to the existing rail network.

The New North/South Transportation Corridor would consist of new railroad and highway alignments, as well as provisions for pipelines, communication systems, and other utilities as may be desired. The corridor alignment would be grade separated from any existing rail, highway or other infrastructure; junctions with existing major railroad lines would be provided, as would interchanges with existing major highways. The highway element of the corridor would consist of a four-lane divided concrete roadway designed to accommodate safe, high speed, heavy truck traffic. The railroad portion of the corridor would initially consist of double track, with expansion capability for a third track in the future. As envisioned, the corridor would include a right-of-way of 660 feet to allow for all facilities, to provide for expansion, and to create a buffer.

Initially, the Steering Committee requested that this concept alternatively be considered in a corridor located farther to the east. However, after an evaluation of both corridors, it was believed that the western alignment (as shown) would be better situated to fulfill the stated function of bypassing the congested areas in the Front Range, while still being reasonably accessible to destinations in the urban areas. It was, therefore, agreed that any further consideration of this concept would be based on the western alignment.

However, because this transportation corridor concept is being actively pursued as a private initiative at this time, this study is not intended to be an evaluation of the feasibility of the new corridor. Instead, the approach has been to treat the concept as a project that may happen and, if it does, to consider its effects on decisions being made about other corridors.

B. EVALUATION OF ALTERNATIVES

1. Evaluation Criteria/ Measures

Evaluation criteria and measures were developed for this study to assess the alternative routes and to prepare a comparison of the results. Factors in the evaluation include traffic service related elements, engineering elements and costs, environmental and community aspects and financial feasibility. Table IV-1 summarizes the criteria, provides a general description of each criterion and identifies the measures which were applied to the various alternative corridors in the evaluation process.

Table IV-1 Corridor Evaluation Criteria and Measures

<i>Evaluation Criterion</i>	<i>Description</i>	<i>Evaluation Measure</i>
Need Based on Traffic	Evaluation determines if alternative improvements need to be built to handle current and future traffic volumes.	<ul style="list-style-type: none"> ◆ Truck Utilization (avg. daily truck volume along corridor) ◆ Traffic Utilization (avg. daily traffic volume along corridor) ◆ Daily Trucks Diverted from I-25 (2025)
Travel Efficiency	Evaluation determines how well each alternative would improve travel, resulting in user benefits.	<ul style="list-style-type: none"> ◆ Trip Length between termini (measured for several key truck patterns) ◆ Trip Travel Time between termini ◆ Change in Daily Vehicle Miles Traveled (VMT) in Study Area (2025) ◆ Change in Daily Vehicle Hours Traveled (VHT) in Study Area (2025) ◆ Change in Annual Number of Accidents in Study Area (2025) ◆ Annual User Cost Savings
Engineering/Cost Feasibility	Evaluation identifies any unusual engineering difficulties and the costs associated with each alternative.	<ul style="list-style-type: none"> ◆ Length of Reconstruction Required in Colorado ◆ Length of Reconstruction in Developed Areas ◆ Right-of-Way Acquisition in Colorado ◆ Project Cost (including construction, engineering, right-of-way)
Environmental/Land Use Impacts	Evaluation identifies the potential level of impacts on the environment caused by the implementation of the alternative.	<ul style="list-style-type: none"> ◆ Air Quality ◆ Noise ◆ Major Streams ◆ Endangered Species ◆ Public Lands ◆ Hazardous Materials ◆ Cultural Resources
Socio-Economic / Economic Impacts	Evaluation determines the potential for positive economic and development impacts on the communities along the corridor and within the study area.	<ul style="list-style-type: none"> ◆ Number of Communities along Corridor ◆ 2000 Population ◆ 2025 Population ◆ 1990 Poverty Status ◆ 1990 Minority Population ◆ Median Household Income ◆ Employment Growth – User Benefits ◆ New Disposable Income – User Benefits ◆ Employment Growth – Construction ◆ New Disposable Income - Construction
Financial Feasibility	Evaluation measures the relative comparison of the project-related benefits with the costs of the alternative.	<ul style="list-style-type: none"> ◆ Cost Effectiveness Ratio

2. Findings of Corridor Evaluations

As noted earlier, the two Heartland Expressway South alternatives could be combined with each of the four corridor connector options, resulting in eight system alternatives to be evaluated. A detailed evaluation of each of these eight alternatives was conducted by compiling data for all of the evaluation measures into spreadsheets for comparison purposes. Based on the range of the data for each evaluation measure, a rating system

representing Most Favorable, Moderate, and Least Favorable options was created. Ultimately, a total rating was developed for each corridor alternative according to each criterion.

The following sections address the results of the evaluation for each of the six basic criteria. Included are detailed descriptions of the evaluation measures, a table summarizing the data for all alternatives, a graphic summary of the ratings, and a brief discussion of the findings relative to that evaluation criterion.

Need Based on Traffic

DESCRIPTIONS OF EVALUATION MEASURES

Truck Utilization - This measure reflects the average daily truck volume for each alternative corridor. Both existing and projected (2025) volumes were evaluated. The higher the truck volume on an alternative corridor, the more favorably it is rated.

Traffic Utilization - Traffic utilization includes usage by both passenger traffic and truck traffic along any given alternative route. The value is the average daily traffic volume, both current and year 2025. Alternative routes with higher traffic volumes rate more favorably.

Daily Trucks Diverted from I-25 - With the improvement of each alternative route, the travel demand model estimated the reduction in daily truck volume on various segments of I-25 due to the improvement. Alternative corridors which would divert higher numbers of trucks off of I-25 rate more favorably.

In order to compile the data for evaluation measures of this criterion, the travel demand model was used to project future (year 2025) traffic volumes on each of the alternatives. These results are graphically summarized in Figures IV-5 through IV-10. Figures IV-5 and IV-6 illustrate the traffic volumes projected on SH 71 and SH 113 under the two scenarios in which one or the other is improved as the Heartland Expressway. Figures IV-7 through IV-10 illustrate the traffic volumes on each of the four routes under consideration as the corridor connector; each figure depicts the projected volumes on all four routes, with one of the routes assumed to be improved as the connector.

These volumes are also summarized in Table IV-2. As shown, the SH 71 Heartland alternative is projected to serve about twice as many trucks as the SH 113 alternative. In 2025, SH 71 would serve about 450 trucks per day, while SH 113 would carry about 240 trucks per day. Among the

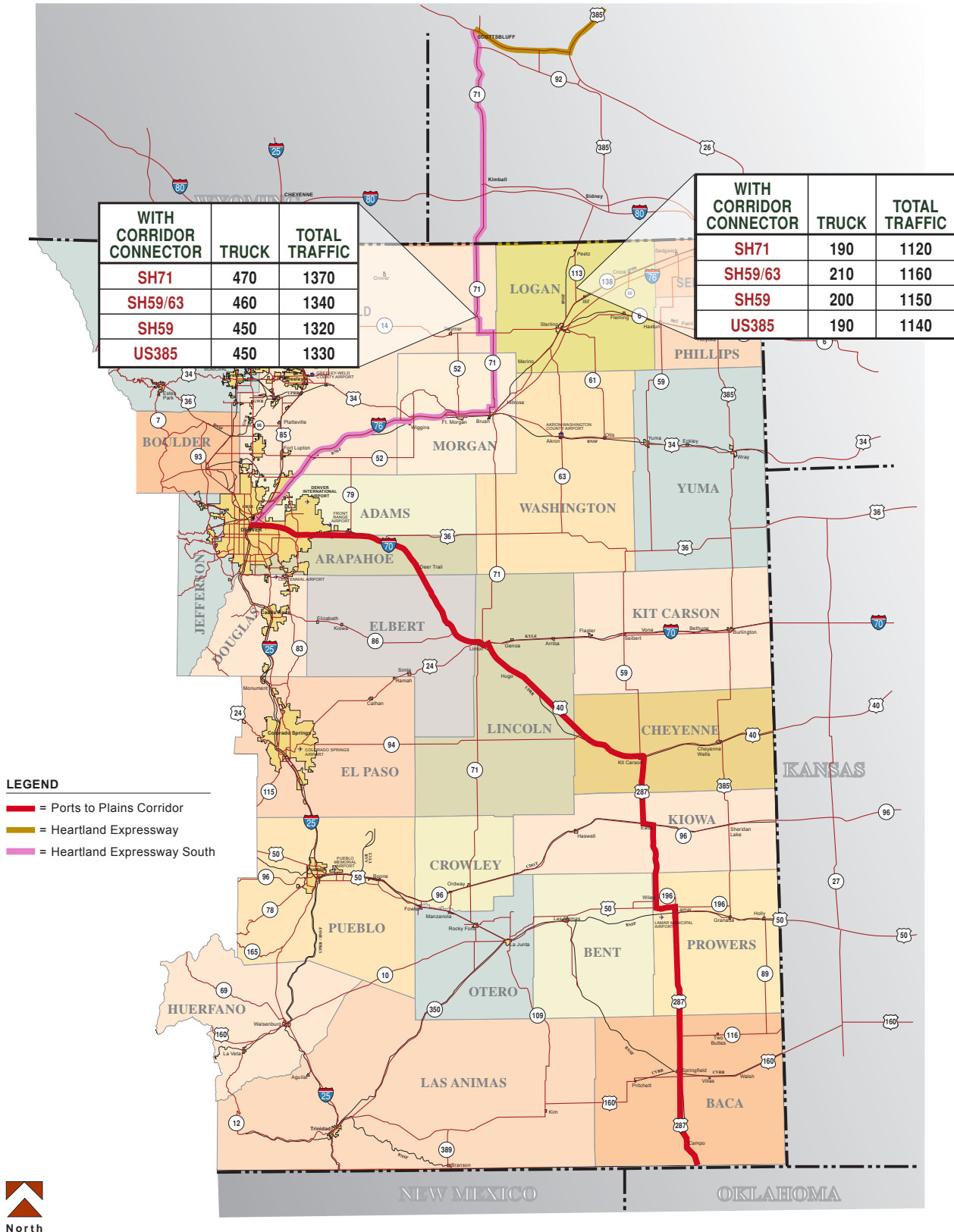
corridor connectors, both SH 71 and US 385 are projected to serve about 600 trucks in 2025, which is about 50 percent more than the SH 59/SH 63 or SH 59 alternative routes. With regard to overall traffic, both SH 71 and US 385 are also projected to serve more trucks and autos in 2025.

Because of the variety of truck flow patterns being served by the different alternatives, the effects of the alternatives in terms of truck diversion off I-25 differ significantly. Improvement of the SH 71 connector, for example, would result in the greatest diversions in the segment of I-25 between Colorado Springs and Denver and the segment north of Denver. On the other hand, enhancement of US 385 would have the greatest effect on diversion from the I-25 segment south of Colorado Springs. Although the model may somewhat overstate the magnitude of these diversions, the patterns reflected by these data are reasonable.

Table IV-3 summarizes the ratings of the alternatives. Overall, the summary shows that the SH 71 and the US 385 connectors with either Heartland alternative rate most favorably.

YEAR 2025 DAILY TRAFFIC VOLUMES/ HEARTLAND EXPRESSWAY SOUTH: SH71 ALTERNATIVE

Figure IV-5



YEAR 2025 DAILY TRAFFIC VOLUMES/ HEARTLAND EXPRESSWAY SOUTH: SHI3 ALTERNATIVE

Figure IV-6

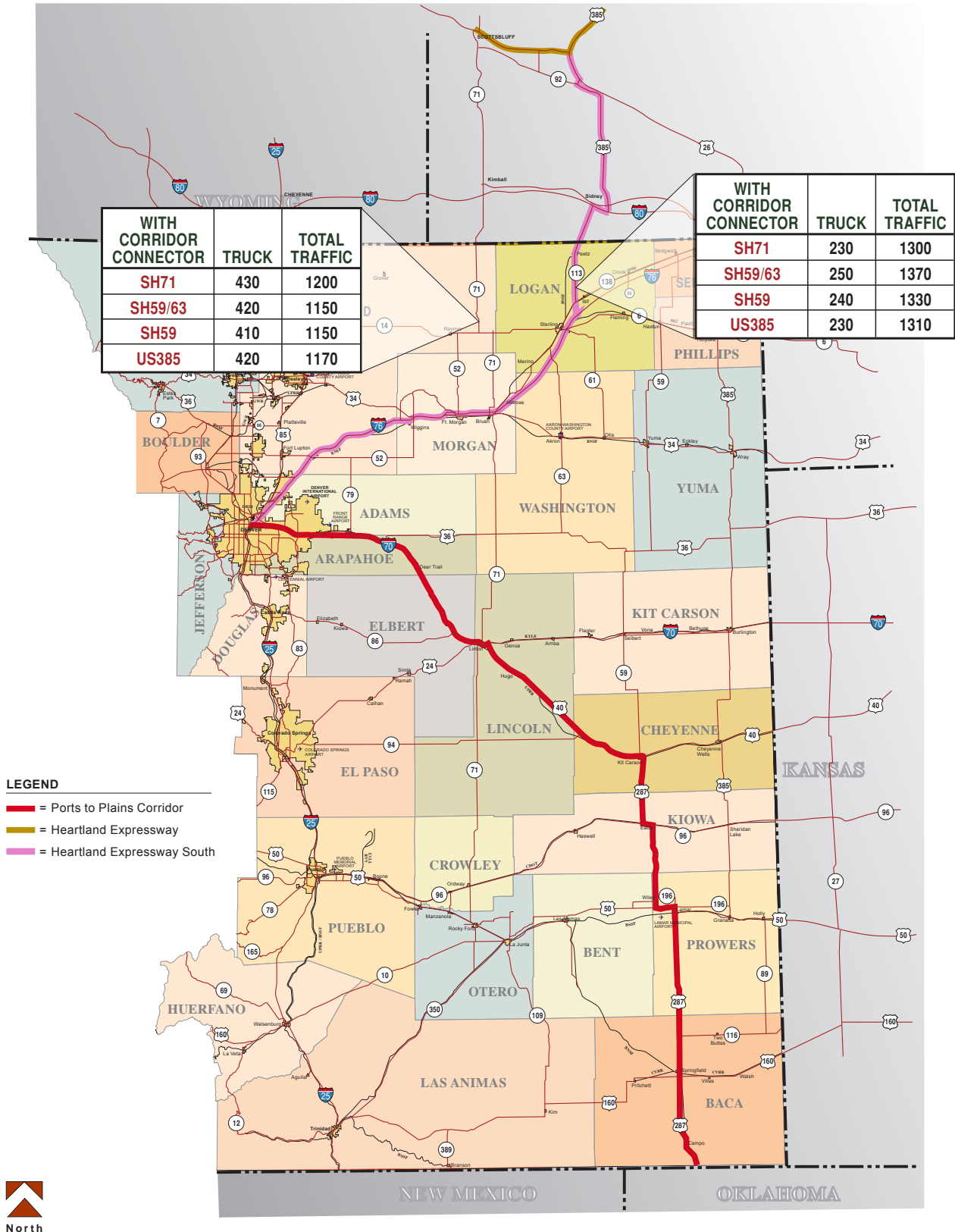


Figure IV-7

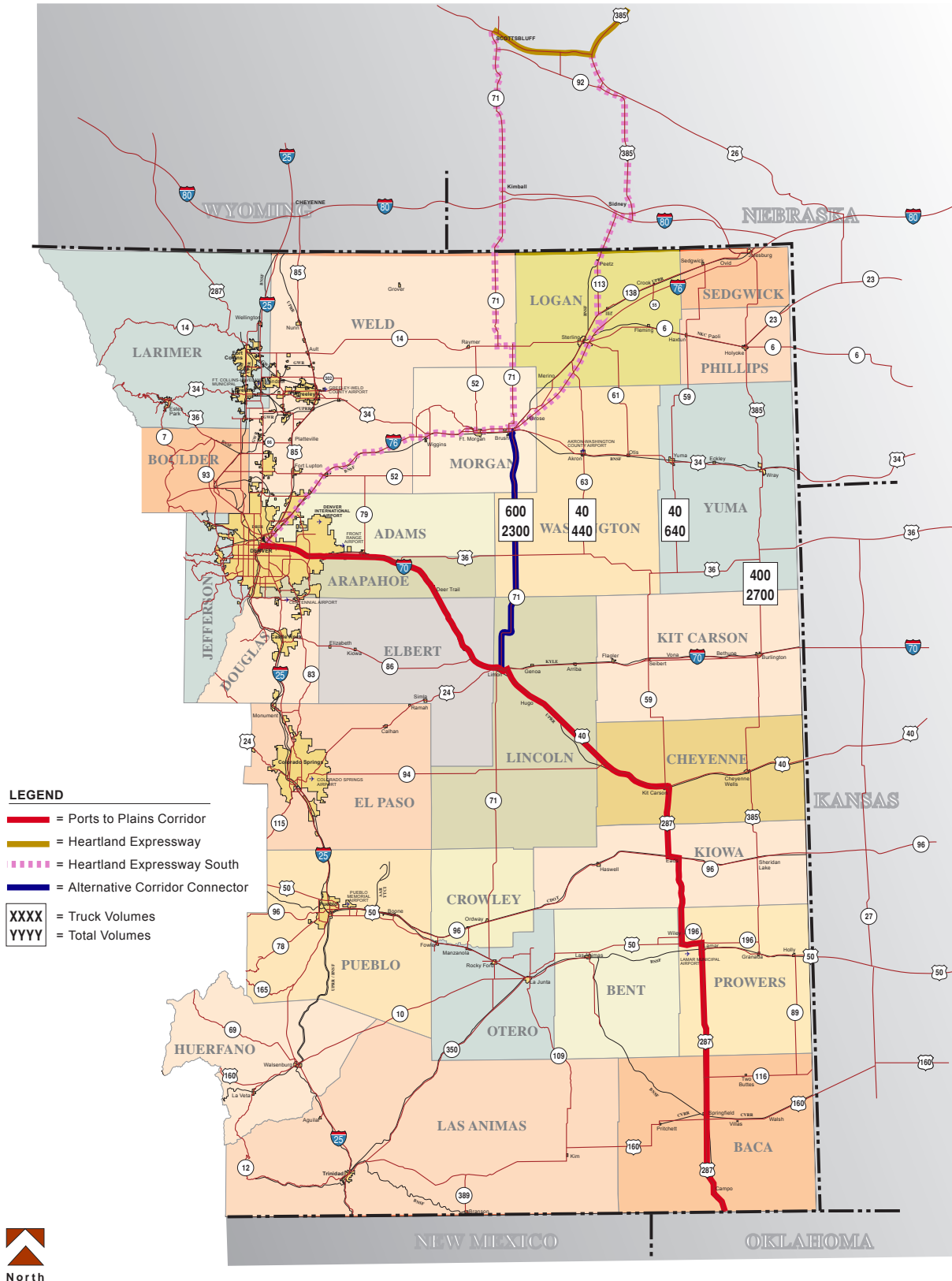


Figure IV-8

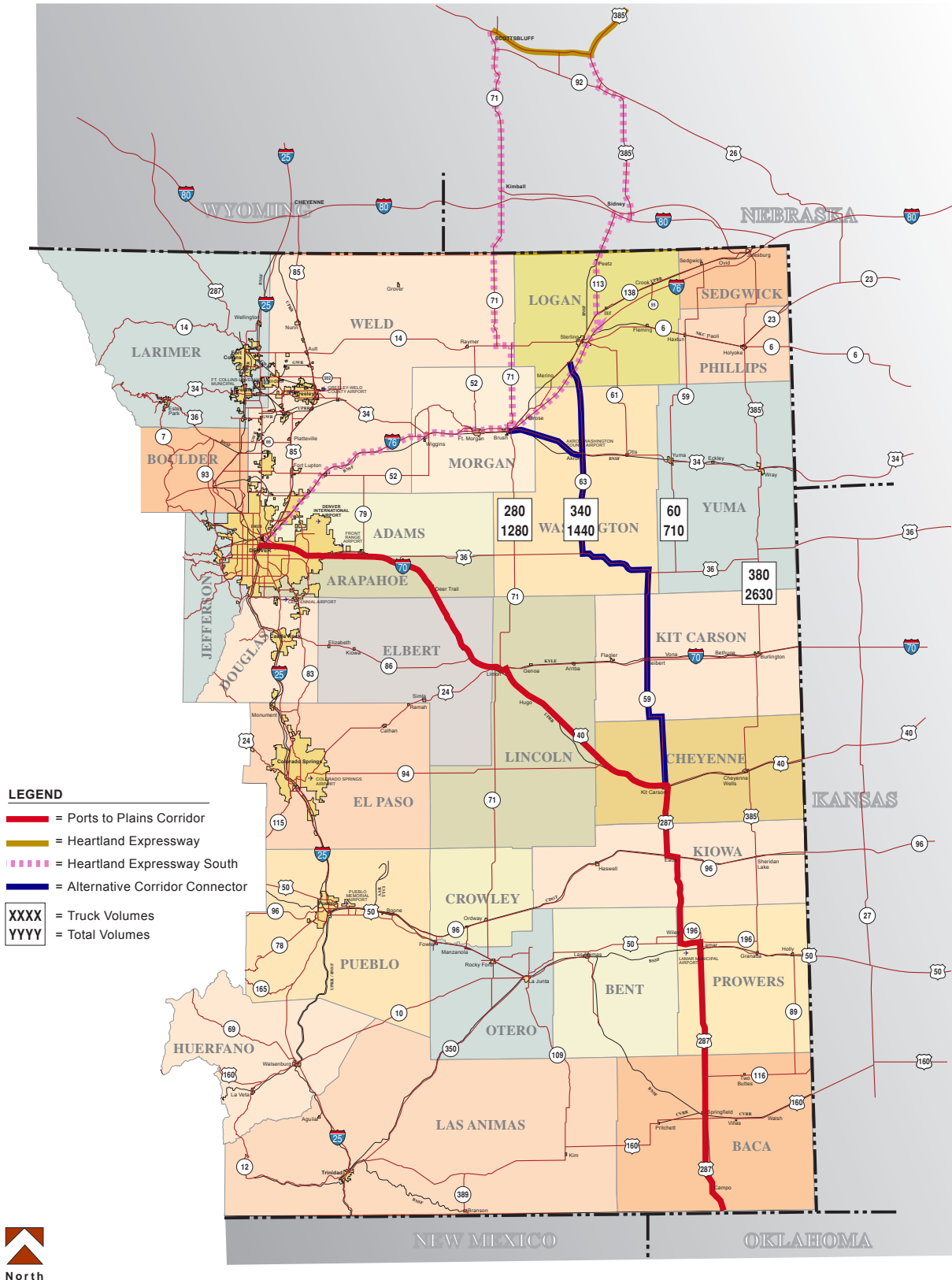


Figure IV-9

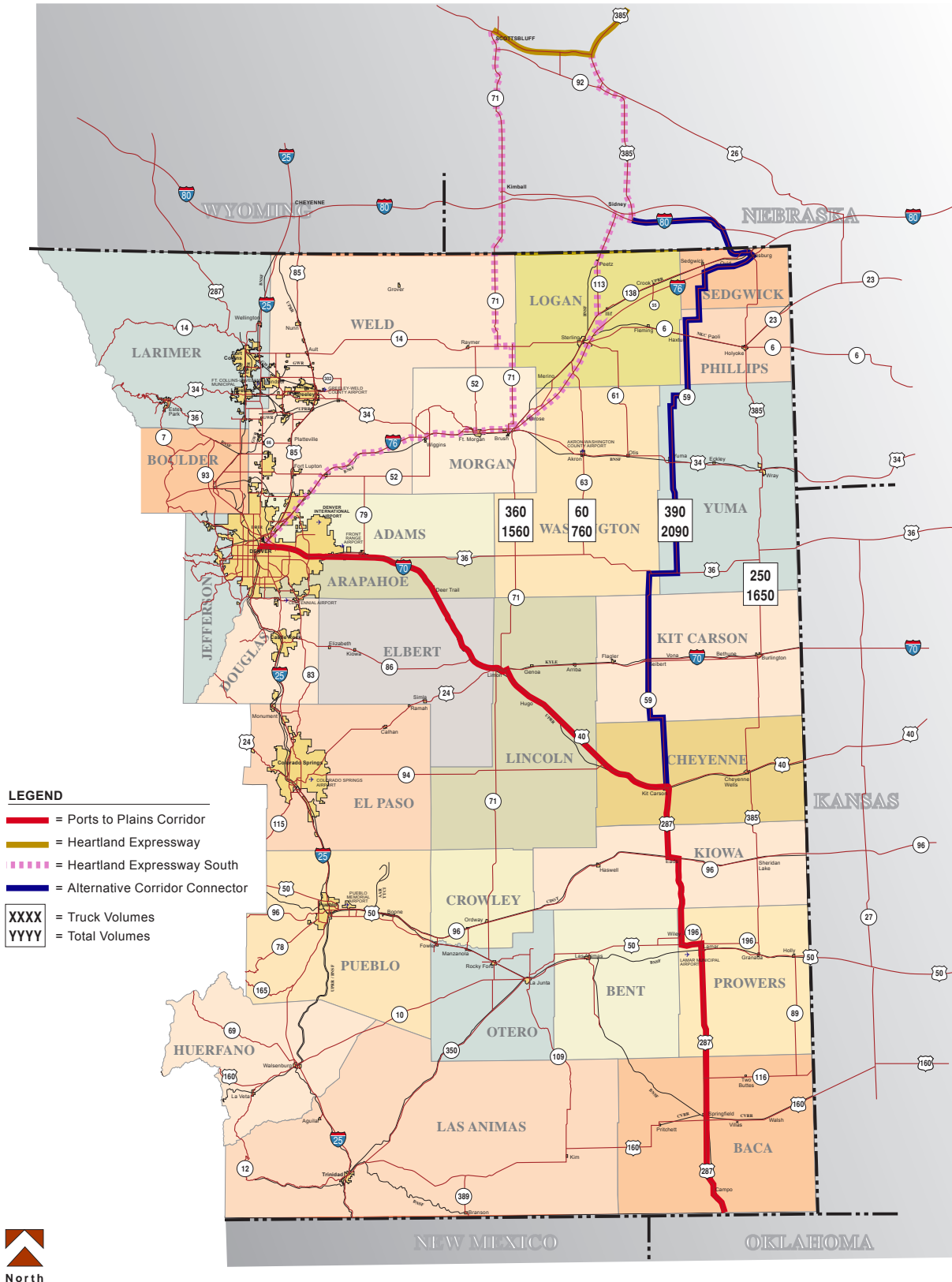


Figure IV-10

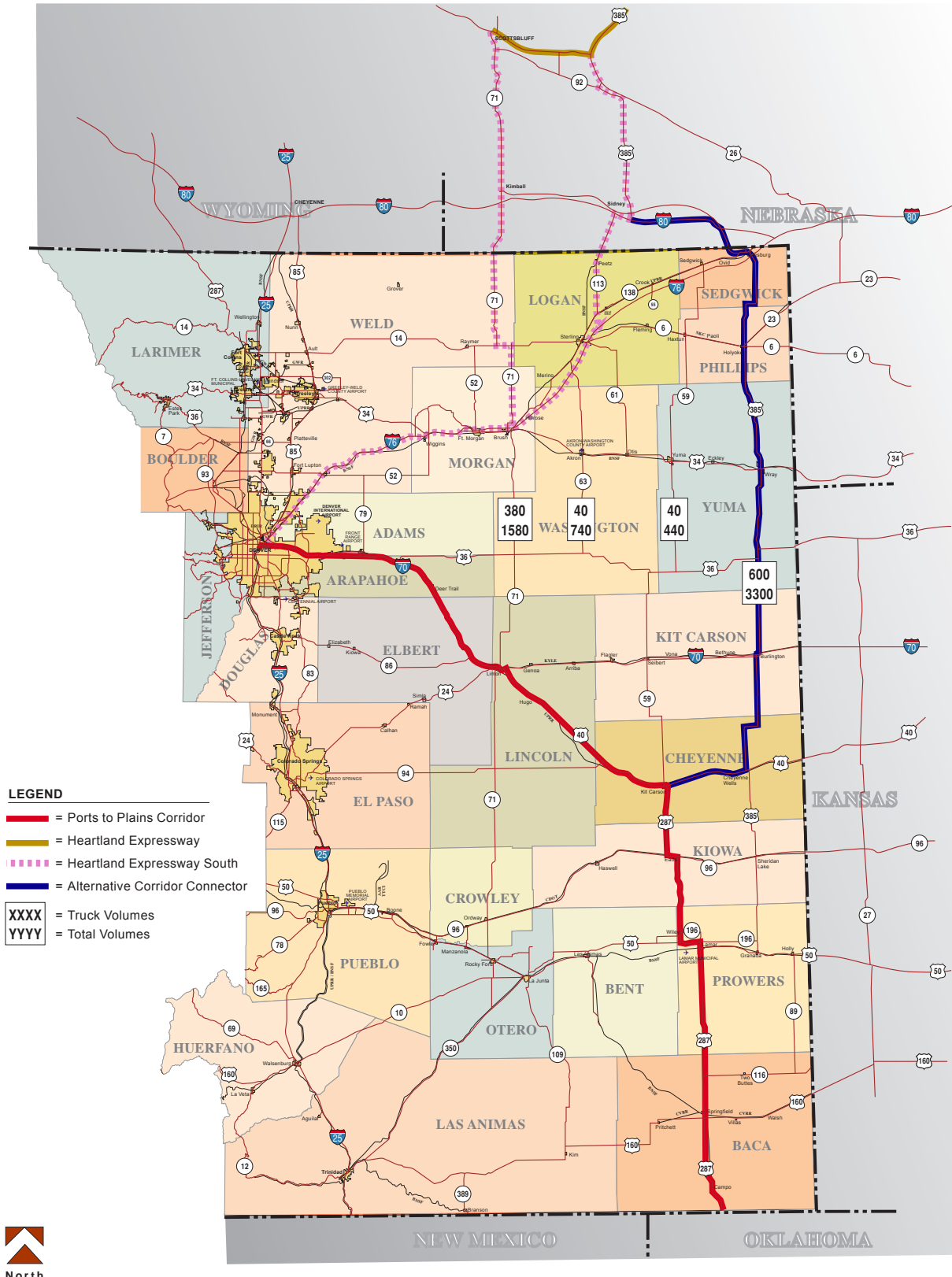


Table IV-2 Summary Data – Need Based on Traffic

<i>Heartland South Alternative</i>	<i>Highway 71</i>				<i>Hwy 113</i>			
<i>Corridor Connector</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>
Truck Utilization (average daily truck volume along corridor)								
Existing								
Heartland South	220	220	220	220	120	120	120	120
Connector	220	20	20	150	220	20	20	150
Future (2025)								
Heartland South	470	460	450	450	230	250	240	230
Connector	600	340	390	600	600	340	390	600
Traffic Utilization (average daily traffic volume along corridor)								
Existing								
Heartland South	580	580	580	580	1100	1100	1100	1100
Connector	930	550	590	800	930	550	590	800
Future (2025)								
Heartland South	1370	1340	1320	1330	1300	1370	1330	1310
Connector	2300	1440	2090	3300	2300	1440	2090	3300
Daily Trucks Diverted from I-25 (2025)								
North of Denver	400	100	100	100	400	100	100	100
Denver – CO Springs	750	100	400	500	750	100	400	500
South of CO Springs	100	200	900	1000	100	200	900	1000

Table IV-3 Summary Rating – Need Based on Traffic

<i>Heartland South Alternative</i>	<i>Highway 71</i>				<i>Hwy 113</i>			
<i>Corridor Connector</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>
Truck Utilization (average daily truck volume along corridor)								
Existing								
Heartland South	■	■	■	■	◐	◐	◐	◐
Connector	■	□	□	◐	■	□	□	◐
Future (2025)								
Heartland South	■	■	■	■	◐	◐	◐	◐
Connector	■	◐	◐	■	■	◐	◐	■
Traffic Utilization (average daily traffic volume along corridor)								
Existing								
Heartland South	◐	◐	◐	◐	■	■	■	■
Connector	■	◐	◐	■	■	◐	◐	■
Future (2025)								
Heartland South	◐	◐	◐	◐	◐	◐	◐	◐
Connector	◐	□	◐	■	◐	□	◐	■
Daily Trucks Diverted from I-25 (2025)	◐	□	◐	■	◐	□	◐	■
TOTAL	■	◐	◐	■	■	◐	◐	■
Legend: □ Least Favorable ◐ Moderate ■ Most Favorable								

Travel Efficiency

DESCRIPTIONS OF EVALUATION MEASURES

Trip Length between Termini – This measure shows the length in miles of each corridor measured from Kit Carson, Colorado to one of several northern termini: Bridgeport, Nebraska for trips heading north; Kimball, Nebraska for trips heading west on I-80; and Julesburg, Colorado for trips heading east on I-80. Alternatives with shorter trip lengths rate more favorably.

Trip Travel Time between Termini - Travel time for each route is measured in hours. The estimates assumed 65 MPH speed for the rural 2-lane roadways and 75 MPH speed for interstates. Shorter travel times rate more favorably.

Change in Daily Vehicle Miles Traveled (VMT) in Study Area (2025) - This measure reflects the increase or decrease in daily VMT on all freeways, arterials and major collectors in the study area. This measure is relative to the base case, which assumes that improvements associated with Ports to Plains are constructed. Decreases in total VMT rate more favorably.

Change in Daily Vehicle Hours Traveled (VHT) in Study Area (2025) - This measure reflects the increase or decrease in total travel time per day on all freeways, arterials and major collectors in the study area. This measure is relative to the base case. Decreases in VHT rate more favorably.

Change in Annual Number of Accidents in Study Area (2025) - This measure reflects the increase or decrease in annual traffic accidents on the study area network relative to the base case. Greater decreases in traffic accidents rate more favorably.

Annual User Cost Savings - This measure reflects the amount in dollars of cost savings to the users of the highway network on an annualized basis. User costs include fuel costs, other operating costs, time costs, and accident costs. Higher annual cost savings result in more favorable ratings.

Tables IV-4, IV-5, and IV-6 provide the summary data for the measures under this criterion. Because a number of travel patterns are of interest, trip lengths and travel times were measured from Kit Carson, CO to various destinations in northern Colorado and the Panhandle of Nebraska. As shown, different routes would best serve the various destinations. The SH 59/63 connector in conjunction with the SH 113 Heartland alternative would provide the shortest trip for vehicles destined to points north along the Heartland Expressway. The eastern connectors (SH 59 and US 385) represent the shortest trip for vehicles destined to I-76 at Julesburg to lead to the Upper Midwest, and the SH 71 alternative provides the shortest route for those vehicles destined to the West Coast and the Northwest.

The results of each travel demand model run for the various alternatives were input

into the IDAS software package, developed by the Federal Highway Administration, to generate performance measures and transportation benefits results. The VMT and VHT data are outputs of the demand model, and the accident and user cost data are estimated through the IDAS model. The user cost savings is a good summary measure of all of the performance measures. As shown, the SH 71 corridor connector would result in the greatest annual user cost savings with either Heartland alternative, at approximately \$79 million. The US 385 connector would provide the next greatest savings, at about \$76 million.

As summarized in Table IV-7, the overall results of these measures are reflected in the most favorable rating for the SH 71 alternative.

Table IV-4 Summary Data – Travel Efficiency: Trip Length

Heartland South Alternative	Highway 71				Hwy 113			
Denver CO to Bridgeport NE (miles)	236.48				220.13			
Corridor Connector	Hwy 71	Hwy 59/63	Hwy 59	US 385	Hwy 71	Hwy 59/63	Hwy 59	US 385
Kit Carson CO to Bridgeport NE (miles)	282.45	288.28	276.28	271.12	266.10	248.15	276.28	271.12
Kit Carson CO to Julesburg CO (miles)	226.00	207.15	179.00	182.84	226.00	207.15	179.00	182.84
Kit Carson CO to Kimball NE (miles)	207.45	213.28	259.50	254.34	254.00	235.15	259.50	254.34

Table IV-5 Summary Data – Travel Efficiency: Travel Time

Heartland South Alternative	Highway 71				Hwy 113			
Denver CO to Bridgeport NE (hours)	3.62				3.14			
Corridor Connector	Hwy 71	Hwy 59/63	Hwy 59	US 385	Hwy 71	Hwy 59/63	Hwy 59	US 385
Kit Carson CO to Bridgeport NE (hours)	4.40	4.47	4.27	4.27	4.08	3.89	4.27	4.27
Kit Carson CO to Julesburg CO (hours)	3.35	3.15	2.77	2.91	3.35	3.15	2.77	2.91
Kit Carson CO to Kimball NE (hours)	3.25	3.32	4.01	4.01	3.81	3.61	4.01	4.01

Table IV-6 Summary Data – VMT, VHT, Accidents and User Costs

Heartland South Alternative	Highway 71				Hwy 113			
Corridor Connector	Hwy 71	Hwy 59/63	Hwy 59	US 385	Hwy 71	Hwy 59/63	Hwy 59	US 385
Change in Daily Vehicle Miles Traveled (VMT) in Study Area (2025)	-71,300	-66,800	+87,200	+172,400	-61,300	-56,800	+97,200	+182,400
Change in Daily Vehicle Hours Traveled (VHT) in Study Area (2025)	-31,000	-27,300	-30,300	-38,200	-30,900	-27,200	-30,200	-38,100
Change in Annual Number of Accidents in Study Area (2025)	-211	-151	-56	-22	-204	-144	-49	-15
Annual User Cost Savings	\$79.2 M	\$66.7 M	\$70.0 M	\$76.3 M	\$78.5 M	\$66.0 M	\$69.3 M	\$75.6 M

NOTE: Comparisons are to a Base Case, which includes the improved Ports to Plains Corridor.

Table IV-7 Summary Rating – Travel Efficiency: Trip Length, Travel Time, VMT, VHT, Accidents and User Costs

<i>Heartland South Alternative</i>	<i>Hwy 71</i>				<i>Hwy 113</i>			
<i>Corridor Connector</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>	<i>Hwy 71</i>	<i>Hwy 59/63</i>	<i>Hwy 59</i>	<i>US 385</i>
Trip Length between Termini	■	■	■	■	□	■	■	■
Travel Time between Termini	■	■	■	■	■	■	■	■
Change in Daily Vehicle Miles Traveled (VMT) in Study Area (2025)	■	■	■	□	■	■	■	□
Change in Daily Vehicle Hours Traveled (VHT) in Study Area (2025)	■	□	■	■	■	□	■	■
Change in Annual Number of Accidents in Study Area (2025)	■	■	□	□	■	■	□	□
Annual Cost Savings (2025)	■	□	□	■	■	□	□	■
TOTAL	■	■	■	■	■	■	■	■
Legend: □ Least Favorable ■ Moderate ■ Most Favorable								

Engineering/Cost Feasibility

DESCRIPTIONS OF EVALUATION MEASURES

Length of Reconstruction Required - Length in miles of each corridor to be improved was measured from its southern tie to Ports to Plains to the northern Colorado stateline. Shorter alternatives would require less reconstruction and rate more favorably.

Length of Reconstruction in Developed Areas - This measure reflects the length in miles along each corridor which passes directly through a community, measured from town limit to town limit (or a minimum of one mile in the absence of available data). Because of higher costs and greater disruption in communities, less length of reconstruction through communities is considered more favorable.

Right-of-Way Acquisition - Two scenarios of right-of-way acquisition were evaluated. To accommodate a "Super 2" design, 150 feet of right-of-way was estimated to be needed. Research revealed that the existing right-of-way along the alternative corridors currently averages about 100 feet. Thus, the "Super 2" scenario would require acquisition of an additional 50 feet. Consistent with the Ports to Plains analysis, the typical right-of-way width for a four-lane divided highway would be 300 feet, thus requiring acquisition of 200 feet. Less right-of-way acquisition results in a more favorable rating.

Project Cost - Costs for each alternative route include right-of-way acquisition, roadway and bridge construction, construction traffic control, mobilization, engineering design, construction management and contingencies. These costs were calculated for construction of a "Super 2" roadway, which would consist of concrete pavement, two 12-foot lanes and two 10-foot shoulders. The four-lane section cost includes right-of-way acquisition for a four-lane road, but construction of only two lanes. Lower overall project costs result in a more favorable corridor rating.

For purposes of this planning study, it was assumed that the two-lane roadways included in the alternatives would be reconstructed. Therefore, the cost estimates were directly related to the length of the alternatives. The costs are based on the "Super 2" section with concrete pavement, two 12-foot lanes and two 10-foot shoulders. Within towns and cities, it was assumed that the roadway would be rebuilt to the existing section. The cost estimates are in 2001 dollars and are based on CDOT unit costs. Based on the given section, the cost is estimated to be approximately \$2.6 million per mile. Right-of-way acquisition costs were estimated at \$225 per acre.

As shown in Table IV-8, the alternatives with the SH 71 connector are the least costly, ranging from approximately \$280 to \$340 million. The eastern alternatives are the most costly, ranging from approximately \$560 to \$650 million. If right-of-way is acquired for a four lane roadway (even though only two lanes would be constructed), the additional right-of-way would add approximately \$0.5 to \$1.0 million to the project cost.

The ratings in Table IV-9 indicate that, from the standpoint of this criterion, the SH 71 connector alternative would rate most favorably, and the US 385 alternative would receive the least favorable rating.

Table IV-8 Summary Data – Engineering/Cost Feasibility

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Length of Reconstruction Required in Colorado (miles)	129.4	199.4	235.3	246.5	103.2	171.7	209.1	220.2
Length of Reconstruction in Developed Area (miles)	5.2	6.3	8.3	9.2	5.7	5.4	8.8	9.7
Right-of-Way Acquisition in Colorado (acres)								
Super 2	816	1,247	1,476	1,549	660	1,073	1,321	1,394
Preserve 4 lanes	3,262	4,987	5,905	6,197	2,640	4,293	5,283	5,575
Project Cost (including construction, engineering, right-of-way) (millions)								
Super 2	\$342.0	\$529.8	\$624.7	\$656.0	\$277.9	\$465.7	\$560.6	\$591.9
Preserve 4 lanes	\$342.5	\$530.6	\$625.7	\$657.0	\$278.3	\$466.4	\$561.5	\$592.8

Table IV-9 Summary Rating – Engineering/Cost Feasibility

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Length of Reconstruction Required in Colorado	■	◐	□	□	■	◐	◐	□
Length of Reconstruction in Developed Area	■	■	◐	□	■	■	□	□
Right - of - Way Acquisition in Colorado	■	◐	□	□	■	◐	◐	□
Project Cost (including construction, engineering, right-of-way)	■	◐	□	□	■	◐	◐	□
TOTAL	■	◐	□	□	■	◐	◐	□
Legend: □ Least Favorable ◐ Moderate ■ Most Favorable								

Environmental/Land Use Impact

DESCRIPTIONS OF EVALUATION MEASURES

Air Quality - This measure indicates the number of communities along each of the alternative corridors that have been identified as a non-attainment area for air quality under the Clean Air Amendments/ National Ambient Air Quality Standards or have been defined as an at-risk area by the State of Colorado. An alternative with fewer such communities would be rated more favorable.

Noise - Noise is considered to be an impact when vehicles and trucks pass through communities. This measure represents the total number of miles of potential noise impact for each alternative route by measuring the cumulative length through all communities along the route. The term “communities” is defined to include those areas identified as incorporated towns and cities by the State of Colorado. Longer lengths through communities result in less favorable ratings.

Major Streams - Along each alternative route the number of significant stream crossings was counted. This not only provides an indication of the number of major waterways that will require protection during any roadway improvements, but also provides a base number of bridge structures that will require evaluation and either improvement or reconstruction. Alternatives with higher numbers of major stream crossings receive less favorable ratings.

Endangered Species - This measure is an indication of the total number of ecologically significant sites intersected by each alternative corridor. Sites include such conditions as known habitats, locations of sightings of threatened or endangered plant or animal species, or areas of suspected habitat. Higher numbers of endangered species sites along any of the alternative corridors result in less favorable ratings.

Public Lands - Public lands include all state and federal lands along the alternative corridor routes. The total length of any given alternative, in miles, passing through public lands is compiled for this evaluation measure. Passing through more miles of public land is considered to be less favorable.

Hazardous Materials - This measure identifies the number of superfund sites immediately adjacent to each alternative corridor route. Any impact to hazardous material sites requires significant coordination and may result in work stoppage if the site is substantial. Therefore, fewer sites would rate more favorably.

Cultural Resources - This measure reflects cultural resources immediately adjacent to each alternative corridor. Cultural resources include such elements as historic, prehistoric and archaeological elements of significance. Higher numbers of sites along any given corridor are considered less favorable.

All of the alternatives were investigated for the environmental elements outlined. As shown in Table IV-10, no superfund sites were found along any of the alternatives; nor were there any non-attainment areas for air quality. Therefore, all of the alternatives rate equally favorably in these categories.

Noise impacts are directly related to the number of miles through communities along each alternative corridor. SH 71 and SH 59/SH 63 alternatives rate most favorably with the SH 71 Heartland

alternative, as these two alternatives have only between 4.5 and 4.7 miles of roadway through communities. With the SH 113 Heartland alternative, SH 59/SH 63 rates most favorably, with about 4.6 miles through communities.

For major stream crossings, again SH 71 and SH 59/SH 63 rate most favorably with either Heartland alternative, as both of these alternatives cross between 9 and 14 major streams.

In researching endangered species, US 385 and SH 59 rate most favorably, as both have only 2 sites along their routes. SH 71 has between 4 and 6 endangered species sites, depending upon which Heartland alternative is considered.

US 385, in conjunction with the SH 71 Heartland alternative, rates the most favorably for public land crossing, as this combination passes through such lands for only 11 miles. The western alternatives, with either Heartland alternative, cross 14 to 16 miles of public lands. SH 59 passes

through the most public land with either Heartland alternative, ranging from 20 to 27 miles, and, therefore, rates least favorably.

Cultural resource sites are encountered only once or twice along the SH 71 and SH 59/SH 63 connectors with either Heartland alternative. Therefore, these corridors rate most favorably for minimal impacts to cultural resource sites.

Overall, the summary rating in Table IV-11 shows that the SH 71 and SH 59/63 alternatives exhibit the best ratings.

Table IV-10 Summary Data – Environmental/Land Use Impacts

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Air Quality	0	0	0	0	0	0	0	0
Noise	4.65	4.54	5.47	8.37	6.23	4.65	6.54	9.44
Major Streams	10	14	16	16	9	9	16	16
Endangered Species	6	4	2	2	4	2	2	2
Public Lands	15.0	16.0	20.5	11.5	14.0	16.0	27.5	18.5
Hazardous Materials	0	0	0	0	0	0	0	0
Cultural Resources	2	1	4	8	2	1	4	8

Table IV-11 Summary Rating – Environmental/Land Use Impacts

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Air Quality	■	■	■	■	■	■	■	■
Noise	■	■	◐	□	◐	■	◐	□
Major Streams	■	◐	□	□	■	■	□	□
Endangered Species	□	◐	■	■	◐	■	■	■
Public Lands	◐	◐	□	■	◐	◐	□	◐
Hazardous Materials	■	■	■	■	■	■	■	■
Cultural Resources	■	■	◐	□	■	■	◐	□
TOTAL	◐	◐	□	□	◐	■	□	□
Legend: □ Least Favorable ◐ Moderate ■ Most Favorable								

Socio-Economic/Economic Impact

DESCRIPTIONS OF EVALUATION MEASURES

Number of Communities - This is the total number of communities along each corridor. The term “communities” is defined to include those areas identified as incorporated towns and cities by the State of Colorado. Passing through more communities is considered more favorable for this evaluation measure, assuming it will result in positive economic climates in the communities.

2000 Population - This measure reflects the population for all incorporated towns and cities physically located directly on the alternative corridor. Alternatives which pass through larger population centers are considered to be more favorable, assuming a positive economic influx.

2025 Population - This measure is the projected population in 2025 for all incorporated towns and cities physically located directly on the alternative corridor. Alternatives which pass through larger population centers are considered to be more favorable as it is assumed corridor improvements would contribute to the economy of the communities.

1990 Poverty Status - This measure is the number and percentage of the municipal area population determined to be below the US Census-defined poverty level. Alternative corridors which pass through areas of high poverty status are considered more favorable, assuming a positive economic influx.

1990 Minority Population - This measure is the number and percentage of minority population in the communities. Alternative corridors which pass through areas of high minority populations are considered more favorable, assuming a positive economic influx.

Median Household Income - This dollar value is the median household income measured for incorporated cities/towns along each corridor. Alternatives which pass through communities of lower median household incomes are considered to be more favorable as the influx of traffic would contribute dollars to the local economy.

Employment Growth – User Benefits - This number reflects the anticipated long-term additional jobs (in 2025) created by the economic benefits of user cost savings. Higher employment growth is considered more favorable.

New Disposable Income – User Benefits - This dollar value is the long-term additional disposable personal income to be experienced in the region (in 2025) created by user cost savings. Higher amounts of new disposable income result in more favorable ratings.

Employment Growth – Construction - This number reflects the anticipated short-term additional jobs created by highway construction and engineering expenditures. Higher amounts of construction jobs result in more favorable ratings.

New Disposable Income – Construction - This dollar value is the short-term additional disposable personal income in the region created by highway construction and engineering expenditures. Alternatives with higher dollar values are considered more favorable.

The evaluation measures within this criterion fall into two categories: socio-economic factors (related to demographic characteristics of the areas through which the alternative passes) and economic impacts.

As depicted by Tables IV-12 and IV-13, the SH 113 Heartland alternative rates more favorably in the area of socio-economic

factors. This result is largely influenced by the presence of Sterling, which adds considerable population to the corridor. The tables also show that the US 385 connector alternative passes through a greater number of communities with a larger total population than any of the other alternatives. Therefore, more communities would likely benefit from investments made along this corridor.

The Regional Economic Models, Inc. (REMI) Policy Insight model was used to conduct the economic impact analysis of the alternatives. The REMI model is a customized regional economic model capable of measuring the short-term and the long-term impacts of economic changes resulting from public policy decisions, such as highway construction. This analysis included two components:

- ◆ Estimates of the long-term impacts of user cost benefits (travel time savings, operating cost savings, etc.) on the Colorado economy.
- ◆ Estimates of the short-term impacts of construction expenditures on the Colorado economy.

Further, although not measured by the model, the greatest economic impacts to eastern Colorado may be due to increased business attraction potential. Improved access to customer, supplier and buyer markets can enhance the attractiveness of a region for industrial recruitment opportunities. Their success, however, also depends largely on other regional economic development factors such as promotion and marketing, labor force training, and utility infrastructure.

Both short-term and long-term economic benefits were estimated to be most significant along the eastern connector alternatives. However, the greatest economic benefits would occur during the construction period and would be directly attributable to the fact that these alternatives would involve the largest construction investment.

Table IV-12 Summary Data – Socio-Economic/Economic Impacts

Heartland South Alternative		SH 71				SH 113			
Corridor Connector		SH 71	SH 59/63	SH 59	US 385	SH 71	SH 59/63	SH 59	US 385
Socio-economic	No. Communities	4	4	5	6	6	5	7	8
	2000 Population	8,326	7,261	6,167	10,856	19,913	13,731	17,707	22,396
	2025 Population	11,373	9,997	7,432	12,700	31,361	22,437	27,231	32,499
	1990 Poverty Status	1047 (15.9%)	955 (16.1%)	673 (12.6%)	1342 (14.3%)	2759 (16.5%)	2086 (17.1%)	2385 (15.4%)	3054 (15.6%)
	1990 Minority Population	479 (6.9%)	839 (13.5%)	86 (1.6%)	401 (4.2%)	1166 (6.7%)	1117 (8.9%)	773 (4.9%)	1088 (5.4%)
	Median HH Income	\$20,278	\$18,364	\$19,203	\$21,638	\$19,227	\$16,991	\$18,610	\$20,556
Economic	Employment Growth - User Benefits	800	780	820	810	796	776	816	806
	New Disposable Income - User Benefits	\$56.1 M	\$55.0 M	\$57.4 M	\$56.9 M	\$55.8 M	\$54.7 M	\$57.1 M	\$56.6M
	Employment Growth – Construction	2,620	3,930	4,600	4,810	1,870	3,180	3,850	4,060
	New Disposable Income-Construction	\$77.3 M	\$115.8 M	\$135.6 M	\$141.9 M	\$55.1 M	\$93.6 M	\$113.4 M	\$119.7M
Statewide Average		Poverty Status		11.6%		Minority Population		11.7%	
		Median HH Income		\$30,140					

Table IV-13 Summary Rating – Socio-Economic/Economic Impacts

Heartland South Alternative		SH 71				SH 113			
Corridor Connector		SH 71	SH 59/63	SH 59	US 385	SH 71	SH 59/63	SH 59	US 385
Socio-economic	No. Communities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	2000 Population	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	2025 Population	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1990 Poverty Status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1990 Minority Population	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Median HH Income	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Economic	Employment Growth – User Benefits	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	New Disposable Income – User Benefits	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Employment Growth - Construction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	New Disposable Income-Construction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TOTAL		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Legend: <input type="checkbox"/> Least Favorable <input checked="" type="checkbox"/> Moderate <input checked="" type="checkbox"/> Most Favorable									

Financial Feasibility

DESCRIPTION OF EVALUATION MEASURE

Cost Effectiveness Ratio – The cost effectiveness ratio was calculated for each alternative by comparing the base year (2002) project-related benefits with the base-year construction costs. To accomplish this comparison, the benefits generated by each alternative through year 2025 were discounted to base year values using a discount rate of 7%. Construction costs for each alternative were formulated assuming a ten-year construction window between the years of 2008 and 2018. The annualized construction costs were converted into a present value and discounted to base-year costs, again using a 7% discount rate. The higher the ratio, the more favorable the rating.

The cost effectiveness ratios shown in Table IV-14 clearly indicate that the SH 71 alternative would result in the most

favorable relationship between user cost savings and construction costs.

Table IV-14 Summary Data – Financial Feasibility

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Cost Effectiveness Ratio	3.05	1.66	1.48	1.53	3.72	1.87	1.63	1.68

Table IV-15 Summary Rating – Financial Feasibility

<i>Heartland South Alternative</i>	<i>SH 71</i>				<i>SH 113</i>			
<i>Corridor Connector</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>	<i>SH 71</i>	<i>SH 59/63</i>	<i>SH 59</i>	<i>US 385</i>
Cost Effectiveness Ratio	■	◐	◐	◐	■	◐	◐	◐
Legend: ◻ Least Favorable ◐ Moderate ■ Most Favorable								

Summary of Findings

In summary, the following highlight the key findings of the detailed evaluation:

- ◆ **Need Based on Traffic**
The SH 71 Heartland alternative is projected to serve about twice as many trucks as the SH 113 Heartland alternative. The SH 71 and US 385 connectors are projected to serve more trucks and autos than the other alternatives.
- ◆ **Travel Efficiency**
The SH 71 connector would result in the greatest annual user cost savings with either Heartland alternative. The next closest alternative would be the US 385 connector.
- ◆ **Engineering/Cost Feasibility**
The SH 71 connector would be the least costly alternative with either Heartland alternative. The eastern alternatives would be most costly.
- ◆ **Environmental/Land Use Impacts**
The western connector alternatives would have fewer impacts, generally because they are shorter and they traverse fewer communities.
- ◆ **Socio-Economic/Economic Impacts**
The US 385 connector alternative would likely create the greatest economic benefits because it would directly serve more communities and the largest population. However, its greatest economic benefits (an increase in employment and disposable income) would occur during the construction period and would be directly attributable to the

fact that it would also involve the greatest construction investment.

◆ **Financial Feasibility**

The SH 71 connector would create higher user benefits and would cost less than other alternatives, thereby resulting in the highest cost effectiveness ratio.

C. RECOMMENDATIONS

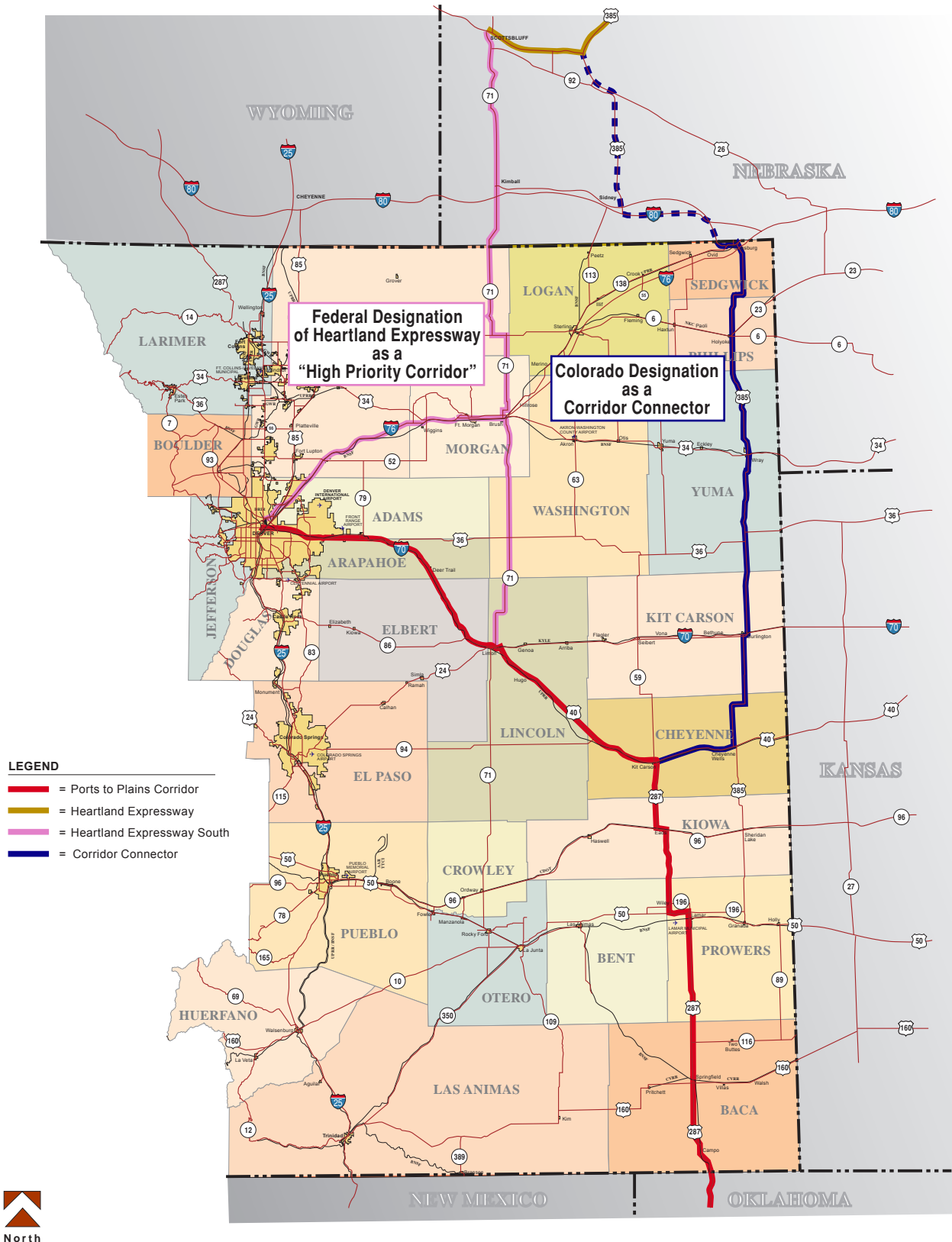
1. Primary Corridor Recommendations

The primary corridor recommendations are illustrated on Figure IV-11

Based on the many benefits exhibited by the findings of the analysis, it is recommended that SH 71 from the Colorado/Nebraska stateline to Brush and I-76 from Brush to Denver be designated the Heartland Expressway as a federal “High Priority Corridor”. To round out the “High Priority Corridor” system in the area, it is also recommended that the same designation be sought for SH 71 from Brush to Limon as part of the Heartland Expressway. In addition to the factors cited in the findings, it should also be noted that designation of the SH 71 alternative would be consistent with investments made, or being made, on the Nebraska roadway network and with a recent Nebraska Highway Commission resolution focusing on the SH 71 corridor.

Understanding the varied truck flow patterns depicted earlier on Figure III-3 and recognizing that no one alternative would serve all of these flows well, the corridor of US 40 and US 385 from Kit Carson to Julesburg should be recognized as a corridor important to eastern Colorado and

Figure IV-II



also requiring improvement. As such, it is recommended that this corridor be designated as the primary Colorado corridor connecting the Ports to Plains Corridor with the Heartland Expressway. Such a designation would be consistent with the fact that US 385 has always been identified as a priority project by the Eastern TPR and that it had been identified as a State Significant Corridor in earlier statewide transportation planning processes.

This combination of primary corridors would work well to serve the varied truck movements through eastern Colorado. The upper segment of the Heartland Expressway (SH 71) would serve the travel between Denver and the Nebraska Panhandle and points north, and the lower segment would enhance the routing for trucks destined to the West Coast and the Northwest. The improvement of US 385 would enhance travel for those trucks destined to the Midwest and the Upper Midwest.

As discussed earlier, the new North/South Transportation Corridor (Front Range Toll Road) is considered to be a private initiative and, therefore, is not part of this study's recommendations. However, the travel demand model was used to estimate the effects of this new facility if it were constructed. The model showed that the primary effect of the new corridor would be to reduce projected truck trips on the SH 71 route, most significantly on the segment between Limon and Brush. Therefore, the likelihood of the roadway being constructed should be monitored and its status should be considered as input to the prioritization decisions regarding these recommendations.

The ultimate goal for improvement of these corridors should be a "Super 2" cross-

section, which would include two 12-foot travel lanes with minimum 8-foot shoulders (10-foot desirable). Truck climbing lanes and additional passing lanes should be constructed where needed, and access management strategies should be implemented to the highest feasible level. All design standards, including the pavement design, should be sufficient to handle over-size/over-weight loads. The truck volumes projected in this study may not warrant concrete pavement; however, the decision to utilize concrete or asphalt pavement will be made during the design process. Although the year 2025 traffic volume projections on these roadways clearly indicate that two lanes would be sufficient within that time frame, the improvements should be designed to allow expansion in the future if needed and acquisition of sufficient right-of-way to accommodate expansion should be considered.

Because no funds are currently programmed for either of these primary corridors, the improvements will need to be phased as funding becomes available, with a focus on improving deficient pavement conditions, lane widths, and shoulders and on removing safety hazards. The first step toward implementation should be a more detailed assessment of each corridor to identify and prioritize the inadequacies of the existing roadway. Table IV-16 summarizes the current deficiencies along each of the primary corridors. As shown, over 40 percent of the total length of these routes currently has a surface condition rated "poor", and about 90 percent of the total length has inadequate shoulders. These data are based on current CDOT inventory information and should be updated regularly to serve as a basis for prioritizing improvements.

Table IV-16 Summary of Primary Corridor Deficiencies

Primary Corridors	Miles of Required Improvements							
	Surface Condition				Lane Width		Shoulder Width	
	Fair		Poor		< 12 ft.		< 8 ft.	
	(mi.)	(%)	(mi.)	(%)	(mi.)	(%)	(mi.)	(%)
SH 71 - Limon to Stateline (125.1 miles)	7.4	6%	66.3	53%	18.8	15%	124.6	100%
US 40 – Kit Carson to Cheyenne Wells (25.8 miles)	10.9	42%	14.9	58%	0.7	3%	25.1	97%
US 385 – Cheyenne Wells to Stateline (157.6 miles)	28.7	18%	53.6	34%	0.0	0%	129.6	82%
Total	47.0	15%	134.8	44%	19.5	6%	279.3	90%

2. Support Corridor Recommendations

In addition to the primary corridors, there are other corridors in eastern Colorado which are also important for freight mobility in the area and which should be considered for improvement. A number of support corridors which are key because they provide access to and connections between the primary freight corridors have been identified, as illustrated on Figure IV-12. Many of these have already been included in the statewide transportation plan, in either the fiscally constrained or the unfunded portion of the plan. Those projects should continue to be pursued. However, as shown on the figure, there are also some obvious gaps which should be included in future versions of the statewide plan. These segments include:

- ◆ US 34 from Yuma to the Nebraska stateline.
- ◆ A segment of US 24 in El Paso County.

Similar to the primary corridors, improvements in these support corridors will also need to be prioritized and implemented in a phased manner. For example, as shown by Table IV-17, “poor” surface conditions and inadequate shoulders are the prevalent deficiencies found on these roadways today. An improvement plan focused on these needs would bring the greatest benefits to these corridors.

Figure IV-12

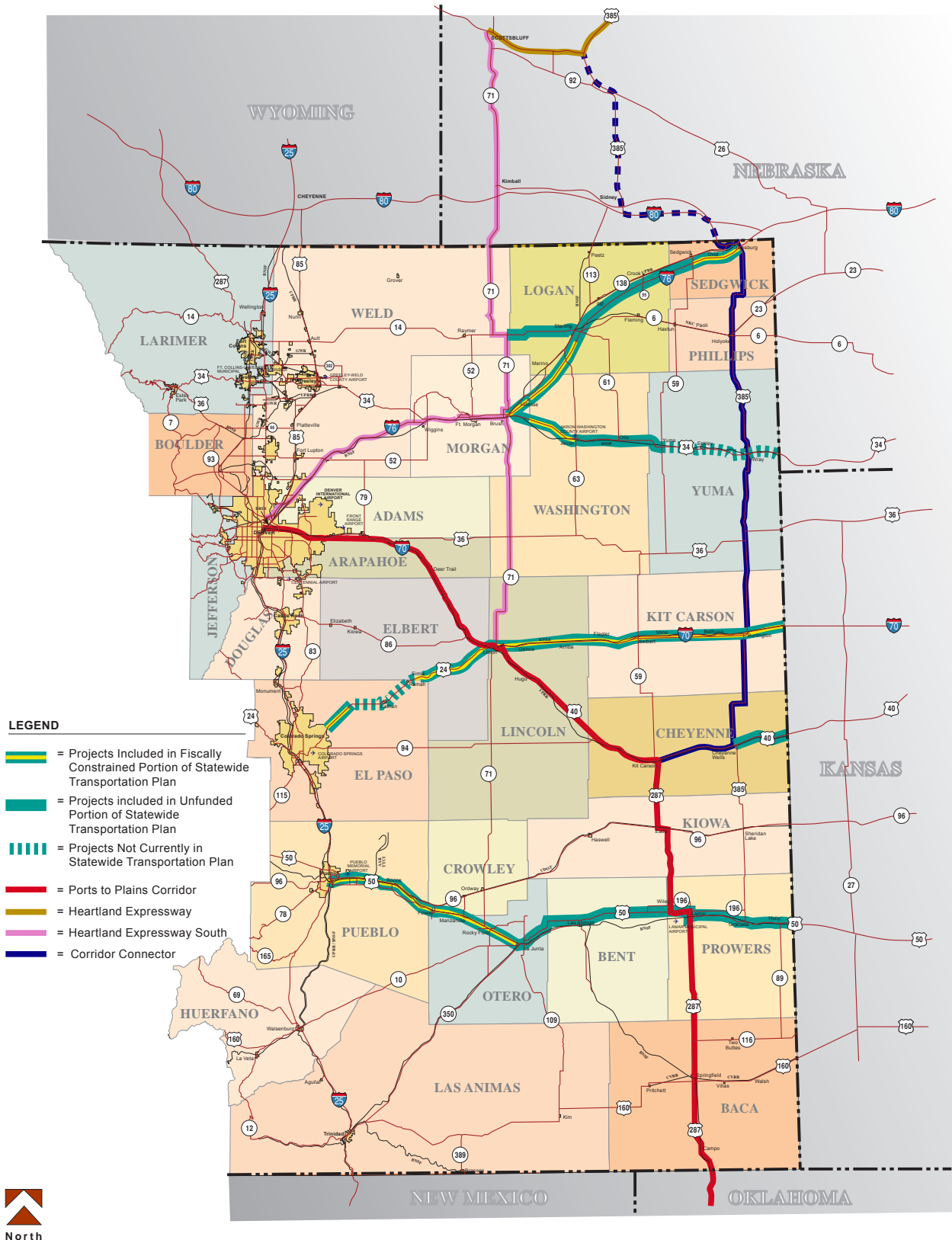


Table IV-17 Summary of Support Corridor Deficiencies

	<i>Miles of Required Improvements</i>							
	<i>Surface Condition</i>				<i>Lane Width</i>		<i>Shoulder Width</i>	
	<i>Fair</i>		<i>Poor</i>		<i>< 12 ft</i>		<i>< 8 ft</i>	
	<i>(mi.)</i>	<i>(%)</i>	<i>(mi.)</i>	<i>(%)</i>	<i>(mi.)</i>	<i>(%)</i>	<i>(mi.)</i>	<i>(%)</i>
<i>Support Corridors</i>								
I-76 – Brush to Stateline (89.3 miles)	16.1	18%	73.2	82%	0.0	0%	0.0	0%
I-70 – Limon to Stateline (90.4 miles)	21.7	24%	31.0	34%	0.0	0%	0.0	0%
SH 14 – Sterling to SH 71 (21.1 miles)	5.7	27%	6.5	31%	6.1	29%	18.4	87%
US 34 – Brush to Stateline (86.6 miles)	11.1	13%	34.6	40%	0.6	1%	43.7	50%
US 24 – Limon to Colorado Springs (67.0 miles)	0.0	0%	14.0	21%	0.0	0%	14.7	22%
US 40 – Cheyenne Wells to Stateline (16.8 miles)	7.0	42%	9.9	59%	9.9	59%	2.0	12%
US 50 – Pueblo to Stateline (150.5 miles)	70.2	47%	17.1	11%	0.0	0%	1.1	1%

V. Rail/Intermodal System Analysis



V. RAIL/INTERMODAL SYSTEM ANALYSIS

A. IDENTIFICATION OF SYSTEM NEEDS



1. Railroad Network

The approach for analyzing and improving the rail freight transportation system included an understanding of several factors:

- ◆ How Colorado fits into the overall national rail freight movement pattern.
- ◆ Rail freight movements to and from, as well as within, Colorado.
- ◆ Quality and capacity of rail within Colorado.
- ◆ Current events within the railroad industry.

Nationally, Colorado is located along one of the major east-west transcontinental railroad routes. Colorado also is an important north-south gateway for coal movements between the Powder River

Basin of Wyoming and utility companies in Texas and adjacent states.

Regionally, Colorado originates commodities such as coal, food products, and farm products and terminates commodities including coal, food products, lumber and wood products. Coal represents the largest volume of both originated and terminated rail freight traffic in Colorado.

The quality of track on Colorado's segments of Class I railroads is sufficient to serve the modern locomotives and heavier freight cars currently utilized. The quality of rail on regional and shortline railroads is typical for low volume branch lines and limits the amount and type of commodities that can be transported on these lines. Capacity, which is determined by the number of trains, the number of tracks, the type of signaling, operating speeds and other considerations, is an issue for some segments of Class I railroads in Colorado. Single-track segments which serve high volumes of multi-directional traffic tend to cause "bottle-necks", where trains require more time and careful coordination to meet and pass each other safely. Capacity is less of an issue on regional and shortline railroads, as they serve less volume and their origin and destination points are fixed and relatively closer together.

Current events within the railroad industry include such topics as:

- ◆ The use of new high-horsepower, AC traction locomotives to handle longer coal trains.

- ◆ Increased movements of high-priority intermodal and automotive traffic.
- ◆ High locomotive fuel costs.
- ◆ Grade crossing safety.
- ◆ Hazardous materials shipments.
- ◆ Residential growth and congestion along many rail lines.

It should be noted that these issues are not only current, but ongoing. Both short-term and long-range planning of improvements for freight rail will need to address these same issues.

2. Intermodal Facilities

Rail/Truck Transfer Facilities

Improvement needs for rail/truck intermodal facilities in Colorado are related primarily to capacity and roadway access. The predominant restriction for these facilities is location, as all of the facilities have maximized their current land and are bound by adjacent development and/or limited access streets and roadways.

Grain Elevators

The issues associated with grain elevators include storage capacity, loading capacity, access/road conditions and safety. Improvements could include increasing grain storage capacity, increasing rail siding and loading capacity, increasing truck loading capacity, improving access to and from elevators, improving the condition of local streets and roads, and improving highway safety relative to seasonal truck movements.

Because grain elevators are typically privately operated, evaluations of individual elevators were not conducted as part of this study. It must be cautioned that if state assisted improvements were made to a specific elevator, it could place neighboring elevators at a competitive disadvantage. However, a statewide program, specific to grain commodity and available to all grain elevators, could provide benefits without inadvertently creating competitive advantages and disadvantages. It is, therefore, suggested that other state agencies involved in the areas of agriculture or economic development investigate the potential for establishing a state assisted program for encouraging improvements to grain elevators.

Further analyses and recommendations were not developed specifically for grain elevators in this study.



Pipeline Terminals

Although the five major petroleum pipeline terminals in the study area are recognized as intermodal facilities important to the flow of at least one commodity in eastern Colorado, these are also all private operations. The applicable issues related to these facilities all evolve around access – congestion, trip time and reliability. Clearly, these locations should be monitored, and, if safety or congestion problems warrant roadway improvements on the state highway system, CDOT should participate in discussions with the operators regarding such improvements. Beyond this recognition, no further analyses or recommendations specific to pipeline terminals were developed in this study.

B. DETAILED EVALUATION OF RAIL/INTERMODAL ALTERNATIVES

1. Rail Alternatives

An initial screening process was used to identify those rail portions of the rail network on which improvements would significantly enhance a key freight movement or on which improvements would provide a significant economic benefit to the region, state, or nation. Only if one of these standards was met was a rail segment considered in greater detail. It should be noted, however, that although a particular segment of rail line may not be considered further, specific grade crossings along that segment continued to be considered if identified as critical to freight mobility enhancement. The detailed evaluation of

candidate segments focused on consideration of three primary factors:

- ◆ Capacity
- ◆ Safety
- ◆ Quality

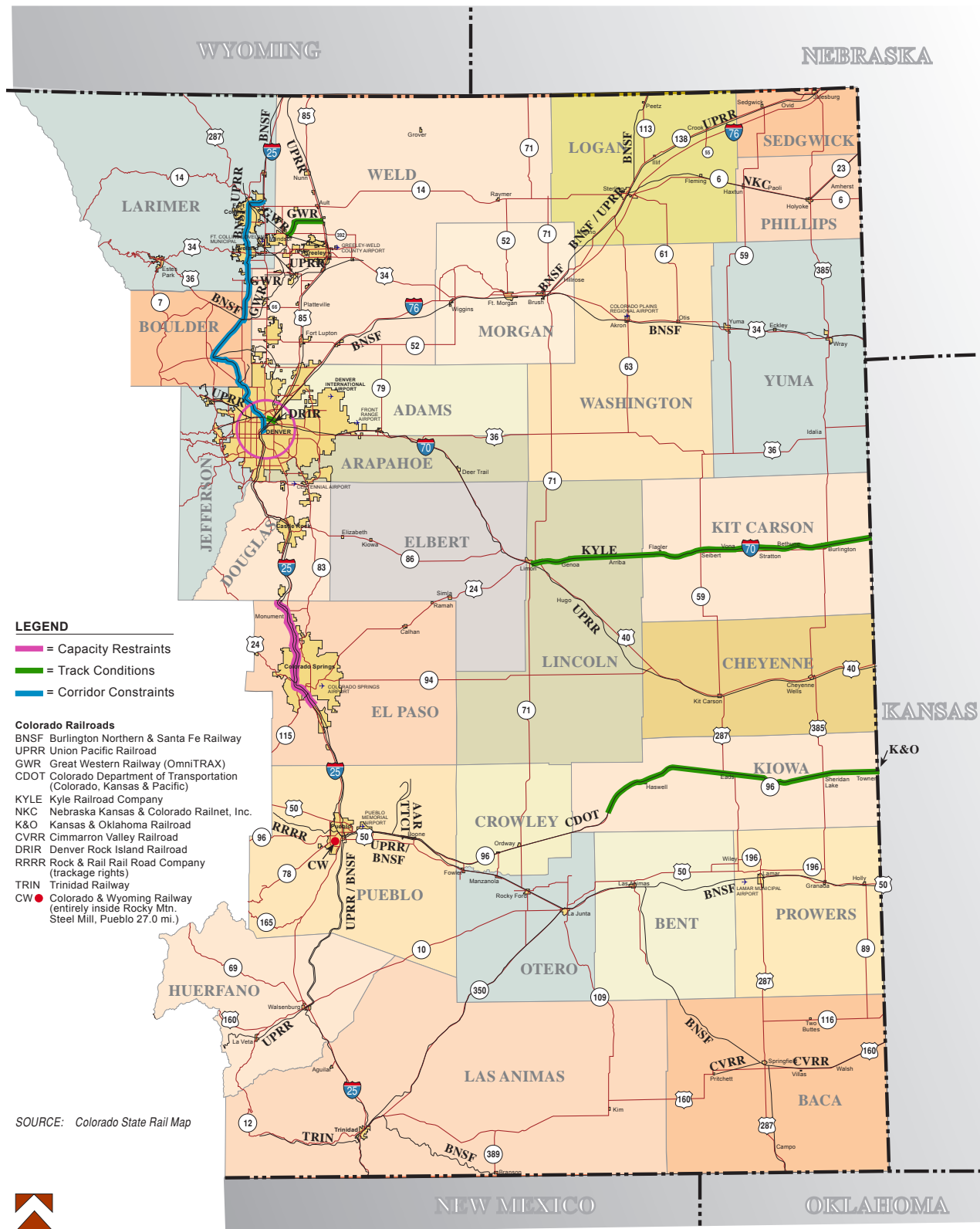
Railroad Capacity Issues

As noted earlier, Class I railroads suffer the most difficulty due to capacity issues. Heavily traveled routes with a single main line track, or two main line tracks that are always busy, experience capacity, as well as safety, problems. As part of this more detailed evaluation, segments of the BNSF and UP railroads along the Front Range and in eastern Colorado were evaluated for capacity issues. Two specific segments were identified as contributing to freight rail congestion and, therefore, as being in need of capacity improvements.

The most heavily traveled Class I rail lines are those along the I-25 corridor between Trinidad and Denver. The line between Trinidad and Pueblo experiences 19 trains per day, increasing to 35 trains per day between Pueblo and Denver. Additionally, the segment of BNSF track along I-76 between Denver and Brush is also heavily traveled, with 22 trains per day. Figure V-1 depicts existing railroad fixed plant deficiencies, which include capacity restraints, track conditions, and corridor constraints.

Capacity restraints were identified on the rail lines along the I-25 corridor, specifically through the Colorado Springs area and northern El Paso County. Capacity restraints were also identified in and around the Denver metropolitan area due to traffic conditions and land use constraints along the tracks and around the facilities.

Figure V-1



Railroad Safety Issues

The primary safety issue for rail lines is train/vehicle conflict, which manifests itself at grade crossings where high volumes of rail traffic and/or vehicular traffic create a higher risk. This detailed evaluation investigated at-grade crossings to identify those with the highest potential for problems. Consultation with both the BNSF and the UP resulted in an initial list of crossings of concern. Further investigation through CDOT and local jurisdictions with regard to traffic volumes at the various at-grade crossings confirmed the initial list and clearly identified priority crossings for safety improvements. The crossings are listed below with information on train traffic and vehicular traffic volumes and a brief description of the basis of their importance to freight mobility.

- ◆ **BNSF at 88th Avenue** - This crossing is used by traffic traveling to and from DIA and is in 60 mph freight train territory. Average trains per day = 22. Traffic is mostly Powder River Basin coal but also includes intermodal, grain, and general merchandise. Average daily traffic (1996 data) is 14,000 vehicles.
- ◆ **UP at 96th Avenue** - This crossing is impacted by the trains operating into and out of the UP Rolla Automobile Facility which is located between 96th and 104th Avenues. The automotive trains are long and slow and, thus, tend to block the crossings when switching cars. Average trains per day = 15. Average daily traffic (1999 data) is 5,700 vehicles.
- ◆ **BNSF at 96th Avenue** - There was a fatality at this crossing in December of 2001. The freight train speed is 60 mph, and 96th Avenue is used by traffic traveling to and from DIA. Average trains per day = 22. Traffic is mostly Powder River Basin coal, but it also includes intermodal, grain, and general merchandise. Average daily traffic (2001 data) is 6,900 vehicles.
- ◆ **UP at 104th Avenue (SH 44)** - This crossing is used by vehicles traveling to and from DIA and is in 60 mph freight train territory. Average trains per day = 15. Train traffic is everything from grain to coal to general merchandise. Average daily traffic (1998 data) is 10,800 vehicles.
- ◆ **BNSF at 104th Avenue (SH 44)** - This crossing is used by vehicles traveling to and from DIA and is in 60 mph freight train territory. Average trains per day = 22. Traffic is everything from grain to coal to general merchandise. Average daily traffic (1998 data) is 10,800 vehicles.



- ◆ **UP at 112th Avenue** - This crossing has enough vehicular traffic that it creates “near miss” conditions as trains enter and leave the adjacent Hazeltine siding. Average trains per day = 15. Traffic is everything from grain to coal to general merchandise. Average daily traffic (1999 data) is 5,700 vehicles.
- ◆ **UP at Broadway (SH 53)** - This crossing is located on the Belt Line that is part of the route for the increasing UP Colorado coal traffic moving through Denver. Broadway at this crossing is a busy street and is somewhat limited in sight distance. Average trains per day vary from 9 to 14. Traffic is mostly Colorado coal. Average daily traffic (1998 data) is 10,875 vehicles.
- ◆ **BNSF at Larkspur (SH 60)** - This crossing is located on the BNSF track which is part of the Joint Line operation with UP. The BNSF and the UP tracks are separated at this location. The average number of trains per day over the BNSF track is 15 to 25. Traffic is mostly Wyoming coal, but general merchandise is also handled on this line that is normally used for southbound trains. Average daily traffic (1997 data) is 3,000 vehicles.
- ◆ **UP at Pecos Street** - This crossing is located near Utah Junction where lines of both UP and BNSF serve yard facilities. There are over 25 UP movements and over 8 BNSF movements per day in the vicinity of the crossing. UP traffic is mostly coal from Colorado mines. Traffic over the BNSF is intermodal and general merchandise. Average daily traffic (1996 data) is 31,000 vehicles.
- ◆ **BNSF at Santa Fe / Kalamath (SH 85)** - These two crossings are located on the Joint Line used by both BNSF and UP. The crossings are very busy with respect to highway traffic. The RTD light rail line also crosses these crossings on elevated structure located immediately adjacent and parallel to the railroad tracks. Average trains per day = 35, including BNSF and UP trains. Traffic is mostly coal with intermodal, grain, and general merchandise. Average daily traffic (1998 data) is 99,750 vehicles.
- ◆ **BNSF at Sedalia (SH 67)** - A grade separation for this location would be for State Highway 67 where it crosses both the BNSF and the UP tracks on the busy Joint Line. If one of the crossings is grade-separated, then both crossings should be done. Average trains per day = 35, including BNSF and UP trains. Traffic is mostly coal with intermodal, grain, and general merchandise. Average daily traffic (1998 data) is 5,400 vehicles.
- ◆ **BNSF at Wadsworth Blvd (SH 121)** - This crossing is located on BNSF’s line through Boulder, Loveland and Fort Collins. The line has an average of 8 trains per day. Traffic is intermodal and general merchandise. Average daily traffic (1998 data) is 48,950 vehicles.
- ◆ **BNSF at Walsenburg (SH 85/87)** - This grade crossing would be at SH 85/87. Average trains per day = 19, including BNSF and UP trains. Traffic is mostly coal with some agricultural and general merchandise. Average daily traffic (1998 data) is 11,800 vehicles.

- ◆ **UP at Washington Street** - This crossing is located on the Belt Line that is part of the route for the increasing UP Colorado coal traffic moving through Denver. Washington Street at this crossing is a busy street and is somewhat limited in site distance. Average trains per day vary from 9 to 14. Traffic is mostly Colorado coal. Average daily traffic (1996 data) is 17,000 vehicles.

Track Quality Issues

The quality of track in Colorado is sufficient on Class I railroads to serve a wide variety of freight rail needs. The main line track of the Class I railroads consists of heavy rail and is well maintained to handle the 286,000-pound and 315,000-pound carloadings of today. Maximum operating speeds of 40 mph to 70 mph are common for UP and BNSF freight trains.

Quality of track is an issue for shortline and regional railroads, as it limits speed, type of rail cars, and tonnage allowed over those lines. Shortline railroads do not have large budgets for track maintenance and improvements. As a result, their track often cannot support the heavy carloadings, and their typical operating speeds are 10 mph to 25 mph. As a result, customers located along shortlines are often placed at a competitive disadvantage because their transportation cost per unit is higher than for a competitor who is located on a rail line that can handle the heavier cars.

Track conditions were evaluated along the shortline and regional railroads relative to their ability to serve their present shipping needs and their potential future freight rail needs. The results of that evaluation are as follows:

- ◆ **CDOT – Colorado Department of Transportation (Colorado, Kansas & Pacific)** - This railroad is 122 miles long from NA Junction to Towner, Colorado. It presently serves agricultural customers, with trains being operated on an “as needed” basis to transport commodities such as milo, corn and wheat. The line also provides storage for surplus rail cars from leasing companies and railroads. Its current track structure is good on the western 50 miles, but it is in need of maintenance and repair over much of the eastern 72 miles. Certain segments in the eastern portion of the track are not sufficient to allow 286,000 pound carloadings or to accommodate any significant amount of overhead traffic that could move over the length of the line.
- ◆ **K&O – Kansas and Oklahoma Railroad** – This railroad is 5 miles long from Towner, Colorado to the Kansas border. It presently serves agricultural customers, with trains being operating on an “as needed” basis to transport commodities such as milo, corn and wheat. Its current track structure is adequate to continue serving its current customers.
- ◆ **CVRR – Cimarron Valley Railroad** – This railroad is 44 miles long from Pritchett to the Kansas border. Its current track structure is adequate to continue serving its current customers.

- ◆ **DRIR – Denver Rock Island Railroad** – This railroad is 3.5 miles long from Denver to Commerce City. It presently serves a variety of customers with one train per day transporting commodities such as lumber, newsprint, and general merchandise. Its current track structure is in poor condition and is not sufficient to continue serving its current customers or to allow for any increase in rail car capacity.
- ◆ **GWR – Great Western Railway (OmniTRAX)** - This railroad is 72 miles long and operates between Loveland, Longmont, Fort Collins and Greeley. It presently serves a variety of customers, with 2 to 4 trains per day transporting commodities such as lumber, beer, grain, chemicals, and other agricultural and manufactured products. Its current track structure is in fair to poor condition and is not sufficient to continue serving its current customers or to allow for any increase in rail car capacity.
- ◆ **KYLE – Kyle Railway** – This railroad is 89 miles long from Limon to the Kansas border east of Burlington, Colorado. It presently serves primarily agricultural customers, with one train per day transporting commodities such as corn, milo and wheat. Its current track structure is in fair to poor condition and is not sufficient to continue serving its current customers or to allow for any increase in rail car capacity.
- ◆ **NKC – Nebraska Kansas & Colorado Railnet** – This railroad is 64 miles long from Sterling to the Kansas border just east of Holyoke, Colorado. It presently serves

agricultural and power plant customers, with one train per day transporting commodities such as coal and agricultural products. Its current track structure is in good condition, which is sufficient to continue serving its current customers.

2. Intermodal Facility Alternatives

Facility Needs

An assessment of the five major rail/truck intermodal facilities in the study area identified the following needs at each location:

- ◆ **UP 40th Street Ramp** – This facility serves domestic and international traffic of all types and is rapidly nearing its capacity of approximately 140,000 units per year. The area surrounding the facility consists of a mixture of industrial and residential properties that restrict expansion of the existing facility. In order to continue to serve intermodal market needs, this facility should be relocated to a larger, more convenient site.
- ◆ **UP Pecos Street Ramp** – One inbound UPS train and one outbound UPS train are handled five days per week at this facility. The facility exists to accommodate shipments that cannot be handled at the existing 40th Street facility due to capacity restraints. This facility could be consolidated with the 40th Street Ramp if sufficient capacity were provided at a new location. The combined consolidation would address the existing capacity needs

of the UP and would allow for expansion to meet the future needs of their customers.

- ◆ **UP Rolla Automobile Distribution Facility** – This facility currently handles approximately 250,000 automobiles per year. Future needs of this operation could potentially include a significant increase in the total number of vehicles handled per year. The location of the facility is constrained and future expansion would likely have to be accommodated by relocating the facility to a new site.
- ◆ **BNSF TOFC Yard** – This facility serves domestic and international traffic of all types and is rapidly nearing its capacity of approximately 190,000 units per year. The existing site is constrained by UP's North Yard on the west, industrial property on the east, I-25 on the south, and Utah Junction on the north. This facility should be relocated to a larger, more convenient site to serve the current and potential future needs.



- ◆ **BNSF Big Lift** - This facility was originally constructed by the Santa Fe as a rail/highway intermodal facility that would serve the Denver

and populated Front Range areas. Currently, the BNSF's TOFC Facility located in Denver accommodates all of that intended business, so the Big Lift now operates as a truck/rail transfer facility for dry and liquid bulk commodities on a somewhat limited scale. No current or future improvement needs for this facility were identified.

Because four of these facilities have maximized their useful land area at their present locations, expansion would require relocation to new and larger sites, and could include consideration of one or more sites.

Desired Characteristics of New Sites

Ideally, the characteristics of potential sites for new or relocated intermodal facilities should include the following:

- ◆ At least 200-acres in size initially (with potential expansion capability to 600 acres in the future).
- ◆ Rectangular in shape to allow loading/unloading tracks approximately 4,000 feet in length.
- ◆ Adjacent and parallel to the railroad main line.
- ◆ Space for trackage along railroad main line for rail car staging and switching.
- ◆ Reasonable distance to connections with other rail lines and routes.
- ◆ Reasonable distance and travel time to the majority of the local origins and destinations.
- ◆ Reasonable distance to distribution centers and air cargo transportation.

- ◆ Reasonable travel distance to and from locomotive servicing facilities.
- ◆ Convenient access to major highways, preferably grade separated from railroad tracks.
- ◆ Access roadways designed for heavy truck usage.
- ◆ Site zoned to allow for intermodal facility.
- ◆ No residential neighborhoods adjacent to the site.

Options for Relocating Intermodal Facilities

There are two options for relocating the existing intermodal facilities. The first option would be to relocate each facility to its own new site. The second option would be to relocate the existing intermodal facilities to a jointly used facility or a large enough site so that the facilities could be located adjacent to one another. There are advantages and disadvantages to each of these two options, as summarized in Table V-1.

This study does not attempt to evaluate, select, or recommend sites for relocating the existing intermodal facilities. Rather, the intent of the study is to identify potential improvements to enhance intermodal freight service in eastern Colorado, and to establish basic parameters for those improvements

Table V-1 Options for Relocating Intermodal Facilities

<i>Option</i>	<i>Advantages</i>	<i>Disadvantages</i>
Separate Sites	<ul style="list-style-type: none"> ◆ Each user can select a site, or sites, based upon their individual requirements and preferences. ◆ Two or more smaller sites are required rather than one large site, which may make it easier to find suitable property. 	<ul style="list-style-type: none"> ◆ The sites may result in heavy truck traffic over several different routes in different parts of the metropolitan area. ◆ High volume customers may incur higher drayage costs because of the travel distance to the different facilities.
Joint or Adjacent Sites	<ul style="list-style-type: none"> ◆ The ability to maintain schedules when a problem occurs on one of the user's routes may be enhanced if sensitive traffic can be detoured over the other user's route that serves the joint facility. ◆ Truck traffic to and from the joint facility would use similar access roads and highways, which would result in fewer routes that have to be maintained to accommodate heavy trucks. ◆ A public/private partnership for the joint facility would not favor one user over another. ◆ High volume customers' drayage costs may be lower due to the joint location of facilities. 	<ul style="list-style-type: none"> ◆ One user may lose a competitive advantage over the other due to the common location of the joint facility versus separate sites. ◆ New track construction may be required in order to provide access to a main line of one of the users.

C. RECOMMENDATIONS

As summarized on Table V-2 and illustrated by Figure V-2, the recommended rail and intermodal improvements that resulted from the detailed evaluation of alternatives fell into four basic categories:

- ◆ **Highway/Railroad At-Grade Crossing Improvements** – These projects are on Class I railroads and are aimed at addressing safety issues by grade separating or closing select crossings. As shown in the table, the need to continue a program of crossing improvements has been recognized in the Statewide Transportation Plan. In addition, input from the railroads in this study has identified 14 crossings (both on the state highway system and off-system) at which improvements would greatly enhance freight operations. The total estimated cost for all of these programs and improvements is slightly more than \$150 million.
- ◆ **Class I Railroad Projects** – These projects focus on increasing capacity through the construction of new lines, second main tracks, or siding tracks. A major element of these projects is aimed at either constructing a new line to relocate through freight rail operations out of the Front Range area and its communities or improving capacity along the Front Range lines. Building the new line would be more expensive, but it would eliminate the current community impacts and would improve the feasibility of passenger rail service in the Front Range. If a new line were built to the east, the total cost of the

recommended projects in this category would be about \$720 million.

- ◆ **Shortline Railroad Projects** – These projects focus on upgrading the existing track structure to accommodate heavier carloadings and upgrading outdated or deficient rail lines with new rail and/or new roadbed materials. Four shortline railroads have been recommended for track and bridge improvements, totaling nearly \$18 million in costs.
- ◆ **Intermodal Facility Projects** – These projects involve the relocation of existing facilities to new sites in order to provide additional land area for expansion. The table includes a new facility for the UP and one for the BNSF, at a cost of \$70 million each. As noted earlier, a jointly owned combined facility may be worth pursuing.

This entire program of improvements, much of which would likely be funded by private industry, would cost a total of about \$1 billion.

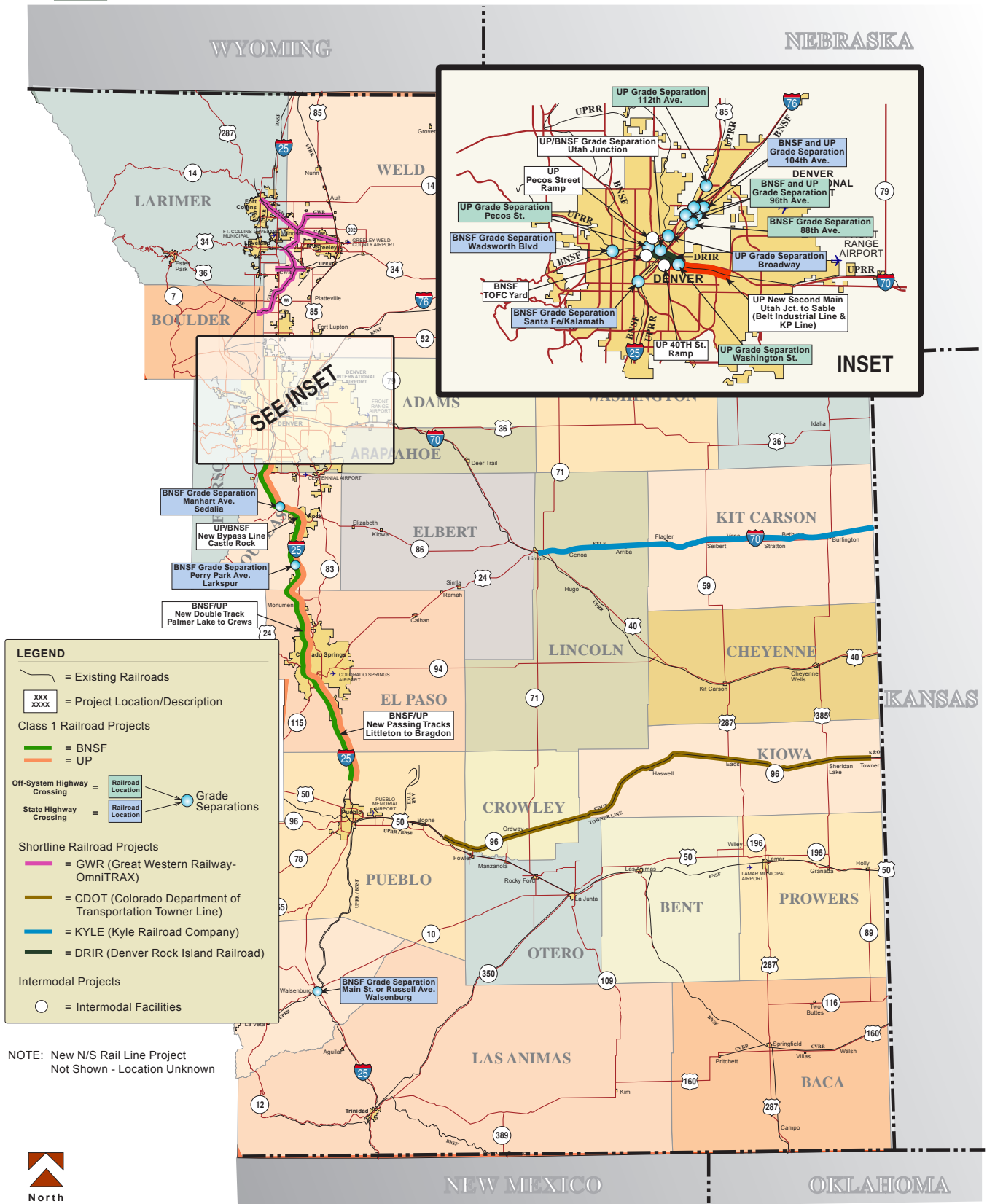
Table V-2 Recommended Rail/Intermodal Projects

Project	Description	Est. Project Cost (2001 dollars)
Highway/Railroad At-Grade Crossing Improvements - State Highway Crossings		
1. Safety / Crossings	<i>Safety / Crossing improvements; Statewide Transportation Plan - Constrained Plan</i>	\$6.73 million
	<i>Safety / Crossing improvements; Statewide Transportation Plan - Unconstrained Plan</i>	\$26.74 million
2. UP at 104th Avenue (SH 44)	<i>Grade separation near US - 85</i>	\$8 million
3. BNSF at 104th Avenue (SH 44)	<i>Grade separation near SH-2 and Peoria St.</i>	\$8 million
4. BNSF at Larkspur (SH 60)	<i>Grade separation</i>	\$6 million
5. BNSF at Sedalia (SH 67)	<i>Grade separation</i>	\$6 million
6. BNSF at Santa Fe/Kalamath (SH 85)	<i>Grade separation</i>	\$18 million
7. BNSF at Walsenburg (SH 85 / 87)	<i>Grade separation</i>	\$6 million
8. BNSF at Wadsworth Blvd (SH 121)	<i>Grade separation</i>	\$8 million
9. UP at Broadway (SH 53)	<i>Grade separation on Belt Line</i>	\$7 million
10. State Program to Eliminate Crossings	<i>Eliminate a number of railroad/ highway crossings per year (Cost subject to number of crossings)</i>	\$12 million
Subtotal		\$112.47 million
Highway/Railroad At-Grade Crossing Improvements - Off-System Crossings		
1. BNSF at 88th Avenue	<i>Grade separation</i>	\$6 million
2. UP at 96th Avenue	<i>Grade separation near US-85</i>	\$7 million
3. BNSF at 96th Avenue	<i>Grade separation near SH-2 and Havana St.</i>	\$6 million
4. UP at 112th Avenue	<i>Grade separation near US-85 and Hazeltine siding (possible candidate for closure)</i>	\$7 million
5. UP at Washington Street	<i>Grade separation on Belt Line</i>	\$7 million
6. UP at Pecos Street	<i>Grade separation (Include with Utah Jct separation)</i>	\$6 million
Subtotal		\$39 million
Class I Railroad Projects		
1. New N/S Rail Line	<i>Relocate Front Range through freight rail operations; estimated length = 165 miles</i>	\$650 million
2. BNSF/UP Joint Line - Double Track	<i>Construct 32.4 miles of new double-track between Palmer Lake and Crews (Not necessary if new N/S line or new sidings are constructed)</i>	\$130 million
3. BNSF/UP Joint Line	<i>Construct new passing tracks between Littleton and Bragdon; 7 sidings, 2 miles each (Not necessary if new N/S line or double track is constructed)</i>	\$56 million
4. UP/BNSF Joint Line - Castle Rock	<i>Construct new 18-mile rail line for freight trains to bypass downtown Castle Rock (Not necessary if new N/S line is constructed)</i>	\$63 million
5. UP/BNSF Utah Jct	<i>Grade separate railroad lines (UP over BNSF). Include with Pecos St separation and Belt Line improvements</i>	\$21 million
6. UP Belt Industrial Line	<i>Construct new second main track between Utah Jct and Pullman Jct (5.8 mi.: Belt = 4; Greeley Line = 1.8), including other related and necessary improvements</i>	\$24 million
7. UP KP Line	<i>Construct new second main track between Pullman Jct and Sable (7.7 miles). Include with Belt Line</i>	\$23 million
Subtotal	<i>(As noted, not all projects would be necessary. Includes only items # 1, 5, 6 and 7).</i>	\$718 million

Table V-2 Recommended Rail/Intermodal Projects (Continued)

<i>Project</i>	<i>Description</i>	<i>Est. Project Cost (2001 Dollars)</i>
Shortline Railroad Projects		
1. NA Junction - Towner Line (CKP)	<i>Improve track and bridges for heavier carloadings (Statewide Transportation Plan - Unconstrained Plan)</i>	\$1.27 million
2. Great Western Railway (OmniTRAX)	<i>Improve track and bridges for heavier carloadings (72 route miles)</i>	\$7.2 million
3. KYLE Railroad	<i>Improve track and bridges for heavier carloadings (90 route miles)</i>	\$9 million
4. Denver Rock Island Railroad	<i>Improve track and bridges for heavier carloadings (3.5 route miles)</i>	\$0.40 million
Subtotal		\$17.87 million
Intermodal Facility Projects		
1. UP 40th Street Ramp	<i>Relocate facility to new, larger site (may include Rolla auto facility)</i>	\$70 million
2. UP Pecos Street Ramp	<i>Relocate with 40th Street Ramp</i>	\$0
3. BNSF TOFC Yard	<i>Relocate facility to new, larger site</i>	\$70 million
Subtotal		\$140 million
<i>Note: The UP and the BNSF could discuss the potential for a jointly owned intermodal facility.</i>		
TOTALS	(All Projects)	\$1,027.34 M

Figure V-2



VI. Aviation System Analysis



VI. AVIATION SYSTEM ANALYSIS

A. OVERVIEW OF AIR CARGO OPERATIONS

Colorado airports serve an important and growing function in goods movement. The ability to ship cargo to and from airports in eastern Colorado is important for on time delivery of time sensitive products and regional economic development. The nature of air freight shipping dictates that, while volumes are much less than that shipped on other modes (truck and rail), the proportionate value is much greater. This characteristic is highlighted by the results of the 1997 Colorado Commodity Flow Survey conducted by the U.S. Census Bureau as part of the Economic Census. These data indicate that only about 0.1 percent of all commodities in weight are shipped by air; however, on the basis of value, nearly 5 percent of commodities are shipped by air.



This study focuses on airports within the study area that currently ship significant amounts of cargo or have the potential to develop cargo shipping capabilities that could serve as regional centers. According to a 1998 report by CDOT's Division of Aeronautics, economic benefits to Colorado from aviation are significant. The aviation industry supplies \$1.2 billion in direct benefits to Colorado's economy. Direct benefits accrue from airlines, air cargo carriers, charter services and associated expenditures. Indirect beneficial impacts are much greater and include an additional \$5.8 billion attributable to aviation visitors, military base operations and other dependent businesses. As the effects of aviation multiply through the economy, the report estimates that total economic activity exceeds \$14 billion and 250,000 jobs statewide. The 1998 report did not distinguish the economic benefits of passenger aviation from that of air cargo.

It is important to recognize that airports serve only air cargo demands generated within an airport's market area; airports are not generators of air cargo demands.

By definition, cargo shipping airports are intermodal centers. Landside transportation in Colorado is currently provided completely by truck; however, the potential exists at certain sites for intermodal facilities that would combine air, rail and truck opportunities in a single location. Such a facility could increase the options for both inbound and outbound shippers, providing a much sought after level of efficiency in the transport arena.

Several factors are typically involved in deciding whether or not to move material via air cargo, including:

- ◆ Cost of transportation
- ◆ Level of service commitment to the customer
- ◆ Time sensitivity

Today, shippers mostly select transportation services based on transit time and reliability rather than mode or route. The focus is on the delivery of products, not the mode.

There are four primary distribution channels for air cargo. They include:

- ◆ **All Cargo Carriers** – These carriers operate airport-to-airport air cargo services to major world markets using wide body cargo aircraft.
- ◆ **Freight Forwarders** - These operators consolidate packages into container loads for other primary shippers.
- ◆ **Commercial Airlines** – 55 percent of air cargo carrying capacity is currently in passenger aircraft, but this share is continuing to decrease as other alternatives are provided.
- ◆ **Integrated Express Carriers** – These carriers move material door-to-door on the most efficient mode available. This group includes FedEx, UPS, Airborne Express, etc., which operate on a hub system similar to passenger service.

Although the air cargo industry competes primarily with the trucking industry, opportunities may exist to maximize the efficiency of each mode through mutually beneficial arrangements. Because trucking can compete directly with air cargo for time-

critical shipments on routes less than 1,000 miles, integrated carriers like FedEx and UPS have become much larger players in the trucking industry, finding it most effective to fly freight to large regional hubs, then deliver (and pick up) cargo by truck. UPS has become the largest trucking company in Europe, and FedEx is one of the fastest growing trucking companies in the U.S.

B. INITIAL SCREENING OF AVIATION/AIR CARGO FACILITIES

Several factors are determinants of the viability of significant air cargo facilities. They include:

- ◆ Strong local production and consumption within a 180 mile radius.
- ◆ Additional markets within 400 miles.
- ◆ Interlining capabilities with connecting passenger carriers, charters and motor carriers.
- ◆ Strong local market for air service.
- ◆ Strong presence of a freight forwarder in the local market.
- ◆ Warehouse distribution services.
- ◆ Appropriate airside and landside infrastructure.

As noted earlier, there are 39 airports in the study area. Each of the determinants cited above was considered in a preliminary screening of each airport to determine if the airport has the potential to be a key base of significant air cargo services and if

improvements of the air cargo facilities at the airport would result in significant economic benefits to the region or the state. This initial screening resulted in the identification of 10 airports to be explored further through a detailed evaluation (see Figure VI-1).

The exclusion of certain airports at this point in the study does not imply that other smaller airports are not capable of handling, or do not currently accommodate, cargo-carrying aircraft. However, smaller airports in smaller markets are limited in both the size of aircraft served and the amount of supporting commercial activity.

C. DETAILED EVALUATION OF AVIATION/AIR CARGO ALTERNATIVES

The detailed evaluation of the 10 airport facilities included research into each existing facility to determine:

- ◆ Existing Capabilities
- ◆ Volume of Operations
- ◆ Deficiencies with regard to each facility's current functional classification.

Capabilities include number of runways and load limits. An operation is defined as a single take-off, landing or approach. Functional classification identifies whether the airport is categorized as a Major (M) or an Intermediate (I) airport, and whether the facility's service is primarily Commercial (C), General Aviation (GA) or Reliever (R), as noted in Section II of this report. To determine deficiencies, the *Colorado*

Statewide Airport Inventory & Implementation Plan (2000) was reviewed; the plan recommends that certain improvements be undertaken to bring each airport into conformity with its standards for the identified functional level of that airport.

For each airport, these data are summarized below. The reader is referred to the *Colorado Statewide Airport Inventory & Implementation Plan (2000)* for additional details or descriptions of specific improvements.

1. Identification of Airport Improvement Needs

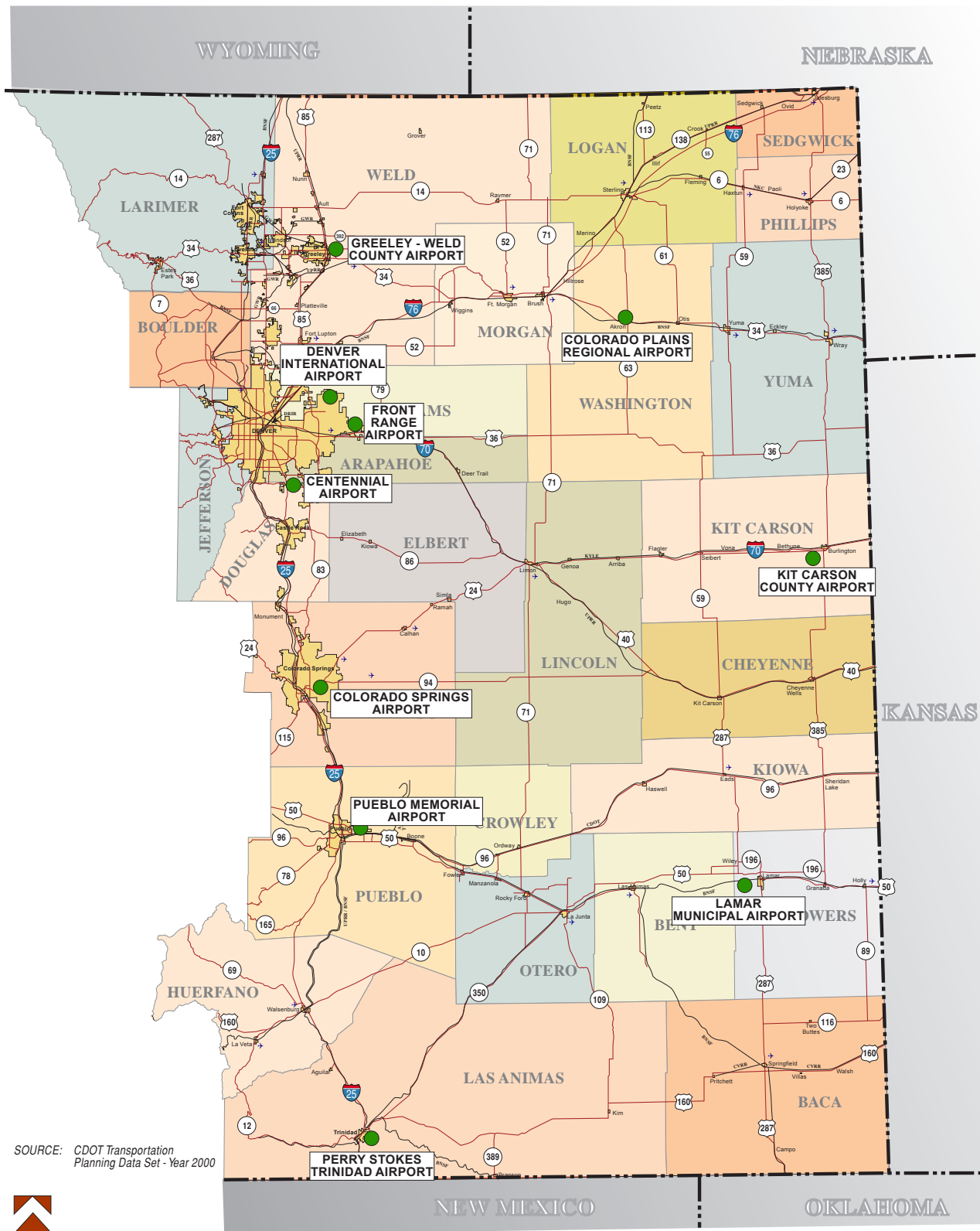
Burlington - Kit Carson County Airport (M)(GA)

The Burlington - Kit Carson County Airport has one 5,202 foot runway. In 2000, average daily operations were 21. Operations are limited to single-wheeled aircraft with a maximum weight of 12,500 lbs. No regularly scheduled commercial service currently exists. There is no current air cargo activity. The master plan does not address air cargo.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Precision Approach
- ◆ Object Free Area / Runway Safety Area
- ◆ Establish Off-Airport Height Restrictions
- ◆ Runway Length Extension

Figure VI-I



SOURCE: CDOT Transportation Planning Data Set - Year 2000



Centennial Airport (M)(GA/R)

The Centennial Airport has three runways: 4,904 feet, 10,002 feet and 7,004 feet in length. Maximum weight limit on the longest runway is 75,000 lbs. In 2000, average daily operations were 1,194. No regularly scheduled commercial service currently exists.

Centennial does not factor air cargo into its latest Master Plan; however, it currently provides a means of access for several minor air cargo operators:

- ◆ Air Net carries checks and is affiliated with various smaller carriers utilized for feeder operations. It operates several Lear 35 aircraft.
- ◆ Ameriflight carries checks and operates one Lear 35.
- ◆ International Jet provides limited cargo services, in addition to charter services, utilizing Lear 24s for cargo operations.
- ◆ Key Lime Air carries many varieties of cargo utilizing Fairchild Metroliners, Navajos, and one Lear 23.
- ◆ Sundance hauls general cargo using Beech 99s.

Although cargo operations at Centennial Airport occur generally at night and during the early morning hours, a number of operational counts can be associated with daytime cargo functions. Cargo aircraft at Centennial Airport utilize ample ramp space for their operations and occasionally use this space in the event of layovers.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Object Free Area / Runway Safety Area

Colorado Plains Regional Airport (formerly Akron - Washington County Airport) (I)(GA)

The Colorado Plains Regional Airport has one 7,000 foot runway with a maximum weight of 125,000 lbs. In 2000, average daily operations were 43. No regularly scheduled commercial service currently exists. There is no current air cargo activity.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Update Airport Master Plan in 2004

Colorado Springs Municipal Airport (M)(C)

The Colorado Springs Municipal Airport has three runways of 8,268, 13,500, and 11,021 feet. Maximum weight limit on the longest runway is 850,000 lbs. In 2000, average daily operations were 514. Several commercial passenger airlines provide regular service, including 12 non-stop destinations.

A variety of air cargo services operate at the airport. Approximately 85,000 tons of air freight were shipped at the airport in 2000.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ None

Denver International Airport (M) (C)

The Denver International Airport (DIA) is the largest airport in the state, serving as a major regional hub for passenger service and the largest air cargo distribution center in Colorado. It has five 12,000 foot runways, each with a maximum weight limit of 850,000 lbs. A total of 12 runways are planned at maximum buildout. In 2000, total average daily operations were 1,362, of which 60 were dedicated cargo aircraft. The airport has a total of 423,000 sq. ft. of cargo space and shipped 845,000 tons of freight in 2000.

DIA has four cargo-handling buildings adjacent to 22 acres of cargo apron for aircraft ramp parking and service. The cargo ramp has some common-use areas for carrier contractors who ferry freight from all over the region. The largest of the four buildings (at 110,244 square feet) is the Passenger Airlines Cargo Facility, in which several commercial airlines process, store and ship air freight. Fifty percent of DIA's air cargo is shipped by passenger airlines. The largest tenant is Continental Airlines, with 50,000 square feet of warehousing space and 11,000 square feet of office space. The facility is equipped to handle up to 20,000 tons of freight and mail per month. Other tenants include America West, Aerolink International, Delta, Eagle USA, Northwest and TWA.

DIA's Cargo Buildings A, B and C have a combined area of 146,000 square feet. Shippers include Federal Express, Integrated Airlines Services, Inc., DHL Worldwide Express, Emery Worldwide, Miami Aircraft Support, Airborne Express, Burlington Air Express, and United Parcel Service. United Airlines operates its own air freight building with an area of approximately 65,000 square feet that can

handle 150 tons of mail and 150 tons of freight daily.

Seventy-two acres adjacent to the cargo buildings and apron are designated for a mixed-use business park and commercial center to be developed by a third party as WorldPort at DIA. Future development could include more than 180,000 sq. ft. of cargo warehousing, just-in-time (JIT) inventory buildings, air freight forwarders, U.S. Customs brokers and support facilities (such as a food court for truck drivers and a day-care center and medical facility for airport employees).

Increasing demand on DIA's facilities for both passenger and freight service may require an additional investment of up to \$150 million to construct a new runway south of Pena Boulevard to be dedicated entirely to air cargo. Some air cargo operators have identified limitations at DIA, which are currently being addressed. Cargo flights have been monitored while on the ground via closed-circuit cameras rather than the preferable line-of-site control from the tower. Other issues include long taxi times to gain access to existing runways north of Pena Boulevard and available warehouse space. Cargo related construction now underway on the south side will address these taxi, control tower and warehouse space issues. Even with these improvements, however, there remains some concern among air cargo carriers that long term growth in passenger operations could cause cargo operations to suffer. DIA will need to constantly monitor this situation and implement appropriate improvements.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ None

Front Range Airport (M)(GA/R)

Front Range Airport has two 8,000 foot runways with a maximum weight limit of 40,000 lbs. In 2000, average daily operations were 327. No regularly scheduled commercial service currently exists.

Air cargo at Front Range is currently limited. The airport and the adjacent Business Park total approximately 10,000 acres. An approximate \$10 million investment would be required to construct an air traffic control tower and runway/taxiway improvements to allow smaller freight hauling aircraft to operate. A total investment of \$93 million would be required to lengthen, widen and strengthen its two runways to allow operations of the largest cargo jets.

The potential exists to establish a rail/truck/aviation intermodal center on existing UP trackage adjacent to the Business Park. Transport is also exploring the possibility of a track sharing agreement that would allow the BN access to the site. It is possible that Front Range Airport may become a larger component of the air cargo industry at some time in the future, particularly with the possible creation of a major intermodal center at the airport.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ None

Greeley-Weld County Airport (M)(GA)

The Greeley-Weld County Airport has three runways of 6,200, 10,000 and 3,599 feet with a maximum weight limit of 18,000 lbs. In 2000, average daily operations were 370. No regularly scheduled commercial service currently exists. A new 265 acre Greeley-Weld Airport Business Park has begun

development of Phase I, with two additional phases planned. The airport reports no significant air cargo service at this time.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Update Airport Master Plan in 2002

Lamar Municipal Airport (M)(GA)

The Lamar Municipal Airport has two runways of 5,001 and 6,304 feet with a maximum weight limit of 100,000 lbs. In 2000, average daily operations were 37. Commercial passenger service has recently been discontinued.

The airport accommodates limited air cargo activities:

- ◆ UPS operates two flights a day into the airport, at 7:00 am and 7:00 pm, by a twin-engine turboprop Fairchild Metroliner.
- ◆ Loading and unloading operations do not require specific cargo facilities, as the aircraft are loaded on the apron.

Previous planning studies have briefly mentioned air cargo activity at the airport. An on-going marketing/business study has addressed air cargo activity in more depth to determine how a proposed industrial park would impact the airport. As a result, future planning studies will include a focus on air cargo activities.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Update Airport Master Plan in 2005
- ◆ Precision Approach
- ◆ Establish Off-Airport Height Restrictions
- ◆ Runway Length Extension

Perry Stokes -Trinidad Airport (M)(GA)

The Perry Stokes -Trinidad Airport has two 5,500 foot runways with a maximum weight limit of 50,000 lbs. In 2000, average daily operations were 37. No regularly scheduled commercial service currently exists.

UPS, under contract with Sundance Air, operates one air cargo flight per day Monday through Friday on a King Air 99. This flight also serves neighboring Raton, NM.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ Update Airport Master Plan in 2006
- ◆ Precision Approach
- ◆ Runway Length Extension

Pueblo Memorial Airport (M)(C)

The Pueblo Memorial Airport has three runways 10,496, 8,308 and 4,073 feet in length with a maximum weight limit of 250,000 lbs. In 2000, average daily operations were 206. Pueblo receives limited commercial jet service. Limited air cargo services and facilities are available at the airport, but are underutilized due to proximity to Colorado Springs Municipal and Denver International Airports.

Identified Improvements Needed for Conformity to Functional Classification:

- ◆ None

2. Costs for Planned Development at Airports

Costs to bring the 10 airports into conformity with the state's functional classification have not been independently determined in this study. However, airport development needs have been identified from other sources. Table VI-1 summarizes the costs for planned development at the 10 airports retained for study after the initial screening analysis. These costs were determined through previous planning and or capital improvement processes.

The 1999 Regional Transportation Plans were completed as part of CDOT's statewide transportation planning process. The projects included in these plans were determined as necessary to maintain mobility at the regional level over a 20 year planning period. Identified project developments at these airports are not specifically tied to air cargo, but may enhance passenger mobility, runway capacity, taxi and storage facilities, and flight control systems. Aviation costs for Burlington-Kit Carson, Colorado Plains Regional, Greeley-Weld County, Lamar, Perry Stokes-Trinidad and Pueblo Memorial were included in these regional plans.

Aviation costs for Centennial and Front Range were not included in the regional transportation plans for their respective areas. For these airports, 6 year capital improvement programs, as submitted to CDOT Division of Aeronautics, have been identified and included in the table as a means of identifying near term needs. Denver International and Colorado Springs Municipal, the two largest airports in the study area, are part of the 1999 National Plan of Integrated Airport Systems, a 5 year federal planning program.

Table VI-1 Summary of Airport Development Costs

Airport	Total Development Cost (\$ M)	Source
Burlington-Kit Carson	\$2.2	Regional Transportation Plan
Centennial	\$20.4	CDOT/Division of Aeronautics - Capital Improvement Program
Colorado Plains Regional Airport	\$8.2	Regional Transportation Plan
Colorado Springs	\$43.2	1999 National Plan of Integrated Airport Systems
Denver International	\$324.1	1999 National Plan of Integrated Airport Systems
Front Range	\$24.9	CDOT/Division of Aeronautics - Capital Improvement Program
Greeley-Weld County	\$19.1	Regional Transportation Plan
Lamar	\$7.8	Regional Transportation Plan
Perry Stokes-Trinidad	\$1.3	Regional Transportation Plan
Pueblo Memorial	\$8.0	Regional Transportation Plan

Additionally, it is evident that three airports in the study area either operate as significant regional centers for air cargo or have the potential market to develop as significant regional centers. These airports are recommended for specific air cargo improvements to support the development of air cargo in the region. The three airports are:

- ◆ Denver International Airport
- ◆ Front Range Airport
- ◆ Colorado Springs Municipal Airport

D. RECOMMENDATIONS

Application of the detailed evaluation revealed that the potential exists at all ten airports to enhance, either directly or indirectly, the use of air cargo operations for movement of goods. Therefore, one recommendation of this study is to support airport development at all ten airports through the implementation of individual airport capital improvement programs and long range transportation plans as funds are available.

VII. Recommended Policies/Strategies



VII. RECOMMENDED POLICIES/STRATEGIES

In addition to the improvements-oriented recommendations previously outlined for each element of the transportation system, the following policies/strategies are also recommended to enhance freight mobility in the highway, rail, intermodal, and aviation transportation modes in eastern Colorado.

These policies/strategies were developed with input primarily from the Freight Working Group and the Steering Committee. Their inclusion in the report reflects a recognition that freight mobility could experience significant benefits from a more focused awareness of freight issues and from a wide range of broad-based programs affecting the freight support system.

A. GENERAL FREIGHT POLICIES/STRATEGIES

1. Increase CDOT involvement in, and coordination of, freight related transportation improvement programs by establishing a statewide freight advisory council to provide input on issues related to all modes involved in the movement of goods.

B. HIGHWAY FREIGHT POLICIES/STRATEGIES

1. Initiate a program with CDOT involvement to improve truck parking opportunities along primary freight routes.

2. Involve the freight industry in the review of the CDOT Design Guide in order to address the concerns of the industry in the planning and design processes.
3. Develop a program to review each CDOT improvement project on freight corridors to ensure that freight-enhancing components are included when feasible.
4. Encourage steady state traffic flow through such strategies as minimum speeds in left lanes; climbing lanes, passing lanes, and acceleration/ deceleration lanes at specific problem locations; and ramp metering.
5. Identify and fund safety improvements (such as horizontal, vertical, and intersection sight distance improvements; shoulder widening; and emergency parking areas) along key freight corridors.
6. Evaluate effectiveness of existing freight truck weight laws and address disparity of allowable weight limits on roadways of varying classification.
7. Expand program to improve enforcement of, and to encourage compliance with, existing truck weight and safety laws.
8. Encourage stricter access management standards along primary freight corridors.

C. RAIL FREIGHT POLICIES/STRATEGIES

1. Enhance the institutional environment in Colorado to encourage railroad investment in the state by continuing improved communications with the railroads through railroad participation on the statewide freight advisory council. Although the primary focus of the advisory council should be on the improvement of freight mobility, the council should provide a structure which also allows a forum for the railroads and other affected parties to discuss a wider range of rail-related issues.
2. Reinstate the State sponsorship of federal grants or low-interest loans for rail enhancement (e.g., CDOT could sponsor, but not be signatory to, Railroad Rehabilitation and Improvement Financing (RRIF) applications by private parties). Examples would be the assistance previously provided to rehabilitate the line now operated by Kyle from Limon to the Kansas State line and the San Luis Central line northeast of Monte Vista in the San Luis Valley.
3. Encourage public investment in railroad improvement projects through the use of programs such as RRIF or TIFIA (Transportation Infrastructure Finance and Innovation Act). Projects should be limited to those which provide public benefits in the areas of improved mobility, economic development, and improved public safety.

4. Encourage an increased level of state and federal funding for the purpose of improving highway/railroad grade crossings, and preferably constructing grade separations or otherwise eliminating crossings.
5. Consider utilizing the rail account of the State Infrastructure Bank, along with the State Rail Bank, for funding potential projects related to the State Rail Corridor Preservation Policy.

D. INTERMODAL FREIGHT POLICIES/STRATEGIES

1. Provide State sponsored or administered low interest loans to support facilities which would encourage the use of intermodal transportation (e.g. truck/rail, truck/air, and truck/rail/air) by either establishing an intermodal account in the State Infrastructure Bank or making intermodal projects eligible for highway and rail SIB accounts.
2. Encourage participation by the State in public/private funding of intermodal facilities and intermodal connectors through the use of programs in which intermodal projects are eligible, such as NHS (National Highway System), STP (Surface Transportation Program), and CMAQ (Congestion Mitigation and Air Quality).

E. AVIATION/AIR CARGO POLICIES/ STRATEGIES

1. Support airport development at all ten airports identified in the alternatives analysis through the implementation of individual airport capital improvement programs and long range transportation plans as funds are available.
2. Expand the aviation account in the State Infrastructure Bank to assist in providing low interest loans specifically for air cargo improvements at Denver International, Front Range, and Colorado Springs Municipal Airports.
3. Recognizing that Front Range Airport may become a larger component of the air cargo industry at some time in the future, particularly with the possible creation of a major intermodal center at the airport, encourage the participation of air cargo carriers in planning efforts with DIA and Front Range Airport regarding long term needs to support air cargo operations.

VIII. Options for Funding



VIII. OPTIONS FOR FUNDING

To support the recommendations of this study, the study team identified a variety of funding sources that could help accomplish the suggested corridor and freight service improvements. In recognition that Colorado's long range improvement plan is already oversubscribed, funding should be sought from a broad array of Federal, State, local, and private sources. To be successful in obtaining incremental funding for enhanced freight mobility, it will be important for community representatives to have early and ongoing involvement in the transportation planning processes coordinated by CDOT.

A. COLORADO HIGHWAY PROGRAMS

CDOT categorizes its road budget into three major program areas: statewide, regional, and the Strategic 28 Projects programs. Two significant components of the statewide road program are applicable to the corridor improvement recommendations in this study: surface treatment and maintenance. Both surface treatment and maintenance funds are allocated by the Commission based primarily on a performance budgeting system targeted at remaining service life and maintenance of levels of service.

The Strategic 28 Projects were established by statute and include two segments on US 287 from Hugo south to Campo. This route has been designated as part of the Ports to Plains Corridor and would connect with portions of the recommended primary corridors in this study. However, neither the recommended Heartland Expressway nor

the Colorado corridor connector has been named in the Strategic 28 Projects program.

Other than the regular surface treatment and maintenance programs, CDOT's "Regional Programs" category appears to be the most appropriate source of road funds for carrying out the recommended corridor improvements. In particular, after certain mandatory programs are funded, remaining regional funds are allocated for "Regional Priorities," and those decisions are made at the CDOT Region level with the advice of the Transportation Planning Regions (TPRs). Hence, the TPRs help establish funding priorities for construction, and they work with CDOT to establish the long-range transportation plan and the Transportation Improvement Program (TIP) for each CDOT Region and statewide. CDOT, in concert with TPR representatives from eastern Colorado, could advance the recommendations of this study as follows:

- ◆ Seek to include freight-oriented components into improvements moving forward under the regular surface treatment and maintenance programs.
- ◆ Seek priority in CDOT's "Regional Programs" funding category, especially funds allocated for "Regional Priorities".
- ◆ Continue to advance the Ports to Plains (US 287) strategic corridor, already funded as part of CDOT's 7th Pot.

- ◆ Include the designated Heartland Expressway in the next round of strategic projects (the proposed 8th Pot).
- ◆ Include the recommended corridor connector (US385 & US40) in the next round of strategic projects (8th Pot).
- ◆ Lay out in detail the improvements needed on the primary and support corridors to facilitate inclusion of improvements and allocation of funding in the regional and state plans on a step-by-step basis over time.
- ◆ Expand utilization of the existing State Infrastructure Bank (SIB) highway account for freight mobility purposes; it may even be appropriate to create and to capitalize a separate account.
- ◆ Develop Public-Private Initiatives applications for freight improvements.
- ◆ Railroad-highway crossing improvements can be funded from Federal programs:
 - ▶ Set-aside from Surface Transportation Program (STP) for elimination of rail crossing hazards.
 - ▶ Additional STP set-aside for crossings on high-speed rail corridors.
 - ▶ Additional general fund authorization for high-speed rail crossing hazards.
- ◆ Important regular highway programs can be applied (with TEA-21 nationwide FY 2003 authorization amounts shown in parentheses), including:
 - ▶ National Highway System (NHS) gives special mention to improving intermodal freight connectors (\$5.1 billion).
 - ▶ STP is flexible and has set-asides (\$5.9 billion):
 - 10% STP set-aside for safety improvements includes rail-highway crossings.
 - 10% set-aside from STP for transportation enhancements (\$590 million).

B. FEDERAL HIGHWAY PROGRAMS

Colorado receives substantial amounts of Federal aid from TEA-21 authorizations in support of its highway programs, amounting to about \$300 million annually. The regular Federal highway funds are subject to numerous requirements, but these programs generally can be applied for freight and intermodal enhancements, and some sub-programs are specifically designed for purposes that could support the recommendations of this study.

- ◆ Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds may benefit projects that improve air quality in designated non-attainment areas (\$1.4 billion):
 - ▶ Generally, CMAQ funds may only be used to support projects physically within air quality Non-Attainment or Maintenance areas.
 - ▶ CMAQ can assist a wide range of intermodal projects that reduce certain air pollutants in non-attainment or maintenance areas.
 - ▶ Recent FHWA/FTA guidance allows CMAQ funding for projects in close proximity where air quality benefits are primarily realized in the non-attainment areas.
- ◆ Other Federal programs are flexible and funds are transferable at CDOT request.
- ◆ Discretionary Federal programs can be tapped for priority corridors, including the Corridors and Borders (CORBOR) Program that supports development of high-priority corridors of national significance (\$140 million). This funding is discretionary to the Secretary of Transportation, though in practice most funds are earmarked by Congress. Both the Heartland Expressway and the Ports to Plains Corridor are eligible for this funding program.

Suggested actions related to Federal sources to fund eastern Colorado priorities include:

- ◆ Apply for CORBOR funds (recognize heavy competition for limited funds).
- ◆ Seek other Federal discretionary funds via the Congressional delegation, building on designation of the Ports to Plains Corridor and the Heartland Expressway.
- ◆ Seek expanded viability of State Infrastructure Bank (SIB) programs; use of Federal funds is now limited under TEA-21 restrictions.
- ◆ Develop action plan to position eastern Colorado primary corridors into “Next TEA” reauthorization, to be effective October 1, 2003.

C. RAIL IMPROVEMENT ASSISTANCE

As discussed earlier in this report, Colorado is served by two Class I railroads and a number of regional and shortline railroads that provide important freight movements across the state. Colorado has regularly sought to preserve rail services and to encourage railroad investments in the state. CDOT has developed a State Rail Corridor Preservation Policy, and a State Rail Bank was established to purchase and preserve rail lines. However, these programs are not well funded, and legislative action is necessary to access the existing rail bank funds. At a minimum, CDOT should have some flexible mechanism to encourage private investment in enhanced railroad facilities and services in the state.

The following are among the steps that should be considered to enhance the institutional environment for railroads operating in Colorado and to provide CDOT with appropriate support mechanisms:

- ◆ Develop an operational State Rail Bank to support freight rail, initially based on an on-going revolving fund supported by existing lease payments; this could be accomplished by establishing and capitalizing a railroad account within CDOT's existing SIB.
 - ◆ Use the flexibility of Federal highway program funds to support intermodal and rail-related improvements; intermodal and rail projects are usually eligible for STP (especially STP set-asides for hazard elimination), transportation enhancements, bridge replacement, CMAQ, and even the TIFIA credit program.
- Selected examples of the application of Federal highway program funds to support rail improvements include:
- ▶ PennDOT applied Bridge Program funds to improve clearances for double-stack container service.
 - ▶ Ohio acquired a freight line using transportation enhancement funds.
 - ▶ Ventura County, CA, purchased two short lines using STP funds.

- ◆ Develop an action plan to access new discretionary Federal credit support provided by the Railroad Rehabilitation & Improvement Financing (RRIF) program enacted as part of TEA-21:
 - ▶ RRIF favors projects that involve small communities and rural areas.
 - ▶ RRIF has a set-aside for small railroads (at least \$1 billion of \$3.5 billion total).
 - ▶ Provides loans and loan guarantees to public and private rail lines and can be used for mainlines, shortlines, and intermodal transfer facilities.
 - ▶ Requires non-federal source to pay the risk premium (or credit subsidy cost); two states have passed legislation enabling payment of credit subsidy.
 - ▶ Program not effectively utilized to date; however, one loan was approved in 2001.
 - ▶ RRIF would be freed up and greatly expanded under several proposed Federal bills.

D. AVIATION FUNDING SOURCES

CDOT has available a number of policies to help develop and sustain aviation and air cargo infrastructure in eastern Colorado. These include full use of existing State and Federal programs. Below is a brief description of several aviation-related options that are appropriate for improving mobility in eastern Colorado.

- ◆ Utilize fuel tax funds administered through the Colorado Aeronautical Board (CAB), which channels aviation fuel taxes back into the airports of origin in the form of regular entitlement funds.
- ◆ Apply for funding available through the Colorado Discretionary Aviation Grant Program (CDAG), which can be used for pavement maintenance, pavement rehabilitation, weather/navigation aids, safety needs, and generally to match Federal funds.
- ◆ Compete for Federal Aviation Administration (FAA) grant funding available for airports included in the National Plan for Integrated Airport System. Each of the ten airports included in the study recommendation is eligible for this FAA program.
- ◆ Compete for existing funds and support additional funding for the aviation account of the Colorado State Infrastructure Bank. CDOT is currently authorized to provide up to \$4 million to an aviation SIB for low interest loans to airports.
- ◆ US DOT recently received \$20 million from Congress to fund the Small Community Airport Service Development Pilot Program. The US DOT plans to distribute these monies among 40 small, non-hub and/or general aviation airports to assist in the improvement of commercial air service in the near future. This Pilot Program is intended to recognize the difficulties that small airports and small communities have in attracting and maintaining adequate air service.
- ◆ Through its existing public/private initiative program (“PPI”), CDOT can encourage such partnerships for airports, as it has already done for highways. This can include making airports in eastern Colorado aware of the PPI program, as well as improving advertising potential opportunities to private airport operators and financiers.
- ◆ TEA-21 launched an innovative financing program known as TIFIA (Transportation Infrastructure Finance and Innovation Act) to help fund large, innovative, intermodal transportation projects. Under TIFIA, an approved project may receive loans and loan guarantees for up to one-third of project cost at attractive rates and terms. TIFIA funds have been used for airport-related projects, including Miami Airport’s intermodal center. TIFIA would be a useful tool for larger airports, air/rail systems, integrated road/airport improvements, or air/truck cargo centers.

E. COMPLEMENTARY STATE AND FEDERAL PROGRAMS

There are numerous complementary State and Federal programs that could be brought to bear on improving transportation infrastructure in eastern Colorado. The programs identified below generally focus on economic development assistance and are targeted at relatively small projects that can assist communities with business and job retention, and development by funding local access, rail spurs, lighting, and other related purposes. These programs could be

useful as adjuncts to the recommended infrastructure improvements.

- ◆ Colorado's Office of Economic Development (OED) provides grants and revolving loans for roadways, railroad spurs, and other infrastructure projects in order to create or retain jobs in the recipient communities:
 - ▶ OED administers a program of Community Development Block Grants that can be used for local improvements to roadways, rail spurs, lighting, and other purposes.
 - ▶ OED also supports regional revolving loan funds that are administered by local loan review committees and can provide loans and loan guarantees.
- ◆ Colorado's Energy & Mineral Impact Assistance Fund can assist communities with construction and maintenance of public roads:
 - ▶ Fund assists communities affected by growth and decline of energy and mineral industries in Colorado, administered by Department of Local Affairs.
 - ▶ Assistance provided in the form of grants and low-interest loans, generally with a maximum grant amount of \$300,000.
 - ▶ Eligible activities include "planning, construction and maintenance of public facilities," which in turn includes public roads and streets.

- ◆ The Colorado Agricultural Value-Added Development Fund supports agriculturally- based economic development and employment in rural Colorado:
 - ▶ Created by legislation enacted in May 2001; administered by a Board with support from the Markets Division of the Department of Agriculture.
 - ▶ Offers financial and technical assistance; Board can make grants, extend credit, and offer tax credits for eligible projects.
 - ▶ Transportation improvement is not a focal point, but might be eligible in the proper project context.
 - ▶ Primary purpose is to facilitate processing of agricultural products within Colorado and to benefit the economy of rural communities; Fund can also support business plans and feasibility studies.
- ◆ USDA Rural Business Cooperative Service has limited funding to support infrastructure development under their Technical Assistance for Rural Transportation Systems:
 - ▶ Grants are primarily directed at technical support for rural passenger transportation improvements.
 - ▶ Grants are awarded only to qualified private, non-profit organizations; public bodies are not eligible.

IX. Approach to Implementation



IX. APPROACH TO IMPLEMENTATION

A. GENERAL APPROACH

Gaining access to funds and implementing projects to improve freight mobility in eastern Colorado will require more than the identification of projects and potential funding sources; it will require an approach that combines appropriate local and state support and an organized effort toward project identification, development, and funding. The following are basic principles upon which an approach should be built:

Encourage Recognition of Freight Issues

To date, freight mobility has not received much attention in either the regional or the statewide transportation planning processes. As a result of this study, it is anticipated that CDOT will establish a statewide freight advisory council to raise awareness of, and to provide input on, freight mobility issues. This council should assist CDOT in providing a focal point to efficiently introduce and advance freight related projects into the statewide planning and funding process. Information discussed and developed by the council should be shared with the transportation planning regions (TPRs) to encourage such projects to be recognized in the development of regional transportation plans.

Emphasize the Benefits of Freight Mobility

In order to justify the need to improve freight mobility in eastern Colorado and to support the mechanisms necessary for development of the corridor recommendations established in this study, it will be important

to identify and quantify to stakeholders all of the benefits associated with improved freight mobility. It should be recognized that the beneficiaries are broad-based (both local and multi-state) and multi-modal.

The following aspects merit special attention in arguing the case for the recommended corridor improvements:

- ◆ Economic development and agricultural impacts in eastern Colorado.
- ◆ Reduced travel time and improved amenities for motor carriers and automobiles.
- ◆ Diversion of freight traffic from I-25, and other congested roadways, and the prospects for congestion improvement benefiting the metropolitan areas.
- ◆ Possible rail improvements in eastern Colorado which could reduce community impacts and which could allow Front Range corridors to be used for transit purposes.
- ◆ Multi-state and national benefits that could be used to attract federal funding.

Support Creative Use of Traditional Funding

The order of magnitude of the recommendations resulting from this study is such that additional funding beyond that currently identified would undoubtedly be needed. Although this implies that new sources of funds may need to be tapped, it is important to recognize that freight mobility can be improved as an adjunct to the regular highway improvement program, often simply by introducing freight priorities into various funding aspects of the ongoing improvement program. This opportunity reflects the fact that freight-oriented aspects of highway projects often comprise only small, specific elements of general roadway improvements. Therefore, careful consideration of creative use of traditional funding sources could go a long way toward implementation of the recommendations.

Promote Local Involvement

Because improvement projects such as those recommended in this study must be recognized in regional transportation plans in order to be funded, awareness of, and involvement with, freight issues must be promoted at the local level where the regional plans are developed. Furthermore, local support will be critical to gaining support of elected officials at the state level for expanding traditional funding sources and for pursuing new sources to allow implementation of freight mobility improvements.

B. NEXT STEPS

Although it should be recognized that implementation of the recommendations of this study is likely to be a long-term program, there are a number of efforts

which could be initiated in the near future to ensure that progress begins toward implementation. A number of these are outlined below

NEXT STEPS

1. *Pursue Designation of the Heartland Expressway*

- ◆ Work with adjoining states to reach agreement on a joint designation of the Heartland Expressway.
- ◆ Work with the Colorado congressional delegation to formally recognize the recommended designation of the Heartland Expressway.

2. *Pursue Recognition of Study Recommendations in Regional and Statewide Transportation Plans*

- ◆ Establish the statewide freight advisory council to continue discussions of freight related issues.
- ◆ Conduct reviews of the corridors recommended in this study to identify improvement needs in greater detail.
- ◆ Encourage the transportation planning regions to prioritize the needs in these corridors and to incorporate the improvements as projects in their regional transportation plans.
- ◆ With the input from the TPRs, amend the statewide transportation plan accordingly.

3. *Pursue All Potential Funding Mechanisms to Incrementally Implement Improvements*

- ◆ Encourage inclusion of the primary corridors in the proposed 8th Pot of Strategic Projects.
- ◆ Consider “Regional Priorities” funding for freight improvements as supported by the TPRs.
- ◆ Encourage application of the regular surface treatment and maintenance programs to the recommended corridors.
- ◆ With the designation of the Heartland Expressway, apply for Corridors and Borders (CORBOR) Program funding for this corridor.
- ◆ Expand the capabilities of the State Infrastructure Bank to assist in funding improvements in all modes of freight transportation.
- ◆ Explore other creative uses of traditional funding and other potential new sources as outlined in the Options for Funding section.



FELSBURG
HOLT &
ULLEVIG

engineering paths to transportation solutions

303.721.1440
fax 303.721.0832

Greenwood Corporate Plaza
7951 E. Maplewood Ave. Ste. 200
Greenwood Village, CO 80111