Oregon Department of Transportation
In a Collaborative Effort with the
South Central Oregon Regional Partnership

Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border

Draft Final Report

June 29, 2001
Executive Summary

This executive summary presents the major findings, recommendations, and implementation strategies from a study evaluating the economic benefits from improvements to Highway 140 East of Klamath Falls to the Nevada Border. Study oversight was provided by officials from the South Central Oregon Regional Partnership and the Oregon Department of Transportation (ODOT).

A. Study Findings

The following summarizes the major findings of the study:

- Low current and potential truck volumes on Highway 140 and its limited statewide strategic importance in terms of cross-border freight traffic in comparison to other routes indicate that the route does not merit designation as a Freight Transportation Corridor.

- Potential economic benefits to the Highway 140 corridor region from highway corridor improvements are primarily in the area of safety improvements and associated accident cost savings, as opposed to economic benefits to Klamath and Lake Counties.

- The estimated cost of base improvements necessary to remove truck length restrictions along the Highway 140 study corridor is $27.6 million. Additional improvements to address safety deficiencies given unrestricted truck usage would cost an estimated $22.8 million, for a total corridor improvement cost of $50.4 million.

- A limited number of current or possible frequent users of Highway 140 would realize benefits through the removal of truck length restrictions, including a few local commercial carriers that haul produce and other commodities into Nevada, local industries with customers or suppliers outside of the region, and federal government land management agencies. However, these local benefits are gained at a high cost given the low traffic volumes.

- Economic growth along the Highway 140 corridor and in the surrounding region is constrained as much or more by other factors such as remote location and lack of certain other infrastructure, such as the truck length restrictions on Highway 140.

- Promoting the tourism traffic segment will provide local spending increases far beyond increasing freight truck traffic through the area.
B. Recommendations

The following recommendations with respect to the Highway 140 corridor are made to the South Central Oregon Area Commission on Transportation and ODOT.

Recommendation 1: Discontinue efforts to pursue Freight Transportation Corridor designation for Highway 140 given the lack of supporting current/potential freight traffic volume and that the corridor is not of statewide strategic importance to Oregon.

- Designation as a Freight Transportation Corridor may not be the most effective mechanism to fund Highway 140 improvements in any case.

Recommendation 2: Based on safety benefits and local/regional reliance on Highway 140, pursue recommended strategies to implement minimal necessary improvements to remove truck length restrictions.

- Funding strategies include use of Federal Lands Highway Program funds (Discretionary Public Lands and Forest Highways Program) and possible use of Forest County Funds as local match.

Recommendation 3: Pursue economic development strategies for industry diversification and provision of necessary non-highway infrastructure.

- Recognize/focus economic development strategies based on regional strengths and competitive position.
- Promote local tourist attractions and/or activities to expand the tourist traffic segment using Highway 140.
- Continue efforts to provide basic physical infrastructure to rural communities.
- Support Lake County's railroad by seeking funds to upgrade service.
- Continue efforts to extend both fiber optic and natural gas service throughout the counties.

C. Implementation Strategies

The following implementation strategies are recommended to fund and to undertake design and construction activities for Highway 140 safety improvement projects.

Strategy 1: Develop an annual workplan to undertake Highway 140 safety improvement projects over the next 20 years.

- Prioritize the minimum necessary improvements to remove truck length restrictions first.
- Approach the improvements based on manageable annual undertakings (i.e. a "curve by curve" approach).
• Ensure that necessary design work is undertaken by ODOT to meet the workplan schedule.

Strategy 2: Pursue and use to the fullest extent possible Federal Lands Highway Program funds for Highway 140 safety improvements.
• Use Forest County Funds as local match if possible.
• Leverage ODOT and South Central Oregon Area Commission on Transportation (ACT) partnership to the fullest extent possible to seek funding.

Strategy 3: Assess the feasibility of a partnership between Klamath and Lake Counties and ODOT to undertake construction activities.
• Consider the potential use of county labor and equipment to support construction activities to address safety deficiencies.

Strategy 4: Develop county-level Transportation System Plans (TSPs) for Klamath and Lake Counties in order to determine regional priorities for the Statewide Transportation Improvement Program (STIP) development process.
• Determine the importance of Highway 140 safety improvements relative to other regional transportation needs.

Strategy 5: Expand participation in regional transportation planning.
• Include United States Bureau of Land Management (BLM), United States Forest Service (USFS), Lakeview Interagency Fire Center, Oregon State Patrol, and ODOT Motor Carrier.
• Include industry representation, such as the Oregon Trucking Association, manufacturing interests, etc.
Oregon Department of Transportation

Transportation Corridor Analysis of Highway 140
East of Klamath Falls to the Nevada Border

Table of Contents

Executive Summary .................................................................................................................. E-1
I. Introduction ............................................................................................................................... 1
   A. Study Purpose and Objectives ............................................................................................ 1
   B. Methodology and Approach ............................................................................................. 2
   C. Report Structure .................................................................................................................. 5
II. Findings, Recommendations, and Implementation Strategies ............................................. 6
   A. Study Findings .................................................................................................................... 6
   B. Recommendations ............................................................................................................. 8
   C. Implementation Strategies .................................................................................................. 10
III. Regional Overview ............................................................................................................... 12
   A. Lake County Region and Lakeview ................................................................................... 12
   B. Klamath County Region and Klamath Falls ..................................................................... 14
IV. Highway 140 Profile .............................................................................................................. 16
   A. Corridor Study Area .......................................................................................................... 16
   B. Highway 140 Traffic Volume ............................................................................................ 17
   C. Accident Data .................................................................................................................... 20
   D. Pavement Condition ......................................................................................................... 21
   E. Highway 140 Truck Length Restrictions .......................................................................... 23
V. Analysis of Economic Costs and Benefits of Highway 140 Improvements .................... 26
   A. Introduction ....................................................................................................................... 26
   B. Cost-Benefit Methodology ............................................................................................... 27
   C. Project costs for Necessary Improvements to Highway 140 ........................................... 29
   D. Anticipated Demand as a Result of Improvements .......................................................... 32
   E. Direct Benefits to Highway 140 Users .............................................................................. 33
   F. Secondary Benefits ........................................................................................................... 34
   G. Potential for Corridor Industry Expansion and Job Creation ....................................... 35
   H. Benefits to BLM, USFS, and Lakeview Interagency Fire Center .................................... 36
   I. Statewide Benefits ............................................................................................................. 37
   J. Western States Transportation Network Benefits ........................................................... 37
VI. Funding Sources .................................................................................................................. 39
   A. State Funding Programs .................................................................................................. 39
   B. Federal Lands Highway Program .................................................................................. 41
   C. County Funding ........................................................................................................... 42

Appendix A: Additional Interviewees ................................................................................ A-1
Appendix B: Trucking Survey and Results ........................................................................... B-1
Appendix C: Arial Photographs of Highway 140 Corridor-C-Error! Bookmark not defined.
I. Introduction

This report presents the results of a Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border.

A. Study Purpose and Objectives

Located in the Southern Oregon Region, the Highway 140 East corridor from Klamath Falls to the Nevada border passes through Klamath and Lake Counties. Unemployment in the area surrounding the Highway 140 East corridor is significantly higher than the national average and the region has struggled to attract new industry and commerce. The Klamath Falls area has seen recent growth of new industries, whereas Lake County and Lakeview are seeking opportunities for new growth. Additional employment from logging and millwork seems unlikely. Prospects for sustained future economic growth in the region rest primarily on diversification of the region’s economy and workforce.

Highway 140 to the east of Lakeview is not passable by most long-haul trucks due to length restrictions imposed by ODOT for safety reasons. Some restrictions also exist between Klamath Falls and Lakeview for certain long trucks. The reasons for the restrictions are tight curves, grade problems, and the narrowness of the highway. There is a long-held belief in the region that substandard conditions on Highway 140 are constraining economic development by reducing freight-related travel along the corridor. The purpose of this corridor study is to examine this issue to determine opportunities to improve transportation and non-transportation infrastructure in the region in order maximize economic benefits.

Key objectives for the study were to:

- Review the viability of adding Highway 140 to the Oregon Highway Plan’s State Highway Freight System\(^1\) as a Freight Transportation Corridor.
- Determine through surveys, interviews, and analysis, the potential increase in freight trucking on Highway 140 should improvements sufficient to remove truck length restrictions be undertaken and the route added to the State Highway Freight System.
- Evaluate the economic benefits to the corridor, Klamath and Lake Counties, the State of Oregon, and the western states transportation network from increased freight mobility if improvements were made to Highway 140 to remove truck length restrictions.

\(^{1}\) A designation developed for the 1999 Oregon Department of Transportation State Highway Plan. The criteria for designation of a highway as a Freight Transportation Corridor is that the highway carries 3,000,000 tons of annual freight shipments. Secondarily, routes that provide important connectivity for the State were also included.
Evaluate other transportation and non-transportation opportunities for expansion of commerce along the Highway 140 East corridor and surrounding area.

Recommend priority construction projects along Highway 140 to expand freight trucking along the route.

Provide an inventory of possible funding sources for road construction projects.

Identify funding strategies and an implementation timeline.

B. Methodology and Approach

To meet the objectives of this review, quantitative and qualitative analyses were completed through comprehensive interviews and site visits, evaluation of corridor conditions, a trucking survey and 24-hour classification count, and economic cost-benefit analysis.

1. Oversight Committee

Study oversight was provided by officials from the South Central Oregon Regional Partnership and ODOT. The following local officials were involved in the study oversight:

- Bill Barry, Lake County Commissioner.
- Jim Bryant, Oregon Department of Transportation.
- Arlene Clark, Lakeview Mayor.
- Larry Holtzgong, Oregon Economic and Community Development Department.
- Deanna Johnston, Lake County Chamber of Commerce.
- Jennie Messmer, Klamath Falls Deputy City Manager.
- Ernie Palmer, Basin Transit Services.
- Sherm Radke, Economic Development Director, Lake County.
- Trey Senn, Klamath County Economic Development Association.
- Mike Stinson, Oregon Department of Transportation.
- Al Switzer, Klamath County Commissioner.

The committee provided input and validated the study at key points, including study inception and presentation of findings and recommendations.

2. Interviews and Site Visits

Interviews were conducted in order to understand: long-haul trucking activity on Highway 140; permitting and enforcement of length restrictions; federal land
management agency interest in improving Highway 140; Oregon highway use taxes; federal, state, and county funding sources for road improvements; traffic from adjoining states; accident statistics; local mineral resources; and local economic development initiatives.

Dye Management Group, Inc. interviewed representatives from the following organizations:

- Town of Lakeview.
- Lake County Chamber of Commerce.
- Oregon Department of Transportation.
- Oregon Economic and Community Development Department.
- Oregon State Patrol.
- Oregon Trucking Association.
- United States Bureau of Land Management.
- United States Forest Service.
- United States Geological Survey.
- Lakeview Interagency Fire Center.
- Nevada Motor Transport Association.
- Nevada Department of Transportation.
- Hi-Desert Economic Development Authority (in Winnemucca, Nevada).

A complete list of interviewees is included in Appendix A.

Project staff conducted two corridor site visits which included driving Highway 140 from Klamath Falls to the Nevada border.

3. Evaluation of Existing Corridor Conditions

Highway 140 traffic volume, accident statistics, and pavement condition reports supplied by ODOT were analyzed. ODOT Motor Carrier Transportation Division length restriction maps were examined. Oregon Economic and Community Development Department community profiles, the 2000 South Central Oregon Regional Investment Plan, and the 1997 Lake County Strategic Plan were also reviewed.
4. Trucking Survey and Special 24-hour Vehicle Classification Count

In order to assess the potential for increased freight demand on Highway 140, should improvements sufficient to remove truck length restrictions be undertaken, a survey of 16 trucking companies currently or likely to use Highway 140 was conducted in May 2001. A survey instrument and list of businesses and trucking companies to interview was developed by Dye Management Group, Inc. and reviewed by the South Central Oregon Area Commission on Transportation (ACT) and ODOT. All surveys were conducted with a structured interview guide that ensured consistency of the information gathered. Appendix B includes the 16 firms surveyed, the survey questionnaire, and compiled responses.

In addition, to obtain data on the number of long-haul trailer trucks using Highway 140, a special 24-hour vehicle classification count was undertaken by ODOT at Adel, Oregon (between the Nevada border and Lakeview) on May 9-10, 2001.

5. Economic Cost-Benefit Analysis

An economic cost-benefit analysis for improvements to Highway 140 was performed as part of the study. The analysis evaluated these factors:

- Project costs for improvements sufficient to remove truck length restrictions on Highway 140.
- Anticipated demand as a result of improvements.
- Direct and secondary benefits to users of Highway 140 and the surrounding region.
- Potential for corridor industry expansion and job creation.
- Benefits to BLM, USFS, and the Lakeview Interagency Fire Center.
- Statewide and western states transportation network benefits.

The approach taken for the economic cost-benefit analysis included:

- Analysis of existing ODOT traffic, accident, and pavement data.
- A special 24-hour vehicle classification count on Highway 140 in Adel.
- Trucking survey of 16 users or potential users of Highway 140.
- Discussions with key agencies in the corridor region, such as ODOT, Oregon State Patrol, Oregon Economic and Community Development Department (OECDD), BLM and USFS.
- Discussions with local businesses, industry interests, and agencies from other states.
• Assessment of vehicle classification counts near border locations and interviews with the Nevada Department of Transportation (NDOT), the Oregon Trucking Association, and trucking survey respondents to determine the potential for diversion to Highway 140 from other routes.

C. Report Structure

The main body of this report is organized into the following sections:

II. Findings, Recommendations, and Implementation Strategies. This section presents the major findings of the study along with recommendations and implementation strategies.

III. Regional Overview. This section summarizes the existing infrastructure and economy of Klamath and Lake Counties.

IV. Highway 140 Profile. This section presents summary data on the highway, including daily traffic volume, yearly accident totals, pavement condition, and existing truck length restrictions.

V. Analysis of Economic Costs and Benefits of Highway 140 Improvements. This section identifies and analyzes the economic costs and benefits of improvements sufficient to remove truck length restrictions on Highway 140.

VI. Funding Sources. This section identifies sources of funding for Highway 140 improvements.

Appendix A: Additional Interviewees. This appendix contains a list of people interviewed by Dye Management Group, Inc. over the course of the review.

Appendix B: Trucking Survey and Results. This appendix contains 16 firms interviewed by Dye Management Group, Inc. in May 2001, the text of the trucking survey administered, and a compilation of survey results.

Appendix C: Aerial Photographs of the Highway 140 Corridor. This appendix includes aerial photographs of four improvement areas, illustrating alignments where length restrictions have been imposed.
II. Findings, Recommendations, and Implementation Strategies

This section presents the major findings, recommendations and implementation strategies from the Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border.

A. Study Findings

The following summarizes the major findings of the study.

- **Low current and potential truck volumes on Highway 140 and its limited statewide strategic importance in terms of cross-border freight traffic in comparison to other routes indicate that the route does not merit designation as a Freight Transportation Corridor.**

  Highway 140 lacks the level of cross-border freight traffic volume to be considered part of the State Freight Highway System. Currently, approximately 10 long-haul trucks per day cross the Oregon – Nevada border on Highway 140.\(^2\) If trailer truck volumes on Highway 140 were to double should truck length restrictions be removed, the highway still would not exhibit the level of statewide strategic importance necessary for consideration as a Freight Transportation Corridor. Highways with much greater volumes than Highway 140, such as US95 and US395, are not part of the State Freight Highway system, but demonstrate greater statewide significance in terms of freight traffic at border crossings. For example, US395 currently has approximately 340 long-haul trucks per day crossing the Oregon – Nevada border.

- **Potential economic benefits to the Highway 140 corridor region from highway corridor improvements are primarily in the area of safety improvements and associated accident cost savings, as opposed to economic benefits to Klamath and Lake Counties.**

  There are real safety concerns on Highway 140 and real benefits that could be gained by the corridor region and the State of Oregon through making improvements sufficient to remove the truck length restrictions on the highway. Long trucks use the highway illegally, cutting inside turns and crossing the centerline. This creates significant safety concerns that may be understated by accident statistics.

---

\(^2\) This estimate is derived from a May 2001 classification count in Lake County conducted by ODOT. The figure is in line with counts conducted by an automated recorder located in Klamath County.
The estimated cost of base improvements necessary to remove truck length restrictions along the Highway 140 study corridor is $27.6 million. Additional improvements to address safety deficiencies given unrestricted truck usage would cost an estimated $22.8 million, for a total corridor improvement cost of $50.4 million.

The ACT and ODOT have jointly identified several problem areas on Highway 140. ODOT subsequently determined projects that would be necessary to undertake in order to remove the truck length restrictions on the highway. The base improvements of $27.6 million are required in order to remove the truck length restrictions. The additional improvements of $22.8 million would address safety deficiencies given unrestricted truck usage along the corridor.

A limited number of current or possible frequent users of Highway 140 would realize benefits through the removal of truck length restrictions, including a few local commercial carriers that haul produce and other commodities into Nevada, local industries with customers or suppliers outside of the region, and federal government land management agencies.

There is significant interest in the highway from local businesses and some motor carriers. Local businesses depend on the highway for delivery of products to customers within and outside the region. Also, a few local trucking firms depend on Highway 140 for hauling produce and other commodities into Nevada. Highway 140 is important to Klamath and Lake Counties as a major transportation artery for the movement of people and goods within the region, and for the regular and emergency operations of USFS and BLM. These local benefits are gained at a high cost of corridor improvement given that traffic volumes for all motor carriers on Highway 140 are low. For example, there are approximately 10 long-haul trucks per day on the highway which cross the Oregon – Nevada border.

Economic growth along the Highway 140 corridor and in the surrounding region is constrained as much or more by other factors such as remote location and lack of certain other infrastructure as the truck length restrictions on Highway 140.

Truck length restrictions on Highway 140 may play a role in the decision of some industries to locate in Lake County. However, other factors are as much or more of a deterrent to businesses looking for new locations. Lake County’s remote location and lack of natural gas and fiber optic networks pose challenges to attracting business to the area.

Promoting the tourism traffic segment will provide local spending increases far beyond increasing freight truck traffic through the area.

Transportation related economic development in the region has been largely focused on removing truck length restrictions on Highway 140 to increase freight truck traffic through the area. The benefits of additional spending in the region by this increased truck traffic may be offset by increased wear and tear on pavements, additional noise
and pollution, and safety issues. However, there are essentially no restrictions on general traffic such as cars, vans, campers, etc. on Highway 140. The region, particularly the Lakeview area, should promote tourism activities in order to increase the tourism traffic segment. Studies have shown that increased tourist traffic will provide local spending increases far beyond increasing freight truck traffic through the area.

B. Recommendations

The following recommendations with respect to the Highway 140 corridor are made to the South Central Oregon Area Commission on Transportation and ODOT.

Recommendation 1: Discontinue efforts to pursue Freight Transportation Corridor designation for Highway 140 given lack of supporting current/potential freight traffic volume and that the corridor is not of statewide strategic importance to Oregon.

- Designation as a Freight Transportation Corridor may not be the most effective mechanism to fund Highway 140 improvements in any case.

Adding Highway 140 to the State Highway Freight System would require changing the Oregon Highway Plan. The system is based on corridors carrying over 3,000,000 tons of cargo per year or providing important connectivity to the state. Freight volumes on Highway 140 do not approach this threshold. Low cross-border freight traffic in relation to other southern Oregon border locations suggests a lack of statewide strategic importance necessary for consideration as a Freight Transportation Corridor. Currently, approximately 10 long-haul trucks per day cross the Oregon – Nevada border on Highway 140 compared to US95 (not part of the State Highway Freight System) with 340 per day at the Nevada border and US97 (which is part of the State Highway Freight System) with approximately 1,100 long-haul trucks per day at the Nevada border.

According to ODOT officials, the primary benefit of being part of the State Highway Freight System is that the road’s traffic congestion is measured more closely and thicker pavement is specified in reconstruction efforts. Since the ACT’s objective is really to fund improvements to Highway 140 (not monitor congestion or thicken pavement), pursuing the Freight Transportation Corridor designation is misguided.

Recommendation 2: Based on safety benefits and local/regional reliance on Highway 140, pursue recommended strategies to implement minimal necessary improvements to remove truck length restrictions.

- Funding strategies include use of Federal Lands Highway Program (Discretionary Public Lands and Forest Highway Program) and possible use of Forest County Funds as local match.

Safety concerns and Highway 140’s importance to the transportation systems of Klamath and Lake County provide justification for prioritizing improvements. Real benefits could be
gained by the corridor region, the State of Oregon, and society as whole through making safety improvements to remove the truck length restrictions on the highway. Highway 140 is important to Klamath and Lake Counties as a major transportation artery for the movement of people and goods within the region, and for the regular and emergency operations of USFS and BLM. The ACT/ODOT partnership must determine priority for Highway 140 safety improvements relative to other regional needs.

Funding strategies include use of Federal Public Lands Highway funds (including both Discretionary and Forest Highway) and possible use of Forest County Funds as local match.

**Recommendation 3: Pursue economic development strategies for industry diversification and provision of necessary non-highway infrastructure.**

- Recognize/focus economic development strategies based on regional strengths and competitive position.
- Promote local tourist attractions and/or activities to expand the tourist traffic segment using Highway 140.
- Continue efforts to provide basic physical infrastructure to rural communities.
- Support Lake County’s railroad by seeking funds to upgrade service.
- Continue efforts to extend both fiber optic and natural gas service throughout the counties.

Klamath and Lake Counties should focus economic development strategies on regional strengths and competitive position. Opportunities to expand value-added production for existing industries should be explored. There are essentially no restrictions on general traffic such as cars, vans, campers, etc. on Highway 140. The region, particularly the Lakeview area, should promote tourism activities in order to increase the tourism traffic segment. Studies have shown that increased tourist traffic will provide local spending increases far beyond increasing freight truck traffic through the area.

The counties will continue to face barriers to attracting new businesses until gaps in basic physical infrastructure are filled. Accordingly, the counties should continue efforts to provide basic physical infrastructure to rural communities and extend both fiber optic and natural gas service throughout the counties. Lake County should seek funds to upgrade rail service, with the eventual goal of making the railroad self-sufficient.
C. Implementation Strategies

The following implementation strategies are recommended to fund and to undertake design and construction activities for Highway 140 safety improvement projects.

Strategy 1: Develop an annual workplan to undertake Highway 140 safety improvement projects over the next 20 years.

- Prioritize the minimum necessary improvements to remove truck length restrictions first.
- Approach the improvements based on manageable annual undertakings (i.e. a “curve by curve” approach).
- Ensure that necessary design work is undertaken by ODOT to meet the workplan schedule.

An annual workplan is required to prioritize the safety improvement projects and provide a tentative annual schedule for undertaking necessary construction activities. Dividing the work up on an annual basis makes the improvement tasks more manageable and increases the likelihood of achieving the end goal. While there may be some variance from the workplan, progress will be made in the right direction and significant improvements will occur over the long term. ODOT must ensure that the necessary design work is completed in order to meet the workplan schedule.

Strategy 2: Pursue and use to the fullest extent possible Federal Lands Highway Program funds for Highway 140 safety improvements.

- Use Forest County Funds as local match if possible.
- Leverage ODOT and South Central Oregon Area Commission on Transportation (ACT) partnership to the fullest extent possible.

Federal Lands Highway Program funds (Discretionary Public Lands and Forest Highway Program) may be the best mechanism to fund Highway 140 safety improvements, at least in the short term. Efforts should be maintained to pursue funding under these sources. An ODOT/ACT partnership and any additional local support to leverage these funding sources will be beneficial. While it may not be possible to use Forest County Funds to entirely fund safety improvement projects on Highway 140, it may be possible to use them as local match for Forest Highway funds.

Strategy 3: Assess the feasibility of a partnership between Klamath and Lake Counties and ODOT to undertake construction activities.

- Consider the potential use of county labor and equipment to support construction activities.

Partnerships between Klamath and Lake Counties and ODOT to undertake construction activities could prove effective as a mechanism to reduce construction costs and provide
needed labor and equipment. All parties have expressed interest in pursuing such partnerships.

Strategy 4: Develop county-level Transportation System Plans (TSPs) for Klamath and Lake Counties in order to determine regional priorities for the Statewide Transportation Improvement Program (STIP) development process.

- Determine the importance of Highway 140 safety improvements relative to other regional transportation needs.

Although development of the STIP is partially driven by technical needs such as pavement condition, safety, etc., local ACTs also provide input that helps ODOT to prioritize projects for the STIP. County-level TSPs are the normal mechanism for establishing local priorities for transportation infrastructure needs. Highway 140 projects that can be funded with federal and/or local funds (i.e. without ODOT funding) still need to be identified as regional priorities and included in the STIP. Klamath and Lake Counties have not yet developed TSPs to formally establish Highway 140 improvements as a regional priority for adequate consideration in the STIP development process.

Strategy 5: Expand participation in regional transportation planning.

- Include BLM, USFS, Lakeview Interagency Fire Center, Oregon State Patrol, and ODOT Motor Carrier.

- Include industry representation, such as the Oregon Trucking Association, manufacturing interests, etc.

Participation is the hallmark of successful transportation planning and effective implementation of plan strategies. Over the course of the Highway 140 corridor study, it became evident that BLM, USFS, Lakeview Interagency Fire Center, Oregon State Patrol, and ODOT Motor Carrier are significant stakeholders in Highway 140. Their input at the planning level will greatly benefit the process. Also, BLM and USFS support for safety improvements will help build the case for leveraging Federal Lands Highway Program. Additionally, industry representation such as the Oregon Trucking Association, manufacturing interests, etc. can help secure additional insight, input, and support for the planning process. How this participation is to be structured should be determined by the ACT; however, efforts should be made for such inclusion.
III. Regional Overview

This section summarizes the existing infrastructure and economy of Lake and Klamath Counties.

A. Lake County Region and Lakeview

Lake County is Oregon’s third largest county. It is located in south central Oregon and borders both California and Nevada. With about 7,400 residents spread out over more than 8,000 square miles, Lake County’s population density is less than one person per square mile. The county’s largest population center is its county seat, Lakeview, which has about 4,000 residents within its urban growth boundary. The only other incorporated place in Lake County is the City of Paisley, which has a population of 350. Unincorporated areas within the county include Adel, Christmas Valley, Fort Rock, Plush, Silver Lake, Summer Lake, and Valley Falls.

Exhibit III-1 illustrates the highway infrastructure within Lake County.

Exhibit III-1: Lake County Highway Infrastructure
The major highways in Lake County are Highway 395, a north-south corridor that connects California and Washington through Oregon, and Highway 140, an east-west corridor that runs from Medford, Oregon into Nevada. The county operates both an airport and a railroad. However, the airport does not have commercial airline service. The Lake County railroad is a freight-only railroad that runs from Lakeview to Alturas, California.

Lake County’s economy has lagged behind the State’s, with almost twice the Statewide average unemployment. Exhibit III-2 presents summary economic indicators for Lake County.

### Exhibit III-2: Economic Indicators of Lake County

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>7,293</td>
<td>7,260</td>
<td>7,157</td>
<td>7,173</td>
</tr>
<tr>
<td><strong>Labor Force</strong></td>
<td>3,890</td>
<td>3,760</td>
<td>3,440</td>
<td>3,371</td>
</tr>
<tr>
<td><strong>Unemployment Rate</strong></td>
<td>11.6%</td>
<td>11.7%</td>
<td>11.8%</td>
<td>10.1%</td>
</tr>
<tr>
<td>(Statewide average)</td>
<td>(5.9%)</td>
<td>(5.8%)</td>
<td>(5.6%)</td>
<td>(5.7%)</td>
</tr>
<tr>
<td><strong>Number of Business Units</strong></td>
<td>277</td>
<td>283</td>
<td>274</td>
<td>274</td>
</tr>
<tr>
<td><strong>Annual Per Capita Income</strong></td>
<td>$18,201</td>
<td>$19,802</td>
<td>$20,154</td>
<td>$20,285</td>
</tr>
</tbody>
</table>

*Note: The Oregon Employment Department 2000 data is not available until September 2001. The Bureau of Economic Analysis 2000 data is not available until May 2002.*

*Sources: Bureau of Economic Analysis, Oregon Employment Department, Oregon Economic and Community Development Department*

Major employers in the county include the public school district, Lake District Hospital, USFS and BLM, ZX Ranch, Safeway, and several wood product businesses (Fremont Sawmill, Woodgrain Millwork, Inc., McFarland’s Door Manufacturing, Lumberman’s Building Center, and Hart Mountain Millwork). According to the Oregon Economic and Community Development Department, prospects for sustained future economic growth in the county rest primarily on diversification of the region’s economy and workforce. However, inadequate infrastructure in certain areas and the county’s remote location provide barriers to attracting new businesses.

The county has sought to strengthen efforts to upgrade its utilities in order to attract new businesses to the county:

- Century Tel, the local telephone provider, has recently moved up its schedule to provide fiber optics within the next two years.
- Although Lake County does not have a natural gas pipeline, county officials are currently investigating the possibility of using the county railroad right-of-way to bring natural gas into the region.
Lakeview’s newly constructed industrial park adjoins the county railroad and includes incubator warehouse space and utility connections for additional construction.

Lakeview recently built a wastewater treatment facility that can service four or five times its current capacity.

B. Klamath County Region and Klamath Falls

Klamath County is Oregon’s fourth largest county. It is located just east of the Cascade Mountains on the California border. Its largest population center is Klamath Falls. Although the city proper has a population of about 20,000, there are approximately 45,000 residents within the Klamath Falls urban growth boundary. Klamath County is less rural than Lake County, with a population density of 11 people per square mile. Although Klamath County has several incorporated cities, Klamath Falls is the only incorporated city along Highway 140. Unincorporated areas along Highway 140 in Klamath County include Olene, Dairy, Beatty, and Bly.

Exhibit III-3 illustrates the highway infrastructure within Klamath County.

Exhibit III-3: Klamath County Highway Infrastructure
Major highways include the north-south corridor of Highway 97, Highway 140 to the east and west, and State Highways 62 and 39. Klamath Falls International Airport includes both charter and commercial air travel. Two private railroad operators run service through the county from California to Washington.

Although Klamath County’s economy has performed better than Lake County’s, it still trails the statewide average in several categories. Exhibit III-4 presents summary economic indicators for Klamath County.

**Exhibit III-4: Economic Indicators of Klamath County**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>62,060</td>
<td>62,779</td>
<td>63,160</td>
<td>63,435</td>
</tr>
<tr>
<td><strong>Labor Force</strong></td>
<td>29,790</td>
<td>29,170</td>
<td>28,930</td>
<td>28,753</td>
</tr>
<tr>
<td><strong>Unemployment Rate</strong></td>
<td>8.7%</td>
<td>9.8%</td>
<td>9.3%</td>
<td>8.8%</td>
</tr>
<tr>
<td>(Statewide average)</td>
<td>(5.9%)</td>
<td>(5.8%)</td>
<td>(5.6%)</td>
<td>(5.7%)</td>
</tr>
<tr>
<td><strong>Number of Business Units</strong></td>
<td>1,773</td>
<td>1,773</td>
<td>1,804</td>
<td>1,773</td>
</tr>
<tr>
<td><strong>Annual Per Capita Income</strong></td>
<td>$18,809</td>
<td>$19,485</td>
<td>$20,036</td>
<td>$20,886</td>
</tr>
</tbody>
</table>

*Note: Oregon Employment Department 2000 data is available until September 2001; the Bureau of Economic Analysis data is not available May 2002.*

*Sources: Bureau of Economic Analysis, Oregon Employment Department, Oregon Economic and Community Development Department*

Major employers in the county include Merle West Medical Center, the county and city school districts, the Oregon Air National Guard, the Oregon Institute of Technology, USFS, Jeld-Wen, Inc., Collins Products, Columbia Plywood, and Sykes Enterprises. According to the Oregon Economic and Community Development Department, better transportation infrastructure gives Klamath County an edge over Lake County in competing for businesses. Access to high-speed digital communications has allowed Klamath County to attract call centers, which have added jobs to the local economy. Klamath Falls' wastewater treatment system was built in 1998 and is operating at half its capacity. There are both natural gas and fiber optic providers in the city.
IV. Highway 140 Profile

This section presents summary data on Highway 140, including daily traffic volumes, yearly accident totals, pavement conditions, and existing truck length restrictions.

A. Corridor Study Area

Located in south central Oregon, the study area of Highway 140 runs from Klamath Falls through Lakeview to the Nevada border, as illustrated in Exhibit IV-1.

Exhibit IV-1: Highway 140 East of Klamath Falls to the Nevada Border

The corridor is approximately 166 miles long. Although the entire corridor is Highway 140, ODOT classifies it as three separate roads: ODOT 20, ODOT 19, and ODOT 431. Exhibit IV-2 illustrates these sections.
Exhibit IV-2: Sections of Highway 140

<table>
<thead>
<tr>
<th>ODOT Number</th>
<th>Location</th>
<th>Beginning Milepost</th>
<th>Ending Milepost</th>
<th>Total Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Klamath Falls to Lakeview</td>
<td>0.00</td>
<td>96.36</td>
<td>96.36</td>
</tr>
<tr>
<td>19</td>
<td>Lakeview to ORE 140 East on US 395</td>
<td>143.02</td>
<td>138.38</td>
<td>4.64</td>
</tr>
<tr>
<td>431</td>
<td>ORE 140 East to the Nevada border</td>
<td>0.01</td>
<td>65.28</td>
<td>65.27</td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td></td>
<td><strong>166.27</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: ODOT

For clarity to the intended audience, this report will use the terms “Klamath Falls to Lakeview” and “Lakeview to the Nevada border” to refer to ODOT 20 and ODOT 431 instead of ODOT’s numbering system. Note that Lakeview to the Nevada border actually begins five miles north of Lakeview since five miles of Highway 140 is shared with US 395.

Highway 140 from Klamath Falls to the Nevada border passes through the Winema National Forest and the Fremont National Forest. Most of Highway 140’s 166 miles traverse lands owned by either the USFS or BLM. Fifty-six percent of Klamath County’s land is publicly owned, while 78 percent of Lake County’s land is publicly owned.

B. Highway 140 Traffic Volume

Traffic volume is the primary indicator of highway usage. Volume is normally measured in terms of Average Daily Traffic (ADT), which is the average number of vehicles that use the road over a 24-hour period.

Traffic volume on Highway 140 is low. Traffic peaks within the urban growth boundaries of Klamath Falls and Lakeview, which indicates local traffic. Exhibit IV-3 shows average daily traffic between Klamath Falls and Lakeview.
Exhibit IV-3: Average Daily Traffic Volumes on Highway 140
Klamath Falls to Lakeview (1999)

Source: ODOT

Exhibit IV-4 graphically shows volumes at various mileposts outside the urban growth boundaries between Klamath Falls and Lakeview.

Exhibit IV-4: Average Daily Traffic Volumes on Highway 140
Klamath Falls to Lakeview* (1999)

Source: ODOT, Dye Management Group, Inc. analysis.
Note (*) Mileposts are not evenly distributed.

- Average daily traffic just outside the city of Klamath Falls approaches 4,000, but traffic decreases to below 1,500 vehicles per day 25 miles outside the city.
There is less traffic between Lakeview and the Nevada border. Exhibit IV-5 illustrates the average daily traffic volumes on this section of Highway 140.

Exhibit IV-5: Average Daily Traffic Volumes on Highway 140
Lakeview to the Nevada Border (1999)

Source: ODOT

Exhibit IV-6 graphically shows volumes at various mileposts outside the Lakeview urban growth boundary between Lakeview and the Nevada border.

Exhibit IV-6: Average Daily Traffic Volumes on Highway 140
Lakeview to the Nevada Border (1999)

Source: ODOT, Dye Management Group, Inc. analysis

* Mileposts are not evenly distributed.
Between Lakeview and Adel, average daily traffic is between 200 and 300 vehicles. After Adel, traffic volume is very low. Average daily traffic at the Nevada border is 170 vehicles per day.

On May 9-10, 2001, ODOT conducted a traffic count for Highway 140 from Lakeview to the Nevada border. Stationed at Adel, 281 vehicles were counted over a 24-hour period. According to the count, there were 14 trailer trucks in the 24-hour period (five percent of the total traffic).

C. Accident Data

Highway safety is usually measured in terms of the number of accidents counted on a particular stretch of road. Highway accident statistics are usually broken into three different categories:

- Property Damage Only (PDO) accidents.
- Accidents resulting in injuries.
- Accidents resulting in fatalities.

Exhibit IV-7 illustrates these incidents over the past seven years on Highway 140.

Exhibit IV-7: Highway 140 Accidents

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PDO</td>
<td>30</td>
<td>38</td>
<td>37</td>
<td>24</td>
<td>31</td>
<td>41</td>
<td>41</td>
<td>242</td>
</tr>
<tr>
<td>Injury</td>
<td>46</td>
<td>43</td>
<td>21</td>
<td>43</td>
<td>32</td>
<td>40</td>
<td>27</td>
<td>252</td>
</tr>
<tr>
<td>Fatality</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: ODOT, Dye Management Group, Inc. analysis

A standard measure that is used to compare accident rates between different locations is crashes per million vehicle miles. This is the number of crashes that occur for every million miles traveled by vehicles on the road. Exhibit IV-8 compares 1999 crash rates with the Statewide average for the type of road.3

Exhibit IV-8: 1999 Highway 140 Crash Rates

<table>
<thead>
<tr>
<th></th>
<th>Crash Rate</th>
<th>Average for Road Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klamath Falls to Lakeview</td>
<td>1.48</td>
<td>0.88</td>
</tr>
<tr>
<td>Lakeview to the Nevada border</td>
<td>0.56</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Source: ODOT, Dye Management Group, Inc. analysis

3 ODOT classifies both sections of Highway 140 as rural non-freeways. However, Klamath Falls to Lakeview is further classified as a primary system road, while Lakeview to the Nevada border is classified as a secondary system road.
While the crash rate is higher than average for Klamath Falls to Lakeview, it is about half the average from Lakeview to the Nevada border. ODOT Motor Carrier and Oregon State Patrol reported that low traffic volumes understate the danger of Highway 140. The accident data reported does not capture the number of accidents narrowly averted. ODOT’s area manager also noted that accident data may not fully reflect dangerous sections because “certain sections of road are safe because they are so dangerous.” In other words, motor vehicle operators drive especially carefully because they know that the road is dangerous. The cautious driving leads to fewer accidents.

Crash rates for rural areas are usually significantly lower than those in urban areas. However, according to the United States Bureau of Transportation Statistics, the fatality rate for crashes in rural areas is more than double that of urban areas. Several conditions, including increased speeding, extreme terrain, and distance from medical treatment, contribute to the higher fatality rate.

D. Pavement Condition

ODOT measures pavement condition annually on all state highways under its jurisdiction, using an “objective condition index” that takes into account rutting, raveling, patching, fatigue, and load. Practically, this results in a 0-100 rating scale where 0-10 indicates a very poor road; 11-45 is a poor road; 46-75 is a fair road; 76-98 is a good road; 98-100 is a very good road.

Exhibit IV-9 shows pavement condition from Klamath Falls to Lakeview.

Exhibit IV-9: Pavement Condition on Highway 140
Klamath Falls to Lakeview (1999)

![Pavement Condition Chart]

Source: ODOT, Dye Management Group, Inc. analysis
With one exception, pavement condition was good or very good between Klamath Falls and Lakeview in 1999.

Exhibit IV-10 illustrates that pavement conditions between Lakeview and the Nevada border are considerably worse than from Klamath Falls and Lakeview.

Exhibit IV-10: 1999 Pavement Condition
Lakeview to the Nevada Border (1999)

Most of the pavement between Lakeview and the Nevada border was in fair or poor condition in 1999. Close to the border, pavement is poor. However, ODOT is planning a resurfacing of this area this summer.

Exhibit IV-11 shows how Highway 140 pavement condition compares to Statewide and ODOT Region 4\textsuperscript{4} averages for pavement condition.

Exhibit IV-11: Highway 140 Pavement Condition Compared to State and Region Pavement Conditions (1999)

<table>
<thead>
<tr>
<th>Pavement Segment</th>
<th>Percent Fair or Better</th>
<th>Percent Fair or Better Statewide</th>
<th>Percent Fair of Better in Region 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klamath Falls to Lakeview (National Highway System)</td>
<td>95%</td>
<td>83%</td>
<td>77%</td>
</tr>
<tr>
<td>Lakeview to Nevada border (Non-National Highway System)</td>
<td>50%</td>
<td>69%</td>
<td>70%</td>
</tr>
</tbody>
</table>

\textsuperscript{4} ODOT Region 4 comprises central Oregon, from Wasco and Gilliam Counties to Klamath and Lake Counties.
As the exhibit shows, the percentage of pavement fair or better from Klamath Falls to Lakeview is significantly higher than the Statewide and region average. The percentage of pavement fair or better from Lakeview to the Nevada border; however, is significantly lower than the Statewide and region average.

E. Highway 140 Truck Length Restrictions

Highway 140 has areas with narrow lanes, sharp curves, narrow or nonexistent shoulders, and dropoffs with no guardrails. While these roadway conditions can be dangerous for any vehicle, they are especially dangerous for longer vehicles, such as trucks with trailers. When vehicles turn corners, their rear wheels do not follow the same path as their front wheels. Rather, the rear wheels tend to cut inside turns, known as off-tracking. The longer the vehicle, the greater its off-tracking. Trucks with trailers will off-track even more. Off-tracking on narrow highways is especially dangerous when a trailer crosses the center of the highway, forcing oncoming traffic off the road. ODOT has imposed length restrictions on Highway 140 based on off-tracking behavior. Oregon law provides two exceptions to the length restrictions:

- **Vehicles with special farm license plates hauling implements of husbandry.** ODOT Motor Carrier and local cattle ranchers disagree on what constitutes an “implement of husbandry,” but ODOT’s position is that cattle transports do not count because they can haul sheep or other livestock.

- **Vehicles responding to emergencies.** Restrictions are suspended during emergencies—either life-threatening emergencies such as fires or mudslides, or emergencies officially declared by a government jurisdiction. However, emergency vehicles returning from emergencies are subject to length restrictions.

1. Location

Currently, there are six segments of truck length restrictions on Highway 140, as shown in Exhibit IV-12. According to ODOT Motor Carrier, only about 10 to 15 percent of current trucks designed for freight movement are short enough to travel the length of Highway 140 legally. In other words, most current trucks, regardless of trailer length, have overall lengths in excess of 60 feet.
Exhibit IV-12: Overall Length Restrictions on Highway 140 East from Klamath Falls to Nevada Border*

<table>
<thead>
<tr>
<th></th>
<th>Truck-tractor with Semi-trailer</th>
<th>Truck-tractor with Semi-trailer</th>
<th>Truck-tractor with trailer drawing a semi-trailer (doubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: ODOT Motor Carrier, Dye Management Group, Inc. analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klamath Falls to MP 25</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
</tr>
<tr>
<td>MP 25 to MP 50.38</td>
<td>No limit, permit required</td>
<td>65' limit, permit required</td>
<td>No limit, permit required</td>
</tr>
<tr>
<td>MP 50.38 to Lakeview</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
</tr>
<tr>
<td>Lakeview to 140 on 395</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
<td>No limit, no permit required</td>
</tr>
<tr>
<td>395 to Adel</td>
<td>No limit, permit required</td>
<td>65' limit, permit required</td>
<td>No limit, permit required</td>
</tr>
<tr>
<td>Adel to Nevada Border</td>
<td>60' limit, no permit required</td>
<td>60' limit, no permit required</td>
<td>75' limit,** no permit required</td>
</tr>
</tbody>
</table>

Length restrictions for trucks exceeding normal widths are somewhat different.

For trailer and semi-trailer combined lengths between 60' and 68', the 75' overall limit applies. There is no overall limit on doubles with trailer and semi-trailer combinations of 60' or less.

2. Penalties and Enforcement

When truckers are cited for operating an overlength vehicle on Highway 140, they are fined either $77 or $92, depending on the hazard level. They are also required to buy an $8 "legalization permit" to continue traveling on Highway 140 until they can safely exit the road.

As of March 2001, penalties for overlength trucks using Highway 140 have been increased. Now, the trucking company receives a warning letter when one of their drivers is cited. When a second driver is cited, the company is assessed a $100 civil monetary penalty in addition to the $77 or $92 citation. No third violations have yet occurred, but the possibility of a company losing driving privileges in the State is being considered.
ODOT Motor Carrier and Oregon State Patrol share responsibility for enforcing truck length restrictions. ODOT Motor Carrier issued overlength citations to 53 truckers over the past year; the department estimates that it catches less than five percent of the illegal trucks. Oregon State Patrol issued 42 overlength citations in 2000. The two agencies have different policies for enforcing length restrictions:

- In general, ODOT Motor Carrier requires trucks to hire pilot cars for the front and rear of the trucks in order to exit Highway 140. (Practically, ODOT Motor Carrier considers the requirement unenforceable. ODOT Motor Carrier officers cannot stay with the cited truck until pilot cars arrive, so they suspect that many truckers wait for ODOT Motor Carrier’s shift to end before continuing without pilot cars.)

- Oregon State Patrol requires trucks to turn around and exit the road.

Neither entity spends many resources patrolling the road, primarily due to the road’s low traffic volume and the breadth of other responsibilities both entities have.

- ODOT Motor Carrier’s Klamath Falls District devotes less than five percent of its resources on Highway 140. Its office is more than 90 miles from Lakeview, and even further from the Nevada border. This distance, which requires a minimum of four hours commuting to and from a patrol, makes additional patrols prohibitively expensive. ODOT Motor Carrier schedules two eight-hour patrols during the daylight hours and one nighttime patrol per month. Nighttime patrols carry the added expenses of hotel and meal expenses that strain ODOT Motor Carrier’s budget. Circumstances may require canceling that patrol.

- Oregon State Patrol only has one officer in the area and does not carry out nighttime patrols.

3. **Effect of Restrictions**

Despite the truck length restrictions on Highway 140, traffic does not appear to be significantly constrained. Based on combined estimates from ODOT, ODOT Motor Carrier, and Oregon State Patrol, truck length restrictions create an estimated 20 to 30 percent deterrent (i.e. 70 to 80 percent of illegal trucks use Highway 140 regardless of the existence of truck length restrictions). While several illegal truckers violate the length restrictions during the day, some truckers use the highway at night to avoid enforcement.

Lack of resources to enforce restrictions combined with truck operator assessment of the low probability of being cited are the reasons that truck traffic is not more constrained. Field observations conducted as part of this study, along with observations by ODOT Motor Carrier and Oregon State Patrol, support the belief that overlength trucks are not significantly deterred from using Highway 140.
V. Analysis of Economic Costs and Benefits of Highway 140 Improvements

This section identifies and analyzes the economic costs and benefits of improvements sufficient to remove truck length restrictions on Highway 140.

A. Introduction

There is a clear relationship between transportation and commerce in any region. The delivery of business goods and services, worker access to jobs, and household access to stores and consumer services all depend on transportation facilities. As a result, decisions about investment in transportation facilities can affect the level, mix, and location pattern of economic activity, which is also the focus of economic development agencies. Because of this relationship, many transportation agencies such as ODOT see value in assessing the economic development impacts of their programs and projects, as well as potentially justifying some projects on the basis of economic development objectives.

Economic development is a broad field with different meanings for different people. In general, economic development goals are intended to enhance an area’s level of economic activity in terms of more jobs, wealth, tax base, and quality of life on a continuing rather than temporary basis. Motivations for desiring economic growth in an area may include:

- **Income** – to improve the economic well-being of residents by increasing employment and raising personal income levels.
- **Job choices** – to improve opportunities for job satisfaction and upward occupational mobility by expanding the types of available jobs.
- **Activity choices** – to improve the quality of life by expanding local opportunities for shopping, social, and entertainment activities in an area.
- **Stability** – to improve the stability of jobs and income in an area through diversification to reduce reliance on declining industries and those subject to significant business cycle fluctuations.

Economic development efforts seek to promote economic activity by increasing an area’s business expansion, retention, new start-ups, and/or attraction. To accomplish this, transportation improvement projects are often encouraged as a mechanism to:

- Reduce business operating costs and increase business productivity.
- Expand the size of business markets.
Increase business access to needed labor, supplies, services, and materials.

Promote the advantages of their areas.

The area's transportation system is a key factor influencing business operating costs and productivity, market access, shipping and logistics decisions, and location decisions. For the purposes of this study, we are interested in the degree to which truck length restrictions along the Highway 140 corridor are an impediment to economic development in Klamath and Lake Counties. Conversely, we are interested in what economic benefits might accrue to the region should improvements sufficient to remove truck length restrictions along the Highway 140 corridor be undertaken.

The analysis of costs and benefits of Highway 140 improvements accomplishes the following objectives:

- Reviews the viability of adding Highway 140 to the Oregon Highway Plan's State Highway Freight System\(^5\) as a freight transportation corridor.
- Determines through surveys, interviews, and analysis, the potential increase in freight trucking on Highway 140 should improvements sufficient to remove truck length restrictions be undertaken and the route added to the State Highway Freight System.
- Evaluates the economic benefits to the corridor, Klamath and Lake Counties, the State of Oregon, and the western states transportation network from increased freight mobility if improvements were made to Highway 140 to remove truck length restrictions.
- Evaluates other transportation and non-transportation opportunities for expansion of commerce along the Highway 140 East corridor and surrounding area.
- Recommends priority construction projects along Highway 140 to expand freight trucking along the route.

B. Cost-Benefit Methodology

The cost-benefit analysis in this section outlines the impacts of Highway 140 improvements on the direct users of the corridor, the surrounding region, and the statewide and western states transportation network.

In the transportation field, the most common form of cost-benefit analysis is known as transportation system efficiency or user-benefit analysis. User-benefit analysis measures the monetary value of travel time, safety, and travel cost savings for users and compares it with the monetary value of the resources used by the project or program. In addition, the user-

\(^5\) A designation developed for the 1999 Oregon Department of Transportation State Highway Plan. The criteria for designation of a highway as a Freight Transportation Corridor is that the highway carries 3,000,000 tons of annual freight shipments. Secondarily, routes that provide important connectivity for the State were also included.
benefits in turn lead to monetary benefits for some users and non-users (individuals and businesses) within the area:

- For affected businesses, there may be economic efficiency benefits in terms of product cost, product availability, and the cost of obtaining production inputs and/or supplying finished products to customers.
- For affected residents, benefits may include reduced costs for obtaining goods and services, increased income from selling goods and services to outsiders, and/or increased variety of work and recreational opportunities associated with greater local accessibility.

Sometimes, as in the case of this study, the cost-benefit analysis is broadened to include economic development impacts, to the extent that they are not already covered by other measures of user and non-user-benefits. These can include shifts in broader population and business location patterns, as well as land use and resulting land value patterns.

The cost and benefit analysis of Highway 140 improvements in this section assessed the following areas:

- Project costs for improvements sufficient to remove truck length restrictions on Highway 140.
- Anticipated demand as a result of improvements.
- Direct and secondary benefits to users of Highway 140 and the surrounding region.
- Potential for corridor industry expansion and job creation.
- Benefits to the BLM, the USFS, and the Lakeview Interagency Fire Center.
- Statewide and western states transportation network benefits.

The approach included:

- Analysis of existing ODOT traffic, accident, and pavement data.
- A special 24-hour vehicle classification count on Highway 140 in Adel.
- Trucking survey of 16 users or potential users of Highway 140.
- Discussions with key agencies in the corridor region such as ODOT, Oregon State Patrol, Oregon Economic and Community Development Department (OECDD), BLM, and USFS.
- Discussions with local businesses, industry interests, and agencies from other states.
- Assessment of vehicle classification counts near border locations and interviews with the Nevada Department of Transportation (NDOT), the Oregon Trucking Association,
and trucking survey respondents to determine the potential for diversion to Highway 140 from other routes.

C. Project costs for Necessary Improvements to Highway 140

The ACT and ODOT have jointly identified several problem areas on Highway 140. ODOT subsequently determined projects that would be necessary to undertake in order to remove truck length restrictions on the highway. Exhibit V-1 shows three such areas between Klamath Falls and Lakeview.

Exhibit V-1: Improvements Needed on Highway 140
Klamath Falls to Lakeview Section

The three areas – Dairy Curves, Beatty Curves, and Bly Mountain – all require curve realignment in order to remove length restrictions. Appendix C includes aerial photographs of the alignments at Bly Mountain and Beatty Curves. While there are currently no overall length restrictions at Dairy Curves, restrictions may be added to the area if videologs demonstrate truck off-tracking.

ODOT has also identified three projects key to removing truck length restrictions from Lakeview to the Nevada border. Those projects are illustrated in Exhibit V-2.
Deep Creek Canyon, Greaser Canyon, and Dougherty Slide all require curve realignments as well. (Dougherty Slide also requires the installation of guardrails.) Cost and schedule for a Greaser Canyon project will be difficult to establish because is a wilderness study area, it harbors a potentially endangered species, and it is a Native American archeological site.

Exhibit V-3 on the following page identifies planning-level costs for the six projects, including:

- Base improvements necessary to remove restrictions on Highway 140.
- Additional improvements to address safety deficiencies on Highway 140 given unrestricted truck usage.
Exhibit V-3: Highway 140 Improvements to Remove Truck Length Restrictions
Estimated Costs for Planning Purposes Only

<table>
<thead>
<tr>
<th>Description</th>
<th>Mileposts</th>
<th>Minimum Improvements Necessary to Remove Truck Length Restrictions ($M)</th>
<th>Additional Improvements to Safely Accommodate Unrestricted Truck Traffic ($M)</th>
<th>Total Minimum Improvements and Safety Improvements ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Curves</td>
<td>11.6-12.6</td>
<td>-</td>
<td>$1.2</td>
<td>$1.2</td>
</tr>
<tr>
<td>Bly Mountain</td>
<td>25.4-34.4</td>
<td>$5</td>
<td>$2.8</td>
<td>$7.8</td>
</tr>
<tr>
<td>Beatty Curves</td>
<td>41.7-42.7</td>
<td>-</td>
<td>$1.8</td>
<td>$1.8</td>
</tr>
<tr>
<td>Deep Creek (Warner) Canyon</td>
<td>15-28</td>
<td>$12</td>
<td>$10.5</td>
<td>$22.5</td>
</tr>
<tr>
<td>Greaser Canyon – Blizzard Gap</td>
<td>28.3-53</td>
<td>$2.0</td>
<td>$6.5</td>
<td>$8.5</td>
</tr>
<tr>
<td>Dougherty Slide</td>
<td>53-57</td>
<td>$8.6</td>
<td>-</td>
<td>$8.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$27.6</strong></td>
<td><strong>$22.8</strong></td>
<td></td>
<td><strong>$50.4</strong></td>
</tr>
</tbody>
</table>

Source: ODOT, Dye Management Group, Inc. analysis
D. Anticipated Demand as a Result of Improvements

There is a long-held belief in the region that freight truck traffic on the Highway 140 corridor is significantly constrained due to the truck length restrictions. As analysis and findings in Section IV Highway 140 Profile have shown, despite the truck length restrictions on Highway 140, traffic does not appear to be significantly constrained. This is the result of limited resources to enforce the restrictions, combined with truck driver evaluations of the low probability of being cited on the highway with an overlength unit.

In order to assess the potential increase in highway usage if improvements were made to the highway to remove truck length restrictions, Dye Management Group, Inc. surveyed 16 trucking firms identified as current or potential users of Highway 140 in May 2001. The trucking survey and detailed results are presented in Appendix B.

The results of the trucking survey are as follows:

- Overall, the 16 respondents cited 1,006 current annual trips, and a potential 1,651 annual trips, or a 64 percent increase.
- Eight of the 16 firms would not increase their usage of Highway 140. While three of the eight would not increase usage because they currently use the corridor to their maximum extent regardless of restrictions, the other five expressed no interest in using the highway for additional trips.

Based on the results from the trucking survey, the classification count undertaken in May 2001 by ODOT at Adel, and discussions with ODOT Motor Carrier, Oregon State Patrol, the Oregon Trucking Association, the Nevada Department of Transportation, ODOT and others, Exhibit V-4 outlines the anticipated demand increase for long-haul freight trucks (as indicated by traffic volumes at the Oregon-Nevada border) on Highway 140.

Exhibit V-4: Possible Scenarios for Increased Long-Haul Freight Traffic

<table>
<thead>
<tr>
<th>Average Daily Traffic Volumes at the Oregon-Nevada Border on Highway 140</th>
<th>Percent Trailer Trucks</th>
<th>Estimated Number of Long-Haul Trucks 2001</th>
<th>Low Increase Scenario (25% Increase)</th>
<th>Trucking Survey Result (64% Increase)</th>
<th>High Increase Scenario (100% Increase)</th>
</tr>
</thead>
<tbody>
<tr>
<td>170</td>
<td>5%</td>
<td>9</td>
<td>11</td>
<td>14</td>
<td>18</td>
</tr>
</tbody>
</table>

*Based on May 2001 ODOT classification count at Adel by ODOT. While five percent appears low, this figure is in line with ODOT’s classification count conducted by an automatic recorder stationed in Beatty which showed seven percent of the total traffic to be trailer trucks.

While improvements may not receive widespread attention from trucking firms outside the Highway 140 corridor area, there is significant interest in the highway from local businesses and some motor carriers. For example, Woodgrain Millwork, Inc. and Lumberman’s Building Centers depend on the highway for delivery of products to
customers within and outside the region. Also, a few local trucking firms such as Ray J. Driscoll depend on Highway 140 for hauling potatoes into Nevada. Highway 140 is important to Klamath and Lake Counties as a major transportation artery for the movement of people and goods within the region, and for the regular and emergency operations of the USFS and the BLM.

**E. Direct Benefits to Highway 140 Users**

In the transportation field, user-benefit analysis measures the monetary value of travel time, safety, and travel cost savings for users and compares it with the monetary value of the resources used by the project or program.

The safety improvements anticipated for Highway 140 do not change route length and grades measurably and therefore will not result in changes in travel time savings and vehicle operating cost savings for existing highway users. For this reason, only accident cost savings can be assessed.

It is difficult to estimate the travel time and cost savings from truckers that might divert from other routes to save time should the truck length restrictions be removed without detailed freight origin-destination information. However, there is significant interest in the highway from local businesses and some motor carriers. Local businesses depend on the highway for delivery of products to customers within and outside the region. A few local trucking firms also depend on Highway 140 for hauling produce and other commodities into Nevada. Highway 140 is important to Klamath and Lake Counties as a major transportation artery for the movement of people and goods within the region, and for the regular and emergency operations of USFS and BLM.

Using the Highway 140 accident figures from Section IV Highway 140 Profile, average annual accident rates were calculated for property damage only (PDO), injury, and fatality accidents on Highway 140.

Exhibit V-5 calculates the potential direct accident cost savings for each 10 percent reduction in the accident rate on Highway 140 based on National Safety Council accident direct cost values. These figures take into account litigation, medical, and property damage expenses in an accident, but do not attempt to approximate the value of lost earnings or any intrinsic value of living.
Exhibit V-5: Potential for Direct Annual Accident Cost Savings on Highway 140

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>15</td>
<td>2.1</td>
<td>$970,000</td>
<td>$2,078,571</td>
<td>$207,857</td>
</tr>
<tr>
<td>Injury</td>
<td>252</td>
<td>36.0</td>
<td>$35,300</td>
<td>$1,270,800</td>
<td>$127,080</td>
</tr>
<tr>
<td>PDO</td>
<td>242</td>
<td>34.6</td>
<td>$6,400</td>
<td>$221,257</td>
<td>$22,126</td>
</tr>
</tbody>
</table>

Source: ODOT accident data, National Safety Council, Dye Management Group, Inc. analysis.

Another way of thinking about the analysis above is that eliminating one fatality through safety improvements to Highway 140 will save society nearly $1 million in direct accident costs. In fact, if a comprehensive value of life figure was used which accounts for individuals’ “willingness to pay” to live longer and/or to reduce safety and health risks, the saving is more than $3 million according to National Safety Council figures.

F. Secondary Benefits

The secondary benefits of undertaking improvements to remove truck length restrictions on Highway 140 include:

- Potential short-term economic benefits associated with the construction activities for the safety improvements.
- Increased spending in the region as the result of increased freight truck traffic traveling through the Highway 140 corridor.

Construction of safety improvements on Highway 140 would likely be undertaken by existing ODOT and/or Klamath and Lake County highway crews. It is quite possible that additional temporary (summer) workers would be employed to assist with the construction activities. These jobs would probably provide good wages for a temporary workforce and would positively affect the local economy. This will be a short-term benefit to the region; however, it is unlikely that any permanent jobs will result from constructing the safety improvements.

Findings in the transportation industry generally show that increasing freight truck transportation through a region does not yield significant economic benefits to the region in terms of expenditures on motels, restaurants, fuel, and so on. There will be some increase to this type of expenditure. For example, based on volume counts at the Nevada border and the Adel classification count, there are currently, approximately 3,200 long-haul freight truck trips per year. According to the trucking survey administered in May 2001,
improvements to remove the truck length restrictions on Highway 140 would result in a 64 percent increase, or an additional 1,800 freight truck trips per year. If these additional 1,800 trips per year spent $50 on average in the region for fuel, restaurant, and motel services, this would result in a $90,000 per year increase in local spending as the result of the increased traffic. However, industry findings generally show that freight truck spending in the through region is low since the truckers want to make their final destination as quickly as possible. In fact, truckers would probably choose Highway 140 in order to reach a destination that could not otherwise be reached in an eight-hour shift.

Findings in other states, (e.g. the case of Texas and the passage of the North America Free Trade Agreement) have shown that the benefits of additional regional spending by truckers is generally more than offset by wear and tear on the state’s highway pavements, increased noise and pollution, safety issues and so on. An analysis by the ODOT Region 4 Pavement Management Engineer predicted that a ten percent increase in five-axle trucks would double truck-related pavement damage and accelerate the deterioration rate of the pavement on Highway 140.

G. Potential for Corridor Industry Expansion and Job Creation

Klamath and Lake Counties have been actively seeking ways to attract new businesses into the regions. There is some indication that Klamath County has diversified its traditional economy. New industries in the county include call centers, a software company, and a high tech manufacturer.

Lake County recently attracted a bronze fine arts foundry and a telemarketing company. The telemarketing company expects to construct its own building and include manufacturing operations in the future. Also, the Oregon Department of Corrections is siting a 400-bed minimum-security prison in Lakeview that will employ 150 people. Lake County has hired a consultant to help in its outreach efforts to attract businesses to the region.

Truck length restrictions on Highway 140 may be a drawback to some industries concerning location in Lake County. However, other factors may be as much or more of a deterrent to businesses looking for new locations. As noted in Section III Regional Overview, Lake County’s remote location and lack of natural gas and fiber optic networks also pose challenges to attracting business to the area.

The South Central Oregon Regional Investment Plan (2000) and the Lake County Strategic Plan (1997), have identified clear goals, objectives, and strategies for promoting economic growth in the Klamath and Lake County region. The following are some goals to be considered:
• Support Lake County’s railroad by seeking funds to upgrade service. Leverage the proximity of the railbed to Lakeview’s industrial park to draw new heavy rail cargo shippers to the area and increase traffic on the railroad.

• Continue efforts to provide basic physical infrastructure to rural communities within the counties by developing regional plans for growth. Continue efforts to extend both fiber optic and natural gas service throughout the counties. Fiber optics is crucial to any call center or high-tech operation seeking new locations; natural gas is important to manufacturing interests considering relocation or expansion.

The region has been largely focused on removing truck length restrictions on Highway 140 to increase freight truck traffic through the area. As discussed in the previous section, the benefits of additional spending in the region by this increased truck traffic may be more than offset by increased wear and tear on pavements, additional noise and pollution, and safety issues. However, there are essentially no restrictions on general traffic such as cars, vans, campers, etc. on Highway 140. The region, particularly the Lakeview area, should promote tourism activities in order to increase the tourism traffic segment. Studies have shown that increased tourist traffic will provide local spending increases far beyond increasing freight truck traffic through the area.

H. Benefits to BLM, USFS, and Lakeview Interagency Fire Center

More than half of the land in both Klamath and Lake Counties is publicly owned. Fifty-six percent of Klamath County’s land and 78 percent of Lake County’s land is publicly owned. Most of that public land is managed by either the BLM or the USFS. Both federal agencies rely on Highway 140 for daily operations, as well as for emergency use. The Lakeview Interagency Fire Center – a joint task force of the United States Fish and Wildlife, USFS, BLM, and Oregon Forestry Department – uses Highway 140 to respond to fire-related emergencies.

BLM requires ODOT to provide traffic control on Highway 140 once or twice a year in order to move heavy equipment into its lands. This is usually accomplished by rolling road closures. In late April 2001, for example, ODOT closed the road in sections for a 160,000 pound BLM vehicle that took up both lanes and half the shoulder at Dougherty Slide. BLM reported occasional difficulties in scheduling road closures with ODOT, but in these circumstances the two agencies are usually able to coordinate operations within a week.

USFS reported that straightening the road would help log trucks move more smoothly on Highway 140, but that the trucks are not usually long trucks. Trucks are limited by the Forest Service’s own interior forest road system, which is often a single lane dirt road or a thinly paved road that cannot handle larger trucks. However, a logging contractor from Klamath County stated that most log trucks are longer than sixty feet.
Lakeview Interagency Fire Center noted that Highway 140’s condition slows its emergency response times since speeds must be reduced to safely negotiate some portions of the highway.

I. Statewide Benefits

Improving Highway 140 to remove truck length restrictions could potentially increase highway use tax revenues for the state. Oregon’s highway-use tax is based both on truck weight and miles traveled in the state. The highway-use tax (or “weight-mile” tax) is collected periodically (monthly, quarterly, or annually) from motor carriers who self-report their weights and miles traveled in Oregon. When overlength trucks use Highway 140, they may fail to report those miles when filing highway-use tax reports in order to avoid being caught. Removing Highway 140 truck length restrictions would reduce incentives to falsify the reports.

To the extent that truck traffic volume on Highway 140 is increased, highway tax revenue may also increase. However, this requires that the trips result in net new truck miles traveled within the State of Oregon. Some new east-west trips that formerly entered Oregon on US95 would actually decrease miles traveled in Oregon by switching to Highway 140.

J. Western States Transportation Network Benefits

In order for Highway 140 to be designated on the State Highway Freight System it would need to be on par or potentially on par with other such highways in Oregon, in terms of statewide strategic importance. Cross-border freight traffic is an effective measure of statewide strategic importance. Traffic volumes from other roads entering Southern Oregon from California and Nevada are significantly higher than volumes for Highway 140, as shown in Exhibit V-6.
Exhibit V-6: Traffic Volumes Near Southern Oregon Border Locations

<table>
<thead>
<tr>
<th></th>
<th>Average Daily Traffic</th>
<th>Passenger Cars and other two-axle, four-tire vehicles</th>
<th>Trailer Trucks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midland Automatic Recorder (US97)*</td>
<td>3,544</td>
<td>64%</td>
<td>30%</td>
</tr>
<tr>
<td>New Pine Creek Automatic Recorder (US395)</td>
<td>992</td>
<td>80%</td>
<td>11%</td>
</tr>
<tr>
<td>Basque Automatic Recorder (US95)</td>
<td>1,168</td>
<td>64%</td>
<td>29%</td>
</tr>
<tr>
<td>ODOT Traffic Count in Adel, May 2001 (OR140).**</td>
<td>281</td>
<td>81%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: ODOT, Dye Management Group, Inc. analysis

*US97 is the only highway on the table that is included in the State Highway Freight System.

**While the five percent figure for trailer trucks appears low, this figure is in line with the Automatic Recorder stationed in Beatty, which recorded seven percent.

The exhibit shows that Highway 140 lacks the level of cross-border freight traffic volume to be considered part of the current State Freight Highway System. If trailer truck volumes on Highway 140 were to double, and should truck length restrictions be removed, the highway still does not exhibit the level of statewide strategic importance necessary for such consideration. Highways with much greater volumes than Highway 140, such as US95 and US395, are not part of the State Freight Highway system, but demonstrate greater statewide significance in terms of freight traffic at border crossings.

The Nevada Department of Transportation (NDOT) stated that Highway 140 on the Nevada side of the border could accommodate increased freight traffic. However, according to NDOT statistics, average daily traffic is 140 at the Nevada-Oregon border; 240 south of Denio, Nevada (where Highway 140 meets Highway 205); 330 at the junction of Highway 140 and US95; then 1,800 when Highway 140 turns into US95.

While some surveyed carriers and local officials believe there is latent demand for Highway 140 as a freight route from Salt Lake City to the coast, NDOT estimates that 20 to 30 trucks per day travel through Nevada to or from Salt Lake City. NDOT estimates that improving Highway 140 on the Oregon side of the border would, at most, increase truck traffic to 50 trucks a day, and only then by drawing some of the traffic that would pass through Oregon on US395 (through Lakeview), US97 (through Klamath Falls), or US95.
VI. Funding Sources

The purpose of this section is to identify potential sources for funding Highway 140 safety improvements.

A. State Funding Programs

ODOT oversees funding programs for highway improvements in Oregon. The sources of funds for these programs include federal-aid funds through the Transportation Efficiency Act for the 21st Century (TEA-21) and State funds collected through fuel taxes and other taxes and fees.

1. Statewide Transportation Improvement Program (STIP)

Every two years, ODOT identifies funding and schedules specific construction projects for the following four years in its Statewide Transportation Improvement Program (STIP). In developing the STIP, ODOT takes into account objective measures of transportation needs identified from management systems for pavement, bridge, and safety. It is often the case that rural low-volume roads, such as Highway 140, have difficulty competing for funds against urban areas with higher populations and traffic volumes since technical measures of transportation needs tend to be driven by population and congestion.

In addition, Area Commissions on Transportation (ACTs) also provide input that helps ODOT to prioritize projects for the STIP. County-level Transportation System Plans (TSPs) are the normal mechanism for establishing local priorities for transportation infrastructure needs. Highway 140 projects that can be funded with federal and/or local funds (i.e. without ODOT funding) still need to be identified as regional priorities and included in the STIP. Klamath and Lake Counties have not yet developed TSPs to formally establish Highway 140 improvements as a regional priority for adequate consideration in the STIP development process.

2. State Safety Programs

Oregon has several different programs to fund highway safety improvements. Most are dependent on objective rating standards that measure dangerous road conditions.
a. Safety Priority Index System (SPIS)

ODOT has developed an objective measurement tool called the Safety Priority Index System (SPIS) to determine hazardous locations on state highways. The system takes into account crash frequency, crash rate, and crash severity for .10 mile segments of highways to calculate a segment score, or “SPIS value.” Every year, the top 10 percent SPIS value sites in each region are collected and evaluated for improvements using a benefit/cost analysis. However, Highway 140 outside the Klamath Falls urban growth boundary does not have any sites close to the top 10 percent SPIS value. Highway 140 is therefore unlikely to receive funding generated through the SPIS.

b. Safety Investment Program (SIP)

ODOT’s Safety Investment Program (SIP) rates five-mile segments of state highways based on the number of fatal and serious injury crashes that have occurred in the previous five years. Ratings range from Category 1 (no fatal or serious injury crashes) to Category 5 (10 or more fatal or serious injury crashes). This expands upon the SPIS to identify longer segments of dangerous road that may be targeted for improvement projects in the future. On Highway 140, outside the urban growth boundary of Klamath Falls, there are five segments that are Category 2 (1 or 2 fatal or serious injury crashes), and one segment that is Category 3 (3 to 5 fatal or serious injury crashes). The rest of the highway is Category 1. Most of Oregon’s Category 5 segments are concentrated in urban areas.

c. Hazard Elimination Program (HEP)

The Hazard Elimination Program (HEP) is a federally funded program that requires ODOT to develop a system of identifying and reducing the number and/or severity of accidents. Oregon receives approximately $2 million per year for HEP projects.

Each of ODOT’s five regions submit recommended projects that address hazards identified using the SPIS, accident data, citizen input, input from enforcement and emergency response agencies, and maintenance crews. Projects are ranked according to availability of other funds, ability to commit to a delivery date, and regional priority of the proposed safety improvements. The highest-ranking projects within funding limitations are programmed into the STIP. Projects should be funded mostly or entirely by HEP funds and should be less than $500,000. An approximately 10 percent local funding match is required.

In 1992, guardrail was installed on Highway 140 between Lakeview and Adel using $441,169 in HEP funds.
B. Federal Lands Highway Program

The Federal Lands Highway Program consists of five separate funds designed to support roads and public transit that serves federally owned land. Public Lands Highways appears to have the most potential to fund improvements on Highway 140. It is split into two separate subprograms, the Forest Highways Program and the Discretionary Public Lands Program.

1. Forest Highways Program

Forest Highways are roads that are designated as important to serving national forests. The Federal Highway Administration (FHWA), in consultation with ODOT and the USFS, makes this designation. FHWA, the USFS, and ODOT jointly select projects annually for the Forest Highway Program (FHP). The program’s objective is to build or improve roads that connect national forests with state highways. In 2001, $162.4 million was available for Forest Highways across the United States. Oregon has historically received between $18 to $20 million per year in Forest Highway funds.

Factors taken into consideration in selecting projects include the road’s importance to forest-related uses, the predominance of forest-related traffic on the road, millions of acres the road accesses, and safety and environmental conditions on the road. Typical Forest Highway Program projects are between $4 million and $6 million. The program covers project development, engineering, and construction costs. Right-of-way acquisition must be covered by another source.

Highway 140 between Klamath Falls and Lakeview is a forest highway, as well as a small portion of the highway between Lakeview and Adel. Half of the six identified Highway 140 improvement projects – Dairy Curves, Bly Mountain, and Beatty Curves – qualify for Forest Highways money.

2. Discretionary Public Lands

FHWA solicits applications once a year for the Discretionary Public Lands Program from state departments of transportation. Eligible projects include:

- Forest roads under the jurisdiction of and maintained by a public authority and open to public travel.
- Highways through unappropriated or unreserved public lands, non-taxable Indian lands, or other Federal reservations under the jurisdiction of and maintained by a public authority and open to public travel.

ODOT evaluates and prioritizes Discretionary Public Lands applications from across the State. The Director of ODOT decides which applications to forward to FHWA.
In 2001, $83.6 million was available for Discretionary Public Lands across the United States. Oregon has historically received between $2 million and $5 million per year. However, most Discretionary Public Lands money is earmarked by congressional legislation for particular projects. When officials from Lake County visited Washington, D.C., they were instructed that in order to receive such an earmark, the County needed congressional support, a multi-jurisdictional partnership in place, and ODOT support for the projects.

Funding is for one year; therefore, projects selected for Discretionary Public Lands funding are usually fully designed projects that are close to construction stage. Although the program does not require a local match, it is encouraged. Also, award amounts are fixed and are often less than requested. Applicants must fund overruns. Shortfalls must be paid for with other funds, or applicants may seek approval to reconfigure projects to meet the funding granted.

C. County Funding

The high percentage of publicly owned land in Klamath and Lake Counties negatively impacts the Counties' tax base, as the public land is exempted from property taxes. The federal government historically compensated for this by making payments in lieu of taxes, which were based on percentages of receipts from timber harvested from the federal lands. These federal payments were used to build and maintain roads and schools in the two counties.

When timber harvesting in the Northwest declined, revenues the Counties depended upon for their local budgets also decreased. In response, the federal government passed legislation to compensate the Counties. This money is known locally as “Forest County Funds.” Over the next six years, Klamath County should receive about $47 million and Lake County about $23 million in Forest County Funds.

Lake County officials expressed reluctance to use Forest County Funds for Highway 140 improvement projects. The funds are intended for county roads, and Lake County has over 700 miles of such roads. However, there may be some potential for the counties to use a limited amount of these funds as a match to leverage other federal highway funds.
In addition to oversight committee members, the following people provided valuable input during the course of this study:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angela Rose Lane</td>
<td>ODOT Motor Carrier Safety Division</td>
</tr>
<tr>
<td>Carolyn Gassaway</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Dick Woodward</td>
<td>United States Forest Service</td>
</tr>
<tr>
<td>George Fekaris</td>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>Glenn Chastain</td>
<td>State Patrol Headquarters</td>
</tr>
<tr>
<td>Jack Svadlenak</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Jane O'Keefe</td>
<td>Lake County Commissioner</td>
</tr>
<tr>
<td>Jim Platt</td>
<td>United States Bureau of Land Management</td>
</tr>
<tr>
<td>Julie Evey</td>
<td>ODOT Motor Carrier</td>
</tr>
<tr>
<td>Mary Lou Hilliker</td>
<td>Oregon Trucking Association</td>
</tr>
<tr>
<td>Mike Lawson</td>
<td>Nevada Department of Transportation</td>
</tr>
<tr>
<td>Paul Donovan</td>
<td>Oregon State Patrol</td>
</tr>
<tr>
<td>Phil Grant</td>
<td>ODOT Motor Carrier</td>
</tr>
<tr>
<td>Ray Roach</td>
<td>Nevada Motor Transport Association, Inc.</td>
</tr>
<tr>
<td>Richard Arnold</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Ron Jones</td>
<td>ODOT Motor Carrier Safety Division</td>
</tr>
<tr>
<td>Steve Kale</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Steve Wilson</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Tim Bednar</td>
<td>Oregon Department of Transportation</td>
</tr>
<tr>
<td>Tom Matthews</td>
<td>Lakeview Interagency Fire Center</td>
</tr>
<tr>
<td>Wally Bolen</td>
<td>United States Geological Survey</td>
</tr>
</tbody>
</table>
Appendix B: Trucking Survey and Results

1. What best classifies your trucking organization? (For hire, private carrier, etc.)

2. How many trucks do you have in your operation?

3. Do you ship freight into or through Southern Oregon?
   If “Yes”:
   - What commodities do you ship?
   - What are your principal origins and destinations for trips into or through Southern Oregon?
   - What routes do you travel through Southern Oregon? Be specific (e.g., US 95, OR 78, OR 20, I-5).

4. Do you use Highway 140?
   If “Yes”:
   - How many trips, estimated, do you make per year on Highway 140?
   - Would your number of trips on Highway 140 increase if the road were improved to remove restrictions on overlength trucks?
   - If so, by how much (yearly estimate)?
   If “No”:
   - Why don’t you use Highway 140?
   - Would you likely use Highway 140 if the highway was improved and length restrictions were removed?
   - If so, what would be your estimated trips per year? If not, why wouldn’t you use Highway 140?
The following 16 firms were surveyed about their current and potential use of Highway 140:

Barrett Livestock          Lumbermen's Building Centers
Bekins Northwest          Maga Trucking
Chappell's Trucking Co.    Metro Freight Systems, Inc.
Combined Transport         Mitchell Bros. Truck Line
D&G Houchin Trucking       Quality Express
Ray J. Driscoll            West Coast Livestock Express
Kruger Truck Line, Inc.    Woodgrain Millwork, Inc.
L&L Express Brokerage      Zelmer's

Exhibit B-1 illustrates the results of the trucking survey.

**Exhibit B-1: Trucking Survey Results**

<table>
<thead>
<tr>
<th>Current Annual Trips</th>
<th>Increase in Annual Trips</th>
<th>Projected Annual Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>150</td>
<td>0</td>
<td>150</td>
</tr>
<tr>
<td>200</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>200</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>0</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>52</td>
<td>73</td>
<td>125</td>
</tr>
<tr>
<td>20</td>
<td>240</td>
<td>260</td>
</tr>
<tr>
<td>240</td>
<td>240</td>
<td>480</td>
</tr>
<tr>
<td>1,006</td>
<td>645</td>
<td>1,651</td>
</tr>
</tbody>
</table>
Appendix C: Aerial Photographs of Highway 140 Corridor

Bly Mountain

Located between Klamath Falls and Lakeview, the Bly Mountain section of Highway 140 requires $5 million of curve realignment as a minimum improvement to remove truck length restrictions and $2.8 million of additional improvements to fully straighten the curves to acceptable geometric standards.
Beatty Curves

$1.8 million in curve realignment is needed to safely accommodate unrestricted truck traffic on Beatty Curves.
Deep Creek Canyon

Deep Creek Canyon's curves (including the S-curve pictured below) require $2 million minimum to lift truck length restrictions. An additional $6.5 million in realignment would allow safe truck traffic.
Dougherty Slide

Dougherty Slide, pictured below, would require $8.6 million in curve realignment and guardrails in order to remove truck restrictions.