REPORT |

Nevada Freight Program Assessment
Statewide




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Table of Contents

Executive Summary

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Executive Summary

This freight assessment document has been prepared to establish the basis for preparing a complete statewide freight plan in compliance with the Moving Ahead for Progress in the 21st Century (MAP-21) Act, the federal policy and funding bill for FY2013/2014. The future state freight plan will be developed with input from stakeholders statewide and reflect Nevada's goals and strategies for future infrastructure improvements and policies to maximize job growth.

This document reviews and builds on the *2000 Nevada Statewide Intermodal Goods Movement Study* and includes current 2011 data for the earlier study's 1997 data. This assessment addresses goods moved outbound and exports, inbound and imports, and internally within Nevada by truck, rail, air, multiple modes (e.g., truck and rail), and pipeline to and from domestic and international origins/destinations. The following table highlights key findings.

A thorough description of Nevada's current economy is presented to lay the ground work for understanding the primary drivers of the state's economic growth. Employment and Gross Domestic Product (GDP) data is presented by industry classifications, identifying the most significant industries and those with the greatest growth potential. Freight dependence data is also presented by industry, stratified by the mode of transport and by origin/destination.

A comprehensive inventory of the state's freight infrastructure by mode is summarized in the document along with a description of transportation flows by mode and discussion of the economic value of trade using Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) data and Surface Transportation Board (STB) Waybill data.

In addition, a baseline for 2012 plus employment and GDP forecasts for 2022 and 2032 are presented for key industries with annual growth rates and industry percent of total figures. All industries are projected to grow with no major changes in the state's dominant industries. Summary and detailed commodity forecasts by mode, value, and tonnage are projected for each origin/destination category in 2022 and 2032 against the 2012 baseline, stratified by outbound, inbound, and internally-within-Nevada flows.

Estimates of the potential economic return from proposed types of infrastructure investments are given to address the state's strategic directions. These estimates are supplemented with a review of Nevada's funding options and current infrastructure tax collections and distributions.

The document also reviews NDOT's existing development processes and federal MAP-21 guidance on state freight plan contents, plus MAP-21's requirements for creating State Freight Advisory Committees with recommendations for stakeholders to be contacted during the state freight plan preparation. Significantly, this document summarizes information on goals, needs, issues, and opportunities by mode that project participants have raised for future plan consideration. Performance measure indicators are included for consideration and refinement in evaluating alternative investment options in the state freight plan.

This freight assessment document provides a comprehensive baseline for NDOT to pursue preparing the Nevada state freight plan.

Nevada Freight Program Assessment Highlights	
2000 Study Update	Inbound freight flows have grown from 1997 to 2011: +30% to 42 million tons
	Outbound freight flows have dipped slightly: -3% to 14 million tons
	Internal freight flows have grown the most: +56% to 51 million tons
	Truck flows have increased 43% and multiple-mode flows have grown 168%
	International exports & imports by truck have increased dramatically by $2 billion each
Current NV Freight Economy	NV jobs increased by 79% from 1992-2012, despite 12% 2007-2012 decline, when construction jobs declined 61%
	Location quotient for accommodations, food service, & gambling jobs > US average
	73% of in & 90% of outbound industry-dependent freight shipped by truck
	3.6% of economy spent on transportation; transportation industry contributes 2.9%
Infra-structure & Commodity Flows	Infrastructure modes: Northern NV – I-80, UPRR, Elko & RNO, pipelines; Southern NV – I-15, UPRR, LAS, pipelines
	FAF: Remainder of NV > Las Vegas (Clark & Nye co.) outbound/exports; Remainder of NV > Las Vegas inbound/imports
	Tons of internal freight flows > other flows
	Far West, SW, & Rocky Mt. primary destinations
	NV exports and imports more freight to and from Canada than Mexico
Future Goods Movement	Arts, entertainment, accommodation, food, & household services will grow by 2.1% a year to 611,000 jobs by 2032
	Total jobs will grow by 2.2% to 2.4 million
	Top six 2032 industries will account for most NV jobs, the same six as in 2012
	In & Outbound flows by value & by weight will grow significantly from 2012 to 2032
	Coal, chemicals, waste scrap, other agricultural products and pipeline flows will grow
Performance Measure Indicators	Services provided; Mobility performance; Accessibility performance; Safety performance; Resource impacts; User Choice performance; Operating efficiency; Fiscal impact
Goals, Needs, Issues, & Opportunities	Roadway Capacity: I-80, I-15, US95, US93 low-cost improvements: preservation, ITS, etc.; improve safety and connectivity, reduce congestion; study & advance major projects
	Truck Safety & Operating: add truck parking, overdimensional permits, and consider AutoSock
	Rail Coordination: coordinate with UPRR & BNSF per state rail plan
	Air: expand air cargo at RNO; expand future LAS fuel farm capacity; increase SkyWest, etc. Elko freight shipments
	Pipeline Capacity: support, as needed

1. Study Purpose, Freight Update, and Approach

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1: Study Purpose, Freight Update, and Approach

This report's first chapter presents the purpose for assessing Nevada's freight flows at this time. It also includes a summary of the last study of Nevada's freight flows, the *2000 Nevada Statewide Intermodal Goods Movement Study* (*2000 Study*), as well as an update of how freight flow conditions have changed since 2000 to help determine the implications for preparing Nevada's future freight plan. Finally, this section describes the approach used to develop and organize this freight assessment's findings and recommendations.

Shipments of goods from Nevada to other states in the US are termed domestic *outbound* shipments and shipments from other US states into Nevada are termed domestic *inbound* shipments, whereas shipments from Nevada to international destinations are termed *exports* and shipments from international origins into Nevada are termed *imports.*

A. Study Purpose

The federal Moving Ahead for Progress in the 21st Century Act (MAP-21) empowers Nevada to improve the condition and performance of the state's freight network to achieve economic competitiveness and efficiency goals. The first step is to assess the state's freight program as a precursor to developing a State Freight Plan that provides renewed attention for safe and efficient freight transportation to promote economic growth. Nevada last addressed its freight goods movement statewide in 2000. Over that decade-plus timeframe, the rapidly-changing US economy and global trading patterns have changed, as have Nevada's commodity flows.

Assessing the transportation corridors in the state, capturing the roles they play in economic growth, and identifying areas best poised for growth will set the stage for future growth. This assessment study establishes the foundation for identifying and growing the state's freight corridors, supporting the state's infrastructure, and enhancing the performance and intermodal connectivity of these systems. Identifying emerging trends in larger national and international freight movement and the role that existing and future freight-dependent businesses can play in the rapidly restructuring global economy is important to understanding what changes should be studied in the future state freight plan. In summary, this assessment is a precursor for the preparation of a new Nevada freight plan; it includes findings and recommendations to support the preparation of a new freight plan.

B. *2000 Study* Summary and Update

1. Study Summary

NDOT's 2000 *Study* was completed in May 2000. The purpose for examining Nevada's freight transportation system was to determine how best to use Nevada's freight strengths to realize economic development and diversification in the state. The *2000 Study* was also prepared to provide input for the *Statewide Long Range Transportation Policy Plan* and to address federal transportation funding requirements.

The *2000 Study* takes multiple significant changes in transportation logistics into consideration, including: deregulation of the rail, truck, and airline industries; a decline in US mining, steel, and manufacturing paired with an increase in service industries and high-tech manufacturing; globalization; global outsourcing; the North American Free Trade Act (NAFTA); just-in-time

freight delivery; computerized ordering and tracking of shipments, including expedited air shipments and delivery service providers; multimodal transportation companies; and global alliances among carriers.

The *2000 Study* focuses on freight transportation systems, use of those transportation systems, freight transportation problems and issues; and the relationship between freight transportation and the Nevada economy. The *2000 Study* has five key objectives:

- To identify the economic impact of the state's freight transportation industry;
- To identify opportunities and strategies for promoting efficient transportation of goods and to evaluate Nevada's position nationally and internationally;
- To identify detailed facility/access needs and strategies;
- To provide needed input for regional corridor and statewide transportation plans, programs, plus congestion management systems; and
- To provide the Goods Movement element of the *Statewide Long Range Intermodal Transportation Plan (NEVPLAN).*

The *2000 Study* references three major federally-designated and western state corridors, as well as some major regional, statewide, and special corridors, notably:

1. Economic Lifeline Corridor, running though CA, AZ, and NV.
2. US395 Corridor, running north-south through WA, OR, NV, and CA.
3. The CANAMEX Corridor, running north-south through MT, ID, UT, NV, and CA. The CANAMEX Corridor is synonymous with the East-West Transamerica Corridor in southern Nevada;
4. The Economic Lifeline, San Francisco – Chicago.

The *2000 Study* emphasizes input from regional economic development agencies.

A separate chapter in the *2000 Study* is devoted to each mode: freight rail, highway freight, and air cargo. The rail chapter summarizes traffic volumes and facilities; it also comments on the Union Pacific Railroad Company (UP) mergers and the resulting BNSF Railway Company (BNSF) trackage rights needed to keep rail competitive in the state. A number of regional economic development agency comments address rail service issues in the various service areas.

The highway chapter references the National Highway System (NHS) and the interstate system; it addresses multiple corridors, presenting then-current and future truck volumes. This chapter also includes the results of a trucker survey, focused on congestion and surface conditions, and the improvement comments that the regional economic development agencies raised.

The air cargo chapter discusses Nevada's two major airports, plus the Elko Municipal Airport and Ely's Yelland Field, and their freight cargo facilities and shipments. The chapter also references Nevada's Freeport Law, which makes the state attractive for warehousing and air cargo distribution. The state's Freeport Law exempts all in-transit personal property from state taxation while it is being stored, assembled, or processed for use in another state, along with

inventories held for sale in Nevada itself. The chapter includes regional economic development agency comments on air cargo issues.

The *2000 Study a*nalyzes Nevada's commodity flows, defining the state's trading partners, types of commodity movements, and modes used to ship the commodities. The effort includes data from TRANSEARCH, carload waybill samples, multiple air data sources (Form 41 reports, airport-to-airport flows, commodity flow survey data, and supplemental data), and the results of a survey of 60 statewide shippers to identify and define commodity flow issues, constraints, and opportunities. Shippers were asked how they move their freight, why they move it that way, what problems do they encounter when using Nevada's freight system, and what are their transportation objectives over the next five and ten years.

The *2000 Study* reports that a total of 36 million tons were shipped into, out of, and within the state in 1995. Las Vegas was the primary origin or destination of these shipments. Significantly, more of these shipments were made by truck rather than rail when measured by tonnage or value; rail tends to be used for shipping the heavier commodities and truck for shipping the higher valued commodities. Only four percent of shipments by value were made by air, which is preferred for the highest value commodities. The *2000 Study* projects overall commodity freight tonnage to grow at an annual rate of about 1.75 percent for both in and outbound freight, with airfreight growing at the fastest rate of about 2.5 percent, given its smaller base and the higher expectation for increases in shipments by this mode.

The *2000 Study* evaluates the direct, indirect, and induced economic impact from earnings and employment that freight transport can generate. Nevada's domestic, international, and internal in-state trade flows were estimated to total about $40 billion and involve almost 357,000 jobs in 1995; they were projected to reach over $54 billion and 495,000 jobs by 2020.

The report notes that Nevada exports to broadly diversified destinations, although lower-value bulk commodities, notably clay and nonmetallic minerals, dominate these exports. The state's location accommodates easy access for its largest single input, coal, from adjacent Utah, and its largest overall import provider, adjacent California. However, Nevada imports about twice as much by weight as it exports. California, Utah, and Arizona account for about two-thirds of Nevada's imports and exports. Shippers and regional economic development agency input viewed the state's air cargo service and highway network positively, although they identified problems with rough road surfaces and traffic congestion, plus some rail service issues in the immediate post Class I rail merger transition.

The *2000 Study* concludes with a discussion of Nevada's freight system strengths and weaknesses, a listing of key freight transportation issues plus strategies to improve goods movement, and a recommended intermodal freight planning process for Nevada. The strengths and weaknesses are based on the commodity flow analysis, shipper surveys/interviews, a trucker survey, and regional economic development agency input.

The document's concluding 15 pages provide generalized, suggestions, recommendations, and supporting documentation and discussion. Page 7-14 lists five elements to provide "a practical

and common sense way to approach freight planning," which is subsequently detailed in the following pages with generalized strategies and needs for each mode:

1. Establishing planning principals to guide planning efforts
2. Developing a freight planning methodology to identify near- and long-term high-leverage improvement projects
3. Developing a methodology to prioritize improvement projects
4. Soliciting end user input on projects and the planning process
5. Developing a process for regularly updating the freight plan.

The last two pages of the conclusions and recommendations chapter discusses a recommended planning process for Nevada. The key steps involve:

1. General freight transportation planning
2. Freight planning methodology
3. Freight project prioritization process
4. End user involvement
5. Update

Nevada has been working to advance the *2000 Study's* generalized planning process conclusions and recommendations for freight, given available funding, since completing the study. Nevada uses its Statewide Transportation Improvement Program (STIP) for this effort. The STIP, which is more fully described in this report's Chapter 6, provides Nevada's current project development process, which yields a four-year list of federally-funded and non-federally-funded transportation projects, which are consistent with the statewide transportation plan. NDOT continually refines this process and is currently working to develop additional decision-support data and to incorporate a multi-discipline staff-level review of potential projects for this process, as noted in Chapter 6. The data included in the following update on freight shipments since 2000 attests to the state's success in implementing its freight infrastructure priorities and policies. In addition, the newly-enacted federal transportation legislation, MAP-21, has formalized the freight planning process since completion of the *2000 Study* with multiple requirements, such as setting timelines for freight study updates.

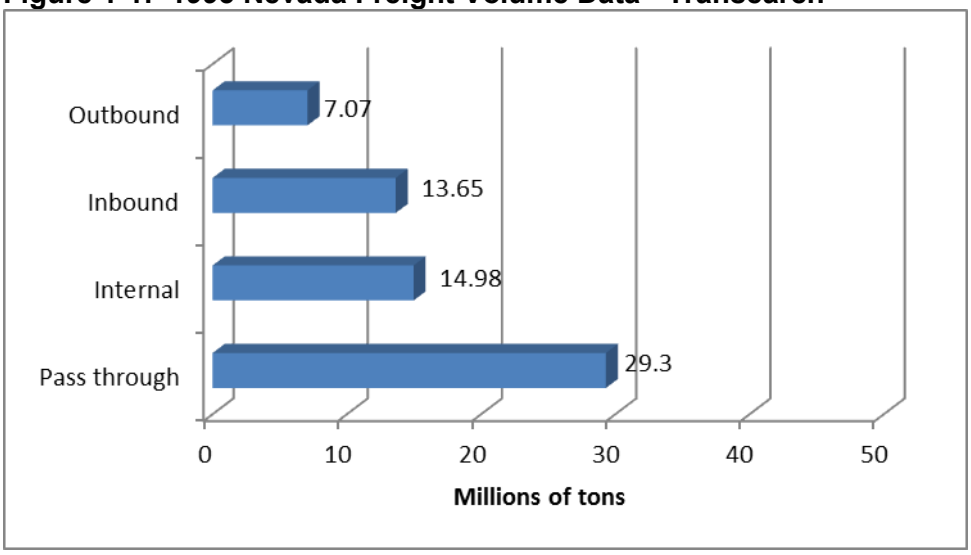
2. *2000 Study* Update

Understanding how freight flows between buyers and suppliers provides important insight into the use of Nevada's multimodal transportation network, and it highlights important considerations for evaluating existing infrastructure. Considerable change has occurred in Nevada's trading partners, increased volumes of shipments, diversity of commodities, and modal shifts, since the completion of the *2000 Study*. The information presented below suggests that supporting these emerging trends may require some rethinking of Nevada's prioritization and allocation of freight transportation investments. The following comparative summary provides cross-sectional detail on Nevada's freight flows, and it identifies current economic and transportation industry characteristics and trends.

The *2000 Study* reported 7.07 million tons of domestic outbound and 13.65 million tons of domestic inbound freight from various parts of the US coming into Nevada in 1995 (Figure 1-1).

Almost 15 million tons of goods were transported within Nevada using the state's transportation infrastructure. In addition, an estimated 29.3 million tons of freight passed through Nevada en route to its final destination.

Figure 1-1: 1995 Nevada Freight Volume Data - Transearch



Source: Goods Movement Study, Wilbur Smith & Associates and Reebie Associates

The 1995 data for the earlier study was based on Reebie Associates' Intermodal Freight Visual database, of which a majority of the commodity flow information came from Reebie Associates' Transearch database. The database—a precursor to the Freight Analysis Framework (FAF), which the US Department of Transportation's (USDOT) Federal Highway Administration (FHWA) now provides—offered a data series of freight flows that provided geographic, modal, and commodity value, as well as tonnage detail on freight shipments.

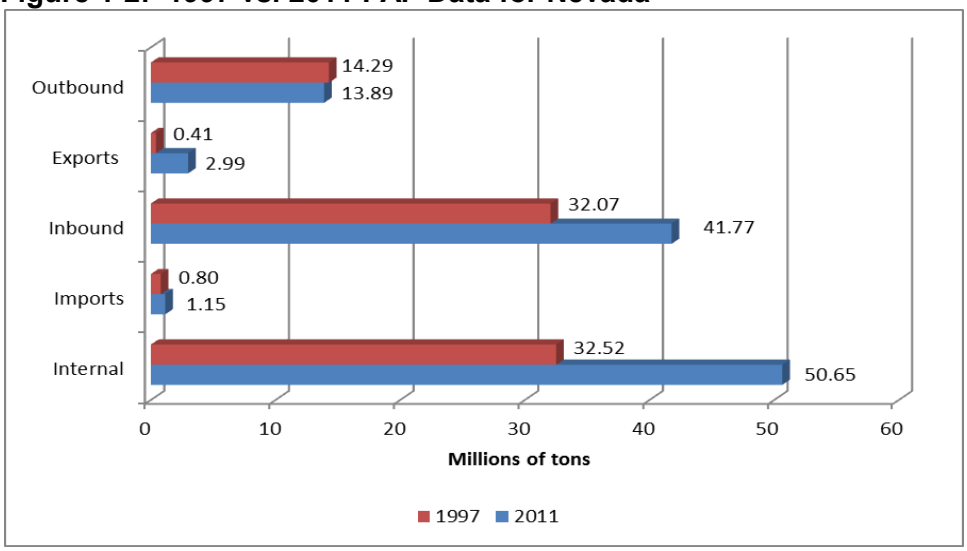
Data for 2011 was gathered directly from FHWA's FAF website to be able to compare it with the *Year 2000* report data for the purpose of measuring evolving trends. The 2011 FAF data is based on the 2007 Commodity Flows Survey and has been "re-based" for 2011 economic data. The FAF data contains estimates of freight shipped to (imports), from (exports), and within (domestic) the US, although it does not contain through shipments that are included in Transearch data. FAF provides a picture of freight movement among states and major metropolitan areas by all modes of transportation, and it provides estimates of tonnage, value, and domestic ton-miles by region for both origins and destinations, commodity type, and mode for recent years with forecasts through 2040.

Recently revised and updated 1997 FAF data were used to compare historical data to current trends through 2011 because of the span of time between 1995 and 2011, as well as the inherent differences between Transearch and FHWA data.[1] Using this data provides a comparable benchmark from the same data source that is relatively close to the base year for the *2000 Study* (1995 vs. 1997). Freight shipments, especially for inbound goods coming into

[1] Transearch uses a STCC commodity code, whereas FHWA FAF uses SCTG. A description of both 2-digit code definitions is given at the FAF web site: http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/faf2_reports/report4/.

Nevada, have grown significantly since 1997. Outbound freight has dipped slightly by three percent to under 14 million tons in 2011, whereas inbound freight to Nevada from the rest of the US has grown over 30 percent to 42 million tons, as shown in Figure 1-2. Internal shipments within Nevada have experienced the largest percentage growth of over 18 million tons, representing a 56 percent increase.

Figure 1-2: 1997 vs. 2011 FAF Data for Nevada



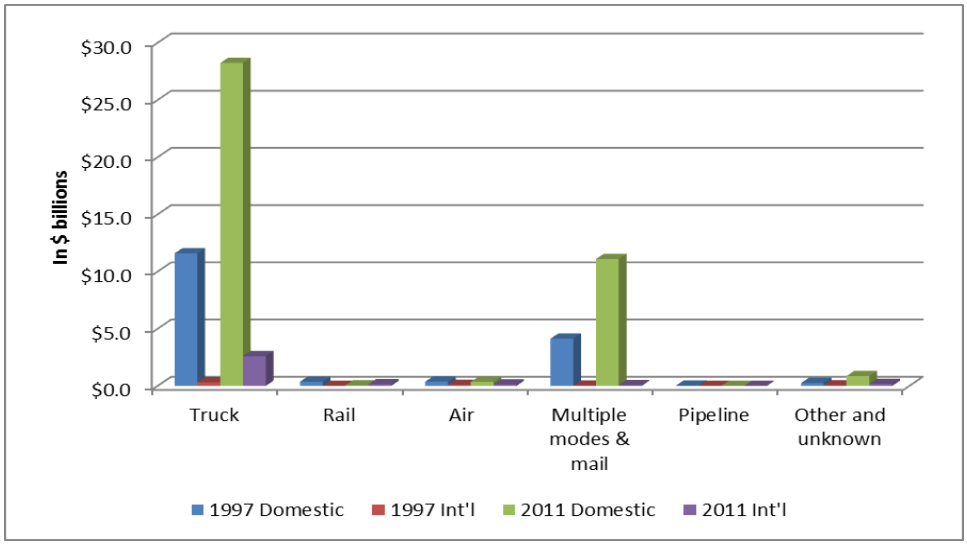
Source: FHWA Freight FAF 1997 and 2011

- ***Modal Overview***

Outbound freight flows from Nevada are predominately transported via truck and what the FAF terms "multiple modes." Truck-transported goods and multiple modes as calculated by value have increased 43 and 168 percent, respectively, since 1997. These domestic outbound shipments are much larger than international exports from Nevada as is evident in Figure 1-3. The multiple mode category was originally called "truck and rail" in 2002 and was changed to "multiple modes and mail" to represent "intermodal shipments," such as truck-rail, truck-water, and rail-water intermodal shipments, involving one or more end-to-end transfers of cargo between two different modes.[2] It also includes shipments moved by "parcel delivery services, US Postal Service, or couriers."[3] Surface Transportation Board (STB) Waybill data summaries suggest that, given the absence of water transportation in Nevada, the multiple modes category primarily includes containers, bulk, and break-bulk shipments that rely on rail and truck combination movements to transport goods.[4]

[2] FAF, Version 3: Overview of the FAF3 National Freight Flow Tables
[3] Table 1: FAF Modes. http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/faf3/userguide/index.htm
[4] STB Waybill data summaries, presented later in this document, assess rail intermodal traffic because FAF does not provide a breakout of rail versus truck segments of the "multiple mode" categorization. These tabulations also provide important through travel information on intermodal/containerized (TOFC/COFC) traffic.

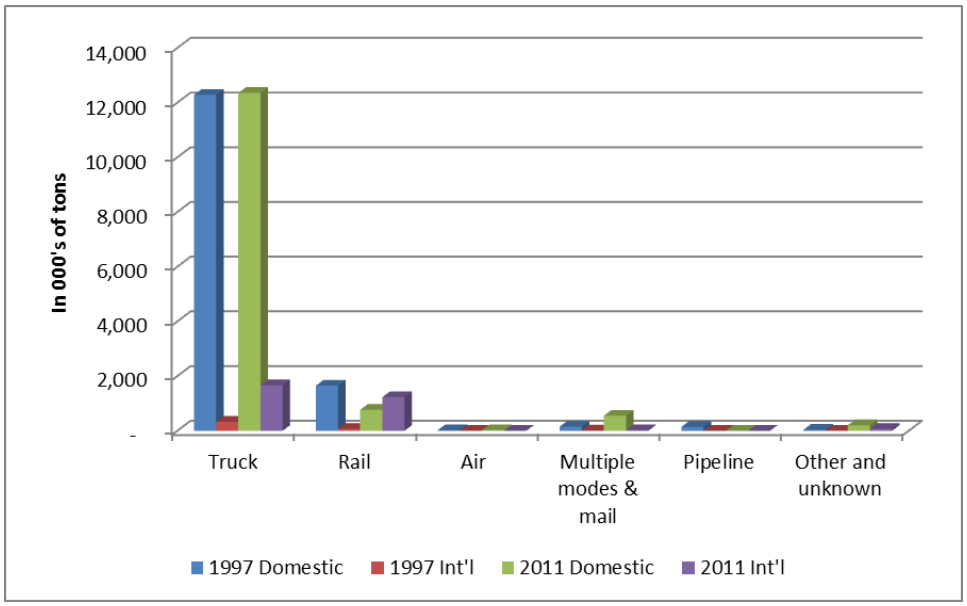
Figure 1-3: Outbound and Export Flows by Mode
(in billions of dollars)



Source: FHWA FAF 1997 and 2011

Truck movements by volume remain the dominant mode of choice; however, rail/intermodal shipments are second in volume with less than two million tons, indicating that lower value goods are being shipped by rail to reach their final destinations (Figure 1-4).

Figure 1-4: Outbound and Export Flows by Mode
(in thousands of tons)

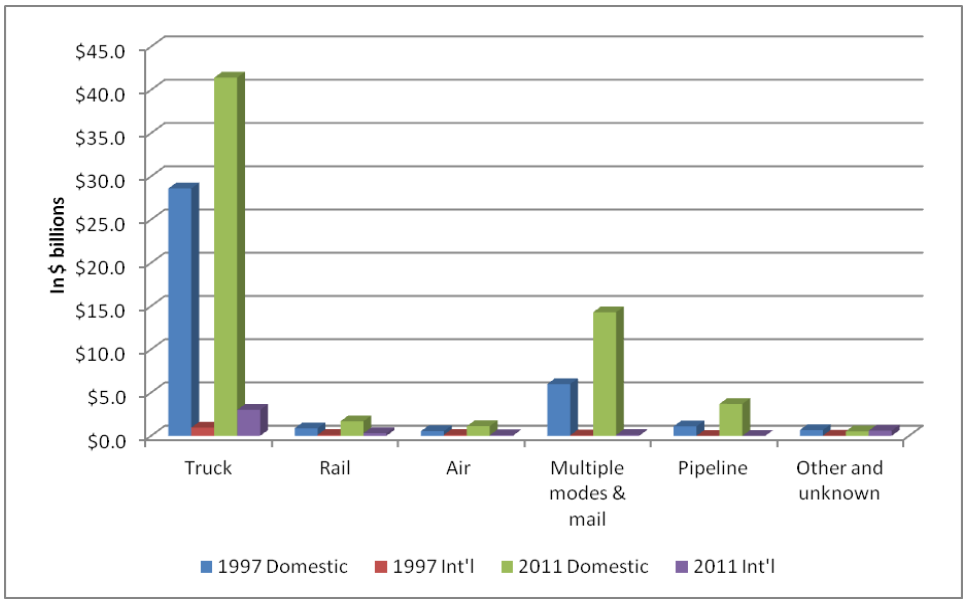


Source: FHWA FAF 1997 and 2011

Inbound/imports exhibit similar modal trends to outbound/export modal uses with the majority of higher value shipments using truck and multiple modes (truck-rail). However, pipelines transport predominately domestic inbound goods (Figure 1-5). Shipments calculated by weight

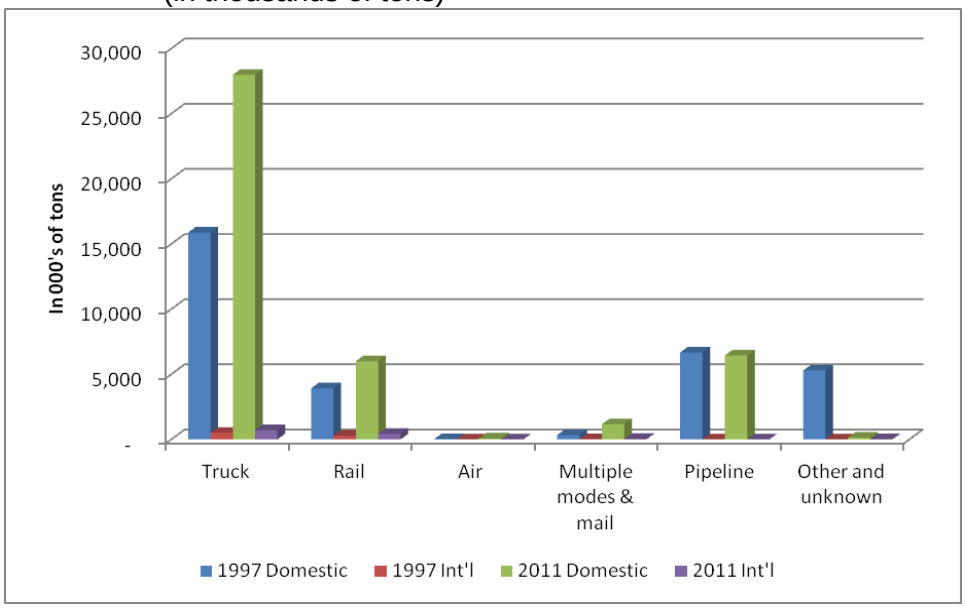
show that the majority of goods brought into Nevada rely on truck, rail, or pipeline (Figure 1-6). The contrast between high tonnage volume and low overall value for rail and pipeline shipments indicates that the commodities these modes transport are likely low value commodities.

Figure 1-5: Inbound and Import Flows by Mode
(in billions of dollars)



Source: FHWA FAF 1997 and 2011

Figure 1-6: Inbound and Import Flows by Mode
(in thousands of tons)



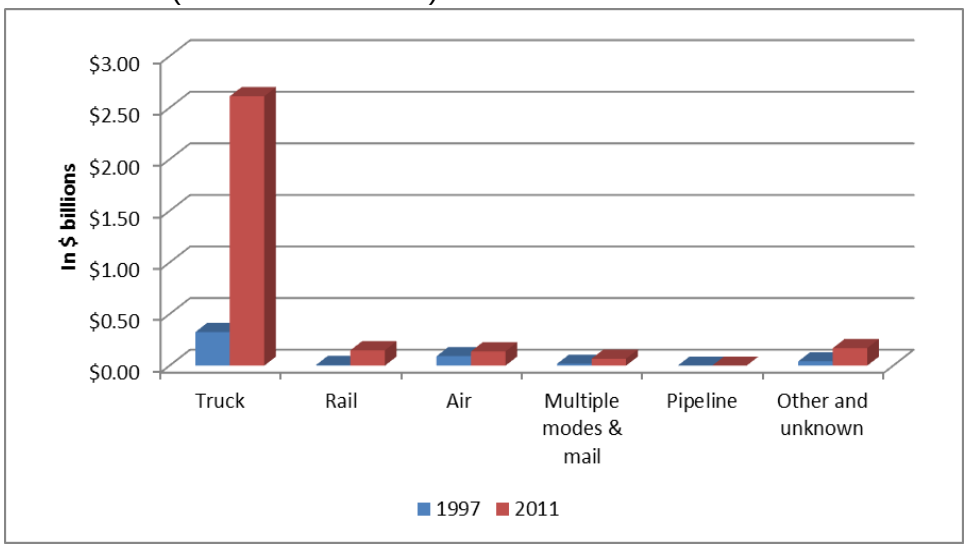
Source: FHWA FAF 1997 and 2011

- ***International Exports and Imports***

International export shipments, representing seven percent of all outbound/export freight movements, increased dramatically between 1997 and 2011 across all modes, especially in the

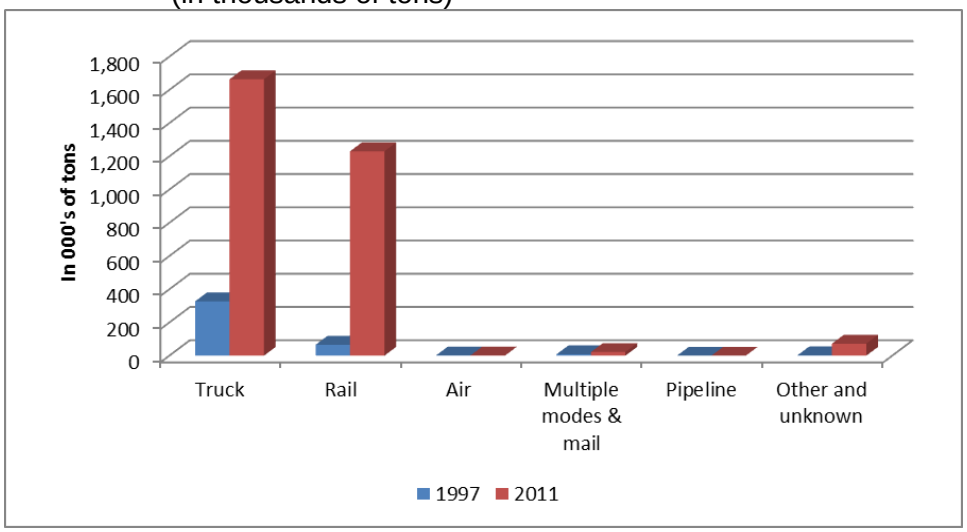
dominant truck mode (Figure 1-7). In contrast, rail shipments measured by tonnage involved nearly 1.2 million tons of freight, representing 41 percent of all shipments compared to truck movements that were responsible for 56 percent of all shipments (Figure 1-8).

Figure 1-7: International Export Flows by Mode
(in billions of dollars)



Source: FHWA FAF 1997 and 2011

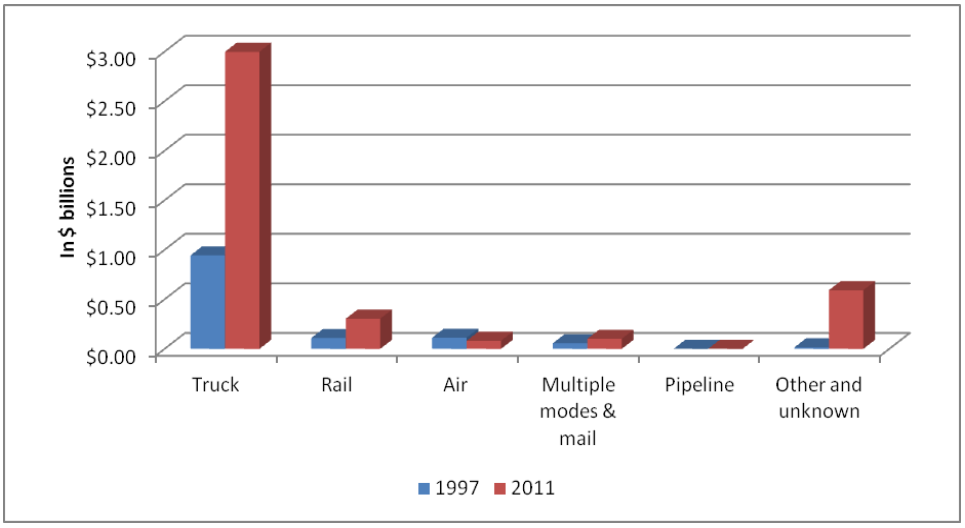
Figure 1-8: International Export Flows by Mode
(in thousands of tons)



Source: FHWA FAF 1997 and 2011

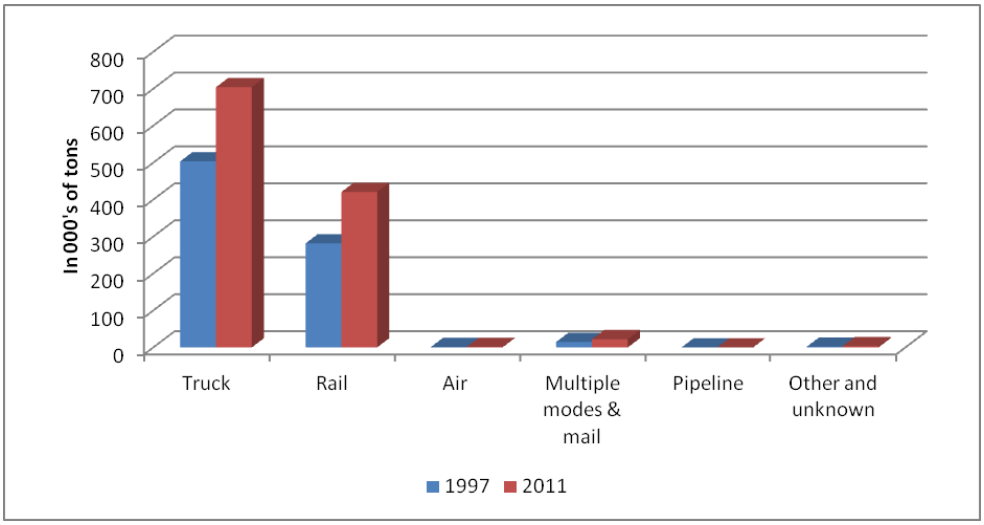
Similarly, international imports (six percent of all inbound shipments) also increased across all modes with truck (a 218-percent increase) leading as the dominant mode, a large increase in other and unknown, and other slight increases across the remaining modes (Figure 1-9). Analyzing mode dependence by tonnage shows the prominence and growth of rail shipments, which are second only to truck (Figure 1-10).

Figure 1-9: International Import Flows by Mode
(in billions of dollars)



Source: FHWA FAF 1997 and 2011

Figure 1-10: International Import Flows by Mode
(in thousands of tons)



Source: FHWA FAF 1997 and 2011

C. Study Approach

The project team reviewed published data to define Nevada's freight conditions so that this freight assessment can provide the framework for developing a Nevada State Freight Plan. This first section of the report (Chapter 1) includes a summary of the findings of the *2000 Study* of goods movement and what has changed since that study. The second section (Chapter 2) outlines Nevada's freight economy, including freight-dependent industries, while the third section (Chapter 3) describes Nevada's existing and proposed freight infrastructure by mode as defined in published reports, the state's transportation flows by mode, and the economic value of the state's trade. Highways, railroads, airports, and pipelines are the four modes that are used to move commodities across Nevada and are addressed in this document.

The project team engaged multiple study participants throughout the state to identify goals, needs, issues, and opportunities to be explored in the new Nevada State Freight Plan. The consultant helped create and engaged a Freight Working Group with broad industry coverage, contacted a number of key participants in one-on-one sessions, contacted Nevada's regional Economic Development Authorities, and posted a page on NDOT's website to solicit input. The fourth section (Chapter 4) of this document identifies the project team and defines the freight needs and issues identified through the public outreach effort. Then, consultant forecast future goods movement in Nevada to create a strategic direction for Nevada, given in the fifth section of this report (Chapter 5). The Jacobs team concludes with implementation recommendations in the sixth section (Chapter 6), including addressing ways to improve existing processes and providing performance indicators.

2. Current Nevada Freight Economy

2: Current Nevada Freight Economy

This chapter assesses Nevada's economy for the purpose of laying the ground work to understand the primary drivers of economic growth and potential risks for the state and to help in formulating a strategy for greater economic prosperity. The recent volatility resulting from the 2008 recession has affected Nevada significantly, underscoring the need for sustainable growth and diversification. The state has commissioned several studies to provide a comprehensive, data-driven analysis of past performance and future projects to address the challenges that Nevada faces. The data in this chapter provides an overview of economic trends by industry and strategic cluster; details on economic flows of supply and demand, with associated job dependence; estimates of dependence on freight transportation; and a clarified understanding of transportation's contribution to Nevada's economy. In summary, this chapter provides an overview of economic trends and the relationship between transportation and Nevada's economy to guide policy and planning discussions. Numbers are rounded and may not sum.

A. Overview of Economy by Industry

1. Employment

Table 2-1 shows the number of jobs in 1992 and every five years thereafter through 2012 for representative industries in the state, the percentage change in employment for the 2007-to-2012 period, and the percentage of the state's employment that each industry employs in each of the five chosen years. Seventy percent of Nevada's economy is concentrated within the first six major industry sectors listed in Table 2-1. Figure 2-1 illustrates employment trends for these six industry sectors, all of which grew between 1992 and 2007. Of the top six, all but the health care & social assistance industry experienced the effects of the 2008 recession, with construction suffering the greatest effects. Construction jobs declined between 2007 and 2012 by 61 percent. Thus, the construction industry, which represented 10 percent of the state's employment in 2007, represented just five percent in 2012. Nevada's total employment increased by 79 percent over the 20-year period between 1992 and 2012, despite the more recent 12 percent decline from 2007 to 2012. In addition to health care and social assistance, transportation and warehousing, management of companies, mining and oil and gas extraction, and educational services grew in the 2007-2012 period, while employment for all other industries declined between four and 22 percent over the more recent five-year period.

2. Gross Domestic Product (GDP)

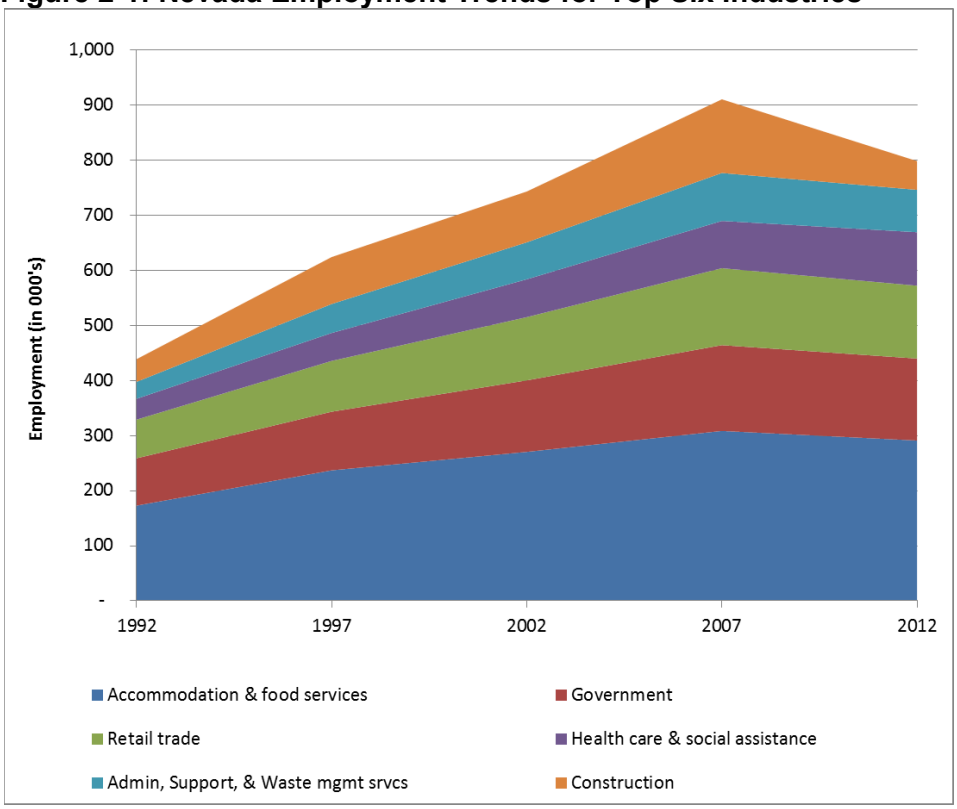
Table 2-2 shows the Gross Domestic Product (GDP) in millions of dollars that the state's representative industries accounted for in 1992 and every five years thereafter through 2012, the percentage change in GDP from 2007 to 2012, and the percentage of the state's GDP that each industry represents in each of the five chosen years. While the 2008 recession severely affected a variety of Nevada industries, some state industries weathered the tough economic conditions and actually grew during this period. On balance, the state's GDP grew by a modest 0.3 percent between 2007 and 2012 as shown in Figure 2-2. The decline in the top nine industries from 1992 to 2012 was offset by resilient growth in finance and insurance, government, retail trade, health care and social assistance, and mining and oil/gas, each of which grew between three and 152 percent.

Table 2-1: Nevada Employment Growth by Industry 1992-2012
(in thousands)

Industry	Employment						Percentage of Total				
	1992	1997	2002	2007	2012	2007-2012 % change	1992	1997	2002	2007	2012
Accommodation and food services	173	237	271	309	291	-6%	27%	27%	26%	24%	25%
Government	86	107	130	156	149	-4%	13%	12%	12%	12%	13%
Retail trade	70	92	115	140	132	-5%	11%	10%	11%	11%	12%
Health care and social assistance	38	51	69	86	97	13%	6%	6%	7%	7%	9%
Admin, support, & waste mgmt. services	31	53	67	87	77	-12%	5%	6%	6%	7%	7%
Construction	41	85	92	134	52	-61%	6%	10%	9%	10%	5%
Transportation and warehousing	20	29	36	49	49	0%	3%	3%	3%	4%	4%
Professional; scientific; & tech. services	26	30	40	55	47	-14%	4%	3%	4%	4%	4%
Manufacturing	26	40	43	50	39	-22%	4%	4%	4%	4%	3%
Other services	17	24	30	37	33	-9%	3%	3%	3%	3%	3%
Wholesale trade	20	30	35	39	33	-17%	3%	3%	3%	3%	3%
Finance and insurance	20	28	34	37	31	-17%	3%	3%	3%	3%	3%
Arts; entertainment; and recreation	21	25	27	31	27	-13%	3%	3%	3%	2%	2%
Real estate & rental and leasing	14	19	21	27	23	-16%	2%	2%	2%	2%	2%
Mgmt of companies	4	6	7	17	20	15%	1%	1%	1%	1%	2%
Mining and oil/gas extraction	12	14	9	12	16	29%	2%	2%	1%	1%	1%
Information	11	14	17	16	12	-20%	2%	2%	2%	1%	1%
Educational services	2	2	4	7	10	37%	0%	0%	0%	1%	1%
Utilities	5	5	5	5	4	-11%	1%	1%	0%	0%	0%
Total	**639**	**891**	**1,052**	**1,293**	**1,143**	**-12%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Moody's

Figure 2-1: Nevada Employment Trends for Top Six Industries



Source: Moody's

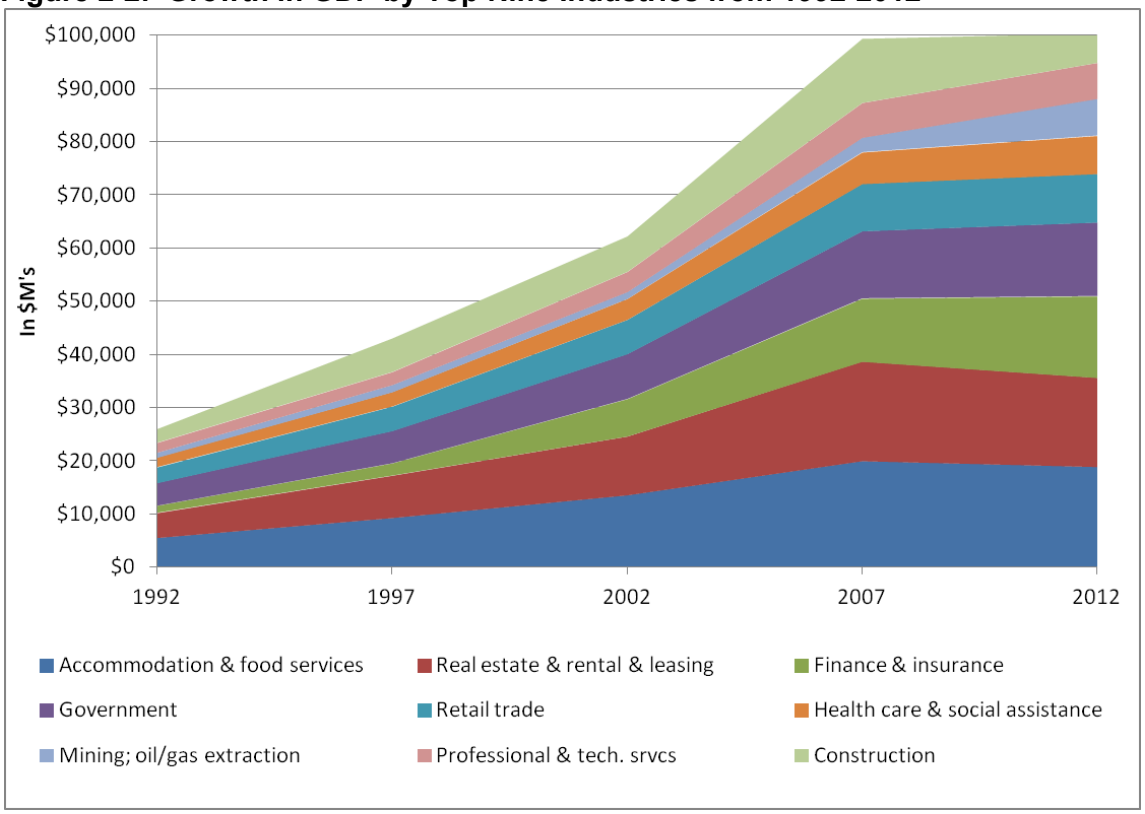
Overall, the top nine industries contributed 75 percent of the state's overall GDP in 2012. Within this group, finance & insurance saw unprecedented growth from representing only four percent of overall state GDP in 1992 to over 12 percent in 2012. Mining and oil/gas extraction also experienced growth since 1992 and now represents five percent of the state's GDP, up from only three percent in 1992; a growth of over 156 percent. Construction contracted significantly with a decline from nine percent of overall GDP in 2007 to only four percent in 2012. Beyond these top industries, all the others either maintained the same share of state GDP or declined slightly from 1992 to 2012.

Table 2-2: Nevada GDP Growth by Industry 1992-2012
(in millions)

Industry	GDP					2007-2012 % change	Percent of Total				
	1992	1997	2002	2007	2012		1992	1997	2002	2007	2012
Accommodation & food srvcs.	$5,552	$9,280	$13,536	$19,919	$18,824	-5%	16%	16%	16%	15%	14%
Real estate & rental & leasing	$4,652	$7,916	$11,002	$18,672	$16,718	-10%	13%	14%	13%	14%	13%
Finance and insurance	$1,293	$2,280	$7,032	$11,886	$15,372	29%	4%	4%	9%	9%	12%
Government	$4,318	$6,106	$8,448	$12,628	$13,835	10%	12%	10%	10%	9%	10%
Retail trade	$2,958	$4,599	$6,471	$8,958	$9,199	3%	8%	8%	8%	7%	7%
Health care and social assistance	$1,830	$2,724	$3,930	$5,947	$7,180	21%	5%	5%	5%	4%	5%
Mining; oil/gas extraction	$984	$1,394	$1,332	$2,748	$6,937	152%	3%	2%	2%	2%	5%
Professional; scientific; tech. services	$1,849	$2,431	$3,806	$6,559	$6,783	3%	5%	4%	5%	5%	5%
Construction	$2,561	$6,299	$6,660	$12,070	$5,533	-54%	7%	11%	8%	9%	4%
Manufacturing	$1,374	$2,272	$3,016	$6,134	$5,504	-10%	4%	4%	4%	5%	4%
Transportation & warehousing	$1,294	$2,191	$2,433	$4,181	$5,456	30%	4%	4%	3%	3%	4%
Wholesale trade	$1,559	$2,747	$3,605	$5,123	$4,804	-6%	4%	5%	4%	4%	4%
Admin; support; waste mgmt. services	$966	$1,830	$2,513	$3,733	$3,667	-2%	3%	3%	3%	3%	3%
Mgmt of companies	$618	$708	$1,086	$3,442	$2,862	-17%	2%	1%	1%	3%	2%
Arts; entertainment; and rec.	$1,221	$1,829	$2,170	$3,343	$2,821	-16%	3%	3%	3%	3%	2%
Other services	$832	$1,339	$1,789	$2,428	$2,525	4%	2%	2%	2%	2%	2%
Information	$799	$1,349	$2,015	$2,564	$2,395	-7%	2%	2%	2%	2%	2%
Utilities	$795	$1,142	$1,565	$2,233	$2,355	5%	2%	2%	2%	2%	2%
Educational services	$45	$88	$178	$378	$518	37%	0.1%	0.2%	0.2%	0.3%	0.4%
Total	**$35,499**	**$58,524**	**$82,587**	**$132,946**	**$133,288**	**0.3%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Moody's

Figure 2-2: Growth in GDP by Top Nine Industries from 1992-2012



Source: Moody's

3. Location Quotients and Job Dependence

Another indicator of an industry's prominence is its Location Quotient (LQ). This metric is a ratio of ratios, which measures the ratios of employment in a given industry employment to total employment, for both the specific locality under examination and for the broader region, and then compares the two ratios. The comparison in this location quotient calculation is between Nevada and the US, based on industry data from the US Department of Commerce Bureau of Economic Analysis (BEA), obtained via IMPLAN.[1]

Table 2-3 shows that the accommodations industry has a LQ of 15.2, indicating that accommodations-industry employment in Nevada compared to the state's overall employment is 15 times greater than employment in the accommodations industry in the US as a whole. Other primary industries, such as food services, amusement/gambling, mining, and sightseeing industries have LQs greater than two, indicating a higher than average concentration of employment in these sectors than in the US as a whole.

A concentration of employment that is higher than national averages indicates that the supply of services for this industry is higher than what is demanded locally (indicated by the column "Supply/Demand ratio"). A ratio greater than 1.0 indicates that the industry supply (e.g.

[1] IMPLAN: IMpact analysis for PLANning. www.implan.com

goods/services) is higher than the demand within Nevada. The next column, labeled "Net Outflow," represents the value of the goods and services sold to non-Nevadan customers, which can occur within or outside the state (e.g., visitors staying in Nevada hotels versus metallic ores delivered outside the state). These net outflows bring dollars into Nevada's economy.

The two columns under the title "Job Dependence" present measures of the job dependence associated with the net outflows of goods and services. The first column indicates the number of estimated jobs per one million dollars of sales. Labor intensive industries, such as food services, administrative support, and clothing generate between 20 and 22 jobs per million dollars of sales. Conversely, mining, quarrying, and support, which relies heavily on machinery and equipment for production, only provides five jobs per million dollars of output. The second column shows the number of jobs associated with these net outflows, according to the ratio of jobs per million dollars of output. The largest of all industries is accommodations, which has net outflow sales of over $14.6 billion and supports 185,000 jobs, representing 35 percent of all jobs dependent on net outflows. Food services and amusement have the next highest number of jobs that are dependent on net exports; each of these industries has nearly 70,000 jobs and represents roughly 13 percent of total outflow-reliant jobs. The top three industries represent over 60 percent of all export-reliant jobs. All industries that provide a net outflow of sales combine to support over half a million jobs in the state.

Other industries that do not produce enough goods or services to meet local demand rely on imports to fulfill the state's consumer demand. These importing industries have a negative outflow/export value. Between all exporting/importing industries, the state has a net negative outflow of $2.8 billion, indicating a higher level of imports than exports of goods and services.

Table 2-3: Location Quotient, Net Outflow, and Job Dependence by Industry
(in millions of dollars)

	Outflow Analysis			Job Dependence		
Industry	**Industry Concen-tration (LQ)**	**Supply/ Demand Ratio**	**Net outflow**	**Jobs per mil. $ Output**	**Jobs Supported by Net Exports**	**% of Total**
Accommodations	15.21	13.42	$14,640	13	185,216	35%
Food services and drinking places	2.00	1.62	$3,449	20	69,093	13%
Amusement, gambling, and rec.	5.48	4.38	$3,733	18	68,414	13%
Mining, quarrying, and support	5.08	5.45	$6,556	5	29,482	6%
Scenic & sightseeing trans. support	5.67	5.28	$1,780	14	25,653	5%
Mgmt. of companies	1.41	2.08	$2,255	11	24,780	5%
Funds, trusts, financial vehicles	2.60	2.27	$1,711	14	24,621	5%
Administrative and support services	1.34	1.16	$807	22	17,731	3%
Transit and ground transportation	4.03	3.61	$1,020	15	15,557	3%
Clothing and accessories	2.03	1.76	$647	20	12,710	2%
Rest of others			-$39,474		59,378	11%
Total			**-$2,877**		**532,634**	**100%**

Source: US Dept. of Commerce, BEA via IMPLAN

4. Key Industry Clusters

The Nevada Legislature passed an Economic Development bill (AB 449) in 2011 to identify and prioritize the state's economic development activities by using data and performance analysis. Nevada engaged the Metropolitan Policy Program at Brookings, Brookings Mountain West, and SRI International as a part of this strategic effort to provide analytic and policy background for the state's planning efforts. This study team produced *Unify / Regionalize / Diversify: An Economic Development Agenda for Nevada* to detail current economic conditions and potential opportunities for greater diversification. The study team identified industry clusters that have the highest potential to restore growth and jobs, elicit innovation in strategic or emerging sectors, or drive diversification. These industries are listed in Table 2-4.

Table 2-4: Employment in Key Industry Clusters for Growth and Diversification 2002-2012

Industry Cluster	County	2002 Jobs	2012 Jobs	% of Industry Total (2012)	% Growth	% of Industry Clusters (2012)
Tourism, gaming, and entertainment	Clark	232,010	262,230	82%	13%	62%
	Washoe	39,880	33,820	11%	-15%	
Health and medical services	Clark	44,960	67,620	70%	50%	19%
	Washoe	16,920	19,940	21%	18%	
	Carson City	2,450	3,820	4%	56%	
Logistics and operations	Clark	25,130	33,550	69%	34%	9%
	Washoe	9,690	11,700	24%	21%	
Manufacturing	Clark	21,160	20,130	51%	-5%	9%
	Washoe	13,290	10,700	27%	-19%	
	Carson City	3,360	2,640	7%	-21%	
Mining and natural resources	Eureka	2,700	4,190	26%	55%	
	Elko	1,240	2,860	18%	131%	
	Humboldt	1,260	2,150	13%	71%	
	Lander	560	1,880	12%	236%	
Clean energy	Clark	2,710	2,060	63%	-24%	1%
	Nye	250	280	9%	12%	
	Humboldt	140	240	7%	71%	
Business IT ecosystems	Clark	340	770	74%	126%	<1%
	Washoe	80	90	9%	13%	
	Churchill	40	60	6%	50%	
Aerospace and defense	Carson City	560	500	81%	-11%	<1%
	Clark	70	60	10%	-14%	
	Lyon	120	40	6%	-67%	
Industry Cluster Total		**418,920**	**481,330**	**42%**	**15%**	**100.0%**
Nevada Total		**1,052,080**	**1,142,570**			

Source: US Dept. of Commerce, BEA via IMPLAN & Unify, Regionalize, and Diversity- SRI & Brookings 2011

The top four cluster industries are located primarily in Clark, Washoe, and Carson City counties and represent 99 percent of all the jobs in industry clusters. The tourism, gaming, and entertainment industry is one of Nevada's pillars of economic activity and employed over

262,230 workers in 2012, representing 62 percent of all key industry cluster jobs. Supporting this industry has strategic importance because of its dominance and contribution to the state. Eighty-two percent of employees in this industry work in Clark County, which has grown by 13 percent since 2002. Health and medical services is also a significant contributor to jobs in Nevada and represents 19 percent of the industry cluster jobs. This industry has seen double digit growth since 2002, even during the recession of 2008. Clark County employs 70 percent of all employees in this industry cluster, followed by Washoe County (21 percent) and Carson City County (four percent). The logistics and operations industry has also experienced growth as high as 34 percent since 2002 and employs over 33,500 workers in Clark County, representing nine percent of all strategic industry cluster jobs.

Manufacturing has experienced a decline in employment since 2002 between five and 21 percent across Clark, Washoe, and Carson City counties. This cluster combined with mining and natural resources equates to nine percent of all cluster jobs. Mining and natural resources, however, is diversified across several counties, such as Eureka, Elko, Humboldt, and Lander, each representing between 26 and 13 percent of employment for this industry. Growth has been significant, ranging from 55 to 236 percent among the counties since 2002.

Another nascent industry that is part of Nevada's diversification strategy is clean energy.[2] Nevada has strategic resources to develop this renewable resource, based on its geothermal expertise, proximity to large energy markets, and capabilities in construction and project management. Opportunities identified include renewable component manufacturing, export of electricity, geothermal development, and energy efficiency.

Business IT Ecosystems is another area of strategic importance and diversification and has potential to capitalize on current services, such as call centers, customer and back office services, e-commerce operations, data centers, cloud computing, and high performance computing.

Aerospace and defense is another strategic industry cluster with anticipated opportunities for growth, based on testing and training infrastructure, unique geographic characteristics, and low population density. These characteristics enable Nevada to be a contender to attract growth in unmanned aerial vehicle (UAV) supply, assembly, and testing and in maintenance, repair, and overhaul (MRO) of aircraft systems.

5. Economic Flows: Commodity Supply and Demand

Economic flows represent the value of goods and services that are brought into or shipped out of the state. Reviewing the flows of economic activity by industry helps define industries that are key to Nevada's success, indicates the relative reliance on imports/exports, and sets the stage for establishing the link between economic flows and reliance on transportation.

Table 2-5 shows the commodity supply and demand for Nevada's top net export and import industries. The four commodity supply columns provide: 1) the value of goods and services

[2] Proxy measurement used for industry electric power generation, transmission, and distribution: NAICS 2211

Table 2-5: Commodity Supply and Demand for Nevada's Top Net Export and Import Industries
(in millions of dollars)

Industry	Commodity Supply				Commodity Demand				Net Production (Supply-Demand)
	Self-Supply (Consumed Locally)	Shipped to Rest of US	Int'l Exports	Total Supply	Self-Supply (Produced Locally)	Produced in Rest of US	Int'l Imports	Total Demand	
Net Exports									
Accommodations	$243	$15,577	$0	$15,819	$243	$936	$0	$1,179	$14,640
Mining, quarrying, and support	$1,093	$5,918	$1,019	$8,030	$1,093	$228	$153	$1,474	$6,556
Amusement, gambling, and rec.	$1,043	$3,794	$0	$4,837	$1,043	$62	$0	$1,105	$3,733
Food services & drinking places	$5,502	$3,491	$13	$9,006	$5,502	$55	$0	$5,558	$3,449
Management of companies	$1,990	$1,639	$714	$4,343	$1,990	$98	$0	$2,089	$2,255
Scenic/sightseeing transportation support	$409	$1,239	$548	$2,196	$409	$7	$0	$416	$1,780
Funds, trusts, financial vehicles	$1,157	$1,898	$0	$3,055	$1,157	$187	$0	$1,344	$1,711
Real estate	$17,855	$2,488	$14	$20,357	$17,855	$819	$0	$18,674	$1,682
Transit & ground transportation	$385	$1,025	$0	$1,411	$385	$5	$0	$391	$1,020
Air transportation	$899	$773	$521	$2,193	$899	$45	$349	$1,293	$900
Rest of others	$22,307	$6,767	$1,839	$30,913	$22,307	$3,165	$563	$26,036	$4,877
Net Imports									
Petroleum & coal manufacturing	$342	$337	$61	$740	$342	$4,719	$616	$5,676	-$4,937
Chemical manufacturing	$160	$1,030	$225	$1,415	$160	$3,720	$1,028	$4,907	-$3,493
Prof., scientific, & tech services	$9,854	$799	$245	$10,898	$9,854	$4,203	$294	$14,351	-$3,452
Food manufacturing	$706	$1,174	$108	$1,988	$706	$4,302	$361	$5,368	-$3,380
Transportation equipment mfg.	$87	$514	$141	$742	$87	$2,573	$1,277	$3,937	-$3,194
Insurance carriers	$2,454	$220	$52	$2,727	$2,454	$2,533	$763	$5,750	-$3,023
Computer and electronic mfg.	$46	$749	$208	$1,002	$46	$2,254	$861	$3,161	-$2,159
Hospitals	$4,987	$0	$1	$4,989	$4,987	$1,789	$4	$6,781	-$1,792
Beverage and tobacco mfg.	$211	$15	$3	$229	$211	$1,286	$150	$1,647	-$1,418
Telecommunications	$2,751	$1	$50	$2,802	$2,751	$1,438	$0	$4,190	-$1,388
Rest of others	$56,377	$8,947	$2,240	$67,565	$56,377	$22,903	$5,528	$84,808	-$17,244
Total	**$130,859**	**$58,396**	**$8,002**	**$197,257**	**$130,859**	**$57,328**	**$11,947**	**$200,134**	**-$2,877**

Source: US Dept. of Commerce, BEA via IMPLAN

(for sales) that are supplied to meet demand within Nevada; 2) exports supplied to customers within the rest of the US; 3) international exports; and 4) the sum of all supplies made to all geographical categories combined. The four commodity demand columns follow the same spatial categorization (i.e., Nevada, US, international, and total). The table's final net production column gives the net balance between supply and demand to indicate if the industry is a net exporter or importer of goods or services.

Major exporting industries are considered to be "pillars" of the economy. Industries that produce more goods than are consumed locally are able to export these products to other states within the US and bring dollars back into Nevada, thereby creating economic growth. Tourism (hotels, gambling, amusement, restaurants, and recreation), mining and quarrying, and management of companies have historically been "pillars" of Nevada's economy; most have experienced a decline in employment and GDP since 2007.

Industries that rely on imports for their operations or production to meet demand in Nevada include petroleum and chemical manufacturing, professional services, and food manufacturing, as well as other manufacturing industries that rely on transportation to deliver their goods.

B. Freight Dependence

The ability of goods and services to flow between industries and customers is the foundation of a functioning economy. Those industries that produce physical (durable and non-durable) goods are particularly reliant on different modes of transportation and select from among those modes, according to the tradeoffs between timeliness, efficiency, safety, and cost. Freight delivery is essential to enable input commodities to reach production locations, deliver intermediate goods, and also to deliver finished products to customers. Industry output in this context can be considered to be "dependent on freight," since transportation is used to move products between buyers and suppliers. The scale of freight dependence is discussed in the following text by quantifying the amount of industry output that is reliant on freight transportation for the various modes.

"Dependence" in the context of this discussion refers to current relationships between industry production and commodity flows, and is not a causal link between commodity or modal usage and production levels. For example, if 30 percent of an industry's output is carried by rail, we say that this percent is "dependent" on rail, but it does not imply that eliminating rail service would result in a 30 percent decline in the industry. In reality, modal utilization is an ever-changing balance of price, speed, flexibility, and reliability; and firms have a number of options at their disposal when faced with disruptions. The same is typically true with commodities (as inputs to production) and trading partners (as suppliers and customers). Firms typically have some flexibility to adjust production given disruptions in commodity supply and demand. Thus, not all of the "dependent" activity would be eliminated. Nevertheless, freight dependence, as defined above, provides an excellent way to understand the structure of an economy and some of its underlying sensitivities.

Data from the US Commerce Department, Bureau of Economic Analysis, outlining buyer and supplier relationships, and commodity flow data from FAF were used to establish the link between industries and commodity flows. STB Waybill data was used in place of FAF data to

provide more accurate commodity composition for rail and multiple-mode shipments. For imports, the ratio of how much a commodity is transported by a particular mode compared to all modes is scaled in relation to the fraction an input commodity represents compared with the overall final industry output. For example, if 50 percent of all inbound wood were transported via rail, and if wood represented 30 percent of all inputs for residential construction, then 15 percent of all residential construction would be considered dependent on rail-transported wood. The relationship is similar for exports; the ratio of modal reliance compared to all modes is scaled to the relationship between industries and the commodities they produce. For example, if 70 percent of all clothing was transported via truck transportation and 100 percent of all clothing was produced by the apparel and accessory manufacturing industry, then 70 percent of all apparel and accessory production would be considered dependent on truck transportation.

Certain industries structure their supply chains in some cases to gather inputs from outside the state of Nevada and then export their final goods for sale outside the state. These cases may yield a degree of double counting, when considering the industry dependence on transportation for both inputs and outputs, since the inputs are considered to be a part of finished products yet the relationship to industry output is calculated separately. However, despite the risk that some industries' production may be considered dependent on both inbound and outbound commodities, identifying the relationships between modes and industries still provides important insights into the transportation underpinnings of the economy.

1. Industry Dependence on Inbound Freight

Inbound freight enables raw materials and intermediate goods to be brought into the state for use in a production process or in providing services. The link between the reliance of sales on inbound commodities indicates the economic scale of modal dependence. The following text reviews the industry dependence for inbound shipments by truck, rail, multiple modes (truck-rail), and air.

Mining, construction, food services, accommodations, and food manufacturing are particularly reliant on inbound materials shipped via truck; they provide between $783 million and $2.7 billion worth of sales, as shown in Table 2-6. The table gives the value added and the income associated with this output, as well as the percentage of output that is reliant on a particular mode of transportation (e.g., truck in Table 2-6) compared to all modes. Sales for industries that are reliant on truck transportation represent 53 to 92 percent of modal dependent sales. Overall, industries that are dependent on inbound transported freight rely on truck transportation for an estimated 73 percent of their total output.

Over $2.2 billion of industry sales are dependent on freight transported by rail into the state. The utilities industry has the highest reliance across all modes with 27 percent of output relying on rail, as given in Table 2-7. The mining, quarrying, and support industry has an 18 percent reliance on rail compared to other modes. Other manufacturing industries, such as primary metals, miscellaneous manufacturing, plastics and rubber, and chemicals also rely on rail transportation to gain access to needed materials for the production of their finished goods. An estimated nine percent of total industry output that is dependent on inbound transported freight relies on rail.

Table 2-6: Industry Dependence on Inbound Freight Transported by Truck
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Truck
Mining, quarrying, and support*	$2,731	$1,979	$478	78%
Construction and buildings	$1,979	$1,150	$1,010	72%
Food services and drinking places	$1,869	$1,142	$869	87%
Accommodations*	$996	$619	$351	70%
Food manufacturing	$783	$123	$69	92%
Miscellaneous manufacturing	$593	$335	$261	82%
Ambulatory health care services*	$578	$397	$356	82%
Utilities	$572	$271	$79	62%
Administrative and support services	$441	$265	$199	53%
Professional, scientific, & tech srvcs.	$438	$294	$224	71%
Rest of others	$7,616	$3,447	$2,369	
Total	**$18,596**	**$10,022**	**$6,265**	**73%**

Source: FHWA FAF and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
* This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

Table 2-7: Industry Dependence on Inbound Freight Transported by Rail
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Rail
Mining, quarrying, & support*	$631	$462	$109	18%
Utilities	$248	$151	$37	27%
Construction and buildings	$104	$61	$53	4%
Primary metal manufacturing	$97	$17	$7	19%
Miscellaneous manufacturing	$85	$48	$38	12%
Plastics and rubber products mfg	$83	$23	$13	16%
Food services and drinking places	$74	$45	$34	3%
Chemical manufacturing	$63	$15	$9	13%
Real estate	$50	$33	$2	19%
Personal services	$49	$30	$17	3%
Rest of others	$694	$307	$230	
Total	**$2,179**	**$1,192**	**$549**	**9%**

Source: FHWA FAF, STB Waybill data, and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
*This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

An estimated $1.04 billion of industry sales are dependent on freight transported into the state by multiple modes (e.g., rail and truck). Several service-oriented industries that are typically thought to be dependent on only truck modes actually rely on the rail-truck shipments to receive needed supplies. Service industries, such as accommodations, professional services, administrative, repair and maintenance, food services, as well as transit and ground transportation use rail-truck shipments to receive needed supplies (Table 2-8). An estimated four percent of industry output that is dependent on inbound transported freight relies on multiple modes.

Table 2-8: Industry Dependence on Inbound Freight Transported by Multiple Modes (Rail-Truck) (in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	% Reliance on Multiple Modes
Accommodations*	$103	$64	$37	7%
Professional, scientific, and tech srvcs.	$70	$50	$34	11%
Mixed freight and n.e.c.	$65	$46	$26	28%
Food services and drinking places	$57	$35	$27	3%
Construction and buildings	$57	$33	$29	2%
Administrative and support services	$48	$31	$21	6%
Repair and maintenance	$39	$25	$21	11%
Computer and electronic mfg.	$37	$6	$5	11%
Transit and ground transportation	$29	$10	$20	7%
Transportation equipment mfg.	$27	$14	$11	10%
Rest of others	$516	$281	$192	
Total	**$1,047**	**$596**	**$423**	**4%**

Source: FHWA FAF, STB Waybill data, and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
* This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

Over $357 million of industry sales are dependent on freight transported by air (which includes the truck portion of the trip) into the state. Scenic and sightseeing transportation has the highest reliance across all modes with eight percent of output dependent on this mode (Table 2-9).

Table 2-9: Industry Dependence on Inbound Freight Transported by Air
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Air
Construction and buildings	$39	$23	$20	1%
Food services and drinking places	$32	$20	$15	2%
Ambulatory health care services*	$28	$19	$18	4%
Scenic and sightseeing transp. support	$20	$15	$15	8%
Transportation equipment mfg.	$18	$5	$3	7%
Hospitals *	$15	$9	$8	3%
Accommodations*	$14	$8	$5	1%
Professional, scientific, and tech srvcs.	$13	$9	$7	2%
Miscellaneous manufacturing	$12	$7	$5	2%
Air transportation	$12	$6	$3	2%
Rest of others	$155	$80	$46	
Total	**$357**	**$199**	**$145**	**1%**

Source: FHWA FAF and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
* This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

Other industries include food and drinking places, health care, hospitals, and professional services, as well as construction and transportation equipment manufacturing industries, which are reliant on air transportation to provide their services or meet production requirements. An estimated one percent of industries that are dependent on inbound transported freight rely on air.

2. Industry Dependence on Outbound Freight

Outbound freight enables intermediate or final goods to be delivered to customers outside the state for their use or consumption. The scale of commodity sales in relation to the choice of mode indicates the relative importance modal selection has on a particular industry. The following text reviews the industry dependence for outbound shipments by truck, rail, multiple modes (truck-rail), and air.

Table 2-10 shows $6.5 billion of mining, quarrying, and support sales are associated with trucks transporting this industry's commodities, which represents 99 percent of output compared to reliance on other modes. Other manufacturing industries, such as food, plastics and rubber, metals, chemicals, and computer/electronics rely on truck transportation to deliver their products to market. Truck transportation-related output ranges from 36 to 100 percent of output transported by all modes for these top 10 industries. Nevada's economy had over $184 billion in sales in 2011, and the truck-dependent portion comprises seven percent of that activity with over $12.5 billion worth of sales.

Table 2-10: Industry Dependence on Outbound Freight Transported by Truck
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Truck
Mining, quarrying, and support*	$6,505	$4,811	$1,124	100%
Miscellaneous manufacturing	$736	$416	$322	93%
Food manufacturing	$725	$115	$61	88%
Plastics and rubber products mfg.	$521	$144	$81	85%
Oil and gas extraction	$517	$19	$6	100%
Primary metal manufacturing	$504	$94	$44	98%
Chemical manufacturing	$495	$116	$66	78%
Mixed freight and n.e.c.	$344	$246	$140	36%
Computer and electronic mfg.	$309	$71	$55	87%
Fabricated metal manufacturing	$295	$93	$65	87%
Rest of others	$1,553	$488	$301	
Total	**$12,503**	**$6,613**	**$2,265**	**90%**

Source: FHWA FAF and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
* This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

Over $273 million of industry sales are dependent on rail-transported freight from Nevada. Waste management and remediation services at 80 percent of its output shipments (Table 2-11) has the highest rail reliance, whereas the mining, quarrying, and support industry as well as the fabricated metal manufacturing industry each have only a less-than one-percent reliance on rail. Chemical manufacturing accounts for a large amount of its sales transported by rail ($118 million and 19 percent of its output shipments) compared to other modes. Other industries that use rail to delivery their products are focused on lower value commodities, such as nonmetal minerals, plastics, and wood products. An estimated two percent of total output for rail-dependent industries' exports relies on rail.

Table 2-11: Industry Dependence on Outbound Freight Transported by Rail
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Rail
Chemical manufacturing	$118	$46	$30	19%
Transportation equipment mfg.	$71	$10	$6	22%
Nonmetal mineral product mfg.*	$34	$10	$7	26%
Mining, quarrying, and support*	$25	$14	$7	<1%
Plastics and rubber products mfg.	$4	$1	$1	1%
Petroleum and coal products mfg.	$4	$1	$0	2%
Waste management services	$3	$2	$1	80%
Wood product manufacturing	$2	$1	$1	5%
Paper manufacturing	$2	$1	$0	1%
Fabricated metal manufacturing	$1	$0	$0	<1%
Rest of others	$8	$3	$2	
Total	**$273**	**$89**	**$55**	**2%**

Source: FHWA FAF STB Waybill data, and US Dept. of Commerce Bureau of Economic Analysis via TREDIS
* This industry (or a portion of the industry) is part of Nevada's key cluster industry initiative.

An estimated $863 million of industry sales is dependent on multiple modes (e.g. rail-truck) from the state. Wholesale trade has the highest reliance on rail-truck with 61 percent of all output dependent on this mode compared to all others (Table 2-12). Other manufacturing industries, such as food, plastics and rubber, fabricated metals, computer and electronics, animal, beverage and tobacco, machinery, and chemicals are dependent on rail-truck shipments to reach their customers. Overall, an estimated six percent of total output for all industries that are dependent on outbound-transported freight relies on rail-truck.

A value of $122 million of industry sales is dependent on freight transported via air out of the state. Transportation equipment manufacturing relies on air transportation for six percent of its overall output, compared to other modal use (Table 2-13). Air dependence is highly concentrated in three major industries: miscellaneous, computer and electronic, and transportation equipment manufacturing, which are typically associated with higher-valued, time-sensitive products. These three industries represent 61 percent of total output transported via air. Overall, an estimated one percent of total output for all industries dependent on air outbound freight relies on air.

Table 2-12: Industry Dependence on Outbound Freight Transported by Multiple Modes (Rail-Truck) (in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	% reliance on Multiple Modes
Mixed freight and n.e.c.	$576	$410	$232	61%
Food manufacturing	$88	$12	$7	11%
Plastics and rubber products mfg.	$79	$22	$13	13%
Fabricated metal manufacturing	$23	$7	$5	7%
Computer and electronic mfg..	$19	$3	$2	5%
Miscellaneous manufacturing	$15	$8	$6	2%

Industry Description	Output (Sales)	Value Added	Wage (Income)	% reliance on Multiple Modes
Animal production	$15	$5	$1	15%
Beverage & tobacco products mfg.	$11	$1	$1	13%
Machinery manufacturing	$9	$3	$2	10%
Chemical manufacturing	$9	$1	$1	1%
Rest of others	$21	$6	$4	
Total	**$863**	**$479**	**$273**	**6%**

Source: FHWA FAF and US Dept. of Commerce Bureau of Economic Analysis via TREDIS

Table 2-13: Industry Dependence on Outbound Freight Transported by Air
(in millions of dollars)

Industry Description	Output (Sales)	Value Added	Wage (Income)	Percent Reliance on Air
Miscellaneous manufacturing	$34	$20	$15	3%
Computer and electronic mfg.	$22	$4	$3	3%
Transportation equipment mfg.	$19	$3	$2	6%
Chemical manufacturing	$7	$2	$1	1%
Plastics and rubber products mfg.	$7	$2	$1	1%
Mixed freight and n.e.c.	$6	$4	$2	2%
Electrical equip. & appliance mfg.	$6	$2	$2	5%
Primary metal manufacturing	$4	$1	<$1	1%
Printing & related support activities	$4	$1	$1	2%
Fabricated metal manufacturing	$3	$1	$1	1%
Rest of others	$11	$4	$2	
Total	**$122**	**$42**	**$31**	**1%**

Source: FHWA FAF and US Dept. of Commerce Bureau of Economic Analysis via TREDIS

C. Transportation's Contribution to Nevada's Economy

Estimating the percentage of total output that industries spend on transportation and combining that with the output of all transportation industries within the state is a way that is used to measure the value of the state's transportation. For example, if $50,000 is spent on truck transportation to ship $1 million worth of metallic ore to customers, then transportation contributed five percent to the total output of the mining industry. Nevada's industries spent a total of over $1.3 billion to deliver products to customers, although this total may include transportation services provided from both inside and outside the state.

Customers both within and outside the state spent over $5.2 billion on Nevada transportation industries in 2011. Air, ground, and truck transportation together account for over 91 percent of the total spent, with the remaining allocated to rail and pipeline companies in Nevada. The amount industries spent on transportation (their contribution) combined with the output of all transportation industries in Nevada equals over $6.5 million spent on transportation. Dividing what is spent on transportation by the state's total output shows that Nevada's spending on transportation amounts to 3.6 percent of the state's economy, as given in Table 2-14.

Table 2-14: Industry Spending on Transportation by Mode
(in millions of dollars)

Industry Contribution by Mode		Transportation Industries	
Transport by truck	$727	Air transportation	$2,029
Transport by air	$200	Transit & ground transportation	$1,402
Transport by rail	$174	Truck transportation	$1,399
Transit & ground passenger transp.	$94	Rail transportation	$249
Transport by pipeline	$71	Pipeline transportation	$206
Transport by water	$10		
Total	**$1,275**	**Total**	**$5,285**
Industry Contribution by Mode + Transportation Industries			**$6,560**
Nevada State Output			**$184,158**
Percent of Economy Spent on Transportation			**3.6%**

Source: US Dept. of Commerce Bureau of Economic Analysis via IMPLAN 2011

Table 2-15 shows the amount invested in transportation and the percent of total output by industry. Nonmetallic mineral manufacturing spent the highest percentage of output on transportation with 10 percent, followed by utilities (four percent), food products (three percent), data processing and hosting (one percent), and construction (one percent). Overall, Nevada's industries spend 0.7 percent of output on transportation services.

Table 2-15: Industry Contribution to Transportation
(in millions of dollars)

Industry	Transportation Spending	Industry Output	% Spent on Transportation
Nonmetallic mineral manufacturing	$71	$749	10%
Utilities	$135	$3,822	4%
Food products	$58	$1,987	3%
Data processing & hosting	$3	$260	1%
Construction of buildings	$88	$8,667	1%
Amusement, gambling, & recreation	$36	$4,787	±1%
Oil and gas extraction	$4	$576	±1%
Mining (except oil and gas)	$51	$7,227	±1%
Food services & drinking places	$62	$8,984	±1%
Health care & social services	$47	$11,048	<1%
Accommodations	$60	$16,954	<1%
Rest of others	$661	$112,726	±1%
Total	**$1,275**	**$177,787**	**0.7%**

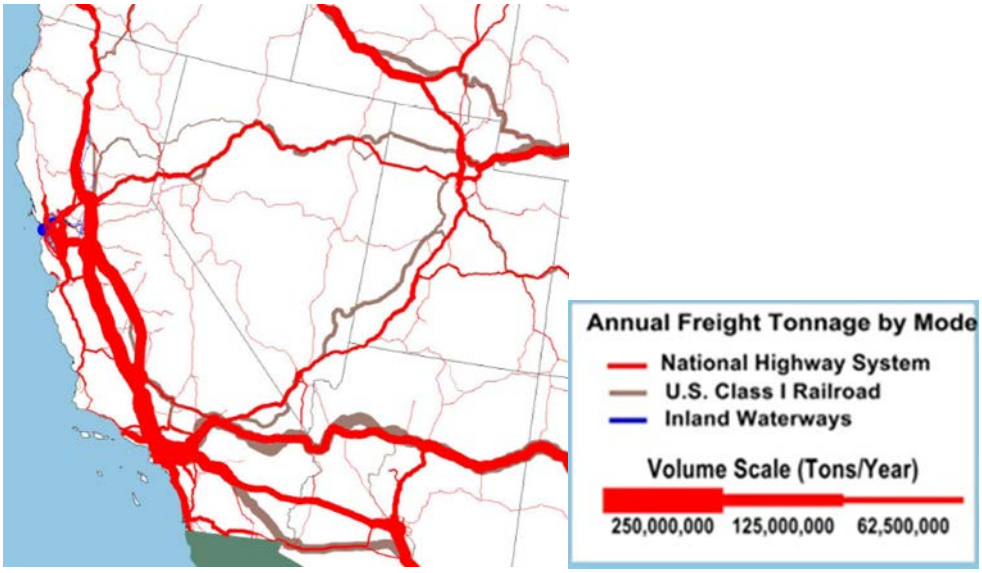
Source: US Dept. of Commerce Bureau of Economic Analysis via IMPLAN 2011

3. Inventory of Freight Infrastructure

3: Inventory of Freight Infrastructure

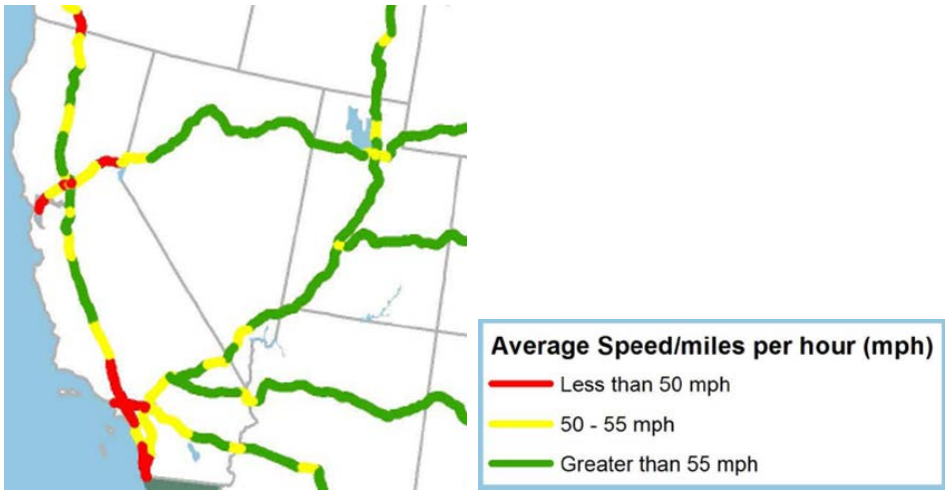
This chapter presents a summary inventory of Nevada's freight infrastructure and a description of transportation flows by mode including information on the economic value of trade. Nevada's primary transportation corridors are located in the northern and southern parts of the state and serve as vital links to interconnect different transportation systems. Figure 3-1 highlights the volume of highway and rail traffic in these two primary corridors in relation to other network connections in the Southwest. These links connect the Nevada economy to other states and to North American and global trade.

Figure 3-1: Tonnage on Highways, Railroads, and Inland Waterways: 2007



Sources: Highways: US DOT, FHWA, FAF, Version 3.4, 2012. Rail: Based on Surface Transportation Board, Annual Carload Waybill Sample and Oak Ridge National Laboratory freight flow assignments.

Figure 3-2: Intensity of Truck Freight Congestion on Selected Interstate Highways: 2011



Source: US DOT, FHWA, Office of Freight Management and Operations, Freight Performance Measurement Program, 2012.

Nevada's interstate highways, I-80 & I-15, are important corridors for both outbound/exports and inbound/imports to the state, as well as for connecting shipments passing through the state to their final destination. These routes are relatively uncongested in Nevada with the exception of short stretches in the Las Vegas and Reno areas as indicated in Figure 3-2. This is a positive sign that existing capacity may be able to absorb some of the state's expected future growth as Nevada's economy expands and produces and purchases more goods.

Nevada truck shipments are important nationally because the state is one of the few in the country that permits operating longer combination vehicles and triple trailers, as well carrying up to 129,000 pounds with an annual permit. These operating conditions help reduce congestion because they reduce the number of trucks on the road, decreasing the potential for accidents. The longer combination vehicles are important for moving Nevada's unprocessed ore, and the triple trailers are used for moving hay. UPS, FedEx, and other terminal operations in Nevada take conventional shipments from California and place them on longer combination vehicles heading east, yielding efficiencies and operational flexibility, as well as create jobs and economic activity for Nevada's logistics, transportation, and warehousing sectors.

A. Infrastructure

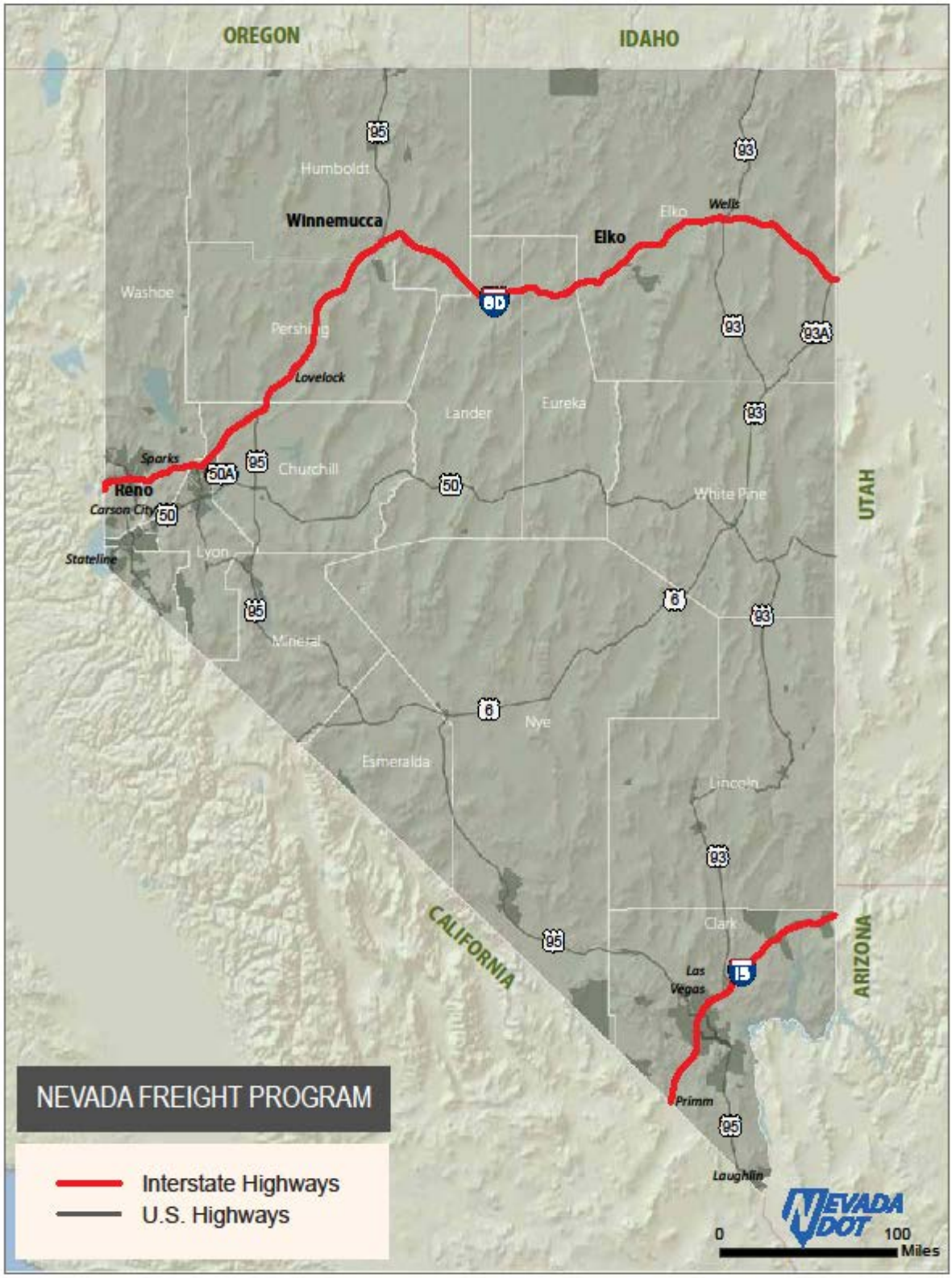
1. Nevada Highway Infrastructure

Figure 3-3 shows the locations of the primary interstate and US highways in Nevada. I-80 and I-15, which run generally east-west 411 miles across northern and 124 miles across southern Nevada, respectively, are Nevada's primary through trucking routes. The larger communities in the state include supplemental interstate routes, such as I-580 in the Reno-Carson City area and I-215 and I-515 in the Las Vegas area. Key US routes, which are primarily two-lane undivided routes extending through often mountainous terrain, include north-south US93 on the eastern side of the state and US95 on the western side of the state, plus east-west US50 across the middle of the state. Numerous, generally-two-lane-wide state routes and local streets feed the interstate and US routes.

NDOT has begun an *I-80 Corridor System Master Plan* and completed one for I-15, to address the future of these key interstates. In addition, NDOT is pursuing a multi-state long-range study of a multimodal I-11 Intermountain West Corridor, a north-south corridor through the states of Nevada and Arizona.

The *I-80 Corridor System Master Plan* study began in January 2013 to address the six HUD, DOT, and EPA livability guiding principles in communities along I-80 in Wyoming, Utah, Nevada, and California. The Freight and Logistics Working Group for this I-80 study has identified a number of items for further study, including: freight performance measures; freight data—types and relevancy; truck bypass/designated lanes for urban areas; over-dimensional permit conformity among states and ease of credentialing; intermodal connectivity; and industry impacts from distance-based tax equity and innovation proposals. Additionally, a bypass has been proposed around downtown Reno in the February 2013 *Western I-80 Corridor Socio-Economic and Economic Development Assessment* (p. 4-55).

Figure 3-3: Nevada Highway Infrastructure



The US DOT designated I-15 in 2007 as one of six Corridors of the Future because of its regional significance for transportation of goods and people. I-15's 10 lanes in Las Vegas had a daily capacity of 220,000 vehicles per day in 2010; handled 257,000 vehicles per day north and south of Desert Inn in 2010, according to NDOT traffic counts; and is projected to approach 300,000 in a decade. The Texas A&M Transportation Institute's 2012 *Urban Mobility Report* notes that Las Vegas had 1,806,000 hours of truck delay with an associated value of $137 million. The I-15 route, which handles CANAMEX corridor truck traffic, will need capacity enhancements. The I-15 Mobility Alliance partners have identified a broad framework approach for improving this interstate route to address a multimodal response through Utah, Nevada, Arizona, and California. A 2011 University of Nevada, Las Vegas study recommended building a bypass around the east side of downtown Las Vegas as the most favorable way to alleviate the capacity issue in this corridor.

The I-11 and Intermountain West Corridor Study is a joint two-year project of the Arizona and Nevada DOTs to study a new high-capacity transportation link between Phoenix and Las Vegas, designated as I-11 in MAP-21; the study will also include a high-level visioning for potentially extending the corridor north to Canada and south to Mexico. A series of focus group meetings were held in January and February 2013 with technical experts and interested professionals, followed by additional meetings. A Corridor Justification Repot addressing freight flows has been completed along with a Level 1 Evaluation, which reduced the number of alternatives. The study is expected to be completed in mid-2014.

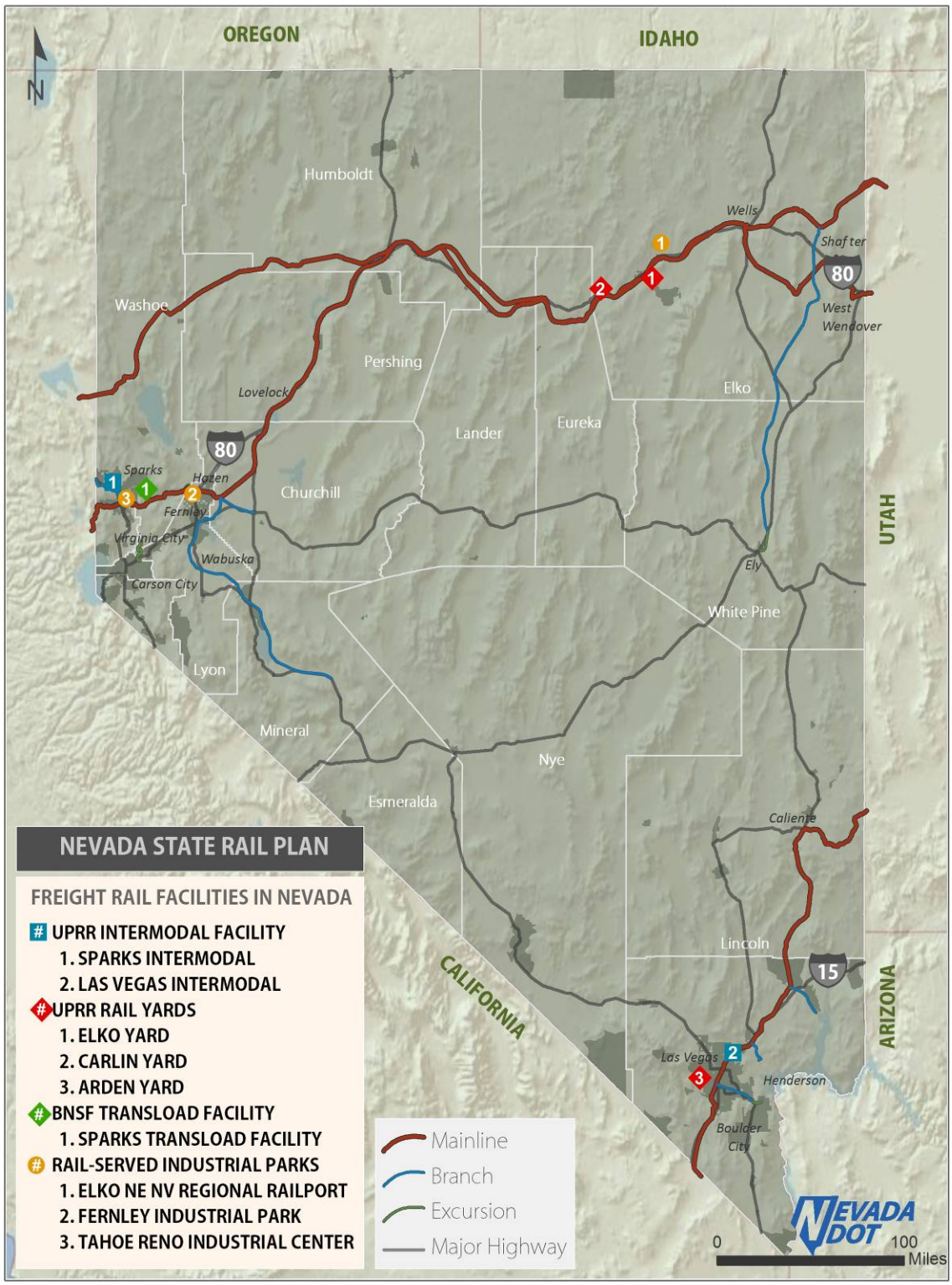
2. Nevada Rail Infrastructure

Figure 3-4, given as Figure 2-8 in the March 2012 *Nevada State Rail Plan*, shows Nevada's main and branch lines, plus its freight rail facilities. The Union Pacific Railroad (UPRR), a Class I railroad, is the largest rail carrier in Nevada (1,023 miles of single- and 62 miles of double-track). Its trackage extends generally east-west across both northern and southern Nevada. The BNSF Railway (BNSF), a Class I railroad, has trackage rights on 804 route miles across northern Nevada (excludes 69 Overland Route miles east of Wells), or 74 percent of the state's freight lines, and uses UPRR operating crews to move BNSF freight in the state by agreement with UPRR; BNSF does not own any trackage in Nevada.

Five branch or short lines are active in northern Nevada: the Nevada Northern Railway and Fallon, Mina, Thorne, and Reno branch lines. A foundation owns the Nevada Northern Railway and is working to increase freight and excursion movements; UPRR owns and operates the northern Nevada branch lines for freight shipments, with the exception of the Thorne Branch, which the federal government owns and operates as an extension of the Mina branch to serve a military facility. Three branch lines operate in southern Nevada: UPRR's Mead Lake Branch, the privately-owned Pabco Gypsum Branch, and the BMI Branch (a state museum, Henderson, and UPRR own segments of this branch).

Nevada freight rail facilities include two UPRR freight intermodal facilities where trailer-on-flat-car (TOFC) and container-on-flat-car (COFC) transfers can be made between rail and truck: the Sparks Intermodal Facility and the Las Vegas Intermodal Facility (Valley Yard). UPRR also operates three classification yards to organize rail car shipments bound for the same destination;

Figure 3-4: Nevada Freight Rail Facilities



Source: Nevada State Rail Plan, 2012

the Elko and Carlin yards serve northern Nevada and the Arden yard serves southern Nevada. In addition, industrial lead tracks connect industrial parks, business parks, and individual companies to branch and main lines, notably: the Northern Nevada Regional Railport (NNRR) at Elko; spurs at Fernley, where work is advancing on the Clean Energy Rail Center (CERC); and track access east of Reno for the Tahoe-Reno Industrial Center (TRIC). BNSF owns a transload facility in Sparks and can use the UPRR's Sparks Intermodal Facility.

3. Nevada Air Cargo Infrastructure

Figure 3-5 shows the locations of the three Nevada airports that provide commercial freight service: Elko Regional Airport (EKO) in northeastern Nevada; Reno-Tahoe International Airport (RNO) in northwestern Nevada; and McCarran International Airport (LAS) in southern Nevada.

Elko Regional Airport handled an average of 29,000 pounds of air cargo freight and 9,000 pounds of air mail annually from 2002 through 2007, according to NDOT's January 2009 *Regional Air Service Study*. Air freight consisted primarily of small package supplies and equipment in support of local merchants, medical supplies, and payroll and banking documents in the belly of cargo space of passenger aircraft. Volumes have declined since the airport lost its tower following the completion of the January 2009 report. Sky West, a Delta affiliate, currently flies between Elko and Salt Lake City frequently handling smaller machine parts in the belly of its passenger planes.

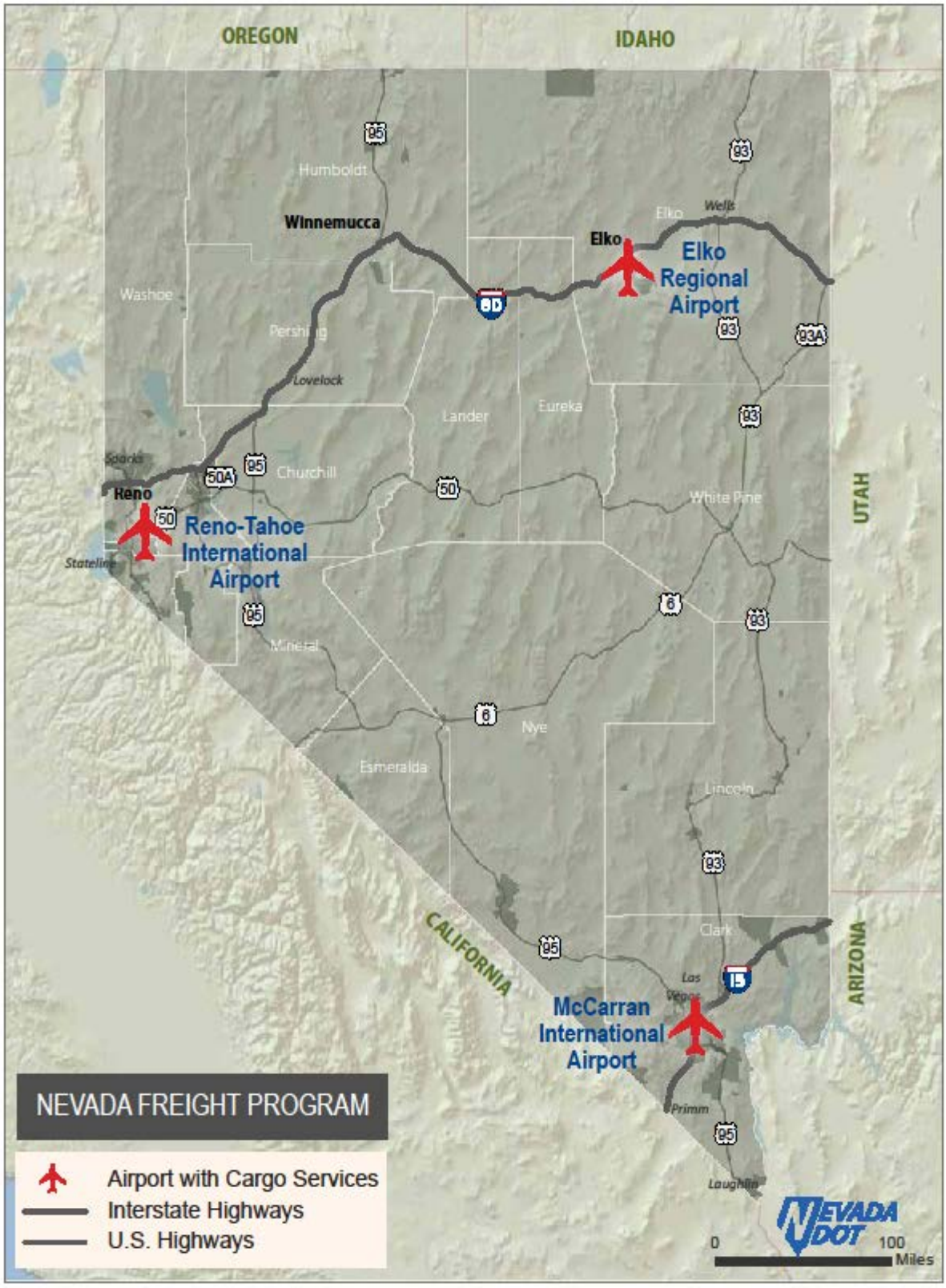
Reno-Tahoe International Airport handled over 52,500 tons or 115 million pounds of cargo shipments in 2012, according to RNO. The airport can accommodate all cargo aircraft. Companies handling air cargo at the Reno-Tahoe airport include: DHL; FedEx Express; and UPS.

Las Vegas' McCarran International Airport partnered with Marnell Properties to develop a 220,928 sq-ft two-building air cargo freight and distribution center on 19 acres located near Terminal 3. This facility, which opened in fall 2010, has full utilities services and build-to-suit tenant suites; it lies within less than a mile of interstate highway and rail service; plus it is within an 80-acre designated foreign trade zone. Current tenants include: United Parcel Service; US Airways; Airport Terminal Services; Allegiant; Worldwide Flight Services, Inc.; Southwest Airlines; and Federal Express. McCarran handled 370-million-plus tons of air cargo in 2012 (FAA ACAIS).

McCarran International Airport completed a $25 million fuel farm upgrade on October 31, 2011, adding a 65,000-barrel storage tank, two additional 1,200-gpm variable-drive pumps, an improved foam fire protection system, a new oil/water separator and lift station, plus dike containment walls. A future Phase II can accommodate three additional 65,000-gallon tanks when needed, providing a total on-airport jet fuel storage capacity of 23.5 million gallons for a 14-day supply.

Ivanpah Airport, a proposed reliever for McCarran Airport where McCarran's freight was proposed to be relocated, is currently on hold because McCarran currently handles 42 million passengers annually (as a result of the downturn in the national economy) and has a future capacity of 60 million (as a result of FAA progress in advancing technology to be able to accommodate more flights per hour), compared with 48.5 million and 53 million, respectively, when Ivanpah was initially proposed in the 1990s. Relocating freight is no longer considered a driver for Ivanpah, according to McCarran Airport officials.

Figure 3-5: Nevada Airports with Air Cargo Services



4. Additional Infrastructure—Inland Ports and Pipelines

- ***Inland Ports***

The *Nevada Inland Ports Viability and Funding Study*, which RCG Economics LLC completed in September 2012 in response to state legislation, concludes that "an inland port is not a viable option for the State of Nevada in the near- and intermediate-term." However, the report does recommend that Nevada focus on developing a logistics and operations cluster, including "value-added" manufacturing, such as the state's Bally's Technology operations, as well as E-commerce and fulfillment centers. The report notes that the state has multiple potential sites of a 1,000 acres or more to be able to accommodate such development and that the main airports at Las Vegas and Reno have significant capacity to expand cargo operations to support the logistics and operations cluster.

- ***Pipelines***

Kinder Morgan Energy Partners and/or its subsidiaries (Buckeye Partners, LP; Calnev Pipeline Company; and SFPP, LP) operate 86 miles of refined petroleum products pipeline in Washoe County serving the Reno Terminal in Sparks and the Reno-Tahoe International Airport, plus three miles between the terminal and the airport, as well as 116 miles of refined petroleum products pipeline serving Nellis Air Force Base and McCarran Airport in southern Nevada. The 30-acre Reno Terminal includes 36 tanks accommodating 6,000-30,000 barrels of refined petroleum products with a total capacity of 645,997 barrels; the facility handles conventional gas, CARB ULSD, EPA ULSD, turbine, and JP-8 fuels, plus ethanol.

Multiple firms pipe natural gas though 1,983 miles of pipeline across Nevada: Colorado Interstate Gas Co. (360); Kern River Gas Transmission Co. (275); NV Energy (8); Paiute Pipeline Co. (860); Southwest Gas Corp. (335); Tuscarora Gas Transmission Company (107); and US Gypsum Co. (38).

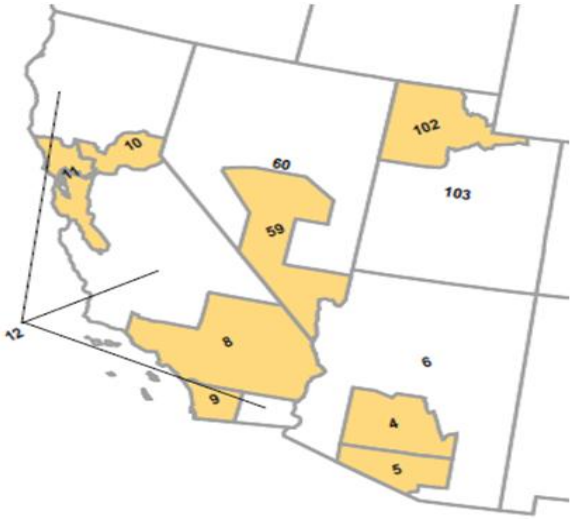
B. Transportation Flows by Mode and the Economic Value of Trade

This section discusses Nevada's (domestic) outbound, export, (domestic) inbound, and import commodity flows, as well as the state's internal commodity flows. It further segments these flows by mode: truck, rail, air, and pipeline. FHWA FAF, Version 3 data is used, which includes a "multiple mode" classification, such as shipments combining truck and rail modes; and it includes an "other" classification, which primarily involves unknown shipment mode(s). STB Waybill data summaries are also presented so that the intermodal rail traffic can be evaluated. These Waybill tabulations provide important through travel information on intermodal/containerized (TOFC/COFC) traffic. This section also includes discussions of both the domestic and international origins and destinations of Nevada's freight flows.

Metropolitan Statistical Areas or Consolidated Statistical Areas (CSA), which the Office of The FHWA FAF US data is organized geographically into 123 FAF regions that are based on Management and Budget defines. A metropolitan area becomes a separate FAF region when it lies entirely within a state or when a state's portion of a multi-state metropolitan area is large enough to support the sampling procedures in the Commodity Flow Survey. Small single-state metropolitan areas and small portions of a multi-state metropolitan area are part of the State or

Remainder of State. Nevada is organized into two FAF regions[1] as shown on Figure 3-6: 1) the Las Vegas-Henderson Combined Statistical Area (CSA – NV part which includes Nye and Clark counties)[2] and 2) Remainder of Nevada. These FAF regions correspond with the state's primary northern and southern corridors.

Figure 3-6: FAF Regions for Nevada and Surrounding States



Source: Geographic Areas for the FAF and 2002 Commodity Flow Survey[3]

The following information for 2011 is presented in the context of these two regions because each exhibits a different composition of commodities.

1. Commodity Flow Summary

Tables 3-1 and 3-2 rank top commodity flows being shipped out of Nevada by mode and *value* and by mode and *weight*, respectively; Tables 3-3 and 3-4 rank top commodity flows being shipped into Nevada by mode and *value* and by mode and *weight*, respectively. The data in these tables is stratified according to Nevada's two FAF regions: the Las Vegas CSA region and the Remainder of Nevada region. Some commodity production is unique to the Las Vegas CSA region, such as textiles/leather, paper articles, and motorized vehicles. Other commodities, such as metallic ores, chemical products, mixed freight, and precision instruments are manufactured and shipped from the Remainder of Nevada region.

Table 3-1 shows that truck and multiple modes (rail-truck) represent 71 and 26 percent, respectively, of all outbound/exported goods from Nevada when measured by value. Goods shipped via rail are lower value bulk commodities (e.g., metallic ores) and freight shipped via air is associated with higher value products, such as electronics. The remaining Table 3-1 commodities are distributed fairly evenly across other categories.

Table 3-2 shows that goods moved via rail (12 percent of all shipments) emerge as second only to truck and highlight their importance in trade between Nevada, the US, and foreign countries

[1] Las Vegas-Henderson Combined Statistical Area is region #59 and Rest of Nevada is region #60 on Figure 3-6.
[2] http://www.census.gov/population/metro/data/def.html
[3] http://ops.fhwa.dot.gov/freight/freight_analysis/faf/cfs_faf_areas.htm

Table 3-1: Top Ranked Commodity Outbound Shipments and Exports by Mode and Value
(in millions of dollars)

Las Vegas Commodities	Truck	Rail	Multiple	Air	Other	Total
1) Textiles/leather	$1,975		$2,517			$4,492
2) Paper articles	$1,639					$1,639
3) Misc. manufactured products			$665	$128		$793
4) Motorized vehicles					$714	$714
5) Metallic ores		$64				$64
6) Electronics				$41		$41
7) Rest of commodities	$9,250	$5	$1,711	$34	$122	$11,123
Las Vegas Total	**$12,865**	**$69**	**$4,893**	**$203**	**$836**	**$18,866**
Remainder of Nevada Commodities						
1) Metallic ores	$3,383	$74				$3,457
2) Mixed freight	$2,458				$93	$2,551
3) Precision instruments			$1,441			$1,441
4) Pharmaceuticals			$652			$652
5) Electronics				$65		$65
6) Nonmetallic minerals		$17				$17
7) Nonmetal mineral products		$16				$16
8) Rest of commodities	$9,210	$22	$4,181	$225	$105	$13,743
Remainder of Nevada Total	**$17,977**	**$129**	**$6,274**	**$290**	**$198**	**$21,942**
Nevada Total	**$30,842**	**$198**	**$11,167**	**$493**	**$1,034**	**$43,734**

Source: FHWA FAF 2011

Table 3-2: Top Ranked Commodity Outbound Shipments and Exports by Mode and Weight
(in thousands of tons)

Las Vegas Commodities	**Truck**	**Rail**	**Multiple**	**Air**	**Other**	**Total**
1) Misc. manufactured products	1,734			17		1,752
2) Nonmetallic minerals	959					959
3) Paper articles	744					744
4) Metallic ores		531				531
5) Motorized vehicles					154	154
6) Textiles/Leather			44			44
7) Nonmetal mineral products			35			35
8) Rest of commodities	2,718	54	96	2	65	2,936
Las Vegas Total	**6,155**	**586**	**175**	**19**	**219**	**7,155**
Remainder of Nevada Commodities						
1) Metallic ores	2,515	613				3,128
2) Nonmetal mineral products	880	123				1,003
3) Nonmetallic minerals		503	137		29	669
4) Animal feed		148				148
5) Precision instruments			38			38
6) Meat/seafood				1		1
7).Mixed freight				1		1
8) Rest of commodities	4,466	24	220	4	26	4,740
Remainder of Nevada Total	**7,861**	**1,411**	**395**	**6**	**55**	**9,728**
Nevada Total	**14,016**	**1,997**	**570**	**25**	**274**	**16,882**

Source: FHWA FAF 2011

when measured by tonnage. Commodities, such as metallic ores and nonmetallic minerals, which are usually lower in value, depend on rail to be delivered to customers. Multiple modes (rail-truck) represent only three percent of overall outbound/export shipments indicating higher-value items (e.g., pharmaceuticals and precision instruments) use this mode to supply goods to market. Overall these primary Table 3-2 commodities represent 55 percent of all commodities shipped out of Nevada.

Table 3-3 shipments into Nevada use truck, multiple mode (rail-truck), and air to deliver higher-value items, such as electronics, precision instruments, and pharmaceuticals. Pipeline is used to bring in coal-n.e.c. (not otherwise classified), which is most likely natural gas, coal slurry mixtures, or other pulverized, liquefied coal-derived products. The top Table 3-3 commodities represent 37 percent all commodities delivered into Nevada.

Table 3-3: Top Ranked Commodity Inbound Shipments and Imports by Mode and Value
(in millions of dollars)

Las Vegas Commodities	Truck	Rail	Multiple	Air	Pipeline	Other	Total
1) Mixed freight	$3,224					$340	$3,564
2) Electronics	$1,872		$1,446				$3,318
3) Machinery	$2,194						$2,194
4) Coal-n.e.c.		$174			$1,893		$2,067
5) Misc. mfg. products			$1,182				$1,182
6) Precision instruments			$1,024				$1,024
7) Gasoline					$761		$761
8) Transport equipment				$266			$266
9) Rest of commodities	$15,722	$429	$3,603	$515	$0	$411	$20,680
Las Vegas Total	**$23,012**	**$602**	**$7,254**	**$781**	**$2,654**	**$751**	**$35,055**
Remainder of Nevada Commodities							
1) Electronics	$1,979		$2,413	$111			$4,503
2) Mixed freight	$2,610					$184	$2,794
3) Precision instruments			$1,088				$1,088
4) Coal-n.e.c.					$826		$826
5) Fuel oils		$312					$312
6) Plastics/rubber		$238					$238
7) Base metals		$167					$167
8) Pharmaceuticals				$131			$131
9) Rest of commodities	$16,811	$671	$3,634	$173	$212	$176	$21,678
Remainder of NV Total	**$21,401**	**$1,388**	**$7,136**	**$415**	**$1,038**	**$360**	**$31,737**
Nevada Total	**$44,413**	**$1,990**	**$14,390**	**$1,195**	**$3,693**	**$1,110**	**$66,792**

Source: FHWA FAF 2011

Truck, rail, and pipeline are the most widely used modes of transportation to ship goods into Nevada when measured by tonnage as shown in Table 3-4. Coal, coal-n.e.c. and basic chemicals rely on rail, while coal-n.e.c. also uses pipeline for shipments into Nevada. Overall, industrial and agricultural industries produce the majority of high-volume commodities and represent 56 percent of all Table 3-4 inbound and import shipments.

Table 3-4: Top Ranked Commodity Inbound Shipments and Imports by Mode and Weight
(in thousands of tons)

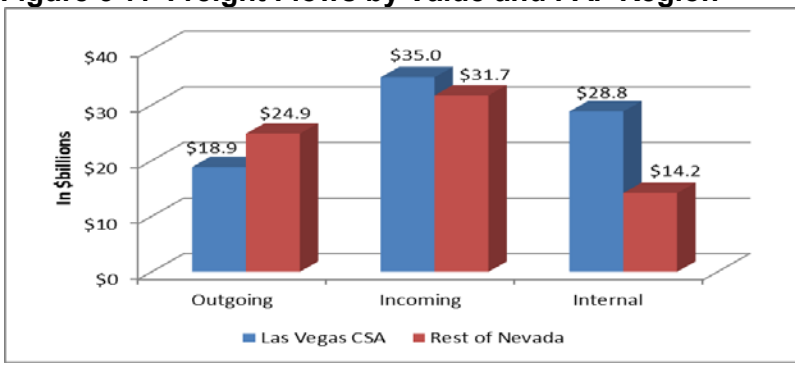
Las Vegas Commodities	Truck	Rail	Multiple	Air	Pipeline	Other	Total
1) Waste/scrap	6,301						6,301
2) Coal-n.e.c.		418			3,779		4,196
3) Nonmetal mineral prods.	2,030			43			2,073
4) Other ag. products	1,641						1,641
5) Coal		1,183					1,183
6) Gasoline					772		772
7) Nonmetallic minerals			165				165
8) Other foodstuffs			135				135
9) Electronics						23	23
10) Machinery				5			5
11) Rest of commodities	7,551	586	427	12	0	45	8,620
Las Vegas Total	**17,524**	**2,187**	**726**	**59**	**4,550**	**69**	**25,114**
Remainder of Nevada Commodities							
1) Coal		2,186					2,186
2) Basic chemicals	1,060	605					1,665
3) Coal-n.e.c.					1,648		1,648
4) Other ag. products	1,136						1,136
5) Other foodstuffs	1,090					23	1,113
6) Motorized vehicles				4			4
7) Rest of commodities	7,873	1,442	452	5	244	39	10,055
Remainder of Nevada Total	**11,158**	**4,233**	**452**	**10**	**1,892**	**63**	**17,807**
Nevada Total	**28,682**	**6,419**	**1,178**	**69**	**6,442**	**131**	**42,921**

Source: FHWA FAF 2011

2. Commodity Flow Details by FAF Region and by Mode

Over $28 billion dollars of freight circulated internally within the Las Vegas CSA (Figure 3-7). This area also had a higher level of incoming shipments when compared to the Remainder of Nevada; yet, the Remainder of Nevada region exported over $6 billion dollars more in goods than in the Las Vegas CSA.

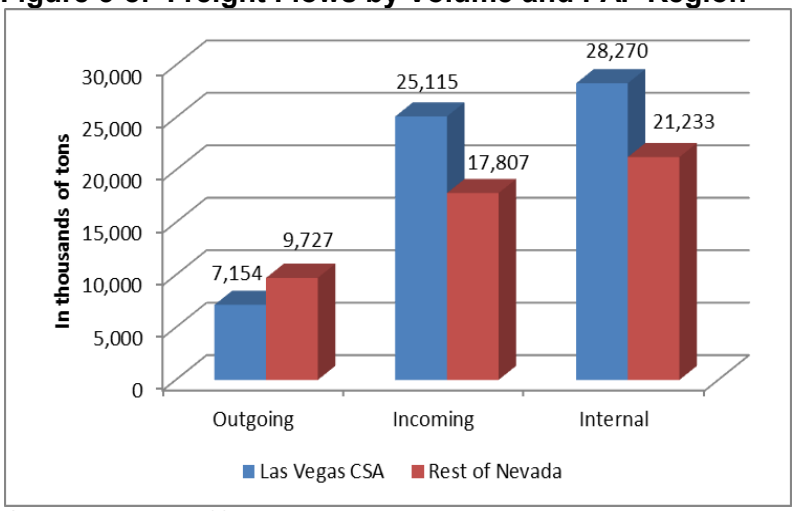
Figure 3-7: Freight Flows by Value and FAF Region



Source: FHWA FAF 2011

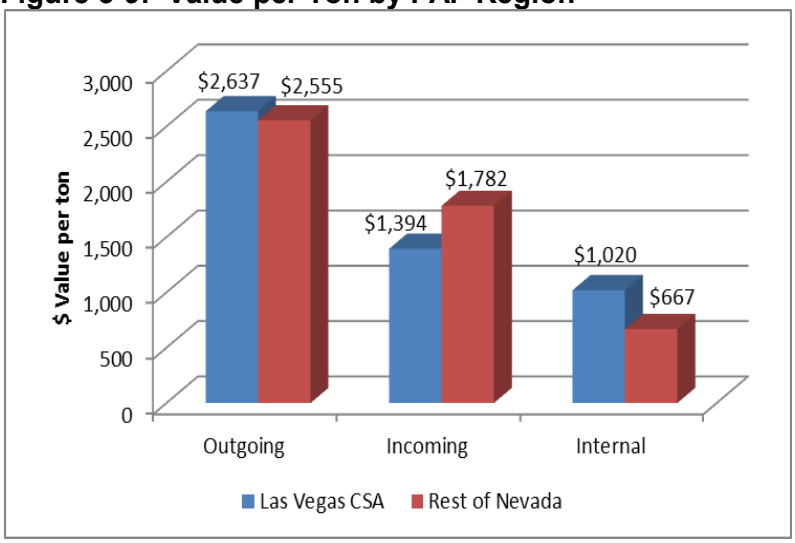
The level of internal freight flows measured in tonnage exceeds incoming or outgoing flows in the Las Vegas CSA and in the Remainder of Nevada regions (Figure 3-8). These relationships between value and volume indicate a lower cost per shipped ton for internal flows and a higher cost per ton for outgoing flows shipped for each FAF area (Figure 3-9).

Figure 3-8: Freight Flows by Volume and FAF Region



Source: FHWA FAF 2011

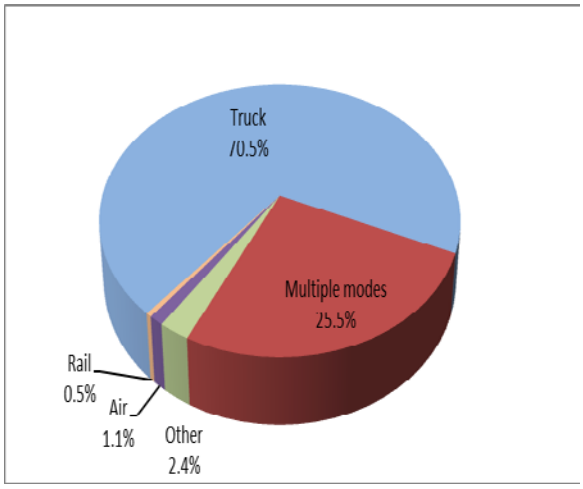
Figure 3-9: Value per Ton by FAF Region



Source: FHWA FAF 2011

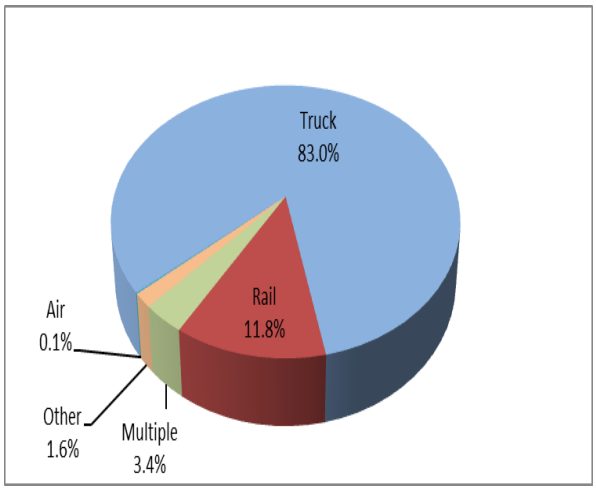
Transportation by truck is the predominate mode to ship goods out of Nevada (70 percent) followed by the use of multiple modes, e.g. rail-truck (Figure 3-10). When switching to movement by tonnage, the percentage of shipments using truck increases to 83 percent followed by rail at 11.8 percent (Figure 3-11).

Figure 3-10: Outbound & Exports by Mode and Percent of Value



Source: FHWA FAF 2011

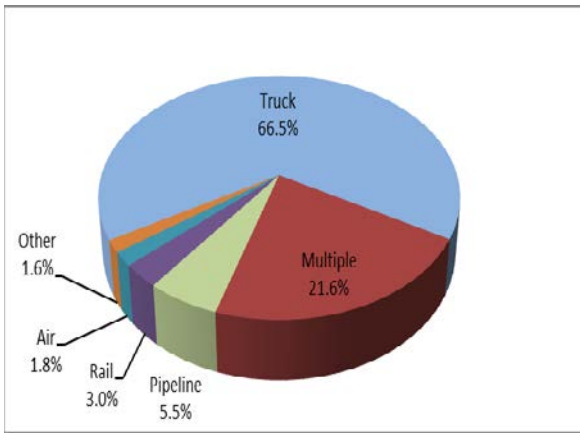
Figure 3-11: Outbound & Exports by Mode and Percent of Tonnage



Source: FHWA FAF 2011

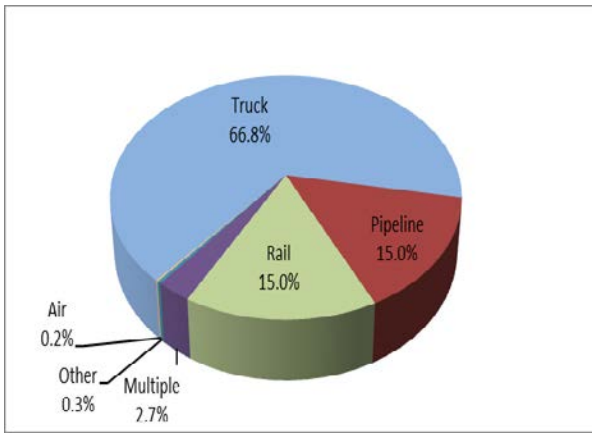
Inbound/ import shipments into Nevada have a similar mix of modal usage with a primary reliance on truck (66 percent) and multiple modes (rail-truck) (21 percent), followed by 5.5 percent of goods transported via pipeline, which are predominately oil/gas commodities (Figure 3-12). Pipeline (15 percent) and rail (15 percent) are the second and third most used mode of transportation for inbound/import shipments measured by volume (Figure 3-13).

Figure 3-12: Inbound & Imports by Mode and Percent of Value



Source: FHWA FAF 2011

Figure 3-13: Inbound & Imports by Mode and Percent of Tonnage

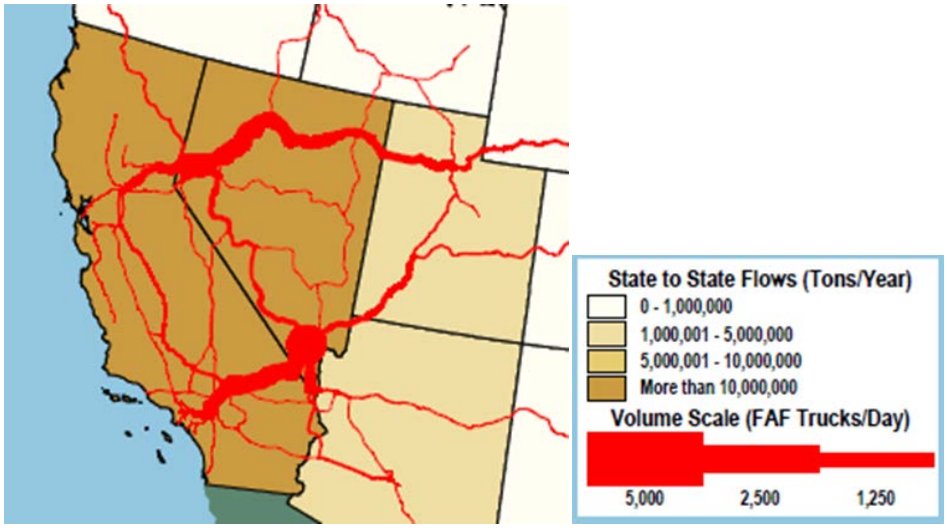


Source: FHWA FAF 2011

The US DOT and the Association of American Railroads (AAR) have developed maps that represent freight volumes in terms of truck, tonnage, and level of service for truck and rail modes to illustrate the magnitude and direction of freight movement on the highway network. These illustrations have been scaled to focus on Nevada and its surrounding states. Figure 3-14 highlights the relative volume that is coming into, from, or within Nevada in relation to other

states. This map highlights the volume of truck movements in the Nevada corridors and the links that connect Nevada to Utah, Arizona, California, and other neighboring states.

Figure 3-14: Major Flows by Truck To, From, and Within Nevada: 2007



Source: US DOT, FHWA, Office of Freight Management and Operations, FAF, Version 3.1.2, 2011.

Figure 3-15 shows the volumes of TOFC and COFC movements within Nevada and the associated international rail hubs in the region. These flows are likely associated with the multiple mode (rail-truck) intermodal movements shown in the preceding FHWA FAF data. These intermodal flows are generally tied to major eastbound movements of intermodal traffic.

Figure 3-15: Tonnage of Trailer-on-Flatcar and Container-on-Flatcar Rail Intermodal Moves: 2010

Source: US DOT, Federal Railroad Administration, special tabulation, September 2012.

In addition to the FHWA FAF data, information is provided for rail shipments from STB Waybill data, which is based on a sample of goods shipped by rail with origins or destinations in Nevada.

This data differs slightly from FAF in terms of geography (county versus metro area), commodity mix (STCC commodity classification versus SCTG[4]), volume (only tonnage included, no value), and origin and destination of flow (includes pass-through shipments). This STB Waybill data was included in the analysis because it is thought to provide a more accurate and detailed insight into the origins and destinations of rail freight flows than are included in the FAF data.

STB Waybill data provides rail carload details not included in the FHWA FAF data. The Waybill information is helpful in determining the scale of carload use to, from, and through Nevada and the commodities associated with each type of railcar. Table 3-5 stratifies the shipment data by carload type (bulk, break bulk, and container) and associated carload types (e.g., hoppers, condoles, flat cars, etc.). Data is also available describing whether the shipments originate in or are destined for Nevada locations, if they are internal shipments (originating and destined within the state), and whether they are for domestic consumption or associated with international trade. Waybill data also provide information on rail shipments through the state and for both domestic US (other states) and foreign trade (international).

Table 3-5: STB Waybill Data by Car Type
(in thousands of short tons)

Carload Type/ Transport Type	Inbound (Domestic)	Outbound (Domestic)	Internal (Domestic)	Import (International)	Export (International)	Through (Domestic)	Through (International)	Total	Total NV Traffic	NV as % of Total Rail Traffic
Box cars/ break bulk	155	291	-	72	25	1,838	93	**2,474**	543	22%
Gondolas/ bulk/break bulk	76	281	-	-	86	930	13	**1,387**	444	32%
Hoppers (covered & open)/bulk	4,311	989	152	103	4	15,750	25	**21,334**	5,559	26%
Refrigerated/ container	-	-	-	-	-	1,364	5	**1,369**	-	0%
TOFC/COFC/ container	92	114	-	4	4	9,988	64	**10,266**	214	2%
Flat cars (incl. multi-level)/ break bulk	145	228	-	15	4	1,415	10	**1,817**	392	22%
Tank cars/ bulk	948	557	62	65	19	4,096	31	**5,777**	1,651	29%
All others/ bulk/break bulk	-	13	-	-	-	7	-	**20**	13	64%
Total	**5,728**	**2,473**	**214**	**259**	**142**	**35,389**	**240**	**44,445**	**8,816**	**20%**

Source: FHWA FAF 2011

[4] An explanation of the STCC versus SCTG commodity classifications are provided in more detail in the Waybill data.

Over 44 million tons of rail traffic used the state's rail network in 2011. Only 8.8 million tons of rail–based traffic was inbound, outbound, or internal to the state. The notable characteristics of rail traffic when tabulated using Waybill classifications is that, with the exception of containerized rail traffic, between 22 and 32 percent of all rail shipments involve movements inbound, outbound, or within Nevada. Only two percent of container shipments made by rail are destined for Nevada. The rest (over 10 million tons) pass through the state.

The highest volumes, 21 million tons, are bulk commodities shipped in (covered and open) hoppers. Of these shipments, 26 percent are inbound, outbound, or shipped internally. Thus, the majority of hopper car shipments are through movements. Open-top hoppers are used to handle bulk commodities impervious to weather conditions, such as coal, coke, aggregates, sand, ores, gravel, slag, and scrap. Covered hoppers are designed for bulk commodities that require protection against the elements and/or contamination; they usually carry grains, cement, or other dry bulks.

The next highest volumes of rail freight (10 million tons) are shipped in containers or trailers loaded on flat cars. The vast majority of containers (98 percent) associated with TOFC/COFC are through movements. All refrigerated rail traffic passes through Nevada indicating that trucks are the most logical choice for perishables destined for Nevada.

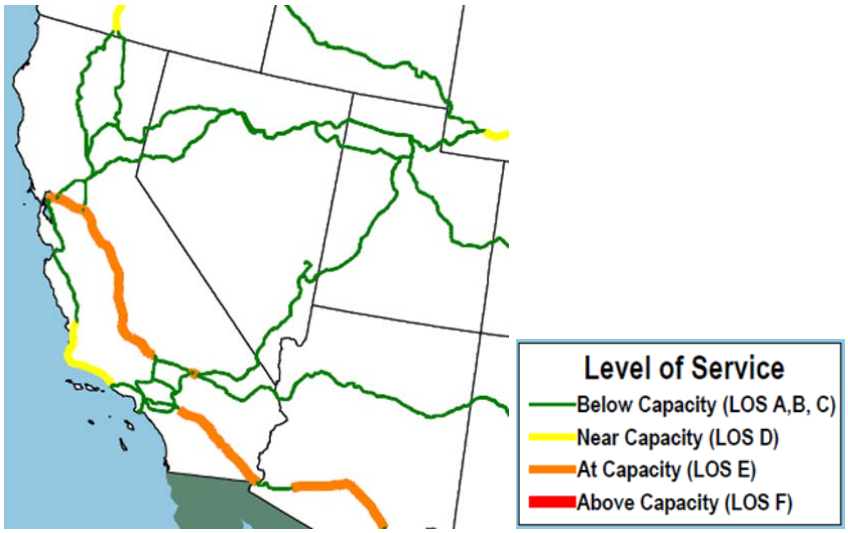
Just under six million tons of rail freight is shipped in tank cars. Of this total, an estimated 29 percent is shipped from or delivered to Nevada and is very specialized equipment for the shipment of bulk liquids. Tank cars carry all types of liquids that range from corn syrup to chemicals.

Flat cars carrying less than two million tons of commodities deliver 22 percent of freight shipments in and out of Nevada. These car types (multiple-axle, platforms, and tie-downs) range from general purpose to very specialized designs capable of moving extremely large and heavy shipments. The majority of multi-level flat cars involved in through traffic in Nevada are designed to transport pick-up autos, trucks, minivans, and sports utility vehicles.

Gondolas, which can carry a total of 1.4 million tons, are the most frequently used equipment (32 percent) for in-state carload shipments to and from Nevada. These cars carry a wide variety of bulk and break bulk commodities impervious to weather conditions, such as metal, coal, coke, aggregates, sand, ores, gravel, slag, scrap, poles, and railroad ties.

The AAR publishes a map detailing the relative level of service for rail networks within the US. Figure 3-16 shows that the rail network in Nevada is below capacity (LOS A, B, or C) by comparison with some rail lines located in nearby California.

Figure 3-16: Current Train Volumes Compared to Current Capacity



Source: AAR, National Rail Infrastructure Capacity and Investment Study prepared by Cambridge Systematics, Inc. (Washington, DC: September 2007), Figure 4.4, page 4-10.

3. Origins and Destinations of Domestic Shipments to and from Nevada

The origins and destinations for the Las Vegas CSA and Remainder of Nevada outbound and inbound shipments begin and end in mostly the same locations, even though the types of commodities that the two Nevada FAF regions ship and receive vary significantly by mode. Tables 3-6 and 3-7 show that these origins and destinations are concentrated within: the

Table 3-6: Outbound Flows by Destination and Value
(in millions of dollars)

Origin: Las Vegas CSA			Origin: Remainder of Nevada		
Destination	**Dollar Value**	**% of Total**	**Destination**	**Dollar Value**	**% of Total**
Los Angeles, CA CSA	$3,083	17%	Salt Lake City, UT CSA	$3,647	16%
Phoenix, AZ MSA	$1,330	8%	Los Angeles, CA CSA	$3,047	13%
Salt Lake City, UT CSA	$1,221	7%	Remainder of California	$2,531	11%
San Francisco, CA CSA	$1,110	6%	San Francisco, CA CSA	$1,809	8%
Remainder of California	$761	4%	Sacramento, CA-NV CSA (CA Part)	$1,737	8%
Remainder of Arizona	$670	4%	Seattle, WA CSA	$1,147	5%
Denver, CO CSA	$636	4%	Remainder of Oregon	$875	4%
Chicago, IL-IN-WI CSA (IL Part)	$542	3%	Phoenix, AZ MSA	$573	3%
Seattle, WA CSA	$539	3%	Idaho	$558	2%
New York, NY-NJ-CT-PA CSA (NY Part)	$536	3%	San Diego, CA MSA	$451	2%
Rest of others	$7,280	41%	Rest of others	$6,515	28%
Total	**$17,708**	**100%**	**Total**	**$22,889**	**100%**

Source: FHWA FAF 2011

Far West (Los Angeles, San Francisco, Seattle, and Remainder of California); Southwest (Phoenix and Remainder of Arizona); and Rocky Mountain (Salt Lake City and Denver) Bureau of Economic Analysis regions.

Table 3-7: Inbound Flows by Origin and Value
(in millions of dollars)

Destination: Las Vegas CSA			Destination: Remainder of Nevada		
Origin	**Dollar Value**	**% of Total**	**Origin**	**Dollar Value**	**% of Total**
Los Angeles, CA CSA	$9,576	29%	Los Angeles, CA CSA	$3,446	11%
Phoenix, AZ MSA	$2,559	8%	San Francisco, CA CSA	$2,774	9%
Remainder of California	$1,847	6%	Remainder of California	$2,347	8%
Salt Lake City, UT CSA	$1,069	3%	Salt Lake City, UT CSA	$2,230	7%
Remainder of Arizona	$988	3%	Sacramento, CA-NV CSA (CA Part)	$1,729	6%
Remainder of Pennsylvania	$954	3%	Seattle, WA CSA	$951	3%
New York, NY-NJ-CT-PA CSA (NY Part)	$797	2%	Remainder of Illinois	$819	3%
Chicago, IL-IN-WI CSA (IL Part)	$711	2%	New York, NY-NJ-CT-PA CSA (NJ Part)	$772	3%
San Francisco, CA CSA	$684	2%	Houston, TX CSA	$610	2%
New York, NY-NJ-CT-PA CSA (NJ Part)	$647	2%	Dallas-Fort Worth, TX CSA	$587	2%
Rest of others	$12,787	39%	Rest of others	$13,830	46%
Total	**$32,618**	**100%**	**Total**	**$30,097**	**100%**

Source: FHWA FAF 2011

Table 3-8 shows that the primary commodities shipped from Nevada via rail are bulk commodities with lower value, such as chemicals, waste/scrap, clay/concrete/glass, non-metallic minerals, and metallic ores, some of which are likely to come from industrial and mining companies. Two thirds of all inbound rail shipments into Nevada are coal and chemical products from Wyoming, Utah, and Nebraska. Arizona and California are the major destinations for the goods coming from Nevada.

Nevada's rail infrastructure network can be considered a gateway to other rail networks and destinations. Rail shipments frequently pass through Nevada on their way from other parts of the country to California with its large economy. Table 3-9 shows that several states ship their finished goods (farm products, coal, mixed shipments, food, and chemicals) to California by rail via Nevada.

In addition, a small amount of internal rail flows, amounting to 214,000 tons, are transported within Nevada's borders, including: clay, concrete, glass, and stone (151,000 tons); chemicals or allied products (58,000 tons); waste or scrap materials (4,000 tons); and transportation equipment (1,000 tons).

Table 3-8: Tons of Domestic Nevada Exports and Imports by Destination/Origin
(in millions of tons)

Nevada Exports				Nevada Imports			
Dest. State	**Commodity**	**Tons**	**% of Total**	**Origin State**	**Commodity**	**Tons**	**% of Total**
AZ	Chemicals or allied products	259	10%	UT	Coal	1,723	30%
CA	Waste or scrap materials	242	10%	WY	Coal	1,378	24%
CA	Chemicals or allied products	204	8%	UT	Chemicals or allied products	254	4%
CA	Clay, concrete, glass or stone	197	8%	TX	Chemicals or allied products	217	4%
CA	Nonmetallic minerals	142	6%	NE	Chemicals or allied products	190	3%
IL	Metallic ores	127	5%	CA	Petroleum or coal products	168	3%
AZ	Waste or scrap materials	121	5%	UT	Clay, concrete, glass or stone	144	3%
CO	Clay, concrete, glass or stone	109	4%	CA	Clay, concrete, glass or stone	118	2%
WY	Nonmetallic minerals	104	4%	TX	Metallic ores	81	1%
CO	Nonmetallic Minerals	89	4%	IA	Chemicals or allied products	76	1%
Rest of others		879	36%	Rest of others		1,381	24%
Total		**2,473**	**100%**	**Total**		**5,728**	**100%**

Source: STB Waybill data 2011

Table 3-9: Nevada Domestic Pass-Through Rail Flows
(in thousands of tons)

Origin State	Dest. State	Commodity	Tons	% of Total
NE	CA	Farm products	3,724	11%
UT	CA	Coal	3,413	10%
IL	CA	Misc. mixed shipments	2,706	8%
IA	CA	Food or kindred products	2,006	6%
NE	CA	Chemicals or allied products	1,533	4%
IA	CA	Farm products	1,364	4%
NE	CA	Food or kindred products	920	3%
IL	CA	Transportation equipment	716	2%
IL	CA	Food or kindred products	711	2%
CA	IL	Food or kindred products	684	2%
Rest of others			17,611	50%
Total			**35,389**	**100%**

Source: STB Waybill data 2011

4. International Shipments

The same types of Nevada commodities shipped domestically are also shipped internationally to a variety of Canadian provinces, with 61 percent of shipments involving metallic ores (Table 3-10). Imports from Canada to Nevada involve chemicals, petroleum, pulp/paper, and lumber products from provinces, such as Alberta, British Columbia, Quebec, and New Brunswick; Alberta is Nevada's largest Canadian trading partner.

Table 3-10: International Nevada Tonnage by Commodity and Origin/Destination
(in thousands of tons)

Nevada Exports				Nevada Imports			
Dest. State	Commodity	Tons	% of Total	Origin State	Commodity	Tons	% of Total
ON	Metallic ores	86	61%	AB	Chemicals or allied products	79	31%
BC	Nonmetallic minerals	25	18%	AB	Petroleum or coal products	31	12%
ON	Chemicals or allied products	19	13%	BC	Pulp, paper or allied products	29	11%
BC	Clay, concrete, glass or stone	4	3%	PQ	Pulp, paper or allied products	18	7%
ON	Clay, concrete, glass or stone	4	3%	BC	Lumber or wood products	15	6%
ON	Nonmetallic minerals	3	2%	NB	Pulp, paper or allied products	15	6%
PQ	Nonmetallic minerals	1	1%	SK	Petroleum or coal products	14	6%
				MB	Chemicals or allied products	12	4%
				BC	Chemicals or allied products	12	4%
				AB	Pulp, paper or allied products	11	4%
				Rest of Others		23	9%
Total Flows		**142**	**100%**	**Total Flows**		**259**	**100%**

Source: STB Waybill data 2011

NOTE: STB Waybill User's Manual: AB = Alberta; BC = British Columbia; MB = Manitoba; NB = New Brunswick; NS = Nova Scotia; ON = Ontario; PQ = Quebec; and Saskatchewan = SK.

International pass-through flows originate in or are destined for California and several provinces in Canada and include food products, pulp/paper, and petroleum (Table 3-11).

Table 3-11: International Nevada Pass-Through Rail Flows
(in thousands of tons)

Origin State	Dest. State	Description	Tons	% of Total
CA	ON	Food or kindred products	57	24%
PQ	CA	Pulp, paper or allied products	21	9%
ON	CA	Petroleum or coal products	16	7%
CA	PQ	Food or kindred products	14	6%
ON	CA	Clay, concrete, glass or stone	13	6%
CA	ON	Farm products	13	5%
ON	CA	Primary metal products	13	5%
UT	BC	Chemicals or allied products	12	5%
AB	UT	Pulp, paper or allied products	12	5%
PQ	CA	Lumber or wood products	11	5%
Rest of others			59	24%
Total			**240**	**100%**

Source: STB Waybill data 2011

The 2011 STB Waybill data does not show any Nevada rail shipments to or from Mexico. North American transborder flow data from the Bureau of Transportation Statistics (BTS)[5] helps to substantiate the lack of Mexican rail shipments through Nevada (Table 3-12). It shows that only Canada was used as a transshipment country to deliver products to and from Nevada (albeit a low value).

The BTS data supplements both the FAF and STB Waybill data, providing further evidence that rail connections to Canada for both Canadian-bound and international shipments to both Europe and China are important for Nevada-produced commodities.

Table 3-12: International Nevada Rail Exports and Imports via Canada
(in dollars)

Nevada Exports		Nevada Imports	
Transshipment via Canada to:	**Export Value by Rail**	**Transshipment via Canada from:**	**Import Value by Rail**
Sweden	$178,488	Belgium	$87,210
United Kingdom	$56,557	China	$117,647
Hungary	$12,227		
Total	**$247,272**	**Total**	**$204,857**

Source: BTS Transshipment Data 2011

Nevada's international shipments are relatively small in comparison to shipments to and from the US. However, a large portion of Nevada's international trade is with neighboring Canada

[5] http://transborder.bts.gov/programs/international/transborder/TBDR_TS/TBDR_TS_Index.html

and Mexico, which is closely linked though the North American Free Trade Agreement (NAFTA). Over $1.4 billion dollars of goods were exported to Canada in 2012 (Table 3-13), according to the US Census Foreign Trade Division. This trade data combines truck, rail, intermodal, pipeline, and any other ground-based movement into a ground category; it also lists air freight shipments. Over 58 percent of all exports to Canada were ground based and include finished goods, such as mineral and ores, manufactured commodities, and fabricated metals. High value goods, such as computer/electronics and electrical equipment, were also shipped via air to markets in Canada.

Imports from Canada also relied on ground transportation to deliver goods from Canada, which included finished products from the chemical, paper, and machinery industries (Table 3-13). Air shipments also transported chemicals, as well as electronics and other commodities, which combined, contributed to $60 million dollars worth of freight. Overall, $768 million of Canadian goods were imported into Nevada in 2012.

Table 3-13: Top Nevada Ground and Air Exports to and Imports from Canada
(in millions of dollars)

Nevada Exports				Nevada Imports			
Mode	**Industry**	**Dollars**	**% of Total**	**Mode**	**Industry**	**Dollars**	**% of Total**
Ground	Minerals & ores	$477	34%	Ground	Chemicals	$116	15%
Ground	Misc. manuf. commodities	$281	20%	Ground	Paper	$103	13%
Ground	Fabricated metals	$70	5%	Ground	Machinery	$81	11%
Air	Computer & electronics	$189	13%	Air	Computer & electronics	$37	5%
Air	Misc. manuf. commodities	$19	1%	Air	Chemicals	$17	2%
Air	Electrical equipment	$12	1%	Air	Misc. manuf. commodities	$16	2%
	Rest of others	$371	26%		Rest of others	$398	52%
Total Exports to Canada		**$1,421**	**100%**	**Total Imports from Canada**		**$768**	**100%**

Source: US Census Bureau Foreign Trade Division from Wiser Trade, 2012

Nevada also trades with Mexico, on a smaller scale than with Canada, with $336 million exported to Mexico in 2012 (Table 3-14). Miscellaneous manufactured commodities on the ground and through the air represent the largest group of Nevada exports to Mexico, accounting for over 53 percent of all Nevada exports to Mexico. Computer and electronics, as well as transportation equipment were the top commodities shipped to Mexico using ground transportation. The top commodities accounted for over 73 percent of all goods exported to Mexico.

Nevada imports from Mexico were of similar scale to exports and totaled $358 million in 2012 (Table 3-14). Beverage and tobacco products accounted for 35 percent of all imports from Mexico, followed by 23 percent for apparel and accessory goods. Computer and electronics, as well as electrical equipment, were shipped by air to Nevada from Mexico and comprised a relatively small share of total imports.

Table 3-14: Top Nevada Ground and Air Exports to and Imports from Mexico
(in millions of dollars)

Nevada Exports				Nevada Imports			
Mode	**Industry**	**Dollars**	**% of Total**	**Mode**	**Industry**	**Dollars**	**% of Total**
Ground	Misc. manuf. commodities	$51	15%	Ground	Beverages & tobacco products	$127	35%
Ground	Computer & electronics	$36	11%	Ground	Apparel & accessories	$83	23%
Ground	Transportation equipment	$22	7%	Ground	Transportation equipment	$24	7%
Air	Misc. manuf. commodities	$128	38%	Air	Computer & electronics	$5	1%
Air	Electrical equipment	$5	2%	Air	Electrical equipment	$2	1%
Air	Plastics & rubber products	$4	1%		Rest of others	$118	33%
	Rest of others	$90	27%				
Total Exports to Mexico		**$336**	**100%**	**Total Imports from Mexico**		**$358**	**100%**

Source: US Census Bureau Foreign Trade Division from Wiser Trade, 2012

4. Freight Needs and Issues

4: Freight Needs and Issues

This section of the report describes the approach used to incorporate input from experts in freight shipping and freight planning across the state, as well as opportunities for the public to participate; a summary listing of potential issues and opportunities gathered from these project participants; and recommendations for parties to be involved in the upcoming state freight plan.

A Freight Working Group (FWG) was established; and Economic Development Authorities (EDA) and Regional Transportation Commissions (RTC) were contacted. One-on-one teleconferences were held with multiple FWG and RTC participants. A webpage was established on NDOT's website to inform the public about this assessment and solicit input.

Table 4-1 lists key members of the freight assessment stakeholder involvement team who provided direction, planning, management, implementation, and support. The stakeholder involvement team worked closely with the NDOT project manager to inform stakeholders about the project status and outcomes through correspondence, meetings, and the Internet. The consultant project team includes employees of Jacobs Engineering Group, the prime consultant, with employees of subconsultant Economic Development Research Group (EDRGroup).

Table 4-1: NDOT and Consultant Project Team

Name	Title	Phone	Email
Bill Thompson	Project Manager, NDOT	775-888-7354	bthompson@dot.state.nv.us
Eric Glick	Program Manager, NDOT	775-888-7464	eglick@dot.state.nv.us
Mike McCarley	Project Director, Jacobs	702-938-5570	mike.mccarley@jacobs.com
John McCarthy	Project Manager, Jacobs	314-335-4415	john.mccarthy@jacobs.com
Angela Thens	Stakeholder Involvement Lead	702-938-5483	angela.thens@jacobs.com
Stephen Fitzroy	Sr. VP-Director of Operations Research	617-338-6775	sfitzroy@edrgroup.com
Adam Winston	Economic Associate	617-338-6775	awinston@edrgroup.com

A. Project Participants

1. Freight Working Group

The FWG for this freight assessment study was established by building on NDOT's in-house FWG and adding industry experts to assist in identifying and examining the issues, needs, and opportunities for the Nevada freight industry. Nevada freight stakeholders were identified from among groups and organizations directly affected by or concerned about Nevada's freight industry, in addition to staff from multiple NDOT divisions. Table 4-2 lists this assessment's FWG members, their organization, and their role within their organization. The committee members were selected because of their roles in the various agencies and freight industry organizations, from planning and policies to permitting, logistics, and operations.

Two meetings were held with the FWG—one towards the beginning of the study on July 9, 2013 and a follow-up review meeting towards the end of the study on October 29, 2013. Early engagement of these individuals was critical in capturing and disseminating information about needs, issues, and opportunities for Nevada's freight infrastructure. The stakeholder involvement team has relied on the FWG for input, review of milestone deliverables, and

feedback at decision points in the study. This committee has also been engaged in reviewing the final freight assessment report.

Table 4-2: Freight Working Group

First Name	Last Name	Title	Agency/Company
Leo	Penne	Program Dir. Intermodal Activities	AASHTO Freight (initially)
Chris	Smith	Program Dir. Intermodal Activities	AASHTO Freight (replacement)
Dawn	Lietz	Auditor	DMV
Wayne	Seidel	DMV Motor Carrier	DMV
Angela	Smith	Management Analyst	DMV
Marvin	Caton	Manager Field Safety	FedEx Freight
Bob	Cunha	Regional Safety Manager	FedEx Freight
Willie	Hargrove	Manager	FedEx Freight
Leah	Sirmin	Program Manager	FHWA
Scott	Kichline	Planner	McCarran International Airport
Jeff	Richter	Over Dimensional Vehicle Permits Manager	NDOT Administrative Services Division
Mary	Martini	District Engineer	NDOT Dist 1
Jae	Pullen	Engineer	NDOT Dist 2
Thor	Dyson	District Engineer	NDOT Dist 2
Michael	Fuess	Assistant District Engineer	NDOT Dist 2
Kevin	Lee	District Engineer	NDOT Dist 3
Dale	Lindsey	Engineer	NDOT Performance & Analysis
Scott	Magruder	Public Info Officer	NDOT PIO
Eric	Glick	Program Manager	NDOT Planning
Tom	Greco	Asst. Dir. Planning	NDOT Planning
Tony	Letizia	Planner	NDOT Planning
Coy	Peacock	Project Manager (I-80)	NDOT Planning
Bill	Thompson	Project Manager	NDOT Planning
Randy	Travis	Traffic Chief	NDOT Planning
Jason	Van Havel	Asst. Chief Planning	NDOT Planning
Ken	Mammen	Safety Asst Chief	NDOT Safety
Bryan	McCurdy	Planner, Vehicle Size & Weight Manager	NDOT Traffic
Ismael	Garza	Traffic Engineer	NDOT Traffic Ops
Denise	Inda	Traffic Engineer	NDOT Traffic Ops
Katherine	Mellon	Traffic Engineer	NDOT Traffic Ops
Lisa	Schettler	TIMS Manager	NDOT Traffic Ops
Juan	Hernandez	Traffic Engineer	NDOT Traffic Ops
Brian	Kramer	Planner	NDOT Traffic Planning
Tony	Rivera	Planner	NDOT Traffic Planning
Lindsay	Anderson	Director of Communications & Research	Nevada Commission on Economic Development
Mike	Skaggs	Executive Director	Nevada Commission on Economic Development
Paul	Enos	CEO	Nevada Trucking Association
Jaron	Hildebrand	Policy Analyst	Nevada Trucking Association
John	Amestoy	DBS/NHP Commercial Training Coordinator	NHP
Beth	Xie	Manager of Planning	Regional Transportation Commission of Southern Nevada
Amy	Cummings	Planning Director	Regional Transportation Commission of Washoe County

First Name	Last Name	Title	Agency/Company
Patrice	Echola	Planner	Regional Transportation Commission of Washoe County
Lee	Gibson	Executive Director	Regional Transportation Commission of Washoe County
Christina	Leach	Planner	Regional Transportation Commission of Washoe County
Brian	Pratte	Dir. Air Service and Cargo Development	Reno-Tahoe International Airport
Bill	Eisele	Research Engineer	Texas A&M Transportation Institute
Carl "Chip"	Mallard	Office of Freight Management and Operations	US DOT
Rod	Schmalhaus	General Transportation Manager	Walmart, Western Regional Operations Center
Barbara	Invanov	Dir. Freight Systems / Chair, TRB Freight Systems Group	Washington DOT
Larry	Pursley	Executive Vice President	Washington Trucking Association
Gerald	Rawling	Consultant, Retired Director of Operations	Retired from Chicago MPO

2. Economic Development Authorities and Regional Transportation Commissions

Each of Nevada's EDAs and RTCs were contacted to solicit their input on freight issues and needs. The EDAs provided valuable input for the *2000 Study*; and the RTCs have ongoing freight studies, which can provide valuable input in the urbanized areas. Table 4-3 lists the EDAs and RTCs. A brief survey was developed and disseminated to 13 economic agencies in Nevada. The survey focused on growth potential and competitive advantages, key initiatives, freight transportation issues, and any additional considerations that may influence the new state freight plan. Responses from the survey are given in the Appendix.

Table 4-3: EDA and RTC Contacts

Agency	Abbreviation	County
Churchill Economic Development Authority	CEDA	Churchill
Economic Development Authority of Esmeralda and Nye Counties	EDEN	Esmeralda & Nye
Economic Development Authority of Western Nevada	EDAWN	Washoe
Elko County Economic Diversification Authority	ECEDA	Elko
Eureka County Economic Development Council	ECEDC	Eureka
High Desert Development Authority	HDEDA	Humboldt & Lander
Lincoln County Regional Development Authority	LCRDA	Lincoln
Lyon County Development Authority	LCDA	Lyon
Mineral County Economic Development Authority	MCEDA	Mineral
Nevada Development Authority	NDA	Clark
Northern Nevada Development Authority	NNDA	Douglas, Storey, & Carson City
Pershing County Economic Development Authority	PCEDA	Pershing
White Pine Economic Diversification Council	WPEDC	White Pine
Regional Transportation Commission of Washoe County	RTC	Washoe
Regional Transportation Commission –Southern Nevada	RTCSNV	Clark

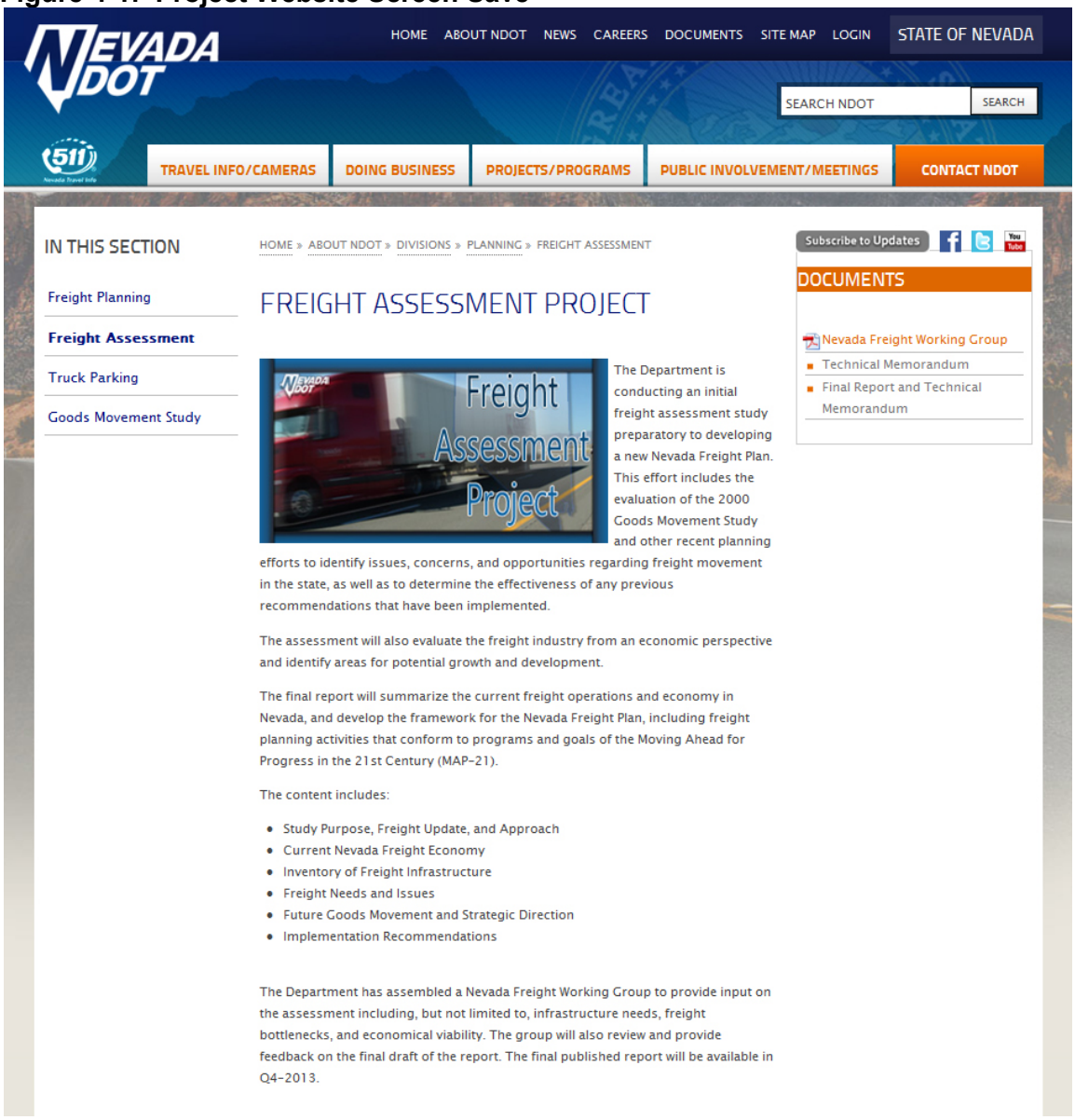
3. One-on-Ones

The stakeholder involvement team conducted seven one-on-one meetings and interviews via teleconference to better understand the activities, operations, and opinions of these organizations and agencies. The Appendix includes the minutes from each meeting, which were furnished to participants for review before being finalized.

4. General Public

A webpage was established on NDOT's website (http://www.nevadadot.com/About_NDOT/NDOT_Divisions/Planning/Freight/Freight_Planning.aspx) to inform the public about this assessment and solicit input. Figure 4-1 shows a project website screen save for the freight assessment study.

Figure 4-1: Project Website Screen Save



B. Goals, Needs, Issues, and Opportunities

MAP-21 established a policy to improve the condition and performance of the national freight network. The focus is economic competitiveness and efficiency, congestion, productivity, safety, security, and resilience for freight movements. The following bullet points by mode are based on input from those identified in Section A of this chapter that offer opportunities for NDOT to explore in the full State Freight Plan.

Highway:

- Capacity: Investigate low-cost improvements to quickly improve roadway capacity on I-80, I-15, US95, and US93, such as: preserving existing pavement; implementing ITS enhancements; implementing traffic signal coordination; adding truck climbing lanes or passing lanes, where needed; advancing measures to reduce rush-hour commuter traffic, etc.
- Capacity: Identify and prioritize construction on I-80, I-15, US95, and US93 roadway segments and linkages that need additional capacity to improve safety, reduce traffic congestion, and improve connectivity, such as the I-80/Rock Boulevard interchange, the USA Parkway extension, Moana Lane/Airway improvements serving Reno-Tahoe International Airport, etc.
- Capacity: Study and work to advance major projects, such as building an I-80 bypass around downtown Reno, advancing an I-15 bypass around downtown Las Vegas, extending I-580 in the Carson City area, expediting Project Neon on I-15 in Las Vegas (especially improvements affecting northbound Tropicana Avenue/Exit 37 to Sahara Avenue/Exit 40), advancing the I-11 corridor study first in the Las Vegas-Phoenix corridor with Arizona's participation and then improving north-south connectivity through Nevada in the Mexico-Canada I-11 study corridor (see Chapter 3, Section A, Subsection 1).
- Truck Safety Improvements: Explore the best locations to provide additional truck parking spaces to be eligible for funding under MAP-21 (Section 1401), Jason's Law. These additional spaces can address existing space limitations and increased truck parking demand, resulting from new federal truck operator requirements.
- Truck Operating Enhancements: Investigate providing online permitting for overdimensional shipments and provide online information on NDOT's website describing route limitations, locations of overpass structures, and other restrictions.
- Truck Operating Enhancements: Consider legislation permitting the use of AutoSock, which is much faster to install than chains for winter weather driving, as other western states, such as California, Colorado, and Washington, now permit with limited restrictions.

Rail:

- Coordination: continue to coordinate with UPPR and BNSF as detailed in the 2012 State Rail Plan to advance identified freight rail priorities, including NDOT rail staffing, multimodal coordination studies, freight rail track improvements, and grade-crossing

improvements. Also, facilitate rail interface for new industrial development in northern and southern Nevada.

Air:

- Air Cargo: work to expand air cargo shipments at Reno-Tahoe International Airport, a designated alternative airport for Air China Cargo shipments, growing the airport into a future dedicated cargo gateway for the western US.
- Fuel Farm Capacity: Advance future East Side Fuel Farm Complex storage capacity with three more 65,000-barrel jet fuel storage tanks at McCarran International Airport.
- Capacity: expand Skywest and other freight shipments out of Elko Regional Airport.

Pipelines:

- Pipeline Capacity: Look to provide support for pipeline expansions and new alignments, where needed, to move needed resources in support of business.

C. Stakeholders to be Contacted during State Freight Plan

The stakeholder team conducted two meetings with the Freight Working Group and one-on-one interviews with seven members of the committee. The data collected from these interactions has provided valuable input on the assessment of Nevada's freight program, including an overview of the issues, needs, and opportunities for the freight infrastructure and the economic outlook for the freight industry. These stakeholders should be re-contacted during the development of the state freight plan.

The stakeholder team recommends engaging a representative cross-section of public and private freight stakeholders to participate in developing the State Freight Plan. Representatives of freight transportation infrastructure; carriers operating on publicly-owned freight infrastructure; shippers and freight forwarders; and state, local, and tribal governments can provide valuable input on the future of freight for Nevada. This collective group can also generate an elite group of volunteers to participate on the State Freight Advisory Committee, pursuant to MAP-21.

The team also recommends contacting additional freight infrastructure owners and users listed in Table 4-4 during the next round of stakeholder involvement.

Table 4-4: Stakeholders to be Contacted in State Freight Plan

First Name	Last Name	Title	Agency/Company
Leo	Penne	Program Dir. Intermodal Activities	AASHTO Freight
Willie	Hargrove	Manager	FedEx Freight
Mike	Skaggs	Executive Director	Nevada Commission on Economic Development
Paul	Enos	CEO	Nevada Trucking Association
John	Amestoy	DBS/NHP Commercial Training Coordinator	NHP
Beth	Xie	Manager of Planning	Regional Transportation Commission of Southern Nevada
Amy	Cummings	Planning Director	Regional Transportation

First Name	Last Name	Title	Agency/Company
			Commission of Washoe County
Carl "Chip"	Mallard	Office of Freight Management and Operations	US DOT
Rod	Schmalhaus	General Transportation Manager	Walmart, Western Regional Operations Center
Barbara	Invanov	Chair	TRB Freight Systems Group
Sacorra	Parmer	Manager	UPS Freight
Kome	Ajise	Planning & Modal Programs Deputy Director	Caltrans
Chris	Cummings	Freight Program Manager	ODOT
Daniel	Kuhn	Railroad & Freight Planner	UDOT
Maureen	Gresham	Senior Transportation Planner	IDOT
Mike	Kies	Assistant Director of Planning & Programming	ADOT
Ed	Hahn	Director, Products Movement	Kinder Morgan Energy Partners
Bruce	Shaw	Senior Vice President	UNEV Pipeline LLC (Holly Energy)
Lance	Gilman	Principal and Director	Tahoe Reno Industrial Center
Liisa	Lawson-Stark	Director of Public Affairs	UPRR
Chris	Bigoness	Manager, Network Development & Merger Customer Access	BNSF
Imee	Osantowski	Chief Engineer	Port of Oakland
Miguel	Reyes	Sr. Trade Development Manager	Port of San Diego
Carlo	Luzzi	Manager of Rail Transportation Engineering	Port of Long Beach
Robert	Skinner	Managing Member	Clean Energy Rail Center

In addition, mining industry leaders with operations in the state of Nevada should also be contacted. The State Rail Plan identified several mining operations (Table 4-5) that currently use rail and trucks to transport materials to their final destinations, and a few that have transload operations.

Table 4-5: Mining Companies Active in Nevada

Company Name	NV City (except as noted)	Company Name	NV City (except as noted)
Allied Nevada Cold Corp.	Winnemucca	Martin Marietta Materials	Sparks
Antler Peak Gold, Inc.	Hawthorne	M-I Swaco	Battle Mountain
Argonaut Gold Inc	Reno	MIN-AD	Winnemucca
Art Wilson Company	Carson City	Moltan Company	Fernley
Atlantic Richfield Company	La Palma, CA	Mud Camp Mining	Amargosa Valley
Baker Hughes Drilling Fluids	Battle Mountain	Nevada Cement Company	Fernley
Barrick Cortez, Inc.	Crescent Valley	Nevada Copper Corp.	Yerington
Barrick Gold Corporation	Golconda	Newcrest Resources, Inc	Sparks
Barrick Gold Corporation	Eureka	Newmont Mining Corp.	Elko
Barrick Gold of North America	Salt Lake City, UT	Newmont Mining Corp.	Midas
Barrick Gold U.S., Inc.	Elko	Newmont Mining Corp.	Battle Mountain
Barrick Goldstrike Mines, Inc.	Elko	Newmont Mining Corporation	Valmy

Company Name	NV City (except as noted)	Company Name	NV City (except as noted)
Chemetail Foote Corporation	Silver Peak	Nutritional Additives Corp.	Winnemucca
Chemical Lime Co.	No. Las Vegas	PABCO Building Products, LLC	Las Vegas
Coeur-Rochester, Inc	Lovelock	Pioneer Gypsum Mining, Inc.	North Las Vegas
CR Reward Corp	Beatty	Premier Chemicals, LLC	Gabbs
EP Minerals, LLC	Lovelock	Queenstake Resources USA, Inc.	Elko
EP Minerals, LLC	Sparks	Rainbow Ridge Opal Mines, Inc.	Denio
Florida Canyon Mining, Inc.	Imlay	Robison Nevada Mining Co.	Ruth
General Moly, Inc	Elko	Rodeo Creek Gold, Inc	Winnemucca
Goldcorp-Marigold Mining Co.	Valmy	Round Mountain Gold Corp	Round Mountain
Graymont Western US, Inc	West Wendover	Standard Gold Mining, Inc.	Imlay
Grefco Minerals, Inc.	Burney, CA	U.S. Gold Corporation	Reno
Gryphon Gold Corporation	Carson City	United States Gypsum Co.	Empire
Halliburton/Baroid	Battle Mountain	Walter Wilson	Denio
Huck Salt Company	Fallon	Wilkin Mining & Trucking, Inc.	Caliente
JR Simplot Company	Overton	Win-Eldrich Mines Ltd.	Grand Junction, CO
Kennecott-Rawhide Mining	Fallon	World Minerals, Inc.	Fernley
Kinross Gold USA, Inc	Reno		

5. Future Goods Movement and Strategic Direction

5: Future Goods Movement and Strategic Direction

This chapter describes future goods movement in Nevada in terms of employment and GDP, stratified by mode and by commodity both outbound and inbound. The chapter also provides strategic direction for advancing Nevada's commodity flows. It concludes with a discussion of funding, tax collection, and tax distributions for goods movement improvements.

A. Future Goods Movement

1. Employment and Gross Domestic Product (GDP) Forecasts

Table 5-1 shows the number of jobs and the percentage of Nevada's total jobs in each key industry in 2012, plus the projected jobs and percentage of total jobs in each key industry in 2022 and 2032, along with the annual growth rate from 2012-2022 and from 2012-2032. All industries are projected to experience positive growth from 2012-2032.

Table 5-1: Employment Baseline and Forecasts

Industry	Employment in thousands of jobs			2012-2022 % Annual Growth	2012-2032 % Annual Growth	Percent of Total		
	2012	2022	2032			2012	2022	2032
Arts, entertainment, accom-modation, food, & hh svcs.*	404	513	611	2.4%	2.1%	26%	26%	26%
Business support services** (prof., mgmt., and admin.)	212	260	299	2.1%	1.7%	14%	13%	13%
Finance, insurance & real estate	196	282	373	3.7%	3.3%	13%	14%	16%
Government	180	214	252	1.8%	1.7%	12%	11%	11%
Retail trade	161	188	212	1.6%	1.4%	10%	10%	9%
Educational, health care, and social services	129	169	223	2.7%	2.8%	8%	9%	9%
Construction	68	120	167	5.8%	4.6%	4%	6%	7%
Transportation	56	70	81	2.2%	1.8%	4%	4%	3%
Manufacturing	43	45	45	0.6%	0.3%	3%	2%	2%
Wholesale trade	36	39	40	0.6%	0.5%	2%	2%	2%
Agriculture, forestry, mining, oil and gas extraction	25	27	26	0.8%	0.2%	2%	1%	1%
Postal service & warehousing	21	25	29	1.9%	1.6%	1%	1%	1%
Media and information	17	21	30	2.2%	2.9%	1%	1%	1%
Utilities	4	5	5	0.9%	1.2%	0%	0%	0%
Total	**1,552**	**1,977**	**2,393**	**2.4%**	**2.2%**	**100%**	**100%**	**100%**

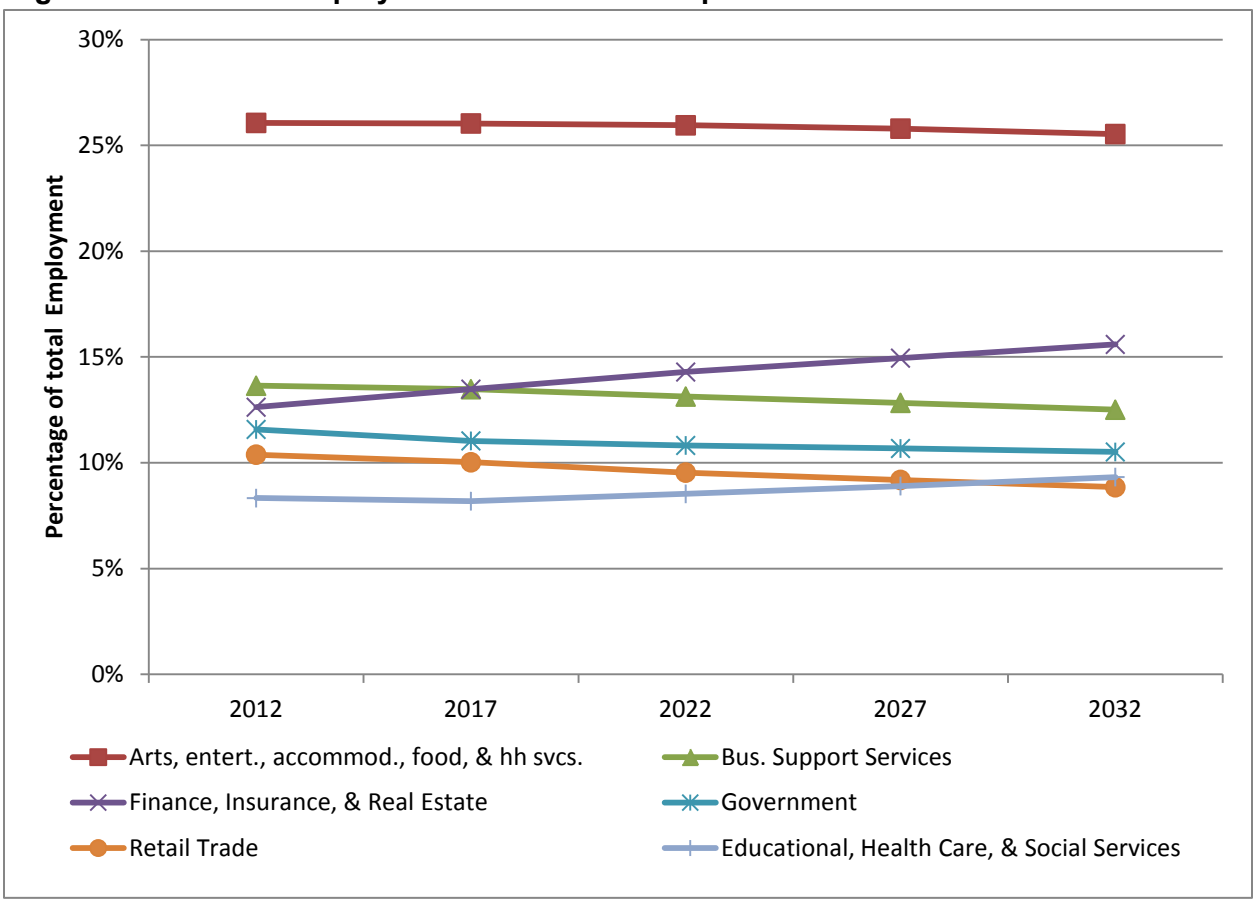
* HH: Household, ** Includes Professional, Management, and Administration Services

Source: Moody's economy.com

Over 80 percent of Nevada's employment was concentrated in the top six major industry sectors in 2012, which continues to be true in 2032. The Arts, Entertainment, Accommodation, Food, & Household Services sector currently employs 404,000 individuals and is expected to remain as the largest industry sector, employing over 611,000 individuals by 2032. This industry encompasses much of the Tourism, Gaming, and Entertainment Cluster identified as a Key

Industry Cluster in the *Unify / Regionalize / Diversify: An Economic Development Agenda for Nevada* report. Finance, Insurance, and Real Estate is projected to experience the highest annual employment growth rate from 2012-2022 at 3.7 percent. The Educational, Health Care, & Social Services industry, which includes the previously-identified Health & Medical Services cluster, is projected to grow annually at 2.7 percent from 2012-2022. Figure 5-1 illustrates employment trends for the top six industry sectors between 2012 and 2032. Finance, Insurance, and Real Estate shows the greatest increase in employment over the 20-year period.

Figure 5-1: Nevada Employment Forecasts for Top Six Industries over 20 Years



The construction industry is projected to grow significantly, at a 5.8 percent annual rate from 2012-2022. Construction had experienced a significant downturn from 2007-2012, with construction jobs declining by 61 percent. Although construction's forecast growth will regain some of these losses, construction is projected to account for only seven percent of total statewide employment by 2032, which is less than its pre-recession high of 10 percent in 2007. Also notable is the forecast growth in Media and Information, which is projected to experience similar growth rates as some of the more dominant industries, such as Business Support Services; although Media and Information accounts for only one percent of total state employment. Additionally, Media and Information corresponds to the Business IT cluster identified previously as having potential for supporting growth and diversification in the Nevada economy.

Table 5-2 shows the GDP in millions of dollars and the percentage of Nevada's total GDP in each key industry in 2012, plus the projected GDP and percentage of total GDP in each key industry in 2022 and 2032, along with the annual growth rate from 2012-2022 and from 2012-2032. GDP is projected to grow in all industries. Additionally, annual GDP growth rates from 2012-2022 are higher, in general, than the corresponding employment growth rate, implying that productivity gains will play an important role in Nevada's future economic competitiveness. Over 75 percent of Nevada's GDP was concentrated in six major industry sectors in 2012 and is projected to fall to 70 percent by 2032, which indicates a degree of diversification in the state's economy. Retail Trade is projected to experience the highest annual GDP growth rate, at 5.4 percent; and Transportation, which currently represents four percent of the economy, is expected to grow 6.9 percent from 2012-2022 to become one of the top six categories in 2032, representing eight percent of the economy.

Table 5-2: GDP Baseline and Forecasts

Industry	GDP (in millions of dollars)			2012-2022 % Annual Growth	2012-2032 % Annual Growth	Percent of Total		
	2012	2022	2032			2012	2022	2032
Arts, entertainmt, accommodations, food, & hh svcs.*	$23,430	$32,717	$44,097	3.4%	3.2%	19%	19%	18%
Finance, insurance & real estate	$21,351	$31,934	$45,865	4.1%	3.9%	17%	18%	19%
Government	$16,167	$20,908	$26,926	2.6%	2.6%	13%	12%	11%
Business support services** (prof., mgmt., & admin.)	$14,239	$16,798	$21,166	1.7%	2.0%	12%	10%	9%
Retail trade	$8,797	$14,821	$23,956	5.4%	5.1%	7%	9%	10%
Educational, health care, social svcs.	$8,042	$9,870	$12,432	2.1%	2.2%	7%	6%	5%
Agriculture, forestry, mining, oil and gas extraction	$6,793	$7,714	$8,983	1.3%	1.4%	6%	4%	4%
Transportation	$5,311	$10,370	$19,961	6.9%	6.8%	4%	6%	8%
Wholesale trade	$4,580	$7,364	$12,033	4.9%	4.9%	4%	4%	5%
Construction	$4,519	$7,072	$10,423	4.6%	4.3%	4%	4%	4%
Manufacturing	$4,316	$6,210	$8,441	3.7%	3.4%	4%	4%	3%
Media and info.	$2,226	$2,979	$4,866	3.0%	4.0%	2%	2%	2%
Utilities	$1,952	$2,967	$4,673	4.3%	4.5%	2%	2%	2%
Postal service & warehousing	$1,259	$2,241	$3,989	5.9%	5.9%	1%	1%	2%
Total	**$122,983**	**$173,963**	**$247,813**	**3.5%**	**3.6%**	**100%**	**100%**	**100%**

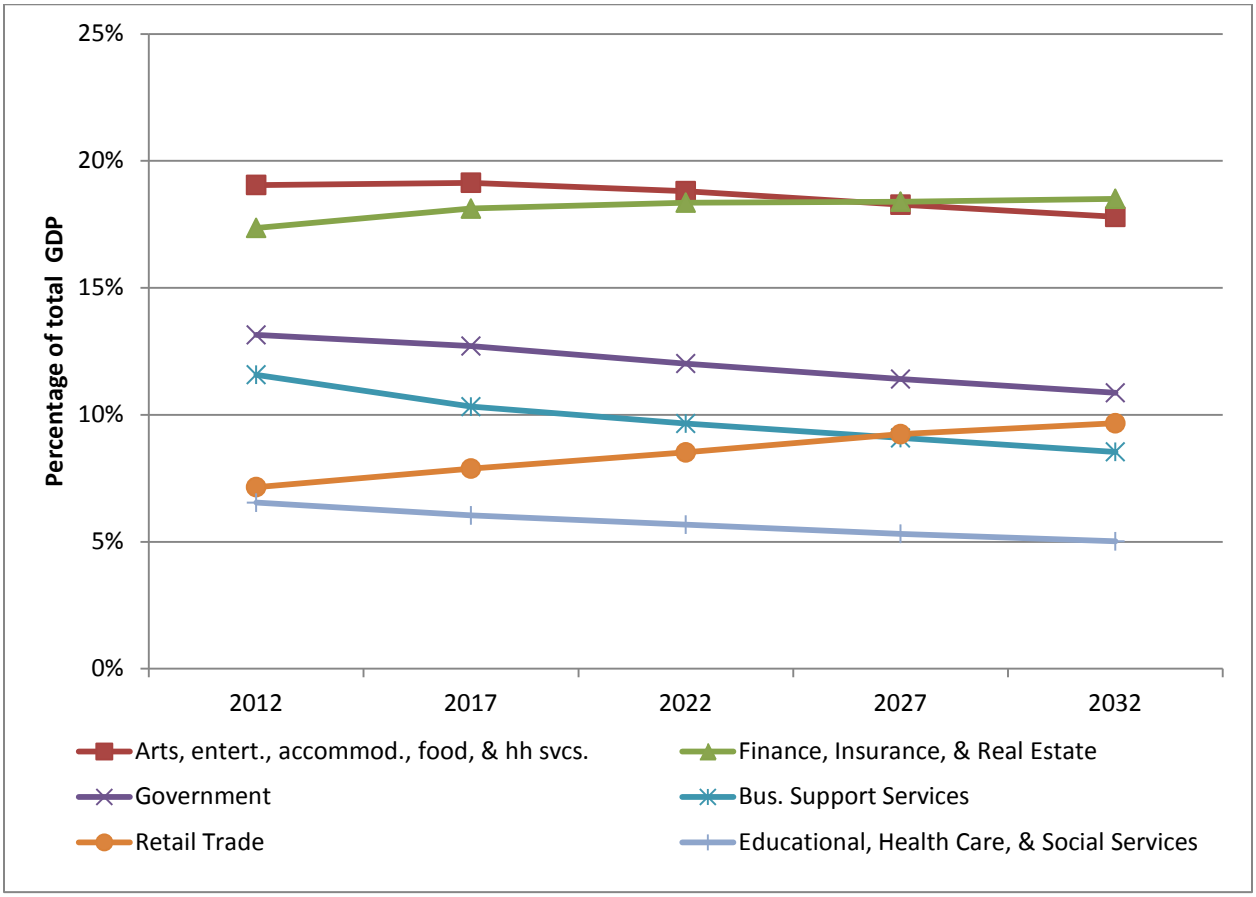
* HH: Household, ** Includes Professional, Management, and Administration Services
Source: Moody's economy.com

The labor-intensive Arts, Entertainment, Accommodation, Food, & Household Services industry sector accounted for 19 percent of the state's GDP in 2012, but it accounted for 26 percent of Nevada's employment in 2012. Conversely, the capital-intensive Agriculture, Forestry, Mining,

Oil & Gas sector accounted for seven percent of the state's GDP in 2012, but only two percent of the state's employment in 2012. This difference calls attention to the high dependence of the mining industry on capital investments in machinery and equipment for production. Construction is projected to grow through 2032; however, as with employment, the forecast GDP in 2032 of over $10 million is still lower than the 2007 pre-recession value of $12 million. Transportation and Postal Service & Warehousing, at 6.9 and 5.9 percent, respectively, are forecast to experience the highest GDP growth rates of the industries listed in the table. These industries correspond to the Logistics & Operations cluster that has been identified as a strategic industry cluster for Nevada's economy.

Figure 5-2 shows the forecast changes in GDP for each of the top six industries in five year increments from 2012 through 2032. Retail growth shows the greatest increase over the 20-year period.

Figure 5-2: Change in GDP Forecasts for Top Six Industries over 20 Years



2. Commodity Forecasts

The above employment and GDP forecasts help frame the expected economic trends and dynamic shifts in the state's economy. Converting these forecasts into tangible commodity movements, expressed in dollars and tonnage (short tons), requires using three sources of data

and applying the process described below to get commodity forecasts by mode, value, tonnage, and time period.

The methodology is based on IMPLAN input-output data, which compiles the latest BEA, BLS, and Census data to determine: (a) which Nevada industries produce which commodities; (b) how Nevada industries and households consume commodities; and (c) trade flow patterns. Trade flow patterns include how much of any commodity is produced or consumed within Nevada versus being imported or exported (with "rest of US"/international splits).

The first step in converting industry forecasts to commodity flows is to reconcile the economic forecasts (Moody's www.economy.com and IMPLAN data for a "base year;" 2011 in the present analysis). This allows the entire input-output structure of Nevada's economy to be forecast into the future. The second step is to translate the forecasted input-output data for industry and household activity in any future year into commodity production and consumption (inbound and outbound in dollar terms and aggregated to SCTG categories). The last step involves applying FAF and Waybill data to split the gross trade flows into mode and trading partner detail, as well as to determine the flow tonnage.

- ***Inbound and Outbound Summary Forecasts by Mode***

Table 5-3 summarizes the forecast value and tonnage of inbound commodities (including imports) by mode. Trucking has a slightly lower overall mode share for goods transported into Nevada, at approximately 80 percent by value and nearly 70 percent by tonnage. The distribution across modes is projected to remain relatively stable in future years, with the most significant change in inbound freight carried by pipeline. Tonnage carried by pipeline is projected to increase from 15.6 percent of the total inbound tonnage in 2012 to 17 percent in 2032.

Table 5-3: Value and Tonnage of Inbound Commodity Flows by Mode, 2012-2032

Inbound Value By Mode (in millions of dollars)							
Year	**Truck**	**Rail**	**Air ***	**Multiple**	**Pipeline**	**Other**	**Total - All Modes**
2012	$45,663	$2,511	$1,216	$2,709	$3,777	$1,093	**$56,971**
2022	$66,148	$3,616	$1,733	$3,855	$5,747	$1,566	**$82,667**
2032	$93,578	$5,039	$2,476	$5,472	$8,751	$2,233	**$117,550**
Inbound Tonnage By Mode (in thousands of short tons)							
Year	**Truck**	**Rail**	**Air***	**Multiple**	**Pipeline**	**Other**	**Total - All Modes**
2012	29,377	6,016	68	167	6,588	135	**42,351**
2022	43,059	8,846	97	237	10,023	193	**62,455**
2032	60,933	12,558	138	336	15,240	271	**89,476**

* Includes truck- air Source: EDRGroup

Table 5-4 summarizes the forecast value and tonnage of outbound commodities (including exports) by mode. More than 86 percent of the export value and 83 percent of the tonnage is carried by truck out of the state. The share carried by truck is forecasted to decline slightly (by one percent in value terms) from 2012 to 2032. The next largest export mode in terms of value is multiple modes (truck-rail). Rail, which usually handles lower value, heavier commodities, is he next largest export mode in terms of tonnage. Rail and multiple modes' overall market share of outbound freight is forecast to increase slightly.

Table 5-4: Value and Tonnage of Outbound Commodity Flows by Mode, 2012-2032

Outbound Value By Mode (in millions of dollars)						
Year	**Truck**	**Rail**	**Air***	**Multiple**	**Other**	**Total - All Modes**
2012	$32,506	$1,069	$492	$1,810	$1,087	**$36,963**
2022	$45,527	$1,579	$712	$2,931	$1,278	**$52,028**
2032	$61,751	$2,202	$1,056	$4,500	$1,543	**$71,053**
Outbound Tonnage By Mode (in thousands of short tons)						
Year	**Truck**	**Rail**	**Air***	**Multiple**	**Other**	**Total - All Modes**
2012	14,588	2,381	26	121	276	**17,393**
2022	18,868	3,120	31	185	287	**22,492**
2032	24,506	4,156	38	290	313	**29,302**

* Includes truck- air Source: EDRGroup

- ***Summary by Directional Flow by Value and Tonnage***

Table 5-5 shows that internal flows of freight by value in Nevada are expected to rise from 32 to 35 percent of total shipments from 2012-2032. Incoming shipments are anticipated to remain at 41 percent of total shipments during the same time period, and consequently outgoing shipments are expected to decline from 27 to 25 percent by 2032. The opposite scenario exists for volume, with internal and outgoing tonnage anticipated to decline by two percent, while incoming volumes are forecasted to increase to 40 percent from 38 percent of all tonnage movements. (A more detailed review of the value and tonnage of commodity movements by mode is included in the next section.)

Table 5-5 Internal, Incoming, and Outgoing Flows by Value and Tonnage
(in millions of dollars and thousands of tons)

Time Period	Internal	Incoming	Outgoing	Combined	Percent Internal	Percent Incoming	Percent Outgoing
2012	$43,996	$56,971	$36,963	$137,929	32%	41%	27%
2022	$65,102	$82,667	$52,028	$199,796	33%	41%	26%
2032	$100,434	$117,550	$71,053	$289,036	35%	41%	25%
2012	51,575	42,351	17,393	111,320	46%	38%	16%
2022	70,106	62,455	22,492	155,053	45%	40%	15%
2032	95,987	89,476	29,302	214,765	45%	42%	14%

Source: EDRGroup

- ***Detail for the Value of Primary Inbound Commodities by Mode***

Table 5-6 through 5-8, respectively, present a detailed account of the value of the top inbound commodities (including imports) by mode for three different time periods. Four to five major commodities were selected for each mode; they combine into a total of 14 commodities, which provide a cross section of commodities, reflecting the majority of transportation movements within the state. These commodities are tracked across the years 2012, 2022, and 2032. Each table is sorted according to value of freight carried by truck, the dominant mode.

The value and tonnage of shipments into Nevada are projected to approximately double over the 2012-2032 period. The modal share for inbound value remains relatively constant from 2012-2032, except for an increase in pipeline use, which is in the coal not-otherwise classified

Table 5-6: Value of Inbound Commodities by Mode, 2012
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total – All Modes
Mixed freight	$6,001	$0	$18	$756	$0	$537	$7,312
Electronics	$3,964	$0	$167	$269	$0	$83	$4,483
Machinery	$3,782	$0	$115	$0	$0	$21	$3,917
Textiles/leather	$2,681	$0	$32	$50	$0	$40	$2,802
Motorized vehicles	$2,378	$75	$56	$698	$0	$122	$3,330
Plastics/rubber	$2,060	$365	$29	$0	$0	$3	$2,457
Pharmaceuticals	$1,910	$0	$150	$0	$0	$0	$2,060
Chemical prods.	$1,499	$1,321	$55	$324	$0	$1	$3,200
Coal-n.e.c.	$1,024	$10	$0	$0	$2,780	$24	$3,837
Precision instruments	$855	$0	$80	$0	$0	$105	$1,039
Printed prods.	$735	$0	$15	$289	$0	$19	$1,058
Gasoline	$653	$5	$0	$0	$872	$0	$1,530
Basic chemicals	$373	$125	$0	$11	$0	$4	$513
Transport equip.	$147	$10	$280	$0	$0	$1	$439
Rest of others	$17,601	$600	$220	$312	$126	$134	$18,994
Total	**$45,663**	**$2,511**	**$1,216**	**$2,709**	**$3,777**	**$1,093**	**$56,971**

* Includes truck- air Source: EDRGroup

Table 5-7: Forecast Value of Inbound Commodities by Mode, 2022
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total – All Modes
Mixed freight	$8,650	$0	$26	$1,095	$0	$773	$10,545
Electronics	$5,765	$0	$244	$400	$0	$118	$6,528
Machinery	$5,503	$0	$166	$0	$0	$30	$5,699
Textiles/leather	$3,756	$0	$45	$70	$0	$56	$3,926
Motorized vehicles	$3,370	$107	$80	$976	$0	$173	$4,706
Plastics/rubber	$3,071	$543	$42	$0	$0	$5	$3,660
Pharmaceuticals	$2,624	$0	$205	$0	$0	$0	$2,830
Chemical prods.	$2,111	$1,857	$77	$455	$0	$1	$4,501
Coal-n.e.c.	$1,546	$15	$0	$0	$4,228	$37	$5,825
Precision instruments	$1,191	$0	$111	$0	$0	$147	$1,449
Printed prods.	$1,023	$0	$21	$397	$0	$26	$1,467
Gasoline	$1,004	$8	$0	$0	$1,323	$0	$2,335
Basic chemicals	$558	$188	$0	$16	$0	$6	$768
Transport equip.	$210	$15	$404	$0	$0	$1	$629
Rest of others	$25,766	$884	$313	$447	$197	$193	$27,799
Total	**$66,148**	**$3,616**	**$1,733**	**$3,855**	**$5,747**	**$1,566**	**$82,667**

* Includes truck- air Source: EDRGroup

Table 5-8: Forecast Value of Inbound Commodities by Mode, 2032
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total - All Modes
Mixed freight	$12,299	$0	$37	$1,535	$0	$1,105	$14,976
Electronics	$8,428	$0	$356	$583	$0	$174	$9,540
Machinery	$7,942	$0	$240	$0	$0	$44	$8,226
Textiles/leather	$5,249	$0	$64	$94	$0	$78	$5,485
Motorized vehicles	$4,682	$148	$111	$1,404	$0	$242	$6,586
Plastics/rubber	$4,346	$769	$60	$0	$0	$7	$5,182
Pharmaceuticals	$3,571	$0	$277	$0	$0	$0	$3,848
Chemical prods.	$2,922	$2,585	$108	$640	$0	$2	$6,257
Coal-n.e.c.	$2,377	$23	$0	$0	$6,417	$53	$8,870
Precision instruments	$1,659	$0	$155	$0	$0	$210	$2,025
Gasoline	$1,515	$12	$0	$0	$2,045	$0	$3,573
Printed prods.	$1,422	$0	$29	$562	$0	$37	$2,049
Basic chemicals	$770	$257	$0	$22	$0	$8	$1,057
Transport equip.	$301	$21	$593	$0	$0	$2	$917
Rest of others	$36,094	$1,224	$447	$633	$288	$272	$38,958
Total	**$93,578**	**$5,039**	**$2,476**	**$5,472**	**$8,751**	**$2,233**	**$117,550**

* Includes truck- air Source: EDRGroup

category (representing natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil)[1] and gasoline commodity classes.

Two-thirds of all inbound freight value fell into one of the 14 commodity categories in 2012. This level dispersion of commodities is projected to remain essentially the same from 2012-2032 for inbound freight movements measured by value. Mixed freight transported by truck continues to be an important and growing commodity with over $6 billion shipped in 2012. The next highest valued commodities are electronics and machinery, which continue to grow and retain their share in future projections.

Tables 5-9 through 5-11 provide detailed commodity information for tonnage of inbound shipments, organized by mode for three time periods. The commodity mix of inbound movements changes when sorted by tonnage instead of by value. Heavier but lower value commodities, such as waste/scrap and other agricultural products are the top two commodities (by tonnage) transported by truck. Inbound shipments of other agricultural products by truck are projected to grow from 2.8 to 6.4 million tons between 2012 and 2032.

Coal and chemical products are the largest rail-transported commodities measured by volume and they are projected to experience significant growth from 2012 to 2032. The non-metal mineral products category is the largest category of inbound air commodities; and motorized vehicles combined with mixed freight are the top two categories by volume that are transported via multiple modes (e.g. truck-rail).

[1] http://ops.fhwa.dot.gov/freight/freight_analysis/faf/faf2userguide/faf2userguide.pdf

Table 5-9: Tonnage of Inbound Commodities by Mode, 2012

(in thousands of short tons)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total – All Modes
Waste/scrap	6,815	50	0	0	0	0	6,865
Other ag prods.	2,860	46	0	0	0	2	2,908
Nonmetal min. prods.	2,282	292	42	1	0	8	2,624
Mixed freight	1,914	0	0	24	0	0	1,939
Other foodstuffs	1,913	58	0	4	0	26	2,001
Gasoline	680	6	0	0	902	0	1,588
Chemical prods.	499	1,003	2	12	0	0	1,517
Coal-n.e.c.	498	15	0	0	5,547	0	6,060
Machinery	374	0	6	0	0	5	386
Electronics	322	0	2	1	0	25	351
Motorized vehicles	244	7	5	69	0	19	344
Fuel oils	158	6	0	0	139	0	304
Coal	83	3,398	0	0	0	0	3,481
Unknown	70	0	0	24	0	0	94
Rest of others	10,664	1,135	10	32	0	49	11891
Total	**29,377**	**6,016**	**68**	**167**	**6,588**	**135**	**42,351**

* Includes truck- air Source: EDRGroup

Table 5-10: Forecast Tonnage of Inbound Commodities by Mode, 2022

(in thousands of short tons)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total – All Modes
Waste/scrap	9,705	75	0	0	0	0	9,780
Other ag prods.	4,503	79	0	0	0	3	4,585
Nonmetal min. prods.	3,286	431	59	1	0	11	3,789
Other foodstuffs	2,776	84	0	6	0	38	2,904
Mixed freight	2,761	0	0	35	0	1	2,797
Gasoline	1,047	9	0	0	1,369	0	2,425
Coal-n.e.c.	757	22	0	0	8,437	0	9,216
Chemical prods.	706	1,410	4	17	0	0	2,136
Machinery	546	0	9	0	0	7	563
Electronics	467	0	4	1	0	36	508
Motorized vehicles	346	10	6	96	0	27	486
Fuel oils	245	9	0	0	218	0	473
Coal	123	5,078	0	0	0	0	5,201
Unknown	101	0	0	35	0	0	136
Rest of others	15,689	1,639	14	46	-	70	17,458
Total	**43,059**	**8,846**	**97**	**237**	**10,023**	**193**	**62,455**

* Includes truck- air Source: EDRGroup

Table 5-11: Forecast Tonnage of Inbound Commodities by Mode, 2032
(in thousands of short tons)

Commodity Description	Truck	Rail	Air*	Multiple	Pipeline	Other	Total – All Modes
Waste/scrap	13,996	101	0	0	0	0	14,097
Other ag. prods.	6,404	111	0	0	0	4	6,519
Nonmetal min. prods.	4,686	604	85	2	0	16	5,392
Mixed freight	3,919	0	0	49	0	1	3,969
Other foodstuffs	3,810	116	0	8	0	52	3,986
Gasoline	1,579	14	0	0	2,114	0	3,707
Coal-n.e.c.	1,149	34	0	0	12,806	0	13,989
Chemical prods.	965	1,962	5	23	0	0	2,955
Machinery	787	0	14	0	0	11	811
Electronics	683	0	5	2	0	53	743
Motorized vehicles	481	14	9	138	0	38	680
Fuel oils	365	14	0	0	319	0	698
Coal	183	7,351	0	0	0	0	7,534
Unknown	145	0	0	49	0	0	194
Rest of others	21,782	2,237	20	64	-	97	24,201
Total	**60,933**	**12,558**	**138**	**336**	**15,240**	**271**	**89,476**

* Includes truck- air Source: EDRGroup

The most significant change in modal split by tonnage is towards the use of pipelines. This increase corresponds to the commodities of coal not-otherwise classified (n.e.c), gasoline, and fuel oils. (Note that fuel oil was not included in the 14 commodities summarized in the three tables above, presenting the value of inbound commodities by mode, yet it is present when measuring commodities by volume.)

- ***Detail for the Value of Primary Outbound Commodities by Mode***

Table 5-12 through Table 5-14, respectively, present a detailed account of the value of the top outbound commodities (including exports) by mode for three time periods. Four to five major commodities were selected for each mode; they combine into a total of 14 commodities, which provide a cross section of commodities, reflecting the majority of transportation movements within the state. These commodities are tracked across the years 2012, 2022, and 2032. Each table is sorted according to value of freight carried by truck, the dominant mode. Outbound freight is forecasted to grow in terms of both value and tonnage.

Approximately 80 percent of the total value of commodities shipped out of the state fall into one of the 14 commodity categories in the three years presented, compared with the two-thirds percentage of inbound shipments, which involve a different set of commodities. Some increased consolidation into the top 14 commodities is forecasted to occur from 2012 to 2032. The top 14 commodities represent 80 percent of all outbound shipments in 2012, and this percentage is expected to rise to 83 percent in 2032.

Shipments of the top commodities carried by truck containing mixed freight and chemical products continue to grow in the future, while metallic ores also experience growth, albeit at a

Table 5-12: Value of Outbound Commodities by Mode, 2012
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Other	Total – All Modes
Metallic ores	$4,625	$0	$0	$0	$0	$4,625
Mixed freight	$3,741	$1	$21	$540	$129	$4,432
Chemical prods.	$3,347	$797	$5	$92	$10	$4,251
Misc. mfg. prods.	$3,076	$0	$150	$39	$25	$3,289
Textiles/leather	$2,614	$0	$30	$169	$11	$2,823
Motorized vehicles	$1,620	$0	$35	$34	$750	$2,439
Electronics	$1,464	$0	$111	$65	$13	$1,653
Plastics/rubber	$1,454	$13	$19	$271	$3	$1,761
Machinery	$1,093	$0	$36	$108	$13	$1,250
Articles-base metal	$1,019	$0	$6	$59	$69	$1,153
Other foodstuffs	$944	$2	$0	$139	$17	$1,102
Nonmetal min. prods.	$272	$79	$0	$0	$1	$353
Unknown	$62	$1	$0	$288	$0	$350
Waste/scrap	$11	$102	$0	$0	$0	$114
Rest of others	$7,164	$73	$78	$7	$46	$7,369
Total	**$32,506**	**$1,069**	**$492**	**$1,810**	**$1,087**	**$36,963**

* Includes truck- air Source: EDRGroup

Table 5-13: Forecast Value of Outbound Commodities by Mode, 2022
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Other	Total – All Modes
Mixed freight	$6,154	$2	$36	$894	$214	$7,299
Chemical prods.	$5,392	$1,212	$7	$148	$17	$6,775
Metallic ores	$5,055	$0	$0	$0	$0	$5,055
Misc. mfg. prods.	$3,490	$0	$162	$47	$28	$3,727
Textiles/leather	$3,044	$0	$34	$195	$12	$3,286
Electronics	$2,584	$0	$198	$104	$21	$2,907
Plastics/rubber	$2,464	$21	$33	$447	$5	$2,970
Machinery	$2,213	$0	$73	$232	$27	$2,545
Articles-base metal	$1,722	$0	$10	$101	$116	$1,950
Motorized vehicles	$1,689	$0	$38	$37	$757	$2,520
Other foodstuffs	$1,538	$4	$0	$241	$26	$1,809
Nonmetal min. prods.	$507	$132	$1	$0	$2	$641
Unknown	$102	$1	$0	$478	$0	$580
Waste/scrap	$16	$135	$0	$0	$0	$151
Rest of others	$9,558	$73	$119	$7	$54	$9,811
Total	**$45,527**	**$1,579**	**$712**	**$2,931**	**$1,278**	**$52,028**

* Includes truck- air Source: EDRGroup

Table 5-14: Forecast Value of Outbound Commodities by Mode, 2032
(in millions of dollars)

Commodity Description	Truck	Rail	Air*	Multiple	Other	Total – All Modes
Mixed freight	$10,117	$3	$59	$1,472	$351	$12,004
Chemical prods.	$7,248	$1,715	$10	$199	$22	$9,195
Metallic ores	$5,591	$0	$0	$0	$0	$5,591
Electronics	$4,887	$0	$378	$182	$38	$5,484
Machinery	$3,951	$0	$129	$426	$49	$4,554
Misc. mfg. prods.	$3,927	$0	$176	$55	$32	$4,190
Plastics/rubber	$3,763	$32	$51	$667	$8	$4,520
Textiles/leather	$3,025	$0	$33	$186	$13	$3,255
Articles-base metal	$2,494	$0	$15	$148	$168	$2,825
Other foodstuffs	$2,080	$5	$0	$332	$34	$2,451
Motorized vehicles	$1,738	$0	$40	$39	$764	$2,581
Nonmetal min. prods.	$777	$192	$1	$0	$3	$973
Unknown	$167	$2	$0	$787	$0	$956
Waste/scrap	$21	$173	$0	$0	$0	$194
Rest of others	$11,965	$81	$165	$8	$62	$12,280
Total	**$61,751**	**$2,202**	**$1,056**	**$4,500**	**$1,543**	**$71,053**

* Includes truck- air Source: EDRGroup

slower pace. The rail mode is forecasted to have the most growth in chemical products, which will more than double from $797 million in 2012 to $1,715 million in 2032. This growth is tied directly into the expanding production that is forecast for this sector.

Growth will also be significant for nonmetallic mineral products carried by rail with $79 million shipped in 2012 and $192 million expected to be shipped in 2032. Electronics are projected to expand more than miscellaneous manufactured products to become the largest commodity group (by value) exported by air in 2032 ($378 million). Outbound shipments carried by multiple modes are forecasted to experience growth in mixed freight and plastics/rubber. Motorized vehicles, the top commodity for the "Other" modal category, (which includes movements that are not elsewhere classified, such as flyaway aircraft and shipments for which the mode cannot be determined) is projected to grow very little from $750 million in 2012 to $764 million in 2032. Mixed freight, by comparison, the second largest commodity group carried by other modes, is forecasted to almost triple from $129 million to $351 million during the same 20-year period.

- ***Detail for Tonnage of Primary Outbound Commodities by Mode***

Tables 5-15 through 5-17 present details of the tonnage (volume) of top outbound commodities by mode. Similar to the previous tables, 14 commodities were selected to represent the top commodities for each mode purpose for 2012, 2022, and 2032. The commodity mix of the top 14 sectors by volume is different when compared to the previous tables ranked by value. For example, miscellaneous manufactured products and nonmetallic mineral products make up a larger portion of the export freight carried by truck, which is attributable to their lower value per ton. In addition, nonmetallic mineral products carried by truck are forecasted to grow by 180 percent from 2012 to 2032.

Table 5-15: Tonnage of Outbound Commodities by Mode, 2012

(in thousands of short tons)

Commodity Description	Truck	Rail	Air *	Multiple	Other	Total – All Modes
Metallic ores	2,852	-	-	-	-	2,852
Misc. mfg. prods.	2,029	-	18	1	25	2,073
Nonmetal min. prods.	1,495	609	0	-	0	2,104
Nonmetallic minerals	1,323	341	-	13	49	1,725
Paper articles	842	-	0	-	6	848
Animal feed	689	-	-	-	-	689
Other foodstuffs	617	4	0	4	14	638
Chemical prods.	586	605	1	2	2	1,196
Mixed freight	461	1	1	42	9	513
Natural sands	343	76	-	-	-	419
Motorized vehicles	213	-	0	1	161	375
Waste/scrap	113	583	-	-	0	697
Gravel	58	76	-	-	-	134
Unknown	54	1	-	42	-	96
Rest of others	2,914	86	6	17	11	3,033
Total	**14,588**	**2,381**	**26**	**121**	**276**	**17,393**

* Includes truck- air Source: EDRGroup

Table 5-16: Forecast Tonnage of Outbound Commodities by Mode, 2022

(in thousands of short tons)

Commodity Description	Truck	Rail	Air*	Multiple	Other	Total – All Modes
Metallic ores	3,113	0	0	0	0	3,113
Nonmetal min. prods.	2,766	1,013	0	0	0	3,780
Misc. mfg. prods.	2,199	0	20	1	28	2,248
Animal feed	1,128	0	0	0	0	1,128
Paper articles	1,082	0	0	0	8	1,090
Other foodstuffs	982	7	0	7	20	1,016
Chemical prods.	945	920	1	3	4	1,873
Nonmetallic minerals	944	192	0	7	33	1,176
Mixed freight	756	1	2	69	15	843
Natural sands	246	55	0	0	0	301
Motorized vehicles	223	0	0	1	163	387
Waste/scrap	165	770	0	0	0	935
Unknown	89	1	0	69	0	159
Gravel	41	55	0	0	0	95
Rest of others	4,192	106	8	27	16	4,349
Total	**18,868**	**3,120**	**31**	**185**	**287**	**22,492**

* Includes truck- air Source: EDRGroup

Table 5-17: Forecast Tonnage of Outbound Commodities by Mode, 2032
(in thousands of short tons)

Commodity Description	Truck	Rail	Air*	Multiple	Other	Total – All Modes
Nonmetal min. prods.	4,231	1,474	0	0	0	5,705
Metallic ores	3,465	0	0	0	0	3,465
Misc. mfg. prods.	2,390	0	21	2	32	2,445
Animal feed	1,892	0	0	0	0	1,892
Other foodstuffs	1,318	10	0	10	27	1,365
Chemical prods.	1,269	1,302	1	5	5	2,582
Paper articles	1,243	0	0	0	9	1,252
Mixed freight	1,242	2	3	114	24	1,385
Nonmetallic minerals	826	158	0	6	29	1,019
Motorized vehicles	230	0	0	1	164	396
Waste/scrap	218	983	0	0	0	1,202
Natural sands	218	49	0	0	0	266
Unknown	146	2	0	114	0	262
Gravel	36	49	0	0	0	85
Rest of others	5,780	128	12	39	22	5,981
Total	**24,506**	**4,156**	**38**	**290**	**313**	**29,302**

* Includes truck- air Source: EDRGroup

Rail is projected to see a reduction in the tonnage of nonmetallic minerals shipments from 341,000 tons in 2012 to 158,000 tons in 2032. Non-metal mineral products on the other hand are forecasted to more than double from 609,000 tons to 1.4 million tons during the same time period. The top commodities for air freight calculated by weight are significantly different than those calculated by value because of the tendency for air freight to carry high value (and low weight) goods. The majority of volume shipped via air is for miscellaneous manufacturing with 18,000 tons transported in 2012 and over 21,000 tons expected to ship in 2032.

Similar to ranking by value, mixed freight is again the largest commodity group exported by multiple modes with 42,000 tons transported in 2012 and 114,000 tons expected to be shipped in 2032. Slow growth in outbound shipments of motorized vehicle is similarly expected to occur along with fast growth in mixed freight carried by other modes.

B. Strategic Direction

MAP-21 guidance for projects to improve performance and conditions call for those projects to increase economic competitiveness and efficiency, reduce congestion, and improve productivity. Infrastructure investments currently identified in this study (see Chapter 4 Section B) are in a nascent and sketch-level state; however, potential impacts on Nevada's economy can still be evaluated within reasonable ranges.

The Strategic Highway Research Program II (SHRP2) project C03, which EDRGroup and its affiliates prepared, conducted over 100 case studies across various regions, project types, and economic settings to determine the estimated economic impacts of the projects on the regional economies several years after project completion. The results of this effort produced a rich

source of data to assist stakeholders, elected officials, and community members in understanding the range of likely impacts from a variety of different types of projects when these projects are at the initial phases of planning and discussion. The case studies and supporting data are located on the website http://TPICS.us, which stands for Transportation Planning Impact Case Studies (TPICS). In addition to providing detailed information for each individual case study, users can select specific project characteristics to determine the potential impacts associated with each project.

The characteristics of the potential Nevada projects in Chapter 4 suggested the types of TPICS projects that best match Nevada's proposed projects. Table 5-18 lists each project type, the high and low estimates for job, wage, and business sales impact, as well as the average construction cost and job impacts attributable to construction. These economic impacts include multiplier or "spin-off" effects, including the additional economic activity that comes from purchasing goods and supplies from supporting businesses, as well as employee spending.

Table 5-18: Potential Impacts of Highway and Intermodal Projects
(in millions of 2012 dollars)

Project Type	Project Cost	Jobs		Jobs per million dollars		Wages		Business Sales		Construc-tion Impacts
		Low	High	Low	High	Low	High	Low	High	Jobs
Connector	$590	31,760	52,930	54	90	$1,839	$3,065	$5,034	$8,390	6,580
Widening	$1,235	13,470	22,450	11	18	$780	$1,300	$2,135	$3,559	13,780
Bypass	$153	5,730	9,550	37	62	$332	$553	$908	$1,513	1,710
Access Road	$136	4,650	7,760	34	57	$269	$449	$738	$1,229	1,520
Limited Access Road	$382	4,300	7,160	11	19	$249	$415	$681	$10,733	4,260
Passenger Intermodal	$215	3,572		17		$219		$739		N/A
Freight Intermodal	$324	7,331		23		$423		$1,327		N/A

The greatest ranges of impacts come from Connector and Widening projects, although these projects also have the highest costs. The number of jobs generated per one million dollars of cost for each project type suggests that Widening and Limited Access roads are on the lower tier of impacts, when compared to other project types. Wages and Business sales impacts are also evaluated by project type and the last two columns include average business sales (output) and the number of jobs created by the construction activity. Passenger and Freight intermodal have a weighted average impact instead of a range for job, wages, and business sale impact estimates.

The information in Figure 5-18 is designed to gauge the range of potential impacts that can be expected by project type for both travel efficiency improvements, as well as construction impacts, when evaluating investment opportunities for Nevada's freight infrastructure. Specific project proposals should be evaluated in more detail as more information is developed in the planning process.

C. Funding, Tax Collections, and Distributions

This section highlights multiple transportation funding sources, which Nevada can use to fund future goods movement and strategic direction implementation; and it summarizes current Nevada tax collections and distributions for transportation projects, including freight shipments.

1. Potential Funding Sources

Federal Funding: The MAP-21 Act was signed into law on July 6, 2012 to address funding, authorization, and transportation policy for FY2013 and FY2014. It consolidated virtually all of the previous federal highway funding programs into five formula programs, each of which requires a non-federal five-percent match. These five programs as they apply in Nevada are:

- **National Highway Performance Program (NHPP):** The NHPP funding-eligible network in Nevada includes the interstate highways, strategic defense highways and connectors, unbuilt National Highway System routes, and MAP-21 principal arterials. Nevada is authorized to spend about $182 million per year on the NHPP network for maintenance, for construction of new facilities, and for investments in highway construction to achieve performance targets for a statewide Asset Management Plan.

- **Surface Transportation Program (STP):** STP funding provides Nevada with an annual average of $86 million in flexible funding, 50 percent of which is distributed based on population, for state and local projects that preserve or improve conditions and performance on eligible highways, bridges, plus non-motorized transportation and transit projects and facilities.

- **Highway Safety Improvement Program (HSIP):** HSIP provides Nevada with an average of $31 million annually for safety improvements identified in the state's Strategic Highway Safety Plan (SHSP).

- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** This program provides Nevada with a flexible funding source averaging $31 million per year for state and local projects addressing the Clean Air Act. The objective is to reduce congestion and improve air quality in locations that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter in nonattainment and maintenance areas.

- **Transportation Alternatives Program (TA):** Nevada receives about $4.8 million annually under this program, 50 percent of which is allocated based on population. The funding is used for recreational trails, transportation enhancements, the state's safe-routes-to-school program, etc.

A number of federal grants and loans, as well as freight rail project financing programs, may also be used to support freight infrastructure development, including the following:

- **Transportation Infrastructure Finance Improvement Act (TIFIA) Loans and Credits:** The TIFIA program provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA credit assistance provides improved access to capital markets, flexible repayment terms, and potentially more favorable interest rates than can be found in private capital markets for similar instruments. TIFIA can help advance qualified, large projects that otherwise might be delayed or deferred because of size, complexity, or uncertainty over the timing of revenues. Each dollar of federal funds can provide up to $10 million in TIFIA credit assistance and leverage $30 million in transportation infrastructure investment. TIFIA is not a funding source, but a method of financing projects through assisted borrowing. The interest rate for a 35-year TIFIA loan was 3.75 percent as of September 23, 2013.

  In addition to large surface transportation projects, public freight rail facilities, private facilities providing public benefit for highway users, intermodal freight transfer facilities, projects that provide access to such facilities, and service improvements (including capital investments for intelligent transportation systems) at such facilities are also eligible for TIFIA assistance.

  The city of Reno obtained $73.5 million in TIFIA financing for ReTRAC, which accounts for roughly 28 percent of total project cost. The TIFIA loans were secured by hotel room tax and sales tax receipts, prior to a restructuring executed in 2006, which enhanced the leverage and improved the all-interest cost while extending the payback period. Reno repaid the original $50.5 million loan with interest in 2006.

- **Railroad Rehabilitation Improvement Financing (RRIF):** The RRIF program provides direct federal loans and loan guarantees to finance railroad infrastructure development or to refinance outstanding debt for such projects. The program can be used for up to 100 percent of project costs for projects up to $35 billion in size with repayment periods of up to 35 years with interest rates equal to the government's cost of borrowing. Up to $7 billion is reserved for projects benefiting freight railroads other than Class I carriers. This program, which requires that projects have fulfilled their NEPA obligations, has primarily funded freight railroads to date; it can be used to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings, and shops.

- **Railroad Rehabilitation and Repair Program (RRR):** This program authorizes the US DOT Secretary to provide $20 million in grants to states applying for FRA RRR funding to cover up to 80 percent of the cost of a project to repair and rehabilitate Class II and Class III railroad infrastructure that suffer damage from hurricanes, floods, and natural

disasters, provided that the infrastructure is located in a county that the President designates as a Disaster Declaration for Public Assistance county. Class II and Class III railroad infrastructure eligible for repair and rehabilitation consists of railroad rights-of-way, bridges, signals, and other infrastructure that are part of the general railroad system of transportation and primarily used to move freight traffic. Non-federal sources in the form of cash, equipment, or supplies must cover at least 20 percent of the cost of eligible repair and rehabilitation projects.

- **Rail Line Relocation and Improvement Capital Grant Program (RLR):** States, political subdivisions of states (such as a city or county), and the District of Columbia are eligible for RLR grants. Most of this program's funds are earmarked for specific projects, with the remainder available for competitive grants. Pre-construction activities (e.g., preliminary engineering, design, and costs associated with project-level NEPA compliance), are considered part of construction and, are therefore eligible for funding; however, activities, such as planning studies and feasibility analyses, are not eligible for funding. Grants may only be awarded for construction projects that improve the route or structure of a rail line and: (i) are carried out for the purpose of mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic development; or (ii) involve a lateral or vertical relocation of any portion of the rail line.

- **Transportation Investment Generating Economic Recovery (TIGER) Grants:** TIGER grant funding is awarded through a competitive selection process; the FY2013 TIGER V grant process, the fifth round of these discretionary grants, resulted in 52 projects being awarded to 37 states for a total of $474 million. Nevada's Pyramid Lake Paiute Tribe received just under $3 million for its Pelican Point Roads project as part of the TIGER V round. Applicants must demonstrate potential project benefits for multimodal connections, economic competitiveness, readiness, travel time efficiencies, safety, reductions in fuel consumption, and decreases in vehicle emissions. Each applicant can submit up to three separate applications.

- **Grants to Public Works and Economic Development Facilities and Economic Adjustment Assistance—Economic Development Administration (EDA) Grants:** These EDA grants from the US Department of Commerce are another federal funding possibility. These programs are intended, respectively, to promote long-term economic development in areas experiencing substantial economic distress, and to assist states and local interests with strategies to bring about a change in the economy, focusing on areas under serious economic damage.

- **Railway-Highway Crossing Hazard Elimination in High-Speed Rail Corridors:** This program has provided funding exclusively for improvements in highway-rail grade crossings on federally-designated high speed rail corridors. Proposed projects are

expected to improve the safety of or to eliminate a hazard at a public or private rail-highway grade crossing.

- **Freight Intermodal Distribution Pilot Program:** The freight intermodal distribution pilot program has provided grants up to one million dollars per project per year to develop intermodal freight facilities. The grants provide capital funds to address freight distribution and infrastructure needs at intermodal freight facilities.

- **US Department of Agriculture (USDA) Community Facilities Direct and Guaranteed Loans:** The USDA Rural Housing Service's Community Facility Program offers loans to: construct, enlarge, extend, or improve community facilities; provide essential services; and/or improve safety in rural areas and towns with a population of 20,000 or less. Eligible transportation-related community facilities include transportation infrastructure for industrial parks and railroads.

- **US Internal Revenue Service (IRS) Railroad Track Maintenance Tax Credit:** The Railroad Track Maintenance Credit authorized under Section 45G of the Internal Revenue Code provides tax credits to qualified taxpayers for expenditures on railroad track maintenance on trackage that Class II or Class III railroads own or lease. The amount of the tax credit provided can equal up to 50 percent of the qualified railroad track maintenance and rehabilitation expenditures. Qualified railroad track expenditures include all expenditures for maintaining and rehabilitating railroad track, involving roadbed, bridges, and related track structures. Eligible taxpayers qualifying for this credit include any Class II or Class III railroad and any person transporting property on a Class II or Class III railroad facility, or furnishing railroad-related property or services to a Class II or a Class III railroad on miles of track that the railroad has assigned to that person. The maximum credit allowed under this program is $3,500 per mile of railroad track owned, leased, or assigned to an eligible taxpayer. The credits can be carried forward for a 20-year period for eligible taxpayers who do not have enough taxable income to make full utilization of the credit.

Federal funding for airside airport improvements includes Federal Aviation Administration (FAA) funds for runways, taxiways and associated aviation support infrastructure, such as apron construction, fire and crash rescue equipment, and installation of lighting and navigation landing lights, funded through the National Plan of Integrated Airport System (NPIAS). Federal Airport Improvement Program (AIP) funds provide 95 percent of the cost and Nevada matches with five percent non-federal funds. These projects are typically not included in Nevada's STIP, while landside projects, such as roadway access, typically are included in the STIP. FAA also provides funding for statewide and regional airport system plans. Airports that are ineligible for FAA funding are funded through county, airport authority, or local sources.

State Funding: Nevada principally uses vehicle fuel tax and registration fees to fund its transportation projects; no general fund revenue is used. User fees, such as hotel, rental car, or parking, and vehicle registration can also be used to secure Nevada state-issued bonds.

Current statutes limit maturities for revenue bonds backed by sales and gas tax revenues to 20 years.

The majority of funding and loan programs in other states are dedicated to freight rail and use differing strategies to support developing, building, and rehabilitating rail. Neighboring-state Oregon's program offers a good example for Nevada. Oregon selects its projects based on a review of: whether the project reduces transportation cost for Oregon businesses; whether it benefits or connects two or more modes; whether it is a critical link in a statewide or regional transportation system; how much of the cost can be borne by applicants; whether the project creates construction and permanent jobs in the state; and whether the project is ready for construction.

Local Funding: Local sources are used primarily for improving the mobility of local residents, which largely involves passenger rail projects, although they can be used for freight projects (e.g., grade-crossing improvements, rail relocation projects, etc.). Potential sources of local funding can include the following:

- **Bonds:** Locally-issued bonds can be backed by general-fund revenues, property taxes, sales taxes, or impact fees that are charged to developers, and other user fees;
- **Tax Increment Financing (TIF):** TIF is a local economic development financing tool used at the discretion of the municipality in conjunction with other local taxing authorities, e.g., county governments, community college districts, school, and hospital districts, etc.; and
- **Donation:** Land and/or buildings that local governments own, which are located on or adjacent to a transportation facility can be donated to encourage development, which can generate property and sales tax revenues.

2. Current Tax Collections

Nevada collects gas taxes and user fees to fund its roadway infrastructure. The state's current gas tax rate is 24.805 cents per gallon, of which 17.65 cents goes to the state, 6.35 cents goes to counties and cities, 0.75 cents goes to the State Petroleum Clean-up Trust Fund, and 0.055 cents goes to inspection fees for imported gasoline.

In addition, counties with less than 400,000 residents may impose an optional gas tax of nine cents per gallon that can be indexed to inflation, which Washoe County does. Clark County was enabled in 2013 to index its current non-aviation motor vehicle tax against the producer price index (PPI) 10-year rolling average for a three-year period beginning in January 2014 and continuing into subsequent years with voter approval. The first three years are expected to increase fuel taxes by three to three and one-half cents per year, resulting in cumulative $25 million increases in receipts in each of the three years. Bonding against the third-year $75 million in receipts could raise $700 million. Voters will be asked to implement a statewide index of state fuel taxes in 2016.

3. Tax Distributions

Nevada distributes its federal funds for transportation projects as given in Table 5-19. State funds for FY2013, involving $10.5 million, include $10 million for Betterments/Districts and $0.5 million for Hydraulics.

Table 5-19: Nevada Federal Tax Distributions by Program and by Allocation

FY2014 Program Allocation	Dollars (in millions)	Percentage	FY2013 Funding Allocation	Dollars (in millions)	Percentage
NHPP	$186	66%	Project Management	$90	39%
STP SW	$48	17%	Roadway	$84	37%
STP 5-200K & STP <5,000	$10	4%	Safety	$22	9%
Safety	$25	9%	Structures	$18	8%
CMAQ	-	0%	Traffic Operations	$9	4%
TAP	$11	4%	Planning	$7	3%
Total	**$280**	**100%**	**Total**	**$230**	**100%**

6. Implementation Recommendations

6: Implementation Recommendations

This concluding report section reviews Nevada's existing project development processes, discusses highlights in proposed agency approaches and guidance (notably, MAP-21), which calls for more detailed recommendations than the generalized ones included in the *2000 Study*, and provides recommendations for implementing Nevada's upcoming state freight plan.

A. Existing NDOT Processes

Nevada has a Statewide Transportation Improvement Program (STIP), which includes a four-year list of federally-funded and non-federally-funded transportation projects, which are consistent with the statewide transportation plan. The STIP is updated annually; and it includes an accompanying Annual Work Program, which provides a schedule of projects to be built throughout the state. Each implementing agency is responsible for prioritizing the funds it controls; eligible metropolitan planning organizations (MPOs) can prioritize NDOT-allocated local Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds. NDOT's goal is to provide maximum flexibility to encourage implementing agencies to address their transportation needs. The STIP and Work Program are included in the state's Transportation System Projects (TSP) document. Figure 6-1 shows the STIP development process.

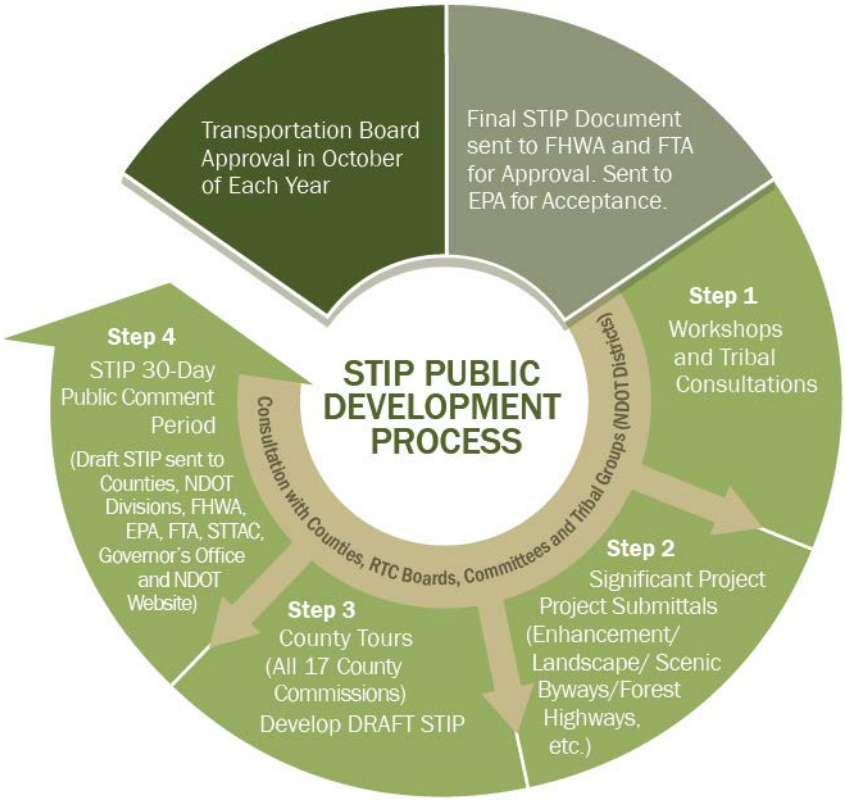


Figure 6-1: STIP Public Development Process

The STIP is a bottom-up process developed in cooperation with towns, counties, state agencies, Native American tribes, etc. in rural parts of the state, and with MPOs, including RTC

of Southern Nevada, RTC of Washoe County, Carson Area MPO (CAMPO), and Tahoe MPO (TMPO). The projects that are submitted for consideration are organized and sequenced. The final list becomes the Work Program and part of the STIP. After the NDOT Board of Directors officially accepts the STIP, it is submitted to the relevant federal agencies involved in funding the projects, such as the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), as well as to the US Environmental Protection Agency (EPA).

The STIP process typically starts with a Project Submittal Application. Federal and state agencies, counties, cities, local governments, local public agencies, Native American tribal governments, and not-for-profit entities may submit projects for consideration. An evaluation committee ranks submittals into high, medium, and low categories. The high-ranked projects are eligible for funding. NDOT's Director notifies each MPO by November 1 of the funds available for its prioritization; and each implementing agency identifies its capacity increasing projects by January 1 and advises the MPOs and NDOT. Then the process is advanced as follows:

January and February each year are the beginning of the submittal process. Workshops are held in small urban areas of populations less than 50,000. Invitations to the workshops are mailed to local public entities and to tribal agencies throughout the state. The workshops are held to educate the agencies about NDOT's various programs for funding transportation improvement projects and to provide assistance in completing the application forms.

NDOT and each MPO, with the assistance of any interested implementing agency, prioritize all the capacity-increasing projects, assign fund categories to each project, and resolve any priority issues by March 1. Then, the MPO completes an air quality conformity analysis by March 31 for each of the projects to be implemented in its area over the four-year period of the STIP and of the Regional Transportation Improvement Program (RTIP).

Each MPO and NDOT agrees by April 30 to a draft list of transportation projects for the next fiscal year, which are included in the proposed Work Program. This document incorporates all of the projects from the rural/local agencies, tribal governments, and the four MPOs.

NDOT conducts consultations with the 14 rural/non-MPO counties and with the MPOs by July 1; and each MPO concurrently completes its respective public participation process. Each MPO approves its part of the STIP/RTIP and obtains the Governor's approval by July 30, followed by an RTIP submittal to FHWA for concurrence in the air quality determination.

Nevada's 23 federally-recognized tribes are invited to attend Tribal consultation meetings in each of the three highway district offices.

All consultation meetings have a published agenda and are open to the public. Participants are encouraged to ask questions, comment, and raise issues about the proposed Work Program.

At the end of the consultation meeting, each entity (such as, a County Commission) is asked to approve the draft TSP plan in its entirety, or with noted exceptions.

The draft TSP plan is then presented to the Statewide Transportation Technical Advisory Committee (STTAC). Meetings are open to the public and include a published agenda. The STTAC, which includes representatives from federal, local, tribal, and state agencies/entities, serves as an advisory board to NDOT's Director and to the State Transportation Board. A "final draft" is prepared once comments are received from all parties; and it is distributed to each of the participants in the process.

Notices are published in local newspapers throughout the state announcing the draft TSP. Comments on the "final draft" document are requested by the end of August and are taken into consideration in preparing the final document. The final document is submitted to the State Transportation Board in September each year for approval of the Work Program. NDOT's Board of Directors approves the NDOT portion of the STIP and accepts the MPO's STIP/RTIP components by September 30.

NDOT applies an administrative modification process to address lesser changes in funding categories and priorities requiring changes in the STIP/RTIP; and the Department applies a four-to-six-month amendment process to address significant changes in the STIP/RTIP.

NDOT is engaged in an ongoing review of its current project development process to develop additional decision-support data and to incorporate a multi-discipline staff-level review of potential projects.

In addition, Nevada has a well-developed rail-highway grade crossing program. This program secures federal funding and applies a railroad company match to improve grade crossings statewide, almost all of which are located on UPRR-owned or operated rail lines. NDOT typically receives $1.1 million in federal Section 130 funding annually, half of which goes for hazard elimination and half goes towards signal improvements. Projects can be funded with up to 90 percent federal Section 130 funding with a minimum local match of 10 percent, for which Nevada applies the railroad company funding. The state does not contribute to the capital cost of the grade-crossing improvements.

B. State Freight Plan Recommendations

This section provides three key components that NDOT will need to address as the Department pursues the preparation of a statewide freight plan in compliance with MAP-21.

1) First is compliance with October 2012 MAP-21 guidance, and any subsequent guidance, addressing the required contents and order of presentation for the plan, as well as development of State Freight Advisory Committees.

2) Refinement of performance measure indicators that the Department will want to apply to this assessment's initial list of projects given in Chapter 4 Section B and to additional projects resulting from the expanded outreach efforts to be applied to the freight plan preparation.

3) A listing of recommendations for preparing and completing Nevada's state freight plan.

1. Agency Guidance on MAP-21

The USDOT issued interim guidance in October 2012 for assembling State Freight Advisory Committees and comprehensive State Freight Plans, which are called for in MAP-21 (Section 1117 and 1118, respectively). The State Freight Advisory Committees are to include a representative cross-section of public and private freight stakeholders, including shippers, carriers, and infrastructure owners and operators, whose perspectives and knowledge can enhance the plans. These committees are charged with providing advice, serving as a forum for discussion, communicating and coordinating with other organizations, promoting the sharing of information between the public and privates sectors, and participating in developing the plan.

The state freight plans are intended to outline immediate and long-range plans for freight-related transportation investments in each state. The guidance includes suggested minimum plan contents, noting that the freight plan may either be developed separately from or incorporated into the state's required statewide strategic long-range transportation plan.

The state freight plans are to be organized according to the 11 components given in Table 6-1.

Significantly, although MAP-21 does not provide any formula or discretionary funding to implement the plans, Section 1116 of MAP-21 authorizes the USDOT Secretary to increase the federal funding share to 95 percent on interstate highway projects and to 90 percent on other certified projects, if the proposed project is included in the statewide freight plan and it improves the efficient movement of freight, including making progress on MAP-21 freight performance measures.

The purpose for the MAP-21 freight planning legislation is to place attention on safe and efficient transportation for the purpose of increasing economic growth in the US. Thus, the freight plans are to identify those transportation facilities that are critical to the state's economic growth and that prioritize investments in those facilities. The plans can help to achieve other strategic goals, such as achieving safety, state of good repair, livability, and environmental sustainability. Freight plans can also address improving transportation facilities that are critical to export movements.

2. Performance Indicators

Table 6-2 presents a series of performance measure indicators that can be refined for use in developing the state freight plan. Specific measures are presented along with multiple indicators for each. They address each of the modes with the exception of pipelines, which require a different approach. Pipelines and their terminal facilities are defined by their capacity and safety considerations and can be measured by their potential to safely satisfy existing and future user requirements. The USDOT's Pipeline and Hazardous Material Safety Administration (PHMSA) monitors pipelines.

Table 6-1: MAP-21 Freight Plan Components

No.	Descriptor	Highlights
1	Strategic Goals	Define how the state meets federal and state strategic goals, including improving economic efficiency, productivity, and competitiveness; reducing congestion; improving safety, security, and resilience; improving the state of good repair; using advanced technology, etc.; and reducing adverse environmental and community impacts.
2	The Economic Context of Freight Transportation Planning	Identify the state's most important industries and its most important supply chains, especially for exports.
3	Freight Policies, Strategies, and Institutions	Includes discussion of state freight funding, freight-related state institutions, their governance and funding, private transportation infrastructure owners, state freight funding constraints, regional freight planning, and the state's freight transportation infrastructure development priorities.
4	State Freight Transportation Assets	Inventory state freight transportation assets for all modes, noting especially energy development, mining, agriculture, and timber production, plus the routes used to move these commodities.
5	The Conditions and Performance of the State's Freight Transportation System	Identify transportation bottlenecks and facilities not in a good state of repair, or that create safety hazards, or have other performance problems. Define how well the freight transportation system achieves state freight transportation goals. Identify measures that reduce: crashes, fatalities, injuries; delay and congestion; and vehicle operating costs.
6	Freight Forecast	Prepare a 20-year forecast of freight transportation demands for each mode and commodity classification for internal, inbound, and outbound shipments.
7	Overview of Trends, Needs, and Issues	Include consideration of how emerging trends affect the significance of needs and issues and how to address them.
8	Strengths and Problems of the State's Freight Transportation System	Identify the strengths of the state's freight system to be preserved and existing or anticipated problems to be solved.
9	The State's Decision-Making Process	Describe: outreach efforts; coordination with other states and with metropolitan areas; and economic analyses
10	The State's Freight Improvement Strategy	Address freight mobility issues and the state's complete, prioritized freight improvement strategy, plus describe how the freight plan relates to other state plans and to adjacent state plans
11	Implementation Plan	Provide: an implementation plan with a schedule; funding consideration; and potential revenue-generating projects and proposed partners

Preparation of the state freight plan should also take into consideration the recommended national-level performance measures included in the findings of the American Association of State Highway & Transportation Officials (AASHTO) Standing Committee on Performance Management (SCOPM), which was prepared in response to MAP-21 and submitted to the USDOT on November 9, 2012. These recommended measures are expected to influence the USDOT's MAP-21 performance measures. Useful information on these findings is included the organization's website (http://scopm.transportation.org/Pages/default.aspx).

Table 6-2: Performance Measure Indicators

No.	Measure	Mode	Indicator
1	Services Provided	--Truck	--Gross Vehicle Trips --Freight US Tons Moved --Vehicle Miles Traveled
2	Mobility Performance	--Rail	--Average Speed per Vehicle --Congestion Delay Index --Reliability/Buffer Time Index --Passenger Occupancy per Vehicle --Freight US Tons per Vehicle
3	Accessibility Performance	--Multiple Modes	--Local Population Market --Same-Day-Delivery Market --Terminal Access Time
4	Safety Performance		--Fatality Collisions --Injury Collisions --Property Damage Collisions --Total Collisions per Vehicle
5	Resource Impacts		--Fuel Use --Vehicle Operating Cost --Air Pollution (Cost Value)
6	User Choice Performance	--Air	--Share of Vehicles --Share of Freight US Tons
7	Operating Efficiency		--Cost per Vehicle Trip --Cost per VMT
8	Fiscal Impact		--Fare and Toll Revenue --Federal Tax --State Tax --Other Tax or Fee Revenue

3. Plan Preparation Recommendations

This Nevada freight assessment document provides a comprehensive basis for NDOT to pursue preparing a state freight plan. The preceding subsection defines what needs to go into the Nevada State Freight Plan. The following six steps, which relate to the materials presented throughout this assessment, can serve as a guidepost for the Department to pursue preparing the Nevada Statewide Freight Plan.

1) Chapter 1 provides a background comparison of goods movement from the *2000 Study*. The changes between the 1997 and 2011 findings presented in this chapter can provide fruitful topics for further study of specific modal flows in the state freight plan.

2) Chapter 2 provides a detailed description of the state's existing freight economy, including trends in employment and GDP over the last 20 years. It identifies the state's key growth industries and industry clusters stratified by mode and type of flow. This data, which can be expanded on in the state freight plan, provides a basis for additional exploration in the state freight plan to identify the industries that Nevada should look to support and grow, as well as identify lagging industries that might be enhanced.

3) Chapter 3 defines the state's current economic flows within, into, and out of the state by mode and the state's infrastructure used for those freight shipments. This understanding of the state's modal commodity flows and freight infrastructure, which the state freight plan can expand on, provides a basis for exploring which infrastructure modes need additional investment and might best benefit selected growth industries.

4) Significantly, Chapter 4 provides an initial listing from the project's participants of the goals, needs, issues, and opportunities to be addressed in the state freight plan; it also includes a listing of recommended stakeholders for the state freight plan, recognizing that MAP-21 calls for establishing State Freight Advisory Committees. The state freight plan needs to include a broad group of stakeholders and a robust public outreach program so that the list of projects is balanced and comprehensive.

5) Chapter 5 presents forecasted goods movement in the state and a strategic direction for freight projects, as well as a baseline discussion of funding, tax collection, and tax distribution to implement the state freight plan. The state freight plan needs to evaluate and enhance the commodity forecasts to identify the growth industries, which NDOT should work to support. It needs to refine and enhance the strategic direction and apply the process to the much expanded list of projects resulting from the expanded stakeholder and public outreach efforts. It needs to explore new and innovative funding sources for improving freight infrastructure investment.

6) Chapter 6 provides a baseline discussion of Nevada's current project development processes along with a discussion of upcoming legislative changes and MAP-21 requirements, plus performance measure indicators to refine for evaluating proposed freight investments in the state freight plan. The state freight plan needs to consider whether Nevada's project development process might be strengthened to better provide for freight infrastructure. It needs to carefully address each of the MAP-21 requirements, especially if any new guidance is issued. Its performance measure indicators need to address the USDOT's priorities, such as an emphasis on safety and transportation efficiency, as well as state of good repair, livability, and environmental sustainability. So for example, a current legislative interest in raising the state's roadway speed limits may be counterproductive with respect to MAP-21's direction.

Appendices

Meeting Minutes

Meeting Subject: Freight Working Group Meeting
Meeting #: 1
Location: NDOT District Offices/ Headquarters
Webinar-Conference Call

Start: 10:00 AM **Finish:** 11:00 AM **Day:** Tuesday **Date:** July 9, 2013

Name	In-Person	On-Phone
Bill Thompson, NDOT	X	
Eric Glick, NDOT	X	
Mike McCarley, Jacobs	X	
Angela Thens, Jacobs	X	
John McCarthy, Jacobs	X	
Stephen Fitzroy, EDR		X
Adam Winston, EDR		X
Jeff Richter, NDOT	X	
Scott Kichline, McCarran		X
Dale Lindsey, NDOT	X	
Jae Pullen, NDOT--Sparks	X	
Willie Hargrove, FedEx		X
Gerald Rawling, Retired-Chicago MPO		X
Bill Eisele, Texas A&M Transportation Institute		X
Leah Sirmin, FHWA		X
Brian Pratte, Reno-Tahoe Airport		X
Mike Fuess, NDOT	X	
Ismael Garza, NDOT	X	
Christina Leach, WRTC		X
Coy Peacock, NDOT	X	
Tony Letizia, NDOT	X	
Beth Xie, RTCSN	X	
Tony Rivera, NDOT	X	
Brian Kramer, NDOT	X	
Dawn Lietz, DMV		X
Katherine Mellon, NDOT	X	
Ken Mammen, NDOT	X	

Agenda

1. Project Overview
2. Study Content
3. Planning Process
4. Project Timeline
5. FWG Participation
6. Freight Overview
7. Discussion of Issues & Opportunities

Discussion

NDOT's Bill Thompson introduced Jacobs Project Director Mike McCarley, who introduced the Jacobs team participants, including EDR members. Project Manager John McCarthy provided an overview of the freight assessment project, including the responsibilities of the project team, the study timeline, and the expectations of the Freight Working Group involvement. (A copy of the presentation with additional detail is enclosed.) John then opened the floor to discussion on freight issues and opportunities.

Jeff Richter, NDOT, briefly touched on program and resource issues, and requested a one-on-one meeting to discuss them in greater detail.

Bill Eisele, Texas A&M Transportation Institute, identified I-15, between Tropicana and Sahara, as a bottleneck in Las Vegas for truck movement. He suggested that information in the Institute's *Urban Mobility Report* and *2011 Congested Corridors Report* (which both include reliability measures) may be of benefit for the Nevada freight study.

Scott Kichline reported that McCarran International Airport has 40,000 square feet of available freight storage capacity. He noted that when Ivanpah Airport was proposed in the 1990s that LAS handled 48.5 million passengers annually with a projected maximum capacity of 53 million, but that LAS currently has only 42 million annual passengers and a projected maximum capacity of 60 million, given the new airspace regulations that allow shorter timeframes between take-offs and landings. He said that Ivanpah is not a near-term option for FAA and LAS; and he added that freight is no longer a driver for Ivanpah. Scott also mentioned a new airport plan to increase flow and storage capacity that he will forward to Jacobs.

Brian Pratte reported that Reno-Tahoe International Airport will be 100% utilized in one month with no capacity issues, and they are three weeks away from announcing a new cargo initiative. RNO is increasing its tankage to provide 13-14 days of fuel storage capacity—they expect to complete a 14" pipeline from northern California later 2013. Jacobs will follow up with Brian with a one-on-one to gain more information on the initiative.

Willie Hargrove reported that Federal Express Freight is looking to expand its Express operations in Elko, Winnemucca, and Wendover, and its future Express and Ground operations in 6-10 years. Jacobs will follow up with Willie with a one-on-one to gain more information on the expansion.

Beth Xie with the RTC of Southern Nevada gave a brief update on the agency's soon to be published Freight Data Study. Beth noted that the RTC study, which is focused on the Las Vegas Valley, included an I-15 intercept study, telephone interviews, and workshops for the private sector, identifying starting and end points for freight flows, etc. Jacobs will follow up with Beth with a one-on-one to gain more information on the study. She shared a copy of the PowerPoint presentation from the RTC's working study workshop held earlier in the morning on July 9.

Prior to adjourning the meeting, participants were encouraged to contact either Bill Thompson or Mike McCarley with any comments regarding freight movement in Nevada. The comment period will close August 1, 2013.

Follow Up One-on-One Meetings:

1. Jeff Richter, NDOT
2. Brian Pratte, Reno-Tahoe Airport
3. Willie Hargrove, FedEx Freight
4. Beth Xie, RTCSN

Next Freight Working Group Meeting: The next freight working group meeting will be held in mid-October. Notifications will go out two to three weeks prior.

Telecon Meeting Minutes

Start: 1:00 PM **Day:** Thursday **Date:** July 25, 2013

Participants
Rod Schmalhaus, Walmart General Transportation Manager
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion
John opened the session, briefly describing the freight assessment study, and then asked Rod Schmalhaus to describe Walmart's freight operations in Nevada. Rod is based at Walmart's Western Regional Operations Center (the "ROCk") in Grantsville, UT; and he described Walmart's truck movements in Nevada. Walmart also has a distribution center in Corrine, UT, from which groceries are shipped, and a regional distribution center in McCarran, NV (from which 97 percent of its daily shipments go westbound to Reno and California). Walmart trucks goods across Nevada on both I-80 and I-15 to and from California, as well as to its retail outlets in Elko and Winnemucca, and in the Reno and Las Vegas areas. In addition, Walmart trucks goods to its return center in Las Vegas. Walmart ships some items by rail and air, although Rod did not have any statistics on the volumes of these shipments.

Walmart engages private fleet trucks and contract carriers. The following are among Walmart's daily shipments:

- about 24 eastbound and 24 westbound trucks across Nevada on I-80 to/from Elko/Winnemucca as well as through-truck movements
- 125 trucks into and out of the McCarran, NV regional distribution center
- 5 trucks eastbound out of California
- 2 trucks westbound out of Grantsville, UT
- 2-3 trucks westbound out of Corrine, UT
- 60 trucks westbound out of Las Vegas on I-15
- 75 trucks eastbound out of Apple Valley, CA into Las Vegas on I-15
- 35 trucks to the Las Vegas return center from Nevada, Arizona, California, Colorado, Utah, Montana, Oregon, Washington, Idaho, etc.

Rod indicated that the only problems Walmart truck drivers encounter on Nevada's interstate system are weather conditions on I-80 and traffic congestion on I-15 in Las Vegas. He does not expect much growth in Walmart shipments on I-80; he could see growth of four to five stores that I-15 serves. He could see a benefit to Walmart shipping with the addition of I-11 between Reno and Las Vegas. He would like to avoid any restrictions on "freeway doubles," which are double tandem 45-ft long trucks, which are important to Walmart's operations.

Telecon Meeting Minutes

Start: 1:00 PM **Day:** Monday **Date:** July 29, 2013

Participants
Bill Eisele, Texas A&M Transportation Institute
Mike McCarley, Jacobs
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion
John opened the session, briefly describing the freight assessment study, and asked Bill, who participated in the Freight Working Group session, to discuss the information that his Institute has that may be useful for our study. Bill directed us to the Institute's website (http://mobility.tamu.edu), which includes two headings on the left side: 2012 Annual Urban Mobility Report and 2011 Congested Corridors Report. He noted that the Urban Mobility Report addresses a number of congestion measures (such as delay [including truck delay), wasted fuel (including truck diesel fuel), plus environmental factors such as extra carbon dioxide resulting from congestion) for the 101 largest urban areas and it permits comparisons with averages by population size. He said that the reports were prepared in partnership with INRIX, a private-sector provider of speed data. He noted that the Institute will have a new mobility report out in the fall.

The Institute's "Truck Commodity Value" methodology is included here:
http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/mobility-report-2012-appx-a.pdf
This is Appendix A from the Institute's website (http://mobility.tamu.edu/ums/report/).
The methodology shows that the Institute uses total national VMT to allocate the truck freight within Nevada (and Las Vegas), so both through and local truck trips are included.

2012 Urban Mobility Report:

- P. 25: Las Vegas has 44 hours of delay per commuter compared with an average of 37 hours for the 32 Large areas, which ranked Las Vegas in a tie for 17th; the average peak travel time relative to the off-peak is 1.20, or 20 percent longer in the peak to make a trip, at an added cost of $906 per auto commuter (note footnote details).
- P. 29: Las Vegas had 45,419,000 hours of delay costing $931 million, of which trucks accounted for $137 million (note footnote details).
- P.33: Las Vegas requires about three times of extra lead time to avoid a once a month delay in arriving to work on time and 1.63 times extra lead time to avoid being late once a week (note footnote details).
- P. 37: Las Vegas causes about 417 pounds of additional carbon dioxide per auto commuter during congestion and 429,000,000 total pounds of additional carbon dioxide due to congestion and 9,358,000,000 pounds for free-flow conditions (note footnote details).

- P. 41: Las Vegas had a 2011 truck commodity value of $36 billion, ranking the city 49th; the community had 1,806,000 hours of truck delay, ranking Las Vegas 40th at an associated cost of $137 million.

2011 Congested Corridors Report:

- P. 30: I-15NB Tropicana Ave./Exit 37 to Sahara Ave./Exit 40, 3.2 miles had ranked 100 with 273,000 person hours of delay per mile and wasted 427,000 gallons of fuel (ranked 190).
- P. A-11: This same corridor along I-15 NB in Las Vegas had a planning time index of approximately three.

Telecon Meeting Minutes

Start: 1:00 PM **Day:** Monday **Date:** July 29, 2013

Participants
Jeff Richter, NDOT—Over Dimensional Vehicle Permits Manager
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion

Jeff participated in our July 9 Freight Working Group session and wrote an email that same date describing his concerns. Jeff discussed his concerns in greater detail. Basically, tasks relating to permits for over dimensional (oversize/overweight) truck movements are not prioritized within NDOT and are split between three state agencies: NDOT (load analysis of effects on roads, planning, permitting, routing, statewide regulatory oversight, infrastructure preservation, public safety, etc.), DMV (motor carrier tax collection, IFTA/IRP, LCV permits), and the Highway Patrol (public safety, escort, hazmat/amber light permits, etc.), which he believes leads to inefficiencies and decentralization causing a lack of attention and priority for the program. The over dimensional truck program involves planning, operations, engineering and district offices. He referenced NDOT's website, which includes rules, procedures, goals and objectives we should review. He noted that different states handle responsibility for the tasks associated with over dimensional trucks differently and that FHWA has guidelines on the topic; he called for Nevada to develop a better strategy for addressing managing for oversized/overweight trucks/loads. He recommended studying changes in NDOT's organizational structure to enhance program efficiency/effectiveness and re-creation/recharging of a strong interagency committee and a statewide advisory committee to coordinate NDOT's and the state's truck programs. He offered to provide any additional assistance that he could.

Telecon Meeting Minutes

Start: 9:00 AM **Day:** Tuesday **Date:** July 30, 2013

Participants
Beth Xie, RTC of Southern Nevada
Dan Andersen, CH2M HILL
Bardia Nezhati, CH2M HILL
Bill Thompson, NDOT
Mike McCarley, Jacobs
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion
Mike opened the session, briefly describing NDOT's freight assessment study and the roles of the project participants. Beth Xie, who participated in the July 9 Freight Working Group session and furnished Jacobs a copy of the July 9 RTC freight PowerPoint, introduced the CH2M HILL participants who prepared the Las Vegas Valley freight study. Beth noted that following RTC's initial data collection study of freight flows in the Las Vegas Valley, the agency will be starting on a one-year master planning phase with an October-November NTP.

The RTC participants discussed some of their study findings and methodology. A total of 86-90 percent of freight flows through the Las Vegas Valley are shipped by truck. The primary trading partners are Utah and Southern California. Raw goods are shipped by rail, for example, into Henderson (Timet) and finished goods leave by truck. Industrial warehouse areas were noted, such as North Las Vegas and the Speedway, and in the vicinity of Russell Rd. west of the I-15 resort corridor. Las Vegas also gets shipments of convention business displays, such as large equipment, that are stored in a staging area before moving to the convention floor. FAF data shows miniscule volumes of air shipments, although some overnight deliveries, such as UPS/FedEx-type air freight/air cargo (Boston Air Cargo) do occur. Regional surveys were conducted at truck stops, which engaged as many as 1,000 truckers in one day. One trucker survey finding is that Las Vegas-Reno shipments on US 95, can involve swapping out drivers midway between the two destinations so that each driver ends up back home after covering both legs of the trip to and from the midpoint of the trip and his shipment still gets to its final destination.

The RTC participants referenced a number of options that could be explored in the new state freight plan, including: the five-year-old UNLV study in which a professor considered different models; segregating freight from the downtown core bypassing the Valley, for example, investigating the Boulder Bypass; and what-if economic scenarios included in the I-11 corridor justification materials (www.I11study.com; project documents; documents & meetings; corridor justification – http://i11study.com/wp/wp-content/uploads/2012/12/I11_CJR_07_02_13_DRAFT.pdf), which includes a different freight generation model. The RTC participants also referenced the Inland Ports study; the Jacobs team has reviewed this report, which came, which resulted in a different solution than the state legislation anticipated, and forwarded it to Beth following the meeting.

Telecon Meeting Minutes

Start: 11:15 AM **Day:** Friday **Date:** August 2, 2013

Participants
Brian Pratte, Reno-Tahoe Airport Authority Director of Air Service and Cargo Development
Lissa Butterfield, Reno-Tahoe Airport Authority Airport Planner
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion
John opened the session, briefly describing the proposed topics for discussion: the status of RNO airport cargo operations and facilities, potential expansion, any suggestions for changes in NDOT policies, and pipeline operations, including expansion raised during the July 9 Freight Working Group session, in which Brian Pratte participated.

Brian noted that the airport (RNO) has adequate fueling capacity for its operations and that a consortium of RNO airlines own the on-airport pipelines and tanks. He is not aware of any expansion in pipeline capacity mentioned in the Freight Working Group session. Lissa Butterfield offered to check with the airport's environmental lead, who is currently away attending a conference, and may be the most informed on this topic. She will provide us with any information that she learns. The Kinder-Morgan pipeline runs under the north half of the RNO airfield connecting the two on-airport fueling facilities. Although there are no known existing capacity issues with the pipeline, the airline consortium has in the past considered adding an additional JetA fuel storage tank on airport; however the current JetA demand has not yet justified the cost associated with the additional capacity a new tank will create. There is adequate land for a new tank when the consortium chooses to go ahead with the addition.

When JetA fuel is transported along the pipeline, diesel is not. Therefore if there are capacity issues along the pipeline, competition could develop as to which fuel takes priority. It is RNO's understand that the pipeline also transports JetA to Fallon NAS but it is not known how many other airports are also supported.

Brian stated that the airport has three brand-name air cargo providers: DHL (which has one east- and westbound plane in and out daily with plans to eventually add a third flight and to up-gauge the size of its airplanes), and FedEx and UPS (which have recently increased the number of their flights and up-gauged the size of the planes they use). RNO cargo operations have increased 3.2 percent in the first six months of 2013, which is a greater increase than the national average during that period; 80 percent of the growth is in the supply chain involving distribution and manufacturing. RNO anticipates the addition of a non-integrated air cargo carrier in the future providing domestic service initially with five-times-a-week wide-bodied aircraft service and eventually providing international service. RNO commodities include a broad range of products, including: agricultural products, on-line fulfillment products, pharmaceuticals, electronics, aircraft products (coming from the Carson City area, which need to be climate-controlled and handled carefully), etc.

Brian and Lissa stated that the airport can accommodate its current air cargo operations with its available aprons and hangars, although its 25 acres of existing facilities are close to being tapped out. The airport has 100 acres in its southwest quadrant designated for air cargo expansion and is beginning to get interest from the private sector in expanding into that area, for example with up to a 900,000-sq-ft hangar. NDOT's Moana Lane/Airway improvements, which link to US395 / I-580, McCarran Blvd., and the future southeast connector, provide good truck access.

Only about three percent of RNO's cargo is moved in the belly of passenger planes; only Southwest and Alaska ship belly cargo (for example, seafood from Seattle and specialty meats, such as emu and ostrich, which take advantage of the more frequent passenger flight schedules for these temperature-sensitive commodities).

RNO cargo shipments typically amount to about 15 percent of RNO traffic, based on RNO landing fees, which are set at a fixed dollar rate, such as $2.78, times each thousand pounds of gross aircraft weight, say a 140,000-pound plane. The average increases to over 20-22 percent in the busy season between late November and Christmas. The airport's 12 freight flights in larger, heavier planes contrast with its 62 more-frequent lighter-weight passenger flights in calculating the percentage.

RNO does not have direct rail interface with its cargo facilities, but the Authority's Stead Airport has a rail spur that has not been used but could provide such a connection if ever needed, although all the services/facilities to support cargo are located at RNO where the air cargo providers prefer to be located.

Lissa noted in response to a consultant question that interstate truck parking is a problem on I-80, and that service stations that provide truck parking, such as Pilot, have been getting pushback in local communities when they try to expand or open new facilities. She noted that such a truck service facility located along I-80 east of Reno in a rest stop fashion is one way to provide adequate truck parking capacity without encountering any truck traffic conflicts with pedestrians, bicyclists, etc. in the local communities along the interstate.

Telecon Meeting Minutes

Start: 10:00 AM **Day:** Tuesday **Date:** August 27, 2013

Participants
Paul Enos, Nevada Trucking Association
Jaron Hildebrand, Nevada Trucking Association
Kim Yaeger, Nevada Trucking Association
Bill Thompson, NDOT
Mike McCarley, Jacobs
Angela Thens, Jacobs
John McCarthy, Jacobs

Discussion
Mike introduced everyone on the call to open the meeting. John briefly described the purpose of the assessment study to set the stage for the future freight plan effort and asked the trucking association for input on issues that should be addressed, such as truck parking spaces and changes resulting from new federal commercial driving regulations. Paul asked if the study team was going to be contacting shippers, manufacturing operations, and the mining industry directly; and John replied that this more detailed effort will occur during the freight plan study. Paul expressed interest in surveying his members, and John offered to tailor some questions that had been prepared for the State Economic Development agencies.

Paul noted that the major roadways affecting trucking operations are I-80, I-15, US 93, and US 95. He noted major new developments affecting truck movements, such as the Reno Industrial Center, the FedEx distribution center, and the Walmart and Amazon operations east of Reno.

- He suggested that adding more truck parking spaces, not necessarily in new rest areas, would be beneficial.
- He said that wintertime informational signs are helpful, but he would also like to get DMV, NDOT, and NHP to accept use of AutoSock in lieu of chains, because chains can take an accomplished driver about a half hour to install, while the AutoSock can be installed in ten minutes. This time savings is beneficial for operations, as well as for reducing the exposure to safety hazards and congestion along operational highways. Off-road installation areas could be helpful, i.e. near Palisade, Nevada, although the greatest need may be in California closer to the Sierras.
- He noted that the new federal meal and rest break period regulations have been in effect for two months and a week, requiring an off-road half-hour break in the first eight hours of a trip, which increases the need for off-road truck parking spaces with food service.
- He commented on over-dimensional shipments and referenced NDOT's Jeff Richter, whose group's staffing is limited in size. Paul would like to see NDOT provide on-line permitting and include information on its website describing route limitations, locations of overpass structures, and other restrictions, which would be helpful as shippers and truckers work to map out routes, for example, those working to bring over-dimensional rigs from Colorado to do testing in Elko County. Over-dimensional trucks stopped at the state line waiting for approval to enter can cost their owners thousands of dollars a day.

He referenced Texas, Oklahoma, Pennsylvania, and West Virginia as states with online practices.

- He noted that federal grants have increased the number of jurisdictions that have become involved in regulating truck traffic, some of whose ticket-writing personnel are not fully conversant with trucking regulations. He indicated that truck weighing is a specialty operation, for example.
- He noted that historically, the trucking association members have had issues involving coordination between NDOT, DMV, and the Highway Patrol. The Trucking Association now sponsors face-to-face Commercial Vehicle Safety Summit and Roundtables in Northern and Southern Nevada to get all of the stakeholders (including representatives from the Federal Motor Carrier Safety Administration and local jurisdictions) in a room together to coordinate and talk through the issues, increasing understanding among all parties. The next meeting is scheduled for September 2013. An invitation was extended to NDOT's Bill Thompson to participate in these sessions.
- He also noted that DMV is proceeding with visible smoke testing for opaqueness, which has the potential to raise production issues.

From:	Steve Osborne
To:	Thompson, George W
Cc:	Thens, Angela S.; McCarley, Mike S.; Glick, Eric O
Subject:	RE: Nevada Freight Program Assessment
Date:	Tuesday, August 13, 2013 4:28:25 PM

Thank you for the opportunity to submit comments concerning the statewide freight assessment study:

Comments:

Nye County has had tremendous population growth over the past several decades. Nye County's population topped 17,000 people in 1990. Between 1990 and 2000, Nye County's population grew to over 32,000. By 2010, Nye County's population exceeded 43,000.

Pahrump Population Growth: The U.S. Census Bureau and the State Demographer track population statistics for the Pahrump area, which is tracked as a Community Designated Place (CDP). According to the U.S. Census Bureau's American Communities Survey, the estimated population of Pahrump was 7,424 in 1990, growing to 24,631 by 2000. As of 2010, the population of Pahrump was estimated to be 36,441.

PAHRUMP'S RELATIONSHIP TO LAS VEGAS, NEVADA: Pahrump, Nye County, is located 63 miles west of Las Vegas. A significant number of employees working in Las Vegas live in Pahrump and commute to their employment in Las Vegas, contributing to what can be referred to as a "bedroom" community. Significant housing development occurred over the past decade in Pahrump due in part to the town's proximity to Las Vegas. Between 2000 and 2010, the number of dwelling units in Pahrump increased from 11,669 to 17,824 – an addition of 6,155 housing units constructed in Pahrump during that 10-year time period. Although in recent years the national and local economies have contracted, Pahrump is starting to show signs of economic recovery, such as lower rates of unemployment and increasing housing values and new home sales.

Within the Pahrump area, Nye County has approved a significant number of Development Agreements which would allow for the construction of an additional 19,173 dwelling units. Continued population growth in Pahrump and Nye County is anticipated over the next several decades. This expected additional population growth in Nye County should be anticipated to result in increased growth of freight volumes.

Pahrump Fairground:
The Town of Pahrump is currently developing a plan for the Pahrump/Nye County Fairgrounds on 427 acres of land near Dandelion Street and State Highway 160. Funding is still being secured for the Fairground's project and it is currently in the first stages of development. Eventually, the facilities are expected to include sports fields, exhibit halls, and a rodeo arena. When complete, the Fairgrounds will be a major

recreation facility for Nye County and the Town of Pahrump.

Additional noteworthy privately owned facilities in Pahrump which are open to the public are the Spring Mountain Motorsports Ranch and the Front Sight Firearms Training Institute. Additional significant commercial development at these locations is planned, including proposed hotels at these sites.

While Nye County bears similarity to many rural counties throughout the United States, some characteristics, when considered in combination, set Nye County apart from the others. These unique characteristics include the following:

Nye County is the third-largest county in the continental United States in terms of land area.

While one of the largest counties, it is sparsely populated with only about 1.8 persons per square mile (U.S. Census, 2011).

Only about 2 percent of the land area in Nye County is privately owned. Almost 98 percent of the land area in Nye County is currently managed by the federal government. The majority of these public lands are managed by the U.S. Bureau of Land Management (BLM), the U.S. Department of Defense (DoD), the U.S. Department of Energy (DOE), the U.S. Fish and Wildlife Service (FWS) and the U.S. Forest Service (USFS). The Nevada National Security Site (NNSS) (formerly the Nevada Test Site (NTS)), Nevada Test and Training Range (NTTR) and Tonopah Test Range (TTR) are large blocks of public land maintained as restricted access for classified activities. The Central Nevada Test Area (CNTA), an alternate site to the NTS, has several surface restricted areas (DOE, 2009). The large areas and locations of these activities limit transportation, define economic activities, and complicate planning for the population in the areas around them.

Three potentially hazardous waste storage facilities are located in Nye County:

- Low-level and mixed low-level radioactive waste disposal area in Area 5 on the NNSS.
- Low-Level Radioactive Waste Disposal Facility at Area 3 on the NNSS.
- U.S. Ecology Low-Level Radioactive and Hazardous Waste Disposal Facility, located 11 miles south of Beatty, Nevada on Highway 95.

A fourth potential site, which could become the nation's first high-level civilian radioactive waste disposal site, has been proposed for construction at Yucca Mountain in Nye County.

Many of Nye County's key industries that support the county's economic growth are dependent upon efficient transportation. Either directly or indirectly, the majority of persons employed in Nye County are dependent upon ranching/farming, forest production, mining, recreation and tourism.

The mineral resources industry is the second largest employer and the largest tax payer in Nye County. In 2010 over 1,379 workers (over 12.9 percent of Nye County resident employment) were employed by the industry. Additionally, companies supporting purchases from mineral resource companies or their employees employ substantial numbers of workers in the Nye County construction, retail and service sectors either directly or indirectly. In 2009, the mining industry in Nye County paid an estimated $5,970,000.00 in net proceeds tax. The State Department of Taxation calculates the net proceeds by deducting allowable expenses from gross yield. During 2009 Nye County's mineral activities saw net proceeds of $160,724,331.00.

Mineral resource companies also pay substantial property taxes on facilities and equipment. During fiscal year 2007-2008, $78,032,570.00 was paid in property tax on mining facilities and improvements in the state of Nevada. In fiscal year 2008, the Nevada mining industry saw an estimated $3,637,504.00, and oil and gas activities saw $255,387.00 in taxable sales.

Thanks again for the opportunity to submit comments. Please let me know should you have any questions or need any additional information.

Regards,

Steve P. Osborne, AICP
Principal Planner
Nye County Planning Department
250 N. Highway 160, Suite 1
Pahrump, Nevada 89060
Phone: (775) 751-4249
Fax: (775) 751-4324
sosborne@co.nye.nv.us

From: Thompson, George W [mailto:GThompson2@dot.state.nv.us]
Sent: Tuesday, August 13, 2013 9:45 AM
To: Steve Osborne
Cc: Thens, Angela S.; McCarley, Mike S.; Glick, Eric O
Subject: FW: Nevada Freight Program Assessment

Hi Steve,
The information we discussed is written below and I thank you for talking with me today.
Please respond by " Reply All" for my team to receive your information.
Any questions you can contact me by phone or email
Thanks again
Bill Thompson
Nevada Dept. of Transportation
Freight Planning

775-888-7354
bthompson@dot.state.nv.us

From: Thens, Angela S. [mailto:Angela.Thens@jacobs.com] **On Behalf Of** McCarley, Mike S.
Sent: Wednesday, July 17, 2013 10:05 AM
To: nyeadmin@co.nye.nv.us
Cc: McCarthy, John (St. Louis); Thens, Angela S.; Thompson, George W; Glick, Eric O
Subject: Nevada Freight Program Assessment

Mr. Osborne,

The Nevada Department of Transportation (NDOT) has engaged Jacobs Engineering to prepare a statewide freight assessment study to establish the basis for preparing a new statewide freight plan for the movement of goods by rail, truck, air, and pipeline into, out of, and within Nevada. The new plan will update the Year 2000 Nevada Statewide Intermodal Goods Movement Study in which your economic development authority (EDA) participated. We are writing to request your comments so that the proposed freight plan addresses the issues that are important to your region.

We would like your input on the following:

- Growth potential and competitive advantages in your region
- Key initiatives that your EDA is undertaking or is programmed to begin
- Freight transportation issues for your EDA that you would like the new plan to address
- Additional considerations that you feel should influence the new state rail plan

Please share your thoughts with us on each of these bullet points and let us hear from you buy **August 15**. You may email your response to: angela.thens@jacobs.com; or mail your response to: Angela Thens; Jacobs Engineering; 319 Warm Springs Road, Suite 200; Las Vegas, NV 89119. Please call or email Angela (702-938-5483) if you have any questions. Thank you for your participation.

Very truly yours,

Mike McCarley, Project Director
Jacobs
702.938.5570
702.938.5454 fax
Mike.McCarley@jacobs.com

319 E. Warm Springs Road, Suite 200
Las Vegas, Nevada 89119
USA
www.jacobs.com

From: Pam Borda
To: "Thompson, George W"
Cc: Thens, Angela S.
Subject: RE: Nevada Freight Program Assessment
Date: Wednesday, August 14, 2013 11:56:50 AM
Attachments: freight input for NDOT.docx

Hi Bill,
The response to your request for input is attached, thanks for sending this to us for our input!
Pam

Pam Borda
Executive Director
Northeastern Nevada Regional Development Authority (formerly ECEDA)
Great Basin College
1500 College Pkwy
McMullen Hall #117
Elko, NV 89801
Bus: 775-738-2100
Fax: 775-738-7978
Cell: 775-397-1003
email: pam@eceda.com
web: www.eceda.com

From: Thompson, George W [mailto:GThompson2@dot.state.nv.us]
Sent: Tuesday, August 13, 2013 2:46 PM
To: pam@eceda.com
Cc: McCarthy, John (St. Louis); Thens, Angela S.; Glick, Eric O; McCarley, Mike S.
Subject: RE: Nevada Freight Program Assessment

Hi Pam,
Hope this Email makes it to you with the updated email address.
The information we discussed is written below and I thank you for talking with me today.
Below will show you how to respond with your response.
Any questions you can contact me by phone or email
Thanks again
Bill Thompson
Nevada Dept. of Transportation
Freight Planning

775-888-7354
bthompson@dot.state.nv.us

From: Thens, Angela S. [mailto:Angela.Thens@jacobs.com] **On Behalf Of** McCarley, Mike S.
Sent: Wednesday, July 17, 2013 9:44 AM
To: pam@eded.com
Cc: McCarthy, John (St. Louis); Thens, Angela S.; Thompson, George W; Glick, Eric O
Subject: Nevada Freight Program Assessment

Ms. Borda,

The Nevada Department of Transportation (NDOT) has engaged Jacobs Engineering to prepare a statewide freight assessment study to establish the basis for preparing a new statewide freight plan for the movement of goods by rail, truck, air, and pipeline into, out of, and within Nevada. The new plan will update the Year 2000 Nevada Statewide Intermodal Goods Movement Study in which your economic development authority (EDA) participated. We are writing to request your comments so that the proposed freight plan addresses the issues that are important to your region.

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Very truly yours,

Mike McCarley, Project Director
Jacobs
702.938.5570
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Mike.McCarley@jacobs.com

319 E. Warm Springs Road, Suite 200
Las Vegas, Nevada 89119
USA
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Northeastern Nevada Regional Development Authority (NNRDA)
Response to request for input on
Nevada Freight Program Assessment

Growth potential and competitive advantages in our region

NNRDA has tremendous growth potential in our region as the primary mining hub in the State and west coast. We are the third largest producer of gold in the world. We have several new mines coming on line over the next 5 to 10 years, some of which are other than gold and the oil and gas industry is also now ramping up in the region. With the only Railport in Northeastern Nevada, we have become a logical hub for rail to truck or truck to rail. The mining industry includes enormous volumes of trucking and we have many of the major trucking companies in Nevada working here in the region.

We have a new Barite processing plant at the Railport which will include a high volume of truck traffic in and out of the Railport. We also have a Flour Spar mine that will come online in a few years that will also include enormous truck traffic volumes in and out of the airport.

Key initiatives

In addition to the diversification of gold mining which will include several other minerals, we are focused on the supply chain in mining and recruit support companies and manufacturers of mining goods and supplies. As we add these companies, the demand for freight transportation will continue to grow.

We have two industrial developments underway to expand the industrial land in the region, one initiative to expand our industrial park at the Railport which is on an I80 exit (303). The other is on I80 exit 298.

Freight Transportation Issues

Exit 303 is not adequate for the truck traffic at the Railport. We need that exit to be upgraded to allow higher clearance and larger turning radius to accommodate double and triple trucking.

Exit 298 may require upgrades as well when that industrial park is developed and companies locate there.

Air service to Reno is another issue that we are trying to solve. A number of companies have requirements to ship via air to/from Reno as well as passengers.

We do not have a logistics company here that handles freight for companies, each company deals with their own freight needs. Once we have adequate industrial space, we may need to recruit a company.

There are a couple items that would be nice from a logistics standpoint;

An Interstate from Boise to Las Vegas (Elko on the route).

An exit and road (Boyd Kennedy?) from I80 to Spring Creek

From:	Mike Baughman
To:	Thens, Angela S.; bthompson@dot.state.nv.us; McCarley, Mike S.
Subject:	Lincoln County Input to Statewide Freight Assessment Study
Date:	Wednesday, August 14, 2013 8:23:25 PM
Attachments:	8_15_13_Freight Assessment Comments to NDOT.doc

Angela: Per Bill Thompson's request, please find attached Lincoln County's input to the subject study.

Mike Baughman, Ph.D.
Intertech Services Corporation (Executive Director, Lincoln County Regional Development Authority)
P.O. Box 2008
Carson City, NV 89702-2008
(775)883-2051
(775)315-2544 (c)

Lincoln County Regional Development Authority
P.O. Box 851
Caliente, Nevada 89008

Lincoln County
City of Caliente

MEMORANDUM

TO: Mr. Bill Thompson, Nevada Department of Transportation

FROM: Mike Baughman, Executive Director

DATE: August 14, 2013

SUBJECT: LINCOLN COUNTY, NEVADA INPUT TO STATEWIDE FREIGHT ASSESSSMENT STUDY

Pursuant to your email request August 13, 2013, please find the following input to topics to be addressed in the subject freight assessment study.

Growth Potential and Competitive Advantages in Your Region

The 35,000-acre **Coyote Springs Master-Planned Community** is located along U.S. 93 at the Clark/Lincoln County line. Approximately, 2/3 of the project area lies in Lincoln County. Pardee Homes is the Master Builder for the project. To date, an estimated $200 million in infrastructure including water and wastewater treatment; electrical substation; interior roads; retention basins and an 18-hole professional golf course have been constructed. At buildout, the project may include various types of single and multi-family residences, commercial and industrial areas and resort hotel gaming facilities. Various public facilities such as police, fire, schools and administrative building will be constructed in the community. At buildout an estimated 150,000 persons may call Coyote Springs home. On-going construction of the project and the need to supply various businesses and consumers in the community will generate additional highway freight traffic on U.S. Highway 93 north and south of the project as well as on SR 168.

The **Toquop Energy Project** is a nearly fully permitted proposed 1,100 MW natural-gas fired power plant to be located in southern Lincoln County approximately 12 miles west of Mesquite. Construction of the project is anticipated to begin as soon as early 2015. Access to the project site for non-oversize vehicles will be from I-15 at the East Mesa Interchange. All oversize freight laden vehicles will access the site from the westbound offramp at the East Mesa Interchange.

Lincoln County is developing the **Alamo Industrial Park** along the east side of U.S. Highway 93 just south of Alamo. The approximate 228-acre site will eventually host a

variety of industrial businesses. Freight from these businesses will be transported both north and south along U.S. Highway 93.

Toreson Industries is developing the **Lincoln Business Center** in Rachel. This 1,000-acre mixed use business park will eventually host various industries. Traffic to and from the Park will utilize SR 375 to access either SR 318 north or U.S. Highway 93 south.

The Bureau of Land Management has recently designated a 25,000 acre solar energy zone in Dry Lake Valley which is located north of U.S. Highway 93 approximately 15 miles west of Caliente. At full development, the **Dry Lake Valley Solar Energy Zone** (SEZ) may host an estimated 2,500 MW of solar PV projects. Access to the SEZ by trucks hauling construction supplies and components will be from U.S. Highway 93.

The City of Caliente has developed the **Meadow Valley Industrial Park** which is located west of and adjacent to U.S. Highway 93 at the northwestern entrance to Caliente. The approximate 68-acre site is adjacent to the Union Pacific Mainline. While rail spurs into the Park are possible, it is more likely that a transloading facility would be developed approximately ½ mile south of the industrial park. The City has completed conceptual designs for said transloading facility. The transloading facility would include 2,000' of rail siding.

Several **major electrical transmission lines** which are proposed to cross Lincoln County are in various stages of permitting and if constructed will add appreciably to highway (and potentially rail) freight shipments into and through Lincoln County.

Lincoln County's **agricultural sector** has remained fairly stable with an increase in commodities being transported by truck out of the area, some for international export.

The right-of-way application for the Department of Energy's proposed **Caliente Rail alignment** to serve the proposed Yucca Mountain geologic repository for nuclear waste is still pending before the Bureau of Land Management. DOE has previously indicated that the proposed rail line would be available for shared-use by commercial traffic.

Lincoln County has been designated by the U.S. Small Business Administration as a HubZone Area. Businesses in the County can and have been designated as HubZone certified. Said businesses enjoy a comparative advantage when competing for U.S. government contracts.

Key Initiatives

Lincoln County Regional Development Authority (LCRDA) actively markets the various industrial sites in Lincoln County. During FY 2014, LCRDA will be seeking to obtain grant funding for development of Phase I improvements to the Alamo Industrial Park. Construction of said improvements would occur during FY 2015. LCRDA continues to work to identify sources of funding for the proposed transloading facility in Caliente.

Freight Transportation Issues

It has been difficult to get Union Pacific Railroad to agree to provide rail service in Caliente, short of stacking many cars along a UPRR required 2,000' siding. This is very expensive to construct. Better commercial rail service from UPRR and the lack of funding for transloading related facilities is an issue for Lincoln County.

Clark County and Las Vegas elected official seek to prevent or minimize **shipments of certain hazardous materials/wastes** through their area, particularly nuclear materials/wastes. As a consequence, these shipments end up crossing rural areas of Nevada, including Lincoln County in route to the Nevada Test Site. This shifting of risk is not equitable, particularly when the severity of accidents and risk of breach of shipping containment is greater on rural two-lane highways.

I trust these thoughts to be of help. I would appreciate the opportunity to review a draft of the Plan when it is available and to receive a final copy when it is completed.

Mike Baughman, Ph.D.
Executive Director
Lincoln County Regional Development Authority
(775) 315-2544 (c)
mikebaughman@charter.net

From: Jeff Page
To: Thens, Angela S.
Subject: Lyon County- NDOT Freight Assessment
Date: Tuesday, August 27, 2013 9:06:02 AM

Growth potential and competitive advantages in your region

1. Lyon County, based on current trending, is projected to grow by 15% by 2032 to a population of 60,680. This trend line could accelerate due to the opening of the Nevada Copper Mine in Yerington, The Walker River Meat Project in Wabuska, the Gateway Commerce Center in Fernley and a myriad of other economic development projects now in planning stages.

2. The growth of the county will be driven by mining and agriculture and a resurgence in manufacturing all leading to a revitalization of the construction trades servicing the growth.

3. As a component of the greater "Sierra Pacific Megapolitan Region" which encompasses the Bay Area, Central Valley of California and all of Northern Nevada, this greater regions growth could also accelerate the counties trend line. This Megapolitan region which now sits at 12 million people is projected to grow to 14.5 million by 2040. This growth will favor Lyon county for ag relocations and startups and should re establish the trend for small manufacturing to establish business in the county to service the growing Megapolitan region.

4. The County's major advantages (including the Sierra Region of Northern Nevada) are:

    a. Geographic location that provides one day trucking to all points in the Western US

    b. Large amount of available land

    c. Favorable tax and regulatory climate

    d. Well organized workforce development programs

    e. Abundance of natural resources

    f. Active ag industry.

- Key initiatives that your EDA is undertaking or is programmed to begin

1. New industrial space in Fernley area (Crossroads and Gateway)

2. New mining operations in Yerington and Dayton area

3. New meat processing plant in Wabuska

4. New milk drying plant in Yerington

5. Expanded and new dairy operations
6. Expanded and new crop operations
7. Megapolitan growth alignment
8. EB5 Financing programs
9. Western Nevada College workforce training programs
10. Completion of the USA Parkway to Silver Springs
11. New rail port outside Fernley

- Freight transportation issues for your EDA that you would like the new plan to address
    1. Intermodal service through expanded rail services
    2. Completion of the USA Parkway
    3. Small package freight improvement out of the Silver Springs Airport
    4. Better freight pickups for RNO
    5. Feeder freight air from small airports to RNO
- Additional considerations that you feel should influence the new state freight plan
    1. West facing intermodal facilities and center

--
Jeffery A. Page
Lyon County Manager
27 South Main Street
Yerington, NV 89447
(775) 463-6531/(775) 577-5037
(775) 302-7088 (Cell)

"It is amazing what you can accomplish if you do not care who gets the credit" ***Harry S. Truman***

JACOBS
319 E. Warm Springs Road, #200
Las Vegas, Nevada 89119