CAMBRIDGE SYSTEMATICS

Transportation and Logistics Hub Study

Appendix A

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Freight Assets and Market Study

Appendix A

prepared for

Mid-Region Council of Governments

prepared by

Cambridge Systematics, Inc.

with

GLD Partners

In conjunction with

Center for Neighborhood Technology

March 23, 2017

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report

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Executive Summary

This memorandum features an analysis of the Mid-Region Council of Government (MRCOG) region's freight assets, commodity flow, economic and industry analysis, logistics and supply chain analysis for companies in the region, and a brief overview of public policy issues relating to future freight-related industrial development.

Though remote from most major markets, the MRCOG region benefits from ample access to cross-country transportation infrastructure. Rail users have access to major markets via the BNSF Transcon line which travels through Belen, NM, transload and rail-served industrial sites in the region. Though container service in the region is limited, the region is connected via intermodal facilities in El Paso and Amarillo, TX. There is also ample access to highways, with Albuquerque conveniently located at the junction of I-40 and I-25, also known as "the Big I." I-25 is a major freight-designated route connecting the region to Mexico and Denver, and I-40 is a major cross-country route, connecting the west coast ports of Los Angeles and Long Beach to the east coast. Albuquerque is also strategically located near international ports of entry (POE) connecting to Chihuahua, Mexico, including the growing border region of Santa Teresa. The Albuquerque International Sunport (ABQ) provides connectivity via air cargo and expedited air freight service (Fed Ex, UPS), and is home to a Foreign Trade Zone (FTZ). Freight transportation infrastructure and commodities are further detailed in Section 1.

An economic analysis, provided in Section 2, shows that the majority of the study area's employment and residential population is in Bernalillo County. The study region has had high growth in population over the last decade, outpacing state and national trends; however growth in employment has not followed the same trend. The four counties in the study region have seen a modest 0.7 percent increase in employment over the last 10 years, compared to 5.1 percent for the state of New Mexico. With a limited recovery from the recession, Bernalillo has seen flat employment over the last decade, while Torrance and Valencia counties have lost jobs. Overall, the region is burdened by a lack of manufacturing and goods dependent industries, with 28 percent of jobs in goods related industries, less than the national average. Albuquerque itself is comparatively weak in terms of production and transportation occupations and is lagging behind virtually all the peer cities analyzed (El Paso, TX; Austin, TX; Dallas, TX; Denver, CO; Phoenix, AZ; Salt Lake City, UT; and Kansas City, MO) in both production and transportation. In the study region, more than half of goods-related employment is in retail or wholesale trade. Health care is the largest industry in the study region, by itself making up 15 percent of all jobs in the four counties.

The natural and man-made geography of the MRCOG region has led to industrial areas generally positioned in a compact pattern tied to major freight transportation assets, as described in Section 3. This pattern has a number of benefits, it constrains intra-regional truck mileage with consequent limitations on local shipping costs, air pollution, road maintenance expenditures, and risks to public safety. Compact development also lowers the overall costs of providing infrastructure including water, power, and sewage, and makes jobs more accessible to the majority of workers. In the cases of two companies profiled in this document, close ties to the transportation systems of the region have been advantageous for their development. However, compact development linked to freight transportation assets also poses challenges. In many cases industrial districts will continue to be close to residential areas, and as industrial areas fill up, they may come to annoy neighbors or even pose public health risks. This can have a significant impacts for future industrial development potential, as these locations are at risk for requiring mitigations or other activities to off-set these negativities. - Compact development also frequently involves difficulties for industrial developers, such as assembling adequate land, dealing with obsolete buildings or environmental contamination, as well as

time delays in securing development permissions. If these problems are not mitigated, they will decrease the competitiveness of the MRCOG region. If MRCOG and the local governments they coordinate are to realize the benefits of compact development without impeding growth, they will need to insist on design and technology choices which ensure that industrial and logistics operations are good neighbors, while smoothing the way for development in desired locations.

Finally, public policy and regulation at the federal, state, and local level impact the ability of MRCOG to attract and retain businesses. Key polices and regulations are are detailed in Section 5. While the region has a well-developed workforce development program, it lacks focus on key transportation related sectors. State issues, such as the tax structure, laws limiting public investment, and NMDOT's ongoing rail challenges impact the competitiveness of the region. Finally, a brief discussion of federal funding opportunities is included. Collectively, this analysis will help determine how to develop successful and sustainable industrial location sites in the MRCOG region.

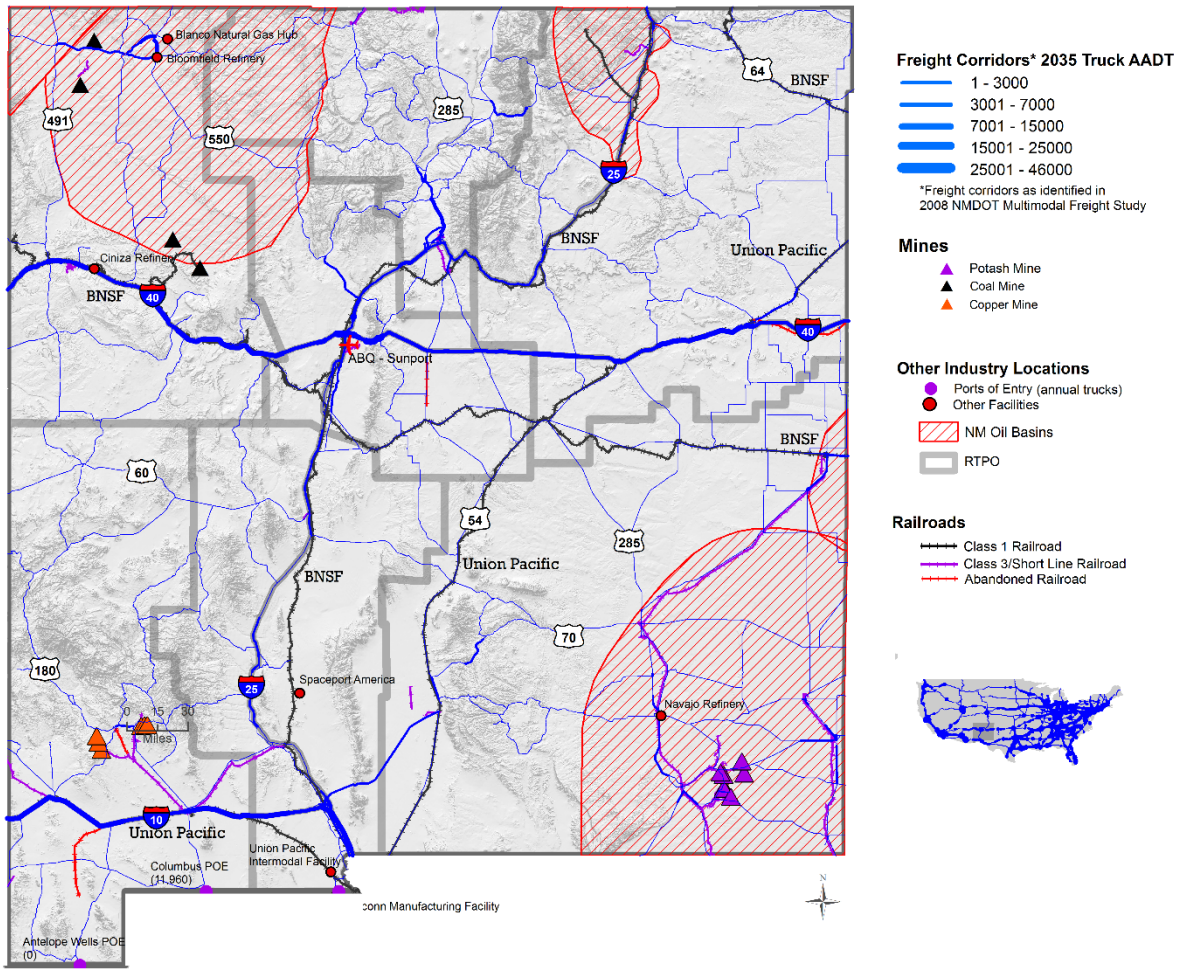
1.0 Freight Assets and Commodity Flow Analysis

This section will detail the existing conditions of the infrastructure in the Mid-Region Council of Governments (MRCOG) region, as well as any major freight trends, planned expansions, or developments. The freight inventory includes rail, highway, air, broadband communication, and other freight assets. Commodity flow trends on each of these modes will be detailed, in addition to the overall international, national, statewide and regional freight trends.

1.1 Mid-Region Freight Assets

New Mexico features a comprehensive network of rail, highway, air, and other freight assets, as illustrated in Figure 1.1. It has several clusters of potash, coal, and copper mines in the southeast, southwest, and northwest portions of the state, in addition to several oil basin regions.

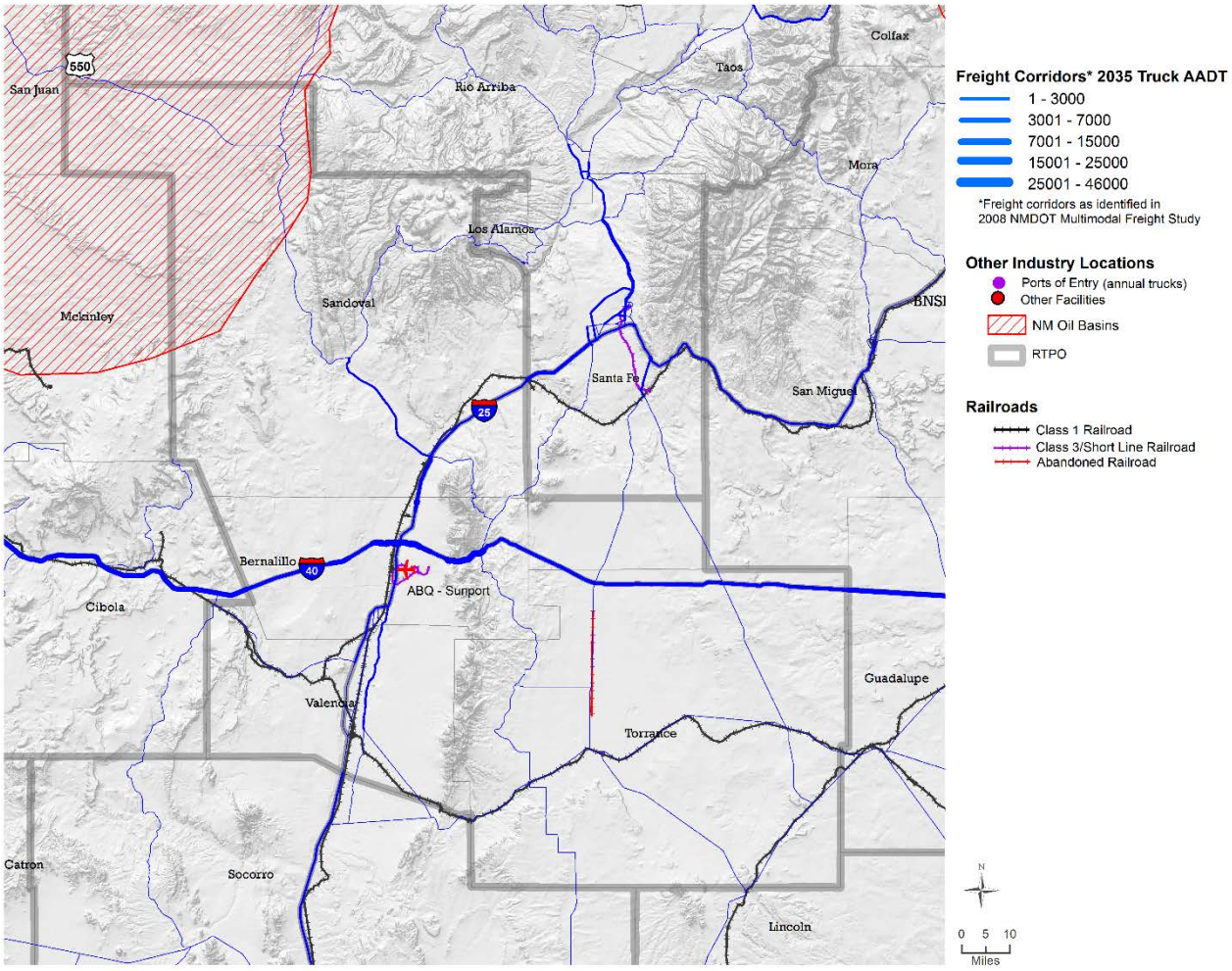
Figure 1.1 New Mexico Multimodal Freight Network



Source: New Mexico Department of Transportation. "The New Mexico 2040 Plan: NMDOT's Long Range, Multimodal Transportation Plan". September 2015. Modified by Cambridge Systematics.

The MRCOG region – which comprises the counties of Bernalillo, Valencia, Torrance, and Sandoval and a small part of Santa Fe County – is located in central New Mexico, at the juncture of I-25 and I-40, as shown in Figure 1.2. The following sections will detail the highway, air, rail, and other freight assets within the region.

Figure 1.2 MRCOG Region Multimodal Freight Network



Source: New Mexico Department of Transportation. "The New Mexico 2040 Plan: NMDOT's Long Range, Multimodal Transportation Plan". September 2015. Modified by Cambridge Systematics.

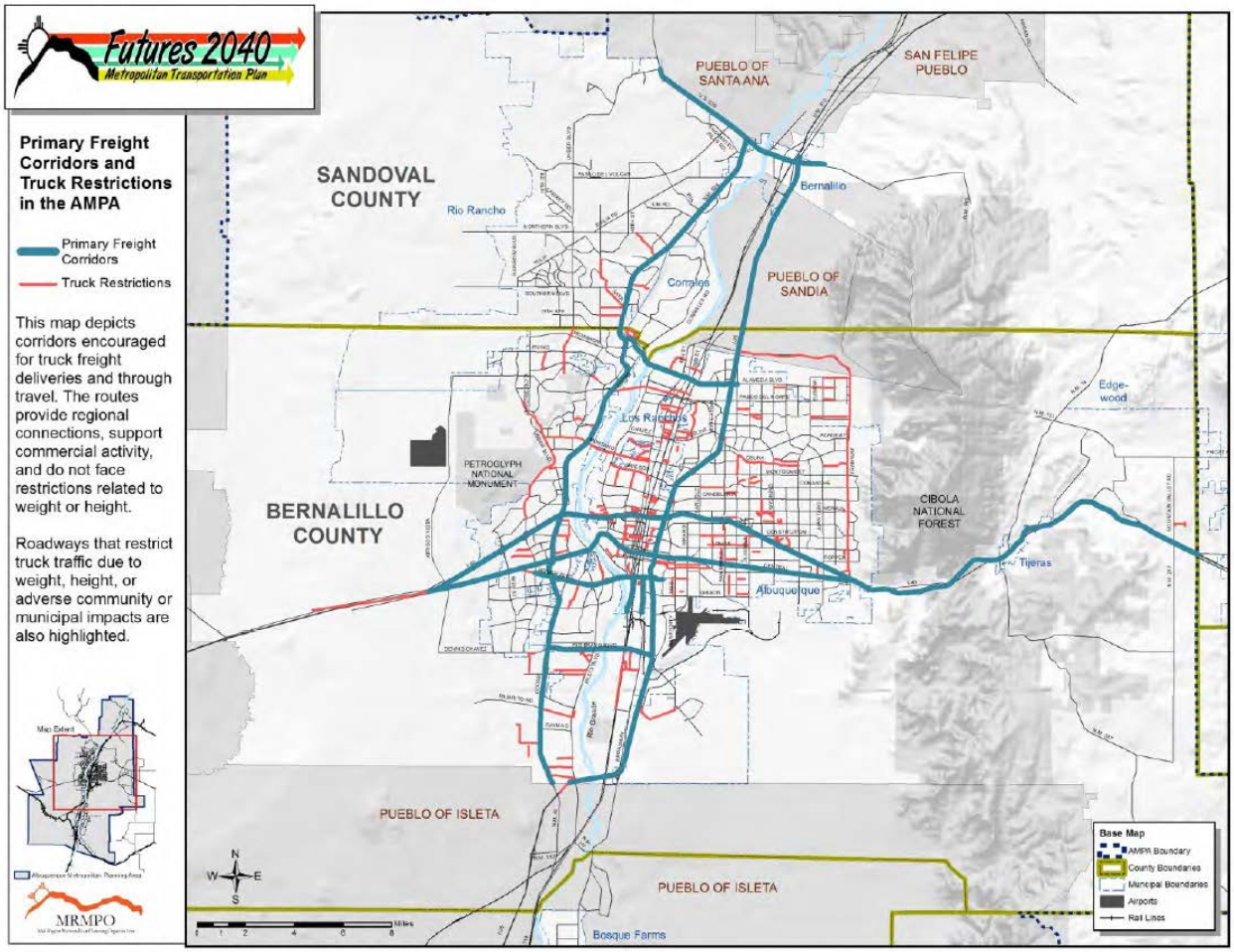
1.1.1 Highway Assets

Albuquerque is conveniently located at the junction of I-40 and I-25, also known as "the Big I". I-25 is a major freight-designated route within the MRCOG region for truck freight that connects the region to Mexico and Denver. In addition, I-40 is a major cross-country route, connecting the west coast ports of Los Angeles and Long Beach to the east coast.[1] For trucks traveling east from the west coast, Albuquerque is about an 11 hour drive, at the limit of the current Federal Motor Carriers Safety Administration's (FMCSA) Hours of

[1] Futures 2040 Metropolitan Transportation Plan. Mid-Region Metropolitan Planning Organization. April 17, 2015.

Service regulations. In addition, the MRCOG region is between 12-14 hours from Houston, TX, which is another major port of entry for freight.[2] US 550, which travels northwest from I-25, at the Town of Bernalillo north of Albuquerque, is also an important corridor for freight movement, connecting communities in northwest New Mexico and to a major shale basin in and around Cuba, NM. Figure 1.3 shows the primary freight network throughout the urban portion of the MRCOG region, including areas where truck freight travel is restricted. The primary corridors include I-25, I-40, Coors Boulevard, New Mexico 528, Alameda Boulevard, and several other routes.

Figure 1.3 Primary Freight Corridors and Truck Restrictions in Sandoval and Bernalillo Counties



Source: Appendix A – Existing Conditions and Trends. New Mexico 2040 Plan.

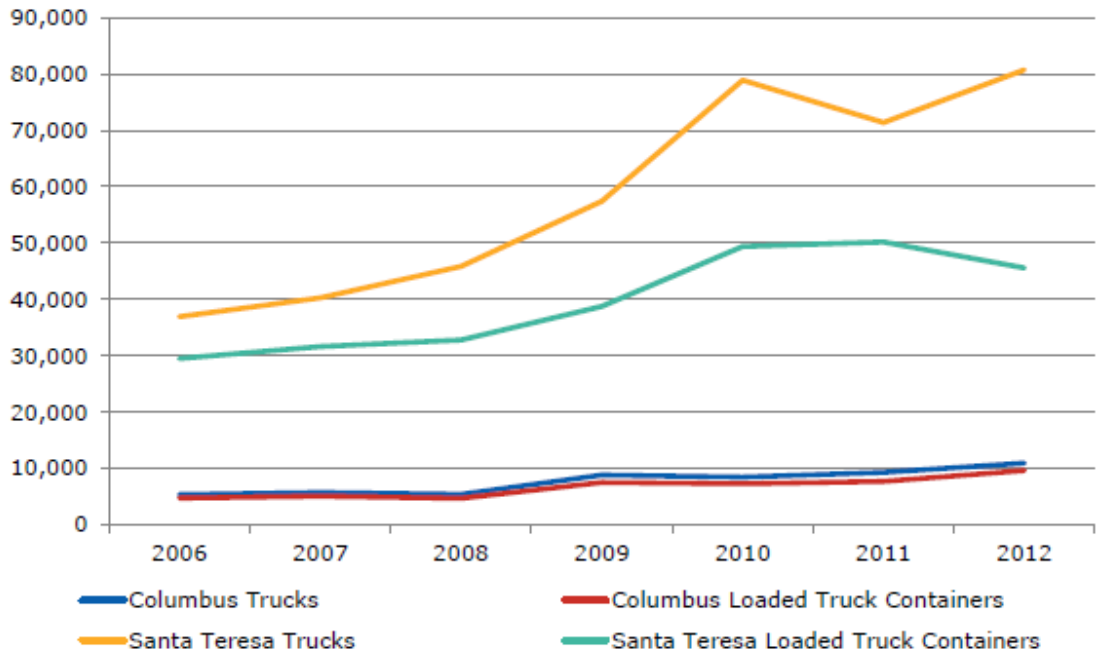
There are three international ports of entry (POE) accessible to trucks between New Mexico and Chihuahua, Mexico. These include Santa Teresa, Columbus, and Antelope Wells. Albuquerque is approximately 4 hours by highway to both Santa Teresa and Columbus POEs, and approximately 5 hours to Antelope Wells POE.

Freight traffic between New Mexico and Mexico has been increasing in recent years due to increased investment along the Mexican border in manufacturing and industry. Figure 1.4 presents the number of

[2] New Mexico Transportation Plan: Mid-Region Regional Transportation Plan. August 13, 2015.

loaded truck containers and the number of trucks at New Mexico's busiest POEs, Columbus and Santa Teresa. Santa Teresa, the largest border crossing, experienced an uptick in truck traffic following a decline in 2011, although a significant percentage of this traffic is empty trucks. At Columbus, a smaller proportion of truck traffic is empty.

Figure 1.4 New Mexico Truck Crossings and Loaded Truck Containers, 2006-2012



Source: New Mexico Department of Transportation. New Mexico 2040 Plan: Appendix A – Existing Conditions and Trends.

1.1.2 Rail Assets

There are 2,055 miles of railroad right-of-way in New Mexico, which helps to connect the east and west coasts. 2,023 miles of the network is owned by Class I railroads and shortline railroads, as shown in Table 1.1 and Figure 1.5. The network includes two major transcontinental rail corridors, both of which are critical to the movement of goods on the national freight network. Two Class I railroads, BNSF Railway and Union Pacific Railway, own 85 percent of the freight railroad in New Mexico. The shortline railroads, which comprise 15 percent of the ownership, run a variety of different services throughout the State of New Mexico.[3]

The primary link between ABQ and major markets via rail is the BNSF Transcontinental Route (Transcon), a 2,239-mile freight route linking the Ports of Los Angeles and Long Beach with Kansas City and Chicago, which crosses east-west through central New Mexico passing through Belen, which is 35 miles south of Albuquerque and also home to a major BNSF yard. BNSF also operates the El Paso subdivision line, which is a 221-mile long track from Belen, NM south to the Mexican border in El Paso, TX. This subdivision serves as one of the BNSF's primary rail connections between the United States and Mexico.

[3] New Mexico Department of Transportation. New Mexico 2040 Plan: Appendix A – Existing Conditions and Trends.

Part of New Mexico's rail network includes a section of NMDOT-owned track right-of-way, a total of 133 miles through the counties of Valencia, Bernalillo, Sandoval, and Santa Fe. The State purchased the track from BNSF in order to build the New Mexico Rail Runner Express, which is the State's first commuter rail service. Although The State owns both the track and the commuter rail service, it does not operate the service directly, and instead has operating agreements with Rio Metro Regional Transit Direct (Rio Metro) and Santa Teresa Southern Railroad (SFS) for rail operations and maintenance of its right-of-way. The tracks run through Albuquerque and are central to the MRCOG region and also carry freight traffic between the BNSF Transcon line in Belen and Albuquerque.

Table 1.1 Freight Railroads in New Mexico

Table Header	Miles of Line Owned	% of System Total
Class I Railroads		
BNSF Railway	1,194.2	59.0%
Union Pacific Railway	533.6	26.4%
Class I Total	*1,727.8*	*85.4%*
Shortline Railroads		
Arizona Eastern Railway	25.3	1.3%
Texas New Mexico Railroad	76.0	3.8%
Southwestern Railroad	57.1	2.8%
Santa Fe Southern Railway	0.3	0.0%
Verde Logistics Railroad, LLC	2.3	0.1%
Santa Teresa Southern Railway	0.0	0.0%
New Mexico Department of Transportation	133.4	6.6%
City of Santa Fe	0.7	0.0%
Shortline Railroads Total	*295.1*	*14.6%*
TOTAL	**2,022.9**	**100.0%**

Source: New Mexico Department of Transportation. New Mexico 2040 Plan: Appendix A – Existing Conditions and Trends.

There are several railroad facilities that are important to the state's freight rail network, including intermodal and transload facilities. Intermodal and multimodal transload facility development allows goods to shift between modes such as truck, rail, and water.[4] Key freight rail facilities are shown in Figure 1.5.

- **Major Market Rail Connection:** The BNSF rail yard in Belen is located at an important junction in BNSF's rail network. It connects west coast freight from the Ports of Oakland, Los Angeles, and Long Beach via the Gallup subdivision, and connects to east coast ports and logistics parks in Chicago, Kansas City, and other major cities via the Clovis subdivision from the east. In addition,

[4] "Transload" is a general term for moving goods from one mode to another. Typically, it refers to bulk or other goods moving between truck, rail, and/or barge via trailers, hoppers, or flatbeds. "Intermodal" specifically refers to moving containerized goods (either international or domestic) via truck, rail, and/or ocean carrier (less commonly via barge).

Belen connects Mexico freight rail via the El Paso subdivision, which extends through Chihuahua down to Silao, Mexico.

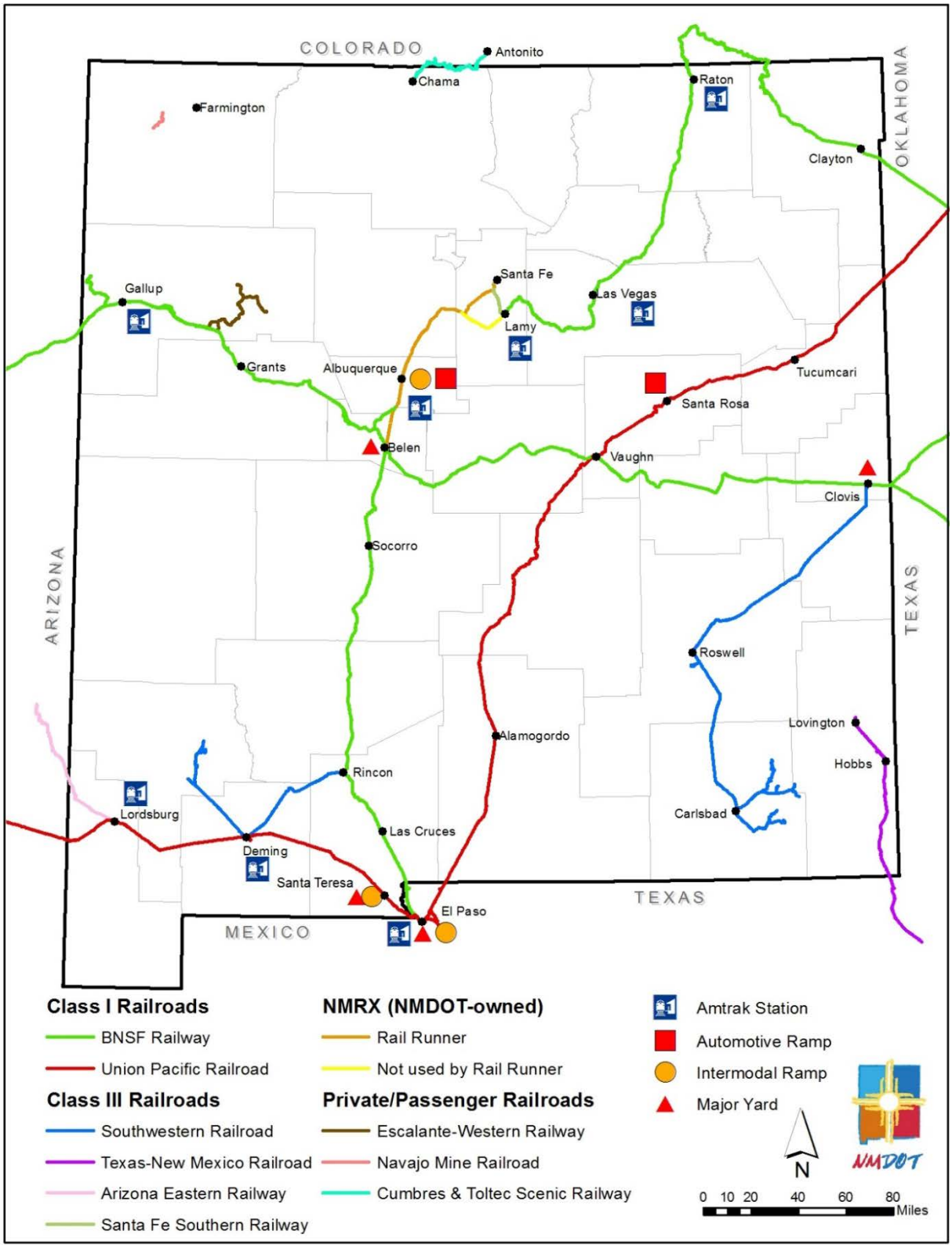
- **New Mexico Transload:** The first transload facility in the MRCOG region opened in spring 2016. The New Mexico Transload facility, which is located off South Broadway Boulevard in Albuquerque, handles a wide range of products, including palletized goods, bulk liquids, bulk solids, construction materials and equipment.[5] Additional transload facilities in the region are being considered at Albuquerque, Belen, or Los Lunas

- **BNSF Intermodal Facilities:** There is a BNSF intermodal ramp in Albuquerque that primarily handles UPS shipments to and from Chicago, and also a facility that handles some automobile traffic. However, the MRCOG region is primarily served by intermodal yards in El Paso and Amarillo, Texas.

- **UP Intermodal Yard (Santa Teresa):** Although not in the MRCOG region, the Santa Teresa facility serves as a gateway to Chihuahua, Mexico. The freight rail facility near the border with Chihuahua, Mexico, opened in May 2014. This massive facility sits on approximately 2,200 acres of land, and serves as a significant inland port for intermodal activity. Currently, the site is primarily serving as a sorting yard for UP containers moving to and from the Ports of LA and Long Beach and other markets. However, the master plan for the site features local, national, and international rail, road, air, and seaport distribution services.

[5] http://nmtransload.com/

Figure 1.5 New Mexico State Rail System, 2014



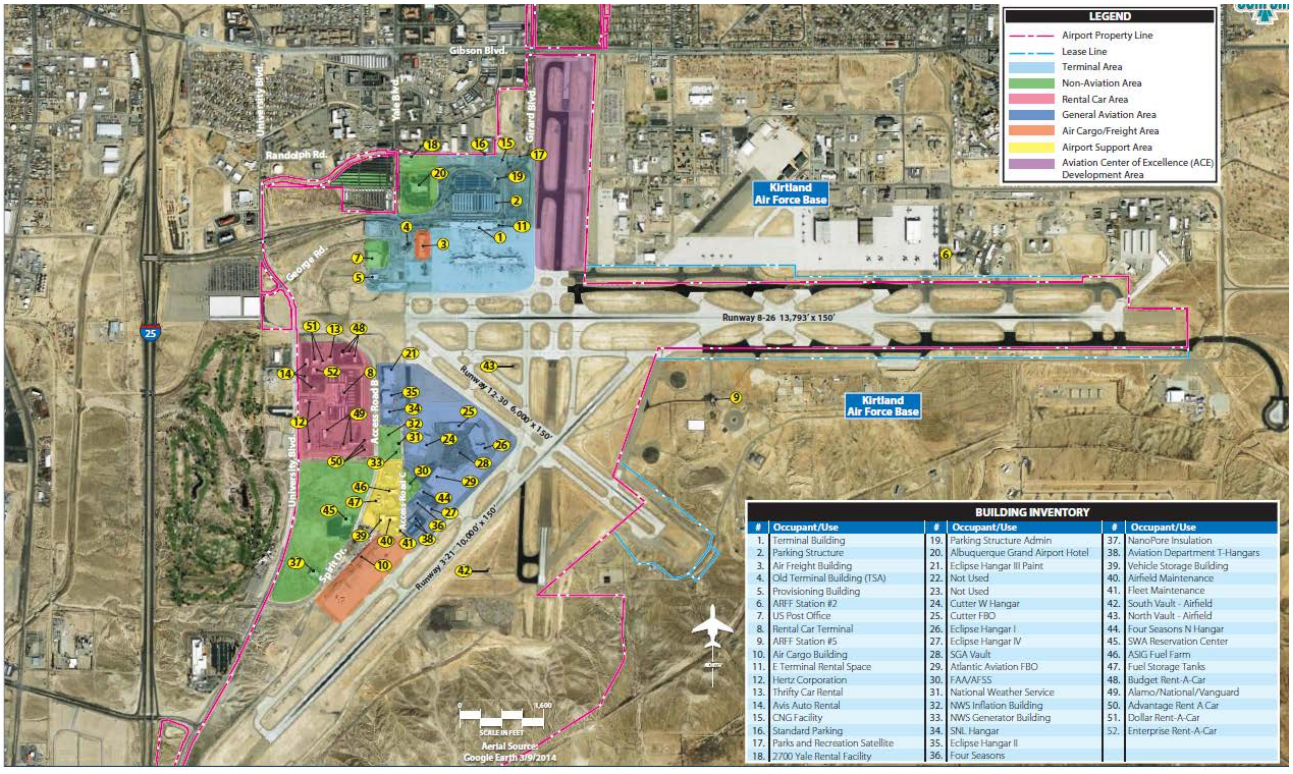
Source: New Mexico State Rail Plan, 2014.

1.1.3 Aviation Assets

Albuquerque International Sunport (ABQ) is the primary airport serving the MRCOG region. It is a medium-sized hub with commercial airport service, and serves much of the State of New Mexico in addition to the MRCOG region. The airport is located in the southern part of Albuquerque, approximately 4 miles southeast of the central business district. The next closest commercial service airport to MRCOG is in Santa Fe, which is approximately 50 miles north-northeast of Albuquerque. There are also four public use airports in a 35-mile radius of the city.

The main freight activity at ABQ are through the expedited carriers – FedEx and United Parcel Service (UPS) - and their partners - Empire Air (provides express feeder service for FedEx), AmeriFlight (express service for FedEx to and from Phoenix), and South Aero (feeder airline to UPS). These operations are housed in the southern part of the airport, with a sorting facility and ground servicing equipment to load and unload air freight for storage, shown in Figure 1.6. An additional air cargo facility of approximately 29,700 square feet is immediately adjacent to the terminal apron in the northern part of the airport. Primarily used for belly cargo for passenger airlines, this facility is currently underutilized. The airport has plans to build a new facility. In the past, ABQ has discussed removing the freight facility entirely in order to expand Concourse B.[6]

Figure 1.6 Current Building Inventory, Albuquerque International Sunport



Source: ABQ Sustainable Airport Master Plan, 2015.

[6] Albuquerque International Sunport Sustainable Airport Master Plan. 2015. Available from: http://thesunport.airportstudy.com/

1.1.4 Broadband Communication Infrastructure

Broadband coverage is increasingly important for commercial and industry activity and is available in various formats throughout the MRCOG region. The broadband infrastructure features several desirable features, such as competitive rates, system and path redundancy, secure high speed data transport, multiple DSL and ISP option, 100% digitally-switched networks, and areas with access to dark fiber network. The National Lambda Rail (NLR) is another key piece of telecommunications infrastructure, spanning 12,000 miles of high-speed fiber-optic cable through New Mexico, Texas, and California.[7] NLR is used by U.S. universities and research-oriented organizations to provide a national scale optical network infrastructure for research and experimentation in the development in new networking technologies and application.[8] In Albuquerque, a number of providers are available and provide digital technology services, including Qwest, the regional operating company for the state of New Mexico, TimeWarner, Xspedius, and Zianet. Fiber optic cables are also available in high density business areas such as downtown and the north I-25 corridor. These cables help lower connectivity costs and provide high-speed internet access.[9]

Figure 1.7 presents a map from the New Mexico Department of Information Technology (DoIT), which features an aerial view of broadband communication coverage throughout the MRCOG area. Albuquerque, Santa Fe, and Valencia are hot spots for cable coverage, while the surrounding areas outside the metros have primarily fixed wireless and mobile wireless access with some patches of DSL coverage. MRCOG has developed specific strategies to improve its broadband communication network, and has specifically highlighted expanding the system, and creating region-wide affordable broadband fiber optic system to allow private providers to open lines, share access and/or develop, fund, and maintain new lines.[10]

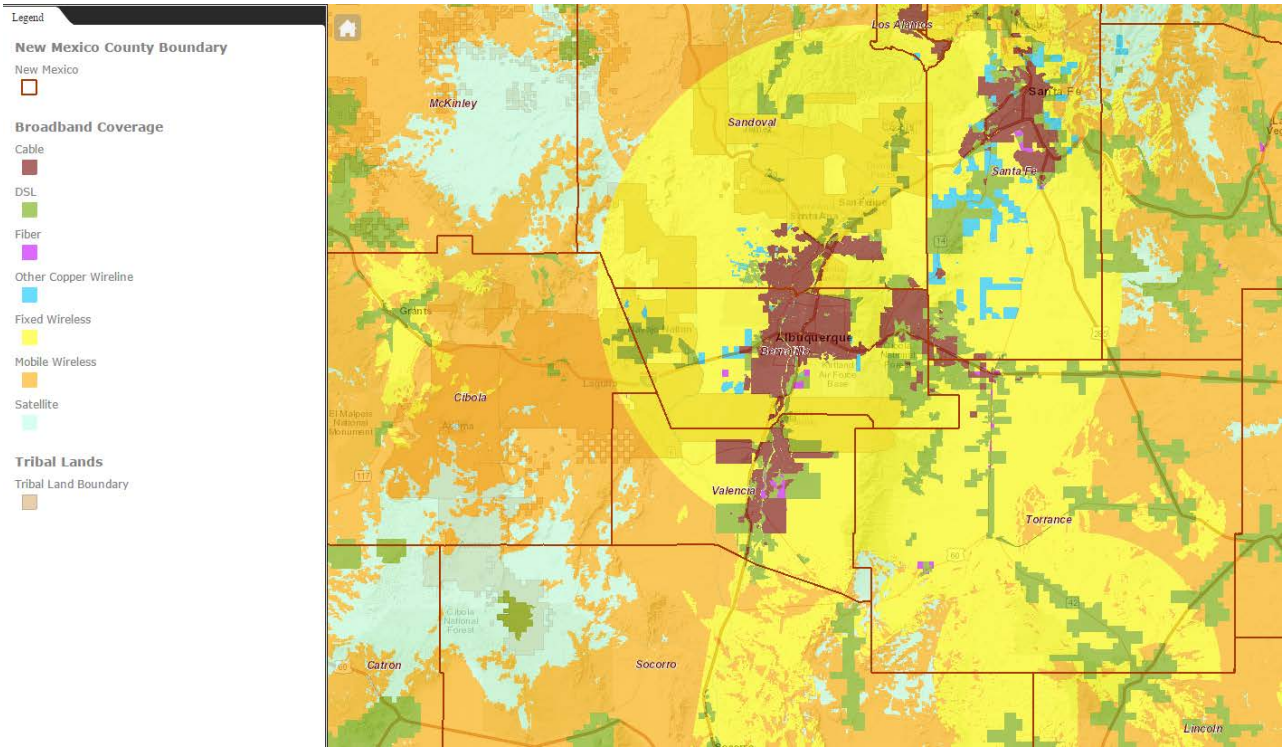
[7] New Mexico Partnership. “Overview”. Available from: http://www.nmpartnership.com/industries/digital-media/

[8] University of New Mexico Information Technologies. “New Mexico Lambda Rail”. Available from: http://it.unm.edu/network/lambdarail.html

[9] Metro New Mexico Development Alliance. “Communications”. Available from: http://www.nmsitesearch.com/site-selection-resources-7/communications

[10] Mid-Region Council of Governments of New Mexico. “Information Technology”. Available from: http://www.mrcog-nm.gov/economic-development/five-year-economic-development-strategy-ceds/information-technology

Figure 1.7 New Mexico Broadband Coverage Map



Source: New Mexico Department of Information Technology. https://nmbbmapping.org/mapping/

1.1.5 Foreign Trade Zone

Foreign Trade Zones (FTZs) are duty-free ports that are regulated by United States Customs, allowing companies to bring in raw materials or finished products that they can store, assemble, repackage, manufacture, or re-export without paying duty taxes. There are two FTZs in New Mexico, one of which is located in Albuquerque and the other in Santa Teresa. [11] This FTZ was originally approved in October 1984, and was expanded and relocated in 2002 to a 62-acre plot adjacent to the Albuquerque International Sunport airport complex.[12] The expanded FTZ was designed to support international and related logistics and cargo activities for the region. Today, it is occupied by one company, Oso BioPharmaceuticals Manufacturing, LLC, which is one of the largest private companies in New Mexico.[13] Albuquerque is once again looking to expand and increase the occupancy of this FTZ to boost international trade and foreign direct investment opportunities.

[11] U.S Foreign Trade Zones. International Trade Administration. 2016. Accessed May 16, 2016. Available from: http://enforcement.trade.gov/ftzpage/letters/ftzlist-map.html#new mexico

[12] "Foreign-Trade Zone 110- Albuquerque, New Mexico Application for Expansion and Relocation". Federal Register: The Daily Journal of the United States Government. July 6, 2001. Accessed May 16, 2016. Available from: https://www.federalregister.gov/articles/2001/07/06/01-16977/foreign-trade-zone-110-albuquerque-new-mexico-application-for-expansion-and-relocation

[13] "Oso Biopharmaceuticals to be acquired by Albany Molecular Research for $110 million in cash". Albuquerque Business First. June 2014. Accessed August 3, 2016. Available from: http://www.bizjournals.com/albuquerque/news/2014/06/02/oso-biopharmaceuticals-acquired-by-albany.html

1.2 Commodity Flow Analysis

1.2.1 Freight Flows and Top Commodities

More than 143 million tons of goods moved to, from, or within New Mexico in 2011. Additionally, New Mexico is a major corridor for through traffic due to its location. There are two transcontinental rail corridors that run through the state, and there is significant through truck traffic on I-40 between the east and west coasts. It is estimated that 90 percent of all rail traffic of New Mexico's rail traffic passes through the state with no local distribution and/or transloading activity. By 2040, total tonnage is expected to increase by 32 percent to 189 million tons for all modes.[14]

Although trucks are a key freight transportation mode for all industries in New Mexico, many of the State's industries are dependent on freight rail transportation to some degree. These sectors include agriculture, mining, and utilities, all of which deal in or utilize large quantities of high-weight but relatively low-value commodities that are not time-sensitive. Other industries, such as wholesale and retail trade, transportation and warehousing, and manufacturing, often depend on intermodal (truck/rail) services, as freight movements from these industries often involve lower weight/higher value commodities (e.g., consumer products) and many facilities do not include an on-site rail spur. Table 1.2 presents a qualitative assessment of the most important freight modes for each freight-depending industry in New Mexico.

Table 1.2 Modal Dependencies of New Mexico Industries

Industry	Air	Rail	Truck
Agriculture, Forestry, Fishing, and Hunting	○	●	●
Mining (Including Oil and Gas Extraction)	○	●	●
Utilities	○	●	●
Construction	○	○	●
Manufacturing	◐	◐	●
Wholesale Trade	○	◐	●
Retail Trade	○	○	●
Transportation and Warehousing	◐	◐	●

● Heavily Dependent	◐ Somewhat Dependent	○ Not Dependent

Source: New Mexico State Rail Plan, 2014.

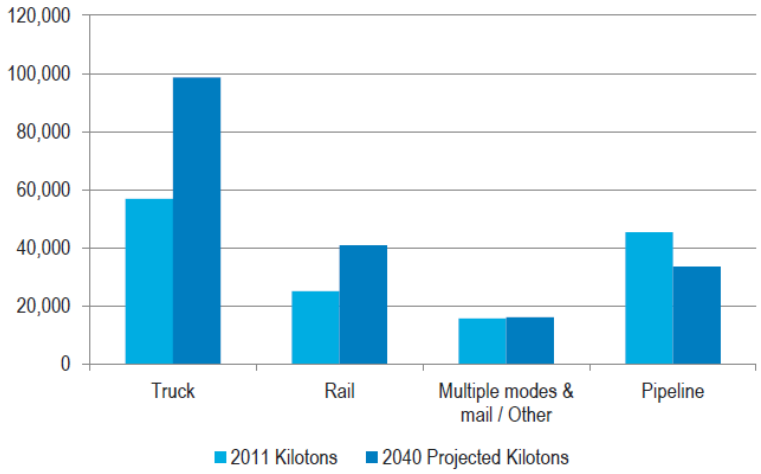
Truck Shipments

As noted in Table 1.2, trucks are an integral component to transporting goods and services for New Mexico's freight-intensive industries. Figure 1.8 presents the breakdown in total freight tonnage between modes in New Mexico from 2011 to 2040. I-10 and I-40 are the major east-west freight corridors in New Mexico, with

[14] New Mexico 2040 Plan: Existing Conditions and Trends. New Mexico Department of Transportation. June 2015.

I-25 providing north-south access from Texas to Colorado. Truck traffic is heavily concentrated in and around Albuquerque. However, there are a number of emerging routes throughout New Mexico that serve key industries, such as U.S. 550, 285, and 70. These highways are especially important to increasing NAFTA-related trade as well as the oil and gas industry. Other key industries such as mining, agriculture, and manufacturing are also generating more loads on these corridors. In addition, over 93,000 commercial trucks entered New Mexico via the three POEs in 2013.[15]

Figure 1.8 Total Freight Tonnage in New Mexico, 2011-2040



Over 90.1 million tons of commodities traveled in, out, and within destinations in New Mexico by truck in 2012. The top commodities transported on this mode align with New Mexico's historic economic strengths in mining and fuel production and are presented in Table 1.3. Gasoline was the most transported product by tonnage at 14 million tons, comprising 15 percent of all tonnage in 2012. This commodity category includes products such as gasoline blends, aviation turbine fuel, ethanol, and other fuel products. Non-metallic minerals and other foodstuffs were also top commodities at approximately 11 million tons each. Non-metallic mineral products includes a variety of salts, stones, and natural abrasives, but excludes energy-related elements such as natural asphalt, shale, and tar sands. Other foodstuffs includes a large selection of processed food products including dairy, spices, confectionary and baked items, and non-alcoholic beverages. Gravel and fuel oils are the fourth- and fifth-most transported items at 9.4 million tons and 8.1 million tons, respectively.

Table 1.3 Top New Mexico Commodities by Truck, 2012

SCTG Code	Commodity	Total Tons (thousands)	% of Total
17	Gasoline	13,809	15%
13	Nonmetal min. prods.	11,403	13%
07	Other foodstuffs	11,381	13%
12	Gravel	9,416	10%
18	Fuel oils	8,050	9%
41	Waste/scrap	5,613	6%

[15] New Mexico 2040 Freight Plan

SCTG Code	Commodity	Total Tons (thousands)	% of Total
19	Coal-n.e.c.	3,792	4%
43	Mixed freight	2,725	3%
11	Natural sands	2,468	3%
04	Animal feed	1,995	2%

Source: Freight Analysis Framework Version 4, Federal Highway Administration (FHWA) and Bureau of Transportation Statistics (BTS).

Rail Shipments

In 2009, more than 127 million tons valued at $8.5 billion were transported on New Mexico's rail system. More than 88 percent of total tonnage and 95 percent of total value was through traffic, which included trains passing through New Mexico bound for long-distance markets. The highest rail volumes in the state were for coal (60 percent of total tonnage), chemicals and allied products (15 percent), and food and kindred products (6 percent), which includes products such as milk and cheese, prepared fruits, nuts, and vegetables, bakeries, and animal processing. However, it is important to note that the majority of these products were supporting a consuming market rather than a rail-dependent industry, as 91 percent of these food products moved to, from, and within New Mexico inbound.

The types and quantities of through rail freight traffic are indicative of national and even global economic activity, with New Mexico benefitting from jobs created to maintain the rail lines and to crew and service the trains. Table 1.4 presents a summary of rail demand in New Mexico in 2009.

Table 1.4 Summary of New Mexico Rail Demand, 2009

	Tonnage		Value	
Rail Traffic	Tons (Thousands)	% of NM Total	Value ($ Million)	% of NM Total
Local	42.7	0%	$1.1	0%
Inbound	3,064.3	2%	$158.5	2%
Outbound	12,161.3	10%	$227.8	3%
Through	112,288.2	88%	$8,197.3	95%
Total	**127,556.5**	**100%**	**$8,584.7**	**100%**

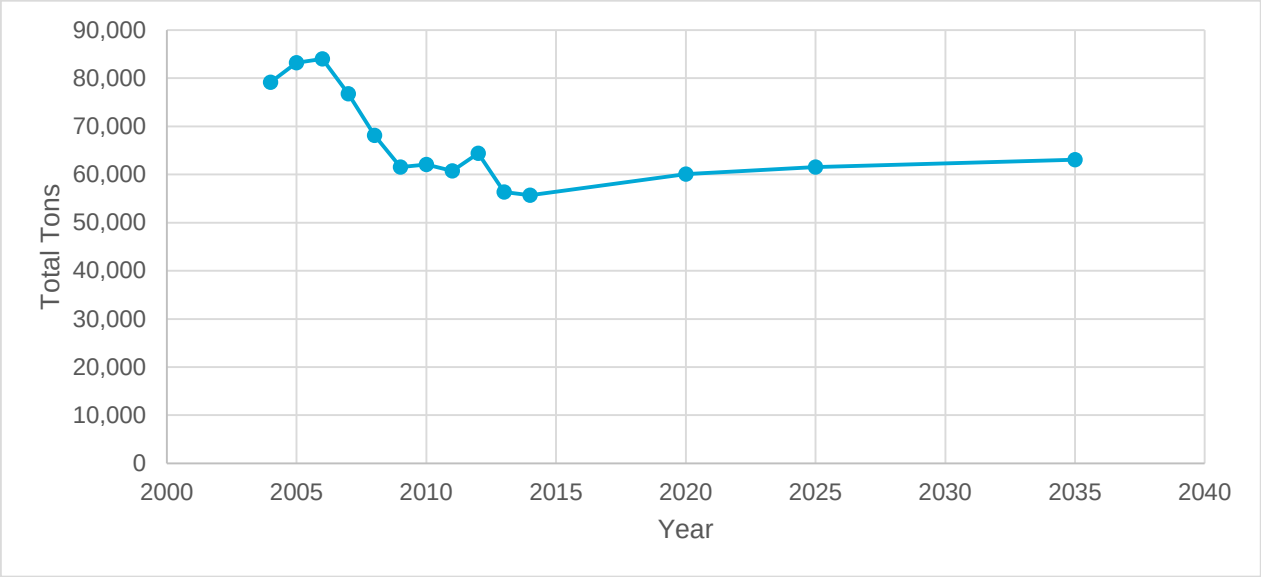
Source: New Mexico State Rail Plan, 2014.

Mining has long been a key industry in New Mexico, with 246 active mines throughout the State producing coal, copper, potash, molybdenum, industrial minerals, and stone and aggregate. All of these commodities are well suited for rail transportation, both from the standpoint of their characteristics, as well as the markets into which they are sold. In addition, New Mexico produced 171,000 barrels of oil per day in 2010. Many of these energy markets are of sufficient distance and density where rail is the most cost-effective and efficient means of transport.

Air Cargo

Albuquerque International Sunport (ABQ) is the primary airport serving the MRCOG region. In 2014, ABQ handled 55,702 tons of air cargo, as shown in Figure 1.9. This is the lowest amount of annual cargo volume since 2004. ABQ projects 63,043 tons by 2035. However, it is not expected that air cargo volumes will reach pre-recession levels in the near future. This is consistent with nationwide trends; reductions in domestic air cargo capacity – a result of a smaller passenger fleet and fewer scheduled domestic air freight airplanes – since the recession has pushed carriers to rely more heavily on trucks.[16] The expected average annual growth rate is 0.59 percent for air cargo.[17]

Figure 1.9 Air Cargo Total Tons (2004-2014) and Forecasts (2020-2035)



Source: ABQ Sustainable Airport Master Plan, 2015.

[16] Boeing World Air Cargo Forecast, 2014-2015. Available from: http://www.boeing.com/resources/boeingdotcom/commercial/about-our-market/cargo-market-detail-wacf/download-report/assets/pdfs/wacf.pdf

[17] Albuquerque International Sunport Sustainable Airport Master Plan. 2015. Available from: http://thesunport.airportstudy.com/

2.0 Economic and Industry Analysis

As a population grows and the economic nature of a region changes, this creates similar shifts in the demands placed on the transportation infrastructure. This section discusses demographic and economic trends in the MRCOG region, along with employment across key industries in the region.

The data used in this analysis come from the following sources:

- U.S. Census Bureau Annual Estimates of the Resident Population that includes current as well as historical estimates of residential population at the county, state, and national level.
- U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages data was used as a source of employment in key industries by county. The industry categories were assigned to one of two sectors: the goods dependent sector and the services sector. In this way those industries that make the most use of freight transportation are analyzed separately.
- Population and employment projections are taken from the Socioeconomic Forecast that accompanies the 2040 Metropolitan Transportation Plan by Data Analysis Subzone.

2.1 Profile of the Study Region

The study region is made up of the area covered by the Mid-Region New Mexico Council of Governments (MRCOG). For the purposes of this economic analysis, the study region is made up of four counties, Bernalillo, Sandoval, Torrance, and Valencia. This profile is concerned with population and employment distribution and growth for the study region as well as its comparison with the state of New Mexico.

2.1.1 Population Growth

Population change is a key contributor to economic growth and transportation demand, as increases in population create demand for goods and services. In conjunction with the expanding demand for goods and services, population impacts the number of passenger and freight trips through the study area's transportation system.

Most of the population in the study area (75 percent) reside in Bernalillo County. Another 15 percent live in Sandoval County, and the remaining 10 percent reside either in Torrance or Valencia counties. These figures can be seen in Table 2.1. The population in the study region grew by 14.6 percent between 2004 and 2014, outstripping the 9.5 percent growth rate for the state of New Mexico. Over this period most of the growth occurred in Bernalillo and Sandoval counties (with growth rates of 12.5 and 34 percent respectively). Torrance County actually saw a decline in population over this period, however this had a limited effect on the study area population, due to the small share of the overall population that this decrease represents (a decrease of 1,573 people, compared to the 2014 study area population of 904,587).

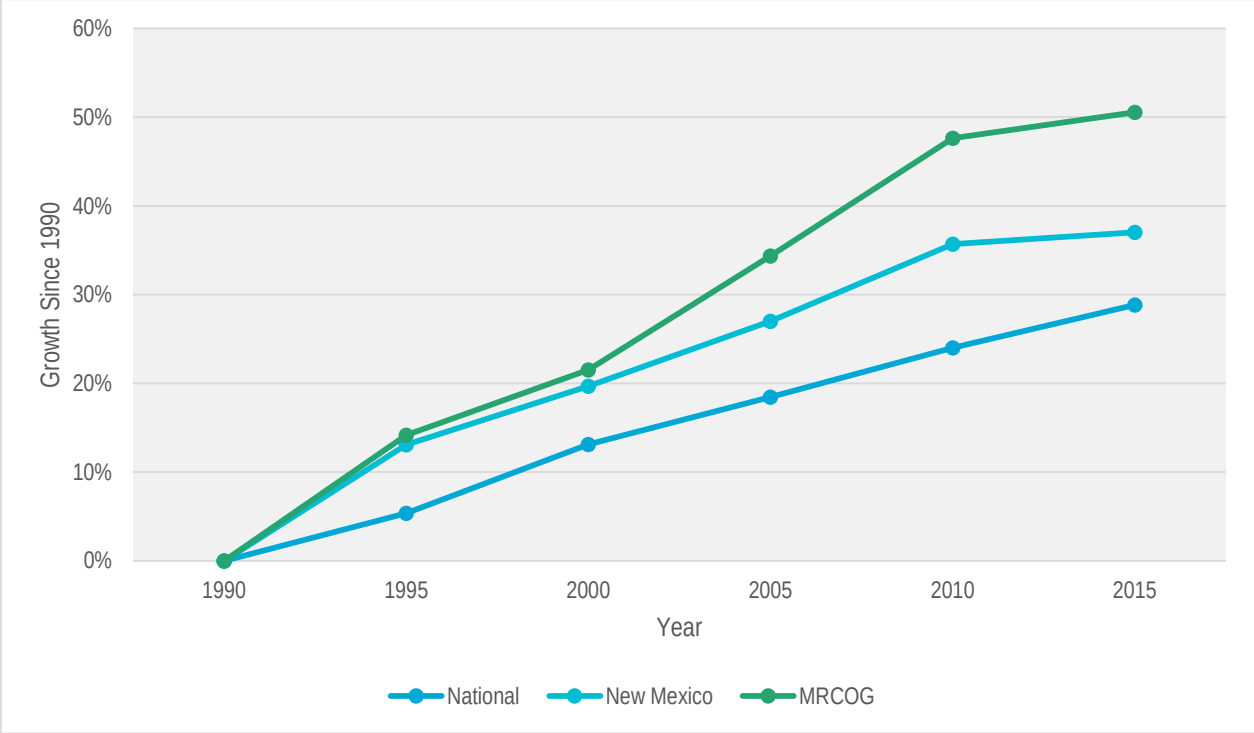
Table 2.1 Population Distribution in the Study Region and New Mexico, 2004 to 2014

Geographic Region	2004 Population	2014 Population	Percent of 2014 Population	Growth Rate, 2004 to 2014
Bernalillo County	600,449	675,551	74.7%	12.5%
Sandoval County	102,583	137,608	15.2%	34.1%
Torrance County	17,184	15,611	1.7%	-9.2%
Valencia County	69,021	75,817	8.4%	9.8%
Study Area	**789,237**	**904,587**	**100%**	**14.6%**
New Mexico	*1,903,808*	*2,085,572*		*9.5%*

Sources: 2004 population estimates from U.S. Census Intercensal Population Estimates for July 1st, 2004 2014 population estimates from U.S. Census Annual Average Estimates of Residential Population for July 1st, 2014

Over the period from 1990 to 2014, population growth in New Mexico has exceeded the national growth trend. The study area has had even higher growth rates than New Mexico, particularly during the periods from 1990 to 1995 and from 2000 to 2010. Figure 2.1 is a comparison of the population growth rates since 1990 of the study region, the state, and the nation.

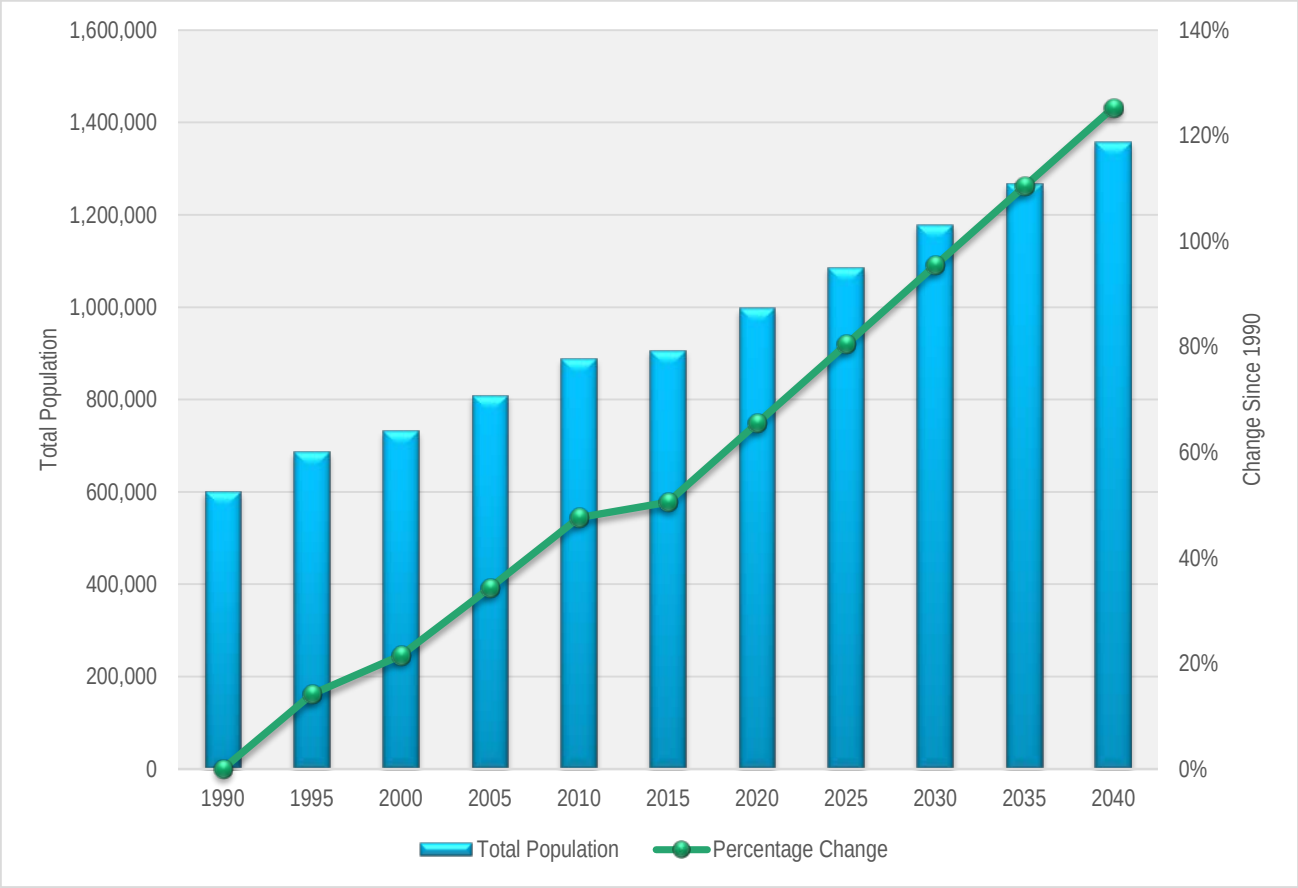
Figure 2.1 Population Growth, 1990 to 2014



Sources: 1990 to 2005 population estimates from U.S. Census Intercensal Population Estimates for July 1st 2010 to 2014 population estimates from U.S. Census Annual Average Estimates of Residential Population for July 1st

Population projections for the study area taken from the MRCOG 2040 Socioeconomic Forecast are presented in the following graph (Figure 2.2). The total population is presented on the left-hand y-axis, while the percentage change in population since 1990 is on the right-hand y-axis. The growth rate for the study area has slowed during the 2010 to 2015 time period, but is expected to resume its general trajectory out to 2040, at which time the population is expected to be about 1,360,000. The overall increase in population from 1990 to 2040 is projected to be 125 percent.

Figure 2.2 Population Projection and Growth Rate, MRCOG 1990 to 2040



Sources: 1990 to 2005 population estimates are from U.S. Census Intercensal Population Estimates for July 1st. 2010 to 2014 population estimates are from U.S. Census Annual Average Estimates of Residential Population for July 1st. 2020 to 2035 projections are straight-line calculations using the 2015 and 2040 data points. 2040 population projections are from the MRCOG 2040 Socioeconomic Forecast that accompanies the 2040 Metropolitan Transportation Plan by Data Analysis Subzone.

2.1.2 Employment Growth

One of the most tangible measures of a region's economic vitality is employment growth. As demand rises for business's products and services, employees and equipment are added to better satisfy the needs of customers. The jobs produced by these companies provide the incomes people need to sustain themselves and their families.

Table 2.2 displays the distribution and growth in employment across the study area from 2004 to 2014, and compares it to employment in New Mexico. Bernalillo County is the major employment hub in the region, with 87.4 percent of jobs in the study region.

Over the last decade, the study region has had an increase in employment of only 0.7 percent, compared to the 5.1 percent growth rate for New Mexico, and 5.7 percent nationally. Most of the study area's growth in employment is driven by Sandoval County, which has seen an increase in employment of 11.7 percent. Both Torrance and Valencia counties have had a decrease in employment, while employment in Bernalillo County has remained approximately constant.

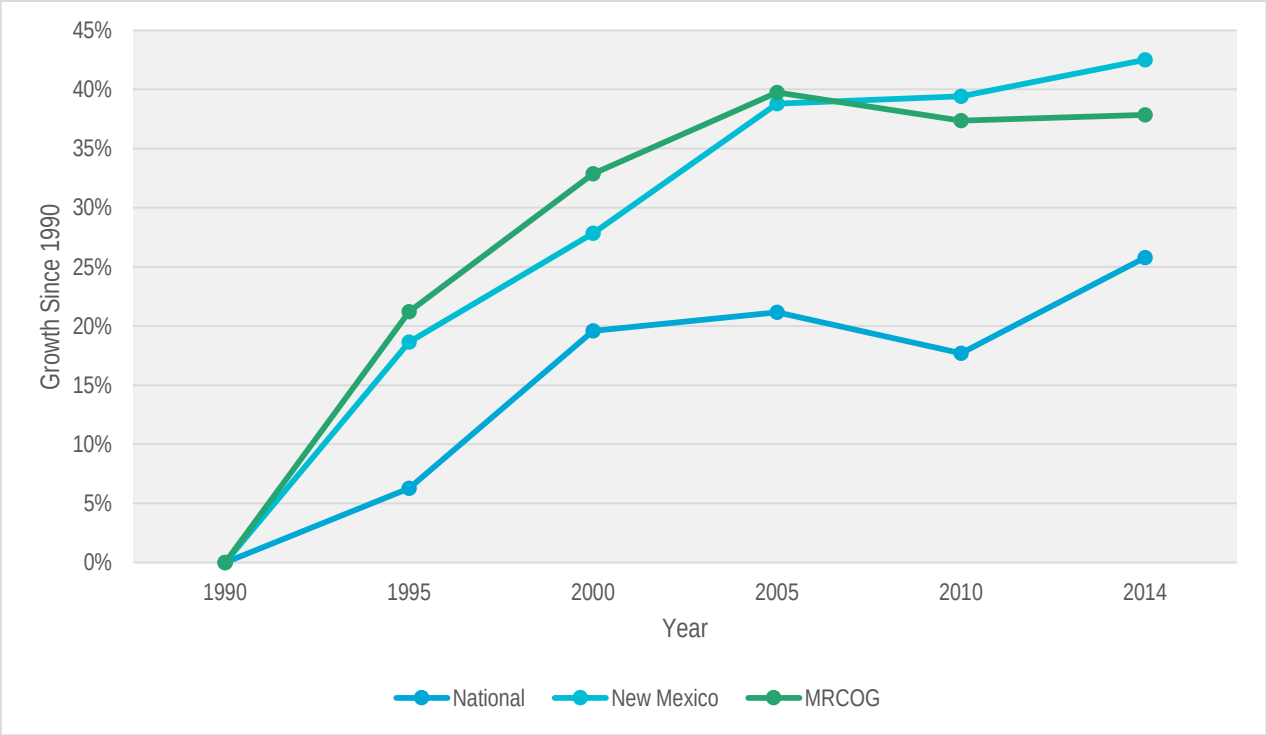
Table 2.2 Employment Distribution in the Study Region and New Mexico, 2004 to 2014

Geographic Region	2004 Employment	2014 Employment	Percent of 2014 Employment	Growth Rate, 2004 to 2014
Bernalillo County	314,071	314,610	87.4%	0.2%
Sandoval County	25,886	28,908	8.0%	11.7%
Torrance County	3,485	3,183	0.9%	-8.7%
Valencia County	13,997	13,080	3.6%	-6.6%
Study Area	**357,439**	**359,781**	**100%**	**0.7%**
New Mexico	*760,449*	*798,912*		*5.1%*

Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Like population, New Mexico has seen larger increases in employment than the rest of the country from 1990 to 2014, especially from 1990 to 1995 and from 2000 to 2005. The study area has followed a similar pattern in in employment growth. Like the rest of the country, the study area saw a drop in employment from 2005 to 2010. New Mexico as a whole however, actually experienced a slight increase in employment during that same time period. Neither the study area nor New Mexico has experienced the recovery from 2010 to 2014 seen in the rest of the county.

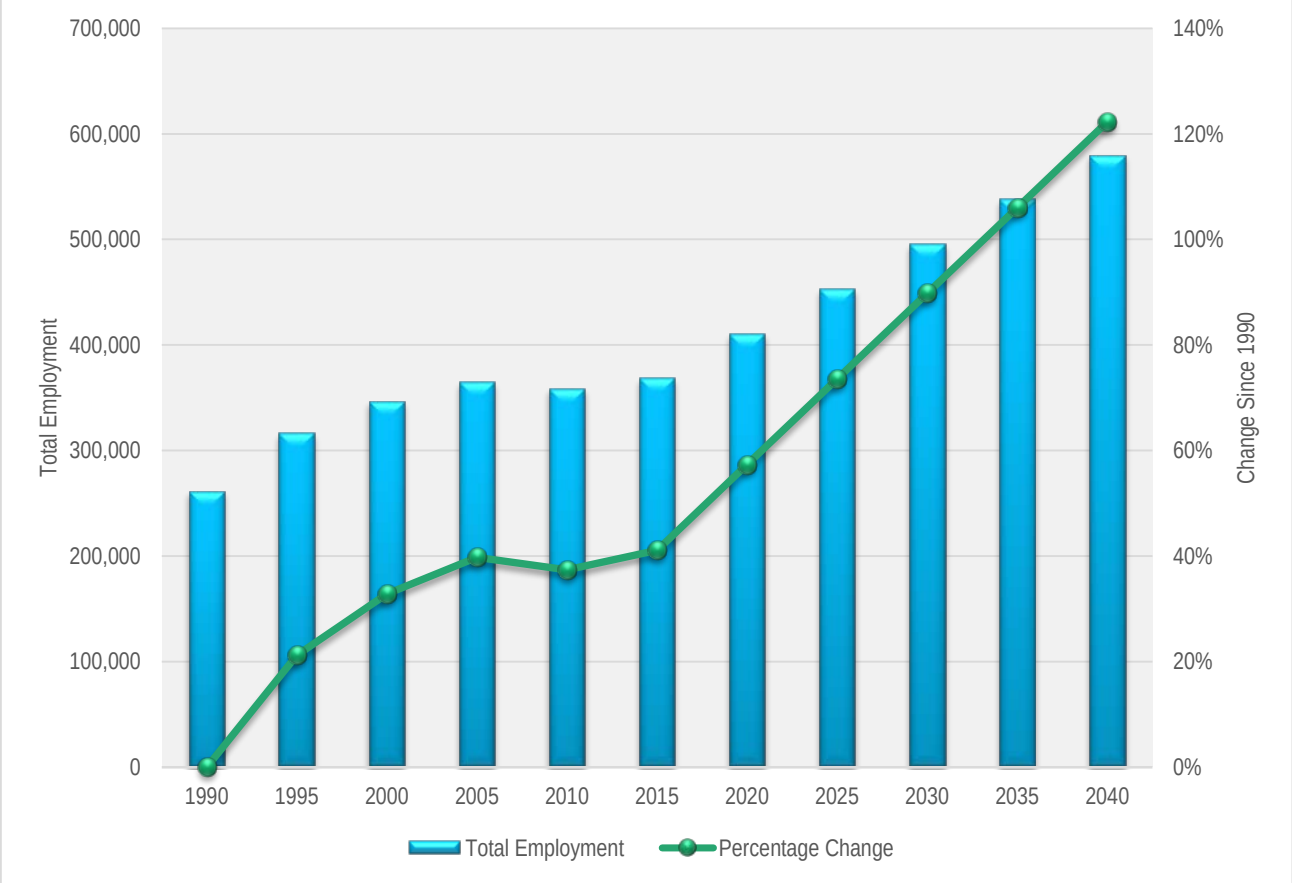
Figure 2.3 Employment Growth, 1990 to 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Employment projections for the study area, taken from the MRCOG 2040 Socioeconomic Forecast, are presented in the following graph (Figure 2.4). The total employment is presented on the left-hand y-axis, while the percentage change in employment since 1990 is on the right-hand y-axis. As with population, the growth rate for the study area fell during the 2005 to 2015 time period, but is expected to continue the long-run growth trend to about 580,000 by 2040. The growth in employment from 1990 to 2040 is projected to be 122 percent, which roughly follows the expected population growth figures.

Figure 2.4 Employment Projection and Growth Rate, MRCOG 1990 to 2040



Sources: 1990 to 2010 Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages. 2020 to 2035 projections are straight-line calculations using the 2014 and 2040 data points. 2040 employment projections are from the MRCOG 2040 Socioeconomic Forecast that accompanies the 2040 Metropolitan Transportation Plan by Data Analysis Subzone

2.2 Industry Analysis

The industry analysis is used to study the economic structure of the study area. Specifically, the analysis identifies those industries that are growing or in decline in terms of employment, with a special focus on those most affected by changes in freight efficiency.

2.2.1 Methodology

In this study, industries are categorized as either in the goods and logistics-dependent sector or the service sector. The goods sector is production oriented while the service sector focuses in the provision of services. While freight is viewed as a factor of production in the goods sector, it is viewed as a supply that facilitates business in the service sector. Although retail trade, wholesale trade, and transportation and warehousing are not production oriented, these industries rely intensively on freight and have been identified as part of the goods sector or logistics-dependent sector. Table 2.3 provides a list of the industries that are included in each sector.

Table 2.3 Goods (Logistics-Dependent) Industries and Service Industries

Goods (Logistics-Dependent) Sector Industries	Service Sector Industries
Agriculture, Forestry, Fishing and Hunting	Information
Mining, Quarrying, and Oil and Gas Extraction	Finance and Insurance
Utilities	Real Estate and Rental and Leasing
Construction	Professional and Technical Services
Manufacturing	Management of Companies and Enterprises
Wholesale Trade	Administrative and Waste Services
Retail Trade	Educational Services
Transportation and Warehousing	Health Care and Social Assistance
	Arts, Entertainment, and Recreation
	Accommodation and Food Service
	Other Services, Except Public Administration
	Public Administration

Source: Cambridge Systematics

Within the study area, in 2014, 102,005 jobs (28 percent) were in goods sector industries, while 257,776 jobs (72 percent) were in service sector industries. There has been a shift in employment out of goods sector industries and into service sector industries since 2004. In 2004 35 percent of jobs were in the goods sector, while 65 percent were in the service sector. As a not of interest, nationally in 2014, employment was similarly split with 35 percent of jobs in goods sector industries and 65 percent in service sector industries.

In order to conduct this study, location quotient (LQ) and shift-share analyses were performed. Both of these analyses are standard methods used to understand the study area's regional economy and measure the uniqueness or concentration of industries within the region compared to the nation as a whole. They identify which industries are strong and/or growing. If these industries are those most impacted by freight efficiency then improvements to the freight system will have a more pronounced impact on the economic health of the region.

2.2.2 Industrial Mix in the Region

Employment in the study region in 2014 was about 360,000. Of this total about 324,500 (approximately 90 percent) was provided by twelve industries. These industries and their associated employment are listed in descending order in Table 2.4.

The industries listed are similar to the largest industries by employment in the state of New Mexico, with the exception of the Mining, Quarrying and Oil and Gas Extraction industry. This provides 336 jobs in the study area (about 0.1 percent of employment) but 27,881 jobs in the state of New Mexico (about 3.5 percent of total employment).

Table 2.4 Top Twelve Industries in the Study Area by Employment, 2014

Industry	Study Area Employment	Percent of Study Area Employment	Percent of New Mexico Employment
Health Care and Social Assistance	55,441	15.4%	16.3%
Educational Services	42,074	11.7%	9.8%
Retail Trade	41,513	11.5%	11.7%
Accommodation and Food Services	40,269	11.2%	10.9%
Professional and Technical Services	28,966	8.1%	6.7%
Administrative and Waste Services	23,830	6.6%	5.4%
Public Administration	22,653	6.3%	7.5%
Construction	20,337	5.7%	5.8%
Manufacturing	16,331	4.5%	3.5%
Wholesale Trade	11,560	3.2%	2.7%
Finance and Insurance	11,267	3.1%	2.7%
Transportation and Warehousing	10,346	2.9%	2.8%
Total of Top Twelve Industries	**324,587**	**90.2%**	**85.9%**

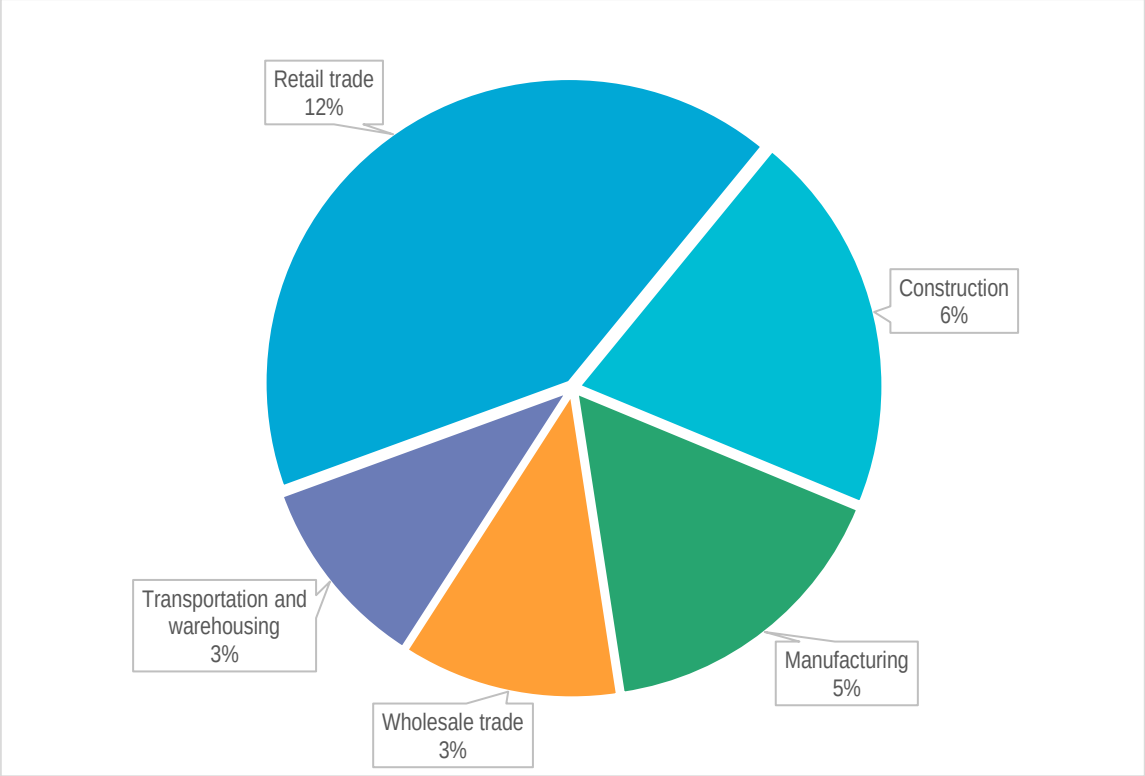
Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Freight-Dependent Industries

Freight transportation or logistics-dependent industries account for 28 percent of employment in the region. Ninety eight percent of employment in the freight transportation dependent sector is made up of the five largest industries (retail trade, construction, manufacturing, wholesale trade, and transportation and warehousing).

Retail trade and construction make up the majority of the employment in the goods sector, accounting for 17 percent of total employment in the region. Together, retail and wholesale trade make up 15 percent of the employment in the study area, but make up over half (52 percent) of the employment in the logistics dependent industries. Manufacturing is the third largest industry in the sector, making up 5 percent of jobs (16 percent of jobs in the goods sector). Figure 2.5 displays the distribution of employment across the top five logistics-dependent industries, as a percentage of total employment in the study region.

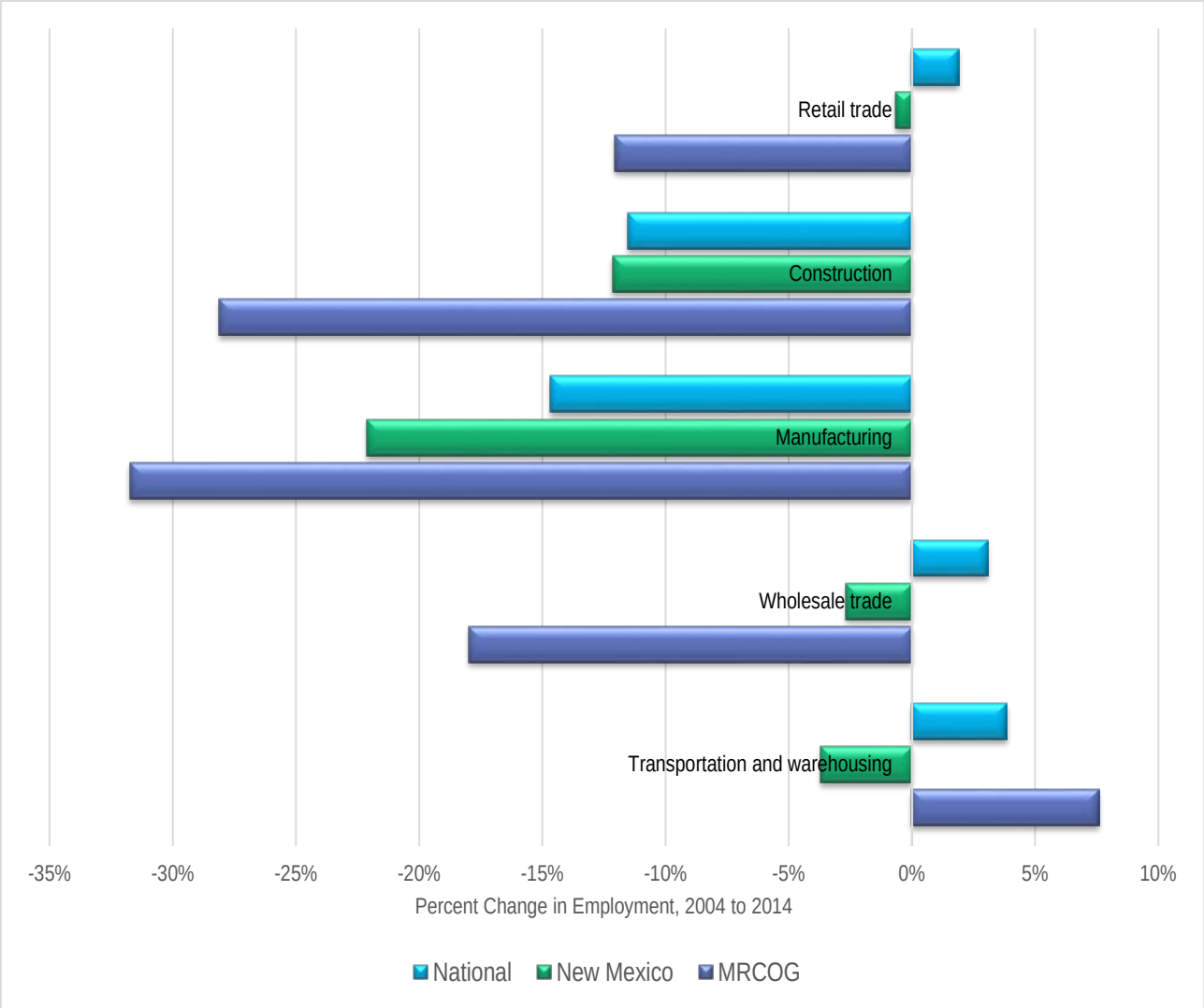
Figure 2.5 Top Five Freight-Dependent Industries in the Study Area by Employment Share, 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

As shown in Figure 2.6, while national employment levels have increased in transportation and warehousing, retail trade, and wholesale trade, from 2004 to 2014, national employment has fallen in the construction and manufacturing industries. In the state of New Mexico, employment has fallen in all five of the top freight-dependent industries in the study area. Within the study region however, while employment has fallen over the same period for four of the five goods dependent industries, employment has increased in transportation and warehousing.

Figure 2.6 Employment Trends in Freight-Dependent Industries, 2004 to 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Shift-Share Analysis

The shift-share analysis is similar to the location quotient (LQ) analysis, but instead of investigating total jobs in each industry, this analysis concentrates on the components of job growth. The shift-share analysis breaks job growth into three components – National Growth Share, Industrial Mix Share, and Local Growth Share. It provides insight into whether local changes in employment at driven by local or national trends. Specifically:

- **The National Growth Share** describes the change in employment that is attributable to the national economy.
- **The Industrial Mix Share** describes the change in employment caused by shifts in employment from one industry to another at the national level.

- **Local Growth Share** is the remaining growth or decline after accounting for the National Growth Share and the Industrial Mix Share. A positive Local Growth Share signals that the region has a competitive advantage that facilitates stronger growth.

The following section discusses the Shift-Share analysis results for the top five freight-dependent industries (retail trade, construction, manufacturing, wholesale trade, and transportation and warehousing).

At the national-level employment increased by 5.7 percent over the study period, and there was an employment shift of 1.9 percent out of transportation and warehousing nationally. Together these national trends create a composite national increase in employment of 3.8 percent (-1.9% + 5.7%) in transportation and warehousing. Over the same time period transportation and warehousing employment in the study region increased by 7.6 percent. The difference between the national trend (+3.8%) and the state trend (7.6 percent) is an increase of 3.7 percent, which is attributable to the local economy of the study region.

At the national level, employment decreased for manufacturing and construction, but increased for transportation and warehousing, retail trade, and wholesale trade. Within the study region, employment decreased in four out of the five industries, but at a faster rate than the rest of the county. In the case of transportation and warehousing (as discussed in the paragraph above), employment has increased at a faster rate than the nation as whole. These changes are shown below in Table 2.5.

Table 2.5 Shift-Share in Jobs for the Top Transportation Dependent Industries in the Study Area, 2004 to 2014

Industry	National Growth Share	National Industry Mix Share	Sum of National Growth and Industry Mix	Local Share Growth	Total Change in Study Area Employment
Retail Trade	5.7%	-3.8%	**1.9%**	**-13.9%**	**-12.0%**
Construction	5.7%	-17.2%	**-11.5%**	**-16.6%**	**-28.1%**
Manufacturing	5.7%	-20.4%	**-14.7%**	**-17.1%**	**-31.7%**
Wholesale Trade	5.7%	-2.6%	**3.1%**	**-21.1%**	**-18.0%**
Transportation and Warehousing	5.7%	-1.9%	**3.8%**	**3.7%**	**7.6%**

Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Location Quotient Analysis

The location quotient (LQ) analysis describes the industry trends between 2004 and 2014. An LQ is used to quantify which industries in a region are concentrated when compared to the nation as a whole. The region's and nation's industries are compared by dividing the region's employment share within a particular industry by the nation's employment share in the same industry. If the LQ is greater than 1, the industry has a higher concentration in the region than the nation. Because of this, the region is able to export some of the industry's productivity after satisfying local demand. However, if the LQ is less than 1, the employment for that particular industry in the region is less than the average across the country. The industry cannot satisfy the demand within the region and must import the remaining goods and services.

The following section discusses the LQ analysis results for the top five freight-dependent industries (retail trade, construction, manufacturing, wholesale trade, and transportation and warehousing).

Because the goods dependent sector is particularly impacted by the freight system, the LQ analysis of the industries falling into this classification has particular importance in this report. While all of the top five industries in the goods sector are common in the study area, they may not be as prevalent as would be expected based on national averages of employment share. For example, the manufacturing industry accounted for 4.5 percent of employment in the study area in 2014, but 8.9 percent of employment nationally, resulting in an LQ of 0.51. Table 3.4 displays the LQ analysis results for the top five freight-dependent industries in the study area.

Employment in construction is more prevalent in the study area than the rest of the country, with a location quotient of 1.23, meaning that the percentage of employment in this industry is 23 percent higher than the national average. Retail trade has a location quotient close to 1, meaning that employment in retail trade is about as common in the study region as the nation as a whole. Manufacturing, wholesale trade and transportation and warehousing all have location quotients below 1, so employment in these industries is not as common in the study region as elsewhere in the country.

All but one of the location quotients have decreased over the last decade. Only transportation and warehousing has seen and increase. It is important to note that an increase in LQ is not the same as an increase in employment in an industry. Rather, it is an increase in employment share relative to the rest of the country. It is a subtle but significant distinction.

Table 2.6 Location Quotient Analysis of the Top Five Transportation Dependent Industries in the Study Region, 2004 to 2014

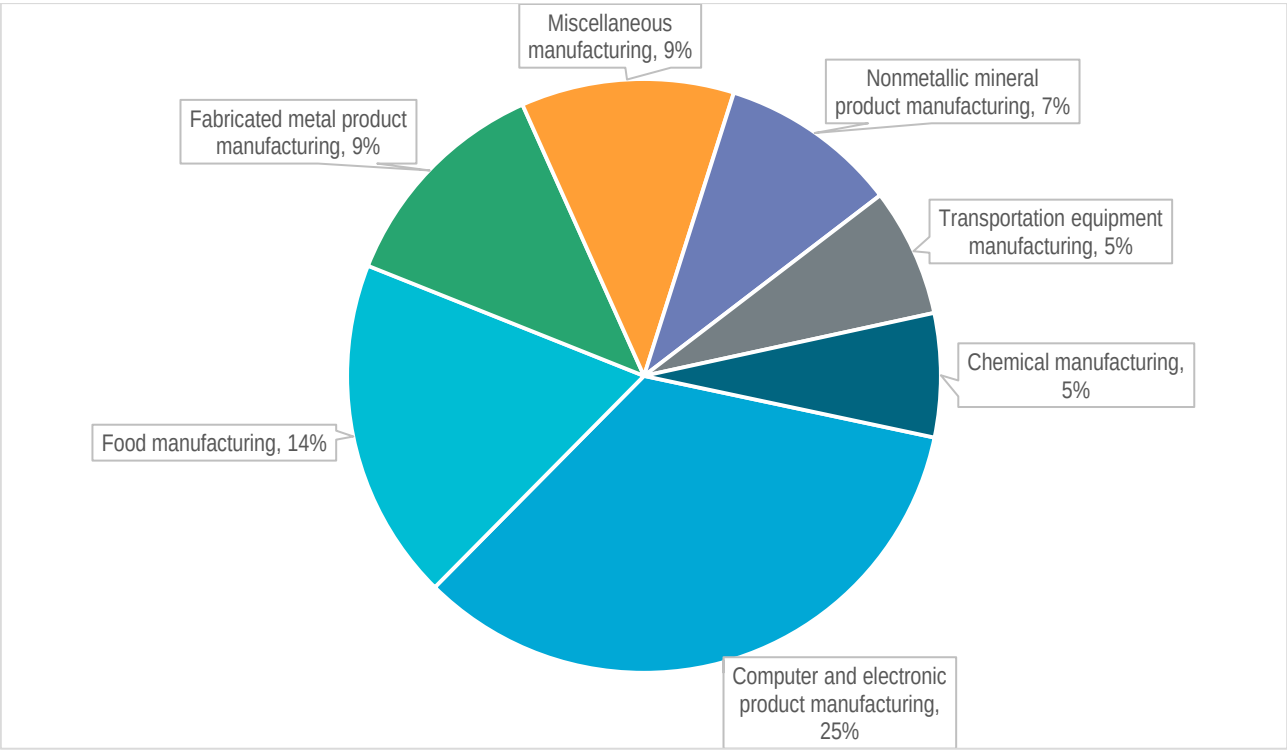
Industry	2014 Employment	2014 Location Quotient	Change in LQ, 2004 to 2014
Retail Trade	41,513	1.02	-9%
Construction	20,337	1.23	-15%
Manufacturing	16,331	0.51	-16%
Wholesale Trade	11,560	0.75	-16%
Transportation and Warehousing	10,346	0.74	+9%

Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Manufacturing Subcategories

In order to further understand the manufacturing industry in the study area, a more in-depth analysis has been done of the employment distribution across the (3-Digit NAICS) subcategories of manufacturing. The majority (74 percent) of manufacturing employment in the study area falls into one of seven manufacturing subcategories. The following figure (Figure 2.7) displays the percentage of manufacturing employment in each of these seven subcategories.

Figure 2.7 Top Seven Manufacturing Industry Subcategories in the Study Area by Manufacturing Employment Share, 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

When compared to the distribution of manufacturing nationally in Table 2.7, the study area has a higher concentration of manufacturing jobs in computer and electronic equipment, nonmetallic mineral product, and miscellaneous manufacturing. The prevalence of food and chemical manufacturing employment is about in line with national trends, while employment in fabricated metal products and transportation equipment manufacturing is lower than national averages. All seven manufacturing subcategories have had a decrease in jobs over the last decade, ranging from 37 percent (in chemical manufacturing) to 15 percent in fabricated metal product manufacturing.

Contributing to the drop in manufacturing jobs in the region are large layoffs, such as those by SCHOTT Solar in 2012 (of about 200 employees) and at the Intel semiconductor manufacturing plant in 2013 (a redeployment of about 400 employees out of the area), as well as smaller incidents such as the roughly 70 jobs lost at GE Intelligent Platforms in 2012. The BLS data in Table 2.7 only covers the time period spanning 2004 through 2014. Therefore any subsequent job losses, such as those at Google Titan Aerospace in 2015, are not reflected.

Table 2.7 Distribution of Manufacturing Employment, 2014

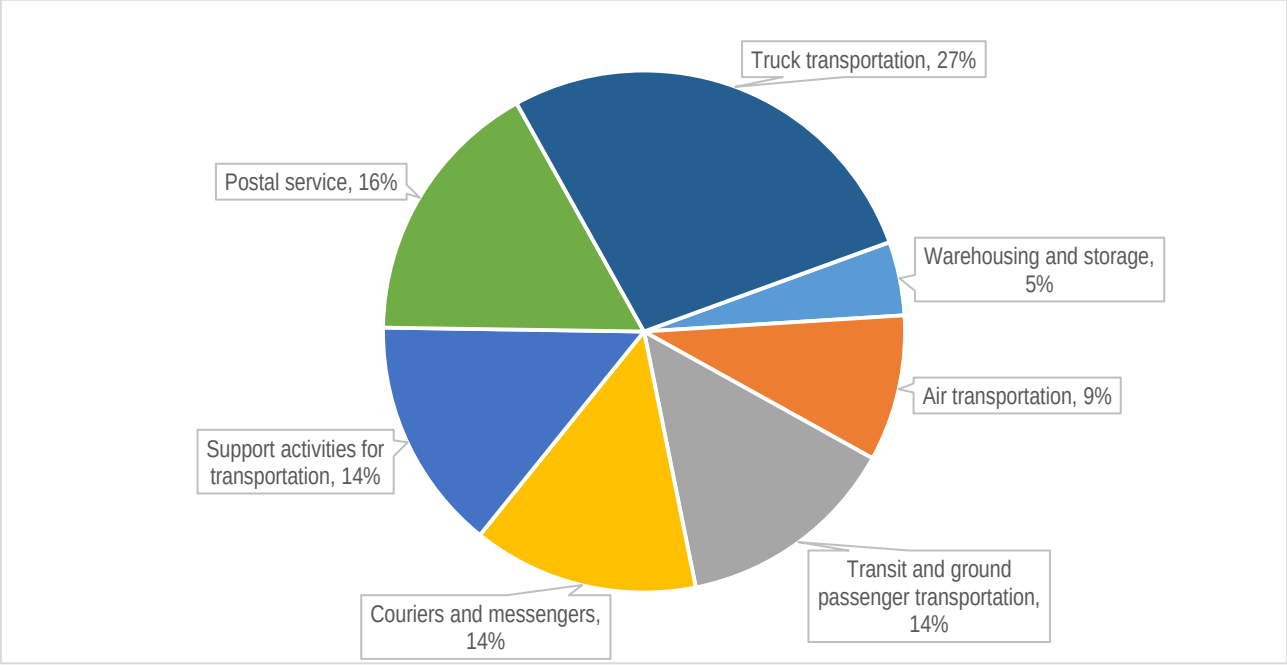
Manufacturing Subcategory	MRCOG Employment	Percent of MRCOG Manufacturing Employment	Percent of National Manufacturing Employment	Change in MRCOG Employment, 2004 to 2014	Change in National Employment, 2004 to 2014
Computer and Electronic Equipment	4,107	25.1%	8.6%	-34.8%	-20.3%
Food	2,244	13.7%	12.2%	-15.2%	-0.4%
Fabricated Metal Products	1,476	9.0%	11.9%	-14.6%	-2.7%
Miscellaneous	1,398	8.6%	4.8%	-51.2%	-10.9%
Nonmetallic Mineral Products	1,171	7.2%	3.1%	-35.1%	-23.4%
Transportation Equipment	843	5.2%	13.1%	-22.9%	-11.0%
Chemicals	812	5.0%	6.6%	-37.0%	-9.3%

Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Transportation and Warehousing Subcategories

The distribution of employment in the transportation and warehousing industry across the 3-Digit NAICS subcategories has been reviewed. Almost all of the employment in this industry (99 percent) falls into one of seven subcategories. These are in the following figure (Figure 2.8) which displays the percentage of manufacturing employment in each of these seven subcategories.

Figure 2.8 Top Seven Transportation Industry Subcategories in the Study Area by Transportation Employment Share, 2004 to 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

Table 2.8 displays the composition of transportation and warehousing employment. The concentration of industry employment in postal service and couriers and messengers is higher than the national average. Employment prevalence in warehousing and storage is lower than the national average, however jobs in this subcategory have been increasing rapidly over the last decade (a 68 percent increase). The other four subcategories line up with national average distributions.

Most of the subcategories of transportation and warehousing have had increases in employment from 2004 to 2014 in the study area. Only two of the seven top categories (postal service and air transportation) have had a decline in jobs over the ten year period.

Table 2.8 Distribution of Transportation and Warehousing Employment, 2014

Transportation and Warehousing Subcategory	MRCOG Employment	Percent of MRCOG Transportation Employment	Percent of National Transportation Employment	Change in MRCOG Employment, 2004 to 2014	Change in National Employment, 2004 to 2014
Truck Transportation	2,818	27.2%	26.5%	29.3%	4.4%
Postal Service	1,702	16.5%	11.2%	-6.2%	-24.0%
Support Activities	1,476	14.3%	13.1%	3.7%	12.1%
Couriers and Messengers	1,431	13.8%	10.6%	12.3%	1.2%
Transit and Ground Transport	1,406	13.6%	13.3%	10.6%	16.7%
Air Transportation	925	8.9%	8.4%	-18.9%	-13.2%
Warehousing and Storage	468	4.5%	14.1%	68.2%	33.2%

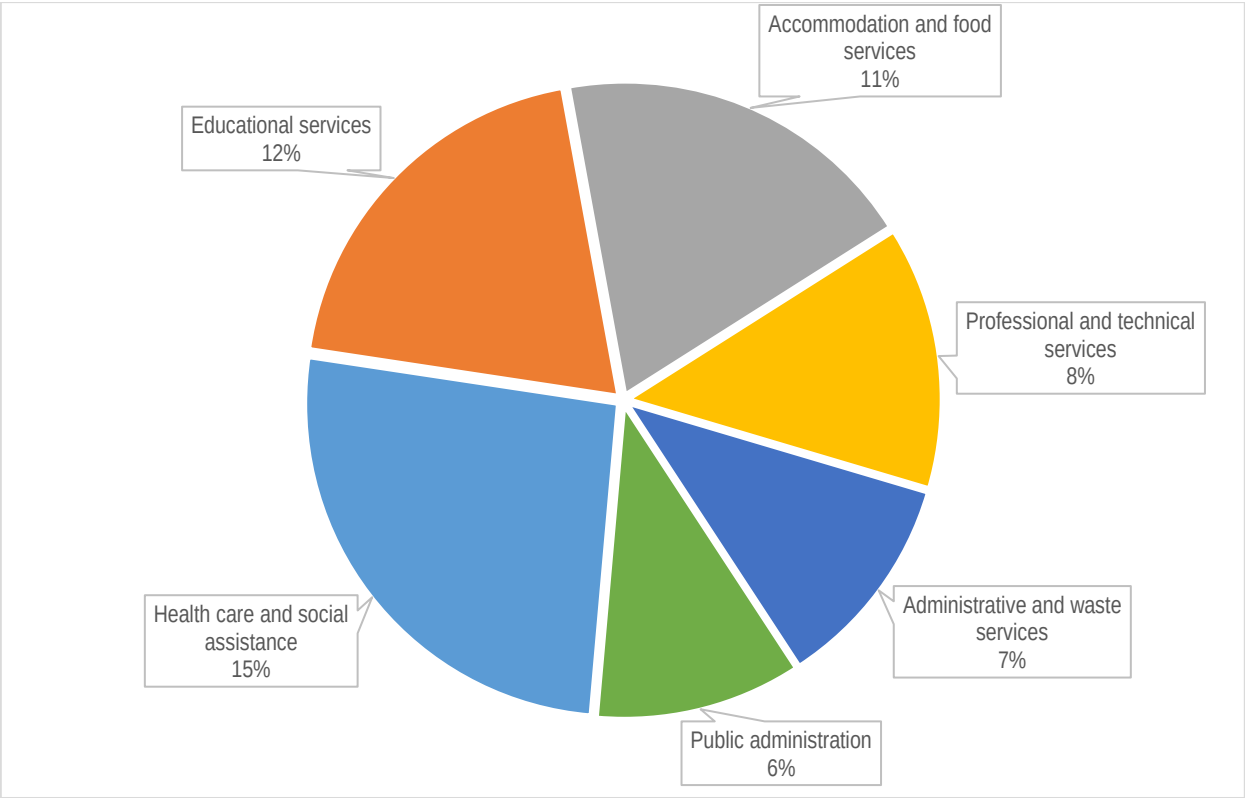
Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

2.2.3 Service Sector Industries

In the study region, 72 percent of employment is in service sector industries. Within this sector, 83 percent of employment is in the top six industries (health care and social assistance, educational services, accommodation and food service, professional and technical services, administration and waste services, and public administration).

Health care, education, and accommodation and food services employ the majority (53 percent) of service sector workers in the study area. Together these three industries employ 38 percent of all workers in the study region. The other three major service sector industries (professional and technical services, administration and waste services, and public administration) make up another 21 percent of total employment. Figure 2.9 below displays the distribution of employment across the top six service sector industries, as a percentage of total employment.

Figure 2.9 Top Six Service Sector Industries in the Study Area by Employment Share, 2014



Source: Employment Estimates are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Cambridge Systematics

2.3 Comparison with Peer Regions

Center for Neighborhood Technology (CNT) developed an analysis to compare the Albuquerque metropolitan statistical area (MSA) to the MSAs of peer regions. The purpose of this is to demonstrate if Albuquerque's strengths and weaknesses are due to national or regional phenomena, or are unique to the metropolitan area. Each section below details a different glimpse into the comparative analysis – through an examination of location quotients, shift share analysis, a look at high-tech manufacturing, and export patterns in each region. Peer cities chosen for this analysis include El Paso, TX; Austin, TX; Dallas, TX; Denver, CO; Phoenix, AZ; Salt Lake City, UT; and Kansas City, MO.

2.3.1 Location Quotient Comparisons

As discussed in the preceding section, the location quotient is a measure of the strength of a local area's industry when compared to the national industry strength. It demonstrates the particular strengths and weaknesses of an area in terms of jobs per occupation. The analysis focuses on businesses that are fundamental to Cargo-Oriented Development (COD) -- the development of manufacturing and logistics businesses in conjunction with freight transportation assets. The primary location quotient analysis provides

a peer region comparison for the two categories of occupations[18] that are basic to COD: 1) production occupations, 2) transportation occupations. In most situations a location quotient above 1.2 is considered strong. Looking at the comparison between Albuquerque and its peer regions in Table 2.9, it is apparent that Albuquerque has quite weak location quotients for production and transportation occupations and is lagging behind virtually all the peer cities in both production and transportation.

Table 2.9 Location Quotient Comparison of ABQ to Peer Regions of Basic Cargo-Oriented Development Occupations: Production and Transportation

Cities	ABQ	El Paso	Austin	Dallas	Denver	Phoenix	Salt Lake City	Kansas City
Total Employment	374,230	290,630	928,810	2,329,820	1,374,280	1,875,860	656,750	1,022,270
Total Production Employment	11,000	15,570	33,340	123,140	51,110	81,880	39,800	59,110
Production Location Quotient	0.45	0.81	0.55	0.80	0.57	0.66	0.92	0.88
Total Transportation Employment	19,630	19,620	38,750	170,180	82,930	115,960	42,930	68,240
Transportation Location Quotient	0.76	0.98	0.60	1.06	0.87	0.89	0.95	0.97

Source: U.S. Bureau of Labor Statistics Occupational Employment Statistics (May 2015), analysis by Center for Neighborhood Technology, 2016

In order to broaden this analysis we also considered the location quotients of 36 occupations that are not grouped under the production or transportation categories of the North American Industrial Classification (NAICS) system, but are clearly required in the production and logistics complex, although they work in other industries as well. These include such occupations as industrial machinery mechanics, several categories of buyers and sellers of manufactured and wholesale goods, engineers and engineering technicians. From this grouping of categories, our team selected 17 occupations that require college educations including engineers, logisticians, and plant managers. Table 2.10 shows the Albuquerque region's location quotients for these occupations relative to peer regions.

Here, Albuquerque shows stronger relative performance, particularly in occupations that require professional training, where it outperforms all other peer regions. This finding reinforces the commonly drawn observation that Albuquerque is rich in highly trained professionals but weak in job opportunities for workers without college educations. It is also notable that while these skilled and professional fields employ significant numbers of Albuquerque workers, they include only a small part of the total workforce.

[18] Production and Transportation occupations as defined by 2010 Standard Occupational Classification (SOC). Definitions can be found here http://www.bls.gov/soc/soc_structure_2010.pdf
51-000 is the SOC heading for production occupations, and 53-000 is the heading for transportation occupations. Included occupations will be listed on the structure under those primary code numbers.

Table 2.10 Location Quotient Comparison of ABQ to Peer Regions of Other COD Related Occupations

Cities	ABQ	El Paso	Austin	Dallas	Denver	Phoenix	Salt Lake City	Kansas City
Total Employment	374,230	290,630	928,810	2,329,820	1,374,280	1,875,860	656,750	1,022,270
COD Related Fields Employment Total	14,690	5,130	38,750	78,700	42,260	59,080	21,800	31,290
COD Related Fields Location Quotient	1.43	0.65	1.41	1.11	1.05	1.05	1.18	1.03
Professional COD Related Fields Employment Total	8,920	900	18,370	31,550	17,110	21,730	6,050	10,770
Professional COD Related Fields Location Quotient	2.42	0.43	2.18	1.41	1.35	1.20	1.08	1.15

Source: U.S. Bureau of Labor Statistics Occupational Employment Statistics (May 2015), analysis by Center for Neighborhood Technology, 2016

2.4 Shift Share Analysis Relative to Peer Regions

Shift share is an analysis which can demonstrate what portion of the job growth or decline over the past decade in any given local sector is attributable to national economic forces, national industry patterns, or local phenomena. Competitive share is the measure of growth or decline due to local conditions for any give occupation. A healthy local industry would be one with a large number of jobs and strong positive competitive share. This analysis refers to all production occupations. Albuquerque has very few production occupations that qualify under those criteria. Of 38 occupations, only three with a strong positive competitive share (>3%) employ more than 200 people in Albuquerque, as illustrated in Table 2.11. One of those occupations is “bakers,” which, while technically a production occupation, probably generates few exports.

There are few positive examples, but many deeply negative ones. The occupations with the highest employment numbers are also the ones that are declining due to local, not national or industry, factors. Jewelers and precious stone and metal workers was one of the top performing occupations in the location quotient measure, it is one field in which Albuquerque employs a much higher percent of workers than the national average. However, looking at this occupation in the shift share analysis, it is clear that although the industry still employs many workers, it has been greatly declining and so doing mostly because of local factors in Albuquerque. This is a common pattern as overall production occupations are declining in the metropolitan area, largely due to local conditions.

A shift share analysis for individual transportation occupations may be a useful future activity for determining areas of potential for regional cargo-oriented development. Trucking is so dominant that a shift share for transportation may not seem extremely relevant right now. However, because the location quotient for transportation in the metropolitan area was higher than that of production, there may be more growth potential in that sector. Additionally, the overall competitive share for transportation jobs in the entire

transportation sector is -4.7%, which although negative, is much less negative than the same figure for overall production occupations.

Table 2.11 Shift Share Analysis of ABQ in Production Occupations

Production Occupation	ABQ			U.S.	SHIFT SHARE (%)		
	Total Emp., 2005	Total Emp., 2015	% Change	% Emp. Change	National Growth	Industry Mixed (IM)	Competitive Share (CS)
All Production occupations	**15,070**	**11,000**	**-27.0%**	**-11.5%**	**5.8%**	**-17.3%**	**-15.5%**
Assemblers and fabricators, all other	280	340	21.4%	-11.4%	5.8%	-17.2%	32.8%
Bakers	260	370	42.3%	22.6%	5.8%	16.7%	19.8%
Packaging and filling machine operators and tenders	360	470	30.6%	-4.5%	5.8%	-10.3%	35.0%
Jewelers and precious stone and metal workers	780	180	-76.9%	-10.1%	5.8%	-15.9%	-66.9%

INDICATES >5% GROWTH

INDICATES >5% DECLINE

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment Statistics, May 2015. http://www.bls.gov/oes/current/oessrcma.htm. Accessed 4/25/2016. Analysis by Center for Neighborhood Technology, 2016

2.5 High Tech Manufacturing

A 2012 report from the Brookings Institution[19] found that 40.2 percent of Albuquerque's manufacturing jobs could be considered very high tech, and an additional 10.4 percent could be considered moderately high tech. The very high tech manufacturing job share is far greater in Albuquerque than almost all the peer cities as well as the national average – 16.1 percent, as shown in Table 2.12. The average annual wage for very high tech manufacturing jobs in Albuquerque is also on par with or above most peer cities, and on par with the U.S. average ($93,315). This report found a manufacturing cluster around the information technology sector in Albuquerque, speaking to the high tech nature of the jobs.

[19] http://www.brookings.edu/research/interactives/manufacturing-interactive

Table 2.12 High Tech Manufacturing Job Comparison between ABQ and Peer Cities

	ABQ	El Paso, TX	Austin, TX	Dallas, TX	Denver, CO	Phoenix AZ	Salt Lake City	Kansas City
Share of Manufacturing Jobs Considered Very High Tech	40.2%	8.3%	53.0%	32.5%	20.9%	46.3%	24.5%	15.0%
Average Annual Wage All Manufacturing, 2010	$57,682	$45,819	$88,026	$66,948	$59,460	$73,032	$53,018	$59,531
Very High Tech Manufacturing Wage	$86,732	$49,431	$118,416	$94,591	$94,249	$103,543	$75,806	64,772
% change in all manufacturing jobs 1980-2000	56.8%	10.9%	180.4%	15.7%	-8.4%	54.6%	29.2%	-8.3%
% change in all manufacturing jobs 2000-2010	-36.7%	-56.0%	-42.8%	-29.3%	-29.7%	-31.7%	-7.8%	-22.1%
% change in all manufacturing jobs Q1 2010-Q4 2011	3.1%	5.8%	7.2%	2.3%	0.1%	1.6%	5.8%	3.3%
Central county[20] manufacturing job growth 1980-2000	55.1%	N/A	194.1%	11.7%	-8.3%	N/A	29.3%	-8.3%
Outlying county[21] manufacturing job growth 1980-2000	115.5%	N/A	57.0%	66.2%	-23.7%	N/A	24.8%	-6.9%
Central county manufacturing job growth 2000-2010	-36.6%	N/A	45.9%	-30.6%	-29.9%	N/A	-8.5%	-21.8%
Outlying county manufacturing job growth 2000-2010	-39.1%	N/A	10%	-18.0%	16.3%	N/A	11.7%	-27.6%

Source: Brookings Institution, 2012. Analysis by Center for Neighborhood Technology, 2016

High Tech Manufacturing & Patents

A 2013 Brookings report on patenting activity in metropolitan areas[22] found that, consistent with Albuquerque's strengths in high-tech manufacturing, the region is a national leader in average claims per patent. Claims are how holding a patent actually generates revenue. Albuquerque ranked very highly at 23rd

[20] Governing county or counties in the central part of the city.

[21] Other counties in the metropolitan statistical area which do not govern in the city center.

[22] http://www.brookings.edu/research/interactives/2013/metropatenting

of 358 metropolitan areas in this measure (see Table 2.13). The metropolitan area was also in the top third nationally in regard to patents per thousand jobs, and on par with most of the peer cities. This speaks to the entrepreneurship and innovation in the area, and when combined with the strength of the highly related employment location quotient, may indicate that workers and entrepreneurs would readily enter the manufacturing field if they saw opportunity expanding there.

Table 2.13 Comparison of Patent Activity in ABQ and Peer Regions

	ABQ	El Paso, TX	Austin, TX	Dallas, TX	Denver, CO	Phoenix, AZ	Salt Lake City, UT	Kansas City
Number of Patents 2007-2011	233	25	2,497	1,945	775	1,437	441	559
Patents/ thousand jobs 2007-2011	0.6	0.1	3.1	0.7	0.6	0.8	0.7	0.6
Rank of 358 MSAs by patents/ thousand jobs 2007-2011	107	319	9	97	104	76	91	118
Claims per patent 2007-2011	17	10	15	13	16	13	13	12
Rank of 358 MSAs by claims per patent 2007-2011	23	272	66	152	55	126	141	194
Top Patenting Companies	Sandia National Laboratory (54)	Delphi Technologies (7)	Inter-national Business Machines Corporation (1206)	Texas Instruments (568)	Avaya Inc (77)	Intel (173)	University of Utah (47)	Sprint Communi-cations Company LP (222)
	University of New Mexico (39)	MTN Products (6)	Dell (208)	Cisco Technology (75)	Magpul Industries Corporation (44)	Honeywell (161)	Fairchild Semi-conductor Corporation (28)	Sprint Spectrum LP (143)
	Honeywell Inter-national Inc (15)	University of Texas at Austin (4)	Freescale Semi-conductor (205)	Samsung (73)	Dharmacon Inc (41)	Freescale Semi-conductor (114)	Longyear TM INC (27)	Embarq Holding Company LLC (41)

Source: Brookings Institution, 2013. Analysis by Center for Neighborhood Technology, 2016

Sandia National Laboratory (SNL) plays an important role in patent development with the largest number of patents granted to any one patent holder in 2011. However, 11 of the 19 other top patent holders in the ABQ MSA surpassed SNL in the average number of claims per patent, suggesting that SNL may not dominate, or even lead, in the commercial value of its patents.

The breakdown of products by category shows a predominance of patents in high-tech fields including communications, computer software, medical instruments and optics. To the extent that the implementation of these patented technologies may lead to manufacturing in the ABQ MSA, the goods produced would probably be shipped by truck-air or truck. However, the list of patents includes categories in more traditional industries including metal working, chemical compounds, computer hardware and peripherals, coatings, and cleaning supplies. The implementation of patented products in these fields would be likely to create demand for shipping by truck or intermodal.

2.6 Export Patterns

The export patterns of individual metropolitan areas can indicate the viability of cargo-oriented development in these locations. Albuquerque is on par with its peer cities in some of these patterns, as shown in Table 3.1. At 8 percent, Albuquerque's exports as a share of their GDP is similar to peer cities, though ranks 290th of 381 metropolitan areas nationally, according to the Brookings Institution.[23] The growth in the value of Albuquerque's exports is also on par with the peer regions and ranks in the top half of metropolitan areas nationally from 2008-2014, although it had the 4th worst decline of any metropolitan area nationally from 2003-2014. This may demonstrate potential for continued growth in export value for Albuquerque, though it has more to catch up on than the peer regions. Additionally, Albuquerque's strongest export industry by value, semiconductors, is declining while all the peer cities have growth in their primary export industry.

Table 2.14 Comparison of Export Patterns between ABQ and Peer Regions

Export Patterns	ABQ	El Paso, TX	Austin, TX	Dallas, TX	Denver, CO	Phoenix, AZ	Salt Lake City, UT	Kansas City, MO, KS
Total Value of Exports, 2014 (in Billions)	$3.2	$3.9	$10.0	$54.9	$13.6	$18.4	$11.4	$10.2
Exports as a share of metro area GDP	8.0%	11.8%	9.2%	13.2%	8.0%	8.9%	15.4%	9.6%
Rank in exports as share of GDP out of 381 MSAs	290	137	233	114	288	258	71	225
Total Export Supported Jobs	20,436	17,903	62,113	315,544	94,701	123,392	66,485	64,588
Growth in Value of exports 2008-2014	2.2%	8.2%	2.6%	4.1%	3.3%	1.4%	10.4%	2.3%
Rank in growth of value exports 2008-2014 of 381 MSAs	166	11	139	80	110	223	5	161
Growth in Value of exports 2003-2014	-0.3%	8.2%	6.3%	7%	5.6%	1.4%	11.4%	4.8%
Rank in growth of value exports 2003-2014 of 381 MSAs	377	40	83	62	110	356	7	159
Strongest Export Industry	Semi-conductors	Petroleum & Coal Products	Computer Equipment	Aircraft Products & Parts	Oil & Gas Extraction	Aircraft Products & Parts	Nonferrous Metal Products	Motor Vehicles
Value of Strongest Export	$546.8	$1369.8	$1296.8	$7386.5	$959.7	$2872.4	$3938.2	$1297.7

[23] http://www.brookings.edu/research/interactives/2015/export-monitor#10740

Export Patterns	ABQ	El Paso, TX	Austin, TX	Dallas, TX	Denver, CO	Phoenix, AZ	Salt Lake City, UT	Kansas City, MO, KS
Industry (in millions)								
Growth of Strongest Export Industry 2003-2014	-7.5%	29.5%	3.3%	8.7%	26.3%	1.8%	26.5%	7.6%
Strongest Export Industry's Share of Total Export Value	17.2%	35.4%	12.9%	13.5%	7.0%	15.6%	34.5%	12.7%

Source: Brookings Institution, 2013. Analysis by Center for Neighborhood Technology, 2016.

3.0 Industrial Geography and Real Estate Conditions

CNT examined trends in geographic, land use, and real estate issues facing the businesses located or wanting to locate in the MRCOG region. The following subsections examine each of these issues in more detail.

3.1 Geographic Distribution of COD Sectors

Examining the distribution of manufacturing and logistics businesses relative to freight transportation assets provides insights into the current operations of these business sectors and suggest ways that their relationship could become more productive. Several maps have been prepared to demonstrate the geographic distributions of jobs and businesses related to cargo-oriented development in the Albuquerque region, including distributions for the manufacturing, transportation & warehousing, and wholesale business sectors.

Figure 3.1 Distribution of Goods Producing Businesses in the MRCOG Region

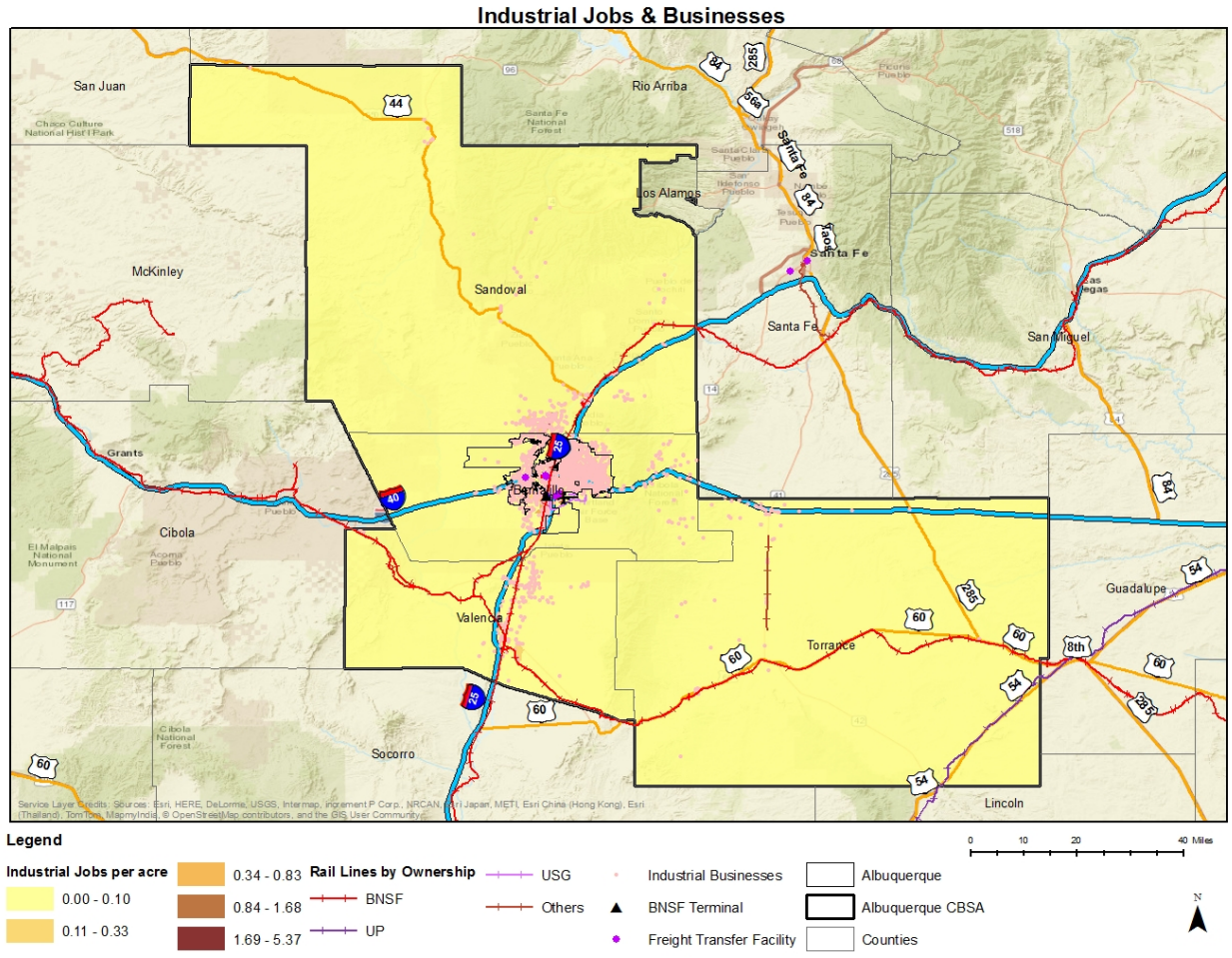


Figure 3.1 shows the distribution of all sizes and types of goods producing and processing businesses -- manufacturing, logistics, and wholesale firms -- across the MRCOG region. The density of these businesses solidly colors the city of Albuquerque and central Bernalillo County. These businesses also follow the I-25

and I-40 expressways with decreasing density as they leave the city. Additional industrial businesses extend across the county line from Bernalillo into Sandoval County reflecting the industrial expansion that has occurred in southern Sandoval County in recent years. Another relatively dense trailing of industrial businesses extends into Valencia County, clustered around the parallel routes of I-25 and the BNSF Railroad branch that connects Albuquerque and Belen. Additional maps are included in Appendix A.

3.2 Land Use Patterns

A number of substantial benefits follow from current patterns in the geographic distribution of industrial business locations in the MRCOG region, which is fairly compact, focused around major transportation assets and largely central to the population. The necessary distance of truck trips within the region is shorter than would be required by a more diffuse industrial pattern. Containing demand for truck mileage in this way limits intraregional costs of shipping, traffic congestion, air pollution including greenhouse gasses, highway maintenance costs, and the risk of accidents. Additionally, the overall costs of providing infrastructure including water, power, and sewage are constrained when development areas are limited. The MRCOG region's generally compact development pattern also makes jobs more accessible to the majority of workers than a more diffuse distribution of businesses would be. The potential for worker access that relatively compact development provides could be realized by further improvements in the region's public transportation system. An example of a meaningful upgrade in the region's transit system is the planned and recently funded Albuquerque Rapid Transit (ART) line. The ART will increase the speed and frequency of transit service along ABQ's Central Avenue –the primary east-west artery that links downtown ABQ with neighborhoods at the city's edges. The ART will speed workers' connections to numerous north-south bus lines that give them access to jobs in industrial districts."

Relatively compact development also entails a number of challenges. In many cases industrial districts will continue to be close to residential areas, and as industrial areas fill up, they may come to annoy neighbors or even pose public health risks. Compact development also frequently involves difficulties for industrial developers, such as assembling adequate land, dealing with obsolete buildings or environmental contamination, as well as time delays in securing development permissions. These problems often drive developers to build on virgin land, reducing their development costs but at the cost of the public and regional economic benefits noted above.

If MRCOG and the local governments it coordinates choose to realize the benefits of compact development without incurring negative consequences, they will need to insist on design and technology standards that will make industrial businesses good neighbors while smoothing the path for development in desired locations.

3.3 Industrial Real Estate Conditions

An assessment of the ways in which the geographic distribution of industrial businesses affects development opportunities now and in the future needs to begin with a review of the present basics of the MRCOG region's industrial real estate market – vacancy, absorption, lease rates, and trends -- which is provided in the following sections. [24]

[24] The information in these sections was compiled from several standard industry reports about the condition of the industrial real estate market both nation-wide and in the Albuquerque market area. These reports include *Albuquerque Industrial, Q1 2016* (CBRE 2016), *Industrial Market Outlook Q1 2016* (Colliers International 2016), *Research & Forecast Report: Albuquerque, NM Q4 2015 Industrial* (Colliers International 2015), and *CRE Trends Outlook* (Costar Realty Information, 2016).

3.3.1 Vacancy Rate

As of Q1 2016, Albuquerque's market area as defined by CBRE has a healthy industrial property vacancy rate of 6.3 percent, which has steadily declined since its peak in 2010. This rate is on par with the industrial national average of 6.4%. This quarter, the vacancy rate was below that of Q3 2008 when the rate originally began to climb, signaling full recovery from the recession. All types of industrial development have contributed to the decline in vacancy, though office/warehouse, R&D/development, and warehouse/distribution centers contributed much more than manufacturing centers. The bad news is that most of this decline in industrial vacancy is due to lack of speculative new construction. The demand for quality commercial space may outweigh its availability, restricting companies' options to relocate or open in the Albuquerque region.[25]

3.3.2 Absorption Rate

Net industrial property absorption[26] in the market area had been consistently positive since 2012 through 2015. Q3 2015 had the highest absorption rate since 2010.[27] However, Q1 2016 saw the first negative net industrial absorption since 2012, and gross activity was 22% lower than the past 20 quarters combined average. This is partly attributed to the L-3 Communications Corp closure which left over 75,000 square feet vacant near West Mesa. Despite this, there were also a couple major new or expanded occupancies.

3.3.3 Lease Rates

Lease rates are steady and on par with the national average. Most of Albuquerque's industrial buildings are old and out of date as only 21% of industrial buildings in the Albuquerque market area were built after 2000. This old inventory will continue to see a downward pressure in pricing with discounts needed to attract buyers. Prices for scarce newer buildings will slowly begin to grow as new, larger tenants enter the market in this area and vacancy rates continue to decline. 20-foot ceilings are one of the most important amenities in high demand, but scarce. The market favors landlords of those few modern buildings, as well as tenants of the older buildings.

3.3.4 Sub-Regional Trends

The North I-25 corridor has been noted as the expected epicenter of new commercial lease activity by forecasters in the field. The largest planned development project in the area as of Q1 2016 is a 48,330 square foot office and warehouse building currently under construction in this region, defined as mainly the western side of I-25 north of I-40, but east of route 47. New industrial construction is not too concentrated though because in addition to this North I-25 project, smaller, yet still considerable developments were completed or under construction during Q1 2016 in the Downtown, South I-25, Airport, and West Mesa submarkets. The downtown area has a remarkably high industrial vacancy rate, at 14.8%, but it also had the

[25] Vadnais, Juliana. "Office, industrial year in review: 'Don't let a good recession go to waste.'" Albuquerque Business First, November 23, 2015, accessed June 13, 2016. http://www.bizjournals.com/albuquerque/news/2015/11/23/office-industrial-year-in-review-dont-let-a-good.html

[26] Gross absorption is the amount of newly rented real estate in square feet in a designated span of time. Net absorption is the space newly rented minus the space newly vacated. Absorption rate is the ratio of net absorption to vacant space in a designated span of time.

[27] Guzman, Stephanie. "Albuquerque's industrial real estate market is on fire" *Albuquerque Business First,* October 26, 2015, accessed June 13, 2016. http://www.bizjournals.com/albuquerque/blog/real-estate/2015/10/albuquerques-industrial-real-estatemarket-is-on.html

highest net industrial absorption rate, so the vacancy is not too concerning. Along with Downtown, North Valley and South 1-25 submarkets had the best absorption rates, while West Mesa, Rio Rancho, and the Airport regions lagged with large negative net absorption rates. The particularly deep negative net absorption rate in West Mesa, at 69,115 square feet is likely due to the aforementioned L-3 Communications Corp closure. Areas where new construction may be needed are those with extremely low industrial vacancy rates, like Rio Rancho (0.7%), NE Heights (2.3%), and Mesa del Sol (0.5%). See more on development in the Mesa del Sol submarket below.

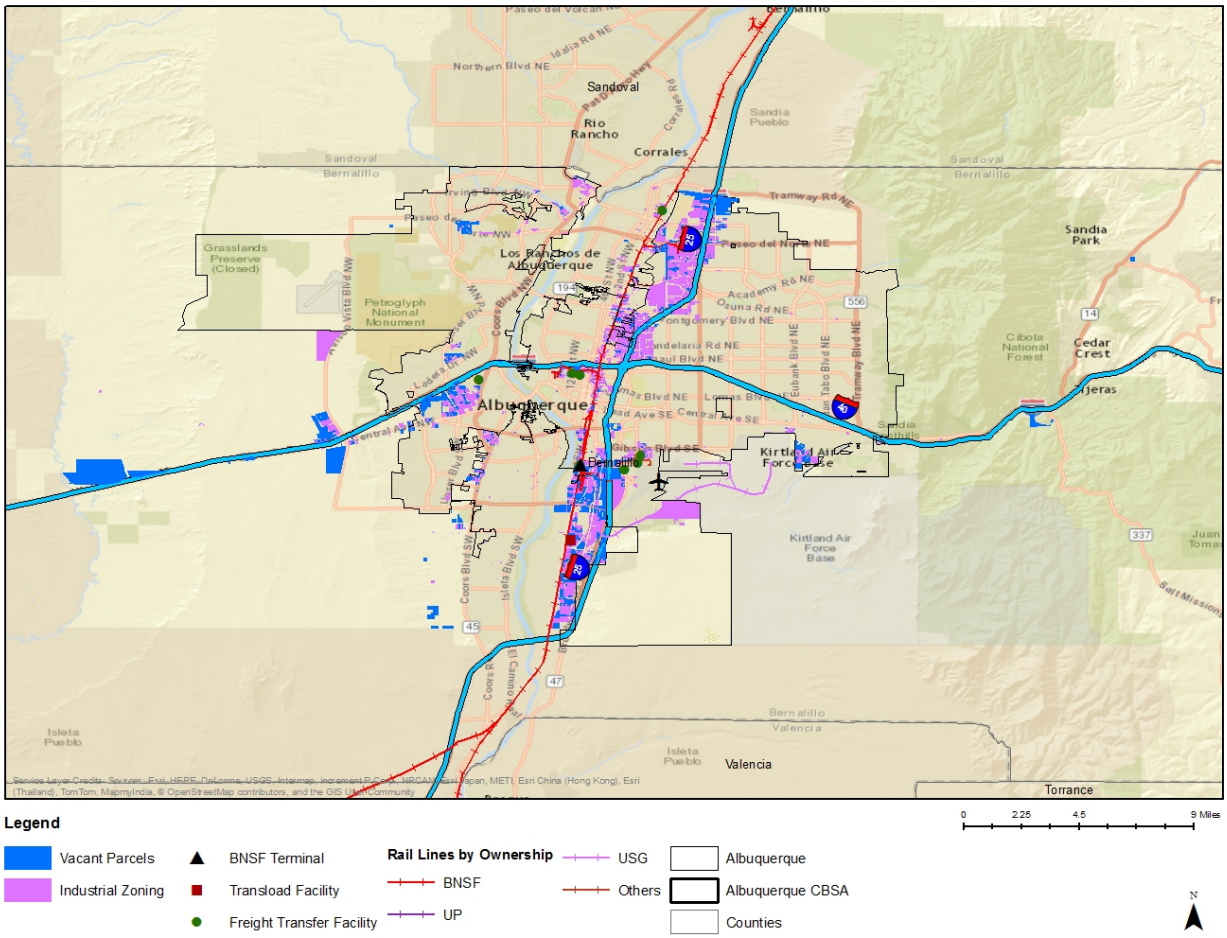
3.3.5 Future Trends

The key to igniting more speculative construction is for rents on new buildings to reach a high enough threshold for new construction to be attractive. As CoStar's national 2016 Commercial Real Estate Trends Outlook points out, premium spaces are in demand all across the country and the best thing developers can do is to adapt to that, i.e. renovate as much as possible. This seems to hold true in the Albuquerque market area. As of Q4 2015, the potential for increase in speculative construction looked strong.However, the slowdown in Q1 2016 with little rent growth made that potential pick up look less likely and quality industrial space for new or relocating business remains scarce. A positive sign for growth to continue despite the Q1 2016 slowdown is a 80-acre industrial and commercial park just announced on June 9th to be built in Albuquerque's master planned community, Mesa del Sol.[28] An investment group under Gold Mesa Investments LLC acquired the land vacated by Schott Solar in 2012, which includes two manufacturing buildings being used by United Poly Systems and NOVA Corp. Other trends signal strength, too. The capitalization rate in Albuquerque's market area as defined by Colliers International is very good at 7.5%, one of the highest in the west, and higher than the national average of 7.1%, there are success stories and interest in industrial businesses relocating or opening in Albuquerque. For example, United Poly Systems recently chose to locate its manufacturing business in Albuquerque instead of West Texas, and created 35 new jobs.

Figure 3.2 shows that industrially zoned districts and vacant properties exist in the central portion of the MRCOG region, where the large majority of industrial businesses are located. This map highlights the ways in which populated industrial districts exist not only along the region's expressways and in its center of population but also in close proximity to the airport, BNSF intermodal terminal, and an existing transload facility. This map also indicates that the established industrial districts of the region contain substantial areas of vacant land with infill development opportunities as well as vacant blocks of land proposed for industrial development.

[28] Guzman, Stephanie. "Steve Chavez, investment group, make plans for Mesa Del Sol industrial park" *Albuquerque Business First*, June 9, 2016, accessed June 13, 2016. http://www.bizjournals.com/albuquerque/news/2016/06/09/steve-chavez-investment-group-make-plans-for-mesa.html

Figure 3.2 Industrial Zones and Vacant Land in the Central Area of the MRCOG Region



4.0 Logistics and Supply Chain Case Studies

A region's transportation system serves as a vital link between an industry, its supply chain, and its customers. The needs of each industry are unique; however understanding the logistics and supply chains of similar industries can help MRCOG determine the region's opportunities and challenges in serving both existing and potential new industries.

This section features two logistics profiles for companies in local industries identified with significant freight movements both to and from the MRCOG region: General Mills and TempurPedic. General Mills is a major manufacturer of cereal, and its Albuquerque processing facility plays an important role in the national supply chain on both highway and rail freight modes. TempurPedic, which owns both Stern & Foster and Sealy brands, is the largest bedding company in the world, and its Albuquerque facility is the largest mattress factory in the world. The site produces 2,000 mattresses a day to be shipped throughout North America. The case studies will outline each company's practices in logistics and, to the extent that information is available, specifics on how they use the region's transportation system.

4.1 Logistics Profiles

4.1.1 General Mills

Built in 1992, General Mills (GM) has expanded its manufacturing operations in the Albuquerque region from 140 employees to over 300 today. Originally a major manufacturer of cereal, since 2008 the plant has seen dual use to manufacture both cereal and granola bars for nationwide distribution. As the company consolidates operations, the Albuquerque facility is playing increasingly important roles in the national supply chain.

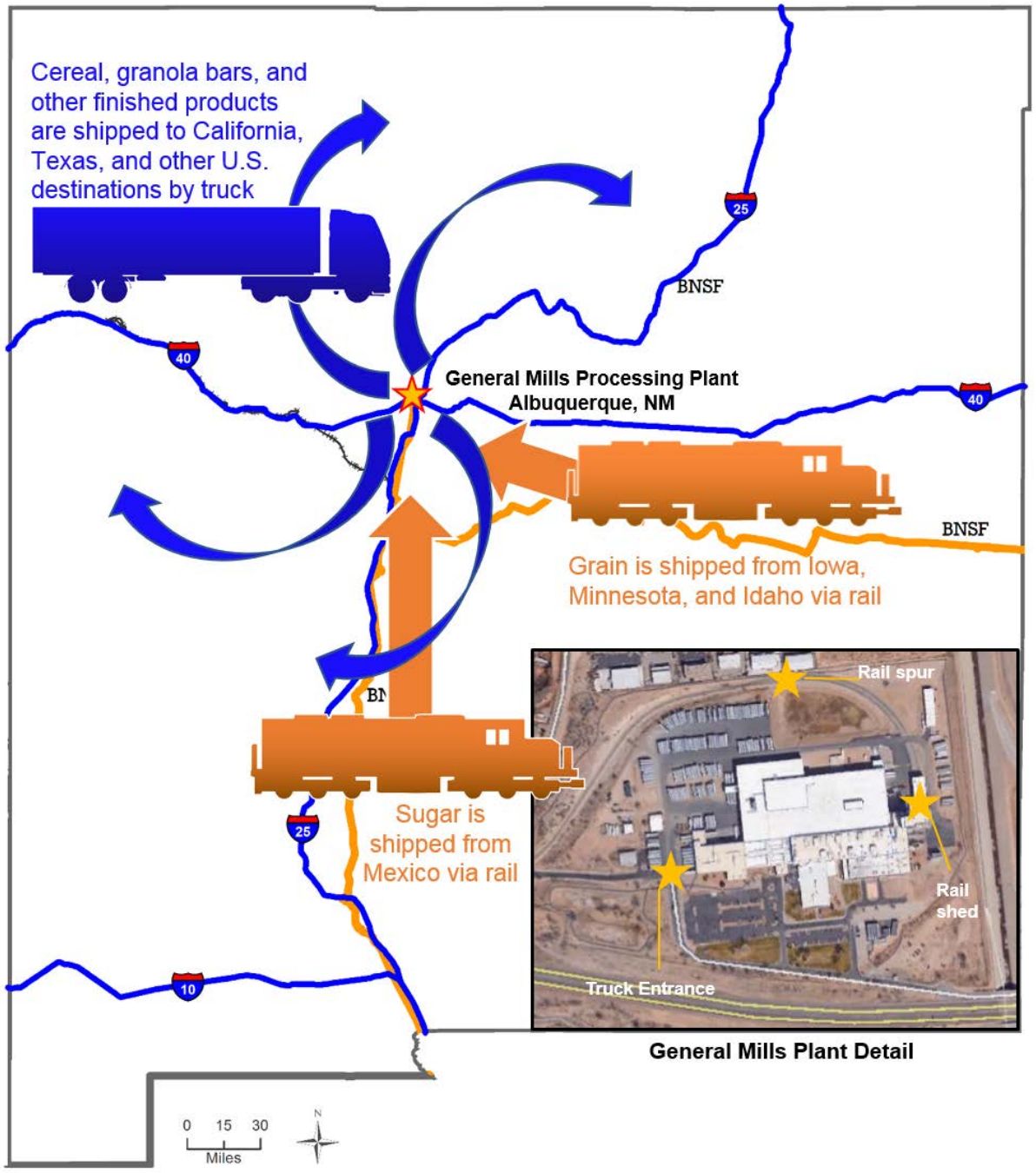
- **Current Infrastructure and Operations:** The facility has daily weekday rail service via BNSF and features a rail shed that can hold six cars, and a rail spur that can hold up to seven additional cars, built in 2015. Although some goods are brought in via truck, the facility does not have the infrastructure required to receive large volumes of goods via truck. The facility is a 24/7 operation with two 12-hour employee shifts.

- **Supply Chain:** This GM plant supplies markets in the southwest, California, Texas, as well as nationwide markets, as shown in Figure 4.1. The plant receives approximately 40 railcars per month of raw commodities, including oats from Minnesota, grains from throughout the Midwest and Idaho, and sugarcane from Mexico. Outbound products are shipped via truck, ranging from 120 to 170 truckloads per week depending on demand, which are dispatched throughout the county to deliver the processed goods to retail locations. Swift and Werner are the two primary truckload carriers currently contracted for distribution, and Fidelitone serves additional distribution and warehousing needs in the region.

- **Challenges & Opportunities:** Despite the onsite amenities, the facility struggles with sourcing, as it is situated far the commodities necessary to manufacture its products. Sourcing more commodities locally, such as corn, would help reduce transportation costs in the current business model. Increasing outbound volumes would also help reduce the cost per mile to ship finished products to retail destinations. There are also some concerns with lack of local infrastructure supporting goods movement, particularly for management of tankers and trailers. Limited tanker washing infrastructure for oil shipments means that tankers are often sent to Texas to be cleaned if rejected by a manufacturer. GM also does not have

access to a drop yard hence trailers are unable to be kept locally, limiting the ability to respond quickly to changes in demand.

Figure 4.1 General Mills ABQ Facility Conceptual Supply Chain



Source: Google Maps, Cambridge Systematics

4.1.2 TempurPedic

TempurPedic, headquartered in Louisville, Kentucky, has 19 plants across the world, including various cities throughout the United States, Denmark, and Mexico. TempurPedic owns the Stern & Foster brand and purchased Sealy in 2012, making them the largest bedding company in the world. Built in the early 2000s, the Albuquerque facility employs 145 in its local facility:

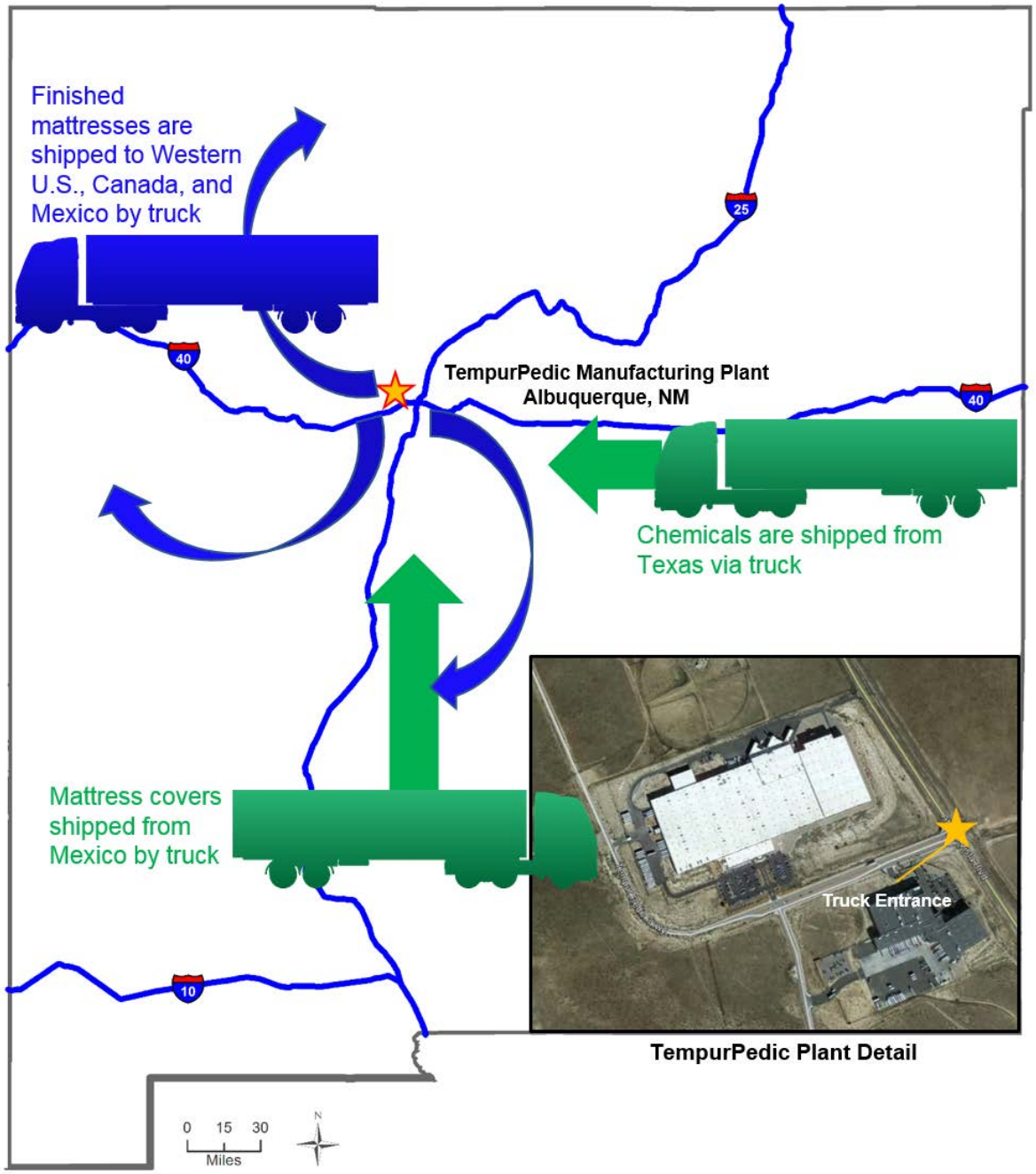
- **Current Operations:** TempurPedic's Albuquerque modern facility spans over 850,000 square feet, making it the world's largest mattress factory. The majority of the facility is dedicated to curing and storing large quantities of foam to be used in creating the mattresses. The facility was built in the early 2000s with incentives from New Mexico, including state investment tax credit, $56 million in industrial revenue bonds, and $1 million to subsidize worker training.[29]

- **Supply Chain:** This TempurPedic plant supplies markets in western United States, Canada, and Mexico by truck, as shown in Figure 4.2. Trucks are the exclusive delivery mode, and are used to serve retail stores directly. Chemical products reach the TempurPedic plant via truck from Texas, and mattress covers are supplied from Mexico. TempurPedic's Albuquerque location supplies finished products to Western United States, Canada, and Mexico. The facility produces 2,000 mattresses a day, and ships 300 truckloads of mattresses per month.

- **Challenges & Opportunities:** TempurPedic would prefer its Albuquerque plant have access to rail facilities for delivery of high volumes of chemicals used in plant operation. Currently these supplies are being received via truck.

[29] http://siteselection.com/ssinsider/bbdeal/bd031117.htm

Figure 4.2 TempurPedic ABQ Facility Conceptual Supply Chain



Source: Google Maps, Cambridge Systematics

5.0 Public Policy Issues

Another key aspect of the baseline conditions that the MRCOG region faces in the development of its production sector and logistics assets is the readiness of public institutions to act in forming a strong workforce, creating an attractive climate for business investment, improving key elements of infrastructure, and removing impediments to development in desired locations. In the following sections, CNT provides an overview of these capacities.

5.1 Workforce Development

The Albuquerque region's workforce development program coordinated by MRCOG is a major asset for the area's economic development efforts.

5.1.1 Research, Tracking and Outreach

Through a private data service the MRCOG workforce program receives quarterly reports of employment levels and job opening announcements for a comprehensive list of the area's employers, with discrimination of these employers to the fourth level in the North American Industrial Classification System (NAICS). So the program tracks hiring and demand by specific companies and by occupational skills and certifications required. In cooperation with private partners such as *innovat**e**ducate*, the program also researches the readiness of job candidates to perform in a position or advance through an appropriate level of training. The program uses the national system of *ACT Workkeys* to help employers better specify their labor needs and prospective workers' ability to meet these requirements. The program also operates a network of *skill up centers* to help aspiring workers raise their basic skill levels.

Ten professionals are engaged throughout the region to make ongoing contacts with employers, learn and anticipate their labor needs. *Business Career Centers* are located in each MRCOG county to provide a local office where job seekers and employers can conveniently make use of workforce development services.

This monitoring and contact gives workforce program managers the ability to truly understand worker and employer needs, plan training opportunities strategically, and respond quickly to shifts in patterns of employment.

5.1.2 Workforce Services

The workforce program helps each job seeker who comes in contact with it develop an individual plan to prepare for, find, and advance in employment. A range of support services are available to help execute these plans from access to office equipment, to support for child care, to enrollment in classes to achieve certification in marketable skills, to counseling in finding and progressing in a job.

A range of services is also available to employers who hire fulltime workers including the design and provision of on-the-job (OJT) training programs and reimbursement for up to half the wages of a worker in an (OJT) program.

5.1.3 Limitations and Utility

On the basis of current employment demand and policy priorities, the MRCOG region's workforce program maintains a short list of "First Tier" industries for which services are currently prioritized. The current list includes Commercial Construction, Healthcare, and Green Energy. A somewhat longer list of "2nd Tier" industries is determined with each county. In each of the region's counties Manufacturing in on this second tier list, although logistics or transportation (except Aviation) are not listed.

The workforce program cannot support extensive training for any industry in which there is not tangible current demand, both to use public funds wisely and to ensure that aspiring job seekers do not expend their limited personal resources on a path that does not quickly lead to employment. However, as the region plans to expand its outreach to industries in which it can determine that it is competitive, some advance investment in industry-specific training capacity may be desirable. A business retention and recruitment program should also utilize and promote the region's workforce development program as a key asset.

5.2 Other New Mexico Policies and Issues

5.2.1 Corporate Income Tax Structure

The State of New Mexico changed the landscape for business investment with a law passed in 2013 that restructured the taxation of businesses in the state. This law created a reduction in the maximum corporate income tax rate from the 7.6% when the law was passed, to 5.9% when fully phased in by 2018.[30] The same law also delivered a tax break for New Mexico manufacturers that sell most of their goods out of the state.[31] In June 2015, the New Mexico state legislature passed a comprehensive tax package in a special session which included several provisions affecting taxation for both corporations and small businesses. The most significant change was a restructuring of the tax assessment system for companies with their corporate headquarters located in New Mexico. The package allows corporations with corporate headquarters to use a single factor sales apportionment to determine taxation in place of the previous apportionment system which uses three factors -- payroll, property, and sales -- to determine taxation.[32] The goal of this single factor system is to attract corporations to locate in the state and not penalize companies for making investments in property and job creation.

5.2.2 Other Business Tax Incentives

The "angel investment" tax credit, which provides incentives to invest in new, New-Mexico based businesses, was greatly expanded in the same 2013 law.[33] The expansion allows for more total credits to be given statewide, more than doubles the maximum credit amount per investment, and increases the number

[30] Associated Press. "Lawmakers give tax bill last-minute approval, avert special session." *Santa Fe New Mexican,* March 16, 2013. http://www.santafenewmexican.com/news/legislature/article_67950e03-b27c-56a0-b284-34b02dce1c81.html (accessed June 16, 2016)

[31] Ibid.

[32] PR Newswire. "New Mexico Governor Inks Tax Bill Containing Incentives." *Albuquerque Business First,* June 24, 2015. http://www.bizjournals.com/albuquerque/prnewswire/press_releases/New_Mexico/2015/06/24/DA42229 (accessed June 16, 2016)

[33] Boyd, Dan. "Gov. Martinez signs tax incentive legislation." *Albuquerque Journal,* June 15, 2015. http://www.abqjournal.com/599375/governor-signs-tax-package-from-special-session.html (accessed June 16, 2016)

of investments eligible to receive the tax credit per individual investor.[34] These expanded incentives are likely to benefit the thriving entrepreneurial start-up environment in New Mexico. It may also help retention of start-ups within the state. The package also extended tax credits for businesses in the border region which engage in trade or trade-support, expanded tax credits for small businesses related to technology and research, and created a deduction for sales of high-tech goods to the U.S. Department of Defense.[35]

5.2.3 NMDOT's Rail Bureau and State Ownership of Rail Lines

NMDOT's Rail Bureau of the Transit and Rail Division oversees or administers all of the operational, regulatory, safety, construction, research, planning, and technical proceedings on the 133-miles of NMDOT-owned rail and its crossings.[36] This division has an authorized staff of only seven individuals, but has had an average of two position vacancies from 2010-2014, indicating severely limited resources to complete the array of tasks assigned to this office.[37] Because of this and other economic reasons, it is unlikely that the state would be able to take on ownership or administration of any new rail lines, despite a recognized need for local freight service, and must rely on service and infrastructure provided by existing operators or private sector investment.

An additional policy obstacle to supporting freight activity via rail is the strict "Anti-Donation Clause" of the New Mexico state constitution. This clause prevents the state from making any significant investment in privately-owned rail lines as the state is restricted from making "donations" to private companies.[38] There may be the possibility for joint development of rail lines, but there is no legislation allowing public private partnership on rail projects. [39] Even if it were possible to invest in rail in this manner, the funding for all NMDOT projects, especially rail, is increasingly limited by the costs of the Rail Runner program. The service includes remaining payments on bonds around $540 million, with average annual payments of $27.5 million between 2014 and 2024, then large balloon payments of $235 million from 2025 to 2027.[40] The state-level capacity to expand local freight service through rail is simply not feasible, despite will to do so.

5.3 Federal Resources

In their planning for freight-linked development, MRCOG regional leaders should consider federal resources that are specifically designed to foster economic development through improving and capitalizing on freight transportation assets. Two major resource programs that meet this description are provisions of the *Fixing America's Surface Transportation (FAST) Act* and the *Transportation Investment Generating Economic Recovery (TIGER)* program.

[34] PR Newswire. "New Mexico Governor Inks Tax Bill Containing Incentives."

[35] Ibid.

[36] New Mexico Department of Transportation. *New Mexico State Rail Plan.* Cambridge Systematics, Inc. with Bohannan Huston, Inc. and Karpoff & Associates. (Austin, TX: Cambridge Systematics, 2014), 3-20,

[37] Ibid.

[38] *New Mexico State Rail Plan,* 3-24.

[39] Ibid.

[40] *New Mexico State Rail Plan,* 3-27.

5.3.1 FAST Act Provisions

The FAST Act aims to optimize the National Highway Freight Network (NHFN) by allocating federal funds to State and local infrastructure projects. The following components comprise NHFN:

- Primary Highway Freight System (PHFS)
- Critical Urban Freight Corridors
- Critical Rural Freight Corridors
- Interstate System roads not included in the above

The FAST Act provides two basic sources of funding:

- FASTLANE: A discretionary grant program funded at an average of $900 million per year available through 2020, with funding awarded to projects proposed on a nationally competitive basis
- Formula-based funding: Each state receives funding according to their proportion of Primary Highway Freight System (PHFS)

In 2016, the FAST Act will appropriate $800 million to "nationally significant freight and highway projects" in a competitive, discretionary grant program called FASTLANE. This $800 million will grow $50 million per year through 2020, which means that FASTLANE funding amounts to 4.5 billion over a 5-year span.

Over the same 5-year span, FAST Act will also apportion an average of $1.2 billion per year among all 50 states by formula. States are allocated this funding according to their proportion of the nation's Primary Highway Freight System. Up to 10% of this funding may be spent on intermodal projects.

There are restrictions on how formula-allocated funds may be spent. States including New Meixco which feature 2% or more of national PHFS may appropriate funds to all components of NHFN except non-PHFS Interstate System roads. For 5 years, New Mexico will be allocated 2.44% of the federal funds apportioned by FAST, in accordance with the state's 2.44% of national Primary Highway Freight System roads[41].

In the MRCOG region, these funds can be used to improve Interstate roads, Critical Rural Freight Corridors and Critical Urban Freight Corridors (CURCs and CUFCs). By working with metropolitan planning organizations throughout the state, NMDOT may designate up to 101.16 miles of urban roads as CUFCs[42]. This designation is required for non-Interstate roads to be eligible for FAST funding in New Mexico. However, no CUFCs have yet been designated. There is no deadline to designate CUFCs. MRCOG can apply for FAST funding once they have coordinated the optimal sites for infrastructure investment with NMDOT.

5.3.2 Transportation Investment Generating Economic Recovery (TIGER) Grant Program

Established as an element of federal efforts to spur recovery from the 2008 recession, TIGER has proven to be an effective means of funding transportation projects that could demonstrate economic benefits from investment in transportation infrastructure on the basis of a rigorous benefit\cost analysis. Numerous freight

[41] http://www.kyovaipc.org/NHFN_Determination_02_19_16.pdf

[42] http://ops.fhwa.dot.gov/freight/infrastructure/nfn/maps/nhfn_mileage_states.htm

projects have been funded through TIGER. In the past New Mexico has been awarded TIGER grants for some road safety and transportation efficiency improvement projects with potential economic development opportunities, such as Torreon Road rehabilitation in Sandoval County, US-491 safety improvements in McKinley and San Juan counties, the Santa Teresa Border Plan, and Bridge Boulevard Corridor Redevelopment Plan in Bernalillo County.

TIGER has not been funded under national transportation act funding but through different Congressional actions. The Senate has approved a bill with $525 million in TIGER funding for Fiscal 2017. If TIGER continues, it may be considered as a potential resource for innovative projects with clearly quantifiable economic impacts in revitalizing the Albuquerque region's industrial economy.

Appendix A.1 Additional Maps

This appendix includes additional maps created by CNT to support the analysis in Section 3.0

Figure A1.1 shows areas in which the density of industrial jobs is greater than .10 per acre in individual census block groups. These areas are not numerous, as might be expected by the small scale of Albuquerque's industrial sector. They are limited to the city of Albuquerque and central Bernalillo County, with some extension across the county line into Sandoval.

Figure A1.2 shows the array of all manufacturing businesses, a subset of all industrial businesses, within the region. This pattern of distribution is virtually identical to that of all industrial businesses.

Figure A1.3 shows only those manufacturing businesses that employ more than 300 workers. The relative open space on this map demonstrates how few manufacturing businesses in the region reach this scale and that these businesses are concentrated along the region's expressways with the exception of the significant business cluster in southern Sandoval County.

Figures A1.4 and A1.5 demonstrate that transportation and warehousing businesses closely follow the overall pattern of distribution of industrial businesses overall and of manufacturing firms, with concentrations in the urban areas and along expressways. The cluster of these businesses, including mid-size firms, in Valencia County, Belen, where the BNSF mainline crosses I-25 is notable.

While following the general regional pattern of industrial business concentrated in urban areas and along expressways, wholesaling shows the widest distribution of businesses, shown in Figure A1.6, including larger wholesaling firms, shown in Figure A1.7, along expressways at some distance from the city of Albuquerque.

Figure A.1.1 Industrial Jobs Density

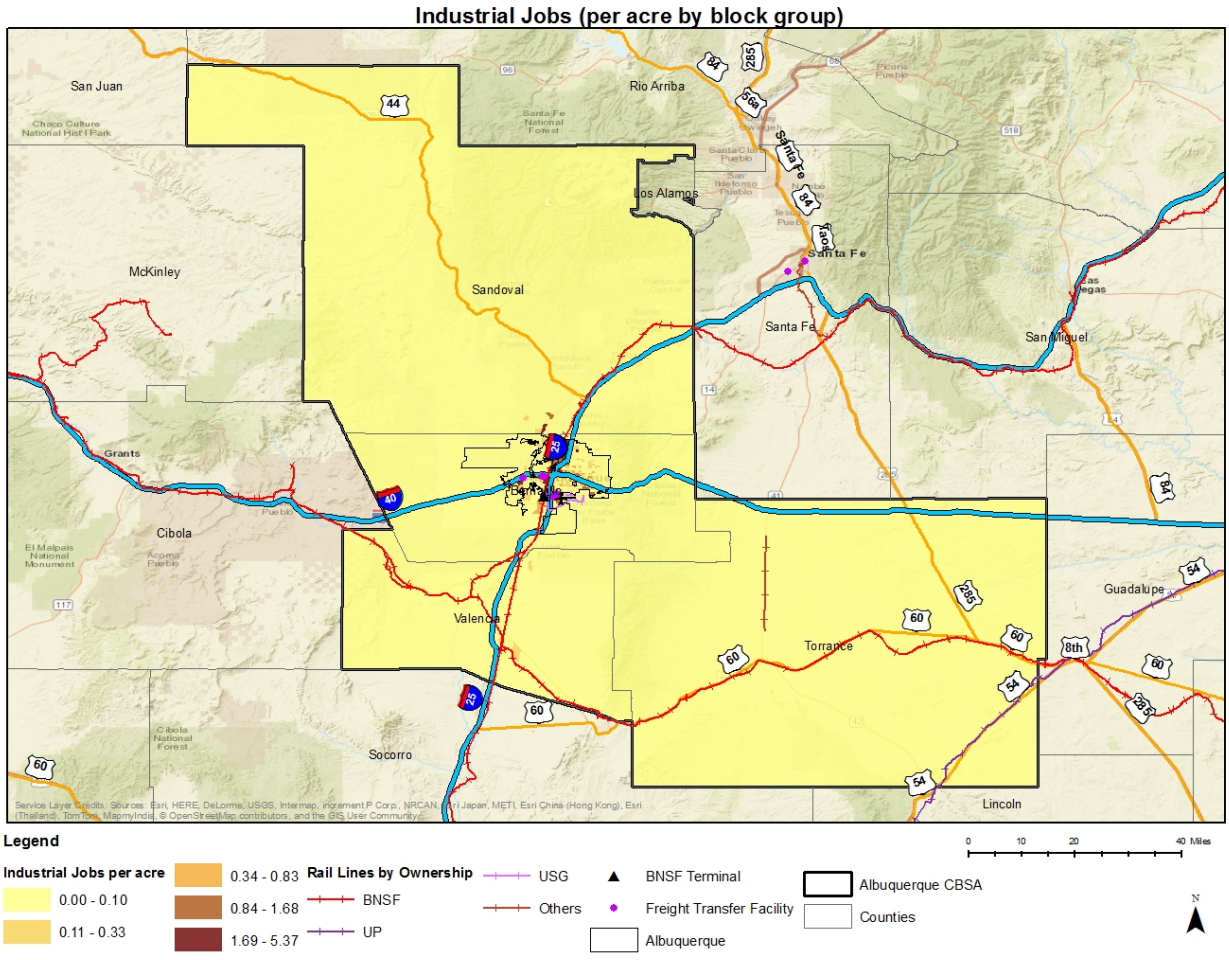


Figure A.1.2 All Manufacturing Businesses

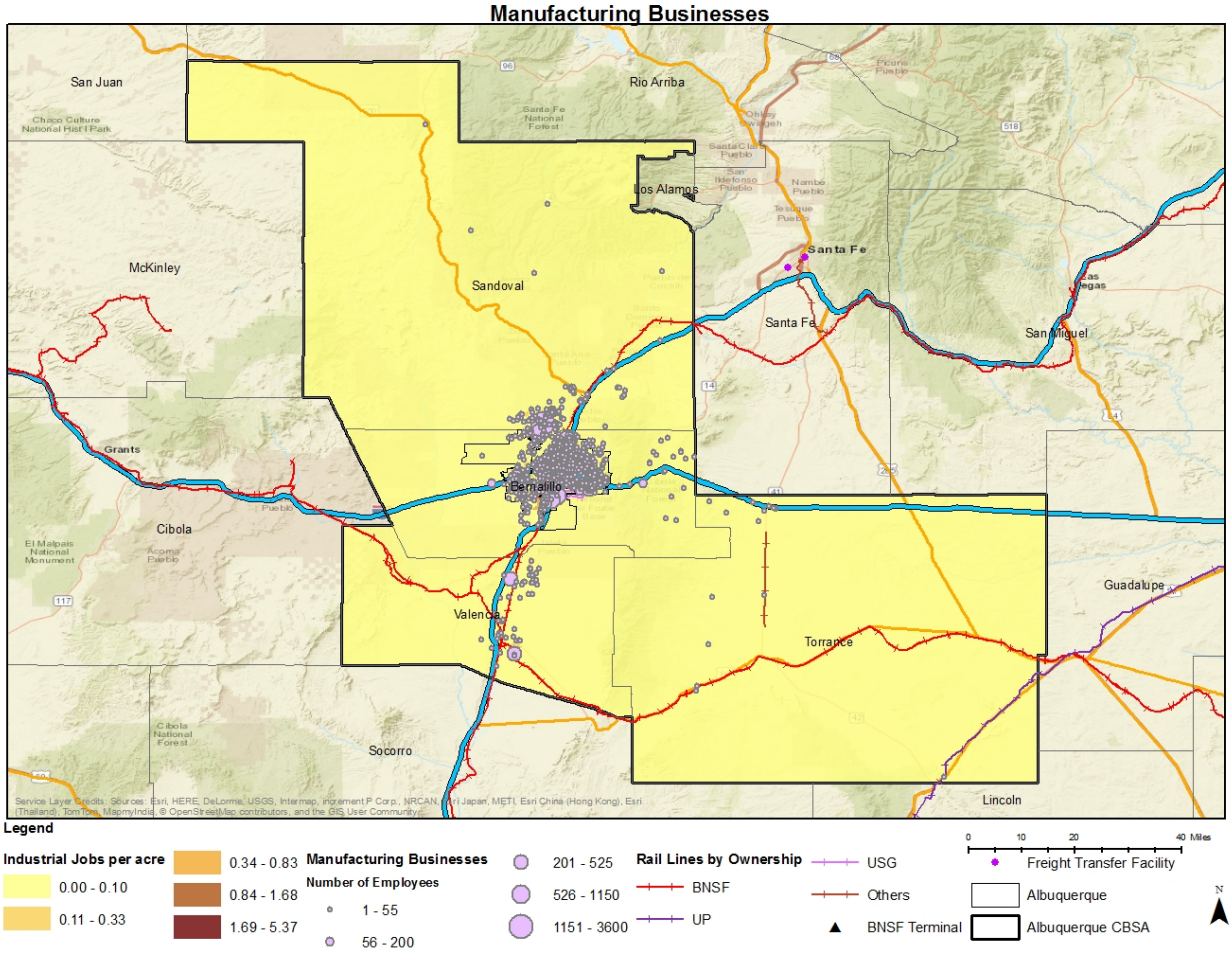


Figure A.1.3 Large Manufacturing Businesses

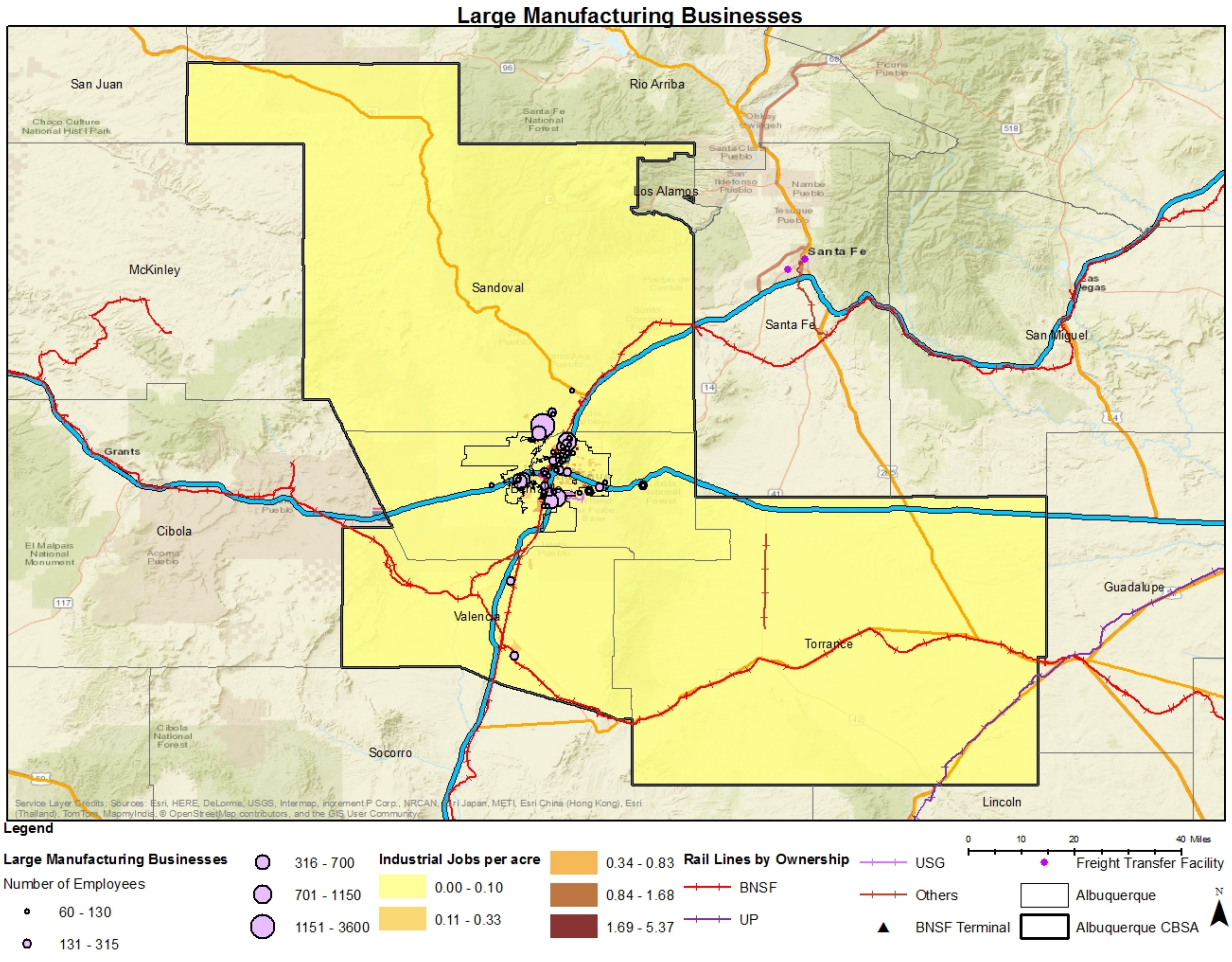


Figure A.1.4 Transportation and Warehousing Businesses

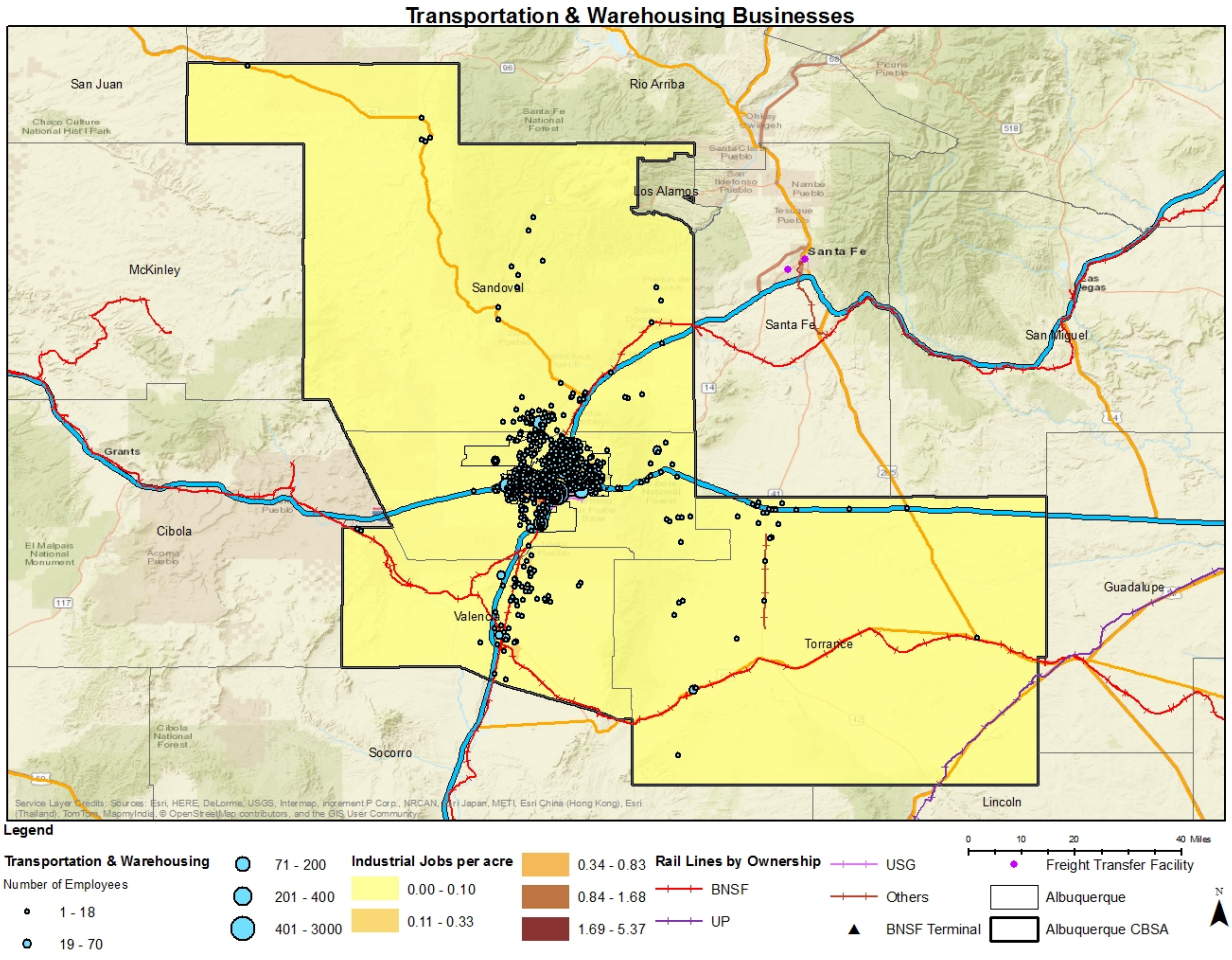


Figure A.1.5 Large Transportation and Warehousing Businesses

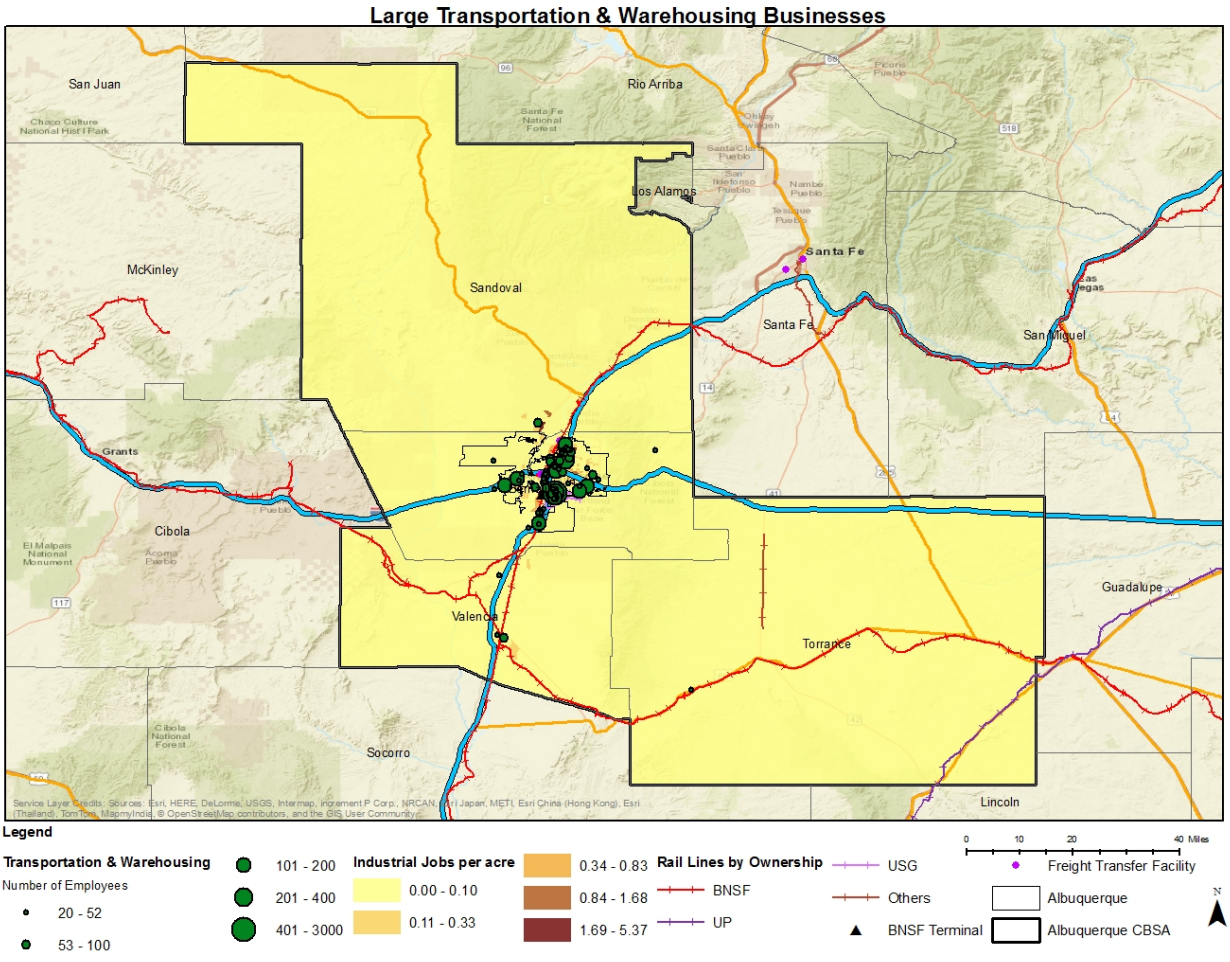


Figure A.1.6 All Wholesale Businesses

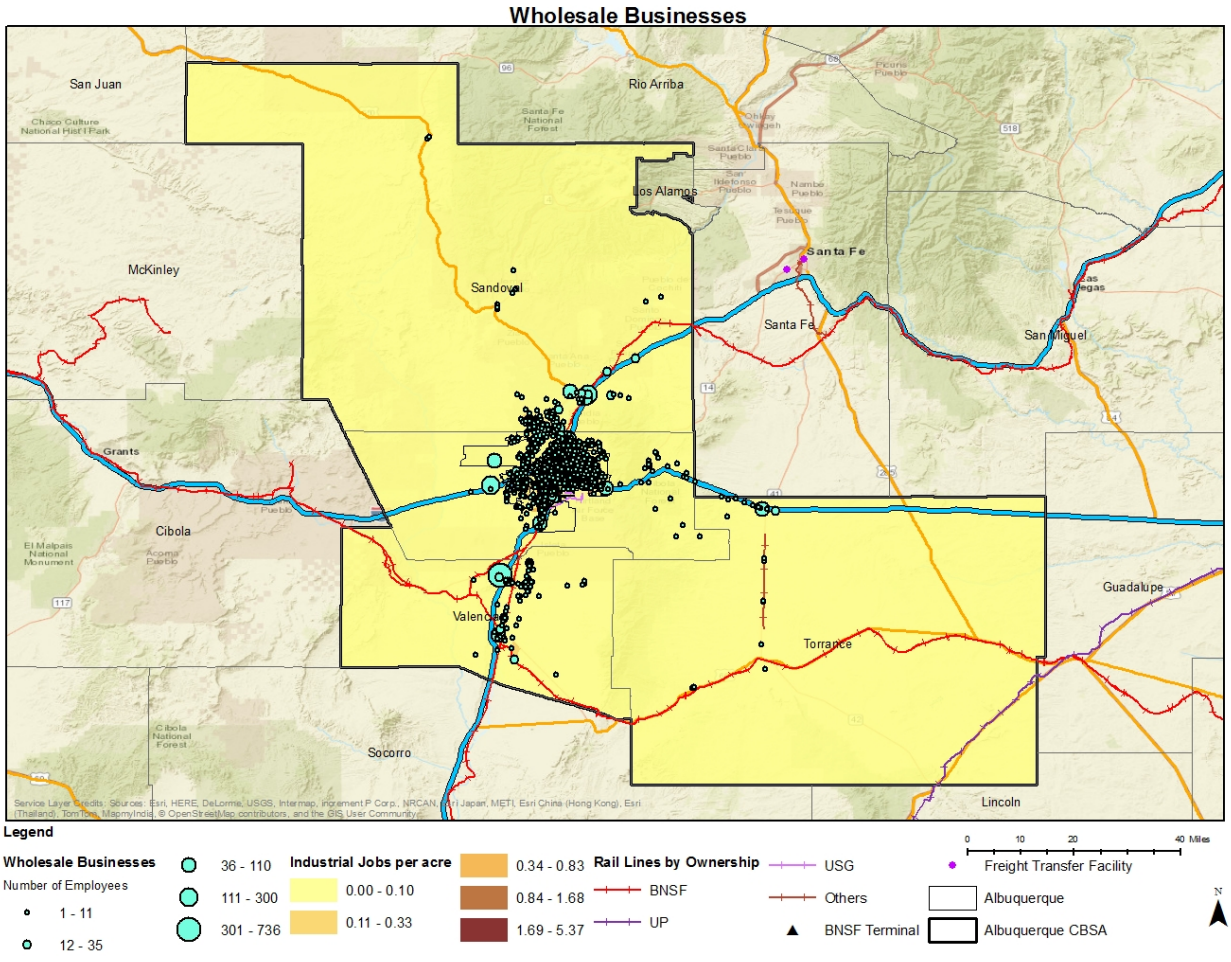


Figure A.1.7 Large Wholesale Businesses