Our Freight Mobility

REGIONAL FREIGHT PLAN

EXECUTIVE SUMMARY

Pima Association of Governments

MARCH 2018

Regional Freight Plan EXECUTIVE SUMMARY

Purpose and Goals

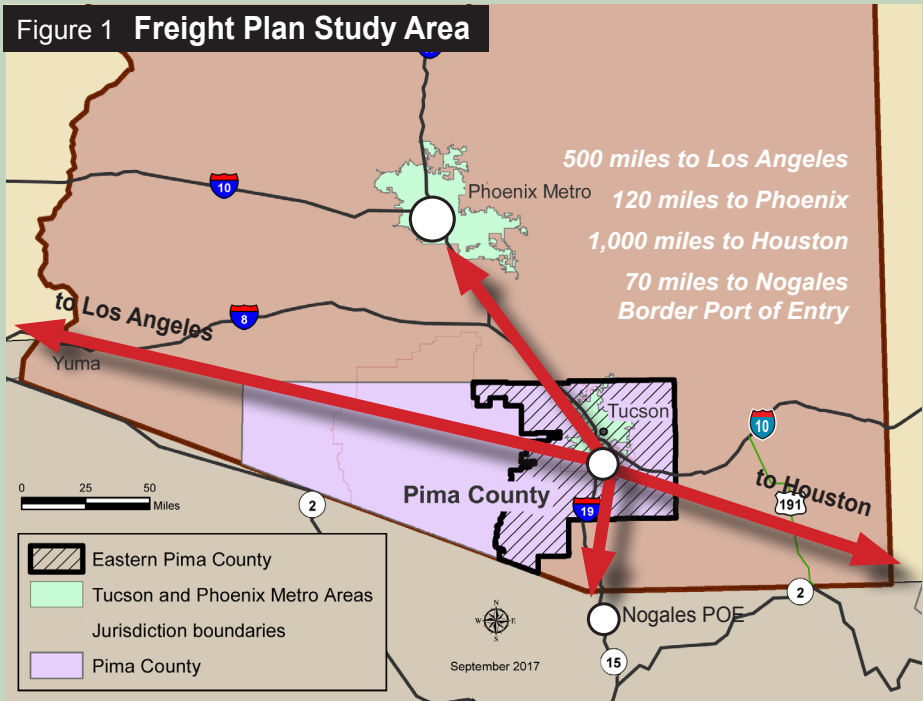
The Regional Freight Plan (Freight Plan), developed by Pima Association of Governments (PAG), identifies how the freight transportation system performs in the PAG Planning Area (the PAG region) and **(Figure 1)** what improvement strategies can be implemented to support regional economic growth and vitality. The Freight Plan marks the first time PAG has pursued a data-driven freight planning effort for the PAG region and establishes direction for future freight planning.

The PAG region sits at the crossroads of Interstates 10 and 19 on the nation's freight system. Each day, hundreds of millions of dollars in goods move along the region's roadways, railroads, airports and pipelines. Originating in California, Texas, Asia, Mexico, locally and elsewhere, these goods supply businesses, support local jobs, and keep the region's and nation's economies growing.

The PAG region has a unique opportunity to capitalize on its transportation distribution and logistics assets to support job growth, business attraction, economic diversification and quality of life. Healthy freight activity supports jobs not only in transportation, including logistics, but also in retail, construction, manufacturing and other sectors.

The Freight Plan marks the first time PAG has pursued a data-driven freight planning effort and establishes direction for future freight planning efforts for the PAG region.

Figure 1 **Freight Plan Study Area**



To support future economic growth and vitality, the Freight Plan establishes several goals for the region's freight transportation system.

FREIGHT PLAN GOALS

Safety and Reliability

A safe and reliable multimodal freight system with the capacity to meet current and future demand.

Accessibility and Connectivity to Markets

Accessibility and connectivity of freight transport to domestic and international markets.

Public and Private Partnerships

Enhanced partnerships between the public and private sectors to support the movement of goods and improve understanding of the importance of freight to the region's economy.

A 30-member advisory body with freight stakeholders guided the development of the Freight Plan over 18 months. The planning process involved four phases as shown in **Table 1**.

Table 1 **Planning Process For The Regional Freight Plan**

PHASE 1 **Plan Preparation**	PHASE 2 **Regional Freight Profile**	PHASE 3 **Needs and Opportunities Identification**	PHASE 4 **Project Recommendations**
February 2016 to June 2016	June 2016 to April 2017	February 2017 to June 2017	June 2017 to October 2017
Research best practices	**Analyze freight commodity flow data**	**Develop methodology for identifying needs and opportunities**	**Identify potential projects and recommendations to address needs and opportunities**
Review state and regional plans	**Inventory freight assets**	**Meet with PAG region jurisdictions**	**Work with jurisdictions and stakeholders to refine project and recommendations list**
Assemble Freight Plan Task Force	**Interview freight stakeholders**	**Identify freight needs and opportunities**	
Develop Freight Plan goals	**Develop commodity flow and asset inventory reports**		

Freight's Role in the Region's Economy

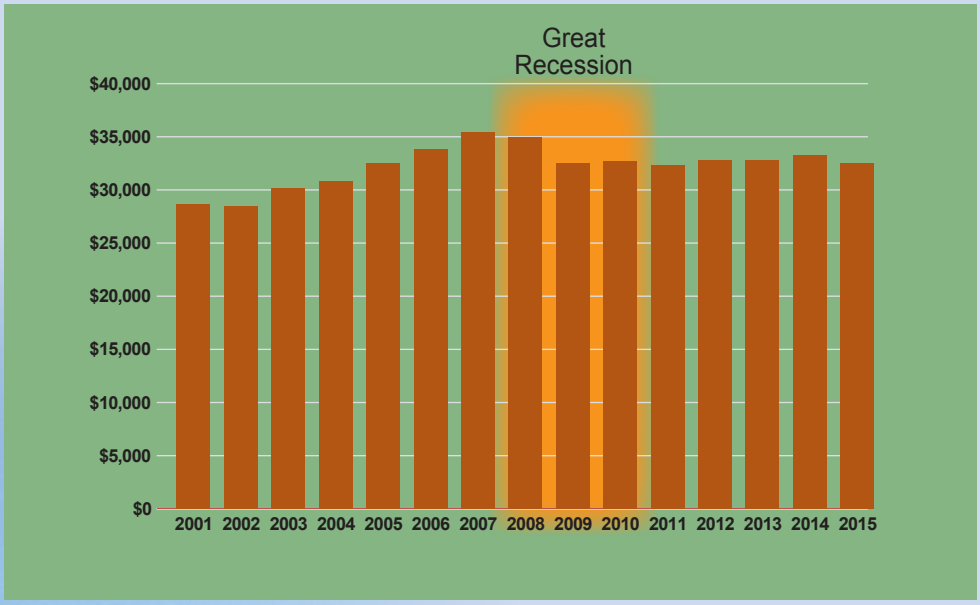
The PAG region's economy, largely service-based with retail, health care, hospitality and government sectors, is overly vulnerable to economic downturns. **Figure 2**, for example, shows the lingering effects of the 2008-2010 Great Recession on the region's economy. Economic activity (as measured by regional gross domestic product, or GDP), showed no meaningful growth between 2009 and 2015 and, in fact, regional GDP in 2015 was still below that of 2005 when controlled for inflation.

Regional wages and household incomes trail those in similarly sized metropolitan areas as a result of the region's economic makeup.

Diversifying the region's economy by attracting and supporting export-focused or primary businesses was identified as a regional priority to support wage and job growth. Offering access to a high-performing freight transportation system is one economic development tool to attract export businesses or encourage export business expansions which, in turn, will create new jobs.

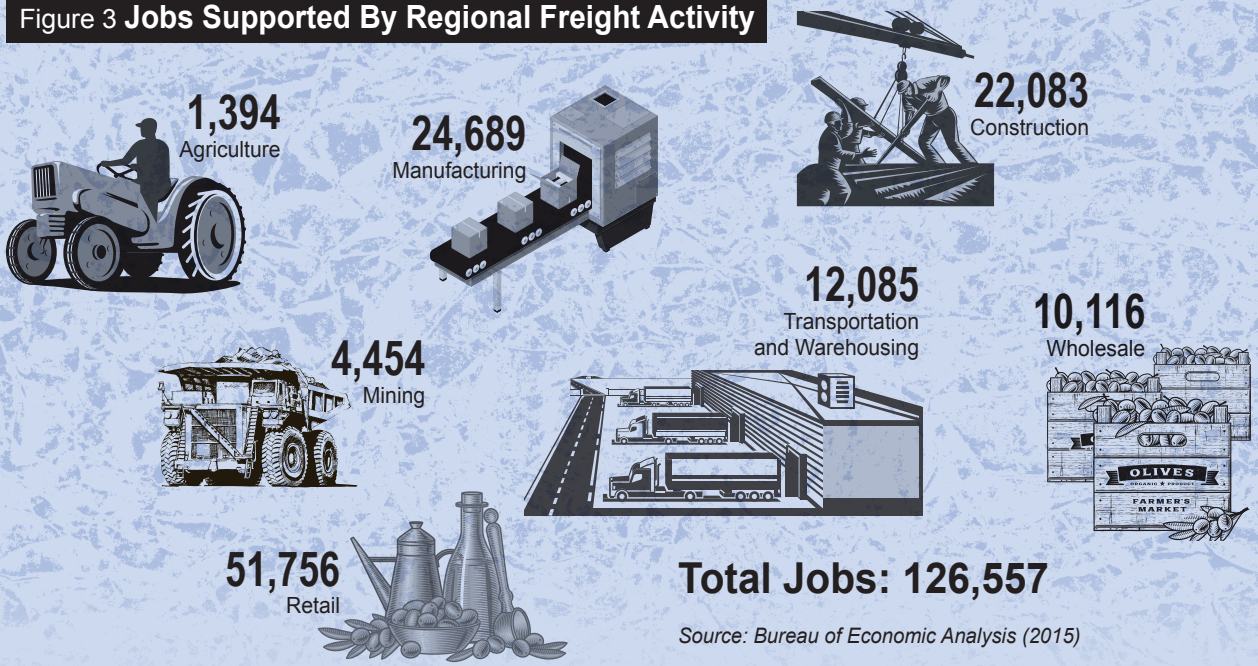
Recent employment numbers from the U.S. Bureau of Labor Statistics show that freight on the PAG region's roads directly supports nearly 130,000 jobs **(Figure 3)** and $10.6 billion in regional economic activity, or about one quarter of the region's total jobs and 30 percent of its GDP.

Figure 2 **Tucson Region Real GDP, 2001-2015**
(Millions Of Chained 2009 Dollars)



Source: Bureau of Economic Analysis, real GDP by metropolitan area; chained dollars adjust real dollar amounts for inflation over time to allow comparison of figures from different years.

Figure 3 **Jobs Supported By Regional Freight Activity**



Total Jobs: 126,557

Source: Bureau of Economic Analysis (2015)

Although the PAG region has fewer total jobs in goods-producing industries than many similarly sized metropolitan areas, it has a particular strength in advanced manufacturing. Because of the high-skill requirements of these jobs, manufacturing in the PAG region pays an average annual wage of over $83,000.

The highest concentration of employment in advanced manufacturing is in aerospace products and parts[2], as evidenced by the 8.5 regional employment location quotient (LQ) for the sector.[3]

Most of the region's outbound freight value (by truck) originates in the areas around:

- Tucson International Airport
- Davis-Monthan Air Force Base
- Innovation Park in Oro Valley
- Mission Mine, Silverbell Mine and Sierrita Mine (copper mines in the region)
- I-10 and Tangerine Road
- I-10 north of Grant Road

FREIGHT FACT

The average annual earnings per local manufacturing employee were $18,300 above the national average in 2016.[1]

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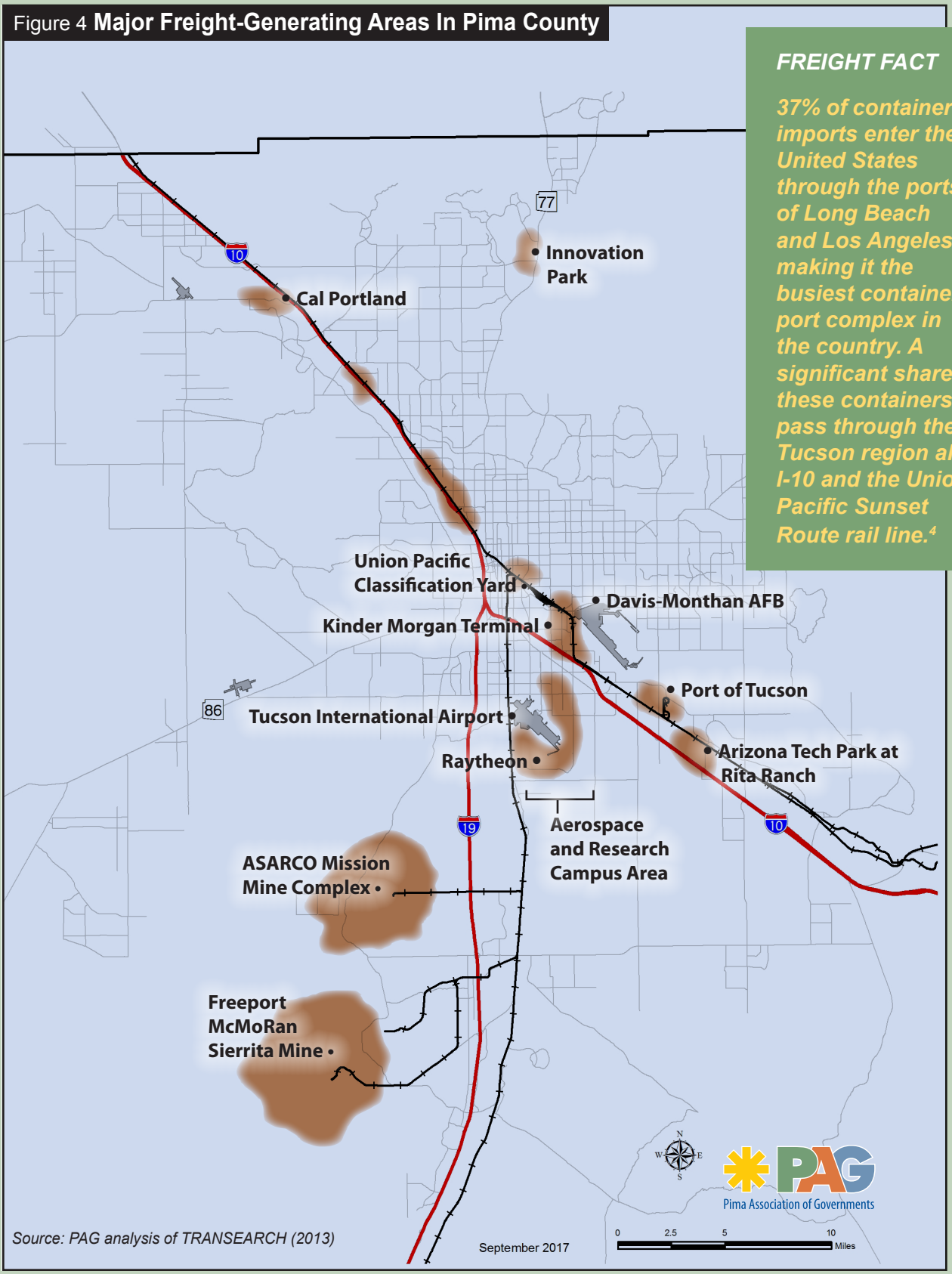
[1] Bureau of Labor Statistics. Quarterly Census of Employment and Wages

[2] Based on PAG's analysis of the Bureau of Labor Statistics' May 2016 National Industry-Specific Occupational and Wage Estimates for Aerospace Products and Parts (NAICS 336400) and Arizona not seasonally adjusted non-farm employment data from the Arizona Office of Economic Opportunity.

[3] LQ is a measurement of how concentrated employment in a particular industry is within a given geographic area. An LQ above 1 indicates that a region has more jobs in a sector or industry than the national share. An LQ of 2, then, shows that a local industry is twice as concentrated in the local economy as it is nationally.

Figure 4 shows which locations within the PAG region generate the highest value of freight.

Figure 4 **Major Freight-Generating Areas In Pima County**



FREIGHT FACT

37% of containerized imports enter the United States through the ports of Long Beach and Los Angeles, making it the busiest container port complex in the country. A significant share of these containers pass through the Tucson region along I-10 and the Union Pacific Sunset Route rail line.[4]

Population Growth Drives Demand for Freight

Population is an important driver of freight demand in a region since the rate of growth or decline of the population impacts the need for goods to be consumed by local residents. The PAG region is predicted to grow by more than 300,000 residents by 2045. The broader Sun Corridor, encompassing Maricopa. Pinal, Pima and Santa Cruz counties, may add more than 3 million residents.

Pima County	Sun Corridor
2015: 1,009,400	2015: 5.5 million
2045: 1,323,200	2025: 8.7 million

Freight Trends and Challenges

In addition to population growth, the Freight Plan identifies a number of emerging trends, challenges, outside factors that may affect how freight moves in the PAG region. Among these are:

- increasing freight and passenger traffic on our region's interstates and other roadways
- the growth of e-commerce and what it means for distribution patterns as well as local sales tax collections
- the region's aging transportation infrastructure and traffic signals
- the impact of new transportation technologies, including connected and autonomous trucks on traffic flows

To address emerging demands, the region can look at the trends and challenges affecting freight movement and consider employing regulatory, operational and infrastructural modifications to strengthen the PAG region's position and support economic growth.

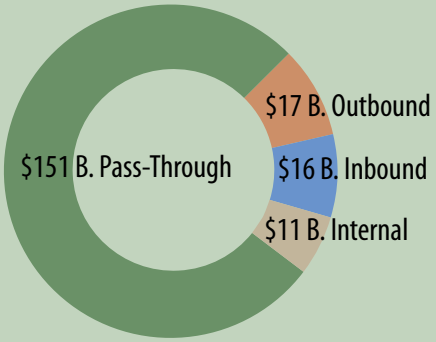
Requirements for truck drivers to use electronic logging devices, aging roadways and bridges, and increasing passenger, truck and rail traffic are among the potential freight system challenges.

Directional Freight Flows

Given the PAG region's location on a major east-west interstate corridor, freight often passes through it, traveling between major markets in California and Texas. In 2013[5], for example, $195 billion in goods traveled on the region's roadways. Of that total, 77 percent of the goods passed through the region.

Inbound and outbound flows **(Figure 5)** to and from Pima County are relatively balanced.

Figure 5 **Freight Flows By Direction In Pima County**



Source: CPCS analysis of TRANSEARCH (2013)

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[4]Kitroeff, Natalie. "Competitors are eating into L.A. ports' dominance." Los Angeles Times. 04/27/2016. http://www.latimes.com/business/la-fi-la-ports-competition-20160427-story.html.

[5]Note: Commodity flow data for the Freight Plan all date to 2013, the latest year available at the time of the Freight Plan's development. These data were acquired for the region through an agreement with the Arizona Department of Transportation so that PAG used the data consistent with the recently completed State Freight Plan.

Commodity Outflows

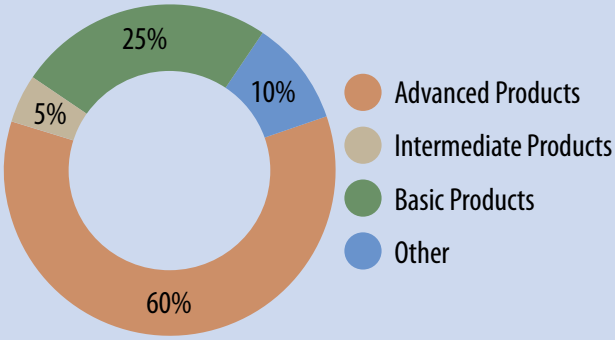
Goods that are produced in the PAG region but consumed elsewhere bring wealth to the community and support tens of thousands of local jobs. Pima County shipped nearly $17 billion in goods in 2013.[6]

Figure 6 shows the majority of the region's outbound freight (60 percent) consisted of advanced products — missile parts, electronics and precision instruments — demonstrating the importance of advanced manufacturing to the local economy. Basic products, primarily mined materials, were the second largest freight outflow by a value of 25 percent, while "Other" products (mostly warehoused goods) and intermediate products (textiles, paper products, chemical preparations) together accounted for 15 percent.

FREIGHT FACT

Raytheon Missile Systems, the region's largest private employer, accounted for approximately 40 percent of Pima County's total outbound freight value in 2013.[7]

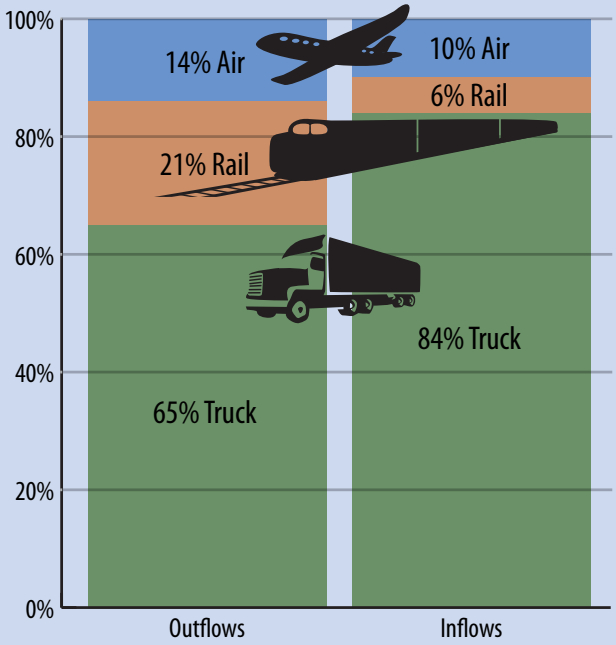
Figure 6 **Outflows By Commodity Group From Pima County**



2013 TRANSEARCH commodity flow data

Figure 7 shows the share of freight by mode. Freight by rail mostly serves copper products and chemicals, while cargo by air carries high-value, time-sensitive goods and small parcels.

Figure 7 **Mode Split For Inbound/ Outbound Freight By Value**



Source: CPCS analysis of TRANSEARCH (2013)

Current Conditions

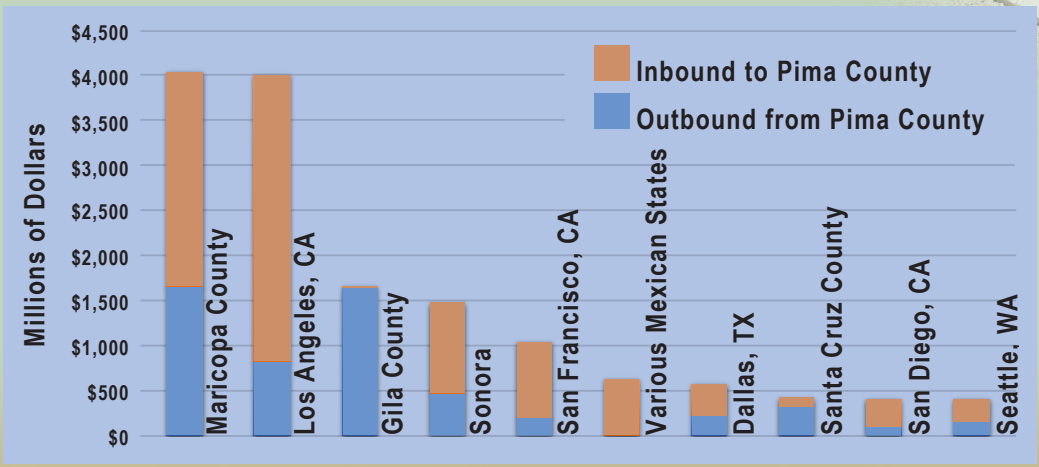
Overall, the region's transportation network is largely serving the current needs of the freight industry, according to regional freight stakeholders and data analysis. However, if no operational or capacity investments are made in the system, future congestion issues – caused by growth in both commercial and passenger travel – would increase freight delay and reduce reliability.

[6] *2013 TRANSEARCH commodity flow data*
[7] *2013 TRANSEARCH commodity flow data*

Top Trading Partners

Pima County's strongest trade relationships, as indicated by the total value **(Figure 8)** of goods moving between markets, are with neighboring and nearby regions. The Phoenix and Los Angeles metropolitan areas, in particular, dwarf other metro areas as the region's top trading partners. Both Phoenix and Los Angeles send many more goods to Pima County than they receive, creating some challenges with empty trucks on return trips. Other important trading partners include Gila County (a major destination for locally mined copper) and Sonora, Mexico, the region's top international trading partner.

Figure 8 **Pima County Top Regional Trading Partners**



Source: PAG analysis of TRANSEARCH (2013)

FREIGHT FACT

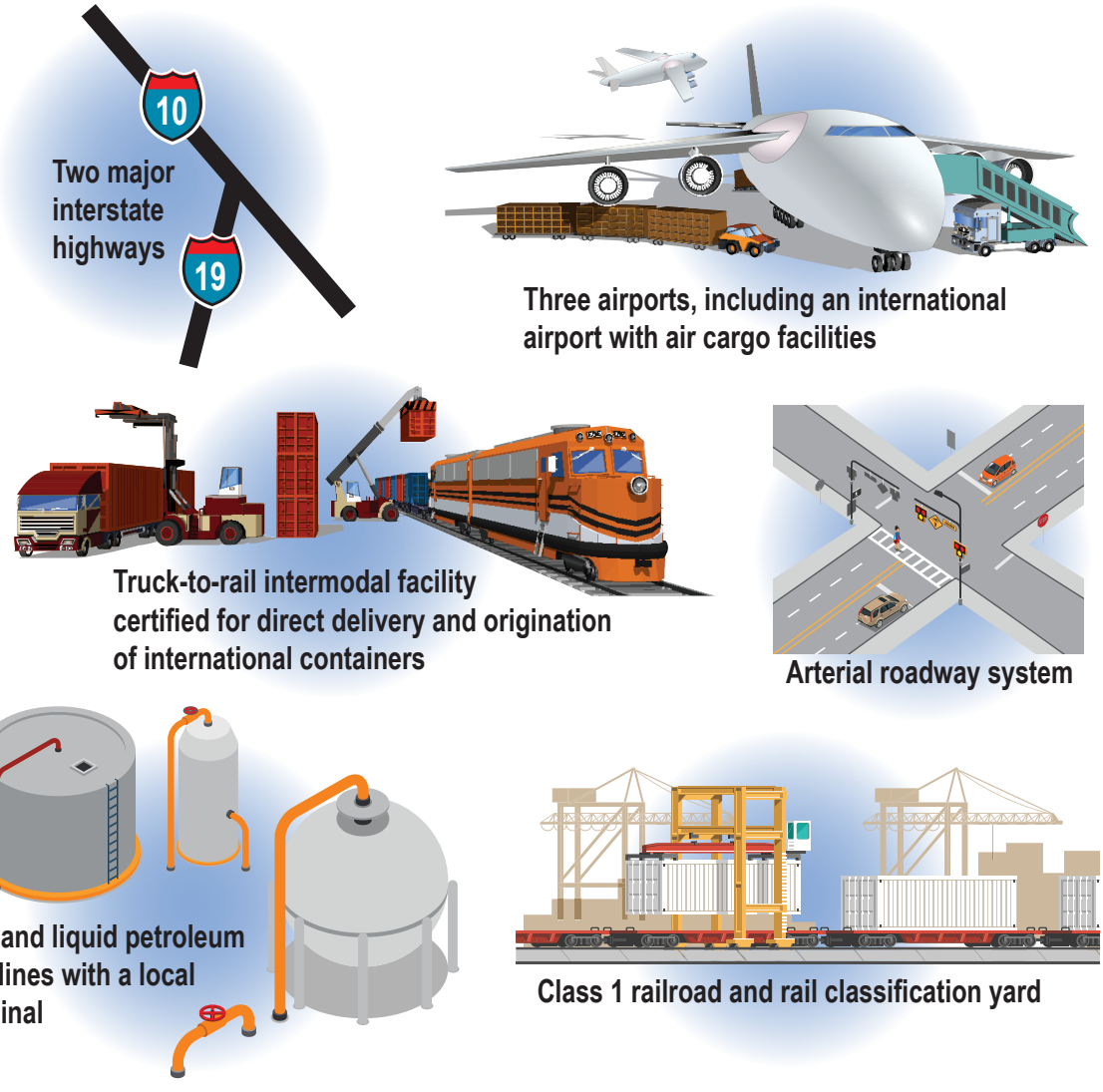
In 2016, over 32 percent of Mexican fresh produce imported into the United States during the winter months crossed the border at the Mariposa Border Port of Entry in Nogales, Ariz., making it the second-busiest border crossing for Mexican produce in the country, just behind Hidalgo, Texas.[8]

[8]*PAG analysis of U.S. Census Bureau Economic Indicators Foreign Trade Data.*

How We Deliver Goods

The PAG region has a significant collection of freight infrastructure assets **(Figure 9)**, including:

Figure 9 **Freight Infrastructure Assets In The Region**



Few regions of similar size can boast this particular collection of infrastructure assets combined with easy border access. We sit at a freight junction of national and international commerce, providing a strong foundation from which to meet the PAG region's economic development goals.

Figure 10 **Tucson Region Freight Infrastructure**

Roadway Freight Volumes

Interstate 10 is the busiest freight corridor in the PAG region, followed by I-19. Currently, trucks represent around 13 percent of all traffic on I-10.

Local roadways experience far less freight traffic than interstates, but they are also critical for the region's goods-based economy. These roadways provide important "first-mile" and "last-mile" connections for almost all goods produced and consumed in the region. Freight trucks represent as high as 1 percent to 2 percent of traffic as observed on the busiest local arterial roadways, according to data from ADOT's and PAG's traffic count programs.

FREIGHT FACT

According to the Federal Highway Administration, long-distance truck volumes are predicted to double on I-10 and increase by 50 percent on I-19 by 2045.

Figure 11 shows relative truck volumes on the region's roadways collected through a sample of GPS records over the course of 2016.

Regional Freight Corridors

To help support transportation decision making and future planning efforts, the Freight Plan identifies a new subnetwork of roadways known as Regional Freight Corridors (RFCs). RFCs are roadways that are most important to the movement of goods in the region, with a focus on non-interstate roadways. The RFC network **(Figure 12)** is intended to be used as a planning tool; the identification is not associated with any funding or specific regulations or other requirements.

Figure 11 **Relative Truck Volumes On Regional Roads (2016)**

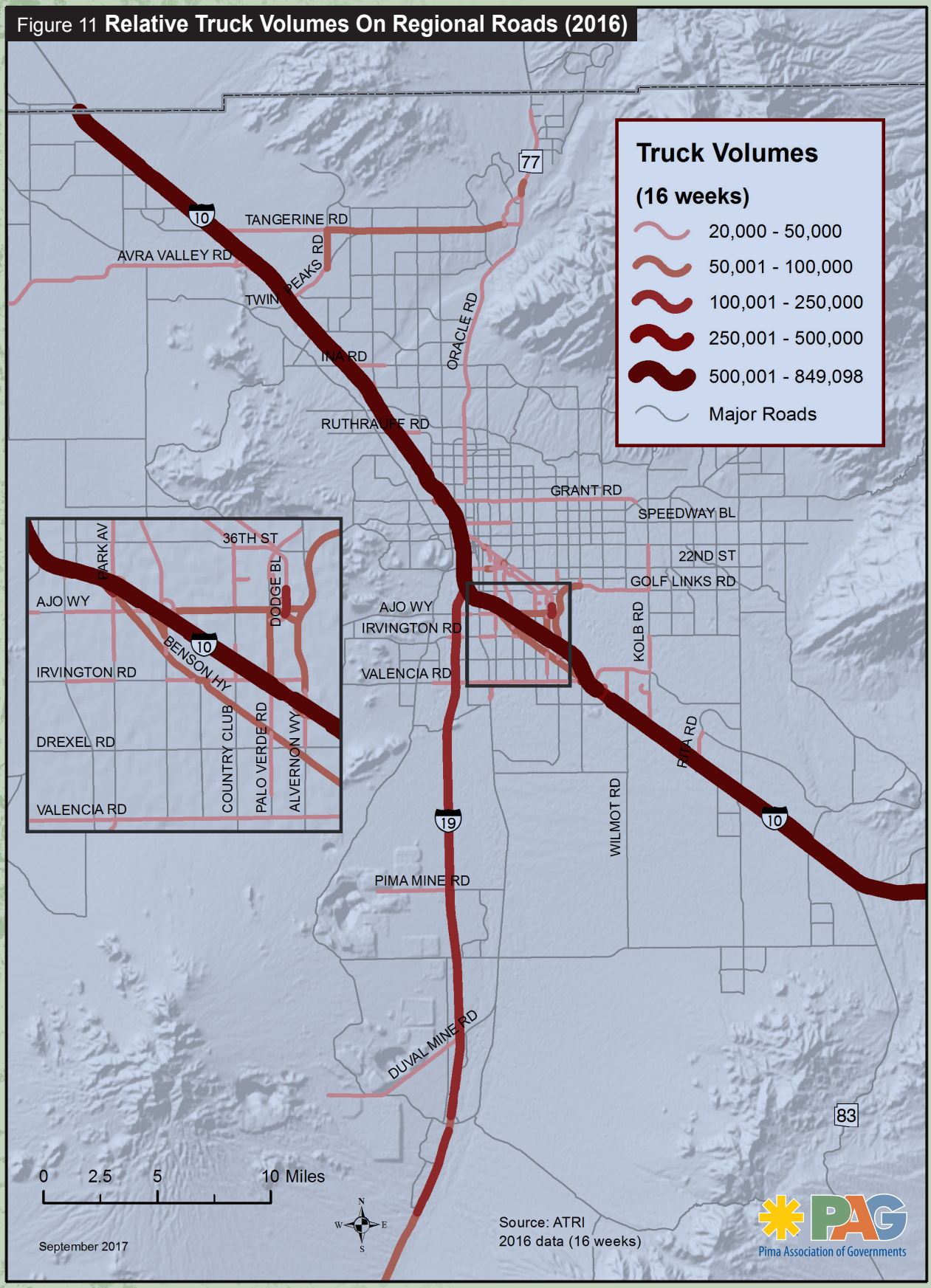
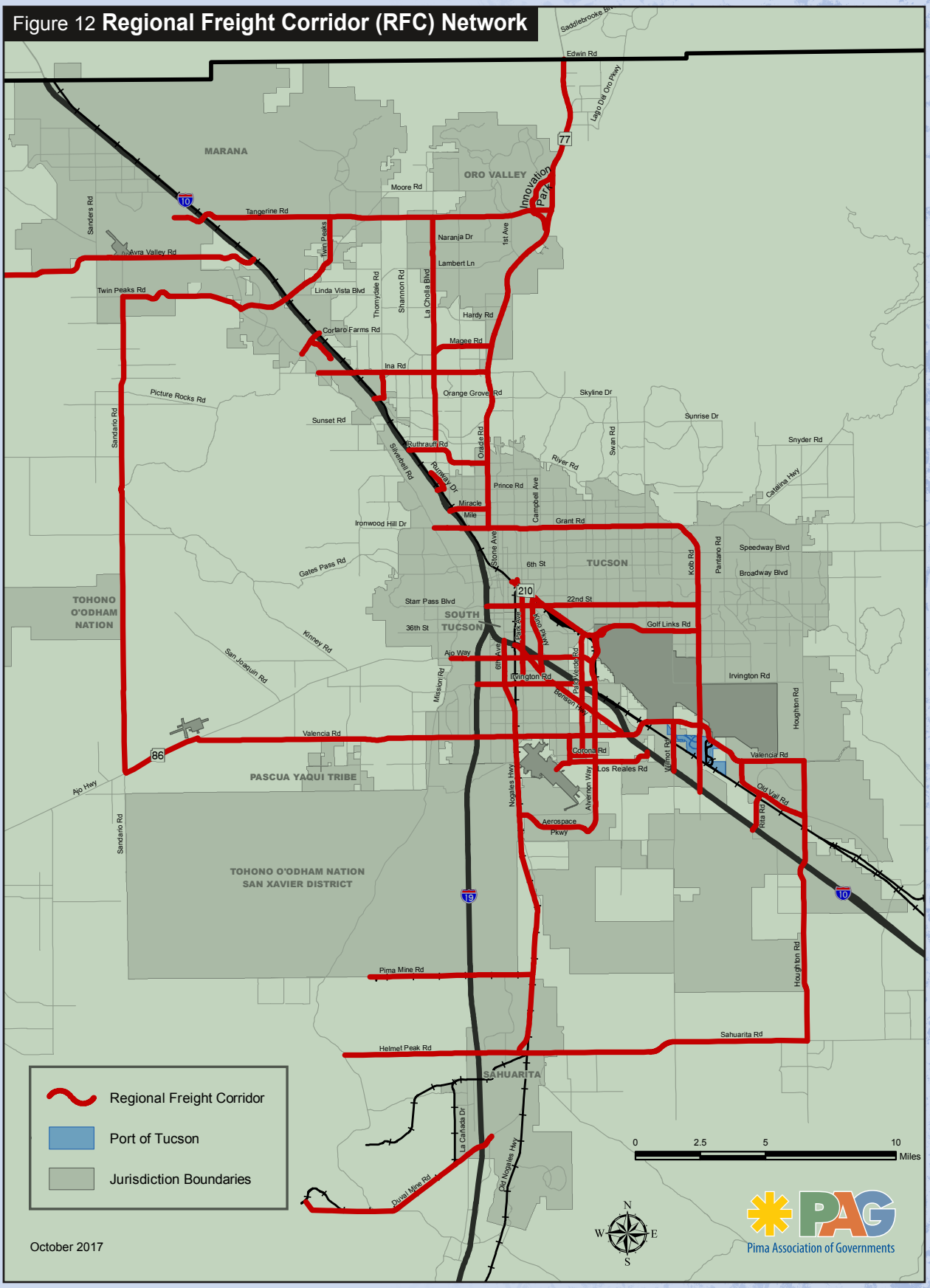


Figure 12 **Regional Freight Corridor (RFC) Network**



Recommendations

Instead of proposing multiple new projects, the Freight Plan identifies already planned transportation projects anticipated to provide a significant benefit for the movement of goods.

Projects include interstate expansions, traffic interchange upgrades, railroad-grade separations, and specific projects such as the Sonoran Corridor that are already identified in PAG's 2045 Regional Mobility and Accessibility Plan (RMAP) or its Transportation Improvement Program (TIP).

Highlights of project types and the number of projects planned for our region by 2045 are shown below:

19 Interstate improvements (includes widening projects on I-10 and I-19 and new or updated traffic interchanges)

3 Other significant projects (includes the Sonoran Corridor, SR 210 extension, and improvements near the Mariposa Port of Entry in Nogales)

30 Arterial roadway improvements

Other investment priorities that arose during the Freight Plan development process include improving pavement conditions in the region, upgrading traffic signals, investigating future railroad grade separations and, where appropriate, pursuing construction of new corridors where road network density is low.

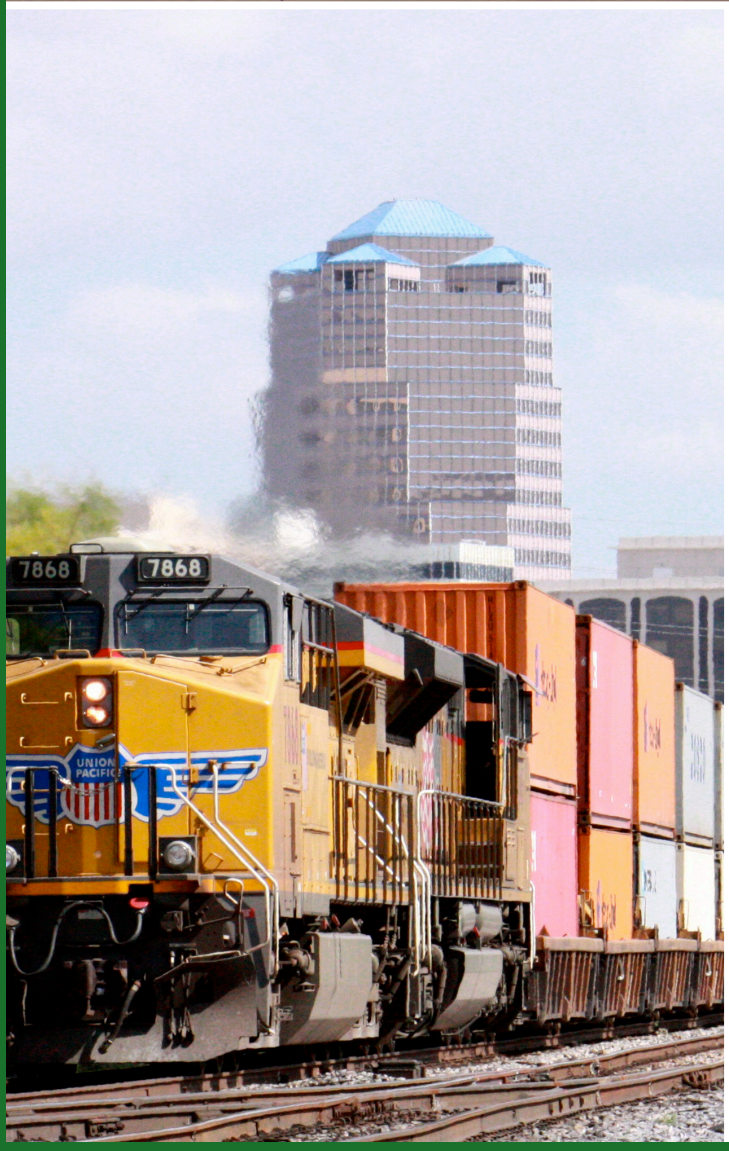
The Future of Freight

In the coming years, global trade patterns, local demographic and economic shifts, technological innovation, changes in shopping habits and distant infrastructure investments will influence where, when, how and how much freight moves through the PAG region. Current predictions are that both freight and passenger travel will increase on the region's roadways, potentially increasing travel delays for passengers and freight alike.

To remain competitive in retaining, growing and attracting freight-intensive and particularly export businesses, we must ensure that the region's freight transportation system continues to perform at the highest levels while serving higher traffic volumes. Investments in the system will include increasing capacity on existing interstates and regional roadways, building new facilities to add density and route alternatives to the network, modernizing traffic interchanges, exploring grade separations at railroad tracks, and making investments in traffic signal and communications technology so that the region is prepared for the arrival of autonomous features in fleet vehicles. Additionally, existing infrastructure will need to be maintained, including repairing and replacing bridges, and improving pavement conditions.

Instead of proposing multiple new projects to address the region's freight needs, the Freight Plan focuses on identifying already planned and programmed projects that are expected to be particularly beneficial for freight transport.

The intent of including identified projects in the Freight Plan is to strengthen freight considerations in regional transportation planning as decision makers think about future investment priorities in an increasingly constrained funding environment.



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