



## PlanWorks Case Study

# Arizona State Freight Plan Arizona Department of Transportation



*This case study is an excellent example of working with freight stakeholders to achieve mutually beneficial outcomes. While Arizona DOT did not use PlanWorks to develop their Freight Plan, the PlanWorks Freight Application will be very useful in helping other agencies interested in this approach.*

### Executive Summary

The Arizona State Freight Plan was created to provide policies, projects, and long-term plans for freight transportation investments in Arizona. The plan provides investment guidance for the Arizona Department of Transportation (ADOT) and the MPOs on freight system-related projects that comply with the Fixing America's Surface Transportation (FAST) Act and the "Moving Ahead for Progress in the 21st Century Act" (MAP-21), with priority given to projects which make the greatest contribution to the state's economy.

The Arizona State Freight Plan was informed by extensive engagement with varied freight stakeholders, and stakeholder feedback was used to form the plan's final planning and policy recommendations. This engagement included a multiagency Freight Advisory Committee (FAC) that guided the overall study process and a Technical Advisory Committee (TAC) that aided in technical aspects of the project to ensure the findings could be implemented/operationalized with ADOT.

This project shows how the private sector's feedback on the transportation system can be collected in a manner that is not onerous, and how this feedback can yield insights for public agency efforts. This study also highlights how multi-agency and stakeholder collaboration can aid in project selection, determining evaluation processes and criteria, and prioritizing projects for inclusion in a plan.

A unique product of this outreach was a set of ten profiles of Arizona's key industries: Mining, Forestry, Energy, Transportation Equipment Manufacturing, Food & Beverage, Wholesale & Retail, Transportation & Logistics, Agriculture, High Tech Manufacturing and General Manufacturing. The specific freight system needs, issues and potential improvements suggested by each industry were identified through mapping the supply chains and one-on-one consultations of each industry.

This FAST Act compliant freight plan established a vision and goals for the state freight system. Using the vision and goals as guidance, evaluation

### Project Snapshot

- The Arizona State Freight Plan represents a collaborative effort between transportation agencies and freight stakeholders.
- This public and private sector partnership included:
  - Multiagency Freight Advisory Committee that guided the overall plan development process, and
  - Technical Advisory Committee to ensure the findings could be implemented/operationalized.
- In addition to producing a FAST Act compliant plan which supports project selection, prioritization, and implementation; the State Freight Plan produced ten profiles of Arizona's key industries based on supply chain mapping and one-on-one consultations.

criteria, plan methodology and performance measures were established to ensure the transportation system was examined through a “freight lens.”

### Agency's Challenge

Social and economic trends have created new pressures for Arizona’s transportation system. Over the past two decades, Arizona has experienced uneven population growth, with the state’s population mostly concentrated around Phoenix and Tucson. This population growth and an ongoing economic recovery throughout the state are driving increased passenger and freight traffic on an already congested road network.

ADOT developed the Arizona State Freight Plan to identify and prioritize the infrastructure projects and policies needed to support the competitiveness of Arizona’s economy. Specific elements of this multimodal plan include an inventory of critical freight infrastructure within the state, profiles of the freight transportation needs of the state’s major industries, a prioritized list of freight infrastructure projects, and an implementation plan to advance understanding of freight within ADOT. Ultimately, the freight plan provides ADOT with a guide for making investment and policy decisions consistent with the state’s vision, goals, and objectives, while promoting regional competitiveness and economic growth. ADOT began working on the freight plan in 2015, and it was completed in 2017.

Freight flows assigned to Arizona’s roadway network are shown in Figure 1. The freight flows related to each of Arizona’s top sectors are also color coded in the map. Key elements of the state’s freight system include four Interstate highways, two Class 1 railroads, and five air cargo facilities, as well as numerous U.S. highways and state highways. Phoenix and Tucson are Arizona’s freight activity centers, thanks to their large consumer markets and labor pools. Other major freight clusters in the state include agriculture in the southwest, forestry in the north and northeast, and mining in the southeast.

To craft a freight plan that would advance the competitiveness of Arizona’s economy, ADOT needed to understand the transportation practices, needs, and concerns of the state’s freight-reliant businesses such

as manufacturing, natural resource, and transportation companies. To gather this information, ADOT and its consultants engaged private stakeholders via a partnership with industry associations such as the Arizona Trucking Association and Arizona Mining Association. Specific forms of stakeholder engagement included:

- Industry representation on ADOT’s Freight Advisory Committee (FAC),
- Industry association-facilitated distribution of surveys, and
- Industry association-facilitated consultations with major freight stakeholders.

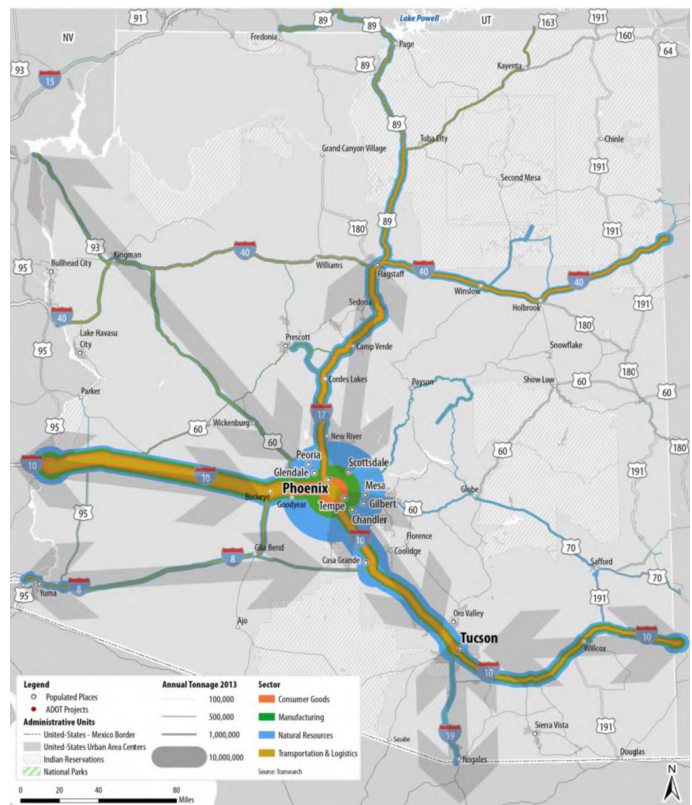


Figure 1: Freight Sector Flows (Inbound, Outbound, and Intra) on Arizona’s Key Commerce Corridors (2013)

This three-part stakeholder outreach effort, facilitated by industry associations, helped ADOT and its consultants efficiently gather industry feedback on both the needs of the transportation system as well as the planning documents themselves. An analysis of freight transportation performance measures and a survey of the stakeholders found that congestion and recurring bottlenecks (especially around urban centers) is the main factor affecting freight service reliability in

Arizona. Other important freight transportation issues facing ADOT include border-related delays, a truck parking shortage, and weather-related disruptions. In addition to road network issues, capacity limits affect rail, air and pipeline services in Arizona.

### State Freight Plan Development

The creation of the Freight Plan was guided by a vision and a series of goals linked directly to the National Freight Policy goals provided in MAP 21. The vision was designed to more fully integrate freight considerations into the ADOT's planning process to focus freight transportation system improvements on economic competitiveness and quality growth. The three main goals of the Plan were to enhance economic competitiveness, improve the freight system's performance, and improve management of existing freight system assets.

The vision, goals, and objectives were reflected in each of the 11 phases of the Freight Plan's development, which are shown in Figure 2. The 11 phases were created to provide a straightforward, practical framework to support the Plan's vision, goals, and objectives and ensure that other policies and strategies at the federal, state, and regional levels (such as Arizona's Long-Range Transportation Plan and its Planning-to-Programming process known as "P2P Link") are reflected in the plans. Additionally, a strategy was to initiate and maintain partnerships and communication with the public and private sector stakeholders that influence (and are influenced by) the freight transportation system in Arizona.

Freight Plan development efforts began in May 2015. The first step was the identification of the business sectors within Arizona that are most reliant on freight transportation, and consultation with the industry association representing each key sector. This work was prioritized in order to determine the main issues relevant to the freight transportation needs of the state's freight-dependent businesses. The state's main freight sectors were identified through an assessment of the volume and values of goods and each industry's contributions to state GDP, income, and employment. These top ten freight sectors (listed below) contributed to about 85% of state's total GDP for all freight sectors, and more than 96% of all the state's export flows.

### Decision Guide Connections

The planning process and specific features of the Arizona State Freight Plan align with many of the PlanWorks long-range planning key decisions.

- **LRP-1-** Scoped to advance the State's economic competitiveness and provide investment guidance for ADOT and MPOs.
- **LRP-2-** Established a vision and goals linked directly to the National Freight Policy goals.
- **LRP-3-** Developed evaluation criteria and performance measures to ensure the transportation system was examined through a "freight lens."
- **LRP-4-** Identified major freight-reliant industries in Arizona to prioritize a list of freight infrastructure projects
- **LRP-5-** Conducted benefit-cost analyses and prioritized projects in the context of available funding
- **LRP-7-** Used scenario planning to forecast future freight issues and three worst-case scenarios.

- Wholesalers and retailers,
- Food and beverage,
- High-tech manufacturing,
- General manufacturing,
- Transportation equipment manufacturing,
- Transportation and logistics,
- Mining (except oil and gas),
- Energy (oil and gas), and
- Agriculture, and forestry.

Based on the alignment and description of each phase showcased in Figure 2, the intensity of collaboration efforts at each phase of the project is shown in Figure 3. Although the FAC was involved in all the phases of planning, targeted consultation with stakeholders and outreach efforts for system performance assessment only took place in certain phases of the planning process.

The results of ADOT's planning efforts included a set of modal profiles for Arizona's top ten industry sectors,

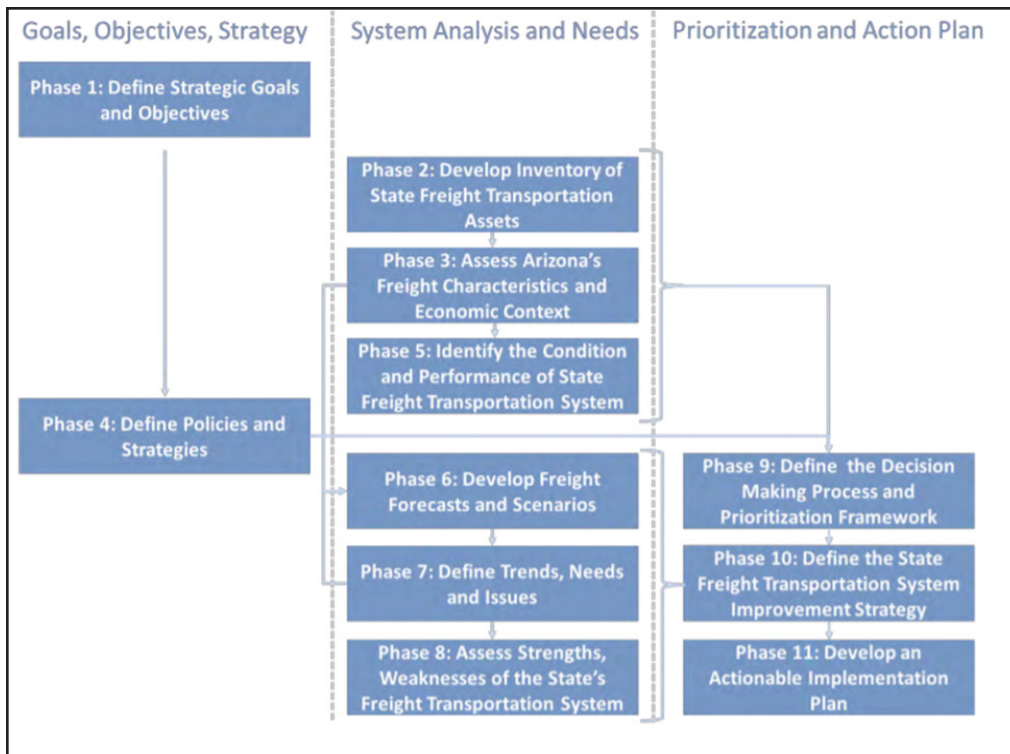


Figure 2: Freight Plan Phase (Source: Arizona State Freight Plan, Project Structure and Timeline)

three freight forecasts for scenarios for the future of movement of freight, and a “five-year State Freight Plan” designed to meet federal requirements for state freight plans established in the FAST Act.

### Stakeholder Collaboration

The Arizona Freight Plan was developed through a combination of literature review, analysis of transportation and economic data, and consultations with industry stakeholders. Two advisory committees supported the development of the Freight Plan: the Technical Advisory Committee (TAC), comprised of internal ADOT freight experts, and the Arizona Freight Advisory Committee (FAC). The FAC was established in 2015 to provide industry feedback to ADOT, and to help identify industry’s transportation needs and concerns. The FAC consists of 35 members, including FHWA and ADOT officials, different industry associations, MPOs, members of academia and freight shippers/consumers/carriers. During Freight Plan development, collaboration with these industry and government stakeholders included online surveys, in-person consultations, and a scenario planning workshop. Stakeholders were also requested to provide data (in particular on major rural and urban freight corridors), review working papers that documented the planning process and prioritization activities and to help validate interim findings. The

FAC also collaborated with ADOT to establish three additional objectives for the Freight Plan (in addition to those in MAP-21 and the FAST Act):

- Maintaining and improving the connectivity of the freight system,
- Using multiple data sources to validate the information, and
- Engaging the FAC and MPOs throughout the planning process.

Some industry associations were already involved with ADOT prior to the start of the Freight Plan through the FAC, so additional collaboration for Freight Plan development was a natural follow-on. Several industry associations helped convene focus groups with the goal of fleshing out specific transportation system needs affecting their members. These industries realized that working closely with ADOT was important, as it would ensure their perspectives and suggested solutions are recognized in the Freight Plan.

### Scenario Planning

The Arizona FAC participated in a scenario planning workshop, which helped ADOT and stakeholder prepare for potential future demands on the freight system. A scenario planning approach was selected because it would allow planners to estimate the effects

| Phase                           | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------------------------|---|---|---|---|---|---|---|---|---|----|----|
| Industry Association Assistance |   |   |   |   |   |   |   |   |   |    |    |
| FAC Meetings                    |   |   |   |   |   |   |   |   |   |    |    |
| Stakeholder Survey              |   |   |   |   |   |   |   |   |   |    |    |
| Stakeholder Interviews          |   |   |   |   |   |   |   |   |   |    |    |

Figure 3: Plan Phases and Outreach Efforts (Source: CPCS analysis of stakeholder involvement)

of different extreme scenarios on the state's freight system. These scenarios were intentionally extreme cases to highlight the most vulnerable features in the state's freight system. The three extreme case scenarios were developed during an all-day workshop in Phoenix. More than 50 participants divided into three groups and discussed the future of freight transportation demand in Arizona. FAC participation was particularly important for defining drivers of private industry performance and efficiency, which helped planners estimate the impacts of each scenario.

### Project Prioritization

The FAC collaborated in identifying and mapping a list of 104 freight-related issues in the state. This list enabled ADOT to focus on specific investments in specific locations to improve the state's freight transportation. For issues and locations where ADOT did not have any (or sole) jurisdiction, collaboration and coordination with relevant stakeholders were considered.

The list of issues was converted into a list of projects, and these projects were prioritized using a two-step process. First, planners conducted a qualitative assessment of the most important strategic freight issues in the state using merit-based criteria and feedback provided by the FAC. Second, planners conducted a quantitative assessment based on merit-based criteria. The FAC and TAC provided feedback on the weights assigned to project criteria for this quantitative assessment.

In 2015, the FAC facilitated the distribution of surveys among the stakeholders. These surveys focused on qualitative performance measures and freight trends that were hard to capture through data analysis. The focus of the surveys was on quantifying truck mobility issues, efficiency, and reliability of the service, safety, and environmental/social impacts of freight systems. The results of the survey analysis also helped in verifying the results of the quantitative analysis

of the freight transport trends in Arizona. Overall, many stakeholders believed that the ease of freight mobility in the state has declined (comparisons were based on 2010-2015 period). The decreasing trend in system performance reflected in data analysis was also expressed by the stakeholders. This first survey established a baseline of stakeholder views. Going forward, ADOT will use the same survey instrument to collect leading indicators of freight system health in the state.

### Working with Freight Stakeholders

The Arizona State Freight Plan demonstrates how transportation agencies and freight stakeholders can partner as a mutual benefit. Understanding the WHO, HOW, and WHEN of freight stakeholder involvement can be a challenge for transportation practitioners.

The PlanWorks Freight Application provides specific information to address this challenge. Go to [Working with Freight Stakeholders](#) for more.

Industry associations representing Arizona's freight-dependent economic sectors providing lists of member contacts for consultation on Arizona's freight transportation issues. The results of these consultations provided insight into the role of freight in Arizona's economy and industry-specific needs (e.g. need of manufacturing, agriculture, and other key industries). The unique feature of this State Freight Plan was the in-depth exploration of commodity flow trends and role of freight in the supply chain of each main sector and its contribution to the Arizona's economy which led to individual industry profile reports. These industry profiles provide an overview of each industry's freight-related performance needs and issues.

The Arizona Mining Association (AMA) and Arizona Trucking Association (ATA) provided significant contributions to the development of industry profiles. More importantly, both of these associations later invited the ADOT to present/promote the final State Freight Plan in their conferences. This was a big step for ADOT in showcasing its freight-related work for a broader audience. Another result of the consultation with stakeholders was the opportunity for follow-up projects. For example, the ATA reached out to ADOT to investigate potential solutions for truck parking

problems in the state. ADOT and ATA are now working together, with other stakeholders, to identify truck parking needs statewide.

### Stakeholder Collaboration

A key resource for the development of the Arizona State Freight Plan was an ongoing collaboration with ADOT's FAC and industry associations during every phase of the plan development. Consultations with the FAC and industry associations provided ADOT and its consultants with a better understanding of each sector's supply chain needs. This improved understanding of freight transportation needs helped planners craft policy, program, and project recommendations specifically intended to support economic growth throughout the state.

The creation of the Arizona State Freight Plan demonstrates the value of extensive collaboration with freight stakeholders in the planning process. The FAC and Industry Associations provided their technical knowledge to ADOT and consultants, and this engagement was beneficial for these freight-related industries because it ensured that planners recognized and addressed their sector-specific needs and supply chain management issues.

### Key Outcomes

Three valuable lessons learned from the stakeholder outreach conducted in the development of Arizona State Freight Plan are:

- **Leverage relationships as early as possible.** Engaging with FAC members, particularly industry associations early in the planning process helped

planners quickly identify key private sector decision makers who had the necessary insights into their firms' or industry's freight operations to provide useful insights for planning. This early identification of and contact with key decision makers also helped with the timely creation of industry focus groups, who could then provide feedback throughout the rest of the planning process.

- **Establish a clear work plan early.** Start with a clear vision for the transportation system, and use this vision to set goals for the plan. Establishing a comprehensive work plan with strategies and timeframes for stakeholder outreach, sector assessment, and data analysis significantly increased the efficiency of the planning process and helped the planners to understand the freight-related issues and needs and validate system performance analysis.
- **Utilize scenario planning to enrich the planning process.** Planners chose to use scenario planning to estimate the impacts of potential changes in the freight system. Three future scenarios were designed through collaboration with stakeholders and the results of scenario planning workshops helped the state identify the most vulnerable parts of the existing freight network and prepare for an unknown future.

The final State Freight Plan includes a comprehensive assessment of Arizona's existing freight system, trends, and needs of the freight system, prioritization of needs and list of potential solutions, a strategy to improve the overall system performance and policy implementation plan.

### For more information

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#### Resources

- **Arizona State Freight Plan.** <https://www.azdot.gov/planning/transportation-programs/arizona-state-freight-plan/project-deliverables>
- **Freight Advisory Committee (FAC) Activities.** <https://www.azdot.gov/planning/transportation-programs/arizona-state-freight-plan/fac-activities>
- **Identification of Top 10 Economic Sectors for Focus:** [https://www.azdot.gov/docs/default-source/planning/State-Freight-Plan/14325-arizona-state-freight-plan-draft-memo-industries-of-focus-\(adot-mpd-085-14\).pdf?sfvrsn=0](https://www.azdot.gov/docs/default-source/planning/State-Freight-Plan/14325-arizona-state-freight-plan-draft-memo-industries-of-focus-(adot-mpd-085-14).pdf?sfvrsn=0)