



REGIONAL FREIGHT NETWORK PROJECT EVALUATION METHODOLOGY

This document sets forth a method for evaluating freight projects in the MAG region. It begins with regional goals, which provide the planning process with a basis for identifying options, evaluating alternatives and making decisions on future transportation investments. The MAG Transportation Policy Committee identified four goals and an associated set of objectives, first approved in February, 2003. In addition, Arizona Revised Statute 28-6354.B directs MAG to develop criteria to establish the priority of corridors, corridor segments, and other transportation projects. Through the regional transportation planning process, MAG applied various prioritization criteria for the development of the Regional Transportation Plan. The Draft 2040 Regional Transportation Plan was recently updated on February 23, 2017 and maintains the previously established goals and objectives.

The MAG Freight Transportation Plan also identifies and prioritizes projects that may become part of the MAG Regional Transportation Plan. The method is based on the region's four transportation goals interpreted in terms of freight. It requires priority projects to be situated on the MAG Freight Transportation Network, because a key purpose of establishing the Network is to concentrate investment on the principal freight facilities of the region, which the Network defines. The method focuses on *locations* needing improvement instead of *projects* per se. This allows sites (route segments and corridors) without defined projects to compete with sites that have them. Effectively, this approach prioritizes needs on facilities, and projects on those facilities receive their initial priority in consequence. Further scrutiny then should be brought to specific projects in priority locations to establish their relevance to freight needs. The final priority among specific and relevant projects in top locations can be established by their benefit-cost assessments and/or economic impact.

In addition, this approach enables MAG to designate Critical Urban Freight Corridors (CUFCs, discussed below), which it is required to do by the federal FAST Act. The FAST Act ties project eligibility for federal freight funds to location on the CUFCs, and CUFC mileage is limited. This means that MAG must prioritize route segments and corridors in order to designate CUFCs, and the CUFCs determine project eligibility for funding. In other words, the method set forth here for prioritizing projects in terms of locations satisfies both FAST Act requirements and region's requirement for deciding freight investment.

The multi-step process begins with a region-wide assessment and results in a prioritized list representing the best locations for future freight-focused transportation investment. The detailed method and steps are described next.

EVALUATION PROCEDURES

First, MAG completed a region-wide network assessment and identified a draft Freight Transportation Network. This network includes more than 200 centerline miles of regional roads and streets. Additional centerline mileage includes key Interstates and State Routes. All of the region's Interstates and State Routes also are examined in the Arizona Department of Transportation State Freight Plan.

Next, the region considered federal transportation legislation. The federal FAST Act requires MPOs in Arizona to designate up to 103 total miles of "Critical Urban Freight Corridors" (CUFCs) within the state, which then are eligible for federal freight funds. Interstates and certain other roadways belonging to a federally defined national freight system also are eligible to receive freight funds for projects, and MAG has made all such facilities part of its Freight Transportation Network. However, projects on roadways that are not part of the federally defined system cannot receive freight funds unless they are located on CUFCs (or on critical rural freight corridors



designated by ADOT). All urban facilities in the MAG Freight Transportation Network that are not already part of the federally defined system qualify for designation as CUFCs because the design of the MAG Network meets the federal criteria. Nevertheless, because no more than 103 miles statewide can receive CUFC designation, MAG must prioritize facilities by defining locations that most need improvements in order to make them eligible for funds. The methods described in the following sections therefore enable MAG to identify the top Network locations for freight transportation investments. This accomplishes two things: it allows MAG to determine which Network miles should receive CUFC designation and become eligible for federal freight funds, and more broadly, it allows MAG to prioritize locations and projects everywhere on its Freight Transportation Network for application of other types of funds.

MEASURING GOAL ACHIEVEMENT

The method for network evaluation scores locations according to measures reflecting each of the four MAG transportation goals. This point based scoring method identifies the most important project needs through the gathering of data and aids the ability to determine which projects trend toward higher priority transportation investments. The scoring employs the Six Sigma Methodology, which was developed in the industrial sector as part of quality and continuous improvement processes. Six Sigma utilizes scoring values of zero, 1, 3, and 9. This triples the sizes of scores as they progress from low to high, which creates clearer distinctions between outcomes than conventional stepwise approaches. The top value of 9 indicates the areas of the network that best achieve the measured goal. This system provides an intuitive means to differentiate among the many competing options and improves the ability for regional decision makers to separate locations with tiers of priority.

COMBINING INDIVIDUAL GOAL SCORES

The scores for each goal are added together to create a composite score by which locations are ranked. However, individual goals may not have equal importance or impact on the performance of the freight system. To reflect this, public and private sector stakeholders should assign weights to transportation goals according to their impact and stakeholder policy preferences. The default is equal weighting; change in weight will advance certain locations and types of need over others, and ought to allow the resulting set of priorities to improve freight system performance more efficiently.

PRIORITIZING PROJECTS

The top locations based on composite scores will have the greatest potential to enhance regional freight performance. In top locations where projects already are defined and included in the Regional Transportation Plan, those projects should be further reviewed for their relevance to freight. Relevance should be graded according to the following categories:

- Project definition has an identified or obvious freight benefit
- Project components can be reevaluated to determine freight benefit
- Project can be modified or enhanced and provide freight benefits
- Project does not provide freight benefits
- Project negatively affects regional freight connectivity



Final priorities among relevant projects in top locations can be decided by available assessments of benefit-cost relationships and/or economic impacts, and projects employing advanced technology can be given added weight as a policy preference. For top locations where projects have not been defined, two practical considerations should influence where preliminary engineering evaluations are most warranted:

- Has the location received public input through an official ADOT, MAG or city initiative in the past five years? If the answer is yes, then public support or opposition can be gauged.
- Is the location identified in a local jurisdiction plan or program? If the answer is yes, then jurisdiction support for projects is more likely.
- Are realistic funding sources available? This question defers or eliminates very large projects whose financing is improbable without special circumstances.

GOALS AND MEASURES

This section details from a freight perspective the four goals established by the MAG Transportation Policy Committee, and applies a tailored set of measures to assess the potential for improved freight performance in network locations to advance those goals.

GOAL 1: SYSTEM PRESERVATION AND SAFETY

Transportation infrastructure that is properly maintained and safe, preserving past investments for the future.

This goal prioritizes locations with significant existing freight utilization, where intelligent transportation systems can improve operational practices, or locations with frequent occurrence of property damage and bodily injury resulting from freight usage. The higher volumes of freight traffic will prioritize maintenance projects to address good state of repair. Preservation and safety goals measure project performance as follows:

- One truck every 20-seconds (Daily average truck counts of 4,320 or greater) OR truck proportion of all vehicle traffic at 20% or greater
- Signalized or stop sign controlled intersection density five or greater per mile (at least one signalized intersection or stop sign controlled intersection per quarter-mile)
- All vehicle, pedestrian, and property damage only crashes with frequency of 25 or greater per mile annually

Measurement method: 9 = three criteria met; 3 = two criteria met; 1 = one criterion met; 0 = no criteria met

GOAL 2: ACCESS AND MOBILITY

Transportation systems and services that provide accessibility, mobility and modal choices for residents, businesses and the economic development of the region.

Goals prioritize reliable access to regionally identified areas of contiguous freight land uses. These are the areas reliant upon access to a skilled workforce employed in logistics-related jobs. Businesses employ residents.



Workforces within job sustaining freight related industry are frequently reliant upon transit modes. Thus, the region prioritizes corridors that maintain or improve the environment supportive of both freight and transit access.

Access and mobility goals measure projects as follows:

- 9 = In a designated freight cluster or adjacent to intermodal facility (within one mile) and containing a local (non-express/ non-commuter) bus route with 30-minute or greater frequencies
- 3 = In a designated freight cluster or adjacent to intermodal facility (within one mile)
- 1 = Not in a designated freight cluster but provides connection to external markets
- 0 = no criteria met

GOAL 3: SUSTAINING THE ENVIRONMENT

Transportation improvements that help sustain our environment and quality of life.

The intention of this goal is to reduce emissions from stop-and-go traffic and from idling vehicles. Goals also prioritize corridors where mobility has been reduced by significant freight demand and existing reliability has deteriorated. Thus, the region prioritizes projects and operational strategies that improve mobility and restore predictable travel times. Location performance in sustaining the environment measures projects based upon the following factors:

- 9 = Motor vehicle peak hour travel time is triple or more the travel time during typical traffic and location provides redundancy to the Primary Highway Freight System (measured as adjacency within 1 mile straight line distance). Typical traffic is defined as the median observed travel time, and peak is defined as the 95th percentile, meaning that only 5 percent of observed travel times are slower.
- 3 = Motor vehicle peak hour travel time is triple or more the travel time during typical traffic
- 1 = Motor vehicle peak hour travel time is double the travel time during typical traffic
- 0 = no criteria met

GOAL 4: ACCOUNTABILITY AND PLANNING

Transportation decisions that result in effective and efficient use of public resources and strong public support.

Goals prioritize projects in corridors that carry economically significant volumes of trade and commerce so improvements are linked to regional economic development. The regional roadway freight network provides the principal means of serving business and population, and of supporting the regional economy. The value of the shipment can be interpreted as relating to the value of the goods to the broader economy and consumers. High value shipments in particular are especially costly to encumber with congestion and unreliability in the network. Location performance for accountability and planning is based upon:

- 9 = Carries greater than \$900M in annual product value
- 3 = Carries greater than \$300M in annual product value



- 1 = Carries greater than \$100M in annual product value
- 0 = no criteria met

SETTING GOAL PRIORITIES

Equal weighting of goals is shown below as the default value, but does not necessarily reflect relative importance to freight performance. Discussion with public and private sector freight stakeholders should determine the appropriate weights in the four goal areas.

- 35% Goal 1: System Preservation and Safety
- 30% Goal 2: Access and Mobility
- 25% Goal 3: Sustaining the Environment
- 10% Goal 4: Accountability and Planning