

3.10 EVALUATION OF SCENARIOS

Planning Factors, Goals, Criteria and How Measured

Table 3.7 shows the planning factors, goals, criteria and measurements that the regional framework consultant teams used to evaluate the three scenarios. The first column, *Planning Factors*, lists five elements that a multimodal transportation system should provide or promote: Mobility and Access, Transportation/Land Use Integration, Environmental and Conservation, Economic Benefit, and Safety. The second column succinctly states the goal associated with each planning factor. The third column lists one or more evaluation criteria used to specify objectives that can help meet each goal. Finally, the last column describes how the performance of each scenario was measured with respect to the criteria.

The ADOT Management Consultant was responsible for the portion of the evaluation that applied criteria based on model output. These were IC, ID, IIIA, IIIB and VA. Each regional consultant took responsibility for the remainder of the criteria, whether quantitative (criteria IA1 and IA2) or non-quantitative (all the rest). On all criteria, whether numerically based or not, each scenario was given a rating of ● (best rating), ◐ (intermediate), or ○ (worst rating). The ratings are relative; i.e., they reflect how the three scenarios fare against one another, so a rating of ○ (worst) does not necessarily mean that a scenario performs badly on some absolute scale.

Table 3.7 Planning Factors, Goals, Evaluation Criteria and How Measured

Planning Factors	Goals	Evaluation Criteria	How Measured
I. Mobility and Access	Develop functional, flexible mobility for Arizona.	A. Improve multimodal network connectivity.	1. Number of passenger terminals served by two or more modes (including air carrier) other than private vehicle access 2. Number of additional free-flow junctions (e.g., system or directional TIs) compared with the Baseline condition
		B. Increase modal choice and improve mobility options.	Amount of transit and rail passenger service compared with Baseline condition <ul style="list-style-type: none"> ● Many new services and extensive improvements compared with Baseline condition ● Moderate improvements including some new services ○ Incremental improvements only
		C. Protect personal mobility from endemic (including seasonal) congestion.	Daily vehicle hours of delay (thousands) on the regionally significant roadway system, from model output
		D. Protect freight transport from endemic (including seasonal) roadway congestion.	Daily hours of commercial vehicle delay (thousands) on the regionally significant roadway system, from model output
II. Transportation/Land Use Integration	Plan transportation facilities to promote land and development patterns that maximize modal choice, minimize trip length and enable multi-purpose trips.	A. Be consistent with county comprehensive plans, city/town general plans, tribal plans, federal land management plans (BLM, USFS) and other adopted land use plans, including development master plans.	<ul style="list-style-type: none"> ● Nearly all improvements are highly consistent with most pertinent plans ● The majority of improvements are consistent with most pertinent plans ○ Some projects are markedly inconsistent with some plans
		B. Be consistent with adopted long-range transportation plans, including tribal plans.	<ul style="list-style-type: none"> ● Nearly all improvements are highly consistent with most pertinent plans ● The majority of improvements are consistent with most pertinent plans ○ Some projects are markedly inconsistent with some plans
		C. Support existing and approved (in local plans) mixed use development.	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for mixed use districts and activity centers ● Improvements provide some support ○ Improvements provide little or no support
		D. Support infill development in cities, towns and built-up unincorporated areas that are well served by existing	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for infill development ● Improvements provide some support for infill development ○ Improvements provide little or no support for infill development

Planning Factors	Goals	Evaluation Criteria	How Measured
		<i>infrastructure.</i>	
		E. Support designated redevelopment and revitalization areas.	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for such areas ● Improvements provide some support <ul style="list-style-type: none"> ○ Improvements provide little or no support
III. Environmental and Conservation	Protect and enhance the natural and human environment.	A. Promote and increase energy security.	Daily vehicle hours of travel (thousands), as a proxy for fuel consumption
		B. Reduce vehicular greenhouse gas (CO ₂) emissions.	Reduction in daily metric tons of CO ₂ emissions compared with Baseline
		C. Minimize effects on environmentally sensitive areas (e.g., biological, cultural, scenic).	<ul style="list-style-type: none"> ● Minimal effects ● Moderate effects ○ Substantial effects
		D. Minimize effects on natural corridors for wildlife movement (as identified by AZ Game & Fish and other resource management organizations).	<ul style="list-style-type: none"> ● Minimal effects ● Moderate effects ○ Substantial effects
IV. Economic Benefit	Increase economic opportunities in Arizona.	A. Support regional and local (including tribal) economic development plans, priorities, goals and objectives.	<ul style="list-style-type: none"> ● Includes many projects that strongly support economic development priorities throughout the region ● Contains projects that support development priorities in some locations ○ The proposed improvements offer little or no support at the state or local level
		B. Support industries considered vital to the region or its communities (e.g., tourism, mining, agriculture, timber, international trade).	<ul style="list-style-type: none"> ● Numerous new or improved facilities and services directly serving key industries or destinations ● Some such improvements ○ Few or no such improvements
		C. Modernize and expand infrastructure that supports freight movement and delivery.	<i>No. of infrastructure projects that directly support freight movement and delivery</i>
V. Safety	Maintain and enhance the safety of the transportation system for all users.	A. Strengthen and expand roadway access management.	<ul style="list-style-type: none"> ● Numerous additional centerline miles with a high level of access management (such as freeways and Arizona parkways), compared with Baseline condition ● A modest number of additional centerline miles with a high level of access

Planning Factors	Goals	Evaluation Criteria	How Measured
			management ○ Few or no additional centerline miles with a high level of access management
		B. Provide parallel or alternative transportation routes or services to facilitate emergency access, including evacuation.	<ul style="list-style-type: none"> ● Substantial alternative routing added (from Baseline condition) ● Some alternative routing added ○ Little or no alternative routing added

- Ratings:
- Highest rating
 - Intermediate rating
 - Lowest rating

Source: ADOT Management Consultant Team

Evaluation Matrix and Results

The Eastern Arizona Framework Study consultant team evaluated each proposed scenario and its affects on the focus area.

Mobility and Access

Based on the proposed scenarios, there will be no improvements in multimodal network connectivity because there are no proposed multimodal passenger terminal facilities or traffic interchanges within the study area. With respect to mobility options, Scenario B proposes an extensive increase in local and regional transit and rail. Scenario C proposes an increase in local transit services and bicycle/pedestrian facilities. Finally, Scenario A does not propose for any additional transit services beyond existing public transportation options.

Transportation/Land Use Integration

This planning factor rates the proposed scenarios against the existing or planned land uses and relevant state, regional and local transportation plans. By design, all scenarios were developed to be consistent with any relevant planning documents. With respect to long-range transportation plans, proposed Scenario A was most consistent with these planning documents because they typically address roadways. The other proposed scenarios provide additional multimodal options beyond what is found in the relevant long-range transportation plans.

The remaining criteria under this planning factor focus on existing or planned land uses. Proposed Scenarios B and C rate in the middle for all three criteria because they provide some transit or bicycle/pedestrian support for mixed-use, infill development and redeveloped/revitalized areas. There are no proposed projects under Scenario A that would support those land use types.

Environmental and Conservation

Based on the proposed projects, the criteria focused on the effects on environmentally sensitive areas and the natural corridors for wildlife movement. The proposed extensive roadway expansion projects under proposed Scenarios A and C are predicted to have substantial effects on the environment. Proposed Scenario B is projected to have moderate effects because there is less roadway expansion, which would reduce the chances for effects.

Economic Benefit

This planning factor evaluates the level in which the proposed scenarios would benefit the study area based on its support for relevant economic development plans, support for the study area's industries and number of projects that are assumed to directly support the movement of goods. Proposed Scenario C has the highest ratings under the first two criteria based on its comprehensive transportation options promoting connectivity and the proposed roadway expansions to the Ports of Entries in Nogales and Douglas. Scenario A, however, has the most proposed infrastructure projects (38) that would promote the movement of goods throughout the study area.

Safety

The only criteria that the consulting team could evaluate rates the amount of proposed alternative routings for emergency access; only proposed Scenario A recommended alternative bypasses in Payson and Safford to improve circulation in congested areas.

Table 3.8 Evaluation of Regional, Multimodal Transportation Scenarios

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Scenario B	Scenario C
I. Mobility and Access	A. Improve multimodal network connectivity.	1. Number of passenger terminals served by two or more modes (including air carrier) other than private vehicle access	○ No new facilities proposed.	○ No new facilities proposed.	○ No new facilities proposed.
		2. Number of additional free-flow junctions (e.g., system of directional TIs) compared with the Baseline condition	○ No new TI proposed.	○ No new TI proposed.	○ No new TI proposed.
	B. Increase modal choice and improve mobility options.	Amount of transit and rail passenger service compared with Baseline condition <ul style="list-style-type: none"> ● Many new services and extensive improvements compared with Baseline condition ● Moderate improvements including some new services ○ Incremental improvements only 	○ No new transit services proposed. Focused primarily on auto mode.	● Extensive increase in local and regional transit and rail service.	● Extensive increase in local transit service, and bicycle and pedestrian facilities.
			C. Protect personal mobility from endemic (including seasonal) congestion.		

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Scenario B	Scenario C
	D. Protect freight transport from endemic (including seasonal) roadway congestion.	Change (from Baseline) in daily hours of commercial vehicle delay on the regionally significant roadways, from model output			

Planning Factor	Criteria	Measure	Evaluation and Explanation		
			Scenario A	Scenario B	Scenario C
II. Transportation/Land Use Integration	A. Be consistent with county comprehensive plans, city/town general plans, tribal plans, federal land management plans (BLM, USFS) and other adopted land use plans.	<ul style="list-style-type: none"> ● Nearly all improvements are highly consistent with most pertinent plans ● The majority of improvements are consistent with most pertinent plans <ul style="list-style-type: none"> ○ Some projects are markedly inconsistent with some plans 	<ul style="list-style-type: none"> ● <p>By design, all scenarios are as consistent with plans as possible.</p>	<ul style="list-style-type: none"> ● <p>By design, all scenarios are as consistent with plans as possible.</p>	<ul style="list-style-type: none"> ● <p>By design, all scenarios are as consistent with plans as possible.</p>
	B. Be consistent with adopted long-range transportation plans, including tribal plans.	<ul style="list-style-type: none"> ● Nearly all improvements are highly consistent with most pertinent plans ● The majority of improvements are consistent with most pertinent plans <ul style="list-style-type: none"> ○ Some projects are markedly inconsistent with some plans 	<ul style="list-style-type: none"> ● <p>Consistent with long-range transportation plans that typically address roadways.</p>	<ul style="list-style-type: none"> ● <p>Includes more transit improvements than typically found in long-range transportation plans.</p>	<ul style="list-style-type: none"> ● <p>Consistent with typical long range transportation plans and provides more multimodal options.</p>

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Planning Factor	Criteria
II. Transportation/Land Use Integration (cont.)	C. Support existing and approved (in local plans) mixed use development.	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for mixed use districts and activity centers ● Improvements provide some support <ul style="list-style-type: none"> ○ Improvements provide little or no support 	<ul style="list-style-type: none"> ○ Primarily roadway expansion that supports standard development patterns.	<ul style="list-style-type: none"> ● Increased transit services supports mixed use development.	<ul style="list-style-type: none"> ● Increase transit service and bicycle and pedestrian facilities support mixed use.
	D. Support in fill development in cities, towns and built-up unincorporated areas that are well served by existing infrastructure.	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for infill development ● Improvements provide some support for infill development <ul style="list-style-type: none"> ○ Improvements provide little or no support for infill development 	<ul style="list-style-type: none"> ○ Roadways promote continued new growth in outlying areas.	<ul style="list-style-type: none"> ● Promotes infill with support from proposed local bus services.	<ul style="list-style-type: none"> ● Promotes infill with support from proposed local bus services and expanded bicycle and pedestrian facilities.
	E. Support designated redevelopment and revitalization areas.	<ul style="list-style-type: none"> ● Transportation improvements provide strong support for such areas ● Improvements provide some support <ul style="list-style-type: none"> ○ Improvements provide little or no support 	<ul style="list-style-type: none"> ○ Roadways promote continued new growth in outlying areas.	<ul style="list-style-type: none"> ● Promotes redevelopment with support from proposed local bus services.	<ul style="list-style-type: none"> ● Investment in transit and bicycle and pedestrian facilities supports redevelopment.

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Scenario B	Scenario C
III. Environmental and Conservation	A. Promote and increase energy security.	Reduction in fuel consumption compared with Baseline			
	B. Reduce vehicular greenhouse gas (CO ₂) emissions.	Reduction in CO ₂ emissions compared with Baseline			
	C. Minimize effects on environmentally sensitive areas (e.g., biological, cultural, scenic).	<ul style="list-style-type: none"> ● Minimal effects ● Moderate effects ○ Substantial effects 	○	●	○
			Extensive roadway expansion, increasing effects to sensitive areas.	Less roadway expansion, reducing the chances for effects.	Extensive roadway expansion, increasing effects to sensitive areas.
D. Minimize effects on natural corridors for wildlife movement (as identified by AZ Game & Fish and other resource management organizations).	<ul style="list-style-type: none"> ● Minimal effects ● Moderate effects ○ Substantial effects 	○	●	○	
		Extensive roadway expansion, increasing effects to sensitive areas.	Less roadway expansion, reducing the chances for effects.	Extensive roadway expansion, increasing effects to sensitive areas.	

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Scenario B	Scenario C
IV. Economic Benefit	A. Support regional and local (including tribal) economic development plans, priorities, goals and objectives.	<ul style="list-style-type: none"> • Includes many projects that strongly support economic development priorities throughout the region • Contains projects that support development priorities in some locations <ul style="list-style-type: none"> ○ The proposed improvements offer little or no support at the state or local level 	<ul style="list-style-type: none"> • Promotes regional connectivity and activity through roadway enhancements. 	<ul style="list-style-type: none"> • Supports regional and local connectivity through the proposed transit improvements. 	<ul style="list-style-type: none"> • Comprehensive transportation options promoting connectivity and activity.
	B. Support industries considered vital to the region or its communities (e.g., tourism, mining, agriculture, timber, international trade).	<ul style="list-style-type: none"> • Numerous new or improved facilities and services directly serving key industries or destinations • Some such improvements <ul style="list-style-type: none"> ○ Few or no such improvements 	<ul style="list-style-type: none"> • Proposed roadway expansions to Ports of Entries in Nogales and Douglas. 	<ul style="list-style-type: none"> • Industrial rail improvements, near Snowflake, Sierra Vista, Douglas, Nogales. 	<ul style="list-style-type: none"> • Proposed roadway expansions to Ports of Entries in Nogales and Douglas.
	C. Modernize and expand infrastructure that supports freight movement and delivery.	<i>No. of infrastructure projects that directly support freight movement and delivery</i>	38	27	30

Planning Factor	Evaluation and Explanation				
	Criteria	Measure	Scenario A	Scenario B	Scenario C
V. Safety	A. Strengthen and expand roadway access management.	<ul style="list-style-type: none"> ● Numerous additional centerline miles with a high level of access management (such as freeways and "Arizona parkways"), compared with Baseline condition ● A modest number of additional centerline miles with a high level of access management ○ Few or no additional centerline miles with a high level of access management 			
	B. Provide parallel or alternative transportation routes or services to facilitate emergency access, including evacuation.	<ul style="list-style-type: none"> ● Substantial alternative routing added (from Baseline condition) ● Some alternative routing added ○ Little or no alternative routing added 	<ul style="list-style-type: none"> ● Recommend alternative bypasses in Payson and Safford to improve circulation in congested areas. 	<ul style="list-style-type: none"> ○ No proposed alternative routing. 	<ul style="list-style-type: none"> ○ No proposed alternative routing.

- = highest rating (2 points)
- = intermediate rating (1 point)
- = lowest rating (0 points)

Conclusion

The evaluation process identified positive and negative aspects for each Scenario. Scenario A provides increased mobility through the addition of more roadway capacity and new roadway links. However the additional automobile traffic expected under Scenario A leads to greater fuel consumption and CO₂ emissions. The additional roadways and traffic lanes also have the potential for greater potential impact on environmentally sensitive areas and wildlife corridors.

Scenario B expands travel choice greatly by providing an extensive increase in transit services. Scenario B also has a lesser environmental impact with less fuel consumption and CO₂ emission, and less potential impact on sensitive areas and wildlife corridors. However, Scenario B limits new roadway capacity with potential impacts on mobility and safety.

Scenario C expands travel choice and invests in adding capacity to the roadway system. Additionally, Scenario C provides investment to improve bicycling and walking conditions. Local trip making by car, transit, bike or on foot is improved under Scenario C. Scenario C, however, has similar potential impact on the environment as Scenario A with higher fuel consumption, CO₂ emissions and impact to wildlife corridors and sensitive areas. Additionally, Scenario C may not be in line with current adopted local plans, particularly in rural communities like those throughout the Eastern Arizona study area.

The evaluation of these scenarios provided important insight to how the different approaches are likely to have varying impacts. In the end the evaluation results did not conclusively identify a scenario that best achieved all the elements within the evaluation criteria.