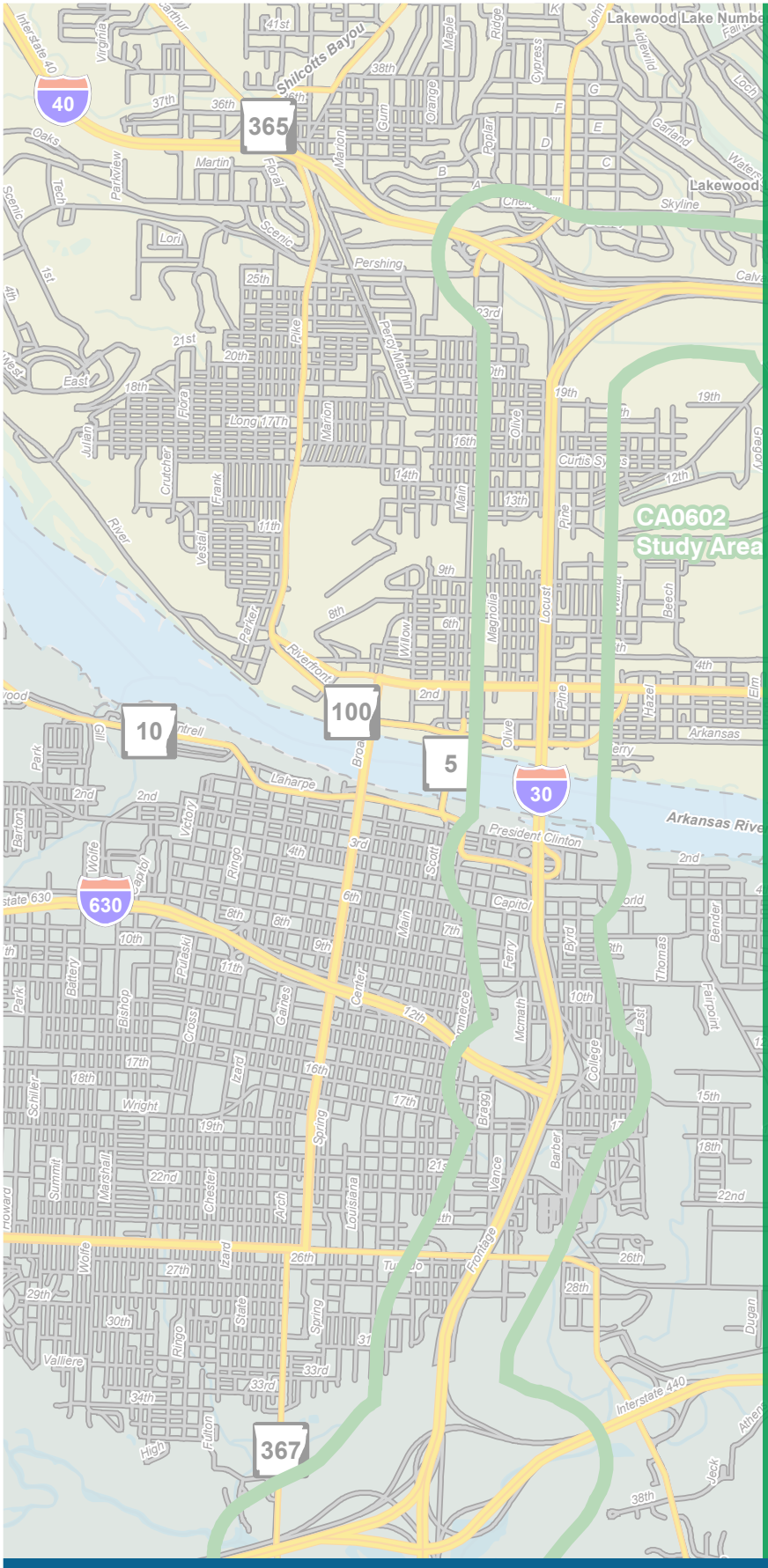

PLANNING AND ENVIRONMENTAL LINKAGES ALTERNATIVES SCREENING METHODOLOGY

CA0602

Interstate 530 – Highway 67

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CONNECTING ARKANSAS PROGRAM
CAP

Arkansas State Highway & Transportation Department

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
AHTD

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1.0 INTRODUCTION AND PLANNING CONTEXT

The purpose of the I-30 PEL Alternative Screening Methodology (ASM) is to provide a decision-making framework to determine how well each of the developed alternatives meets the I-30 PEL purpose and need and the study goals. The I-30 PEL Study will be used to develop and evaluate transportation alternatives using a tiered screening process to identify the alternatives that will best solve the transportation problems in the corridor. The recommendations identified in the PEL Study will be moved into subsequent stages of project development in accordance with planning guidelines established in Moving Ahead for Progress in the 21st Century (MAP-21) and in the Long-Range Metropolitan Transportation Plan (MTP) for the Central Arkansas Regional Transportation Study (CARTS), as described in the *I-30 PEL Study Purpose and Need Report* (**Appendix A**).

The first step in the alternative screening process is the development of the *Universe of Alternatives* (**Appendix D-1**), which includes all possible solutions to the transportation problems in the I-30 PEL study area **(Figure 1)**. The ASM will be used to evaluate the alternatives in a sequential process to narrow the results to a set of *Preliminary Alternatives*, then *Reasonable Alternatives*, and ultimately, to the *PEL Recommendations* for continued project development. The alternative development and screening evaluation is based upon the purpose and need (**Table 1**) and the study goals (**Table 2**) as referenced from the *I-30 PEL Purpose and Need Report* (**Appendix A**).

Table 1. Purpose and Need

Need	Purpose
• Traffic congestion • Roadway safety issues • Roadway structural and functional deficiencies • Navigational safety issues • Structural and functional bridge deficiencies	To develop, compare and recommend solutions to the transportation problems outlined in the *I-30 PEL Purpose and Need Report* (**Appendix A**) that: • Relieve traffic congestion; • Improve roadway safety; • Address structural and functional roadway deficiencies; • Improve navigational safety; and • Address structural and functional bridge deficiencies.

Table 2. Study Goals

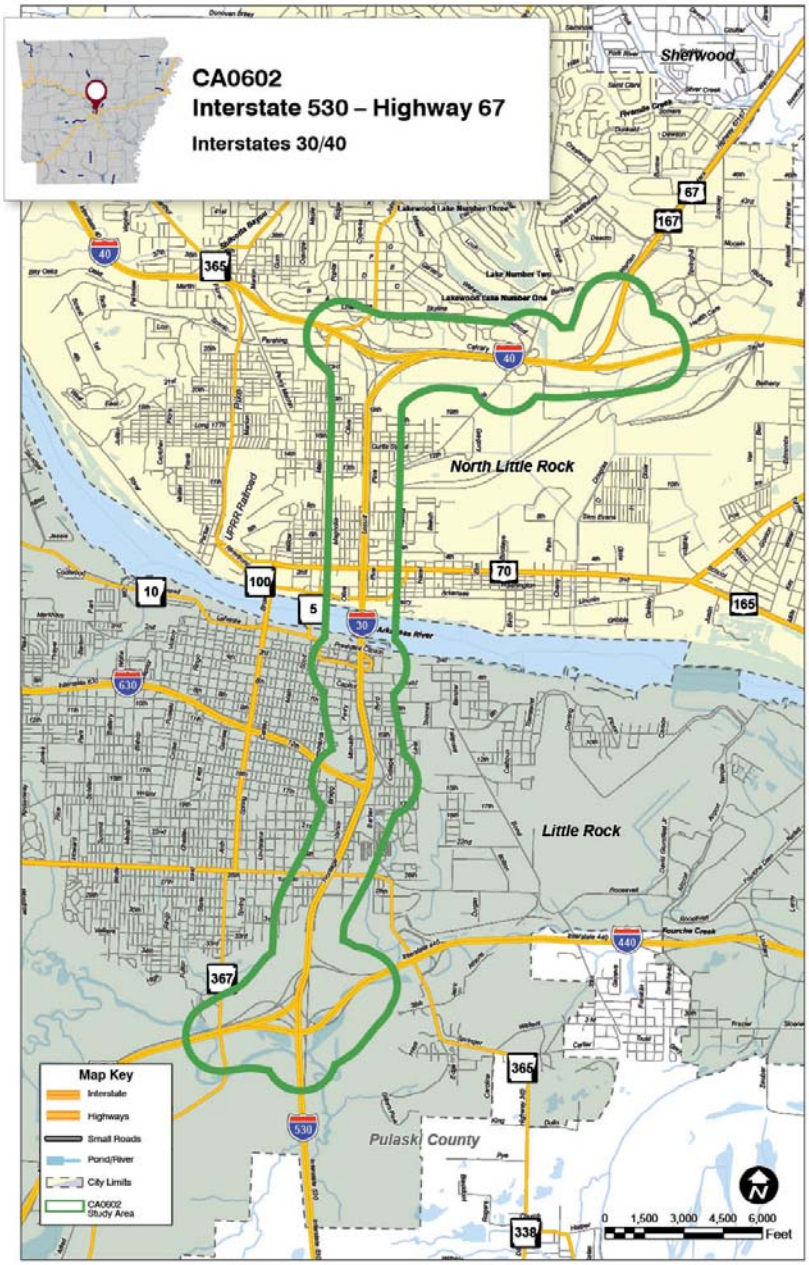
(Listed in no particular order)

- Improve opportunity for east – west connectivity
- Enhance mobility
- Improve local vehicle access to and from downtown Little Rock and North Little Rock
- Connect bicycle / pedestrian friendly facilities
- Accommodate existing transit and future transit
- Minimize roadway disruptions during construction
- Minimize river navigation disruptions during/after construction
- Improve safety
- Follow through on commitment to voters to improve I-30 as part of the Connecting Arkansas Program (CAP)
- Optimize opportunities for economic development
- Avoid and/or minimize impacts to the human and natural environment, including historical and archeological resources
- Sustain public and agency input and support for the I-30 corridor improvements
- Improve system reliability
- Optimize cost

Guiding principles that will influence the overall project include (listed in no particular order):

- Accelerated Project Delivery;
- Context Sensitive Solutions/Aesthetically Pleasing Facility;
- Minimize the real, perceived and visual barrier of the freeway;
- Open public participation process; and
- Support of Local, Regional and Statewide Transportation Plans.

Figure 1. I-30 PEL Study Area



2.0 ALTERNATIVE SCREENING FRAMEWORK

The ASM is established before any alternatives are developed to ensure that each alternative is examined consistently and evaluations are unbiased. Each of the alternatives, including the No-Action Alternative, will be evaluated using this methodology. The No-Action Alternative represents the baseline condition in the I-30 PEL study area as if no improvements are implemented other than normal operations and maintenance (which also includes those already programmed within the fiscally constrained MTP).

The three screening levels that comprise the ASM include:

- **Level 1** qualitative screening of the Universe of Alternatives based on the purpose and need;
- **Level 2** qualitative (with some quantitative) screening of the Preliminary Alternatives based on the study goals; and
- **Level 3** quantitative screening of the Reasonable Alternatives based on the study goals.

The effectiveness of each alternative (Universe, Preliminary and Reasonable), in terms of meeting the needs of the study area, will be measured by a wide range of criteria defined by the purpose and need and the study goals. The potential impacts of each alternative will be analyzed and documented by the ASM evaluation criteria (e.g. congestion, order of magnitude cost estimates, displacements, etc.). The alternatives at each screening level that meet the established criteria will be advanced to the next screening level for further evaluation, while those that do not will be eliminated from further consideration.

The alternative screening process is similar to a funnel with multiple levels of screening, blending a varied group of strategies, corridor needs and goals into a set of refined transportation alternatives through an elaborate “filtering”, or evaluation process. Definitions of the various screening stages are listed below and shown graphically in **Figure 2**.

- **Level 1, Concept or Fatal Flaw Screening**, involves the evaluation of the Universe of Alternatives across a spectrum of modes and strategies. The Study Team will develop the Universe of Alternatives with input received from the Technical Work Group (TWG), stakeholders and the public. Fatal flaw criteria will be utilized to evaluate and screen the Universe of Alternatives against the purpose and need using the screening matrix depicted in **Table 4** (page 18). In Level 1 Screening, alternatives will be given a *pass* or *fail* rating for each of the screening criteria. A *pass* rating is not required on all criteria for an alternative to move to the next level; alternatives must show an overall positive impact on the I-30/I-40 corridor in order to advance for further analysis. Practicable alternatives that meet the purpose and need of the project will be advanced to Level 2 Screening as Preliminary Alternatives. For transportation projects, generally, an

alternative is practicable if it: 1) meets the purpose and need; 2) is available and capable of being done (i.e., it can be accomplished within the financial resources that could reasonably be made available, and it is feasible from the standpoint of technology and logistics); and 3) will not create other unacceptable impacts such as severe operation or safety problems, or serious socioeconomic or environmental impacts.[1] Alternatives that are clearly impractical based on cost or effectiveness in Little Rock and North Little Rock will be eliminated at this level.

- **Level 2, the Refinement Process**, will consist of 2 steps. In each step, the qualitative analysis of each Preliminary Alternative will be summarized in a five-level rating system as defined in **Table 3** below.

Table 3. Qualitative Rating System

Rating	Meaning
+ +	Substantial positive effects
+	Some positive effects
O	Neutral effects
–	Some negative effects
– –	Substantial negative effects

Level 2A will evaluate the Preliminary Alternatives individually to determine those that most successfully meet the study goals. The remaining alternatives after Level 2A screening will be categorized into two groups:

- *Primary Alternatives,* which are capable of making a substantial impact on the congestion problems on I-30/I-40 as stand-alone options; and
- *Complimentary Strategies*, such as Transportation System Management (TSM) and Intelligent Transportation Systems (ITS), which will be combined with the Primary Alternatives to improve the efficiency of the transportation system.

After Level 2A screening, various combinations of Primary Alternatives and Complimentary Strategies will be grouped to form *Basic Scenarios* for further evaluation in Level 2B. At this stage, the Basic Scenarios will begin to take the shape of traditional transportation alternatives, consisting of designs showing number of highway lanes and bridge layouts, supplemented with other modes of transportation and congestion management strategies to form complete, multi-modal transportation options.

In **Level 2B**, each Basic Scenario will be developed to a level of detail to define the corridor's general location and basic right-of-way (ROW) requirements. The level of alternative development will be sufficient to allow for the qualitative

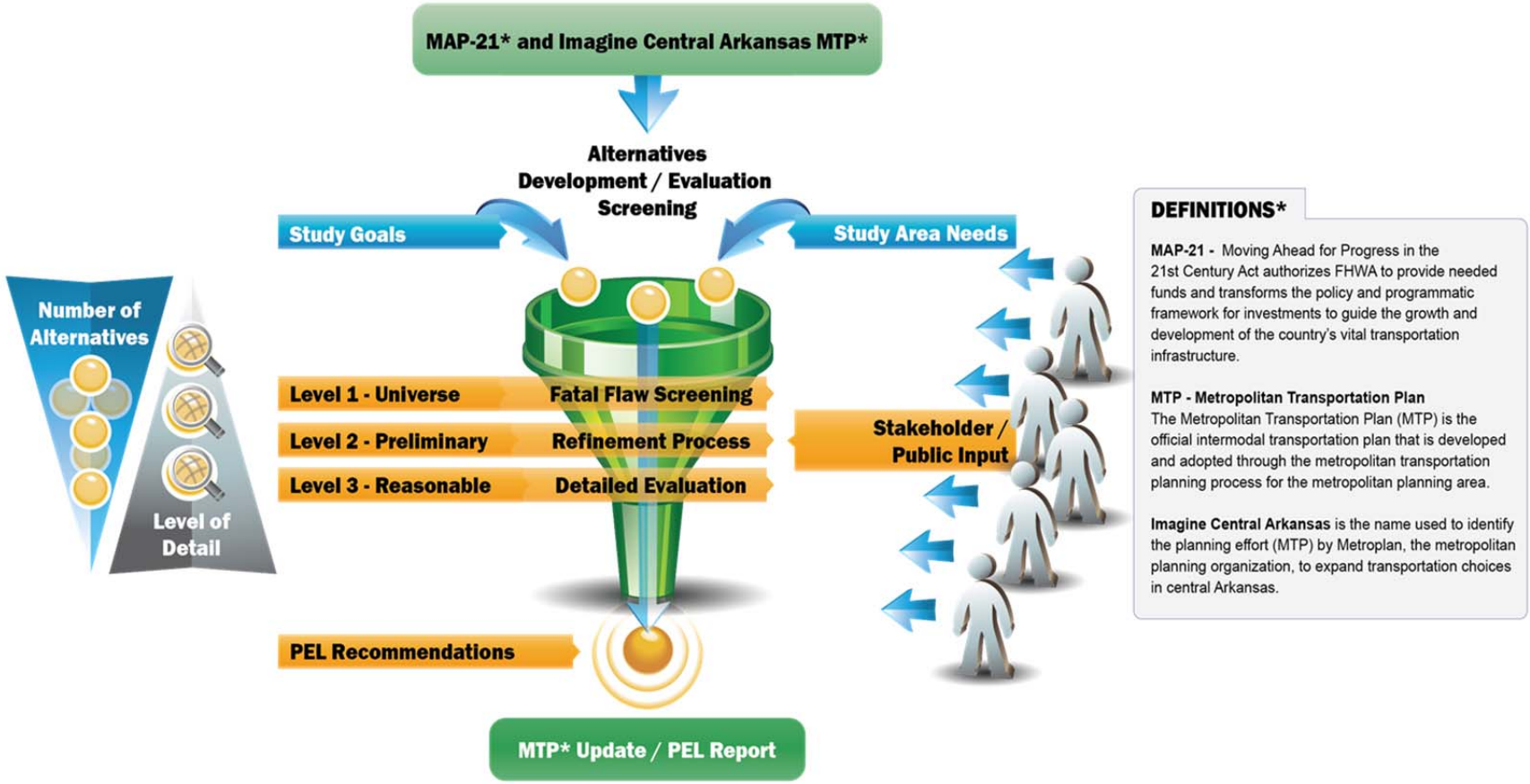
[1] The evaluation of alternatives must consider a reasonable range of options that could fulfill the project sponsor's purpose and need. Reasonable alternatives include those that "are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (Council on Environmental Quality, 1981).

evaluation of a range of criteria and measures including engineering, cost, environmental and public input, which correlate to the study goals as shown in **Table 5** (page 19). This level of screening may use quantitative data for traffic analysis, while qualitatively assessing land use, utility impacts, natural terrain and other constraints. In Level 2B, the study goals may be prioritized and weighted in order to emphasize the critical needs of the project.

Based on the Refinement Process analyses, alternatives that best meet the established study goals will be advanced to the next development phase of the project as Reasonable Alternatives.

- **Level 3, Detailed Evaluation**, involves the Reasonable Alternatives being developed to a higher level of detail and evaluated using quantitative measures as shown in **Table 6** (page 20). The alternatives will be designed to a level of detail as to define the entrance and exit points for ramps and any ROW needs associated with implementation of the alternatives. More detailed cost estimates for each alternative will also be developed at this level. In Level 3, the study goals may be prioritized and weighted in order to emphasize the critical needs of the project. This level of screening will quantitatively assess future traffic, land use, parcel boundaries, major structures, utility impacts, natural terrain, and other constraints. The Level 3 screening process will identify the alternative or alternatives that best address the transportation needs of the I-30/I-40 corridor while minimizing the negative impacts to the surrounding area. The remaining alternative(s) will be recommended for further development/study during the National Environmental Policy Act (NEPA) process.

Figure 2. Alternative Screening Process



3.0 ALTERNATIVE EVALUATION CRITERIA AND MEASURES

Alternative evaluation criteria and measures for the I-30 PEL Study are based upon both the purpose and need and the established study goals. The following sections provide detailed definitions for each of the evaluation criteria and measures, as well as the evaluation matrix process to be utilized during the screening process.

3.1 Purpose and Need – Level 1

3.1.1 Traffic Congestion

Congestion relief is an important part of the purpose and need for the project. Study alternatives must provide an improvement in mobility and travel time along the I-30/I-40 corridor and an improvement in access into the downtown areas in the design year, as compared to the No-Action Alternative. The overall traffic analysis for the PEL Study will include a multi-modal comprehensive analysis of I-30/I-40 mobility and safety and the supporting transportation network for the existing traffic (2013) and projected traffic (2040) using Metroplan's Travel Demand Model (TDM). For the Level 1 screening, mobility will be evaluated in terms of Level of Service (LOS), which is an industry standard measure of congestion and travel performance within a corridor or roadway facility. It provides a way of quantifying attributes of congestion such as freedom to maneuver in the travel stream, traffic interruptions, comfort, and convenience. LOS is represented by letter designations (A through F), with LOS A being the most favorable (free flow traffic – no delays) and LOS F being the least favorable (heaviest congestion – considerable delays). Travel time is a standard of how people measure their travel/transportation experience. Generally, alternatives which provide the largest improvement to the LOS and travel time along I-30/I-40 will have the highest ratings. Note that in subsequent phases of the alternative screening process, measures of mobility other than LOS such as travel time to key destinations, travel speed, duration of congestion, vehicle miles traveled (VMT), vehicle hours traveled (VHT), and average delay per motorist will be utilized to evaluate mobility.

3.1.2 Roadway Safety

Safety is important to all modes of travel in the corridor. The high traffic volumes in the study area combined with functional deficiencies of the roadway, are important safety factors to be considered. Alternatives which improve roadway safety for all modes of travel will receive higher ratings.

3.1.3 Structural Roadway Deficiencies

Roadway structural deficiencies are due to the deterioration of concrete and asphalt over time. Portions of the I-30/I-40 corridor will need some level of rehabilitation within the expected timeframe of the project. Alternatives that correct structural deficiencies will receive higher ratings.

3.1.4 Functional Roadway Deficiencies

Roadway functional deficiencies include geometric features that do not meet current design standards, such as narrow lanes and shoulders, and inadequate ramp lengths

and spacing as defined by the American Association of State Highway and Transportation Officials (AASHTO) and the Arkansas State Highway and Transportation Department (AHTD). Alternatives that correct these issues will receive higher rankings.

3.1.5 Navigational Safety

The I-30 Bridge over the Arkansas River has a history of being struck by barges due to the location of a pier in the navigational channel. Alternatives which provide greater horizontal clearance (navigation span) will receive higher ratings.

3.1.6 Structural Bridge Deficiencies

The I-30 Bridge over the Arkansas River was rated as Structurally Deficient[3] with a substructure rating of "poor" as a result of an October 2013 inspection by AHTD. Alternatives that improve the structural integrity of the bridge will receive higher ratings.

3.1.7 Functional Bridge Deficiencies

The width of the existing bridge is insufficient for the current peak hour traffic demands and the narrow shoulders do not meet current design standards. Those alternatives that improve the bridge to current design standards will receive higher ratings.

3.2 Study Goals – Levels 2 and 3

Additional or secondary alternative evaluation criteria and measures are derived from the study goals. These goal and associated criteria have been categorized by engineering, cost, environmental, and public involvement and are summarized as follows:

3.2.1 Engineering

Engineering criteria includes traffic, operational and design measures such as mobility, accessibility, safety, design standards, and constructability.

3.2.1.1 Enhance Mobility

Congestion Relief

Level 2 screening will be a quantitative assessment based on spot Highway Capacity Manual (HCM) analysis of the ability of an alternative to provide an improved mobility as compared to the No-Action Alternative. Level 3 screening will be a quantitative comprehensive mobility analysis of an alternative to provide improved mobility along the mainline and in weaving areas as compared to the No-Action Alternative using a simulation model. The simulation model will provide additional mobility measures such as travel time to key destinations, travel speed, duration of congestion, VMT, VHT, and average delay per motorist. Generally, alternatives which provide the largest improvement in mobility along the I-30/I-40 corridor will have the highest ratings.

[3] Bridges are considered structurally deficient if significant load carrying elements are found to be in poor condition due to deterioration. Source: *FHWA 2010 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*; *AHTD Bridge Inspection, Oversight, and Maintenance Performance Audit (November 2008).*

Transportation Efficiency

Transportation efficiency is measured by an assessment of changes in travel times and average speeds through the study area transportation network resulting from the implementation of an alternative. Level 2 screening will be based on a quantitative assessment based on spot HCM analysis of the ability of an alternative to provide an improved travel time and speed as compared to the No-Action Alternative. Level 3 screening will be a quantitative comprehensive travel time and speed analysis of the corridor's efficiency for each alternative compared to the No-Action Alternative using a simulation model. Generally, alternatives which provide the largest improvement to travel time and average speed along the I-30/I-40 corridor will have the highest ratings. Level 3 screening will also include highway system measures of effectiveness from a micro-simulation model, including total VMT, VHT, and average delay per motorist in comparison to the future No-Action Alternative.

3.2.1.2 Improve Local Access to and from Downtown Little Rock and North Little Rock

Mobility

Alternatives should provide improved capacity for through traffic and more efficient connections into downtown Little Rock/North Little Rock. Level 2 screening will be a qualitative assessment of capital improvements to provide improved access into the downtown areas. Level 3 screening will be a quantitative comprehensive mobility analysis of the access provided by each alternative into the downtown areas as compared to the No-Action Alternative using a simulation model (mobility measures from the simulation model described in **Section 3.2.1.1**). Generally, alternatives which provide the largest improvement in mobility into the downtown areas will have the highest ratings.

Travel Time

Alternatives should enable traffic to move efficiently along the I-30 main lane into the downtown areas. Level 2 screening will be a quantitative assessment of spot HCM analysis to evaluate travel time into the downtown areas as compared to the No-Action Alternative. Level 3 screening will be a quantitative comprehensive travel time analysis of an alternative's access into the downtown areas to provide an improved travel time as compared to the No-Action Alternative using a simulation model. Generally, alternatives which provide the largest improvement to the travel time along I-30/I-40 will have the highest ratings.

3.2.1.3 Improve Opportunity for East-West Connectivity

Since its initial construction, I-30 through Little Rock and North Little Rock has been seen as a barrier, creating a real and perceived obstruction to connectivity in the metropolitan area. Alternatives should consider locations and design features that allow local governments to reconnect their jurisdictions with streets and green spaces. Level 2 and Level 3 screening will be based on a qualitative assessment of the ability of each alternative to allow these connections.

3.2.1.4 Connect Bike/Pedestrian Facilities across I-30/I-40

Bicycle and pedestrian connectivity is measured by how well an alternative accommodates bicycle and pedestrian access across the I-30/I-40 corridor. Level 2 screening will be based on a quantitative assessment of each alternative's ability to allow these connections. Level 3 screening will be based on a count of the number of locations that accommodate bicycle/pedestrian crossings and the quality of those bicycle/pedestrian crossings such that they foster safe connectivity and meet current design standards.

3.2.1.5 Accommodate Existing Transit and Future Transit

Transit accommodation is measured by the ridership potential of an alternative along the I-30/I-40 corridor. Level 2 screening will be a qualitative assessment of the potential transit ridership of an alternative using the Metroplan travel demand model, and a conceptual transit scenario model developed for the I-30 PEL Study. The potential diversion from auto trips to transit trips and the contribution of transit reducing demand for the highway will be assessed. Level 3 screening will be a quantitative assessment of the potential transit ridership of the alternative using the same Metroplan and conceptual transit scenario models described above.

3.2.1.6 Improve System Reliability

Incident Management

This criterion addresses the impacts of alternatives on the occurrence of incidents in the study area. A higher rating will be given to an alternative that reduces the number of conflict points along the I-30/I-40 corridor. Level 2 screening will be a qualitative assessment of the potential crash reduction of an alternative based on the number of conflict points (vehicle, bicycle, and pedestrian) along I-30/I-40. Level 3 screening will be a quantitative assessment of the potential crash reduction of an alternative based on the number of conflict points (vehicle, bicycle and pedestrian) along I-30/I-40.

Emergency Vehicle Access

Alternatives should provide access for emergency vehicles responding to incidents within the study corridor. Level 2 screening will be a qualitative assessment of the travel time from a first responder site to an incident as compared to the No-Action Alternative. Level 3 screening will be a quantitative assessment of the of the travel time from a first responder site to an incident as compared to the No-Action Alternative using a simulation model.

3.2.1.7 Minimize Roadway Disruptions during Construction

Construction generally requires temporary lane closures and detours. It is important that the alternatives minimize disruption to neighborhood businesses and residential neighborhoods during construction. An alternative that has little or no effect during construction will generally have a neutral rating. An alternative that is likely to cause greater inconvenience to the public during construction, because of its proximity to more intense development, or in areas where ROW is limited, will be given a more negative

rating. Level 2 (qualitative) and Level 3 (quantitative) screening will be based on engineering judgment of the number and severity of road/lane closings impacting existing mobility and access for each alternative.

3.2.1.8 Minimize River Navigation Disruptions during Construction

The Arkansas River provides a means for the transportation of commodities from Oklahoma through Arkansas to the Mississippi River. It is important that the construction of any I-30 improvements minimize disruption to barges traveling on the river. Those alternatives that have substantial closures of the river will receive lower ratings. Level 2 (qualitative) and Level 3 (quantitative) screening will be based on engineering judgment.

3.2.1.9 Minimize River Navigation Disruptions after Construction

The existing I-30 Bridge does not provide the recommended clearance across the Arkansas River, and there have been a number of pier strikes by barges as a result. The Arkansas Waterways Commission has recommended a horizontal clearance of 332 feet and a vertical clearance of 62.4 feet if any improvements are made to the I-30 Bridge. The Level 2 qualitative screening will be based on engineering judgment of the ability of the alternatives to provide adequate clearance of the navigational channel based on pier alignment. Level 3 quantitative screening will be based on the designed distance for horizontal and vertical clearances for each alternative.

3.2.1.10 Improve Safety

The high number of traffic crashes in the study area makes safety a priority for this study. Substantial improvements in road geometry and roadway/bridge structural condition are needed to make I-30/I-40 a safer route.

I-30/I-40 Conflict Points

Conflict points exist where vehicles need to cross paths to reach desired destinations. Proper access management techniques reduce the number of conflicts in order to provide a safer route. Alternatives that provide the fewest conflict points along the mainline will receive the highest rankings. Level 2 qualitative screening will be based on the probable number of conflict points for the preliminary layout of each alternative. Level 3 quantitative screening will be based on the number of conflict points of each alternative.

Ramp Spacing

AASHTO recommends a maximum of two ramps per direction per mile for urban interstates. Alternatives that come closest to meeting this threshold will receive higher rankings. Level 2 qualitative screening will be based on the probable number of ramps per direction for the preliminary layout of each alternative. Level 3 quantitative screening will be based on the number of ramps per direction of each alternative.

Ramp Acceleration and Deceleration Lengths

Proper ramp lengths are required to allow motorists to accelerate to freeway speeds when entering the interstate, and to decelerate as they approach intersections when leaving the interstate. Level 2 will include a qualitative analysis based on the ability of an alternative to improve ramp junctions. Ramp acceleration and deceleration lengths will be evaluated in greater detail in Level 3 when interchange types and configurations have been identified. Screening will be based on the percentage of ramps meeting AASHTO standards for ramp lengths based on design speeds.

I-30 Roadway and Bridge Structural Condition

Alternatives must improve the structural condition of the I-30 roadway and the Arkansas River Bridge, which are showing signs of deterioration due to age. Level 2 and Level 3 screenings will be a qualitative evaluation of the alternatives' ability to improve the roadway and bridges to acceptable structural conditions.

Arterial Connection Conflict Points

Conflict points exist where vehicles need to cross paths to reach desired destinations on the arterial network. Proper access management techniques reduce the number of conflicts in order to provide a safer route. Alternatives that provide the fewest conflict points at arterial connections will receive highest rankings. Level 2 qualitative screening will be based on the probable number of arterial conflict points for the preliminary layout of each alternative as compared to the No-Action Alternative. Level 3 quantitative screening will be based on the number of arterial conflict points as compared to the No-Action Alternative.

3.2.1.11 Optimize Opportunities for Economic Development

This criterion addresses how well an alternative provides a supportive climate for economic development and how well an alternative accommodates economic development. Alternatives that provide access to existing/potential areas of economic activity within the PEL study area without negatively impacting the surrounding area will receive higher rankings. Level 2 qualitative screening will be based on the probable number of highway entrance and exit points to / from the downtown areas for the preliminary layout of each alternative as compared to the No-Action Alternative. Level 3 screening will be based not only on the number of highway entrance and exit points to / from the downtown areas, but also on the quality of access provided by those ramps (e.g., to prime development areas) as compared to the No-Action Alternative. Input provided by the cities and stakeholders will be obtained and incorporated, as applicable, to assist in the determination of the quality of proposed access locations and their impact on economic development.

3.2.2 Optimize Cost

Funding for this project is limited to the amount set forth in the CAP; therefore, the alternatives must be viable and cost-effective to ensure that they provide the best solution for the money available. The following criteria have been identified to ensure alternatives are cost effective.

3.2.2.1 Construction Cost

Level 2 screening will be based on planning level (i.e., per mile) cost estimates. In Level 3, planning level costs will be supplemented with conceptual-level cost estimates using estimated quantities and unit costs for major construction items such as structures when information is available. A contingency will be added to account for items not listed in the conceptual assessment. Alternatives with lower construction costs will be ranked higher than alternatives with high construction costs.

3.2.2.2 ROW Acquisition

ROW acquisition costs consist of acquiring land (parcels) and the cost of displacements. The ROW footprint of each alternative will be determined and compared. Those alternatives that have substantial ROW requirements and costs will be ranked lower than alternatives with minor ROW requirements and costs. Level 2 screening will be based on ROW required for typical highway sections for each alternative. In Level 3, more precise alternative layouts will be used for accurate measures.

3.2.2.3 Utilities and Infrastructure

Existing utilities and infrastructure information will be obtained by contacting utility companies and conducting field investigations. Each alternative's impact to major utilities and infrastructure will be documented and compared. Alternatives with substantial impacts to major utilities and infrastructure will be ranked lower than alternatives with minor impacts to major utilities and infrastructure. Level 2 screening will be based on costs for utilities required for typical highway sections for each alternative. Level 3 screening will be based on the cost of the utilities impacted by each alternative.

3.2.2.4 Investment Required by Others

Construction of some improvements to the I-30/I-40 corridor may require expenditures by local governments to accommodate the resulting change in traffic patterns. Level 2 screening will be based on an assessment of potential financial impact to local governments. Level 3 screening will be based on a more detailed cost analysis of the financial impact to local governments. Alternatives with lower financial impacts to others will receive higher rankings.

3.2.3 Avoid and/or Minimize Impacts to the Human and Natural Environment

Environmental impacts are evaluated to ensure that the alternatives blend with and complement the resources of the communities within the study area. The environmental impacts are subdivided into the following classifications:

- Community Impacts;
- Cultural Resources Impacts;
- Natural Resources Impacts; and
- Other Impacts.

3.2.3.1 Community Impacts

Community impacts are evaluated to ensure that the alternatives complement the study area community and enhance community qualities. The community impacts that will be evaluated in this category include neighborhood characteristics and Environmental Justice (EJ)/Limited English Proficiency (LEP) populations impacted.

Neighborhood Characteristics

The alternatives should avoid impacts to existing and proposed neighborhoods, have minimal effect on community cohesion, and should enhance neighborhoods qualities. Alternatives with substantial impacts to neighborhoods, school districts, and other community features will be ranked lower than other alternatives. Level 2 screening will use preliminary designs and the County Assessors Mapping Program (CAMP) - Pulaski County Parcel Data to assess the potential number of acres, parcels and structures impacted, and the number of displacements. Level 3 will use refined alternative designs and CAMP data to quantify the number of parcels/structures impacted, number of displacements, and acreage of ROW to be taken by each alternative.

EJ and LEP

Potential impacts to the social and economic environment of the study area will be identified. EJ and LEP issues will be analyzed in order to prevent the potential for discrimination and disproportionately high and adverse effects to minority, low-income, and non-English speaking populations. Demographics from the 2010 U.S. Census Bureau regarding minority, low-income, and LEP populations will be documented and compared. For Levels 2 and 3 screening purposes, the following three measures will be evaluated: 1) Are EJ/LEP populations present in the study area?; 2) Is there a potential for adverse impacts to EJ/LEP populations (e.g., displacements, changes to access, etc.)?; and 3) Is there a potential for beneficial impacts and/or mitigation to offset any potential adverse impacts to EJ/LEP populations (e.g., improved community cohesion, improved mobility and safety, etc.)? Alternatives which could potentially adversely impact EJ/LEP populations while not providing potential beneficial impacts and/or the likelihood of mitigation for any potential adverse impacts will be ranked lower than alternatives which do not result in potential adverse impacts or could potentially provide beneficial impacts and/or mitigate for adverse impacts.

3.2.3.2 Cultural Resources Impacts

The study should avoid impacts to existing cultural resources because they preserve the rich history of the Central Arkansas area. The cultural resource properties evaluated include archaeological sites and historic resources.

Archaeological Sites

Alternatives should avoid or minimize impacts to archaeological sites. Recorded archaeological sites will be determined through Arkansas Archeological Survey (AAS) record searches. Level 2 screening will be based on an assessment of each alternative's probable impact to cemeteries and archeological sites listed or eligible for listing in the National Register of Historic Places (NRHP). Level 3 screening will be

based on the number of cemeteries and archeological sites listed or eligible for listing in the NRHP, which are impacted by each alternative.

Historic Resources

Alternatives should avoid or minimize impacts to historic resources. For screening purposes, historic resources are considered to be historic-age properties (45 years or older) and those listed or eligible for the NRHP as determined through record searches from the Department of Arkansas Heritage – Arkansas Historic Preservation Program (AHPP). Level 2 screening will be based on an assessment of each alternative's probable impact to NRHP listed or eligible structures and historic districts. Level 3 screening will be based on the number of NRHP listed or eligible structures or historic districts impacted by each alternative.

3.2.3.3 Natural Resources Impacts

The alternatives should have minimal effects on the study area's natural resources, including park land, water resources, and biological resources.

Park Land

The alternatives should avoid or minimize impacts to park land. Park land will be identified through field reconnaissance and coordination with the AHTD Environmental Division, as well as with the Arkansas Department of Parks and Tourism and the Cities of Little Rock and North Little Rock Parks and Recreation Departments, all of which will have the opportunity to provide input and comments on the project as members of the I-30 PEL Study Technical Work Group. The potential impact of each alternative will be documented and compared. Alternatives that potentially impact park land will receive a negative rating, while the alternatives that do not will receive a neutral rating. Level 2 screening will be based on an assessment of each alternative's probable impact to known parks. Level 3 screening will be based the number of parks and acres of park lands impacted by each alternative.

Water Resources

Alternatives should avoid or minimize impacts to jurisdictional waters of the U.S., including wetlands. The number of surface water crossings and acres of jurisdictional features potentially affected by each of the alternatives will be identified and compared. Level 2 screening will be based on an assessment of each alternative's probable impact to jurisdictional waters. Level 3 screening will be based on the number/linear feet of surface water crossings and the acres of wetlands impacted by each alternative.

Biological Resources

Biologically sensitive areas will be identified such as state and federally listed, threatened and endangered species and their habitat. The potential for occurrence of impacts to threatened and endangered species and their habitat, as well as other wildlife habitat areas will be evaluated and compared for each alternative. Level 2 screening will be based on each alternative's probable impact to listed and non-listed species and/or habitat, and rare locally important species. Level 3 screening will be

based each alternative's impact to listed and non-listed species and/or habitat (in acres), and rare locally important species.

3.2.3.4 Other Impacts

The alternatives will be assessed to determine the impacts to the existing environment and constraints such as hazardous materials and traffic noise.

Hazardous Materials

A list of existing known hazardous materials sites will be obtained from the U.S. Environmental Protection Agency (EPA) and Arkansas Department of Environmental Quality (ADEQ) databases. Level 2 screening will be based on an assessment of the sites that may negatively affect construction of each alternative. Level 3 screening will be based on the number and types of potential hazardous material sites present.

Traffic Noise Receivers

Sensitive traffic noise receivers (schools, hospitals, parks, residences, daycares, etc.) directly adjacent to each alternative will be determined. Alternatives which would move potential sources of increased noise to sensitive receivers (e.g., main lane widening alternatives) will be ranked lower than alternatives which would not move potential noise sources closer to sensitive receivers. Level 2 screening will be based on an assessment of existing land use (e.g., residential, commercial, industrial, etc.), potential impacts by each alternative, and the likelihood of mitigation. Level 3 screening will be based on the number of adjacent sensitive noise receivers, potential impacts by each alternative, and the likelihood of mitigation.

3.2.4 Public Input

Public input addresses the public perception of an alternative's overall benefit. Methods to gauge public input include written or verbal comments received at public meetings, resolutions of local agency support, and the compatibility of an alternative with regional transportation plans.

3.2.4.1 Follow Through on Commitment to Voters to Improve I-30 as Part of the CAP

The citizens of Arkansas voted to pass a one-half cent sales tax over a ten year period to provide additional funding for highways, county roads, city streets, bridges, and surface transportation. I-30 extending through Little Rock and North Little Rock was among the list of routes to be improved through this Constitutional Amendment. Those alternatives that make improvements to the I-30 facility will receive higher rankings.

3.2.4.2 Sustain Public and Agency Input and Support for the I-30/I-40 Corridor Improvements

The citizens of Arkansas showed their support for major transportation improvements when they passed Constitutional Amendment No. 1 on the November 2012 ballot. The I-30 project will be developed in a manner that continues to earn their support. The project team will listen to the public and local agencies to ensure the project addresses

their vision for the study area. Alternatives that have broad public and agency support will be ranked higher than those that do not.

4.0 EVALUATION SCREENING MATRICES

The methodology described in this document will be followed to evaluate the various alternatives to determine their comparative advantages and disadvantages. The alternative screening process depicted in **Tables 4, 5** and **6** contains the primary evaluation categories as well as the individual criteria within those categories. Units of measure for the criteria are also provided, where applicable. Utilizing this screening process and decision making framework will ultimately lead to the selection of PEL Recommendations for continued development during the NEPA process.

Table 4. Concept/Fatal Flaw Screening Process

Level 1		
Need	**Purpose**	**Measure**
Traffic Congestion		
Congestion along I-30, at interchanges and ramp terminals.	Improving reliability and optimizing flow	Does alternative improve mobility and travel time along I-30 mainline and at interchanges/intersections to reduce congestion?
Roadway Safety		
Roadway - High crash rates in the I-30 Corridor	Improving transportation facilities to reduce roadway crash rates	Does the alternative have the potential to reduce vehicle crash rates?
Structural Roadway Deficiencies		
Structural deficiencies - Aging roadway	Improving roadway to state of good repair	Does alternative improve roadway structural conditions?
Functional Roadway Deficiencies		
Functional deficiencies - lane/shoulder widths, ramp spacing, ramp lengths	Bringing roadway up to current design standards	Does alternative improve roadway functional deficiencies?
Navigational Safety Issues		
Navigational - Accident history of Arkansas River Bridge being struck by marine traffic	Improving transportation facilities to reduce navigational bridge strikes	Does the alternative have the potential to reduce navigational bridge strikes?
Structural Bridge Deficiencies		
Structural deficiencies - Aging bridge	Improving bridge to state of good repair	Does alternative improve bridge structural conditions?
Functional Bridge Deficiencies		
Functional deficiencies - lane/shoulder widths	Bringing bridge up to current design standards	Does alternative improve Arkansas River Bridge functional deficiencies?

Table 5. Refinement Screening Process

Level 2				
Study Goals	**Criteria**		**Measure**	**Source**
Engineering				
Enhance mobility	Travel Performance	Congestion Relief	Mobility in the PEL Study Area	Spot Location HCM
		Efficiency	Total travel time savings	Spot Location HCM
			Average peak hour travel speed through corridor	Spot Location HCM
Improve local vehicle access to and from downtown Little Rock and North Little Rock	Mobility		Mobility at key intersections within PEL Study Area	Spot Location Synchro
	Travel Time		Travel time to key destinations in PEL Study Area	Spot Location HCM
Improve opportunity for east - west connectivity	Provide opportunity to reconnect the street grid		Locations allowing for local street connectivity	Opportunities for road crossings
	Provide opportunity to connect green spaces		Designs that allow for open spaces across I-30	Opportunity for open spaces across I-30
Connect bicycle / pedestrian friendly facilities	Bicycle and pedestrian accommodations		Grade separated bike / ped accommodations across I-30	Number of grade separated crossings
Accommodate existing / future transit	Transit effectiveness		Transit ridership in PEL Study Area	Metroplan Travel Model, I-30 PEL Scenario Model
Improve system reliability	Incident management		Potential accident reductions	Potential Accident reductions
	Emergency Vehicle Access		Emergency vehicle travel time (from Fire Station/Hospital to locations along mainline)	Estimated travel time
Minimize roadway disruptions during construction	Effectively move roadway traffic during construction		Severity of I-30 lane closures, detours during construction	Number of roadway closures
Minimize river navigation disruptions during construction	Effectively move river traffic during construction		Severity of river closures during construction	Number of river closures
Minimize river navigation disruptions after construction	Effectively move river traffic after construction		Location of navigational impediments (bridge piers)	Pier alignment
Improve safety	I-30 conflict points		I-30 mainline conflict points in weaving / merge / diverge areas	Number of conflict points
	Ramp spacing		Number of ramps per mile on I-30 in the study area	Number of ramps per mile
	Ramp acceleration and deceleration lengths		Ability to improve ramp junctions	Ramp lengths
	I-30 roadway and bridge structural conditions		Improved structural conditions	Qualitative assessment
	I-30 connection conflict points		Number of arterial connection conflict points	Number of arterial conflict points
Optimize opportunities for economic development	Economic development opportunities		Access to existing/potential business sites within the PEL Study Area	Access to existing / potential business sites within the PEL Study Area
Cost				
Optimize Cost	Construction Cost		Total conceptual cost to AHTD	Planning level cost estimates
	ROW acquisition		Total cost of ROW acquisition	ROW costs for typical sections
	Utilities and infrastructure		Impact to major utilities and infrastructure	Utilities cost for typical sections
	Investment required by others		Total investment required by others	Required investment by others
Environmental				
Avoid and/or minimize impacts to the human and natural environment	Community Impacts	Neighborhood Characteristics	ROW / Parcels / Structures impacted	Source: CAMP Pulaski County parcel data (Geostor); Method: Assessment of each alternative's potential to impact parcels / structures
			Displacements	Source: CAMP Pulaski County parcel data (Geostor); Method: Assessment of each alternative's potential to result in a displacement.
		EJ / LEP	Are EJ / LEP populations present?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
			Are potential impacts to EJ / LEP populations beneficial?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
			Are potential impacts to EJ / LEP populations detrimental?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
	Cultural Resource Impacts	Archaeological Sites	Recorded archaeological sites potentially impacted	Source: Arkansas Archeological Survey (AAS) for previously recorded archeological sites. Method: Assessment of each alternative's potential impact to potentially eligible and eligible for listing in the National Register of Historic Places (NRHP) archeological sites.
		Historic Resources	Number of NRHP, NRHP-eligible sites potentially impacted	Source: Department of Arkansas Heritage - Arkansas Historic Preservation Program (AHPP); Method: Assessment of each alternative's potential impact to NRHP eligible/listed structures and historic districts.
	Natural Resource Impacts	Park Land	Park impacts	Source: AHTD Environmental and Arkansas Department of Parks and Tourism; Method: Assessment of each alternative's potential impact to known mapped parks.
		Water Resources	Surface water crossings, wetlands	Source: AHTD field reconnaissance, desktop review and review of National Wetland Inventory maps. Method: Assessment of each alternatives' potential to impact to mapped water and wetland features.
		Biological Resources	Potential to impact threated/endangered, rare locally important species; Habitat	Source: AHTD Environmental; Method: Assessment of each alternative's potential impact to listed and non-listed, species and/or habitat.
	Other Impacts	Hazardous Materials	High risk hazardous material sites impacted	Source: Environmental Protection Agency (EPA) and Arkansas Department of Environmental Quality (ADEQ) geodatabases.; Method: Review of sites that may negatively affect the construction of each alternative.
		Traffic Noise Receivers	Noise receivers directly adjacent	Source: Most recent existing land use files, AHTD provided information on schools, churches and other public facilities; Method: Review of existing land use (residential, commercial, industrial, etc.)
Public involvement				
Follow through on commitment to voters to improve I-30 as part of the CAP	Make improvements to the I-30 corridor		Mobility and safety on I-30 mainline	Spot Location HCM
Sustain public and agency input and support for the I-30 Corridor Improvements	Public and agency input		Meeting comments and local resolutions	Source: Input gained from TWG and pubic meetings.

Table 6. Detailed Evaluation Screening Process

Level 3				
Study Goals	**Criteria**		**Measure**	**Source**
Engineering				
Enhance mobility	Travel Performance	Congestion Relief	Mobility in the PEL Study Area	VISSIM or other quantitative methods
		Efficiency	Total travel time savings	VISSIM or other quantitative methods
			Average peak hour travel speed through corridor	VISSIM or other quantitative methods
			VMT, VHT, VHD and other system performance measures	VISSIM or other quantitative methods
Improve local access to and from downtown Little Rock and North Little Rock	Mobility		Mobility at key intersections within PEL Study Area	VISSIM or other quantitative methods
	Travel Time		Travel time to key destinations in PEL Study Area	VISSIM or other quantitative methods
Improve opportunity for east - west connectivity	Provide opportunity to reconnect the street grid		Locations allowing for local street connectivity	Opportunities for road crossings
	Provide opportunity to connect green spaces		Designs that allow for open spaces across I-30	Opportunity for open spaces across I-30
Connect bicycle / pedestrian friendly facilities	Bicycle and pedestrian accommodations		Number of grade separated bike / ped accommodations across I-30	Number of crossings that meet current design standards
Accommodate existing / future transit	Transit effectiveness		Transit ridership in PEL Study Area	Metroplan Travel Model, I-30 PEL Scenario Model
Improve system reliability	Incident management		Potential accident reductions	Potential Accident reductions
	Emergency Vehicle Access		Emergency vehicle travel time (from Fire Station/Hospital to locations along mainline)	VISSIM or other quantitative methods
Minimize roadway disruptions during construction	Effectively move roadway traffic during construction		Severity of I-30 lane closures, detours during construction	Number of roadway closures
Minimize river navigation disruptions during construction	Effectively move river traffic during construction		Severity of river closures during construction	Number of river closures
Minimize river navigation disruptions after construction	Effectively move river traffic after construction		Location of navigational impediments (bridge piers)	Pier alignment
Maximize safety	I-30 conflict points		I-30 mainline conflict points in weaving / merge / diverge areas	Number of conflict points
	Ramp spacing		Number of ramps per mile on I-30 in the study area	Preliminary designs
	Ramp acceleration and deceleration lengths		Percentage of ramps meeting design standards	Preliminary designs
	I-30 Roadway and bridge structural conditions		Improved structural conditions	Qualitative assessment
	I-30 connection conflict points		Number of arterial connection conflict points	Number of arterial conflict points
Optimize opportunities for economic development	Economic development opportunities		Access to existing/potential business sites within the PEL Study Area	Access to existing / potential business sites within the PEL Study Area
Cost				
Optimize Cost	Construction Cost		Total conceptual cost to AHTD	Planning level costs with supplemental cost data
	ROW acquisition		Total cost of ROW acquisition	Cost per acre
	Utilities and infrastructure		Impact to major utilities and infrastructure	Cost of utilities to be impacted
	Investment required by others		Total investment required by others	Required investment by others
Environmental				
Avoid and/or minimize impacts to the human and natural environment	Community Impacts	Neighborhood Characteristics	Acres of ROW Impacted	Source: CAMP Pulaski County parcel data (Geostor); Method: Number of parcels / structures potentially impacted by each alternative
			Number of parcels impacted	
			Number of structures impacted	
			Displacements	Source: CAMP Pulaski County parcel data (Geostor); Method: Number of potential displacements resulting from each alternative
		EJ / LEP	Are EJ / LEP populations present?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
			Are potential impacts to EJ / LEP populations beneficial?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
			Are potential impacts to EJ / LEP populations detrimental?	Source: 2010 Census Data; Method: Review of 2010 Census Data specific to each alternative.
	Cultural Resource Impacts	Archaeological Sites	Recorded number of archaeological sites potentially impacted	Source: Arkansas Archeological Survey (AAS) for previously recorded archeological sites. Method: Number of cemeteries and archeological sites listed, eligible, or potentially eligible for the NRHP potentially impacted by each alternative
		Historic Resources	Number of NRHP, NRHP-eligible sites potentially impacted	Source: Department of Arkansas Heritage - Arkansas Historic Preservation Program (AHPP); Method: Number of NRHP eligible / listed structures and historic districts potentially impacted by each alternative.
	Natural Resource Impacts	Park Land	Number, acreage of park impacts	Source: AHTD Environmental and Arkansas Department of Parks and Tourism; Method: # and Acres of known mapped parks impacted.
		Water Resources	LF/number of surface water crossings, acreage of wetlands	Source: AHTD field reconnaissance, desktop review and review of National Wetland Inventory maps. Method: Acres of waters or wetlands potentially impacted.
		Biological Resources	Potential to impact threated / endangered, rare locally important species. Acreage of habitat	Source: AHTD Environmental; Method: Acreage of habitat potentially impacted.
	Other Impacts	Hazardous Materials	Number of high-risk hazardous material sites impacted	Source: Environmental Protection Agency (EPA) and Arkansas Department of Environmental Quality (ADEQ) geodatabases; Method: Number and type of potential hazardous material site present.
		Traffic Noise Receivers	Number of noise receivers directly adjacent	Source: Most recent existing land use files, AHTD provided information on schools, churches and other public facilities (from MPO, cities, or AHTD). Method: Number of adjacent receivers (residential parcels, schools, churches, daycares, and parks).
Public involvement				
Follow through on commitment to voters to improve I-30 as part of the CAP	Make improvements to the I-30 corridor		Mobility and safety on I-30 mainline	VISSIM or other quantitative methods
Sustain public and agency input and support for the I-30 Corridor Improvements	Public and agency input		Meeting comments and local resolutions	Source: Input gained from TWG and pubic meetings.