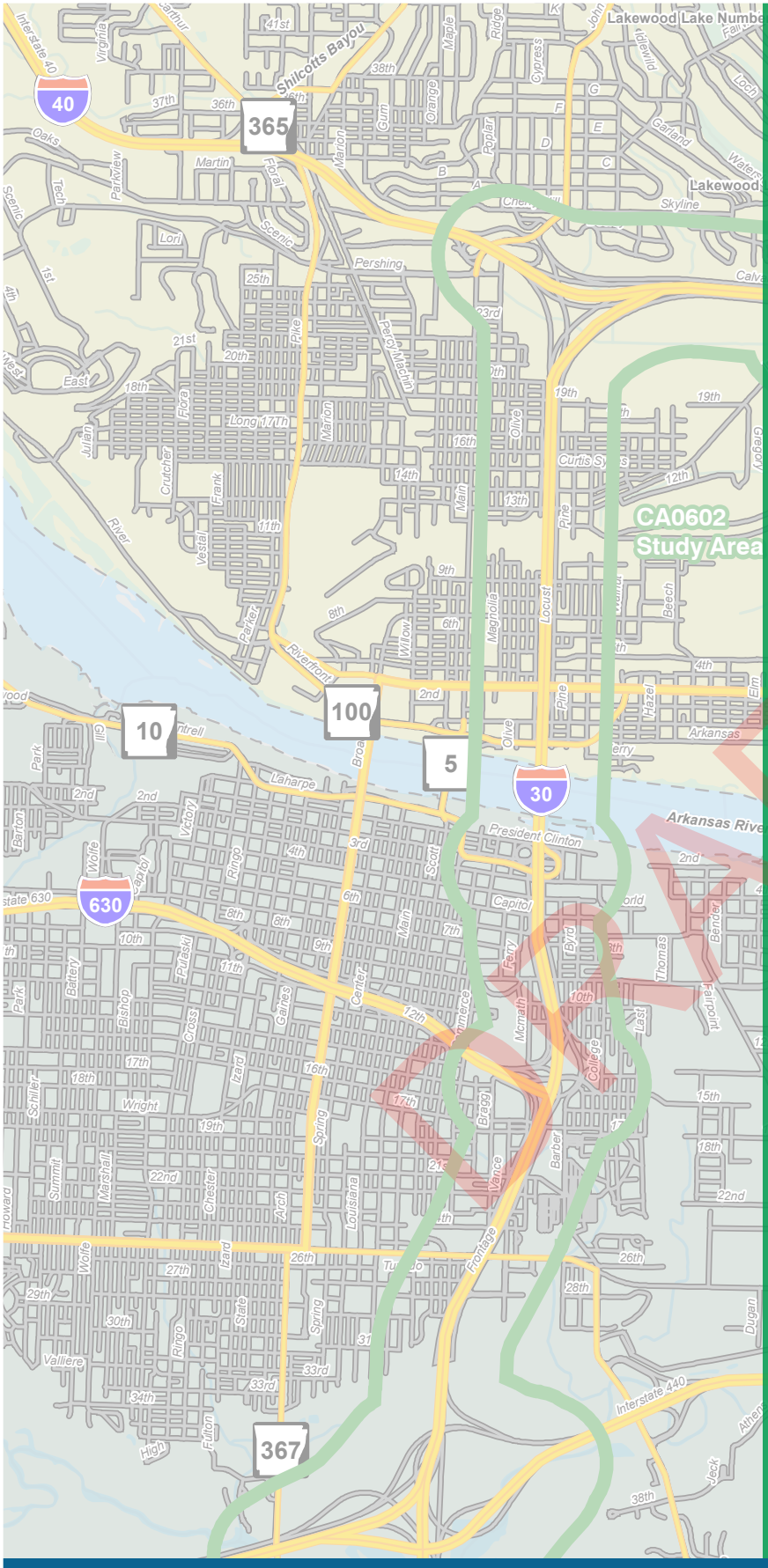

PLANNING AND ENVIRONMENTAL LINKAGES LEVEL 1 SCREENING METHODOLOGY AND RESULTS MEMORANDUM

INTERSTATE 30

CA0602

Interstate 530 – Highway 67

December 2014

CONNECTING ARKANSAS PROGRAM CAP

Arkansas State Highway & Transportation Department

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1.0 INTRODUCTION

The Arkansas State Highway and Transportation Department (AHTD) is conducting the I-30 Planning and Environmental Linkages (PEL) Study to identify the purpose and need for improvements within the I-30/I-40 study area, determine possible viable alternatives for a long-term solution, and recommend alternatives that can be carried forward seamlessly into a National Environmental Policy Act (NEPA) study.

The proposed I-30 PEL study area is located in central Arkansas, and stretches approximately 6.7 miles through Little Rock and North Little Rock. The study area begins at I-530 in the south and extends to I-40 in the north, and along I-40 eastwardly to its interchange with Hwy. 67 in North Little Rock as detailed in **Figure 1**.

A number of studies have been completed that provide background on the study area. The most relevant to the study area was the *Central Arkansas Regional Transportation Study Areawide Freeway Study, Phase 1: Arkansas River Crossing Study* from 2003. Other past relevant studies include:

- Central Arkansas Regional Transportation Study (CARTS), Areawide Freeway Study, Phase 1 Arkansas River Crossing Study Final Report and Phase 2 Areawide Study, 2003;
- River Rail Airport Study, Phase 2 Final Report, 2011;
- I-630 Fixed Guideway Alignment Study, 2010;
- The Six Bridges Framework Plan 6 Bridges Study, late 1990s; and
- I-630 (from I-430 to I-30) Final Environmental Impact Statement (FEIS), 1978.

As documented in the I-30 PEL Study Purpose and Need Technical Report, the I-30 PEL Study intends to identify improvements to the existing transportation network to address the following needs:

- Traffic Congestion;
- Roadway Safety Issues;
- Structural and Functional Roadway Deficiencies;
- Navigational Safety Issues; and
- Structural and Functional Bridge Deficiencies.

These issues lead to increased vehicle delay for area residents, commuters, businesses, and emergency vehicles. Further issues may be identified during the PEL public involvement process through coordination with technical work groups and the public.

The purpose of the I-30 PEL Study is to develop conceptual transportation alternatives that would address transportation system capacity, safety, and roadway and bridge deficiencies mentioned above by:

- Relieving Traffic Congestion;

- Improving Roadway Safety Issues;
- Addressing Structural and Functional Roadway Deficiencies
- Improving Navigation Safety; and
- Addressing Structural and Functional Bridge Deficiencies.

In addition to the Purpose and Need, the following goals have been established to balance transportation and environmental goals and objectives (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
- 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
- Improve safety

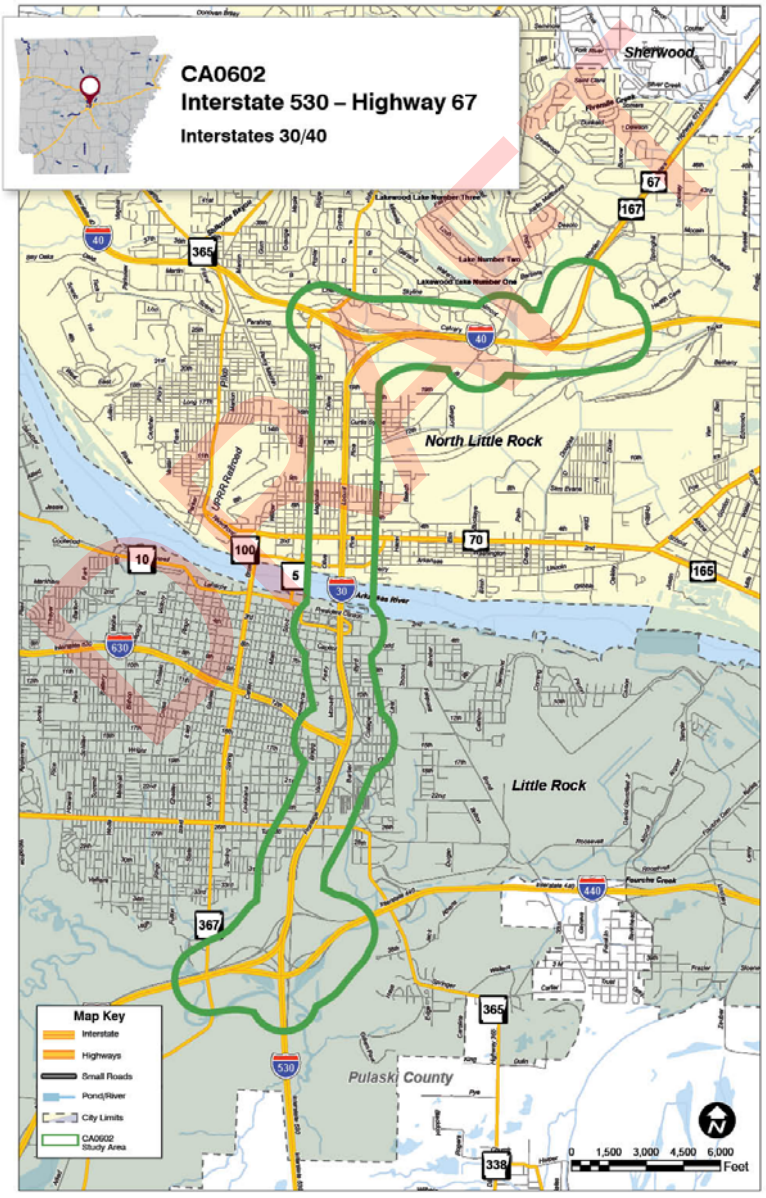
Guiding principles that will influence the overall project include (listed in no particular order):

- 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.

Metroplan, the Metropolitan Planning Organization (MPO) for central Arkansas**,** does not identify any proposed capacity improvements to the study area in the current fiscally constrained Long Range Metropolitan Transportation Plan (LRMTP) other than a small project at the I-30/I-530/I-440 Interchange, nor does it list associated improvements near the study area that may draw significant traffic to other routes or modes. The LRMTP does list several capacity and operational improvement projects for the I-30/I-40 study area in the *Roadway Vision Plan,* which is fiscally unconstrained and therefore is not supported with available funding.

The recommendations identified in the I-30 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), in the LRMTP, and in the CARTS Agreement of Understanding between Metroplan and the local jurisdictions and transit authorities (i.e., *Metroplan Policy on Freeways and Expressways*), as described in the *I-30 PEL Study Purpose and Need Technical Report*. With a view towards achieving consistency with local and regional planning efforts, it is anticipated that the PEL recommendations will be submitted to Metroplan to inform future updates/amendments to the LRMTP financially constrained plan and to the CARTS Transportation Improvement Program (TIP), as well as to the AHTD to inform future Statewide Transportation Improvement Program (STIP) updates/amendments.

Figure 1. I-30 PEL Study Area



2.0 ALTERNATIVE SCREENING PROCESS

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 follow below and are shown graphically in **Figure 2**, and described in detail in the *I-30 PEL Alternatives Screening Methodology*.

3.0 CONCEPTUAL LEVEL ALTERNATIVE DEVELOPMENT PROCESS

The Universe of Alternatives for the I-30 PEL Study has been developed utilizing the following precedents, processes and guiding documents:

- 2003 *Areawide Freeway Study*;
- *METRO 2030.2* LRMTP;
- I-30 PEL Study travel demand modeling;
- *I-30 PEL Study Purpose and Need Technical Report*;
- *I-30 PEL Study Alternative Screening Methodology*;
- *I-30 PEL Study Environmental Constraints Report*;
- Input from the I-30 PEL Study Technical Work Group (TWG);
- Input from the public through I-30 PEL Study public meetings; and
- Coordination with individual stakeholder groups.

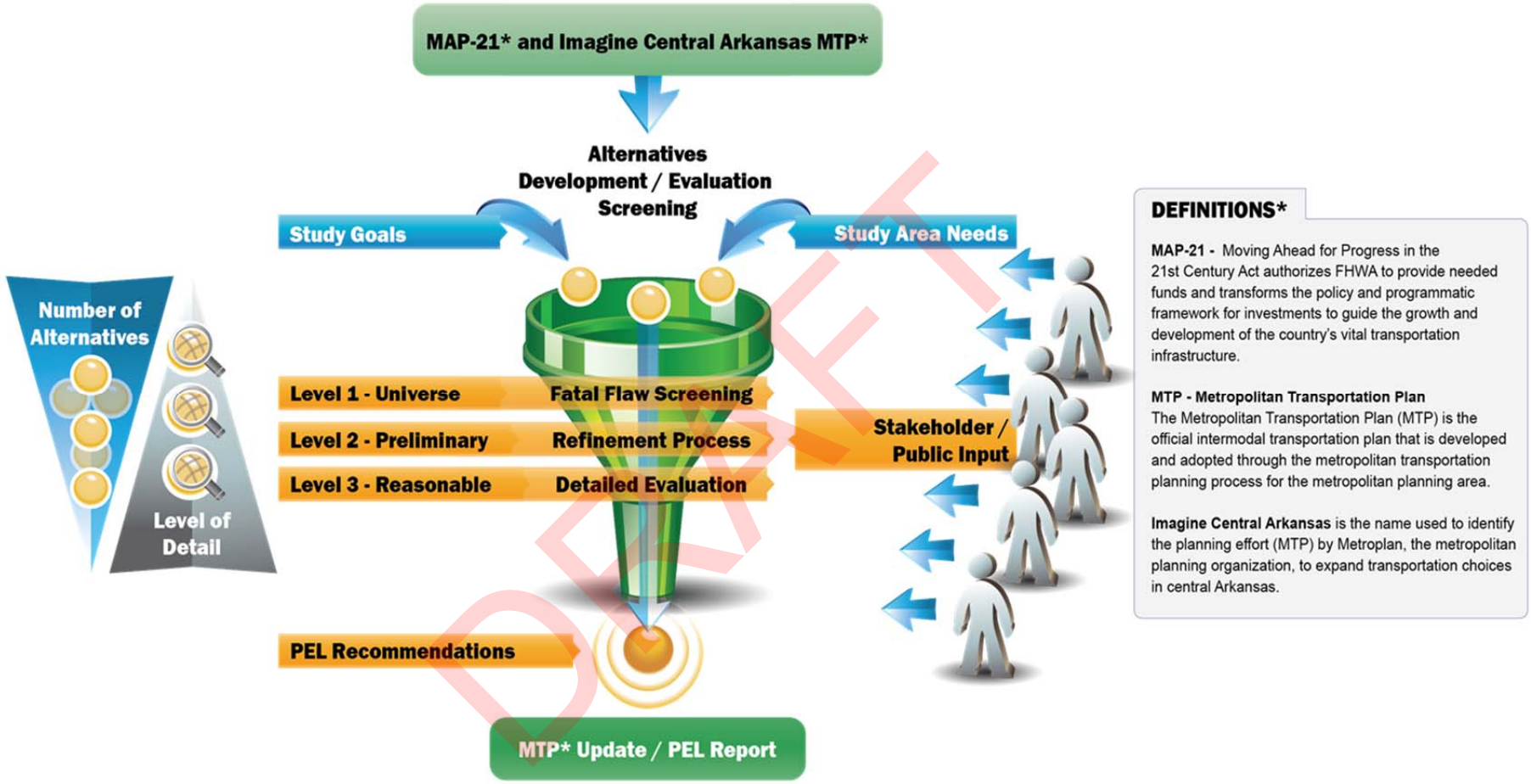
Both the *I-30 PEL Study Purpose and Need Technical Report* and the *I-30 PEL Study Alternative Screening Methodology* served as the guiding documents for the alternative groupings based on the primary needs identified for the I-30 PEL study area including: traffic congestion, roadway safety, structural and functional roadway deficiencies, navigational safety, and structural and functional bridge deficiencies.

Traffic Congestion addresses transportation mobility through the study area, including access into the downtown areas of Little Rock and North Little Rock. Transportation solutions were identified to address congestion in the study area including (but not limited to) adding capacity to the existing facility; building on new location; and adding or improving transit, Intelligent Transportation Systems (ITS) and Transportation Systems Management (TSM) strategies to improve traffic flow and safety along the study corridor.

Roadway Safety addresses the high crash rates for vehicles, cyclists and pedestrians in the study area. Transportation alternatives were identified to reduce the number of conflict points along the corridor and improve ramp lengths and spacing to provide safer weaving areas.

Roadway Structural and Functional Deficiencies addresses the need to improve the deteriorating pavement and to correct the geometric deficiencies that do not meet current design standards, such as narrow lanes and shoulders.

Figure 2. Alternative Screening Process



Navigational Safety addresses the high number of bridge strikes by barges to the I-30 Bridge over the Arkansas River. These strikes were caused by the location of a bridge pier in the middle of the navigational channel, which divides the channel into two navigation spans and reduces the horizontal clearance. Bridge alternatives seek to provide solutions for the pier obstruction and adequate horizontal and vertical clearance across the channel.

Structural and Functional Bridge Deficiencies addresses the need to improve the aging substructure of the bridge, and also to provide an adequate number of lanes for the projected traffic and shoulders that meet current design standards.

4.0 DESCRIPTION OF ALTERNATIVES

This section provides a description of the Universe of Alternatives under consideration in the I-30 PEL Study. The initial qualitative fatal flaw analysis for each of these alternatives is provided in **Section 5.0**.

4.1 No-Action

The No-Action Alternative represents the baseline condition in the I-30 PEL study area as if no additional improvements are implemented other than those already programmed in the fiscally constrained LRMTP.

The No-Action Alternative provides a baseline to gauge how effective various alternatives will be at accomplishing the Purpose and Need and Study Goals for the project. This alternative is required to be considered in PEL and NEPA analyses.
In addition to the programmed transportation improvements that have been identified as fiscally constrained in the LRMTP, the No-Action Alternative includes the preservation of the existing transportation network and all of the short-term operational and maintenance improvements currently underway and planned within the study area.

4.2 Highway Build

Highway Build Alternatives represent capital improvements to the I-30/I-40 main lanes, associated ramps and functional interchange areas.

4.2.1 Main Lane Widening

This alternative includes the addition of lanes to the existing interstate main lanes, which is one of the most common methods used to increase roadway capacity.

4.2.2 Main Lane Pavement Rehabilitation

This alternative rehabilitates pavement along the existing I-30/I-40 main lanes.

4.2.3 Elevated Lanes

This alternative includes increasing roadway capacity in the existing right-of-way (ROW) by adding express lanes on structure directly above the existing roadway.

4.2.4 Collector/Distributor (C/D) Roads

C/D roads consist of local access lanes, usually parallel to, but separated from the existing corridor, in order to remove local traffic from main lane through traffic. This alternative eliminates a significant amount of weaving from the main lanes, allowing through traffic to flow more freely.

4.2.5 Auxiliary Lanes

This alternative provides an extra lane between on and off ramps to allow for safer weaving and merge/diverge movements.

4.2.6 Dedicated Truck Lanes / Ramps

The addition of trucks to the traffic stream reduces travel speeds and safety due to their large size and slow response time. This alternative provides truck-only lanes and ramps in order to separate trucks from main lane traffic.

4.2.7 Frontage Road Improvements

This alternative improves the geometry and connectivity of the frontage road system, allowing for more efficient separation of local traffic from the main lanes.

4.2.8 Intersection Improvements

Intersection improvements consist of modifications to existing intersections near I-30/I-40 to improve traffic flow and reduce conflict points. This could include the addition or modification of signals, additional turning lanes, or control of traffic movement.

4.2.9 Interchange Improvements

Congested interchanges can cause traffic to back up onto the main lanes of the interstate, causing further congestion and unsafe conditions. This alternative replaces or makes geometric improvements to existing interchanges that are not functioning at an acceptable level.

4.2.10 Ramp Consolidation / Elimination

Current standards suggest a maximum of two ramps per direction per mile for urban interstates. One section of the study corridor has 10 ramps in one direction in a 2.5 mile span, and most of the ramps do not meet current length requirements for safe acceleration and deceleration. This alternative improves main lane traffic flow and safety by decreasing the number of entrance and exit points along the study corridor.

4.2.11 Roadway Shoulder Improvements

Adequate shoulders provide space for emergency stops and emergency vehicle access, provide the driver with a sense of comfort in congested areas, and improve the capacity of the main lanes of travel. This alternative increases the width of shoulders in the corridor to current design standards.

4.2.12 Horizontal/Vertical Curve Improvements

The I-30/I-40 facility within the study area has several horizontal and vertical curves that make the road less safe due to limited sight distance. This alternative will modify the roadway to meet existing American Association of State Highway and Transportation Officials (AASHTO) standards for horizontal and vertical curves.

4.2.13 Bottleneck Removal

Spot locations with recurring high congestion, or bottlenecks, cause significant delay and unsafe conditions. Many times these areas can be improved with alternatives focused on the immediate area in order to reduce the congestion at a lower cost than improvements to the whole corridor.

4.2.14 Bypass Route

The addition of an alternate route on new location can draw traffic from a congested route, thereby improving the level of service of the original route. This alternative involves a fourth connection across the Arkansas River, to the east or west of I-30.

4.3 I-30 Arkansas River Bridge

The I-30 Arkansas River Bridge alternatives represent capital investments to improve travel on I-30 across the Arkansas River.

4.3.1 Bridge Rehabilitation

The I-30 Bridge over the Arkansas River has been rated as structurally deficient and the existing 6 lanes cause recurring bottlenecks during peak travel times. This alternative rehabilitates and widens the existing structure.

4.3.2 Bridge Replacement

This alternative provides a new, improved I-30 Arkansas River Bridge to meet current design standards and provides acceptable horizontal and vertical clearance for navigational traffic on the Arkansas River.

4.3.3 Bridge - Elevated Lanes

This alternative constructs additional lanes within the existing ROW by building elevated lanes directly above the existing I-30 Arkansas River Bridge. This could be in combination with the *Elevated Lanes* roadway alternative, or as a stand-alone bridge option, with northbound traffic traveling on one level and southbound traffic traveling on the other.

4.4 Other Modes

Other travel mode alternatives represent capital and operating improvements to non-highway modes including transit, rail, bike and pedestrian.

4.4.1 Arterial Bus Transit

This alternative provides new or expanded bus service along existing roadways.

4.4.2 I-30 Express Bus Transit

This alternative provides or expands bus service that operates on existing arterials or freeways to provide modal options to commuters who follow consistent work trip patterns. Buses usually stop every 3 to 5 miles in the suburban area and then travel non-stop into the downtown area.

4.4.3 Bus on Shoulder

Similar to *Express Bus Transit*, bus on shoulder provides the option for buses to travel on the highway shoulder during peak travel times or incidents.

4.4.4 Arterial Bus Lanes

This alternative provides exclusive lanes for bus transit on arterial routes.

4.4.5 Arterial Bus Rapid Transit

This alternative provides bus service that operates on exclusive ROW or in the existing traffic stream for advantages similar to rail transit with lower cost. Stops are usually at distances of ½ mile or greater.

4.4.6 Light Rail (Streetcar)

This alternative provides rail service that operates with a single railcar or multiple connected cars, either on exclusive ROW or in the traffic stream. Stops are usually at distances of ½ mile or greater.

4.4.7 Heavy Rail

This alternative provides rail service that operates on exclusive ROW with multiple connected passenger railcars. Stops are usually at distances of ½ mile or greater.

4.4.8 Commuter Rail

This alternative provides rail service that operates on freight rail corridors between city centers and suburbs with multiple connected cars. Stops are usually at distances of greater than 2 miles.

4.4.9 High Speed Rail

This alternative provides rail service that operates in exclusive ROW at significantly higher speeds than traditional rail. Stops are usually located at large cities along the rail corridor.

4.4.10 Bicycle / Pedestrian

This alternative provides improved or new sidewalks and bicycle lanes for improved non-motorized connectivity.

4.5 Congestion Management

Congestion management strategies represent alternatives to general purpose highway lanes that focus on reducing congestion on I-30/I-40 by either adding capacity or reducing demand.

4.5.1 Information Systems / Advanced Traveler Information

This alternative includes use of en route traveler information systems and/or pre-trip advanced traveler information. Traveler information systems provide messages to drivers related to weather, travel times, emergencies, delays, upcoming construction projects, etc. For use en route, dynamic message signs display short messages to drivers, and radio broadcasts can provide information in greater detail. To disseminate advanced traveler information (pre-trip), a wide range of media can be used. Radio broadcasts, internet sites, and mobile devices can all be used to inform drivers of travel conditions before a trip begins.

4.5.2 Managed Lanes

This alternative provides a travel lane for transit, vehicles with more than one occupant and/or vehicles willing to pay a toll for travel time savings. Managed lanes provide many mobility benefits to motorists.

4.5.3 Reversible Lanes

Reversible lanes are useful in areas with high directional flow during peak hours. This alternative provides lanes that can be quickly modified to allow travel in either direction in response to peak travel periods.

4.5.4 Ramp Metering

This alternative includes signals placed at the end of entrance ramps to manage the number of vehicles entering the traffic stream. Ramp meters improve the rate of traffic flow and safety on the major roadway by reducing the number of vehicles entering the weaving area from minor roadways.

4.5.5 Hard Shoulder Running

Hard shoulder running is an active traffic management alternative that allows vehicles to use a paved shoulder as an additional lane during peak congestion periods. These lanes can allow all vehicles or certain vehicles such as transit, High Occupancy Vehicles (HOV), or High Occupancy Toll (HOT) vehicles. Dynamic overhead signs are used to inform drivers about whether the shoulder is open for use. In addition to mitigating peak-period congestion, this technology can also mitigate congestion related to traffic incidents.

4.5.6 Travel Demand Management (TDM)

This alternative includes alternative work hours, telecommuting and ridesharing. Alternative work hours can help decrease the intensity of the peak congestion period by shifting some commuters to other times of the day. For some, telecommuting or working from home can eliminate the need to drive in to work altogether, resulting in a lower daily traffic volume. These alternatives both depend on whether or not employers allow for nontraditional work hours. Ridesharing is an alternative that can be used in accordance with *Hard Shoulder Running* or other *Managed Lanes*. By providing an incentive (the ability to use an HOV lane), commuters may be encouraged to carpool,

resulting in a lower daily traffic volume. Other incentives, such as employer incentives, can also encourage the use of rideshare.

4.5.7 Transportation System Management (TSM)

TSM is a planning tool that increases the efficiency of the transportation system by using technology to minimize the effects of vehicle congestion. TSM can involve equipment, such as signals and communications equipment, and technology to monitor traffic and make adjustments to traffic operations on a real-time basis when more vehicles are using the road than can pass through without causing congestion. TSM can also involve improvements to the street and highway network such as lane modifications and parking configuration.

4.5.8 Wayfinding / Signage

This alternative improves signage along the study area to provide the traveler better information to aid in decision making, and allowing for a safer travel experience, i.e. last minute weaving to reach a desired exit.

4.5.9 Arterial Improvements

This alternative includes increasing capacity and safety on existing parallel arterial roads, which can reduce demand on the interstate main lanes. Improvements could be, but are not limited to, additional lanes or traffic signal improvements.

4.5.10 Land Use Policy

This alternative includes the careful consideration of land use in relation to transportation, which plays a large role in mitigating congestion. Effective land use policy varies from place to place, depending on the area's specific needs and limitations.

4.6 Non-Recurring Congestion

Non-recurring traffic represents traffic incidents, bad weather, work zones and special events.

4.6.1 Crash Investigation Sites

This alternative involves the implementation of crash investigation sites, which are designated zones off of the main lanes where crashes can be investigated safely. By removing the vehicles from the original incident location, the persons and vehicles involved in the crash are safe from additional harm. Also, main lanes are less likely to experience secondary incidents. In the case of major incidents, these locations can serve as staging areas. These zones are typically placed in locations where crashes tend to occur more frequently.

4.6.2 Roadside / Motorist Assist Enhancements

Roadside and motorist assistance is an alternative or set of alternatives that can reduce the amount of time that an incident is impeding traffic flow. Quick response time can be vital not only to the incident at hand, but also to preventing secondary incidents from

occurring. Frequent mile markers (as frequent as a tenth of a mile) help motorists to more precisely communicate their location. Service patrols also decrease response time and prevent incidents by removing obstructions or dealing with other possible sources of congestion.

4.6.3 Improvements to Detour Routes

This alternative includes increasing capacity and safety on detour routes during construction by using existing shoulders as additional lanes, widening the detour route to accommodate additional lanes, and improving the road surface to allow for higher speeds.

4.6.4 Variable Speed Limits (Speed Harmonization)

Speed Harmonization is an incident management alternative that can include the use of dynamic overhead signs to communicate a variable speed limit on a freeway during an incident. Non-recurring reasons to vary the speed include construction, adverse weather conditions, traffic incidents, concerts, football games, etc. Variable speed limits in non-recurring conditions help reduce secondary crashes. The dynamic overhead signs can be multifunctional. Not only can they display the speed limit, they can communicate a lane closure due to an incident or operate along with *Hard Shoulder Running* and *Queue Warning*.

4.6.5 Queue Warning

This alternative includes use of a queue warning system, which is typically utilized in addition to speed harmonization. Dynamic signs are mounted on the sides of the same gantries used for the *Speed Harmonization* signs, and a congestion icon is lit when congestion downstream is present. Queue warning systems have been reported to reduce the frequency of traffic incidents.

5.0 LEVEL 1 ALTERNATIVE SCREENING METHODOLOGY AND RESULTS

As detailed in the *I-30 PEL Alternative Screening Methodology* report, qualitative, fatal flaw criteria were utilized to evaluate and screen the Universe of Alternatives against the Purpose and Need. **Figure 2** provides an overview of the alternative development and screening process for the I-30 PEL Study.

5.1 Level 1 Screening Approach

In Level 1, alternatives were given a *pass* or *fail* rating for each of the screening criteria. A *pass* rating was not required on all criteria for an alternative to move to the next level; alternatives must have shown an overall positive impact on the I-30/I-40 corridor and be determined practicable. 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 did not meet the Purpose and Need, and those that were clearly impractical based on cost or effectiveness in Little Rock and North Little Rock, were eliminated at this level.

The output of the Level 1 screening analysis will be used as a basis for further quantitative evaluation in Level 2 of the alternative development and screening process.

5.2 Level 1 Screening Results

This section presents the results from the fatal flaw screening process and provides rationale as to why alternatives were either eliminated or carried forward for further study in Level 2.

Table 1 contains the matrix for Level 1 screening, including the rating for each alternative compared to the Purpose and Need criteria.

5.2.1 Alternatives Eliminated from Further Study

The following alternatives were eliminated from further consideration because they did not meet the Purpose and Need of the project, or they were deemed impractical. Two roadway alternatives, one bridge alternative, and two rail alternatives were eliminated from further study based on the justifications below.

- Elevated Lanes (Roadway) – This alternative was deemed impractical and eliminated because of the high construction cost and the difficulties associated with constructability.

- Truck Lanes/Ramps – This alternative was eliminated because it would have minimal effect due to the low percentage of trucks currently using I-30.

- Elevated Lanes (Bridge) – This alternative was deemed impractical and eliminated because of the high construction cost and the difficulties associated with constructability.

- Heavy Rail – This alternative was deemed impractical and eliminated because of the high construction and operating cost.

- High Speed Rail – This alternative was deemed impractical and eliminated because of the high construction and operating cost.

[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).

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Table 1. Level 1 Screening Matrix

	Alternative	Congestion	Roadway Safety	Roadway Structural Deficiencies	Roadway Functional Deficiencies	Navigation Safety	Bridge Structural Deficiencies	Bridge Functional Deficiencies	Practicality	Pass/Fail, and Justification for Fail Rating
4.1	**No-Action**	Fail	Fail	Pass	Fail	Fail	Pass	Fail	Fail	Pass - Required to be carried forward by NEPA
4.2	**Highway-Build**									
4.2.1	Main Lane Widening	Pass	Pass	Pass	Pass	Fail	Fail	Fail	Pass	Pass
4.2.2	Main Lane Pavement Rehabilitation	Fail	Pass	Pass	Pass	Fail	Fail	Fail	Pass	Pass
4.2.3	Elevated Lanes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail - Very high cost, difficult to maintain traffic during construction
4.2.4	Collector/Distributor (C/D) Roads	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.5	Auxiliary Lanes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.6	Dedicated Truck Lanes / Ramps	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail - Minimal effect because of low truck percentage on I-30
4.2.7	Frontage Road Improvements	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.8	Intersection Improvements	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.9	Interchange Improvements	Pass	Pass	Pass	Pass	Fail	Fail	Fail	Pass	Pass
4.2.10	Ramp Consolidation / Elimination	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.11	Roadway Shoulder Improvements	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.2.12	Horizontal / Vertical Curve Improvements	Pass	Pass	Pass	Pass	Fail	Fail	Fail	Pass	Pass
4.2.13	Bottleneck Removal	Pass	Pass	Pass	Pass	Fail	Fail	Fail	Pass	Pass
4.2.14	Bypass Route	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.3	**Arkansas River Bridge**									
4.3.1	I-30 Arkansas River Bridge Rehabilitation	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass
4.3.2	I-30 Arkansas River Bridge Replacement	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
4.3.3	I-30 Arkansas River Bridge Elevated Lanes	Pass	Pass	Pass	Fail	Fail	Pass	Pass	Fail	Fail - Very high cost, difficult to maintain traffic during construction
4.4	**Other Modes**									
4.4.1	Arterial Bus Transit	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.2	I-30 Express Bus Transit	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.3	Bus on Shoulder	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.4	Arterial Bus Lanes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.5	Arterial Bus Rapid Transit	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.6	Light Rail (Street Car)	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.7	Heavy Rail	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail - Very high cost per mile
4.4.8	Commuter Rail	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.4.9	High Speed Rail	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail - Very high cost per mile
4.4.10	Bicycle / Pedestrian	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5	**Congestion Management**									
4.5.1	Information Systems / Advanced Traveler Information	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.2	Managed Lanes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.3	Reversible Lanes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.4	Ramp Metering	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.5	Hard Shoulder Running	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.6	Travel Demand Management	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.7	Transportation System Management (TSM)	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.8	Wayfinding / Signage	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.9	Arterial Improvements	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.5.10	Land Use Policy	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Pass	Pass
4.6	**Non-Recurring Congestion**									
4.6.1	Crash Investigation Sites	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.6.2	Roadside / Motorist Assist Enhancements	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.6.3	Improvements to Detour Routes	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.6.4	Variable Speed Limits (Speed Harmonization)	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass
4.6.5	Queue Warning	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass

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5.2.2 Alternatives Moving Forward to Level 2 Screening

The following alternatives, called Preliminary Alternatives, were determined to have met the criteria of the Purpose and Need, and therefore, will be advanced for further analysis in Level 2.

Highway Build

- Main Lane Widening
- Main Lane Pavement Rehabilitation
- C/D Roads
- Auxiliary Lanes
- Frontage Road Improvements
- Intersection Improvements
- Interchange Improvements
- Ramp Consolidation / Elimination
- Roadway Shoulder Improvements
- Horizontal / Vertical Curve Improvements
- Bottleneck Removal
- Bypass Route

I-30 Arkansas River Bridge

- Bridge Rehabilitation
- Bridge Replacement

Other Modes

- Arterial Bus Transit
- I-30 Express Bus Transit
- Bus on Shoulder
- Arterial Bus Lanes
- Arterial Bus Rapid Transit
- Bicycle/Pedestrian
- Commuter Rail
- Light Rail (Streetcar)

Congestion Management

- Information Systems/Advanced Traveler Information
- Managed Lanes
- Reversible Lanes
- Ramp Metering
- Hard Shoulder Running
- Travel Demand Management (TDM)

- Transportation System Management (TSM)
- Wayfinding/Signage
- Arterial Improvements
- Land Use Policy

Non-Recurring Congestion

- Crash Investigation Sites
- Roadside / Motorist Assist Enhancements
- Improvements to Detour Routes
- Variable Speed Limits (Speed Harmonization)
- Queue Warning