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1.0 INTRODUCTION

The Arkansas Highway and Transportation Department is conducting the Interstate 30 (I-30) Planning and Environmental Linkages (PEL) Study to identify the purpose and need for improvements within the I-30 PEL study area, determine possible viable alternatives for a long-term solution, and recommend alternatives for further evaluation. The study team, with public and agency input, developed the *I-30 PEL Study Purpose and Need Technical Report*, which identified the purpose and need for the project, along with the goals of the study. The team then developed the *Universe of Alternatives*, which contains a wide range of possible solutions to the issues in the study corridor identified in the purpose and need and the study goals.

The *I-30 PEL Study Alternative Screening Methodology (ASM) Technical Report* describes the measures and the scoring system utilized to evaluate the alternatives in a tiered screening process as described below:

- **Level 1** is a qualitative screening of the Universe of Alternatives based on the Purpose and Need. Those alternatives that passed Level 1 screening were advanced to Level 2 as Preliminary Alternatives. Details of Level 1 screening are documented in the *I-30 PEL Level One Screening Methodology and Results Memorandum*.
- **Level 2** is primarily a qualitative screening (with some quantitative analysis) of the Preliminary Alternatives based on the study goals, which produced the Reasonable Alternatives.
- **Level 3** is a quantitative screening of the Reasonable Alternatives based on the study goals. Level 3 screening will result in a recommended solution(s) which will be advanced for further development/study during the subsequent National Environmental Policy Act (NEPA) study.

The documents and analysis previously produced that were relied upon for the development of the Level 2 Screening include:

- *I-30 PEL Purpose and Need Technical Report*;
- *I-30 PEL Universe of Alternatives Technical Report*;
- *I-30 PEL Alternative Screening Methodology Technical Report*; and
- Level 1 Screening.

This document presents the results of the Level 2 Screening process.

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 Interstate 530 (I-530) in the south and extends to Interstate 40 (I-40) in the north, and along I-40 eastwardly to its interchange with United States Highway 67 (Hwy. 67) in North Little Rock as shown in **Figure 1**.

Figure 1. I-30 PEL Study Area



2.0 LEVEL 2 ALTERNATIVE SCREENING METHODOLOGY AND RESULTS

Level 2 screening analyzed the Preliminary Alternatives, which passed the fatal flaw screening based on the purpose and need in Level 1. In Level 2, qualitative (and some quantitative) criteria were utilized to evaluate and screen the Preliminary Alternatives against the study goals in a two-step process. In Level 2A, the Preliminary Alternatives were screened individually against the study goals. In Level 2B, the remaining Preliminary Alternatives were grouped and screened as multimodal *Basic Scenarios*. The screening process is fully described in the *I-30 PEL Study Alternative Screening Methodology Technical Report*.

For most measures, alternatives were rated on how well they were able to achieve the study goals using the scale presented in **Table 1**.

Table 1. Qualitative Rating System

Rating	Evaluation
++	Substantial positive effects
+	Some positive effects
O	Neutral effects
-	Some negative effects
--	Substantial negative effects

After ratings were assigned for each measure, scores for each alternative were tallied according to the values in **Table 2**.

Table 2. Scoring System

Rating	Score
++	2
+	1
O	0
-	-1
--	-2

One variation from the above methodology relates to the assessment of potential direct impacts to Environmental Justice/Limited English Proficiency (EJ/LEP) populations. For this measure, the following questions were asked for each alternative:

- **Question 1:** Are EJ/LEP populations present in the study area?
- **Question 2:** Is there a potential for adverse direct impacts to EJ/LEP populations?
- **Question 3:** Is there a potential for beneficial impacts and/or mitigation to offset direct adverse impacts to EJ/LEP populations?

“Yes” or “No” answers were determined for each question; and scores associated with the “Yes” and “No” answers were dependent on the anticipated degree of potential impacts. For example, a response of “Yes” to Question 2 would receive a negative rating and the score would be dependent on the number of potential displacements in census areas reporting EJ/LEP populations. Additional explanation about the

methodology, rating and scoring system for the EJ/LEP measure, as well as other environmental measures, is included in **Attachment D**.

2.1 Level 2A Screening

In Level 2A, Preliminary Alternatives were evaluated individually to determine those most capable of meeting the study goals.

Because Level 2A was mostly a qualitative screening process, the ratings given were based on assumptions. Assumptions used in the analysis are presented in **Table 3** below. These assumptions drive the results of the analysis, so any changes could affect the results.

After evaluating each alternative against the screening criteria, the scores were totaled and compared to other alternatives within the respective groupings identified in **Table 4** (Highway Build, Bridge, Other Modes, Congestion Management, and Non-Recurring Congestion) in order to allow the best in each group to emerge. The matrix presented in **Table 4** shows the ratings for each alternative against each of the Level 2A screening criteria, based on the study goals. For the Level 2A screening, the No-Action Alternative was considered to be the baseline condition and all Preliminary Alternatives were scored in comparison to the No-Action Alternative.

Table 3. Level 2A Screening Assumptions

Alternatives		Mobility	Safety	Cost	Environmental ¹
Action Alternatives	Highway	<ul style="list-style-type: none"> Impacts analyzed in the PEL study area. Only peak hour benefits were analyzed. Used Metroplan’s Travel Demand Model to determine the change in travel demand with varying number of through lanes. Bypass was assumed to be at Chester Street. CATA 10-Year Strategic Plan was used. I-30 PEL Transit Analysis was used (see Attachment B). Arterial bus lane and Bus Rapid Transit would remove a general purpose lane during peak hours as a starting point to maximize their benefits. Buses could use a shared lane but benefits would be compromised. Managed lane was assumed to be barrier separated and tolled. Ramp meter assumed to include a queue bypass lane for buses. Non-recurring congestion assumed off-peak hour benefits. Either of the Arkansas River Bridge alternatives, replacement or rehabilitation, would require complete reconstruction of the approaches. Therefore, either option would offer the opportunity for better east-west connectivity near the river. 		<ul style="list-style-type: none"> Conceptual ROW and utility costs to AHTD were assumed to increase as the roadway/bridge width increased. 	<ul style="list-style-type: none"> The qualitative rating system described in Tables 1 and 2 were utilized for all the environmental measures, except EJ/LEP, which utilized the qualitative scale described in Attachment D, Table D-2. Because potential direct impacts to environmental resources were evaluated based on the anticipated footprints of the Preliminary Alternatives, impacts were generally assumed to be neutral (“0”) if additional ROW was not anticipated for all environmental measures. If additional ROW was anticipated, potential for displacements was assumed. If added capacity is anticipated, noise impacts were assumed. EJ/LEP rated based on the anticipated level of potential impacts to the following three questions: <ol style="list-style-type: none"> Are EJ/LEP populations present within the study area? Is there a potential for adverse direct impacts to EJ/LEP populations? <i>Note: If additional ROW was anticipated and EJ/LEP populations were determined present in the study area, then the potential for displacements (adverse impacts) was assumed.</i> Is there a potential for beneficial impacts and/or mitigation to offset any potential adverse impacts to EJ/LEP populations (e.g., improved mobility, safety, community cohesion, etc.)? <i>Note: Given that all of the Preliminary Alternatives would be designed to either improve mobility, safety, other transportation modes, community cohesion, etc., all of which would be beneficial to all populations, including EJ/LEP, then the potential for beneficial impacts or the ability to mitigate for adverse direct impacts to EJ/LEP populations was assumed.</i> Attachment D provides details related to the EJ/LEP screening methodology. For alternatives without a general footprint or potential location, one of the following was assumed when assessing impacts to environmental measures only: <ol style="list-style-type: none"> Alternative has not yet been designed to a level of detail allowing for the assessment of potential environmental impacts (e.g., interchange improvements) – more detailed design to occur in Level 3; or Alternative is likely to be designed and implemented by others (e.g., improvements to detour routes); and the location will likely be determined by the implementing agency. For both categories, it is difficult to determine the nature (beneficial or adverse) and level/severity of potential environmental impacts, thus impact to environmental measures scored neutral (“0”).
	I-30 Arkansas River Bridge				
	Other Modes				
	Congestion Management		<ul style="list-style-type: none"> Costs for alternatives that increased roadway width were considered more substantial than those that were technology based. 		
	Non-recurring Congestion		<ul style="list-style-type: none"> Costs for alternatives requiring some roadway construction were considered moderate. 		

¹ See **Attachment D** for additional details on the screening of environmental measures, including EJ/LEP.

Table 4. Level 2A Screening Matrix

Goals	Enhance Mobility		Access to Downtown		East-West Connectivity		Bicycle/Pedestrian		Accommodate Transit		System Reliability		Minimize Roadway Disruptions		Minimize River Disruptions		Improve Safety			Opportunity for Economic Development	Maximize Cost Efficiency				Community Impacts ^{1,2}				Cultural Resource Impacts ^{1,2}		Biological Resource Impacts ^{1,2}			Other Impacts ^{1,2}		Commitment to Voters	Public/ Agency Input	SCORE				
	Alternatives	Mobility in PEL Study Area	Total travel time savings	Average peak hour travel speed through corridor	Mobility of key intersections within PEL Study Area	Travel time to key destinations in PEL Study Area	Locations allowing for local street connectivity	Designs allowing for open spaces across I-30	Grade separated bike / ped accommodations across I-30	Transit ridership in the PEL Study Area	Potential accident reductions	Emergency Vehicle Travel Time	Severity of I-30 lane closures, detours during construction	Severity of river closures during construction	Location of navigational impediments (Bridge Piers)	I-30 mainline conflict points in weaving /merge / diverge areas	Number of ramps per mile on I-30 in the study area	Ramp acceleration and deceleration lengths	I-30 Roadway and bridge structural conditions	Arterial connection conflict points	Access to existing / potential business sites within the PEL Study Area	Total conceptual cost to AHTD	Total cost of ROW acquisition	Impact to major utilities and infrastructure	Total investment required by others	ROW / parcels / structures potentially directly impacted	Potential Displacements	Are EJ/LEP populations present in the study area?	Is there a potential for adverse direct impacts (displacements) to EJ/LEP populations?	Is there potential for beneficial impacts and/or mitigation to offset any potential adverse effects to EJ/LEP populations (e.g., improved mobility, safety, community cohesion, etc.)?	Recorded archaeological sites potentially directly impacted	NRHP or NHRP-eligible sites potentially directly impacted	Potential direct park impacts	Potential direct surface water crossings, wetlands impacts	Potential direct impacts to listed and non-listed species and/or habitat, and rare locally important species	High risk hazardous material sites potentially directly impacted	Potential noise impacts		Mobility on I-30 Main Lane	Meeting comments and local resolutions		
		Measures ³																																								
Highway - Build																																										
Main Lane Widening	++	++	++	-	++	0	0	0	-	0	++	-	0	0	0	0	0	0	+	0	-	-	-	0	-	-	yes	yes	yes	0*	0*	0*	-	-	0*	-	++	+	3			
Main Lane Pavement Rehabilitation	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	++	0	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	5	
Collector/Distributor (C/D) Roads	+	+	+	-	+	0	0	0	0	+	+	+	0	0	0	0	0	0	0	0	-	-	-	0	-	-	yes	yes	yes	0*	0*	-	-	-	0*	-	+	+	3			
Auxiliary Lanes	+	+	+	0	+	0	0	0	0	+	+	0	0	0	+	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	+	+	13		
Frontage Road Improvements	+	+	+	+	0	0	0	0	0	+	+	+	0	0	0	0	0	0	0	+	-	-	0	0	-	-	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	-	+	+	7		
Intersection Improvements	+	+	+	++	+	+	+	0	0	+	+	0	0	0	0	0	0	0	0	+	-	-	-	0	-	-	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	-	+	+	8		
Interchange Improvements	++	+	+	++	+	+	+	+	-	++	+	-	0	0	0	0	0	0	+	+	-	-	-	0	-	-	yes	yes	yes	0*	0*	0*	-	-	0*	-	++	+	9			
Ramp Consolidation / Elimination	+	+	+	0	+	+	+	0	0	++	+	0	0	0	++	++	+	0	++	-	0	0	0	0	0	0	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	+	++	16			
Roadway Shoulder Improvements	+	+	+	0	+	0	0	0	0	+	+	-	0	0	0	0	0	0	0	0	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	+	+	9		
Horizontal / Vertical Curve Improvements	+	+	+	0	+	0	0	0	0	+	+	-	0	0	0	0	0	0	0	0	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	+	+	7		
Bottleneck Removal	+	+	+	0	+	0	0	0	0	+	+	-	0	0	0	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	+	+	9		
Bypass Route	+	+	+	-	+	0	0	0	0	0	+	+	-	0	0	0	0	0	0	0	0	-	-	-	-	-	yes	yes	yes	0*	0*	-	-	-	0*	-	0	+	-5			
I-30 Arkansas River Bridge																																										
Rehabilitation	++	++	++	0	++	+	+	+	-	0	+	-	--	--	0	0	+	+	0	+	--	--	--	0	--	-	yes	yes	yes	0*	0*	-	-	-	0*	-	++	--	-4			
Replacement	++	++	++	0	++	+	+	+	-	0	++	-	-	++	0	0	+	++	0	+	--	--	--	0	--	-	yes	yes	yes	0*	0*	-	-	-	0*	-	++	++	7			
Other Modes																																										
Arterial Bus Transit	+	0	0	+	0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	+	0	0	0	-	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	++	7		
I-30 Express Bus Transit	+	+	+	+	+	0	0	0	++	+	+	0	0	0	0	0	0	0	0	+	0	0	0	-	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	0	++	13	
Bus on Shoulder	+	+	+	+	+	0	0	0	++	0	+	0	0	0	0	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	0	++	12	
Arterial Bus Lanes	+	0	0	+	+	0	0	0	+	0	+	0	0	0	0	0	0	0	0	+	0	0	0	-	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	0	7		
Arterial Bus Rapid Transit	+	0	0	+	+	0	0	0	+	0	+	0	0	0	0	0	0	0	0	+	0	0	0	-	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	0	+	8	
Light Rail (Street Car)	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	+	0	-	-	--	-	-	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	-	0	+	-4		
Commuter Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	--	0	0	yes	yes	yes	0	0	0	0	0	0	0	0	0	0	-3		
Bicycle / Pedestrian	+	0	0	0	0	0	0	++	+	+	0	0	0	0	0	0	0	0	++	+	-	0	0	-	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	++	10		
Congestion Management																																										
Information Systems / Advanced Traveler Information	+	+	+	+	+	0	0	0	+	+	+	0	0	0	0	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	12	
Managed Lanes	+	+	+	-	+	0	0	0	+	0	+	-	0	0	-	0	0	0	0	+	--	-	-	0	-	-	yes	yes	yes	0*	0*	0*	-	-	0*	-	+	0	-4			
Reversible Lanes	+	+	+	0	+	0	0	0	-	0	+	-	0	0	-	0	0	0	0	+	--	-	-	0	-	-	yes	yes	yes	0*	0*	0*	-	-	0*	-	+	+	-4			
Ramp Metering	+	+	+	0	+	0	0	0	+	+	+	0	0	0	0	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	11	
Hard Shoulder Running	+	+	+	0	+	0	0	0	-	-	--	-	0	0	-	0	0	0	0	+	-	0	0	0	-	-	yes	no	yes	0*	0*	0*	0*	0*	0*	0*	-	+	0	-1		
Travel Demand Management (TDM)	+	+	+	+	+	0	0	0	+	+	+	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	13	
Transportation System Management (TSM)	+	+	+	+	+	0	0	0	0	+	++	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	13	
Wayfinding / Signage	+	+	+	+	+	0	0	0	0	+	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	11	
Arterial Improvements	+	0	0	+	+	+	0	0	0	+	+	0	0	0	0	0	0	0	0	++	+	0	-	-	-	-	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	-	0	+	4		
Land Use Policy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	0	0	yes	yes	yes	0	0	0	0	0	0	0	0	0	--	0	-4	
Non-Recurring Congestion																																										
Crash Investigation Sites	+	+	+	+	+	0	0	0	0	+	+	0	0	0	-	0	0	0	0	+	-	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	10	
Roadside / Motorist Assist Enhancements	+	+	+	+	+	0	0	0	0	+	+	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	0	+	+	12
Improvements to Detour Routes	+	+	+	+	+	0	0	0	0	+	+	+	0	0	0	0	0	0	0	+	+	-	-	-	-	-	yes	yes	yes	0*	0*	0*	0*	0*	0*	0*	-	+	+	5		
Variable Speed Limits (Speed Harmonization)	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	5	
Queue Warning	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	yes	no	yes	0	0	0	0	0	0	0	0	0	+	+	5	

X

Legends:

Shaded alternatives were eliminated in Level 2A	
Color Codes for Measures	
Light Blue	Mobility
Light Green	Safety
Light Orange	Cost
Light Yellow	Environmental
Scoring Legend	
++	Substantial Positive Effects
+	Some Positive Effects
0	Neutral Effects
-	Some Negative Effects
--	Substantial Negative Effects

¹ Potential direct impacts to environmental resources evaluated based on anticipated footprints of the alternatives.
² See **Attachment D** for additional details on the environmental screening scoring and methodology for environmental measures, including EJ/LEP.
³ Measures used to evaluate alternatives in Level 2 screening are defined in the accompanying document CA0602 PEL Alternative Screening Methodology.

*Score of neutral "0" assigned because at this level of screening, the nature (beneficial or adverse) and level/severity of potential direct environmental impacts is difficult to determine due to 1) the alternative has not yet been designed to a level of detail allowing for assessment of potential direct environmental impacts (e.g., intersection improvements) and more detailed design will occur during the Level 3 analysis; OR 2) the alternative will likely be designed and implemented by others (e.g., improvements to detour routes) and the location/alternative footprint will be determined by the implementing agency. Applies to environmental measures only.

2.2 Level 2A Screening Results

2.2.1 Level 2A Categories

The Level 2A screening resulted in the alternatives being grouped into three categories:

1. **Alternatives Screened Out from Further Study** - Defined as those alternatives that did not adequately address the goals of the study due to negative environmental impacts, costs, difficulties from an engineering standpoint such as geometric issues or constructability, and not meeting the mobility or safety goals. Alternatives that scored zero (0) or less in Level 2A were screened out from further consideration.
2. **Primary Alternatives** - Defined as those alternatives considered to have the potential to substantially address the study goals as stand-alone alternatives. The Primary Alternatives were the Highway Build main lane widening, C/D roads, interchange improvements and Arkansas River Bridge replacement.
3. **Complementary Alternatives** - Defined as those alternatives that when combined with the Primary Alternatives address the study goals. The Complementary Alternatives were the Highway Build (other than main lane widening and interchange improvements), Other Modes, Congestion Management, and Non-Recurring Congestion alternatives.

2.2.2 Alternatives Screened Out From Further Study

The following alternatives were screened out from further consideration.

Highway Build

- **Bypass Route** – Metroplan’s Travel Demand Model runs showed that the addition of a bypass route would reduce peak hour traffic on I-30 by approximately 3.5%. This alternative was screened out due to the moderate reduction in I-30 traffic, environmental impacts (e.g., anticipated ROW impacts; potential displacements; and potential park, surface waters, and habitat impacts associated with a new Arkansas River Bridge crossing), and lack of a dedicated funding source identified in the Metroplan Long Range Metropolitan Transportation Plan (LRMTP).

I-30 Arkansas River Bridge

- **Rehabilitation** – As shown in **Table 4**, poor scoring in categories related to structural condition, project cost, and navigational impediments resulted in the elimination of the Arkansas River Bridge rehabilitation alternative from further consideration.

With the rehabilitation alternative, necessary repairs to the existing main river pier foundations would be costly and would result in further restriction of the navigation span and frequent closure to navigation traffic during construction. Because of the extent of existing and anticipated fatigue cracking, replacing all of the existing approach bridge spans and supports in their entirety would be necessary, further adding significant cost. Cracking and spalling present in the existing bridge deck may be indicators that the deck concrete is near the limits of its useful life, therefore, it would be prudent to consider future replacement of the deck, further adding to life-cycle costs. Implementing other repairs or measures to eliminate the fracture critical status¹, to retrofit for increased seismic resistance, and to increase the navigational clearance are neither cost effective nor feasible.

The anticipated service life of a typical bridge, when designed, is between 50 and 75 years. If all feasible repair and modifications were made to the existing I-30 Bridge, it can be assumed that the bridge would perform adequately for its remaining service life – approximately 20 to 25 years. However, concerns regarding the lack of redundancy¹ inherent in a two-girder and pin-and-hanger system, the poor functionality resulting from narrow shoulder widths, and the inadequate seismic capacity and navigational clearance would remain.

In response to letters from AHTD (letter date December 3, 2013) notifying the United States Army Corps of Engineers (USACE) and the United States Coast Guard (USCG) that either widening or replacement of the I-30 Bridge were planned as part of the overall I-30 project, and seeking their respective input on these construction options, the USACE (letter date January 10, 2014) noted their concern that the existing pier bisecting the channel creates a problem aligning tow barges; and the USCG (letter date January 29, 2014) recommended replacing the existing bridge with a new structure that provides a minimum horizontal navigation opening of at least 320.0 feet and minimum vertical clearance of 63.0 feet (above normal pool stage). The USCG also noted that any reduction of the existing horizontal clearance of the left descending channel (preferred navigation span) would be unacceptable unless otherwise approved by the USCG. As mentioned above, the rehabilitation option would result in further restriction of the navigation span. Additionally, in an August 21, 2014 letter to AHTD, the Arkansas Waterways Commission recommended similar horizontal and vertical clearances as the USCG and removal of the existing pier dividing the navigation channel. Bridge rehabilitation would not address the cited concerns of the USACE, USCG and Arkansas Waterways Commission.

¹ The two girder system in the main river span, the pin-and-hangers at the ends of the suspended spans, and the steel bent caps in the approach spans of the I-30 Arkansas River Bridge have been designated as “fracture critical” elements in accordance with the National Bridge Inspection Standards. A fracture critical element is defined as any element whose failure would cause whole or partial collapse. Collapse following fracture of these elements is possible because of the inability to transfer load to other supporting elements, also known as a lack of redundancy.

Attachment A-1 provides a detailed summary of the condition of the existing I-30 Bridge and further discussion regarding the disadvantages of a rehabilitation option. The referenced AHTD, USACE, USCG and Arkansas Waterways Commission correspondence letters are provided in **Attachment A-2**.

Other Modes

- **Light Rail (Street Car)** – The Central Arkansas Transit Authority (CATA) Strategic Plan (10-year plan) does not include light rail improvements. Light Rail is part of CATA’s long range plan; however, CATA has indicated that they would implement Bus Rapid Transit (BRT) before implementing Light Rail along future Light Rail corridors. This alternative was screened out as a result of CATA not including light rail in their 10-year Strategic Plan and the lack of a dedicated funding source identified in the Metroplan LRMTF. Metroplan modeled Light Rail under the category of Fixed Guideway which included both Light Rail and Commuter Rail and found that together under the most aggressive “Supportive” land use policy, fixed guideway attracts approximately 6,400 person trips.
- **Commuter Rail** – The CATA Strategic Plan (10-year plan) does not include commuter rail, nor is it included in CATA’s long range plan. This alternative was screened out as a result of CATA not including commuter rail in any of their future planning documents and the lack of a dedicated funding source identified in the Metroplan LRMTF. Metroplan modeled Light Rail under the category of fixed guideway which included both Light Rail and Commuter Rail and found that together under the most aggressive “Supportive” land use policy, fixed guideway attracts approximately 6,400 person trips.

Congestion Management

- **Managed Lanes** – This alternative was screened out due to the increase in conflict points in weaving areas, the high initial cost given the lack of an existing managed lane system, the continued operational costs, and potential negative impact to low-income populations given the added monetary cost for use of these lanes.
- **Reversible Lanes** – This alternative was screened out due to high initial cost, continued operational cost, increased conflict points in the weaving areas, and ROW requirements.
- **Hard Shoulder Running** – This alternative was screened out due to potential safety impacts resulting from interference with emergency vehicles and conflict with the Bus on Shoulder transit option, which CATA identified as a preferential congestion management alternative for possible future implementation.
- **Land Use Policy** – The region’s adopted land use policies are incorporated into the Metroplan regional transportation models and are represented as the

“Emerging Trend”, also considered the *Base* land use condition. Metroplan also modeled a “Supportive” land use trend which represents substantial land use policy changes that would support increased transit such as commuter rail, light rail, and local bus transit service. This alternative would not result in near-term benefits to the I-30/I-40 facility, nor does it meet a study goal to “follow through on commitment to voters to improve I-30 as part of the CAP.” Elimination of this alternative does not mean that land use is not important to the corridor or region, but that it is not considered to be a main solution for addressing safety, mobility and associated roadway deficiencies along I-30/I-40. Land use has been and will continue to be a component of the stakeholder led Visioning Workshops throughout the PEL and NEPA phases of project development. Future plans through the Visioning Workshops, such as providing connectivity across I-30 and ensuring access and mobility to support existing and planned development, will be coordinated with city planners.

2.2.3 Primary Alternatives

The following were advanced as Primary Alternatives due to their potential to substantially address the study goals as stand-alone alternatives.

Highway-Build

- **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.
- **Collector/Distributor (C/D) Roads** – This alternative includes the addition of lanes, separated from the main lanes by a barrier, to facilitate efficient traffic movement into and out of the downtown areas with minimal disruption to through traffic.
- **Interchange Improvements** – This alternative includes improvements to highway connections that allow travelers to move from one route to another without directly crossing any other traffic stream.

I-30 Arkansas River Bridge

- **Replacement** - This alternative includes construction of a new I-30 Bridge. The design and construction of a full replacement structure would adhere to current standards and codes and structural and functional deficiencies would not be present in the new structure. The navigation clearances and alignment would meet current Coast Guard standards and barge operator preferences, and the “design life” of the structure would be equal to or in excess of 75 years. The seismic resistance would meet current code and the bridge would provide preferred levels of redundancy eliminating the fracture critical classification present in a rehabilitation option. With full replacement there would be a new wider deck with safer barriers providing the maximum desired functionality.

Main lane widening and bridge replacement were included in the Basic Scenarios and further evaluated in Level 2B screening. Specific interchange improvements will be reflected in each reasonable alternative that will be evaluated in Level 3 after interchange locations and configurations have been identified.

2.2.4 Complementary Alternatives

The following were advanced to Level 2B screening as Complementary Alternatives.

Highway – Build - These alternatives will be incorporated as needed into the new I-30 facility designs to improve mobility and meet current design standards.

- Main Lane Pavement Rehabilitation
- Auxiliary Lanes
- Frontage Road Improvements
- Intersection Improvements
- Ramp Consolidation/Elimination
- Roadway Shoulder Improvements
- Horizontal/Vertical Curve Improvements
- Bottleneck Removal

Other Modes – These alternatives were advanced and evaluated separately to determine the amount of traffic that would be diverted or attracted from/to I-30 by other modes. Then the group of alternatives were evaluated to determine the total improvement in peak hour mobility that could be expected from their implementation.

- Arterial Bus Transit
- I-30 Express Bus Transit
- Bus on Shoulder
- Arterial Bus Lanes
- Arterial Bus Rapid Transit
- Bicycle/Pedestrian

Congestion Management – These alternatives were advanced and evaluated as a group to determine the total improvement in peak hour mobility that could be expected from their implementation.

- Information Systems/Advanced Traveler Information
- Ramp Metering
- Travel Demand Management (TDM)
- Transportation System Management (TSM)
- Wayfinding/signage
- Arterial Improvements

Non-Recurring Congestion – These alternatives were advanced and evaluated as a group to determine the total improvement in mobility that could be expected from their implementation.

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

2.3 Level 2B Screening

In Level 2B, the remaining alternatives were grouped to form Basic Scenarios for further evaluation.

2.3.1 Basic Scenarios

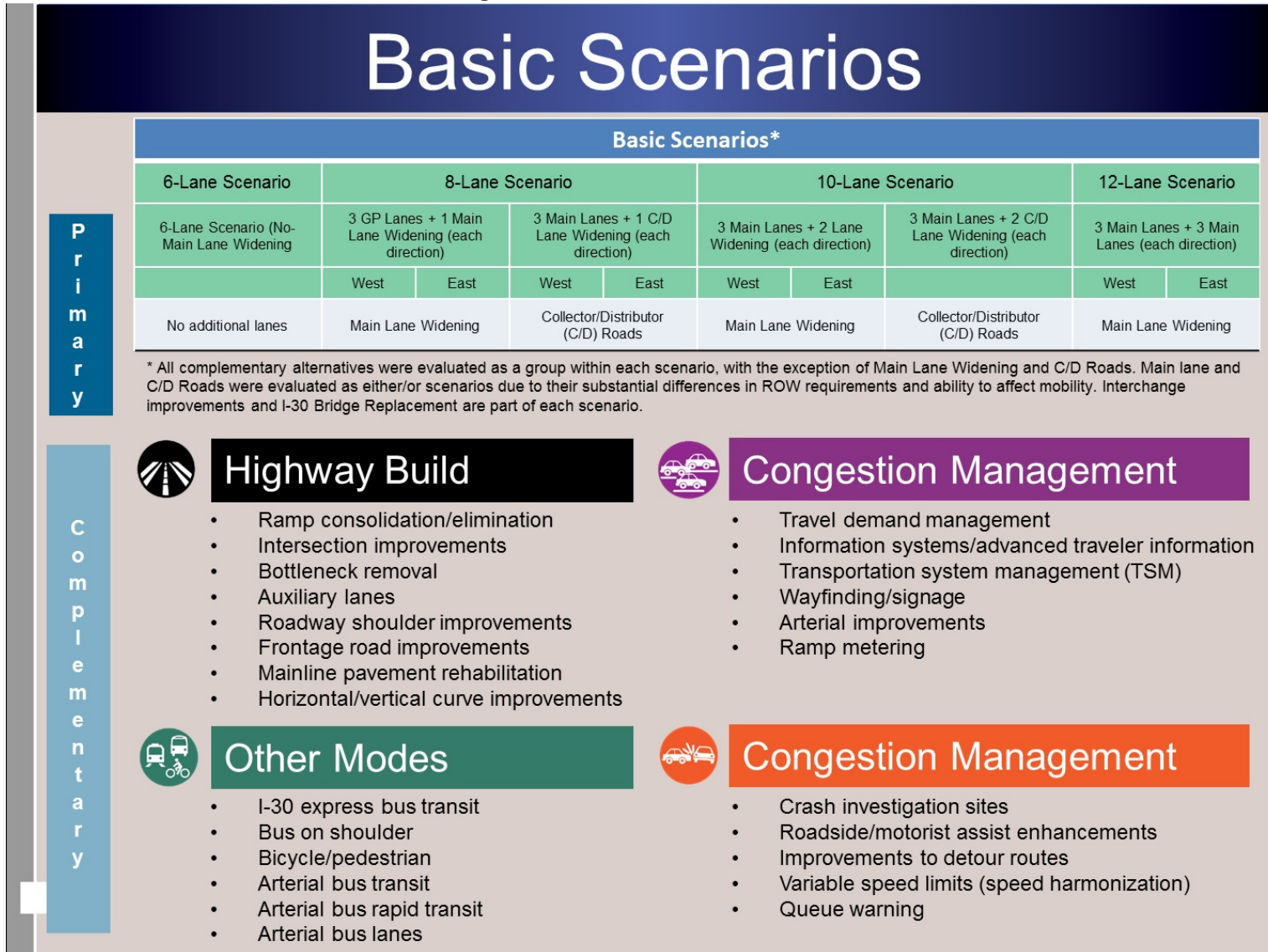
The Basic Scenarios were developed to evaluate a reasonable range of combinations of Primary and Complementary Alternatives. The Primary Alternatives by definition have the most direct ability to meet the goals and objectives of the project, so varying the specifics of the Primary Alternatives in the Basic Scenarios provides the most insight into that scenario's overall performance. Thus, Basic Scenarios were developed based upon the number of lanes throughout the I-30 corridor, including 6, 8, 10, and 12-lane options. Because I-30 is a 6-lane facility currently, the 6-Lane Basic Scenario would not add any additional main lane capacity.² The 8-lane Basic Scenario adds one additional lane in each direction, the 10-lane Basic Scenario adds two additional lanes in each direction, and the 12-lane Basic Scenario adds 3 lanes in each direction. In addition, the I-30 Bridge Replacement was included in all Basic Scenarios, with the overall width of the bridge replacement driven by the number of main lanes in the scenario. Interchange Improvements were also identified as a Primary Alternative. However, to focus the analysis on the number of main lanes and the bridge replacement across the Arkansas River, interchange improvements were not evaluated in Level 2. Interchange improvements and options will be further developed and evaluated as part of Level 3.

The Basic Scenarios as described above were further defined for analysis by adding the remaining Complementary Alternatives. The Basic Scenarios represent complete transportation solutions that incorporate other modes and the latest technologies with highway build improvements to develop comprehensive transportation scenarios for analysis. The compilation of these Basic Scenarios is illustrated in **Figure 2** and further described below.

² Assumed that the 6-lane facility would occur within the existing project footprint and that bridge replacement would occur on the existing project centerline. However, should it be determined that the bridge replacement needs to be constructed to the east or west of the existing centerline to maintain traffic flow resulting in a change to the project footprint, adverse direct impacts to environmental measures would be anticipated.

1

Figure 2. Level 2B Basic Scenarios



2

As shown in **Figure 2**, the 6-Lane Basic Scenario (no main lane widening) was developed with the I-30 Arkansas River Bridge Replacement and remaining Complementary Alternatives (those that passed Level 2A screening) in an effort to achieve the study goals without adding lanes to the existing roadway.

Also shown in **Figure 2**, the 8, 10, and 12-lane Basic Scenarios were developed with the I-30 Arkansas River Bridge Replacement and the remaining Complementary Alternatives. However, given the agency and public input regarding C/D lanes in lieu of main lanes, the team developed scenarios for each type of capacity addition. A C/D system is a freeway main lane that is separated from the through traffic main lanes. The C/D system provides access to the local service interchanges, thereby eliminating most of the weaving areas from the I-30 main lanes.

In addition, the team tested the same set of Complementary Alternatives with each main lane or C/D scenario. The dependence and relative importance of the Complementary Alternatives is more significant with a fewer number of added main lanes or C/D roads. The ultimate goal is to find the optimal combination of lane widening and Complementary Alternatives to meet the study goals.

For evaluation purposes, the C/D roads were located in the sections of the I-30 facility with heavy traffic moving into and out of the downtown areas. The C/D road for the southbound 10-lane scenario was assumed to begin north of 15th Street in North Little Rock and terminate just south of 6th Street in Little Rock. The C/D road for the northbound 10-lane scenario was assumed to begin south of 6th Street in Little Rock and terminate north of 9th Street in North Little Rock. C/D roads for the 8-lane scenario were assumed to begin near Broadway Street in North Little Rock and terminate south of 6th Street in Little Rock. The addition of C/D roads results in Basic Scenarios with wider footprints than the main lane widening Basic Scenarios (190 feet for the 8-lane C/D compared to 142 feet for the 8-lane with main lane widening, and 214 feet for the 10-lane C/D compared to 166 feet for the 10-lane with main lane widening). Outside the beginning and end points of the C/D system, the roadway would narrow to the same width as the main lane options (142 feet for 8-lanes with main lane widening and 166 feet for 10-lanes with main lane widening). As a result of the beginning and end points of the C/D road, 2 C/D lanes plus auxiliary lanes between interchanges would be required in each direction to serve the demand.

Each widening Basic Scenario, with the exception of the 10-lane C/D Basic Scenario, also has an east and a west option. This represents the location of the bridge replacement, with staged construction of the new bridge beginning to the east or west of the existing bridge. The first stage will include construction of a new structure wide enough to carry at least 6 lanes of traffic, built as closely as possible to the existing bridge while the old bridge is still open to traffic. Once the first stage of the new bridge construction is completed, traffic will be diverted to the new structure and the old bridge will be removed. The remaining portion of the new bridge will then be constructed while traffic remains open on the recently completed section. In this way, the bridge is constructed taking as little ROW as possible, while keeping at least 6 lanes of traffic

open at all times. Separate Basic Scenarios (east and west) were created for each lane option due to the different environmental impacts on either side of the bridge. The 10-lane C/D Basic Scenario widens to both sides of the existing bridge location, and therefore does not have an east/west option.

2.3.2 Level 2B Process

Historical growth rates and the CARTS travel demand model were used to estimate 2040 traffic volumes in the study area (existing and forecasted traffic volumes are presented in the *CA0602 Traffic and Forecast Plan*, December 2014, included as part of the project file with AHTD). Analysis was performed to quantify the volume of traffic that could be attracted to or diverted away from I-30 as a result of changes in corridor capacity and Complementary Alternative improvements, such as transit in the study area. These volumes were then added to or subtracted from the projected 2040 volumes to produce modified I-30 traffic demand. The resulting volumes were then used as the basis for a high level evaluation of the various lane scenarios and the impact that C/D roads could provide compared to main lane analysis only. This analysis is only a snapshot at three locations along the corridor and does not take into account downstream queuing or main lane merge, diverge or weaving. The target Level-of-Service (LOS) of D is AHTD's standard for an urban corridor during the peak hour of travel. Additional analyses were completed to measure the Basic Scenarios performance against the alternate performance standard of LOS E as shown on **Attachment C**. Should that standard be adopted by AHTD for this project, the congestion relief related evaluation scoring for the Basic Scenarios will be reconsidered.

The Level 2B Transportation Analysis described above is provided in **Attachment C**.

Impacts to environmental resources were assessed using the general footprint for each Basic Scenario. Utilizing ArcGIS, each footprint was overlaid with the identified environmental constraints of the I-30 PEL study area. Given that many of the Complementary Alternatives would either be implemented by other agencies in the future (e.g., arterial improvements, express bus transit, etc.) or the design has not been fully developed at this level of screening (e.g., intersection improvements, ramp consolidation/elimination, etc.) the footprint and location of many Complementary Alternatives remain unknown. Accordingly, at the Level 2B screening, all environmental impacts were assessed within the known footprints of the 6-lane, 8-lane, 8-lane C/D, 10-lane, 10-lane C/D, and 12-lane Basic Scenarios, exclusive of interchanges.

Costs for construction, ROW and utilities were assumed to vary proportionately to the width of the typical sections for the alternatives. More detailed cost estimates will be developed in Level 3 when interchange locations, ramp configurations, and cross street layouts are known.

2.3.3 Level 2B Scoring

In Level 2B, the qualitative rating system shown in **Table 1** was used to score each Basic Scenario against the measures established based on the study goals. The measures utilized to evaluate the Basic Scenarios fall into the following 4 groups:

Mobility

1. Mobility in the PEL study area
2. Total travel time savings
3. Average peak hour travel speed through corridor
4. Mobility of key intersections within PEL study area
5. Travel time to key destinations in PEL study area
6. Locations allowing for local street connectivity
7. Designs that allow for open spaces across I-30
8. Grade separated bicycle/pedestrian accommodations across I-30
9. Transit ridership in the PEL study area
10. Severity of I-30 lane closures, detours during construction
11. Severity of river closures during construction
12. Location of navigational impediments (Bridge Piers)
13. Access to existing/potential business sites within the PEL study area
14. Mobility on I-30 main lane

Safety

1. Potential accident reductions
2. Emergency vehicle travel time
3. I-30 main lane conflict points in weaving/merge/diverge areas
4. Number of ramps per mile on I-30 in the study area
5. Ramp acceleration and deceleration lengths
6. I-30 roadway and bridge structural conditions
7. Arterial connection conflict points

Cost

1. Total conceptual cost to AHTD
2. Total cost of ROW acquisition
3. Impact to major utilities and infrastructure
4. Total investment required by others

Environmental

1. Potential direct impacts to ROW/parcels/structures
2. Potential displacements
3. Are EJ/LEP populations present in the study area?
4. Is there potential for adverse impacts to EJ/LEP populations?
5. Is there potential for beneficial impacts and/or reasonable mitigation to offset any potential adverse impacts to EJ/LEP populations?
6. Potential direct impacts to recorded archaeological sites
7. Potential direct impacts to National Register of Historic Places (NRHP) or NRHP-eligible sites
8. Potential direct impacts to parks
9. Potential direct impacts to surface water crossings, wetlands
10. Potential direct impacts to listed and non-listed species and/or habitat, and rare locally important species
11. Potential direct impacts to high risk hazardous material sites

- 12. Potential noise impacts
- 13. Meeting comments and local resolutions

The study team's goal was to ensure an equitable scoring system in Level 2B that gave equal proportionate weighting to the four groups of project measures. However, if the scores for each of the measures were simply added for each alternative, the Safety and Cost groups would have been undervalued due to their low number of measures (7 for Safety and 4 for Cost compared to 14 for Mobility and 13 for Environmental).

In order to give the four groups equal weight, the scores were averaged within each group and then summed for each scenario so that each group provided 25% of the scoring. The resulting scores were then multiplied by 38, the number of measures in Level 2B analysis.

The scoring process for the 10-Lane C/D scenario is provided below in **Tables 5 – 9** as an example.

Table 5. Example Scoring for Mobility – 10-Lane C/D Scenario

	Mobility Measures	Rating	Score
1	Mobility in PEL Study Area	++	2
2	Total travel time savings	++	2
3	Average peak hour travel speed through corridor	++	2
4	Mobility of key intersections within PEL Study Area	+	1
5	Travel time to key destinations in PEL Study Area	++	2
6	Locations allowing for local street connectivity	+	1
7	Designs that allow for open spaces across I-30	+	1
8	Grade separated bike / pedestrian accommodations across I-30	+	1
9	Transit ridership in the PEL Study Area	+	1
10	Severity of I-30 lane closures, detours during construction	-	-1
11	Severity of river closures during construction	-	-1
12	Location of navigational impediments (Bridge Piers)	++	2
13	Access to existing / potential business sites within the PEL Study Area	++	2
14	Mobility on I-30 Main Lanes	++	2
	Total		17

Table 6. Example Scoring for Safety – 10-Lane C/D Scenario

	Safety Measures	Rating	Score
1	Potential accident reductions	++	2
2	Emergency vehicle travel time	++	2
3	I-30 main lane conflict points in weaving / merge / diverge areas	+	1
4	Number of ramps per mile on I-30 in the study area	+	1
5	Ramp acceleration and deceleration lengths	++	2
6	I-30 roadway and bridge structural conditions	++	2
7	Arterial connection conflict points	+	1
	Total		11

Table 7. Example Scoring for Cost – 10-Lane C/D Scenario

	Cost Measures	Rating	Score
1	Total conceptual cost to AHTD	--	-2
2	Total cost of ROW acquisition	--	-2
3	Impact to major utilities and infrastructure	--	-2
4	Total investment required by others	-	-1
	Total		-7

Table 8. Example Scoring for Environmental – 10-Lane C/D Scenario

	Environmental Measures	Rating	Score
1	ROW / parcels / structures impacted	-	-1
2	Displacements	-	-1
3	Are EJ populations present within the I-30 PEL study area?	yes	0
4	Is there a potential for adverse impacts to EJ/LEP populations (e.g., displacements within EJ/LEP areas)?	yes	-1
5	Is there potential for beneficial impacts and/or mitigation to offset any potential adverse effects to EJ/LEP populations (e.g., improved mobility, safety, community cohesion, etc.)?	yes	1
6	Recorded archaeological sites potentially impacted	O	0
7	NRHP or NRHP-eligible sites potentially impacted	O	0
8	Park impacts	--	-2
9	Surface water crossings, wetlands	--	-2
10	Potential impacts to listed and non-listed species and/or habitat, and rare locally important species	--	-2
11	High risk hazardous material sites impacted	-	-1
12	Noise receivers directly adjacent	-	-1
13	Meeting comments and local resolutions	O	0
	Total		-10

The scores within each group were averaged, and then summed to give a total score for the scenario, as shown below in **Table 9**.

Table 9. Example Scoring for all Groups – 10-Lane C/D Scenario

Group	Score / Number of Measures	Average
Mobility	17 / 14	1.214
Safety	11 / 7	1.571
Cost	-7 / 4	-1.750
Environmental	-10 / 13	-0.769
	Total	0.266

The total was then divided by 4 to give the average for all 4 measures.

$$0.266/4 = 0.0665$$

This number was then multiplied by 38, the number of measures, to give the final score.

$$0.0665 \times 38 = 2.53$$

Each scenario was scored in this manner.

Assumptions used in the Level 2B screening analysis are presented in **Table 10** below. Supporting qualitative data is included in **Attachments B, C and D**. The matrix presented in **Table 11** shows the ratings for the Basic Scenarios against each of the Level 2B screening measures, based on the study goals. For the Level 2B Screening, the No-Action Alternative was scored in the same manner and against the same mobility, safety, cost and environmental measures as the Basic Scenarios. Evaluating the No-Action Alternative in this manner gave a quantifiable score that was compared to the various Basic Scenarios and which provided a better understanding of the performance and impacts resulting from the No-Action Alternative.

Table 10. Level 2B Screening Assumptions

Alternatives		Mobility	Safety	Cost	Environmental ¹
No-Action		<ul style="list-style-type: none"> Normal operations and maintenance only. Other regional projects identified in the Metroplan Long Range Plan would be implemented. No-Action Alternative scored against same measures for Mobility and Safety as other Action Alternatives for baseline comparison. 		<ul style="list-style-type: none"> No capital improvements would be made to I-30 or I-40. Other regional projects identified in the Metroplan Long Range Plan would be implemented. No-Action Alternative scored against the same measures for Cost as other Action Alternatives for baseline comparison. 	<ul style="list-style-type: none"> No additional ROW required. No-Action Alternative scored against the same criteria for Environmental Impacts as other Action Alternatives for baseline comparison.
Action Alternatives	Scenario	Description			
	6-lane Basic Scenario ²	No Main Lane Widening	<ul style="list-style-type: none"> Impacts located in the PEL study area. Only peak hour benefits were analyzed. Used Metroplan’s Travel Demand Model results to determine the change in travel demand with varying number of through lanes. 	<ul style="list-style-type: none"> Conceptual ROW and utility costs to AHTD were assumed to increase as the roadway/bridge width increased. 	<ul style="list-style-type: none"> Impacts to environmental resources assessed using the general footprint for each Basic Scenario. Footprints overlaid with environmental constraints. Because footprint/location of many Complementary Alternatives is unknown, all environmental impacts were assessed within the known footprints of the 6-lane, 8-lane, 8-lane C/D, 10-lane, 10-lane C/D and 12-lane Basic Scenarios. Assumptions for environmental measures: <ul style="list-style-type: none"> ROW/parcels/structures: rated based on the number of parcels where new ROW would potentially be required. Potential displacements: rated based on the number of structures potentially affected by new required ROW. EJ/LEP: rated based on the anticipated level of potential impact to the following three questions: <ol style="list-style-type: none"> Are EJ/LEP populations present within the study area? Is there a potential for adverse direct impacts (displacements) to EJ/LEP populations? Is there a potential for beneficial impacts and/or mitigation to offset any potential adverse impacts to EJ/LEP populations (e.g., improved mobility, safety, community cohesion, etc.)? Potential direct impacts to recorded archaeological sites and NRHP or NRHP-Eligible Sites: rated based on the number of sites potentially directly impacted within the proposed alternative footprint. Potential direct impacts to parks: rated based on the number of parks potentially impacted multiplied by the typical section width at the Arkansas River Bridge crossing (all potential park impacts to occur near the river crossing). The wider the typical section, the greater anticipated impacts. Potential direct impacts to surface water crossings: rated based on the typical section width at the Arkansas River Bridge crossing, with the wider the typical section, the greater anticipated impacts. Potential direct impacts to listed and non-listed species and/or habitat, and rare locally important species: rated based on the number of new habitat areas potentially crossed. Potential direct impact to high risk hazardous material sites: rated based on the number of encroachments on hazardous material sites and potential impacts to sites. Potential noise impacts: rated based on the potential impact to parcels containing sensitive receptors and the likelihood of feasible and reasonable noise mitigation.
	8-lane Basic Scenario	3 Main Lanes + 1 Main Lane Widening (each direction)	<ul style="list-style-type: none"> Bypass was assumed to be at Chester Street. Transportation assessment of Complementary Alternatives (except for the 12-lane Scenario, which used Metroplan model results)(Attachment C) I-30 PEL Transit Analysis was used (Attachment B) 		
		3 Main Lanes + 1 C/D Lane Widening (each direction)	<ul style="list-style-type: none"> CATA 10-Year Strategic Plan was used. 8-lane Basic Scenario – C/D lanes would run from approximately Broadway Street in North Little Rock to south of 6th Street in Little Rock. For this C/D system, a 1-lane plus auxiliary lane C/D system would be needed. 		
	10-lane Basic Scenario	3 Main Lanes + 2 Main Lane Widening (each direction)	<ul style="list-style-type: none"> 10-lane Basic Scenario – The southbound C/D lanes would run from near 15th Street in North Little Rock to south of 6th Street in Little Rock. The northbound C/D lanes would begin south of 6th Street in Little Rock and terminate north of 9th Street in North Little Rock. For this C/D system, a 2-lane plus auxiliary lane C/D system would be needed. 		
3 Main Lanes + 2 C/D Lane Widening (each direction)		<ul style="list-style-type: none"> Adding 1-lane C/D would operate better than adding 1 main lane. 			
12-lane Basic Scenario	3 Main Lanes + 3 Main Lane Widening (each direction)				

¹ See **Attachment D** for additional details on the screening methodology for environmental measures, including EJ/LEP.

² Assumed that the 6-lane Basic Scenario would occur within the existing project footprint and that bridge replacement would occur on the existing project centerline. However, should it be determined that the bridge replacement need to be constructed to the east or west of the existing centerline to maintain traffic flow resulting in a change to the project footprint, additional adverse direct impacts to environmental measures would be anticipated.

Table 11. Level 2B Screening Matrix

Goals	Color Codes for Measures		No Action	6-lane Scenario		8-lane Scenario		10-lane Scenario		12-lane Scenario			
	Measures ⁴	Bridge Location		6-lane Scenario ⁷ (No-Main Lane Widening)	3 Main Lanes + 1 Main Lane Widening (each direction)		3 Main Lanes + 1 C/D Lane ² Widening (each direction)		3 Main Lanes + 2 Main Lane Widening (each direction)		3 Main Lanes + 2 C/D Lane ³ Widening (each direction)		
					West	East	West	East	West	East	West	East	
	Maximum Main Lane Width ¹ (Sq. Ft. of Pavement)		102	118	142 (3.55M)		190 (3.85M)		166(4.15M)		214(4.58M)	190(4.75M)	
Enhance Mobility	Mobility in PEL Study Area		--	--	0	0	0	0	+	+	++	++	++
	Total travel time savings		--	--	0	0	0	0	+	+	++	++	++
	Average peak hour travel speed through corridor		--	--	0	0	0	0	+	+	++	++	++
Access to Downtown	Mobility of key intersections within PEL Study Area		--	+	+	+	+	+	+	+	+	+	+
	Travel time to key destinations in PEL Study Area		--	--	0	0	0	0	+	+	++	++	++
East-West Connectivity	Locations allowing for local street connectivity		--	-	+	+	+	+	+	+	+	+	+
	Designs that allow for open spaces across I-30		--	-	+	+	+	+	+	+	+	+	+
Connect Bicycle/Pedestrian Friendly Facilities	Grade separated bike / ped accommodations across I-30		0	+	+	+	+	+	+	+	+	+	+
Accommodate Existing Transit and Future Transit	Transit ridership in the PEL Study Area		+	++	++	++	++	++	++	++	++	++	++
	Potential accident reductions		--	-	0	0	+	+	++	++	++	++	++
System Reliability	Emergency Vehicle Travel Time		--	-	0	0	+	+	++	++	++	++	++
	Severity of I-30 lane closures, detours during construction		++	--	--	--	-	-	-	-	-	-	-
Minimize Roadway Disruptions	Severity of river closures during construction		++	0	-	-	-	-	-	-	-	-	-
	Location of navigational impediments (Bridge Piers)		--	++	++	++	++	++	++	++	++	++	++
Improve Safety	I-30 main lane conflict points in weaving / merge / diverge areas		--	+	+	+	+	+	+	+	+	+	+
	Number of ramps per mile on I-30 in the study area		--	+	+	+	+	+	+	+	+	+	+
	Ramp acceleration and deceleration lengths		--	++	++	++	++	++	++	++	++	++	++
	I-30 Roadway and bridge structural conditions		--	++	++	++	++	++	++	++	++	++	++
	Arterial connection conflict points		--	+	+	+	+	+	+	+	+	+	+
Opportunity for Economic Development	Access to existing / potential business sites within the PEL Study Area		--	--	-	-	0	0	+	+	++	++	++
	Total conceptual cost to AHTD		++	0	-	-	-	-	-	-	-	-	-
Maximize Cost Efficiency	Total cost of ROW acquisition		++	0	-	-	-	-	-	-	-	-	-
	Impact to major utilities and infrastructure		++	0	-	-	-	-	-	-	-	-	-
	Total investment required by others		0	-	-	-	-	-	-	-	-	-	-
Community Impacts ⁵	ROW / parcels / structures potentially directly impacted		0	0	-	-	-	-	-	-	-	-	-
	Potential displacements		0	0	-	-	-	-	-	-	-	-	-
	Are EJ populations present within the I-30 PEL study area? ⁶		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Is there a potential for adverse direct impacts (displacements) to EJ/LEP populations? ⁶		no	no	yes	yes	yes	yes	yes	yes	yes	YES	YES
	Is there potential for beneficial impacts and/or mitigation to offset any potential adverse effects to EJ/LEP populations (e.g., improved mobility, safety, community cohesion, etc.)? ⁶		no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cultural Resource Impacts ⁵	Recorded archaeological sites potentially directly impacted		0	0	0	0	0	0	0	0	0	0	0
	NRHP or NRHP-eligible sites potentially directly impacted		0	0	0	0	0	0	0	0	0	--	--
Natural Resource Impacts ⁵	Potential direct park impacts		0	0	-	-	--	--	-	-	--	--	--
	Potential direct surface water crossings, wetlands impacts		0	0	-	-	--	--	-	-	--	--	--
	Potential direct impacts to listed and non-listed species and/or habitat, and rare locally important species		0	0	-	-	--	--	-	-	--	--	--
Other Impacts ⁵	High risk hazardous material sites potentially directly impacted		0	0	-	-	-	-	-	-	-	-	-
	Potential noise impacts		0	0	-	-	-	-	-	-	-	-	-
Commitment to Voters Public / Agency Input	Mobility on I-30 Main Lanes		--	-	+	+	+	+	++	++	++	+	+
	Meeting comments and local resolutions		--	-	+	+	+	+	+	+	0	0	0
SCORE			-25	-4	2	2	3	3	12	12	11	4	4
Weighted Score			-16.39	-0.97	-0.99	-0.99	0.89	0.89	8.46	8.46	2.53	-10.13	-10.13
Mobility			14	-1.071	-0.643	0.357	0.357	0.500	0.500	0.857	0.857	1.214	1.143
Safety			7	-2.000	0.714	1.000	1.000	1.286	1.286	1.571	1.571	1.571	1.571
Cost			4	1.500	-0.250	-1.000	-1.000	-1.000	-1.000	-1.000	-1.750	-1.750	-1.750
Environmental			13	-0.154	0.077	-0.462	-0.462	-0.692	-0.692	-0.538	-0.538	-0.769	-1.231

Scoring Legend	
++	Substantial Positive Effects
+	Some Positive Effects
0	Neutral Effects
-	Some Negative Effects
--	Substantial Negative Effects

¹Maximum roadway and bridge width does not include interchanges, cross streets and ramps in Level 2.

²8-lane C/D extends from near Broadway Street in North Little Rock to just south of 6th Street in Little Rock (Approximately 20% of the study corridor.)

³10-lane Southbound C/D extends from near 15th Street in North Little Rock to south of 6th Street in Little Rock. 10-Lane northbound C/D begins south of 6th Street in Little Rock and terminates north of 9th Street in North Little Rock. (Approximately 40% of the study corridor.)

⁴Measures used to evaluate alternatives in Level 2 screening are defined in the accompanying document CA0602 PEL Alternative Screening Methodology.

⁵Potential direct impacts to environmental resources evaluated based on anticipated footprints of the alternatives.

⁶ See **Attachment D** for additional detail on the screening methodology for environmental measures, including EJ/LEP.

⁷ Assumed that the 6-lane Basic Scenario would occur within the existing project footprint and that bridge replacement would occur on the existing project centerline. However, should it be determined that the bridge replacement needs to be constructed to the east or west of the existing centerline to maintain traffic flow resulting in a change to the project footprint, additional adverse direct impacts to environmental measures would be anticipated.

2.3.4 Level 2B Screening Results

In summary, the Cost and Environmental category evaluation results are mostly tied to section and ROW needs, generally the greater the Cost and Environmental evaluation impacts. Mobility and Safety categories do not necessarily correlate to the footprint size the same way as Cost and Environmental. Based on the future traffic demand in the 2040 design year, a wider typical section than existing conditions would better accommodate mobility. There is a point where additional lanes would not have an incremental benefit to mobility. Also, because there is a significant amount of traffic destined to either downtown North Little Rock or Little Rock, separation of the through traffic and local traffic with a C/D system would be beneficial from a mobility stand point. Other Cost and Environmental impacts are introduced with a C/D system as described above. Finally, both additional lanes and a C/D system can provide solutions to existing safety problems. However, a typical section with additional lanes does increase weaving and the potential for crashes. A C/D system can help reduce crashes by separating local traffic from through traffic, but Cost and Environmental impacts are introduced with a C/D system as described above, due to the increased typical section.

As mentioned in **Section 3.0**, east and west Basic Scenarios were created for each lane option (except the 10-lane C/D) because different environmental impacts are anticipated depending on the location of the bridge replacement. However, as shown in **Table 11**, the east and west options of each respective Basic Scenario showed no differentiation between the ratings of potential direct impacts for the environmental measures. This is because at the Level 2B Screening stage, scoring was based on threshold ranges associated with each specific environmental measure. For example, the threshold range for potential direct impacts to parcels was 1-40 parcels potentially impacted = single negative (-) with a score of -1; and 40 or more parcels potentially impacted = double negative (--) with a score of -2. Although there are differences between the potential impacts to the respective environmental measures resulting from the east and west options, these differences were not large enough to differentiate the ratings at this high level of screening. For those Basic Scenarios moving forward, the detailed and highly specific nature of the Level 3 Screening will quantify the differences in potential impacts between east and west options.

The following section summarizes the Basic Scenarios that were screened out from Level 2B and the Basic Scenarios that are proposed to move forward to Level 3.

2.3.5 Screened Out Scenarios

The following Basic Scenarios were screened out from further consideration due to their low scores in the Level 2B screening.

- **6-Main Lanes** (3 main lanes in each direction) – This Basic Scenario was screened out because it failed to substantially improve mobility and safety in the study area, and as traffic volumes continue to increase, the conditions will grow progressively worse over the next 20 years.
- **8-Main Lanes** (4 main lanes in each direction) East and West Basic Scenarios – These scenarios were screened out because they incurred costs

and environmental impacts while not adequately addressing mobility and safety in the study area. While the 8-lane Scenario did meet the LOS D standard at 2 of 3 analysis points using the HCM Methodology (**Attachment C**), it failed to meet that standard at one analysis point with a calculated LOS F (AM Peak) and a LOS E (PM Peak). Given that the high level analyses fails to account for the effects of merging and diverging traffic, which is prevalent throughout the corridor, it is likely that the HCM analysis overstates the actual performance of the 8-Lane Scenario, especially when the LOS standard of D is applied. Should the LOS E standard be applied, additional analyses is required to validate these results and to truly test the efficiency of the 8-Lane option when merge and diverge traffic is accounted for. Although this scenario would require additional ROW, particularly near the I-30 Bridge over the Arkansas River, which resulted in impacts to parks, water crossings, endangered species, and hazardous material sites, this scenario had fewer environmental impacts than all other scenarios except the No-Action and 6-lane Basic Scenario.

- **12 Main Lanes** (6 main lanes in each direction) East and West Basic Scenarios – These scenarios were screened out because HCM traffic analysis shows that the 10-lane alternatives were capable of addressing mobility and safety along the study corridor, and therefore the extra lanes were not needed. These scenarios also had high construction, ROW and utility costs, along with the most serious impacts to parks, water crossings, endangered species, hazardous material sites, and parcels, many of which resulted in displacements, as compared to all other main lane widening and C/D scenarios.

2.3.6 Scenarios Moving Forward To Level 3 Screening

The following Basic Scenarios received the highest scores in the Level 2B screening process, and therefore will be advanced as *Reasonable Alternatives*, along with the No-Action alternative.

- **No-Action** – Although the No-Action has few environmental impacts and costs are low, mobility and safety were rated poorly as a result of the No-Action not meeting the study's goals. (**Level 2B Score = -16.39**)
- **8-lane C/D** (3 main lanes + 1 C/D lane in each direction) East and West Scenarios – This scenario included adding 1 C/D lane in each direction from near 7th Street in North Little Rock to just south of Broadway Street in North Little Rock. Outside the location of the C/D road, the new facility included 4 main lanes in each direction, with the same footprint as the 8 main lane Basic Scenarios. This scenario will also include replacement of the I-30 Bridge over the Arkansas River, with the new bridge width extending to the east or to the west of the existing bridge location. These scenarios were advanced because the scenarios work toward minimizing the cost and environmental

impacts to parks, water crossings, endangered species, hazardous material sites, and parcels. While this scenario received neutral or positive ratings on the mobility measures, the cost and environmental impacts of the footprint required to incorporate the C/D roads (wider than the 8-lane Main Lane Scenarios) caused some negative impact on the score. Both east and west options are being carried forward because environmental impacts vary based upon the location of the proposed bridge, which will be differentiated during the Level 3 Screening analysis.

High level analysis indicates that a 2-lane C/D would be needed to meet the demand for the assumed C/D beginning and end points near 7th Street in North Little Rock to just south of 6th Street in Little Rock. In order for a 1-Lane C/D to operate at a desirable level of mobility, the beginning and end points would have to be modified to near 7th Street in North Little Rock to just south Broadway in North Little Rock. **(Level 2B Score = 0.89)**

- **10 Main Lanes** (5 main lanes in each direction) East and West Basic Scenarios – These scenarios included widening on both sides of the current 6-Lane facility to 10 main lanes throughout the corridor, 5 lanes in each direction, with the new I-30 Bridge over the Arkansas River being constructed to the east or to the west of the existing bridge. Most of the widening will occur within the existing ROW, except for at the Arkansas River Bridge, the proposed frontage road extension over the Union Pacific Railroad to the west of I-30, and a few smaller parcels. Other areas may be impacted depending on the location of interchanges, which will be determined in Level 3. These scenarios scored high due to improvements to mobility and safety, and the relatively smaller footprint than the scenarios with C/D roads. Both east and west options are being carried forward because environmental impacts vary based upon the location of the proposed bridge, which will be differentiated during the Level 3 Screening analysis. **(Level 2B Score = 8.46)**
- **10-lane C/D** (3 main lanes + 2 C/D lane in each direction) – This scenario included adding 2 C/D lanes in each direction from near 7th Street in North Little Rock to just south of 6th Street in Little Rock. Outside the location of the C/D roads, the new facility included 5 main lanes in each direction, with the same footprint as the 10 Main Lane Scenarios. This scenario will also include replacement of the I-30 Bridge over the Arkansas River, with the new bridge width extending to the east and west of the existing bridge location. This scenario received high scores for mobility and access, but had lower environmental and cost scores due to the larger footprint of the C/D roads. The total score was still higher than all other scenarios other than the 10 Main Lane Scenarios. **(Level 2B Score = 2.53)**

The Basic Scenarios moving forward to Level 3 Screening will be refined to include intersection and interchange improvements in order to evaluate the connections to the local street grid and to other modes. In Level 3, a micro-simulation model will be used to

perform a comprehensive mobility assessment within the I-30 PEL study area. The analysis will begin with the evaluation of the highest scored Basic Scenario of 10 main lanes throughout the corridor, with a target Level-of-Service (LOS) of D, with consideration also given to LOS E. If the model shows that sections of the roadway will operate at a better LOS than the target, the model will be modified to evaluate the performance of fewer lanes in that area. This means that a 10 lane section could be reduced to 8 lanes in some sections of the corridor or conversely, sections of the corridor may need to be increased to 12 lanes in other sections. This iterative process will continue until the number of lanes necessary to achieve the target LOS D (with consideration for LOS E) for the entire corridor is determined. A similar process will be used to evaluate the second highest scored 10-lane C/D Basic Scenario and the third highest scored 8-lane C/D Basic Scenario. The No-Action will also be analyzed in the Level 3 Screening.