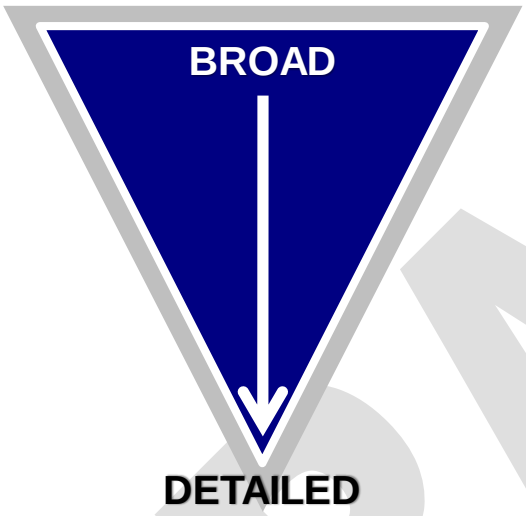
Willow Road Study
CAG Meeting #6
November 18, 2010

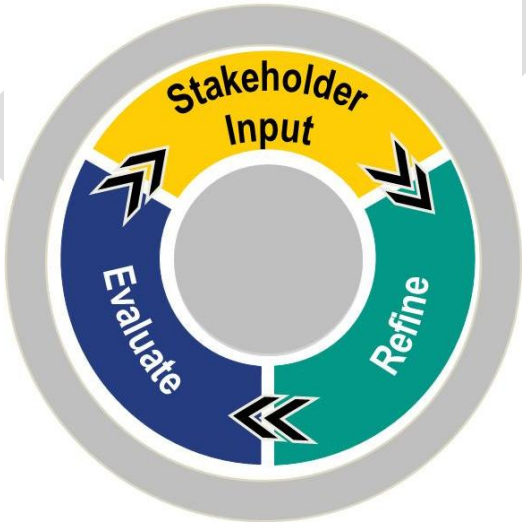
DRAFT Alternatives Development and Evaluation Process Outline

INTRODUCTION

The purpose of this document is to describe how proposed alternatives will be developed and evaluated for the Willow Road Phase I Study. The process begins with defining a list of alternatives, based upon stakeholder input, the problem statement, and supporting technical analysis. Once the alternative list is defined, basic characteristics will be added such as the number of lanes, location of ramps, and their respective termini (where the improvement ends and begins), which will be sufficient information for travel demand modeling and performing the safety analysis (see Figure 1 on the next page). The alternatives will be analyzed at a broad level of detail.



- The process starts at a broad level of detail, adding more specific detail as the process moves forward to a preferred alternative.



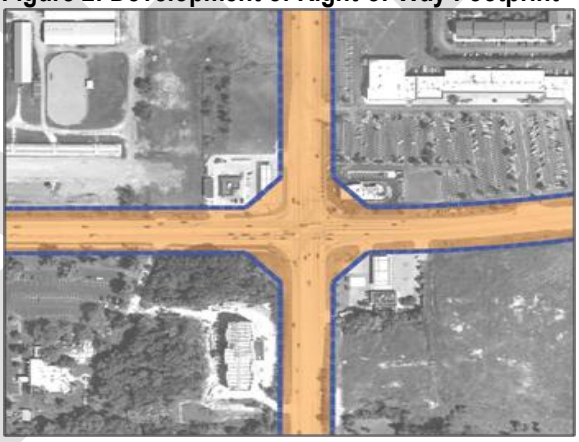
- Stakeholder input, alternative refinement, and continued evaluation are the key steps in each round of the alternative evaluation process.

The project Purpose and Need Statement will be used as an initial evaluation tool. At this level the locations of the alternatives are identified. All local and regional alternatives will be measured in terms of how they improve or enhance safety for all users, improve mobility, and improve facility condition and design along Willow Road from Illinois Route 43 (Waukegan Road) to Interstate 94 (Edens Expressway). Evaluation of alternatives will be based on relative comparisons to each other with a goal of improvement over the No-Build Alternative. It is possible that alternatives will meet the goal of a particular criteria item to varying degrees. But, if in comparison, one alternative better meets a criterion than other alternatives, relative differences can be identified. The project team will review the evaluation results and discuss them with the stakeholders.

Figure 1: Broad Level of Detail

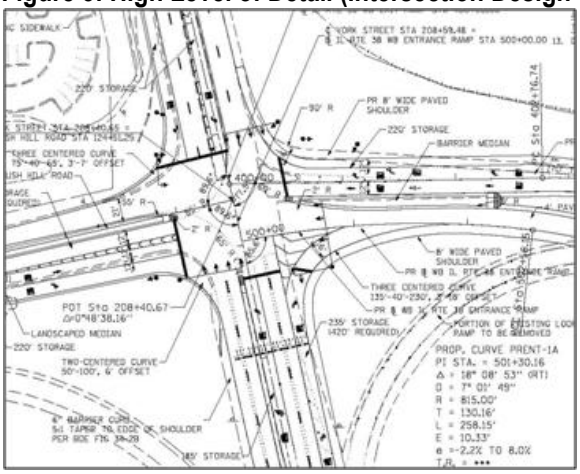
After the Purpose and Need round of evaluation, additional details will be added to measure impacts. The level of detail of the alternatives will increase. At this level of detail, the right-of-way footprint of the alternative is determined (see Figure 2). Order of magnitude costs estimates will be developed and the safety, mobility, and facility condition criteria will be further evaluated. Combinations of improvements may be developed. Evaluations of alternatives will continue to be based on relative comparisons to each other with a primary goal to improve over the No-Build Alternative. The project team will continue to review the evaluation results and discuss them with the stakeholders.

Figure 2: Development of Right-of-Way Footprint



After a public meeting where all of the alternatives will be shared with the public and input gathered, a third round of alternative evaluation will begin. Alternatives that perform poorly in comparison to other alternatives will be considered for removal from further study. For remaining alternatives, the level of detail increases further and project specific features are identified (see Figure 3). More detailed evaluation of comparison criteria will be completed. Elimination of the lowest performing alternatives, where appropriate, will be considered. At the end of this process the Preferred Alternative is selected.

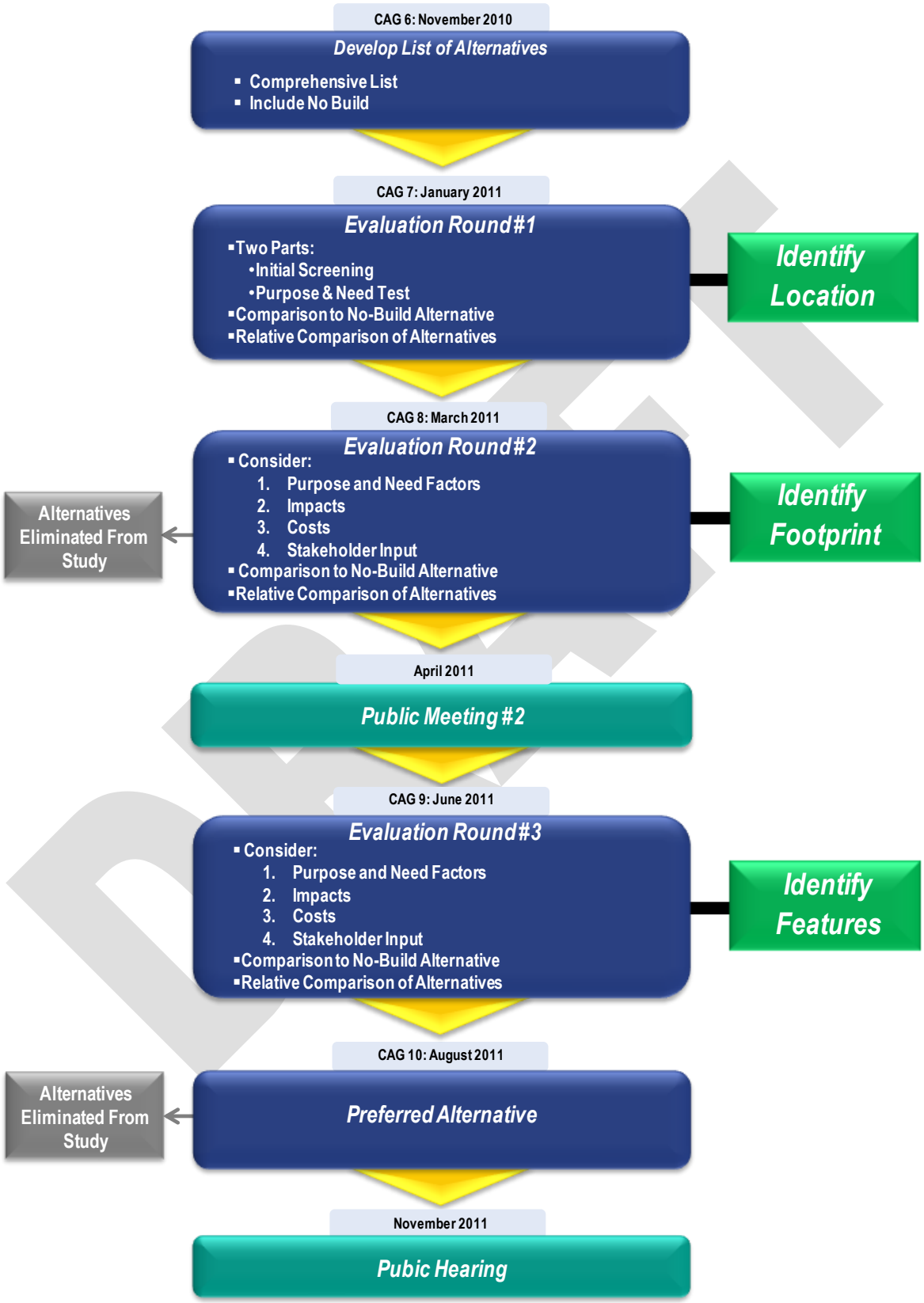
Figure 3: High Level of Detail (Intersection Design Study)



The Alternatives Development and Evaluation Process is being introduced to the CAG on November 18, 2010 for their review and further discussion at the upcoming CAG meeting in January 2011. Stakeholder input will be a constant during this process. Additional alternatives can be suggested at the next CAG meeting.

Figure 4 on the next page illustrates the flow of this process for the Willow Road Study.

Figure 4, Alternatives Development and Evaluation Process Diagram



ALTERNATIVES DEVELOPMENT AND EVALUATION PROCESS

BUILD LIST OF ALTERNATIVES

Based upon input received during the Willow Road Phase I Study and more specific discussions with the CAG, a list of roadway improvement alternatives will be developed. A draft list of alternatives based on input received to date from the CAG has been drafted to start discussions.

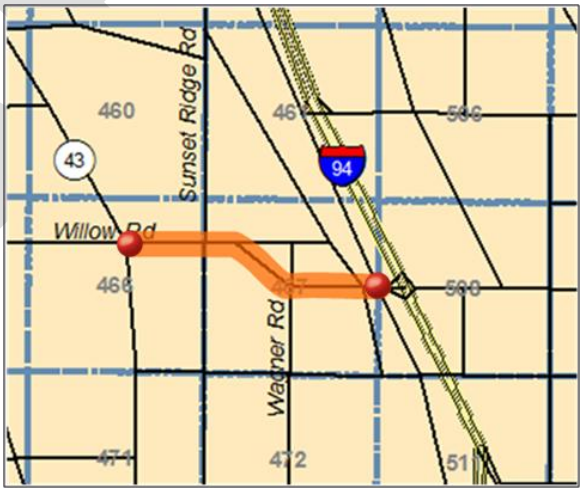
The initial list of alternatives will be stand alone projects, but as the process advances, combination alternatives may be identified and further evaluated. For example, if a regional alternative is found to be effective at improving safety and mobility on Willow Road between Waukegan Road and Interstate 94, but does not improve the facility condition, a combination alternative that includes reconstructing Willow Road may be developed.

A No-Build Alternative will be carried throughout this process and will be used as a basis for comparing the effectiveness of each alternative.

EVALUATION ROUND #1: INITIAL SCREENING & PURPOSE AND NEED TEST

Once the list of alternatives is defined, an initial screening will be completed to determine if any of the alternatives are sufficiently flawed to be dropped from consideration. A flaw is a characteristic or part of an alternative that would render it infeasible or impractical. Flaws would be assessed at a broad level of detail based on existing aerial photography. Flaws could include:

- Substantial direct impacts to residential or commercial buildings
- Substantial direct impacts to environmental or community resources
- Substantially high costs
- Located beyond the influence of the Willow Road Study area (e.g., widening expressways in downtown Chicago)



Whether these types of flaws exist with any of the initial alternatives will be determined once they are defined and discussed with stakeholders. Changes could be made to suggested alternatives to potentially address these flaws.

Stakeholder input will be sought to help complete this initial screening. Alternatives that pass this initial screening step would continue forward for more analysis.

After the initial screening the alternatives will be compared to determine how well they meet the project's Purpose and Need. Alternatives that do not adequately meet these needs (improve or enhance safety for all users, improve mobility, and improve facility condition and design) would be eliminated from further study. This comparison will be based on the conditions of Willow Road between Waukegan Road and Interstate 94.

Methodology and Evaluation Criteria:

The evaluation will consider a combination of safety, mobility, and facility condition and design factors with stakeholder input throughout the process.

- To evaluate an alternative's safety performance, the Highway Safety Manual will be used. Crash Modification Factors that can differentiate alternatives will be used in the model. The calculated safety performance of an alternative will be estimated.

- A travel demand model will be used to measure the mobility benefits of each alternative. Improved mobility will be evaluated in comparison to achieving LOS D at the intersection of Willow Road and Sunset Ridge Road, as this is the key intersection within the project limits where LOS will most influence the number of required through lanes. Level of Service is evaluated by using the Highway Capacity Manual. The feasible alternatives may increase traffic on Willow Road or draw traffic away from Willow Road. A projected traffic volume will be determined for future conditions to determine the future traffic volume and improvements needed to meet LOS D. The alternatives will also be compared to the No-Build Alternative to assess performance.

- The facility condition and design component will be assessed by determining to what extent each alternative improves design features and facility condition.

Relative comparisons of the alternatives will be guided by the information shown in the table below. As part of this round of evaluation, the location of an alternative is identified.

EVALUATION ROUND #1		
Level of Detail:	**Tools:**	**Comparison Criteria:**
• **High level analysis** • **Identify location of alternatives**	• **Highway Safety Manual** • **Travel Demand Model** • **Highway Capacity Manual** • **Existing Aerial Photography** • **Maps and GIS**	• **Calculated safety performance** • **LOS at Willow Road/Sunset Ridge Road intersection** • **Facility condition and design** • **Flaw analysis**

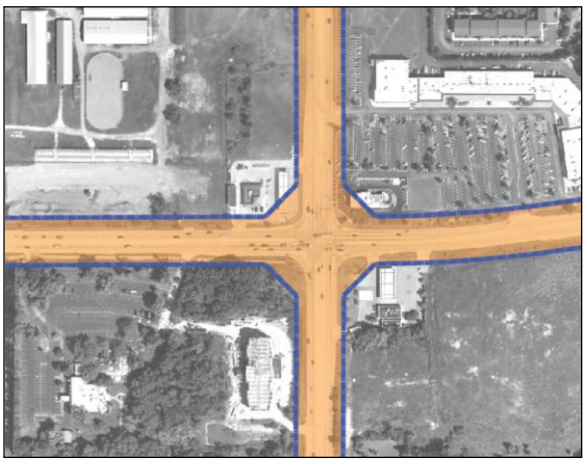
Stakeholder input will be sought to help complete this Purpose and Need test. Alternatives will be compared relative to each other with a goal to identify if a certain alternative or alternatives would perform better or worse in comparison to the No-Build Alternative. After reviewing the evaluation results, the project team discusses the results with the stakeholders.

Alternatives that pass this initial step would continue forward for more in-depth analysis.

EVALUATION ROUND #2

Alternatives that pass through the Initial Screening and Purpose and Need Test will be further defined. More engineering elements will be available for each of the alternatives. The roadway edges of pavement will be defined as well as a typical cross section. The right-of-way footprint will then be developed for each alternative, impacts will be assessed and initial costs will be developed. As part of this round of evaluation, the footprint of an alternative is identified.

Methodology and Evaluation Criteria:
The evaluation will consider a combination of safety, mobility, and facility condition and design features, as well as impacts, costs, and stakeholder input throughout the process.



- The Highway Safety Manual will be used to evaluate an alternative's safety performance. Refined Crash Modification Factors, given the clearer view of the alternative, are incorporated into the model. The calculated safety performance of the alternatives will be estimated.

- The travel demand model and Highway Capacity Manual will be used to measure the level of service at all of the intersections on Willow Road between Waukegan Road and Interstate 94.

- The facility condition and design component will be assessed by determining to what extent each alternative improves design features and facility condition. With more detail, additional factors can be included to assess if an alternative includes: bridge replacement, drainage improvements, signal modernization/interconnection, or updated geometric deficiencies.

Beyond the Purpose and Need factors, other evaluation factors will be defined, including:

- Costs
- Impacts
  - Impacts to environmental resources
  - Acres of right-of-way
  - Residential and commercial displacements

Relative comparisons of the alternatives will be guided by the information shown in the table below. The level of detail has increased beyond that of Evaluation Round #1. New information relative to this perspective is shown in bold. As part of this round of evaluation, the footprint of an alternative is refined.

EVALUATION ROUND #2		
Level of Detail:	**Tools:**	**Comparison Criteria:**
• **More definition** • **Identify what alternative looks like**	• Highway Safety Manual • Travel Demand Model • Highway Capacity Manual • Existing Aerial Photography • Maps and GIS • **On site verification**	• Calculated safety performance • LOS at Willow Road/Sunset Ridge Road intersection • Facility condition and design • Flaw analysis • **LOS at all intersections in study area** • **Cost** • **Impacts to environmental resources** • **Acres of ROW** • **Number of homes acquired** • **Number of businesses acquired**

Stakeholder input will also be sought to help complete Evaluation Round #2. Alternatives will be compared relative to each other with a goal to determine if a certain alternative or alternatives would perform better or worse in comparison to other alternatives and the No-Build Alternative. The project team will review the evaluation results and discuss them with the stakeholders. The lowest performing alternatives in comparison to others will be considered for elimination from further study.

PUBLIC MEETING #2

A public meeting will be held to present the project's Purpose and Need and all the alternatives considered to date. A summary of the screening and evaluation results will be presented for each alternative. It will be noted if an alternative performs poorly in comparison to other alternatives or to the No-Build Alternative. The Purpose and Need, the alternatives, and the evaluation results to date will be presented.

EVALUATION ROUND #3

At this round of evaluation, details will be added so that impacts and costs can be compared. As part of this round of evaluation, project specific features of an alternative are identified and a fuller range of evaluation criteria is used. Combinations of alternatives may also be considered at this stage. Safety, mobility, and facility condition factors will be further evaluated.

Methodology and Evaluation Criteria:

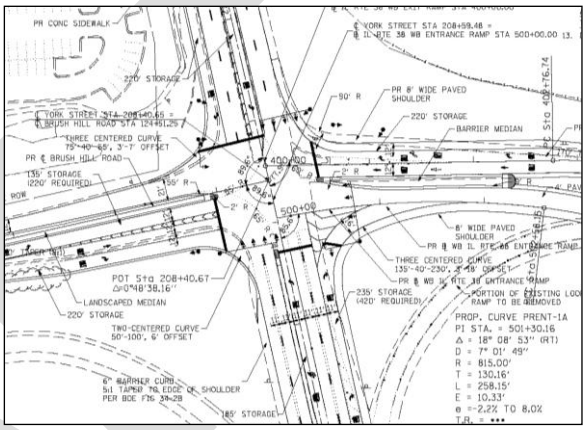
- The Highway Safety Manual will be used to evaluate an alternative's safety performance. Refined Crash Modification Factors, given the clearer view of the alternative, are incorporated into the model. The calculated safety performance of the alternatives will be estimated.

- The travel demand model and Highway Capacity Manual will be used to measure other mobility criteria (segment LOS, volume to capacity (V/C) ratios, queue lengths) in the project area.

- The facility condition and design component will be reassessed by determining to what extent each alternative improves design features and facility condition.

Beyond the Purpose and Need factors, other project elements will be defined, including:

- Costs
  - Construction
  - ROW
  - Environmental
  - Engineering
- Impacts
  - Definition of impacts to environmental resources
  - Definition of impacts to homes and businesses



Relative comparisons of the alternatives will be guided by the information shown in the table below. The level of detail for the comparison has increased. New information relative to this round is shown in bold.

EVALUATION ROUND #3		
Level of Detail:	**Tools:**	**Comparison Criteria:**

• **More definition**
• **Identify what alternative looks like**
	• Highway Safety Manual
	• Travel Demand Model
	• Highway Capacity Manual
	• Existing Aerial Photography
	• Maps and GIS
	• On site verification
	• **Ground Survey**
	• **Geometrics and cross sections**
		• Calculated safety performance
		• LOS at Willow Road/Sunset Ridge Road intersection
		• Facility condition and design
		• Flaw analysis
		• LOS at all intersections in study area
		• Cost
		• Impacts to environmental resources
		• Acres of ROW
		• Number of homes acquired
		• Number of businesses acquired
		• **Segment LOS**
		• **V/C ratios**
		• **Queue lengths**
		• **Cost details:**
		  ○ **Construction**
		  ○ **ROW**
		  ○ **Environmental**
		  ○ **Engineering**
		• **Definition of impacts to environmental resources**
		• **Definition of impacts to homes & businesses**

Stakeholder input will be sought to help complete Evaluation Round #3. Alternatives will be compared relative to each other with a goal to determine if a certain alternative or alternatives would perform better or worse in comparison to other

alternatives and the No-Build Alternative. The project team will review the evaluation results and discuss them with the stakeholders. After review and discussion, dropping the lowest performing alternatives from further study will be considered, where appropriate. A technical report summarizing this analysis will be distributed to the CAG for review.

PREFERRED ALTERNATIVE

The Preferred Alternative best meets the Purpose and Need, avoids, minimizes, and mitigates the identified impacts, and has cleared all previous evaluation steps of the process. The Preferred Alternative will continue to be further refined and detailed for the Environmental Assessment (EA) report.

The following factors will be evaluated for the Preferred Alternative:

- Social/Economic - including changes in travel patterns, economic impacts, community cohesion and other conditions
- Agricultural
- Cultural Resources - including potential historic and archaeological sites
- Air Quality
- Noise
- Energy
- Natural Resources
- Water Quality/Resources
- Flood Plains
- Wetlands
- Special Waste
- Special Lands including 4(f), 6(f), and OSLAD lands

PUBLIC HEARING

The public hearing process will follow the completion of the preliminary Environmental Assessment (EA) report. The EA will be made available for review by the resource agencies and public entities for a period of 30 days. The public hearing will be held to present the Preferred Alternative to the public, including all detailed analysis, design elements, impacts and mitigation measures, and plans. Following a public comment period after the hearing, substantive comments will be evaluated and responded to, and required modifications made to the EA through supplemental documentation. A FONSI (Finding of No Significant Impact) will be prepared and reviewed. These documents are again made available for review. At the end of this process, the Federal Highway Administration will consider approval of the Phase I Study.