13.0 LEVEL 2 EVALUATION – PRELIMINARY ANALYSIS

13.1 Level 2 Evaluation Summary

The Level 2 evaluation assigned qualitative ratings and/or numerical values for each alternative in each evaluation category. The results of the Level 2 evaluation are discussed below and presented in Tables 23 and 24 in Appendix A. Quantitative values presented in the matrices are approximations or estimates based on general alignments located within the proposed corridors. *Again, brief summaries are given for alternatives being carried forward to Level 3, while those not carried forward beyond this analysis level are discussed more thoroughly.* For reference the traffic forecasts for each of the alternatives are included in Appendix G.

Alternative 1 – No-Build

Alternative 1 (No-Build Alternative) offers no physical improvement to the current transportation system, nor does it address the traffic and transportation deficiencies identified in the study. It also offers no new opportunities for economic development. However, the No-Build Alternative also has few if any impacts on the human and natural environments; no construction cost; no property or utility impacts; and some local support. It preserves the visibility of current businesses on US 51 and has little effect on community character. The No-Build Alternative also provides the basis for comparing other build alternatives. Therefore Alternative 1 was carried on to Level 3 both as a benchmark and as a viable alternative.

Alternative 2 – Spot Improvements

Alternative 2 seeks to improve traffic operations on US 51 by upgrading four critical locations highlighted as potential problem areas. Each of the four locations is discussed briefly below, with a recommendation regarding advancement to the Level 3 evaluation.

Alternative 2A – US 51 / US 62 / Front Street Intersection

The proposed improvements benefit traffic flow, truck operations, and traffic safety as shown in Table 23. Few if any environmental impacts are expected. The major community issue associated with the project is the closure of Elm Street, however, access would be maintained via Ashford Street located a block further north on US 51. Alternative 2A had the highest level of support of any of the proposed improvements in the town and the cost is estimated to be “Low to Medium”. Based on the expected benefits, Alternative 2A was recommended for advancement to Level 3.

Alternative 2B – US 51 / Jennings Street Intersection

Alternative 2B includes removing the unwarranted signal at Jennings Street, with potential benefits to both traffic flow and traffic safety at a negligible cost. Many local

residents also appear to support the project, with 40 percent of survey respondents giving it positive marks. Alternative 2B is recommended for advancement to Level 3.

Alternative 2C – US 51 / KY 123 (Elsey Avenue) Intersection

Alternative 2C includes widening and reconstructing the US 51 / KY 123 intersection to provide the turning radii necessary for trucks turning to and from KY 123. Few if any environmental impacts are expected and the effect on the community is expected to be limited. Alternative 2C is beneficial, feasible, and the estimated cost is low. Therefore it was recommended for advancement to Level 3.

Alternative 2D – US 51 at Curve by Methodist Church

Alternative 2D includes increasing the radius of the curve by the Methodist Church and reducing the grade of the hill by the Bardwell Community Center (Lions Club). The curve realignment would improve the sight distance and both elements could benefit truck traffic operations and highway safety. The project is unlikely to impact the natural environment; however significant efforts would have to be made to avoid impacts to three sites that are potentially eligible for the National Register of Historic Places. There are also possible impacts to the Lions Club and a chiropractor's office. It also may have significant utility impacts. The cost estimate ranges from "Low to High" depending on the extent of reconstruction. Overall however, Alternative 2D directly addresses the safety and traffic concerns related to the curve and hill for the least cost of any alternative. Therefore, Alternative 2D was recommended for advancement to Level 3.

Alternative 3 – Reconstruct US 51 as Two-Lane Roadway with Turn Lanes

Traffic Operations - As shown in Table 23, Alternative 3 rates "High" with respect to traffic benefits due to the signalization improvements, turn lanes, and wider lanes. It also benefits all roadway users (i.e. both local and through traffic). Alternative 3 rates "High" for truck traffic benefits due to increased radii and the other items mentioned in the spot improvement alternatives. Alternative 3 also receives a "High" mark for safety since the project may mitigate the high crash rate problem in Bardwell. In addition, the project offers the possibility of improved access control and significantly improved bicycle and pedestrian facilities.

Environment - Alternative 3 is expected to have a very limited affect on the natural environment as shown in Table 23. With regard to the human environment, there are a number of potential hazardous material sites in the corridor, but the most important issue is the presence of 6-7 sites that are potentially eligible for the National Register of Historic Places.

Community - As shown in Table 24, Alternative 3 is rated "Good" for current businesses in town because it not only preserves their visibility, but may also enhance the aesthetics of the community through new sidewalks and other enhancements. With regard to new development, Alternative 3 opens no new land for development. It may also result in some residential and business impacts. During reconstruction, delays and other maintenance of traffic issues are expected.

Public Support - Of the proposed build alternatives, Alternative 3 received the second highest level of public support in the public comment form responses (37 percent), second only to the Alternative 2 Spot Improvements.

Implementation / Construction - Construction complexity and cost will be higher for this alternative than for Alternative 2 because US 51 would be completely reconstructed. There is also the potential for issues related to major utility relocations because many utilities are located in the current right-of-way.

Construction of Alternative 3 may result in some short-term disruptions to the community. However, upon completion the traffic, safety, and community character benefits are expected to outweigh the construction impacts. Furthermore, the Level 2 analysis shows only modest potential impacts to the community and the environment. Therefore, Alternative 3 was recommended for further study in Level 3.

Alternative 4A – US 51 Realignment West of the Methodist Church

Traffic Operations - Because of its similarity through town, Alternative 4A offers the same or better traffic improvements as Alternative 3. In town, traffic volumes will be similar to the Alternative 3 volumes, with most traffic south of town shifting to the new alignment. Again, it benefits all highway users (local and through). Truck traffic benefits for Alternative 4A were rated "High" because it bypasses the hill and curve and because it includes the other Alternative 3 improvements. The straightened highway may improve overall travel times and efficiency for through trucks. Expected benefits to vehicular and pedestrian safety were also rated "High".

Environment - As shown in Table 23, Alternative 4A has several potential impacts on the natural environment. The alternative crosses two streams and may require the relocation of nearly half a mile of stream just east of the railroad. The alternative also may impact one to two farm ponds and approximately seven acres of floodplain. As a result of the many water resources located within the corridor, there is the potential for habitat impacts related to the streams, farm ponds, and floodplain areas.

Table 23 shows that there are 5-6 sites potentially eligible for the National Register of Historic Places along the corridor including the Methodist Church. The alternative will likely require acquisition of a portion of the church property. Direct impacts to the church building as well as the other potentially eligible buildings can be avoided. Based on public comments, there may also be one or more unmarked cemetery sites within the proposed corridor that could be affected. Impacts to farming operations can be expected since the proposed corridor runs through an agricultural district. Possible impacts to potential hazardous material sites are expected to be similar to Alternative 3 with no additional sites impacted by the proposed realignment.

Community - Alternative 4A is rated "Good" for current businesses in town, similar to Alternative 3, because it both preserves visibility and enhances local aesthetics. However, Alternative 4A reduces traffic flow passing by the few businesses on US 51 south of the Methodist Church. It is rated "Fair" for new business development because it opens some land south of the town for new development. As was mentioned

previously, this land is currently productive farmland. In order to construct Alternative 4A, one to two homes and one to two outbuildings may need to be acquired. Other non-building acquisitions are necessary to provide the necessary right-of-way. During reconstruction in town, maintenance of traffic issues are expected. After reconstruction, the community character and aesthetics may be improved through the provision of new sidewalks and other enhancements.

Public Support - Based on the comment form responses, it appears that the community may be willing to accept implementation of Alternative 4A. Approximately 20 percent of the respondents at the public meeting favored this alternative, with only three percent of respondents indicating direct opposition to the alternative.

Implementation / Construction - The realignment of US 51 is unlikely to pose any significant construction problems, but construction difficulties may still exist for the proposed improvements in town, as discussed for Alternative 3. As shown in Table 24, approximately 35 acres of right-of-way will be required to realign US 51, which is more than the required right-of-way for Alternative 3. As a result of improvements in town, utilities impacts are rated "Poor". Overall, the construction cost is rated "High". This is due in part to the length of new road construction south of the town.

In order to improve the current safety problems associated with a sharp curve and hill near the Methodist Church, Alternative 4A was developed to realign US 51 south of Bardwell and west of the Methodist Church. However, compared to Alternative 4B, which provides many of the same benefits listed above, this alternative has more potential environmental impacts, requires more right-of-way, and has a higher estimated construction cost. The differences are highlighted in Tables 23 and 24 as well as Figure 24 in Appendix B. Therefore Alternative 4A was not recommended for further study.

Alternative 4B – US 51 Realignment East of the Methodist Church

Traffic Operations - The traffic benefits of Alternative 4B are similar to those of Alternative 4A. Truck traffic benefits and safety benefits are also expected to be similar as the two alignments have many similar characteristics.

Environment - As shown in Table 23, environmental issues associated with Alternative 4B are expected to be less significant than those associated with Alternative 4A. Alternative 4B is not expected to have any significant impact on streams or floodplains, but could impact one to two farm ponds. As with Alternative 4A, there are 5-6 structures in the corridor that area potentially eligible for the National Register of Historic Places. No direct building impacts are expected for any of these, but property acquisition may be required. This is especially true for the church property. Similar to Alternative 4A, the corridor goes through an agricultural district and may split some farmland. The potential hazardous material site issues are also similar to Alternative 4A.

Community - Alternative 4B supports current businesses on US 51 (except the few south of the church) through continued visibility. It opens some land south of town to potential new development (land that is currently in agricultural use). As shown in Table 24, Alternative 4B may require the acquisition and demolition of one or two homes.

Other undeveloped property will be required for the new alignment south of town and some frontage may be needed in town. Otherwise the same maintenance of traffic issues and streetscape benefits for Alternative 4A apply to Alternative 4B.

Public Support - Approximately one-fifth of the community supported a general southern realignment of US 51, with three percent of respondents specifically opposed to it. The public support for a southern realignment was less than the support for spot improvements and US 51 reconstruction, but there was still measurable public support for this alternative.

Implementation / Construction - There is little development in the proposed Alternative 4B corridor therefore construction of the highway could be relatively straightforward. Approximately 30 acres of right-of-way will be required, which is more than Alternatives 2 and 3 require, but less than that required for constructing Alternative 4A. Impacts to utilities are rated "Poor" due to construction improvements in town. Overall, the construction cost is expected to be "Medium to High" depending on the final alignment and extent of reconstruction in town. Alternative 4B is expected to be less expensive than Alternative 4A and therefore rates better than Alternative 4A for this category.

Alternative 4B provides similar benefits to Alternative 4A without the additional cost and impact to the environment. In addition, the realignment of US 51 will be shorter in length than Alternative 4A, requiring less construction and less additional right-of-way. Compared to spot improvement Alternative 2D, this alternative offers another possible solution to the safety problem of the curve and hill by the Methodist Church. Based on this analysis, Alternative 4B was recommended for further study in Level 3.

Alternative 5A – US 51 Bypass from the Curve near the Fire Station

Traffic Operations - Alternative 5A proposes construction of a two-mile bypass on the east side of Bardwell. As shown in Table 23, up to 1,200 vehicles per day (vpd) may divert to the new highway in 2003 (1,900 in 2030). This compares to 4,200 vpd (7,100 in 2030) that will remain on US 51 in the center of town. The traffic remaining in town is enough to require improvements at the US 51 / US 62 intersection to achieve a good LOS even with the bypass. It is anticipated that nearly all of the through truck traffic will use the bypass, reducing truck traffic in town. The bypass provides a higher speed alternate route for this through traffic. However, one large trucking firm (Mead WestVaco) indicated that "bypasses would provide some benefits to our wood fiber haulers in terms of speed and time, but at the distance from which most of our fiber comes, the time savings are not very significant." Instead their main concerns appeared to be safety and improvements to the US 51 / US 62 intersection.

The reduction in traffic and especially truck traffic may benefit safety in town, though the current safety and geometric issues in town will not be addressed directly. A portion of the traffic simply avoids the high crash rate section. However, the future 2030 traffic volumes in town exceed the current traffic volumes and as a result the high crash rate problem in town may persist even with the bypass. The bypass benefits the through traffic somewhat more than local traffic by providing a new through route, while leaving the more heavily traveled road through town unimproved. However, the local traffic

does benefit from some reduction in traffic, especially truck traffic. Refer to Figure 25 in Appendix B for a summary of key issues for Alternative 5A.

Environment - As demonstrated in Table 23, Alternative 5A may impact two streams, one of which is Truman Creek, which runs north of Bardwell. The existing US 51 currently bridges Truman Creek just north of town. Alterative 5A may impact both the natural wetland and the floodplain along Truman Creek. In addition a number of farm ponds may be impacted. Table 23 also shows that impacts to the western edge of a potential maternity (summer) Indiana Bat habitat are possible, along with impacts to habitats related to stream, farm pond, wetland, and floodplain areas.

In addition to impacts to the natural environment, there could be impacts to potential historic sites and agricultural districts. In the northern end of the Alternative 5A corridor is a potential archeological site that is an open habitation site and is currently unassessed as to eligibility for the National Register of Historic Places. In the southern portion of the corridor there is the possibility of an impact to an unmarked African-American cemetery located north of the Bardwell Cemetery. For cultural historic reasons, the State Historic Preservation Office also expressed opposition to a bypass and support for in town improvements. The bypass may impact farming operations by splitting one or more of the farms in the corridor. There is also an agricultural district at the northern end of the corridor. Overall, Alternative 5A appears to present a number of potential environment issues and concerns.

Community - Of all of the alternatives, Alternative 5A likely results in the most extensive changes for the community. The most frequently discussed concern for local residents is the shifting of traffic to the bypass. Based on the initial estimates, approximately 20 percent of the total traffic in the center of town could be diverted, diminishing local business visibility. The existing road would also remain as is without highway or streetscape improvements. For these reasons, the alternative received a “Poor” rating for support of current businesses. It receives a “Fair” rating for new business development because it potentially opens land for new development. However, based on a recent University of Kentucky research report as well as local population and employment data, it appears unlikely that any significant new development will take place along the bypass.[4] Therefore, it appears unlikely that a bypass will impact the economy of Bardwell substantially.

Table 24 shows that up to three residences may have to be acquired to construct the highway along with as much as 45 acres of additional right-of-way. The community character benefits associated with Alternatives 3, 4A, and 4B are not present with Alternative 5A because the community is bypassed; therefore, the alternative is rated “Fair” in this category.

Public Support - Comment form responses gathered at the first public meeting in Bardwell revealed that more people were specifically opposed to an eastern bypass (27 percent) than were in favor of it (17 percent). In addition, many local community leaders

[4] *The Impact of a New Bypass Route on the Local Economy and Quality of Life*, Thompson, Miller and Roenker, KTC Research Report KTC-01-10/SPR219-00-2I, June 2001.

and Project Work Group members spoke out against construction of a bypass. Even the MeadWestVaco (trucking interest) representative to the Project Work Group focused mainly on other alternatives such as improving US 51 / US 62; though they indicated they might support the north portion of the Alternative 5A Bypass.

Implementation / Construction - The two-mile Alternative 5A bypass passes through primarily undeveloped land, which may limit construction complications. However, the additional right-of-way required (approximately 45 acres) is the most of any of the build alternatives. Few major utility issues are anticipated in the corridor; therefore, impacts to utilities are rated as "Good". The order of magnitude cost estimate for this alternative is "High" mainly because of the construction length.

Overall, construction of the Alternative 5A bypass offers benefits for through traffic, but the benefits come with a high capital cost and at the expense of the environment and community. It also does not address the safety problems in the town. In addition, the public feels strongly that construction of a bypass would be harmful to the community. For these reasons, Alternative 5A was not recommended for further analysis in Level 3.

13.2 Level 2 Analysis Summary

Tables 23 and 24 in Appendix A include information for the designated categories used to compare the alternatives remaining after Level 1. After the Level 1 initial screening evaluation, six (6) of the original nine (9) alternatives remained for further consideration. The more detailed analysis performed in the Level 2 preliminary analysis evaluation further reduced the alternatives to only four (4) alternatives. It was recommended that the other two alternatives (Alternatives 4A and 5A) be removed from further consideration. Major reasons for discarding these alternatives included potentially significant community and environmental impacts, high construction costs, and local community opposition.