

9.0 CONCLUSION

The purpose of this Feasibility Study was to determine the feasibility of various alternatives to alleviate roadway congestion caused by the existing rail lines through the City of Tupelo.

9.1 SUMMARY OF ANALYSIS

The feasibility analysis examined operational improvements to the existing rail lines, the addition of grade separations at select locations along the existing corridor, the construction of a new railroad corridor, and/or a combination of these alternatives. In addition to the rail alternative analysis, an at-grade traffic analysis was completed to assess the delays to vehicular traffic by the trains passing through the City of Tupelo.

At-Grade Traffic Analysis

To determine the benefit of rerouting trains from both of these existing lines within the City of Tupelo, vehicular delays were examined at sixteen (16) at-grade railroad crossings along the Burlington Northern Santa Fe Railway (BNSF) and the Kansas City Southern (KCS). The traffic delay related to the at-grade crossings was calculated in two components: 1) the at-grade crossing vehicle delay; and 2) the delay caused by the at-grade crossings as a secondary impact on the near-by intersections. The current year 2005 condition and future year 2030 condition were modeled for both of the components. The two components were calculated based on existing and future train volumes.

A uniform distribution of the future and existing train volumes was utilized for the calculation of the traffic delays which occur at specific at-grade crossings. A more detailed description of the future train volumes and at-grade crossing delay analysis is provided in **Section 6** and **Section 7**, respectively. The cumulative cost of congestion from year 2005 to year 2030 at the at-grade crossings and near-by intersection is shown in **Table 9-1** and is estimated at **\$1.25 billion** (in 2030 dollars).

Table 9-1
Cumulative Cost of Congestion from Year 2005 to Year 2030

From 2005 to 2030	At-Grade Crossing	Near-by Intersections as Secondary Impact	Total Cost of Congestion
	\$402,621,900	\$848,183,750	\$1,250,805,650

To more accurately compare the benefits to the cost of construction, the cumulative cost of congestion in 2030 dollars is converted to 2005 dollars using the present worth formula (P/F, i%, n) with an interest rate of 3% over a 25 year time period. Converting to 2005 dollars, the total cumulative cost of congestion equates to approximately **\$597 million**.

Operational Improvements

Railroad operations were examined for potential improvements to reduce the auto traffic delay at the various at-grade crossings, particularly at Main Street and Gloster Street. The proposed operational improvement is to move the BNSF and KCS interchange to the southeast and to the south of the Pvt. John Allen National Fish Hatchery and north of US Highway 45. The interchange would allow northbound trains on either the BNSF or KCS lines to travel southbound on the KCS or BNSF lines, respectively. A more detailed description of both the rail and roadway improvements can be found in **Section 8.1**. The total construction cost estimate for the operational improvements is estimated to be approximately **\$70.7 million** in 2005 dollars.

In Town Alternative

The objective of this alternative was to improve the operating speed of rail traffic to reduce auto traffic delay along the rail lines through Tupelo. The Crosstown intersection was identified as a primary location for improvements to enhance safety and mobility by eliminating the conflicts between trains and vehicular traffic. Several alternative concepts were developed for the intersection and are provided in the “Feasibility of ‘In-Town’ Alternative Technical Memorandum” in **Appendix F** and are summarized in **Section 8.2**.

The total construction cost estimate of the required improvements to the downtown roadway network and rail improvements is estimated to be between **\$64 and \$110 million** in 2005 dollars depending on the estimates for right-of-way and business damage costs.

New Railroad Alignments

Five (5) new alignments were examined to determine the feasibility of relocating rail operations around Tupelo. These corridors were examined for impacts to the human, natural, and physical environments. Detailed descriptions of the alignments are provided in **Section 8.4**. Preliminary construction cost estimates were prepared for the each of the new alignments. The costs include construction, professional services, and right-of-way costs. The total construction cost estimate of the new rail alignments including rail, roadway, and right-of-way was estimated to range from approximately **\$328 million** to **\$747 million** in 2005 dollars.

An operating analysis (with the rerouted trains and the recommended plant improvements) was completed on the new alignments. The proposed railroad alignments analyzed are longer than the existing corridor. However, the new alignments would permit an average increase in operating speed over the entire corridor. The operating analysis and cost estimate was based on the additional train miles on an annual operating basis. The annual operating costs that would result from rerouting trains onto the new alignments were estimated to range from approximately **\$2.1 million** to **\$8.7 million** in 2005 dollars using 2030 rail volumes.

Automobile/Train Traffic Conflict

Each of the alternatives was examined to determine the ability of each alternative to remove exposure to the traffic conflict of trains and automobiles at at-grade crossings. Although this benefit cannot be measured from a cost perspective, it is easy to conclude that less exposure of automobile trips and train trips at at-grade intersections would result in additional benefits of enhanced safety and reduced traffic delay. The traffic conflict removed from the each of the study alternatives ranges from approximately **700,000** to **4.1 million** per day.

9.2 RECOMMENDATION

The benefits of rerouting the trains out of the downtown Tupelo area are clearly evident as seen in the congestion costs summarized in **Table 9-1**. However, the congestion benefits are not the only benefits of rail relocation. The BNSF and KCS will also be able to complete interchange operations without disrupting the roadway users and emergency response time, especially at the Crosstown intersection. Other potential benefits include safety (removal of automobile/train conflicts), environmental benefits for locomotive emissions, general roadway network improvements, and potential property values increases. The dollar values of these benefits have not been calculated at this time.

While the true test of feasibility is the benefit cost (b/c) ratio, as previously discussed *all of the benefits have not been calculated* within this study. However, the congestion costs alone can be utilized to calculate a b/c ratio with the understanding that the *benefits are actually higher than indicated*. Using these assumptions the b/c ratio for the new alignments can range from **0.80** (using the highest cost alignment) to **1.82** (using lowest cost alignment) using the benefits in 2005 dollars divided by the construction costs in 2005 dollars. If the b/c ratio utilized benefits in 2030 dollars divided by the construction costs in 2005 dollars the ratio would range from **1.67** to **3.81**.

Based upon the results of the analyses contained within this document, it appears that a rerouting option is feasible and should be studied in further detail in the Environmental Impact Statement (EIS). Additionally it appears than an operational or an in-town improvement, including a grade separation, is also feasible and should also be studied further in the EIS. The additional detailed analysis will be completed as part of the EIS to finalize specific alternatives, and subsequently, determine the benefits and impacts from each of the alternatives.