Tupelo Mississippi
Planning & Environmental Study
Railroad Relocation

FINAL

APPENDIX F

Feasibility of "In-Town" Alternative Technical Memorandum

May 2006

Prepared for:

MDOT

Prepared by:

HDR

ABMB ENGINEERS, INC.

Feasibility of "In-Town" Alternative
Technical Memorandum

HDR | ONE COMPANY *Many Solutions*℠

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CC:			
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1.0 PURPOSE

The Mississippi Department of Transportation (MDOT) retained HDR Engineering, Inc. and its team of subconsultants, including ABMB Engineers, Inc., to provide a Railroad Relocation and Planning and Environmental Study. The purpose of this study is to identify, develop and evaluate potential alternatives routes for the Burlington Northern-Santa Fe (BNSF) in Lee County, Mississippi both within and around the City of Tupelo. This technical memorandum discusses the condition and operations of the existing BNSF railroad route within the Tupelo city limits and considers the feasibility of upgrades and improvements which could improve the operating speed of rail traffic along the existing "In-Town" corridor. Of particular interest is the "Crosstown" intersection, a high-volume at-grade crossing in near downtown Tupelo that appears to be a good candidate for a grade separation to address safety and delay concerns.

2.0 EXISTING CONDITIONS

The first step in this study was to establish the limits of the study area, review the existing conditions of the railroad and properties within the study area, and identify the deficiencies along the main line which may impact its operational speed. BNSF owns the main railroad track that runs diagonally through Tupelo from the northwest to the southeast. This single track-line currently carries an average volume of 20 to 25 trains per day through downtown Tupelo.

ABMB obtained information on existing conditions from several sources for this study, including BNSF track charts and GIS mapping provided by HDR. Parcel maps showing property ownership adjacent to the BNSF main line were obtained from the Lee County Tax Assessor's office. From the Tupelo Water and Light Department, information on existing water and sewer utility lines adjacent to and crossing the BNSF route was verified. During a field visit to Tupelo, it was observed that there are power lines and fiber optic lines in the vicinity of the BNSF mainline.

Within the city limits, there are twelve (12) public highway-rail at-grade crossings and one (1) at-grade crossing with the KCS mainline. The crossing ID for the highway-rail at-grade crossings on the BNSF mainline in the Tupelo area is listed in following table:

Crossing ID	Crossing Street Name
667342U	Lumpkin/Trace Ave.
667343B	W Jackson St.
667344H	Blair St.
667345P	W Jefferson St.
667346W	N Park St.
667347D	S Gloster St.
667347D	W Main St.
667348K	Church St.
667349S	Green St.
667350L	S Spring St.
667353G	W Elizabeth St.
667359X	E Eason Blvd.

Information on existing grades, horizontal curvature, functional speeds and crossing locations were obtained from the BNSF track charts for the Tupelo area. According to the track charts, there is a 20 mph permanent speed restriction through downtown Tupelo. This restriction is due in part to the lack of electric lock switches in the rail yard in downtown Tupelo. This speed restriction begins at mile post 587.4 and ends at milepost 588.6. This speed restriction extends through "Crosstown", the at-grade rail crossing located within the intersection of Gloster Street (MS Highway 145) and Main Street (MS Highway 6), which is bisected diagonally by the BNSF main line. It is the primary purpose of this report to determine what combination of equipment upgrades, at-grade crossing closures, and geometric improvements could be installed along the existing mainline to eliminate this speed restriction through downtown Tupelo.

Figure 1 (page 5) illustrates the speed limitations of the BNSF and KCS main lines in the Tupelo study area.

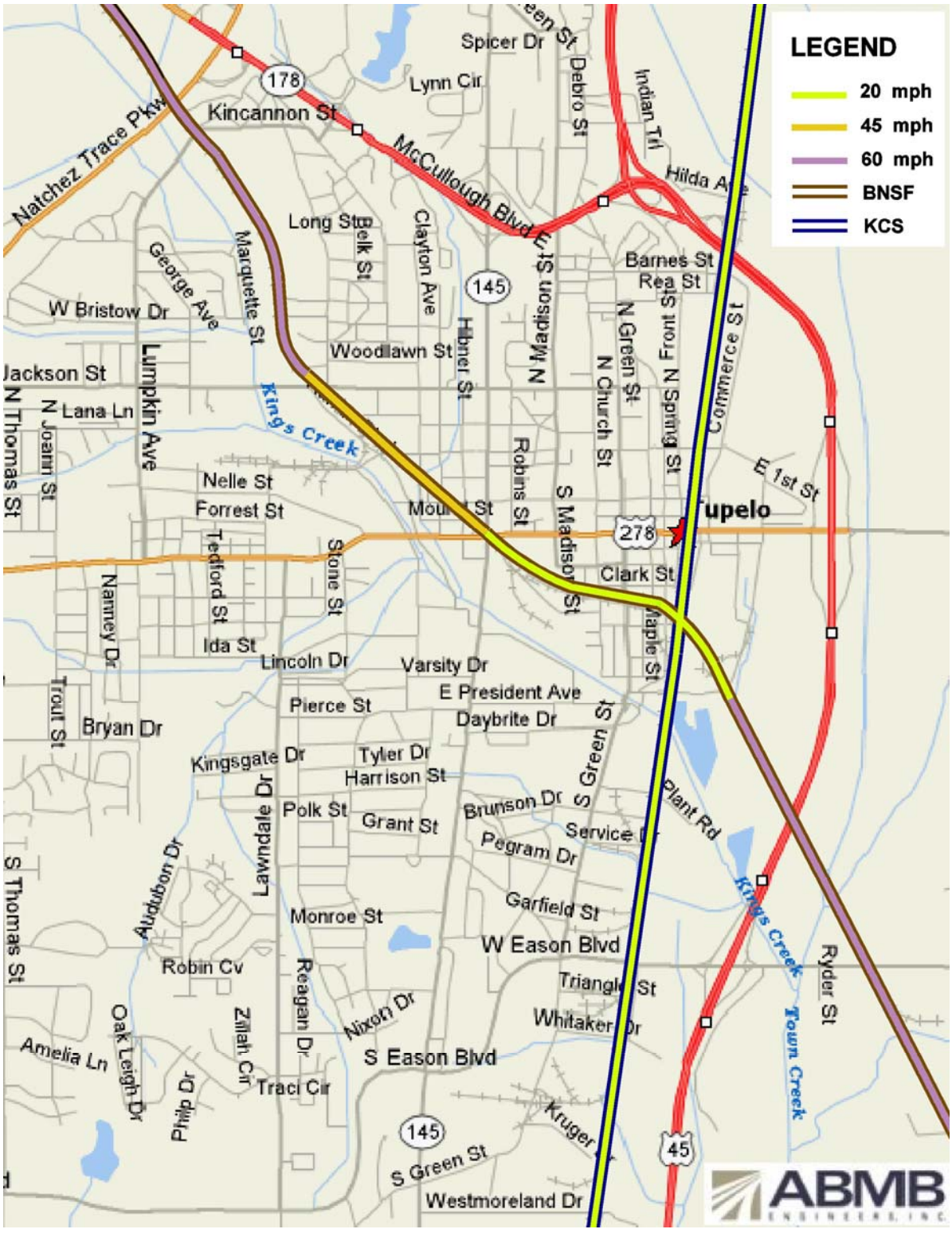

Figure 1 - Train Operating Speed in the Tupelo Study Area

3.0 DESIGN CRITERIA

The next step involved the development and identification of relevant design criteria, standards and guidelines for use in evaluating the operation of the BNSF main line and developing recommended geometric improvements. The design criteria, based on BNSF design standards, included the following items:

- Maximum grade: 1.25%
- Design speed: 45 mph desirable, 60 mph maximum
- Maximum rate of horizontal curvature: 2º 30”

Another source of information for establishing design criteria was *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO), which establishes the design standards for streets and highways and minimum clearances for grade separations. The *MDOT Design Manual* was also referenced as a source of information for roadway design standards.

4.0 CROSSING EVALUATION

Each of the following crossings within the permanent speed restriction limits were evaluated for deficiencies and eligibility for crossing enhancements, grade separation, geometric improvements, and/or full closure.

4.1 Blair Street

Blair Street is a two-lane local street with a 30-mph speed limit that runs east-west. The rail crossing has a flashing light and crossbucks with no gates. According to a traffic model developed by ABMB Engineers, the average AADT near this crossing is approximately 1,500 vehicles per day (vpd). If the crossings at Jefferson Street and Park Street were closed, a portion of that traffic would likely be directed at this crossing, making closure of this crossing undesirable and not recommended.

4.2 Jefferson Street

Jefferson Street is a two-lane local street with a 30-mph speed limit that runs east-west. The at-grade rail crossing has a flashing light and crossbucks with no gates. According to a traffic model developed by ABMB Engineers, the average AADT at this crossing is approximately 1,970 vpd. Closure of this crossing would divert eastbound or westbound traffic to either Blair Street or Main Street, increasing the traffic volumes that cross the railroad at these locations. Closure of this crossing would necessitate that both the Blair Street and Crosstown crossings be maintained and possibly enhanced with additional warning devices.

4.3 Park Street

Park Street is a two-lane local street with a 30-mph speed limit that runs north-south. The at-grade rail crossing has a flashing light and crossbucks with no gates. According to a traffic model developed by ABMB Engineers, the average AADT at this crossing is approximately 6,100 vpd. Closure of this crossing would likely cause traffic to be diverted to Gloster Street, potentially adding traffic volume to the nearby Crosstown intersection, which according to the traffic model, will have a failing level of service based on current traffic volumes. Closure of this crossing must be accompanied with geometric improvements to the Crosstown intersection, such as turn lanes and optimal signal timings, to accommodate the increased traffic.

4.4 Crosstown

Both Gloster Street and Main Street are functionally classified as minor arterials. Gloster Street is a five-lane road with twelve-foot travel lanes and a center turn lane with curb and gutter on both sides of the roadway. Main Street is also is a five-lane minor arterial with four twelve-foot travel lanes and a continuous center left turn lane with curb and gutter on both sides of the roadway. From 2004 AADT maps from the MDOT Planning Division, Gloster Street carries more than 22,000 vehicles per day (vpd) and Main Street has a daily volume of 17,000 vpd. Several commercial properties are in the vicinity of this intersection, including a Walgreens Drugs Store, a Burger King restaurant, a gas station (abandoned at the time of this report), and several small office buildings.

The Crosstown intersection was identified as a preferred location for a grade separation, which would improve safety and mobility by eliminating the conflicts between trains and the vehicular and pedestrian traffic within the intersection. Motorists often experience significant delays on Gloster Street and Main Street daily due to long freight trains passing through the area. Creating a grade separation at this location will eliminate this cause for motorist delay and improve the safety of this busy intersection. The method used to create a grade separation at this intersection controls whether several nearby at-grade crossings could be enhanced, closed or grade separated.

Conceptually, the grade separation of the Crosstown intersection from the railroad tracks can generally be accomplished under one of the following scenarios:

1. Elevating the Gloster Street @ Main Street intersection over the railroad track by constructing a four-leg highway bridge over the railroad;
2. Constructing a new railroad bridge over the Crossroads intersection.

Scenario 1 – Elevate Crosstown Intersection over Railroad

The required minimum vertical clearance over the top of the railroad is twenty-three and one-half (23.5') feet to the bottom of the overpass structure. Although a highway overpass can be physically sited at the intersection of the rail with Main Street and Gloster Street within the existing right-of-way, there are significant impacts and costs associated with having to acquire adjacent properties and to demolish several buildings in order to provide temporary traffic detouring during construction of the bridge structure and utility relocations. The costs to establish and maintain traffic control and/or implement a detour route for both Gloster Street and Main Street during construction of the overpass structure will be significant given the high daily traffic volume that passes through this intersection and the lack of nearby routes having the capacity to carry such volumes. A minimum of two temporary railroad crossings would likely need to be constructed along the detour routes. Retaining walls would minimize the amount of adjacent land that would be taken up by the high fills resulting from the new elevated crossing, but also raises the construction cost significantly. Raising the roadway would also allow for the closure of the Jefferson Street and Park Street crossings by redirecting the volumes at those crossings to Crosstown.

The most obvious drawback to raising the roadway is the removal of access from businesses that currently have driveway ingress/egress close to the intersection. A possible solution would be to construct secondary access routes to the corner parcels. These improvements are shown in Figure 2 of the Appendix.

Scenario 2 – Elevate Railroad over Crosstown Intersection

The second scenario requires constructing a railroad bridge over the Crosstown intersection. Given the need to maintain full and uninterrupted train service along the existing track during construction, and the need to relocate the rail bridge and its piers outside of the Crosstown intersection, it is recommended that a new track be constructed parallel to the BNSF mainline at a distance of 50' northeast from the centerline of the existing rail. This new mainline would replace the existing track, which would be removed after rail traffic is transferred to the new track. Construction activity that could potentially disrupt service, such as tying in to the new track to take the old alignment off-line, should be scheduled in time slots between trains.

The required minimum vertical clearance over the top of the roadway is sixteen and one-half feet (16.5') to the bottom of the bridge structure. Using a grade of 1%, this clearance can be obtained by raising the elevation of the rail track just south of the Jackson Street crossing, and creating grade separated crossings by constructing steel truss bridges to span the Crosstown intersection and the crossings at Blair, Jefferson and Park Streets. The track would then be lowered to at a 1.25% grade to meet the at-grade crossing at Spring Street. Some modification to Spring Street may be required to match the elevation of the railroad at this crossing. The switch point for access to the rail yard would need to be relocated to the east near the Spring Street crossing.

Since during construction, the active tracks will be in close proximity to the bridge work excavations, reinforced shoring may be needed to protect the existing track from the rail construction. A retaining wall should be constructed along the rail viaduct to minimize impacts on the more developed properties north of the proposed rail alignment. Construction of this track will necessitate purchasing an additional 50' wide strip of right of way as well as temporary easements from several adjacent properties for construction and maintenance of the new track.

These improvements are shown in Figure 3 of the Appendix.

4.5 Church Street

Church Street is a two-lane local street with a 30-mph speed limit that runs north-south. The rail crossing has a flashing light and crossbucks with no gates. No volumes have been determined for this crossing; however, it would appear that if this crossing were closed, traffic at this crossing would need to be redirected to the Green and Spring Street crossings which could accommodate the additional volume.

4.6 Green Street

Green Street is a two-lane local street with a 30-mph speed limit that runs north-south. The rail crossing has a flashing light and crossbucks with no gates. No volumes have been determined for this crossing; however, it would appear that if the Church Street crossing were closed as mentioned in the previous paragraph, the traffic at this crossing would increase, making it desirable to augment the crossing by installing automatic gates for safety.

4.7 Spring Street

Spring Street is a two-lane local street with a 30-mph speed limit that runs north-south. The rail crossing has a flashing light and crossbucks with no gates. According to a traffic model developed by ABMB Engineers, the average AADT near this crossing is approximately 2,768 vpd. If the nearby crossings at Green Street and Church Street were closed, that traffic would likely increase at this crossing, making closure of this crossing undesirable and not recommended. It is recommended that this crossing be augmented with the installation of automatic gates.

4.8 Kansas City Southern (KCS) Railroad

The interchange with the Kansas City Southern (KCS) railroad occurs near milepost 588.2 along the BNSF mainline, just east of the Spring Street crossing. The nearby railroad switch between the BNSF and KCS lines is controlled from a signal box that is not equipped with electronic switch locks, and appears to be manually operated. This results in the aforementioned speed restriction that reduces the effectiveness of freight operations and increases delays for the area

motorists. If the rail line at Crosstown remains at grade, equipping this signal box with an electric switch lock system would improve the safe operation of switching operations in the rail yard and increase the speed at which approaching trains could enter the yard.

5.0 CONCEPTUAL COST ESTIMATES

The total estimated construction cost for the "In-place" Alternative ranges from $64 million to $110 million depending on which grade separation scenario is implemented at Crosstown. The recommended improvements under each scenario are itemized in the following table:

Table 1 - Recommended Crossing Improvements

Scenario 1 - Elevate Crosstown Intersection over Railroad

CROSSING LOCATION	RECOMMENDED IMPROVEMENTS	ESTIMATED COST
Blair Street	Install 2-gate crossing system	$300,000.00
Jefferson Street	Full closure	$85,000.00
Park Street	Full closure	$85,000.00
Gloster Street (Crosstown)	Grade separation (road over rail)	$62,828,000.00
Church Street	Full closure	$85,000.00
Green Street	Install 2-gate crossing system	$300,000.00
Spring Street	Install 2-gate crossing system	$300,000.00
	TOTAL COST:	**$63,983,000.00**

Scenario 2 - Elevate Railroad over Crosstown

CROSSING LOCATION	RECOMMENDED IMPROVEMENTS	ESTIMATED COST
Blair Street, Jefferson Street, Park Street and Gloster Street (Crosstown)	Grade separation (rail over road)	$109,434,000.00
Church Street	Full closure	$85,000.00
Green Street	Install 2-gate crossing system	$300,000.00
Spring Street	Install 2-gate crossing system	$300,000.00
	TOTAL COST:	**$110,119,000.00**

Unit costs used in this estimate were derived from average bid cost tabulations from MDOT and reflect 2005-2006 average costs. Fees for Design, Construction Engineering and Inspection

(CEI) costs and a contingency were included as part of the total value for the intersection improvements. A breakdown of cost items is contained in Appendix 'A'.

6.0 SUMMARY

To summarize, in order to improve the functional speed of the BNSF line in its current alignment thru downtown Tupelo, the following improvements are recommended:

- Full closure of the Church Street crossing;
- Full closure or grade separation of the Jefferson Street and Park Street crossings;
- Grade separation or enhancement of the Blair Street crossing;
- Installation of a 2-gate crossing system at the Spring Street and Green Street crossings;
- Installation of a grade separated crossing at the Crosstown intersection either by creating a highway bridge structure over the existing railroad or constructing a railroad bridge to the north of the intersection and removing the existing rail tracks.

FIGURES

BLAIR STREET

BNSF MAINLINE (EXISTING)

RANKIN STREET

PARK STREET

JEFFERSON STREET

MADISON DR.

ROBINS STREET

GRADE SEPARATED CROSSING
(RAILROAD UNDERPASS)

MAIN STREET

PARK STREET

MAIN STREET

STRAUSS ST.

CARNATION STREET

CHURCH STREET

BROADWAY STREET

CLARK STREET

GREEN STREET

SPRING STREET

LEGEND

FULL CLOSURE

UPGRADE CROSSING

EXISTING RAILROAD

EXISTING STREET

PROPOSED STREET

PROP. RETAINING WALL

PROP. RIGHT-OF-WAY

MDOT

Feet
0 500 1000 1500
SCALE: 1"=500'

Tupelo Railroad Relocation
Planning and Environmental Study

Scenario 1: Elevate Road

EXHIBIT T1.DGN

4/24/2006

W. Jackson Street

Rankin Street

ADDITIONAL 50' ROW REQ'D

BEGIN CONSTRUCTION OF NEW ALIGNMENT

PROPOSED RAIL ALIGNMENT

Blair Street

CONSTRUCT GRADE SEPARATED CROSSING (RR OVERPASS)

Burlington Northern Santa Fe (Existing)

Rankin Street

Jefferson Street

PROPOSED RAILROAD BRIDGE

Park Street

PROPOSED RETAINING WALL

Glosser Street

Robins Street

Jefferson Street

Park Street

Main Street

RELOCATE RAIL ALIGNMENT NORTH OF INTERSECTION

Main Street

Main Street

CROSSTOWN

Glosser Street

Stratton Street

PROPOSED RETAINING WALL

Carnation Street

EXISTING ALIGNMENT TO BE REMOVED

Church Street

Broadway Street

Clark Street

Spring Street

CLOSE AT-GRADE CROSSING

Green Street

INSTALL 4-WAY GATE CROSSING

END NEW ALIGNMENT CONNECT TO EX. RAIL

LEGEND

- EXISTING RAILROAD
- PROPOSED RAILROAD
- PROPOSED RAIL BRIDGE
- PROP. RETAINING WALL
- PROP. RIGHT-OF-WAY

MDOT

Feet

0 500 1000 1500

SCALE: 1"=500'

Tupelo Railroad Relocation
Planning and Environmental Study

Scenario 2: Elevate Rail

ExhLBL3.mxd

4/21/2006

APPENDIX A

CONCEPTUAL COST ESTIMATES

ENGINEER'S OPINION OF PROBABLE COST (CONCEPTUAL)
CROSSTOWN INTERSECTION IMPROVEMENTS

SCENARIO 2:
ELEVATE RAILROAD OVER CROSSTOWN INTERSECTION

Item Description	Quantity	Unit	Unit Cost	Item Cost
Grading and Track Construction				
Clearing and Grubbing	20	AC	$10,000.00	$200,000.00
Remove Structures	12	EA	$10,000.00	$120,000.00
Grading / Earthwork	120000	CY	$12.00	$1,440,000.00
Erosion Control Silt Fence	20000	LF	$5.00	$100,000.00
Subballast	4000	CY	$35.00	$140,000.00
Track Construction (Ballast, Ties, Rail and Labor)	10000	TF	$160.00	$1,600,000.00
Remove Existing Track	11000	TF	$25.00	$275,000.00
Remove Existing Turnout	2	EA	$1,500.00	$3,000.00
Remove Existing Crossings	200	TF	$75.00	$15,000.00
Diamond Crossings	1	EA	$125,000.00	$125,000.00
At-grade crossing signals	3	EA	$300,000.00	$900,000.00
Utility Relocation (fiberoptic, sewer, water, cable)	1	LS	$3,500,000.00	$3,500,000.00
Turnout assembly (No. 11 Turnout)	1	EA	$150,000.00	$150,000.00
Temporary Turnouts	2	EA	$300,000.00	$600,000.00
			Grading and Track Construction Subtotal:	**$9,168,000.00**
Drainage Structures				
Box Culvert	100	LF	$600.00	$60,000.00
Pipe Culvert	200	LF	$200.00	$40,000.00
			Drainage Structures Subtotal:	**$100,000.00**
Roadway Work				
Removal of pavement	1	LS	$20,000.00	$20,000.00
Grading / Earthwork	0.3	MI	$1,200,000.00	$360,000.00
Asphalt paving	0.3	MI	$1,400,000.00	$420,000.00
Encasement of water and sewer lines	250	LF	$100.00	$25,000.00
Maintenance of traffic during construction	1	LS	$250,000.00	$250,000.00
Seeding and Fertilizing	1	LS	$50,000.00	$50,000.00
Landscaping	1	LS	$10,000.00	$10,000.00
			Roadway Work:	**$1,135,000.00**
Signalization				
Signal (New Track)	1.6	MI	$400,000.00	$640,000.00
Signal (Control Points)	4	EA	$250,000.00	$1,000,000.00
			Signalization Subtotal:	**$1,640,000.00**
Bridge Structures				
Railroad Bridges*	1600	LF	$20,000.00	$32,000,000.00
MSE Retaining Wall	75000	SF	$30.00	$2,250,000.00
			Bridge Structures Subtotal:	**$34,250,000.00**
Miscellaneous				
Mobilization	1	LS	10%	$4,630,000.00
Environmental/ Cultural Mitigation	15	AC	$100,000.00	$1,500,000.00
Miscellaneous Items	1	LS	5%	$2,315,000.00
			Miscellaneous Subtotal:	**$8,445,000.00**
			Construction Subtotal:	**$53,738,000.00**
Design Services	1	LS	20%	$10,748,000.00
Construction, Engineering and Inspection (CEI)	1	LS	15%	$8,061,000.00
Land Acquisitions & Right-of-Way (ROW)	20	AC	$750,000.00	$15,000,000.00
			Design, Construction and ROW Subtotal:	**$33,809,000.00**
Contingency (25%)	1	LS	25%	$21,887,000.00
			GRAND TOTAL:	**$109,434,000.00**

* Includes grade separated crossings at Blair Street, Park Street, Jefferson Street and Crosstown

ENGINEER'S OPINION OF PROBABLE COST (CONCEPTUAL)
CROSSTOWN INTERSECTION IMPROVEMENTS

SCENARIO 1: ELEVATE CROSSTOWN INTERSECTION OVER RAILROAD				
Item Description	Quantity	Unit	Unit Cost	Item Cost
Demolition				
Clearing and Grubbing	1	LS	$10,000.00	$10,000.00
Removal of obstructions	1	LS	$100,000.00	$100,000.00
Demolition and removal of pavements	25000	SY	$10.00	$250,000.00
Demolition and removal of curbs	6000	LF	$5.00	$30,000.00
Demolition and removal of traffic signals	1	LS	$20,000.00	$20,000.00
Plug and abandon storm pipes and inlets	1	LS	$15,000.00	$15,000.00
			Demoliton Subtotal:	**$425,000.00**
Earthwork				
Borrow Excavation	130000	CY	$8.00	$1,040,000.00
Unclassified Excavation	20000	CY	$5.00	$100,000.00
			Earthwork Subtotal:	**$1,140,000.00**
Roadway, Curb and Sidewalk				
Asphalt paving (2" thick)	5000	Ton	$75.00	$375,000.00
Bituminous base course (6" thick)	15000	Ton	$70.00	$1,050,000.00
Granular sub-base (12" thick)	15000	CY	$15.00	$225,000.00
Concrete curb and gutter	15000	LF	$12.00	$180,000.00
Concrete sidewalk	4000	SY	$30.00	$120,000.00
			Roadway, Curb and Sidewalks Subtotal:	**$1,950,000.00**
Utilities (Water, Sewer, Drainage)				
8" D.I. Water Main	3000	LF	$40.00	$120,000.00
8" PVC Sanitary Sewer	3000	LF	$35.00	$105,000.00
48" Sewer Manholes	10	Each	$3,000.00	$30,000.00
18" Storm Drainage Piping	2250	LF	$40.00	$90,000.00
24" Storm Drainage Piping	2500	LF	$60.00	$150,000.00
Curb Inlets	16	Each	$3,000.00	$48,000.00
Storm Manholes	4	Each	$3,500.00	$14,000.00
			Utilities Subtotal:	**$557,000.00**
Roadside Development				
Clearing and grubbing	1	LS	$10,000.00	$10,000.00
Seeding and Fertilizing	1	LS	$50,000.00	$50,000.00
Landscaping	1	LS	$10,000.00	$10,000.00
			Roadside Development Subtotal:	**$70,000.00**
Maintenance of Traffic During Construction	1	LS	$500,000.00	**$500,000.00**
Highway Lighting	1	LS	$100,000.00	**$100,000.00**
Permanent Traffic Control				
Traffic Signal	1	Each	$100,000.00	$100,000.00
Pavement Markings	1	LS	$25,000.00	$25,000.00
Roadside Signs	1	LS	$10,000.00	$10,000.00
			Traffic Control Subtotal:	**$135,000.00**
Bridge Structures				
Highway Bridge (5-lane, 4 leg elevated intersection)	75000	SF	$250.00	$18,750,000.00
Retaining Wall	50000	SF	$30.00	$1,500,000.00
			Bridge Structures Subtotal:	**$20,250,000.00**
Miscellaneous				
Mobilization	1	LS	10%	$2,513,000.00
Additional Miscellaneous Items	1	LS	5%	$1,257,000.00
			Miscellaneous Subtotal:	**$3,770,000.00**
			Construction Subtotal:	**$28,897,000.00**
Design Services	1	LS	20%	$5,780,000.00
Construction, Engineering and Inspection (CEI)	1	LS	15%	$4,335,000.00
Right-of-Way (ROW)	15	AC	$750,000.00	$11,250,000.00
			Design, Construction and ROW Subtotal:	**$21,365,000.00**
Contingency (25%)	1	LS	25%	$12,566,000.00
			GRAND TOTAL:	**$62,828,000.00**

Table 1 - Recommended Crossing Improvements

Scenario 1 - Elevate Crosstown Intersection over Railroad

CROSSING LOCATION	RECOMMENDED IMPROVEMENTS	ESTIMATED COST
Blair Street	Install 2-gate crossing system	$300,000.00
Jefferson Street	Full closure	$85,000.00
Park Street	Full closure	$85,000.00
Gloster Street (Crosstown)	Grade separation (road over rail)	$62,828,000.00
Church Street	Full closure	$85,000.00
Green Street	Install 2-gate crossing system	$300,000.00
Spring Street	Install 2-gate crossing system	$300,000.00
	TOTAL COST:	**$63,983,000.00**

Scenario 2 - Elevate Railroad over Crosstown

CROSSING LOCATION	RECOMMENDED IMPROVEMENTS	ESTIMATED COST
Blair Street, Jefferson Street, Park Street and Gloster Street (Crosstown)	Grade separation (rail over road)	$109,434,000.00
Church Street	Full closure	$85,000.00
Green Street	Install 2-gate crossing system	$300,000.00
Spring Street	Install 2-gate crossing system	$300,000.00
	TOTAL COST:	**$110,119,000.00**