

# **Corridor Two Regional Rail Feasibility Study and Alignment Alternatives**

## **TECHNICAL MEMORANDUM 9.0**

### **Estimated Capital Costs for the Rail Alternative**

**December 2009**

## **Corridor Two Regional Rail Feasibility Study and Alignment Alternatives**

### **Estimated Rail Capital Costs for the Rail Alternative**

#### **Overview and Purpose**

The purpose of this Technical Memorandum is to present the assumptions, approach, and the results for developing estimated rail capital costs for the Harrisburg-Hershey-Lebanon corridor. The analyses and the results are based on a key decision made earlier in the study process that identified the most feasible strategy for introducing commuter rail service in the Corridor as adding a third track to the Norfolk Southern mainline for the full length of the route.

The capital improvements that form the basis for the estimate of costs included in this report are documented in Technical Memorandum 8.0 Engineering Concepts.

The materials presented in this report were developed by Gannett Fleming, Inc. with support from Dawood Engineering, Inc. on structural assessments and costs.

#### **Basis of Estimate**

The Corridor Two Feasibility Study project consists of a 26.8 mile rail corridor with six proposed stations and associated parking; all located between the Cities of Harrisburg and Lebanon Pennsylvania. All proposed construction is located within and adjacent to the existing Norfolk Southern Railroad right-of way. The cost estimate represents the current opinion of probable cost to construct the project based on our best professional judgment. As the feasibility study and the conceptual design phase are progressed, the indicated probable costs will be further modified and refined as more data and detailed design information become available.

All costs are indicated in mid-2008 dollars and include contractors' mobilization/demobilization, permitting, contractors' general conditions/site overhead, and construction/design contingency. Project costs also include engineering, construction management and inspection and anticipated property acquisition costs. The project scope did not call for a spending plan reflecting staged of construction; therefore, no escalation factors have been applied to reflect year-of-expenditure amounts. Comparable costs were collected from historical data, recently developed costs on ongoing projects, commercially available construction cost data and other sources.

## Scope of Estimate

The following provides a brief description of the program elements for each of the cost categories, including assumptions.

### 1) Track and Special Track Work (Ballasted)

The cost for track work was based on 15 foot track centers; the track structure consisted of 136 lb CWR seated on timber ties and supported with 12 inches of ballast and 12 inches of sub-ballast. The cost for track relocation consists of preparing the sub-grade and then shifting the track into its final position as opposed to reconstructing the track. Once the track is shifted, it would be lined and surfaced. The estimate does not address how the work would be staged with minimal impact to freight service. The cost estimate includes the cost to purchase and install special track work (turnouts and crossovers). All quantities for special track work were developed from the proposed track alignment aerial mile maps.

### 2) Highway Crossing Panels:

The cost for highway crossing surfaces is included. For the purposes of this estimate, it was estimated that 19 crossing are required at an assumed length of 65 feet each. EP-Flex rubber and asphalt are the assumed materials.

### 3) Right-of-Way Clearing:

The estimate includes the cost of vegetation and brush removal in almost all areas of new track construction. It was assumed that since this work is being performed close to existing track work, only light vegetation and brush removal will be required. No large tracts of heavy tree and stump removals are anticipated.

### 4) Structures:

The survey of the existing bridges, retaining walls, culverts, rock outcrops and miscellaneous items was performed and the recommended modifications for each affected structure or proposed new structure are noted and described within the cost estimate. Where sufficient clearance for the additional track work was noted, no proposed work is identified or anticipated. Costs are based on square foot pricing, unit pricing and historical data.

The track work and structural costs associated with the optional construction of the duck under structure are both priced independently and are indicated at the conclusion of the overall cost estimate.

5) Stations:

The estimate includes the cost to construct platforms and shelters at each of the six proposed stations. Each station consists of one 300' long x 12' wide high level platform.

The station civil costs include parking lots, bus shelters, barrier fencing, drainage pipe and inlets, associated excavation/backfill and cost allowance for landscaping. Items that are unique to certain stations (e.g. demolition of U.S. Postal Service Building and remaining portion of the Postal Service Building Façade Closure for the Harrisburg Station only) are also included.

Station structural costs include foundation excavation, precast pier and pier footings, pier caps and precast high level platform panels. ADA platform ramps and stairs are also included.

Station architectural costs include items unique to a particular station (e.g. pedestrian overpass, elevators and stair towers for the Harrisburg Station only). Station costs also include platform shelters, tactile warning strip, railing, platform benches, trash receptacles, bike racks, identifying devices, lighting and associated conduit and wiring.

6) Ticket Vending Machines:

The cost of ticket vending machines are included and are quantified at one per station; with the exception of two units being required at Harrisburg Station. The units are assumed to be equipped with a central computer system with reporting capabilities.

7) Signal and Train Control:

Signal and train control costs are included and assumed to be wayside with positive train control (PTC). Crossovers between Norfolk Southern and CAT are assumed to be electric lock locations. Signal and train control costs are indicated by station-to-station segments.

8) Property Acquisitions:

The cost of property acquisition has been assessed in three distinct categories:

- a) Track right-of-way (Norfolk Southern)
- b) Track right-of way required beyond Norfolk Southern property
- c) Property acquisitions at station locations

The property acquisition costs associated with all three categories mentioned above are included in the cost estimate, with values being assigned, developed and appropriately adjusted using the 2001 Corridor One Valuation Study of the Norfolk

Southern line in Lemoyne and Lower Allen Township as a starting point. It was assumed the trends in land values since 2001 have grown at a rate of 2-4% per year, with a 2.5% compounded rate being applied up to the year 2007. For 2007-2008 2008, costs were calculated based on an estimated decline of approximately 5%. Using the factors mentioned above, an overall growth rate of 11% has been applied to the property values previously established for the Lemoyne/ Lower Allen segment to produce adjusted base values for the Harrisburg-Hershey-Lebanon Corridor.

It is also recognized that land development interest/potential in Derry Township and the Palmyra areas would place property values at the higher end of the Lemoyne/Lower Allen value scale. To account for the anticipated higher-end property values, a value factor of 1.50 has been applied to all adjusted base values derived through the procedure described above. The combined results after developing adjusted base values and applying the value factor of 1.5 are presented in the Summary Table on the next page.

**Table 1**

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	TOTAL COST
<b><u>OPINION OF PROBABLE COST - SUMMARY</u></b>	
Track Work - Harrisburg Station to Lebanon Station (8th St.)	\$40,002,925
Structure Modifications - Harrisburg Station to Lebanon Station (8th St.)	\$30,678,050
Structure Construction Phasing and Temporary Run Around Construction	\$4,601,708
Structure Modifications, Maintenance & Protection Of Traffic	\$2,500,000
Structure Modifications, Roadway Approaches	\$1,410,000
Stations:	
Harrisburg Station	\$5,832,976
Harrisburg East Station	\$886,476
Hummelstown Station	\$808,756
Hershey Station	\$450,641
Annville Station	\$1,112,238
Lebanon Station	\$970,570
Ticketing:	\$770,000
Signal and Train Control:	\$18,867,000
Subtotal	\$108,891,340
Mobilization/Demobilization @ 4%	\$4,355,654
Permitting @ 1.5%	\$1,698,705
Subtotal	\$114,945,698
General Conditions/Site Overhead @ 10%	\$11,494,570
Subtotal	\$126,440,268
Contingency @ 25%	\$31,610,067
Subtotal	\$158,050,335
Engineering @ 8%	\$12,644,027
Construction Management & Inspection @ 10%	\$15,805,033
Property Acquisitions	\$24,185,237
<b>ESTIMATED TOTAL PROJECT COST EXCLUDING DUCK UNDER OPTION:</b>	<b>\$210,684,632</b>
Duck Under Option (Includes All Soft Cost Items Listed Above)	\$19,065,001
Subtotal:	\$229,749,634
<b>ESTIMATED TOTAL PROJECT COST INCLUDING DUCK UNDER OPTION:</b>	<b>\$230,000,000</b>

## Estimated Rolling Stock Costs

The rail operations analysis documented in Technical Memorandum 6.1 assumed that the single-level variant of the Colorado Railcar diesel multiple-unit (DMU) vehicle would be used for the Harrisburg-Hershey-Lebanon service. The Colorado Railcar DMU vehicles meet or exceed current Federal Railroad Administration (FRA) buff strength (collision survivability) requirements, and the costs should be representative of the FRA-compliant class of DMU equipment. For purposes of estimating capital costs of rolling stock, the Colorado Rail Car DMU is also assumed. If further engineering and operations studies are advanced for Corridor Two, a detailed analysis of rail vehicle options would be completed and a recommended vehicle type identified at that time.

Three-car trainsets are assumed since they would be adequate for the projected demand and would still allow room for growth. Each trainset would have a total seating capacity of 290 (94 passengers for each powered unit and 102 passengers for each unpowered trailer coach), according to materials circulated by the manufacturer. Specifications for by Colorado Rail Car DMU were obtained from the manufacturer's web site and are presented immediately following the table of estimated rolling stock costs on the next page.

It was also reported in Technical Memorandum 6.1 that the "Enhanced Service Plan" (13 round trips on weekdays) would require two trainsets to meet peak service requirements. A third trainset would be required to allow one complete three-car trainset to be rotated out of service for repairs and/or scheduled inspection without affecting either the service or the capacity of the trains in service. In addition, the fleet would need to be supplemented by at least one additional powered car to support servicing and mandatory inspection requirements.

Each full trainset would be comprised of three cars including a powered car at each end and an unpowered "trailer" car in the middle position. All powered cars would be equipped with a full control cab to allow push-pull operations, thereby eliminating the need to turn trains to reverse directions at the end of each run.

The unit costs for purchasing Colorado Rail Car DMU rolling stock that were reported by TriMet of Portland, Oregon in 2008 are used for cost estimation purposes. The unit cost of a powered car was reported to be \$4 million, and the cost of each unpowered car was \$3 million.

Estimated rolling stock costs were calculated based on the above assumptions and are presented in Table 2 on the next page.

**Table 2**  
**Estimated Rolling Stock Costs**  
**(2008)**

Description	Quantity	Unit Cost	Total
Powered cars	7	\$4,000,000	\$28,000,000
Unpowered cars	3	\$3,000,000	\$9,000,000
<b>Total</b>			<b>\$37,000,000</b>

**Colorado Rail Car DMU Specifications Page**

*(From the Colorado Rail Car web site*

*December 19, 2008)*

<b>Dimensions...</b>	Single Level	Bi-Level
Length (over couplers)	85'	85'
Length (over body ends)	83' 6 1/2"	83' 6 1/2"
Width (over side sheets)	10'	10'
Height (rail to roof)	12' 10"	18'
Height (rail to lower floor)	50"	18"
Headroom (center aisle)	7' 6"	6' 8"
Doorway width	34"	9'
Doorway height	7'	7'
Step height (above top of rail)	18"	18"
Truck centers	60'	60'
Truck wheelbase	8' 6"	8' 6"
Track gage	4' 8 1/2"	4' 8 1/2"
Wheel diameter	33"	33"
Aisle width (lower deck)	24" - 32"	24" - 32"
Aisle width (upper deck)	N/A	24" - 32"
<b>Weight and Capacity...</b>	Single Level	Bi-Level
Empty weight (trailer car)	142,000 lbs	157,000 lbs
Empty weight (cab car)	148,000 lbs	163,000 lbs
Seating (trailer car)	102	190
Seating (cab car)	98	185
<b>Performance...</b>	Single Level	Bi-Level
Maximum design speed	100 mph	100 mph
Maximum operating speed	90 mph	90 mph
Service braking	1.5 mphps	1.5 mphps
Emergency braking	1.8 mphps	1.8 mphps

Min horizontal curve radius	250 ft.	250 ft.
Min vertical curve radius	2,000 ft.	2,000 ft.
MAcceleration to 55 mph	38 seconds	49 seconds
EMU Acceleration	49 seconds	N/A
<b>Electrical System...</b>	<b>(power car only)</b>	
Power supply	480 V, 3 ph, 60 Hz, up to 150 kW internal generation off prime movers or external head end power	
Low-voltage power suply	24 VDC emergency battery	
Interior lighting	Fluorescent	
MU	Multiple units can be controlled from end cab car	
<b>Drive Train...</b>	<b>(power car only)</b>	
Engine	Two Detroit Diesel series 60 motors with electronic fuel control. Each rated at 600 hp (500 hp available for final drive, 100 hp dedicated to power supply	
Transmission	Two Voith T211 rzze with KB190 retarder	
Final drive	Two Voith V20	
<b>Car Body...</b>		
Car structure	Low-allow, high-tensile steel	
Doors	One pneumatically operated two-leaf sliding pocket door per side, service doors at each end; optional vestibule loading through two pneumatically operated single-leaf sliding pocket doors per side	
Side windows	Fixed, tinted, meeting FRA Type II standards	
Fixed seats	Fixed seats, aluminum frames, molded fiberglass with upholstered inserts	
Trucks/Bogies	Two per vehicle, cast steel with inboard bearings	
Primary suspension	Chevron rubber spring	
Secondary suspension	Air spring	
Wheelslide protection	Yes	
Brakes	Pneumatic tread and disk brakes	
Parking brake	Mechanical hand brake	
Heating	Electric convection floor heaters, forced-air window heaters	
Air conditioning	Four self-contained units mounted center of car, between levels	
Toilet room	One per car, ADA accessible	

# Appendix

## Backup for Capital Cost Estimates



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Track Work - Harrisburg Station to Lebanon Station</i>				
<b>TRACK WORK:</b>				
<b>Ballasted Track Construction</b>				
New Track	110000	TF	\$250.00	\$27,500,000
Realign/ Upgrade Existing Track	39600	TF	\$84.00	\$3,326,400
<b>Subtotal:</b>				\$30,826,400
<b>Special Track Work</b>				
#10 Turnout	14	EA	\$87,700.00	\$1,227,800
#15 Turnout	15	EA	\$128,200.00	\$1,923,000
#20 Turnout	2	EA	\$157,700.00	\$315,400
#15 X-over	11	EA	\$244,600.00	\$2,690,600
#20 X-over	4	EA	\$303,600.00	\$1,214,400
<b>Subtotal:</b>				\$7,371,200
<b>Highway Crossing Surfaces (19 crossings assumed @ 65' in length)</b>				
EP-Flex rubber and asphalt	1235	TF	\$895.00	\$1,105,325
<b>Right-of-Way Clearing</b>				
Vegetation and Brush Removal	100000	TF	\$7.00	\$700,000
<b>Subtotal:</b>				\$1,805,325
<b>TRACK WORK TOTAL :</b>				<b>\$40,002,925</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures: Harrisburg Station to Harrisburg East Station (Paxtang Ave.)</b>				
<b>Structure Modifications:</b>				
Mulberry Street OHB (MP 112.07) - (No proposed work)	1	LS	\$0	\$0
Paxton Creek UGB (MP 111.8) Not accessible without NS permission - (No proposed work)	1	LS	\$0	\$0
South Cameron St. UGB (MP 111.71) --120' span, plate girder bridge, widen 17' No MOW: Assuming 14' existing C-C, 50' is sufficient with track shift or widen 17'	1	LS	\$1,020,000	\$1,020,000
Possible Utility (MP 111.55) -- Relocate existing utility box 18' from existing location	1	LS	\$2,000	\$2,000
13th St. OHB (MP 111.45) -- 68' clear span using existing pier Shift 1 existing track to open span or new structure from pier with 68' clear span	1	LS	\$1,882,000	\$1,882,000
Retaining Wall -- 10' High retaining wall 1,800' length - Relocate signal	1	LS	\$2,700,000	\$2,700,000
17th St. OHB (MP 111.13) -- 6,100 CY cut with rock outcrop Shift existing tracks 13', rock cut Corridor Two side	1	LS	\$153,000	\$153,000
Mile 111 -- MOW road on south with space on both sides. Few small signal structures (No proposed work)	1	LS	\$0	\$0
19th St. OHB (MP 110.93) -- 5,000 CY of excavation & removal of retaining wall 2 Span P/S PA I-Beam Bridge. A pier will be placed between existing and proposed tracks. Remove retaining wall, adjust existing grade of industrial track and install new retaining wall	1	LS	\$125,000	\$125,000
S. 29th St. OHB (MP 110.05) -- New Structure 40' x 95' (2 Span P/S Box Beam, 35'-10" span 1, 56'-8" span 2, 2 existing tracks in span 2)	1	LS	\$1,900,000	\$1,900,000
Mile 110 -- MOW Road south side, drainage ditches both sides of the tracks (No proposed work)	1	LS	\$0	\$0



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures (Continued): Harrisburg Station to Harrisburg East Station (Paxtang Ave.)</b>				
<b>Structure Modifications:</b>				
Spring Creek Culvert UGB (MP 109.79) -- 17' culvert extension, existing 18' span, 5' depth Assuming existing embankment is sufficient, additional 17' required	1	LS	\$108,000	\$108,000
Paxtang Ave. UGB (MP 109.64) -- 17' widening of superstructure only No shift, 38' span steel plate girders, extra space in abutments for widening, 4'-1" clr	1	LS	\$323,000	\$323,000
<b>Subtotal:</b>				<b>\$8,213,000</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures: Harrisburg East Station (Paxtang Ave.) to Hummelstown Station (Hanover St.)</b>				
<b>Structure Modifications:</b>				
Spring Creek UGB (MP 109.48) -- 17' culvert extension, existing 25' span, 8' depth	1	LS	\$212,500	\$212,500
Mile 109 -- MOW Road north side from 40th St. MOW between existing tracks until 29th St. (No proposed work)	1	LS	\$0	\$0
40th Street OHB (MP 108.86) -- 10' high x 500' retaining wall MOW Corridor Two side, 18'-10" pier to CL existing, 38'-3" span 1, 62'-10" span 2, 2 existing	1	LS	\$750,000	\$750,000
Utility (MP 108.75) -- New signal structure 77' span Cantilever overhead signal structure over 4 tracks + MOW	1	LS	\$128,000	\$128,000
Rt. 322 UGB (MP 108.67) -- 17' widening, 100' length Additional 17' required, 2 span steel girder, 50' spans, 65'-6" clr, 3 existing tracks	1	LS	\$850,000	\$850,000
I-83 OHB (MP 108.5) -- Two new bridges 80' x 60' & 80' x 42' MOW Corridor Two side, need 80' clear, two bridges	1	LS	\$3,672,000	\$3,672,000
Abandoned Abutments (MP 108.6) -- 1,900 CY excavation and removal of abutment Remove north abutment, 63'-7" clr, 3 existing tracks between abutments	1	LS	\$48,000	\$48,000
Mile 108 -- Cut section to I-83 OHB, fill to Rt. 322 OHB; No MOW roads until after 322 OHB (No proposed work)	1	LS	\$0	\$0
Mile 107 -- Rutherford Yard (No proposed work)	1	LS	\$0	\$0
63rd St. OHB (MP 106.68) -- New bridge 65' x 40' 63' clr, 1 span P/S Box w/ P/S I-Beam east fascia 44'-10" Clr, low overhead clearance - replace	1	LS	\$1,170,000	\$1,170,000
Mile 106 -- Rutherford Yard, no clear MOW road (No proposed work)	1	LS	\$0	\$0

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures (Continued): Harrisburg East Station (Paxtang Ave.) to Hummelstown Station (Hanover St.)</b>				
<b>Structure Modifications:</b>				
Milroy Rd. UGB (MP 105.06) -- Replace Structure Additional 17' required, 22' span, 70' along abutment, concrete slab 69'-9" clr, very narrow for amount of traffic	1	LS	\$1,200,000	\$1,200,000
Mile 105 -- Beginning of Rutherford Yard; MOW roads vary (No proposed work)	1	LS	\$0	\$0
Pleasant View Rd. UGB (MP 104.64) -- Replace Structure Additional 19' required, 31'-9" span conc. box, 28' clr, utility lines hang under bridge	1	LS	\$1,200,000	\$1,200,000
Beaver Creek UGB (MP 104.5) -- 24,900 CY fill over structure Additional fill only, 48' span, 2 bay concrete culvert, 150' long, under deep fill ~30'	1	LS	\$249,000	\$249,000
Mile 104 -- MOW road north (No proposed work)	1	LS	\$0	\$0
Swatara Creek UGB (MP 104) -- New structure 49' x 350' for two tracks + MOW 5 span conc. arch, 54'-10" clr, 47' to bottom of arch, 63'-6" clr spans	1	LS	\$6,003,000	\$6,003,000
Mile 103 -- MOW road south, then north and south near Swarata Creek (No proposed work)	1	LS	\$0	\$0
Hanover St. UGB (MP 102.85) -- Replace Structure Fits with track shift, 19'-8" concrete arch, 58'-5" clr. very narrow for amount of traffic	1	LS	\$1,200,000	\$1,200,000
<b>Subtotal:</b>				<b>\$16,682,500</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures: Hummelstown Station (Hanover St.) to Hershey Station (Park Ave.)</b>				
<b>Structure Modifications:</b>				
Country Lane OHB (MP 102.47) -- New Bridge 66' x 20' Remove or new structure - 66' clr, private steel truss, 66'-10" clr, 21'-9" abutment to CL south existing	1	LS	\$462,000	\$462,000
Mile 102 -- Relocate 11 poles Relocate 11 utility poles on south side; MOW road South	1	LS	\$39,000	\$39,000
Abandoned UGB (MP 101.9) -- Fits with track shift (No proposed work)	1	LS	\$0	\$0
Rt. 39 UGB (MP 101.85) -- 17' widening, 107' length Additional 17' required, 6' plate girders, 107' span, 32'-9" clr, 2 existing tracks	1	LS	\$818,550	\$818,550
Mile 101 -- Relocate 7 utility poles on south side; MOW road not apparent, south	1	LS	\$25,000	\$25,000
Abandoned Tunnel UGB (MP 100.45) -- (No proposed work)	1	LS	\$0	\$0
W. Choc. Ave. UGB (MP 100.4) -- Fits with track shift (No proposed work)	1	LS	\$0	\$0
Mile 100 -- MOW road south (No proposed work)	1	LS	\$0	\$0
Ridge Rd. UGB (MP 99.75) -- (No proposed work)	1	LS	\$0	\$0
Overhead pedestrian bridge (MP 99.6) 1 span, 3 existing tracks -- (No proposed work)	1	LS	\$0	\$0
Park Ave. OHB (MP 99.53) 1 span, concrete bridge, 3 existing tracks -- (No proposed work)	1	LS	\$0	\$0
<b>Subtotal:</b>				<b>\$1,344,550</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures: Hershey Station (Park Ave.) to Annville Station (Railroad St.)</b>				
<b>Structure Modifications:</b>				
Mile 99 -- Unknown c/cr to monorail track; No MOW road through Hershey -- (No proposed work)	1	LS	\$0	\$0
Spring Creek UGB (MP 99.22) Using existing tracks -- (No proposed work)	1	LS	\$0	\$0
W. Mansion Rd. UGB (MP 99.18) 12'-4" Tunnel -- (No proposed work)	1	LS	\$0	\$0
Laudermilch Rd. OHB (MP 98.39) -- New Structure 30' x 66', 28' roadway width MOW north side, 66' c/cr needed, 9'-6" steel through girder, 80'-3" beam length, 18'-7" to S track, 61'-5" c/cr	1	LS	\$891,000	\$891,000
Mile 98 -- MOW roads north and south -- (No proposed work)	1	LS	\$0	\$0
N. Lingle Ave. OHB (MP 97.09) -- 12' x 100' retaining wall (use open span) 3 span P/S Conc. Box, 2 existing tracks, 53' middle span, 32'-7" end span clear	1	LS	\$180,000	\$180,000
Mile 97 -- MOW road south with space on north -- (No proposed work)	1	LS	\$0	\$0
Mile 96 -- MOW road south -- (No proposed work)	1	LS	\$0	\$0
N. Grant St. OHB (MP 95.93) - Use open span to south, or move turnout beyond bridge (No proposed work)	1	LS	\$0	\$0
Mile 95 -- New signal structure 90' span MOW road north, signal structure east of Grant St. over 4 existing tracks	1	LS	\$149,000	\$149,000
Mile 94 -- Quarry area (No proposed work)	1	LS	\$0	\$0
Killing Creek UGB (MP 93.57) -- 17' Culvert extension 25' span Additional 17' required, fill with Structure	1	LS	\$149,000	\$149,000
Mile 93 -- Quarry sidings (No proposed work)	1	LS	\$0	\$0

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures (Continued): Hershey Station (Park Ave.) to Annville Station (Railroad St.)</b>				
<b>Structure Modifications:</b>				
Clear Spring Rd. OHB (MP 92.84) -- New structure 30' x 80' MOW Corridor. Two side, need 77' clr, steel through girder, 62' clr, 3 existing tracks, 24' to CL	1	LS	\$1,200,000	\$1,200,000
W. Quittapahilla UGB (MP 92.63) -- 17' culvert extension 12' span Widen 17', 12' stone arch, 16'-3" height, 2 existing tracks, ~40 Clr	1	LS	\$102,000	\$102,000
E. Quittapahilla UGB (MP 92.59) -- 17' widening, 57' length Stone masonry/conc.. arch, 57' length, 34'-9" clr, 2 existing tracks	1	LS	\$243,000	\$243,000
Quarry pipe culvert UGB (MP 92.1) -- 13,300 CY fill & 12' pipe extension 3' diam, pipe culvert, under ~20' fill, 101' length, 2 existing tracks	1	LS	\$137,000	\$137,000
Mile 92 -- 2-new signal structures, 77' span & 66' span MOW road on north until Quittapahilla Cr., then south, relocate 2 signal structures	1	LS	\$231,000	\$231,000
Storm Water UGB (MP 91.97) -- 700 CY, (21') fill and 10' pipe Old culvert, 8' diameter pipe, extends 10' beyond headwall, 2 existing tracks, 6' to south tracks	1	LS	\$21,000	\$21,000
Rt. 934 OHB (MP 91.54) -- No MOW, fits with track shift, large rock outcrop both sides 1 span steel through girder, 32'-4" wide, 63'-5" clr, 2 existing tracks (No proposed work)	1	LS	\$0	\$0
LVC Pedestrian OHB (MP 91.43) -- Carries many utilities. 83'-2" Clr, 34'-6" to CL existing (No proposed work)	1	LS	\$0	\$0
Mile 91 -- 19,900 CY cut, mostly rock No MOW roads, deep rock cut both sides of existing	1	LS	\$995,000	\$995,000
<b>Subtotal:</b>				<b>\$4,298,000</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Structures: Annville Station (Railroad St.) to Lebanon Station (8th St.)</b>				
<b>Structure Modifications:</b>				
Mile 90 -- Relocate small signal structure, MOW road south, with space north (No proposed work)	1	LS	\$0	\$0
Small culvert UGB (MP 89.47) -- Small culvert, existing tracks (No proposed work)	1	LS	\$0	\$0
Center St. OHB (MP 89.34) -- 1 span P/S conc. Adj. box, 64'-5" span, 11'-5" to south track, existing tracks (No proposed work)	1	LS	\$0	\$0
Mile 89 -- MOW road north (No proposed work)	1	LS	\$0	\$0
Concrete Arch UGB (MP 88.55) -- 3' x 5' Conc. Arch, possibly closed, existing tracks (No proposed work)	1	LS	\$0	\$0
25th St. UGB (MP 88.07) -- 12' stone masonry arch, existing tracks, 57'-6" Clr (No proposed work)	1	LS	\$0	\$0
Mile 88 -- MOW road north (No proposed work)	1	LS	\$0	\$0
Storm Sewer UGB (MP 87.23) -- Abandoned, filled with concrete, 2 existing tracks (No proposed work)	1	LS	\$0	\$0
Brandy Creek UGB (MP 87.16) -- 23' concrete culvert extension, 12' span 3 existing tracks, 18'-1" to south existing, 72' clr	1	LS	\$138,000	\$138,000
Mile 87/86 -- Mile 87, Railroad yard, MOW road each side; MOW road south before yard (No proposed work)	1	LS	\$0	\$0
Lincoln Ave (MP 85.85) -- Remove existing retaining wall and fill, 100 CY	1	LS	\$2,000	\$2,000
<b>Subtotal:</b>				<b>\$140,000</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Structures (Continued); Totals</i>				
<i>Structure Modifications:</i>				
<b>CORRIDOR TWO STRUCTURE SUBTOTAL :</b>				
Structure Modifications, Other Associated Costs:				
Structure Construction Phasing and Temporary Run Around Construction @ 15%				\$4,601,708
Maintenance and Protection of Traffic @ \$2,500,000			(Included on Summary Sheet)	\$2,500,000
Roadway Approaches @ \$1,410,000			(Included on Summary Sheet)	\$1,410,000



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST SUMMARY**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Harrisburg Station (Market St.)</b>				
<b>CIVIL / SITE :</b>				
Demolish Portion Of Post Office Building (580'x160')	1	LS	\$2,960,000.00	\$2,960,000
Closure Of Remaining Portion of Building	5,760	SF	\$100.00	\$576,000
Parking Lot (Spaces)	107	EA	\$3,500.00	\$374,500
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
24" Perforated HDPE Pipe	370	LF	\$30.00	\$11,100
18" Solid HDPE Pipe	70	LF	\$21.00	\$1,470
Excavation, Bedding, Backfill, Compaction	281	CY	\$42.00	\$11,802
Inlets	5	EA	\$2,700.00	\$13,500
Soil Test Pits (3' x 3' x 5') and Double Ring Infiltrometer	2	EA	\$657.00	\$1,314
Landscaping (Allow)	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				<b>\$3,973,686</b>

<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				<b>\$317,200</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST SUMMARY**

January, 2008

ITEM DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Harrisburg Station (Market St.)</b>					
<b>ARCHITECTURAL :</b>					
	Pedestrian Overpass (To Transportation Center)	1	LS	\$286,000.00	\$286,000
	Overpass Elevators, HD Transit Type (2 Stop)	2	EA	\$390,000.00	\$780,000
	Overpass Stair & Elevator Towers	1	LS	\$356,000.00	\$356,000
	Stair & Elevator Tower Roofing	1	LS	\$5,000.00	\$5,000
	Stair & Elevator Tower Finishes	1	LS	\$15,000.00	\$15,000
	Platform Shelter	2	EA	\$7,000.00	\$14,000
	Platform Railing	324	LF	\$60.00	\$19,440
	Platform Benches	2	EA	\$400.00	\$800
	Telephone (Public)	1	EA	\$1,800.00	\$1,800
	Trash Receptacles	3	EA	\$350.00	\$1,050
	Identifying Devices	6	EA	\$1,110.00	\$6,660
	Platform Lighting	12	EA	\$3,650.00	\$43,800
	1" PVC Conduit	400	LF	\$6.00	\$2,400
	Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
	Junction Boxes	4	EA	\$175.00	\$700
	Tactile Warning Strip	300	LF	\$25.00	\$7,500
	Bike Rack	1	EA	\$500.00	\$500
	<b>Subtotal:</b>			\$1,542,090	\$1,542,090
	<b>Harrisburg Station (Market St.) Total Excluding ROW:</b>				<b>\$5,832,976</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Harrisburg East Station (Paxtang Ave.)</b>				
<b>CIVIL / SITE :</b>				
Parking Lot (Spaces)	116	EA	\$3,500.00	\$406,000
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
24" Perforated HDPE Pipe	370	LF	\$30.00	\$11,100
18" Solid HDPE Pipe	70	LF	\$21.00	\$1,470
Excavation, Bedding, Backfill, Compaction Inlets	281	CY	\$42.00	\$11,802
Soil Test Pits (3' x 3' x 5') and Double Ring Infiltrometer	5	EA	\$2,700.00	\$13,500
Landscaping (Allow)	2	EA	\$657.00	\$1,314
	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				<b>\$469,186</b>
<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				<b>\$317,200</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>ARCHITECTURAL :</b>				
Platform Shelter	2	EA	\$7,000.00	\$14,000
Platform Railing	324	LF	\$60.00	\$19,440
Platform Benches	2	EA	\$400.00	\$800
Telephone (Public)	1	EA	\$1,800.00	\$1,800
Trash Receptacles	3	EA	\$350.00	\$1,050
Identifying Devices	6	EA	\$1,110.00	\$6,660
Platform Lighting	12	EA	\$3,650.00	\$43,800
1" PVC Conduit	400	LF	\$6.00	\$2,400
Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
Junction Boxes	4	EA	\$175.00	\$700
Tactile Warning Strip	300	LF	\$25.00	\$7,500
Bike Rack	1	EA	\$500.00	\$500

**Subtotal:**

\$100,090

**Harrisburg East Station (Paxtang Ave.) Total:**

**\$886,476**

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Hummelstown Station (Hanover St.)</b>				
<b>CIVIL / SITE :</b>				
Parking Lot (Spaces)	93	EA	\$3,500.00	\$325,500
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
36" Perforated HDPE Pipe	260	LF	\$55.00	\$14,300
18" Solid HDPE Pipe	50	LF	\$21.00	\$1,050
Excavation, Bedding, Backfill, Compaction Inlets	281	CY	\$42.00	\$11,802
Soil Test Pits and Double Ring Infiltrimeter	5	EA	\$2,700.00	\$13,500
Landscaping (Allow)	2	EA	\$657.00	\$1,314
	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				<b>\$391,466</b>
<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				<b>\$317,200</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>ARCHITECTURAL :</b>				
Platform Shelter	2	EA	\$7,000.00	\$14,000
Platform Railing	324	LF	\$60.00	\$19,440
Platform Benches	2	EA	\$400.00	\$800
Telephone (Public)	1	EA	\$1,800.00	\$1,800
Trash Receptacles	3	EA	\$350.00	\$1,050
Identifying Devices	6	EA	\$1,110.00	\$6,660
Platform Lighting	12	EA	\$3,650.00	\$43,800
1" PVC Conduit	400	LF	\$6.00	\$2,400
Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
Junction Boxes	4	EA	\$175.00	\$700
Tactile Warning Strip	300	LF	\$25.00	\$7,500
Bike Rack	1	EA	\$500.00	\$500
<b>Subtotal:</b>				\$100,090

**Hummelstown Station (Hanover St.) Total:** **\$808,756**



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Hershey Station (Park Ave.)</b>				
<b>CIVIL / SITE :</b>				
Parking Lot (Spaces)	0	EA	\$3,500.00	\$0
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
6" Solid PVC Pipe	360	LF	\$7.00	\$2,520
6" Perforated PVC Pipe	60	LF	\$7.00	\$420
6" PVC Cleanouts	6	EA	\$55.00	\$330
Excavation, Bedding, Backfill, Compaction	137	CY	\$30.00	\$4,110
Soil Test Pits and Double Ring Infiltrometer	3	EA	\$657.00	\$1,971
Landscaping	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				<b>\$33,351</b>
<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				<b>\$317,200</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>ARCHITECTURAL :</b>				
Platform Shelter	2	EA	\$7,000.00	\$14,000
Platform Railing	324	LF	\$60.00	\$19,440
Platform Benches	2	EA	\$400.00	\$800
Telephone (Public)	1	EA	\$1,800.00	\$1,800
Trash Receptacles	3	EA	\$350.00	\$1,050
Identifying Devices	6	EA	\$1,110.00	\$6,660
Platform Lighting	12	EA	\$3,650.00	\$43,800
1" PVC Conduit	400	LF	\$6.00	\$2,400
Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
Junction Boxes	4	EA	\$175.00	\$700
Tactile Warning Strip	300	EA	\$25.00	\$7,500
Bike Rack	1	EA	\$500.00	\$500
<b>Subtotal:</b>				\$100,090

**Hershey Station (Park Ave.) Total:**

**\$450,641**

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Annnville Station (Railroad St.):</b>				
<b>CIVIL / SITE :</b>				
Parking Lot (Spaces)	167	EA	\$3,500.00	\$584,500
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
24" Perforated HDPE Pipe	760	LF	\$30.00	\$22,800
18" Solid HDPE Pipe	300	LF	\$21.00	\$6,300
Excavation, Bedding, Backfill, Compaction	668	CY	\$40.00	\$26,720
Inlets	10	EA	\$2,700.00	\$27,000
Type "DW" Endwall	1	EA	\$1,000.00	\$1,000
Soil Test Pits and Double Ring Infiltrimeter	4	EA	\$657.00	\$2,628
Landscaping (Allow)	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				<b>\$694,948</b>
<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				<b>\$317,200</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>ARCHITECTURAL :</b>				
Platform Shelter	2	EA	\$7,000.00	\$14,000
Platform Railing	324	LF	\$60.00	\$19,440
Platform Benches	2	EA	\$400.00	\$800
Telephone (Public)	1	EA	\$1,800.00	\$1,800
Trash Receptacles	3	EA	\$350.00	\$1,050
Identifying Devices	6	EA	\$1,110.00	\$6,660
Platform Lighting	12	EA	\$3,650.00	\$43,800
1" PVC Conduit	400	LF	\$6.00	\$2,400
Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
Junction Boxes	4	EA	\$175.00	\$700
Tactile Warning Strip	300	LF	\$25.00	\$7,500
Bike Rack	1	EA	\$500.00	\$500
<b>Subtotal:</b>				\$100,090

**Annville Station (Railroad St.) Total:**

**\$1,112,238**

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Stations: Lebanon Station (8th St.)</b>				
<b>CIVIL / SITE :</b>				
Parking Lot (Spaces)	130	EA	\$3,500.00	\$455,000
Barrier Fence -- 6'-0" Chain Link	400	LF	\$30.00	\$12,000
Bus Shelter	1	EA	\$7,000.00	\$7,000
24" Perforated HDPE Pipe	730	LF	\$30.00	\$21,900
Excavation, Bedding, Backfill Compaction Inlets	474	CY	\$48.00	\$22,752
Soil Test Pits and Double Ring Infiltrometer	10	EA	\$2,700.00	\$27,000
Landscaping (Allow)	4	EA	\$657.00	\$2,628
	1	LS	\$5,000.00	\$5,000
<b>Subtotal:</b>				\$553,280
<b>STRUCTURAL :</b>				
Excavation, cl. 3, Backfill, & Compaction for Platform Pier Footings (6' x 6' x 6')	320	CY	\$30.00	\$9,600
Platform Piers and Pier Footings -- 2' x 2' x 5'	40	EA	\$2,500.00	\$100,000
Pier Caps -- 2' x 2' x 9'	20	EA	\$3,000.00	\$60,000
Precast Platform Panels -- 300' x 12'	3600	SF	\$36.00	\$129,600
Station ADA Platform Ramp	1	EA	\$6,000.00	\$6,000
Stairs	4	EA	\$3,000.00	\$12,000
<b>Subtotal:</b>				\$317,200



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>ARCHITECTURAL :</b>				
Platform Shelter	2	EA	\$7,000.00	\$14,000
Platform Railing	324	LF	\$60.00	\$19,440
Platform Benches	2	EA	\$400.00	\$800
Telephone (Public)	1	EA	\$1,800.00	\$1,800
Trash Receptacles	3	EA	\$350.00	\$1,050
Identifying Devices	6	EA	\$1,110.00	\$6,660
Platform Lighting	12	EA	\$3,650.00	\$43,800
1" PVC Conduit	400	LF	\$6.00	\$2,400
Conductors - 2-#12, 1 Grid.	480	LF	\$3.00	\$1,440
Junction Boxes	4	EA	\$175.00	\$700
Tactile Warning Strip	300	LF	\$25.00	\$7,500
Bike Rack	1	EA	\$500.00	\$500
<b>Subtotal:</b>				\$100,090
<b>Lebanon Station (8th St.) Total:</b>				<b>\$970,570</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>TICKETING :</b>				
<i>TICKET VENDING MACHINE (Central Computer System with Reporting) :</i>				
Harrisburg Station	2	EA	\$110,000.00	\$220,000
Harrisburg East Station (Paxtang Ave.)	1	EA	\$110,000.00	\$110,000
Hummelstown Station (Hanover St.)	1	EA	\$110,000.00	\$110,000
Hershey Station (Park Ave.)	1	EA	\$110,000.00	\$110,000
Annville Station (Railroad St.)	1	EA	\$110,000.00	\$110,000
Lebanon Station (8th St.)	1	EA	\$110,000.00	\$110,000
				<b>\$770,000</b>

**TICKETING TOTAL :**



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Signal and Train Control: Harrisburg Station to Harrisburg East Station (Paxtang Ave.)</i>				
CP 112 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
Electric Lock MP 111.50 -- Industrial Siding	1	EA	\$150,000	\$150,000
Auto Signal MP111 -- Auto Signal	1	EA	\$207,000	\$207,000
Electric Lock MP 110.80 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 110.75 -- X-over NS	1	EA	\$150,000	\$150,000
<b>Subtotal:</b>				<b>\$1,234,000</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Signal and Train Control: Harrisburg East Station (Paxtang Ave.) to Hummelstown Station (Hanover St.)</i>				
Auto Signal MP109 -- Auto Signal	1	EA	\$207,000	\$207,000
Auto Signal MP107 -- Auto Signal	1	EA	\$207,000	\$207,000
CP 106 -- Universal Int.	1	EA	\$1,013,000	\$1,013,000
Auto Signal MP105 -- Auto Signal	1	EA	\$207,000	\$207,000
CP 104 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
Overview Drive -- Crossing 4 Trk	1	EA	\$231,000	\$231,000
Farm Road -- Crossing 4 Trk	1	EA	\$231,000	\$231,000
CP 103 -- Universal Int.	1	EA	\$1,013,000	\$1,013,000
Auto Signal MP103 -- Auto Signal	1	EA	\$207,000	\$207,000
Duke Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Railroad Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000

**Subtotal:**

\$4,347,000



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Signal and Train Control: Hummelstown Station (Hanover St.) to Hershey Station (Park Ave.)</b>				
Electric Lock MP 102.80 -- To MIDDLETOWN & HUMMELSTOWN RR	1	EA	\$150,000	\$150,000
CP Brown MP 101.75 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
CP 101 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
Auto Signal MP101 -- Auto Signal	1	EA	\$207,000	\$207,000
Electric Lock MP 100.90 -- X-over NS	1	EA	\$150,000	\$150,000
Electric Lock MP 100.80 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 99.80 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 99.75 -- X-over NS	1	EA	\$150,000	\$150,000
Derry Road -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
<b>Subtotal:</b>				<b>\$2,338,000</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Signal and Train Control: Hershey Station (Park Ave.) to Annville Station (Railroad St.)</i>				
Auto Signal MP99 -- Auto Signal	1	EA	\$207,000	\$207,000
Electric Lock MP 98.60 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 97.30 -- X-over NS	1	EA	\$150,000	\$150,000
Electric Lock MP 97.20 -- Industrial Siding	1	EA	\$150,000	\$150,000
Auto Signal MP97 -- Auto Signal	1	EA	\$207,000	\$207,000
Electric Lock MP 96.50 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 96.30 -- X-over NS	1	EA	\$150,000	\$150,000
Railroad Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Electric Lock MP 96 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 95.75 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 95.60 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 95.30 -- X-over NS	1	EA	\$150,000	\$150,000
Auto Signal MP95 -- Auto Signal	1	EA	\$207,000	\$207,000
CP Millards -- Universal Int.	1	EA	\$1,013,000	\$1,013,000
Auto Signal MP93 -- Auto Signal	1	EA	\$207,000	\$207,000
Electric Lock MP 91.9 -- Industrial Siding	1	EA	\$150,000	\$150,000
Electric Lock MP 91.2 -- X-over NS	1	EA	\$150,000	\$150,000
Auto Signal MP91 -- Auto Signal	1	EA	\$207,000	\$207,000
Moyer Road -- Private Crossing 3 Trk	1	EA	\$227,000	\$227,000
Weaver Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Mill Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
<b>Subtotal:</b>				<b>\$4,606,000</b>

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<i>Signal and Train Control: Annyville Station (Railroad St.) to Lebanon Station (8th St.)</i>				
Electric Lock MP 89.8 -- X-over NS	1	EA	\$150,000	\$150,000
Auto Signal MP89 -- Auto Signal	1	EA	\$207,000	\$207,000
CP 89 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
CP 88 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
Auto Signal MP88 -- Auto Signal	1	EA	\$207,000	\$207,000
CP Hom MP 87.75 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
CP Cornwall MP 87.50 -- Universal Int.	1	EA	\$1,013,000	\$1,013,000
CP Brandy MP 87 -- Single Turnout Int.	1	EA	\$577,000	\$577,000
Auto Signal MP87 -- Auto Signal	1	EA	\$207,000	\$207,000
12 Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
10th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Route 72 9th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Gannon Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
8th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
7th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
5th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
4th Street -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Lincoln Avenue -- Crossing 3 Trk	1	EA	\$227,000	\$227,000
Auto Signal MP85 -- Auto Signal	1	EA	\$207,000	\$207,000

**Subtotal:**

\$6,342,000

**Signal and Train Control Total:**

**\$18,867,000**



Conceptual Design --- OPINION OF PROBABLE COST SUMMARY

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
------------------	----------	------	-----------	------------

Property Acquisitions - Harrisburg Station to Lebanon Station (8th St.):

\$24,185,237.30

Property Acquisition Total:

-----  
\$24,185,237.30

Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE CONSTRUCTION COST**

December, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>OPINION OF PROBABLE COST - DUCK UNDER OPTION - SUMMARY</b>				
Track Work - Modifications				-\$1,088,600
Duck Under Structure				\$12,220,076
<b>Subtotal</b>				<b>\$11,131,476</b>
Mobilization/Demobilization @ 4%				\$445,259
Permitting @ 1.5%				\$173,651
<b>Subtotal</b>				<b>\$11,750,386</b>
General Conditions/Site Overhead @ 10%				\$1,175,039
<b>Subtotal</b>				<b>\$12,925,425</b>
Contingency @ 25%				\$3,231,356
<b>Subtotal</b>				<b>\$16,156,781</b>
Engineering @ 8%				\$1,292,542
Construction Management & Inspection @ 10%				\$1,615,678
<b>ESTIMATED TOTAL COST - DUCK UNDER OPTION:</b>				<b>\$19,065,001</b>



Gannett Fleming, Inc.

**CORRIDOR TWO FEASIBILITY STUDY**

**Conceptual Design --- OPINION OF PROBABLE COST**

January, 2008

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
------------------	----------	------	-----------	------------

*Track Work and Duck Under Structure Option:*

**TRACK WORK**

**Ballasted Track Construction**

New Track - Deleted  
 Realign/ Upgrade Existing Track - Added

1000	TF	\$250.00		-\$250,000
1000	TF	\$84.00		\$84,000

**Subtotal:**

-\$166,000

**Special Track Work**

#20 Turnout - Deleted  
 #20 X-over

2	EA	\$157,700.00		-\$315,400
2	EA	\$303,600.00		-\$607,200

**Subtotal:**

-\$922,600

**TRACK WORK TOTAL :**

-----  
**-\$1,088,600**

**DUCK UNDER STRUCTURE**

Excavation/Backfill  
 Top Slab Concrete  
 Deck Waterproofing  
 Reinforcing Steel - Epoxy Coated  
 Walls 48" Dia. Drilled Shafts  
 Wall Footing Concrete  
 Wall Concrete  
 Retaining Walls

14000	CY	\$20.00		\$280,000
833	CY	\$872.00		\$726,376
12500	SF	\$7.00		\$87,500
970000	LBS	\$2.00		\$1,940,000
6700	LF	\$846.00		\$5,668,200
1800	CY	\$480.00		\$864,000
3,300	CY	\$480.00		\$1,584,000
10,000	SF	\$107.00		\$1,070,000

**Subtotal:**

-----  
**\$12,220,076**

**Duck Under Option Total:**

**\$11,131,476**