

A7 - Capital Cost

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Cincinnati, 90 mph Maximum Speed

Revised on 10/14/02



			MWRRS Cleveland Route									
			Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Cleveland to Berea		Berea to Columbus		Columbus to Sharonville		Sharonville to Cincinnati			
			NS		CSXT		CSXT		CSXT			
			MP 181.7 - MP 194		MP 194 - MP 138		MP 138 - MP 246		MP 246 - MP 2.2			
			12.3 miles		121 miles		108 miles		17 miles		241.3 miles	
			79 mph		90 mph		90 mph		90 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork												
1.1	HSR on Existing Roadbed	per mile		\$ 993		-		-		-		-
1.2a	HSR on New Roadbed	per mile	12	\$ 1,059		12,708		-	14	14,826	26	27,534
1.2b	HSR on New Roadbed & New Embankment	per mile	12	\$ 1,492	70	104,440	59	88,028		-	141	210,372
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile		\$ 2,674		-		-		-		-
1.3	Timber & Surface w/ 33% Tie replacement	per mile		\$ 222		-		-		-		-
1.4	Timber & Surface w/ 66% Tie Replacement	per mile		\$ 331	51	16,881	49	16,219		-	100	33,100
1.5	Relay Track w/ 136# CWR	per mile		\$ 354		-		-		-		-
1.6	Freight Siding	per mile		\$ 912	20	18,240	20	18,240		-	40	36,480
1.65	Passenger Siding	per mile		\$ 1,376		-		-		-		-
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile		\$ 51	20	1,020	70	3,570		-	90	4,590
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	12	\$ 153	80	12,240	20	3,060		-	112	17,136
1.73	Fencing, 10 ft Chain Link (both sides)	per mile		\$ 175		-		-		-		-
1.74	Decorative Fencing (both sides)	per mile	1	\$ 394	21	8,274	18	7,092		-	40	15,760
Total Track Costs					32,842	161,095	136,209	14,826			344,972	
Turnouts												
4.1	#24 High Speed Turnout	each		\$ 450	4	1,800	4	1,800		-	8	3,600
4.2	#20 Turnout Timber	each	4	\$ 124		496		-		-	4	496
4.3	#10 Turnout Timber	each		\$ 69		-		-		-		-
4.4	#20 Turnout Concrete	each	14	\$ 249		3,486		-		-	14	3,486
4.5	#10 Turnout Concrete	each	4	\$ 118		472		-		-	4	472
Total Turnouts Cost					4,454	1,800	1,800	-			8,054	
Curves												
9.1	Elevate & Surface Curves	per mile		\$ 58	10	580	10	580		-	20	1,160
9.2	Curvature Reduction	per mile		\$ 393	10	3,930	10	3,930		-	20	7,860
9.3	Elastic Fasteners	per mile		\$ 82	10	820	10	820		-	20	1,640
Total Curves Cost					-	5,330	5,330	-			10,660	
Signals												
8.1	Signals for Siding w/ High Speed Turnout	each	1	\$ 1,268	4	5,072	4	5,072		-	9	11,412
8.2	Install CTC System (Single Track)	per mile		\$ 183	70	12,810	59	10,797	17	3,111	146	26,718
8.21	Install CTC System (Double Track)	per mile	12	\$ 300		3,600		-		-	12	3,600
8.3	Install PTC System	per mile		\$ 197	106	20,882	58	11,426		-	164	32,308
8.4	Electric Lock for Industry Turnout	each	4	\$ 103		412		-		-	4	412
8.5	Signals for Crossover	each	4	\$ 700		2,800		-		-	4	2,800
8.6	Signals for Turnout	each	10	\$ 400		4,000		-		-	10	4,000
Total Signals Cost					12,080	38,764	27,295	3,111			81,250	
Stations / Facilities												
2.1	Full Service - New	each	1	\$ 1,000	3	3,000	4	4,000		-	8	8,000
2.2	Full Service - Renovated	each		\$ 500		-		-		-		-
2.3	Terminal - New	each		\$ 2,000		-		-	1	2,000	1	2,000
2.4	Terminal - Renovated	each	1	\$ 1,000		1,000		-		-	1	1,000
2.6	Layover Facility (Columbus, Cincinnati)	lump sum		\$ 5,544	1	5,544		-	1	5,544	2	11,088
2.7	Service & Inspection Facility in Cleveland	lump sum	1	\$ 18,973		18,973		-		-	1	18,973
Total Station Cost					20,973	8,544	4,000	7,544			41,061	

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Cincinnati, 90 mph Maximum Speed

Revised on 10/14/02



TEMS

			MWRRS Cleveland Route									
			Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Cleveland to Berea		Berea to Columbus		Columbus to Sharonville		Sharonville to Cincinnati			
			NS		CSXT		CSXT		CSXT			
			MP 181.7 - MP 194		MP 194 - MP 138		MP 138 - MP 246		MP 246 - MP 2.2			
			12.3 miles		121 miles		108 miles		17 miles		241.3 miles	
			79 mph		90 mph		90 mph		90 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under												
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	1	4,835	1	4,835
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	-	-	-	-	-	1	3,054	1	3,054
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	-	-	-	-	-	-	-	-	-
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	1120	10,476	2320	21,700	-	-	3,440	32,176
5.73	Single Track on Flyover Structure	per LF	\$ 6.0	-	-	-	-	-	-	-	-	-
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	-	15840	47,520	15,840	47,520
Total Bridges-under Cost				-	-	10,476	21,700	55,409	-	-	-	87,585
Bridges-over												
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	-	-	-	-	-	-	-
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	-	-	-	-	-	-	-
6.3	Two Lane Highway	each	\$ 1,903	-	-	-	-	-	-	-	-	-
6.4	Rail	each	\$ 6,110	-	-	-	-	-	-	-	-	-
Total Bridges-over Cost				-	-	-	-	-	-	-	-	-
Crossings												
7.1	Private Closure	each	\$ 83	-	15	1,245	10	830	-	-	25	2,075
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	77	37,884	74	36,408	-	-	151	74,292
7.3	Four Quadrant Gates	each	\$ 288	-	90	25,920	80	23,040	2	576	172	49,536
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-	-
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	-	-
7.4b	Conventional Gates double mainline track	each	\$ 205	-	-	-	-	-	-	-	-	-
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	-	-	-	-	-	2	100
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	-	-	-	-	-	-	-	-
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	-	-	-	-	-	2	300
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	-	-	-
Total Crossings Cost				400	65,049	60,278	576	126,303	-	-	-	-
Segment Totals				70,749	291,058	256,612	81,466	699,885	-	-	-	-
Placeholders												
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	-	-	-	-	-	1	52,000
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	-	-	-	-	-	1	20,000
	Interlockings and Special Signal Work	lump sum	3,000	-	-	-	-	-	1	3,000	1	3,000
TOTAL				142,749	291,058	256,612	84,466	774,885	-	-	-	-
NOTES												
	This estimate is an update of the previous 3C study cost estimate using 2002 MWRRS unit costs								Stations and Facilities	Segment	Proposed Improvement	
	Cost Estimate does not include utility relocation.								Cleveland	1	Terminal - Renovated	
	Corridor access with freight railroads to be negotiated; costs not included								SW Cleveland	1	Full Service - New	
	Station costs are MWRRS allocation amounts								Galion	2	Full Service - New	
	This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.								North Columbus	2	Full Service - New	
									Columbus	2	Full Service - New	
									Springfield	3	Full Service - New	
									Dayton	3	Full Service - New	
									Middletown	3	Full Service - New	
									North Cincinnati	3	Full Service - New	
									Cincinnati	4	Terminal - New	

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CN with 79 mph Maximum Speed

TEMS

Revised on 11/08/02

MWRRS Cleveland Route													MWRRS Detroit Route											
Segment 1													Segment 2		Segment 3		Segment 4		Segment 5		Total			
From - To													Berea to Toledo		Toledo to Vienna Jct.		Vienna Jct. to West Detroit		West Detroit to Detroit (Milw Jct)					
Host Carrier													NS		NS		NS		CN		CR Shared Assets			
Mileposts													MP 194 - MP 289.75		MP 57.7 to MP 47.8		MP 4.92 to MP 50.2		MP 3 to 4.2					
Track Miles													12.3 miles		9.9 miles		45.3 miles		5.3 miles		168.5 miles			
Maximum Authorized Speed													79 mph		79 mph		79 mph		60 mph					
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount										
Trackwork																								
1.1	HSR on Existing Roadbed	per mile	\$ 993	-	-	-	-	-	-	-	-	-	-	-										
1.2a	HSR on New Roadbed	per mile	\$ 1,059	12	12,708	17	18,003	5	5,401	45.3	47,973	-	-	-										
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	12	17,904	53	79,076	5	7,162	-	-	-	-	-										
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674	-	-	-	-	-	-	-	-	-	-	-										
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	-	-	83	18,426	-	-	45.3	10,052	-	-	-										
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	-	-	-	-	-	-	-	-	-	-	-										
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	-	-	-	-	-	-	-	-	-	-	-										
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	-	-	-	-										
1.65	Passenger Siding	per mile	\$ 1,376	-	-	20	27,520	-	-	10	13,760	-	-	-										
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	-	-	76	3,856	-	-	36.2	1,847	-	-	-										
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	12	1,836	14	2,169	-	-	7	1,039	-	-	-										
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	-	-	-	-										
1.74	Decorative Fencing (both sides)	per mile	\$ 394	1	394	5	1,862	-	-	2	892	-	-	-										
Total Track Costs					32,842		150,911		12,563		75,563		-		271,879									
Turnouts																								
4.1	#24 High Speed Turnout	each	\$ 450	-	-	8	3,600	-	-	-	-	-	-	8	3,600									
4.2	#20 Turnout Timber	each	\$ 124	4	496	9	1,116	-	-	4	496	-	-	17	2,108									
4.3	#10 Turnout Timber	each	\$ 69	-	-	-	-	-	-	-	-	-	-	-	-									
4.4	#20 Turnout Concrete	each	\$ 249	14	3,486	9	2,241	-	-	-	-	-	-	23	5,727									
4.5	#10 Turnout Concrete	each	\$ 118	4	472	4	472	-	-	-	-	-	-	8	944									
Total Turnouts Cost					4,454		7,429		-		496		-		12,379									
Curves																								
9.1	Elevate & Surface Curves	per mile	\$ 58	-	-	4	206	-	-	-	-	-	-	4	206									
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-	-	-	-	-									
9.3	Elastic Fasteners	per mile	\$ 82	-	-	4	291	-	-	-	-	-	-	4	291									
Total Curves Cost					-		711		-		-		-		711									
Signals																								
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268	1	1,268	4	5,072	-	-	-	-	-	-	5	6,340									
8.2	Install CTC System (Single Track)	per mile	\$ 183	-	-	70	12,810	-	-	45.3	8,286	-	-	115	21,096									
8.21	Install CTC System (Double Track)	per mile	\$ 300	12	3,600	-	-	-	-	-	-	-	-	12	3,600									
8.3	Install PTC System	per mile	\$ 197	-	-	53	10,441	-	-	-	-	-	-	53	10,441									
8.4	Electric Lock for Industry Turnout	each	\$ 103	4	412	4	412	-	-	-	-	-	-	8	824									
8.5	Signals for Crossover	each	\$ 700	4	2,800	9	6,300	-	-	-	-	-	-	13	9,100									
8.6	Signals for Turnout	each	\$ 400	10	4,000	-	-	-	-	-	-	-	-	10	4,000									
Total Signals Cost					12,080		35,035		-		8,286		-		55,401									
Stations / Facilities																								
2.1	Full Service - New	each	\$ 1,000	1	1,000	-	-	-	-	-	-	-	-	1	1,000									
2.2	Full Service - Renovated	each	\$ 500	-	-	2	1,000	-	-	2	1,000	1	500	5	2,500									
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	-	-	-									
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	1	1,000	-	-	-	-	-	-	2	2,000									
2.6	Layover Facility (Detroit)	lump sum	\$ 5,544	-	-	-	-	-	-	-	-	1	5,544	1	5,544									
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973	-	-	-	-	-	-	-	-	1	18,973									
Total Station Cost					20,973		2,000		-		1,000		6,044		30,017									

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CN with 79 mph Maximum Speed

TEMS

Revised on 11/08/02

MWRRS Cleveland Route													MWRRS Detroit Route	
Segment No.													Total	
From - To														
Host Carrier														
Mileposts														
Track Miles													168.5 miles	
Maximum Authorized Speed														
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under														
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-	-	-	-
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	-	-	2	6,108	-	-	-	-	-	2	6,108
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	-	-	16	12,960	-	-	-	-	-	16	12,960
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-	-	-
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	-	18	3,600	-	-	-	18	3,600
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-	-	-	-
5.73	Single Track on Flyover Structure	per LF	\$ 6	-	-	-	-	-	-	-	-	-	-	-
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	-	-	-	-	-	-	-
Total Bridges-under Cost				-	-	19,068	3,600	-	-	-	-	-	22,668	-
Bridges-over														
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	2	4,174	-	-	-	-	-	2	4,174
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	2	5,858	-	-	-	-	-	2	5,858
6.3	Two Lane Highway	each	\$ 1,903	-	-	2	3,806	-	-	-	-	-	2	3,806
6.4	Rail	each	\$ 6,110	-	-	1	6,110	-	-	-	-	-	1	6,110
Total Bridges-over Cost				-	-	19,948	-	-	-	-	-	-	19,948	-
Crossings														
7.1	Private Closure	each	\$ 83	-	-	5	415	-	-	1	83	-	6	498
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-	-	-	-
7.3	Four Quadrant Gates	each	\$ 288	-	-	17	4,896	-	-	-	-	-	17	4,896
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-	-	-	-
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	-	-	-	-
7.4b	Conventional Gates double mainline track	each	\$ 205	-	-	14	2,870	11	2,255	62	12,710	-	87	17,835
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	1	50	-	-	-	-	-	3	150
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	-	16	1,280	11	880	-	-	-	27	2,160
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	16	2,400	-	-	-	-	-	18	2,700
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	62	930	-	62	930
Total Crossings Cost				400	11,911	3,135	13,723	-	-	-	-	-	29,169	-
Segment Totals				70,749	247,013	19,298	99,069	6,044	442,172					
Placeholders														
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	-	-	-	-	-	-	-	1	52,000
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	-	-	-	-	-	-	-	1	20,000
	CSX / NS grade separation near Toledo	lump sum	40,000	-	-	1	40,000	-	-	-	-	-	1	40,000
	Maumee River Bridge crossing	lump sum	50,000	-	-	1	50,000	-	-	-	-	-	1	50,000
	River Rouge Yard Track Reconfiguration and Capacity Enhancements	lump sum	40,000	-	-	-	-	-	-	1	40,000	-	1	40,000
	River Rouge Lift Bridge	lump sum	50,000	-	-	-	-	-	-	1	50,000	-	1	50,000
	Capacity Enhancements River Rouge to West Detroit	lump sum	20,000	-	-	-	-	-	-	1	20,000	-	1	20,000
	West Detroit to Beaubien Costs (from Lansing to Detroit Study)	lump sum	15,302	-	-	-	-	-	-	-	-	1	15,302	1
TOTAL				142,749	337,013	19,298	209,069	21,346	729,474					
NOTES														
Cost Estimate does not include utility relocation.										Stations and Facilities	segment	Proposed Improvement		
Corridor access with freight railroads to be negotiated; costs not included										Cleveland	1	Terminal - Renovated		
Station costs are MWRRS allocation amounts										Cleveland Airport	1	Full Service - New		
Four Quadrant Gates all public crossings at speeds > 79mph										Elyria	2	Full Service - Renovated		
Conventional Gates all public crossings at speeds <= 79mph										Sandusky	2	Full Service - Renovated		
Precast Panels with Rdway Improvements installed where track embankment is replaced										Toledo	2	Terminal - Renovated		
Precast Panels without Rdway Improvements installed where track embankment is not replaced										Monroe	4	Full Service - Renovated		
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.										Wyandotte	4	Full Service - Renovated		
										Detroit	5	Full Service - Renovated		

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CN with 110 mph Maximum Speed

Revised on 11/08/02

TEMS

----- MWRRS Cleveland Route -----													MWRRS Detroit Route	
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork														
1.1	HSR on Existing Roadbed	per mile	\$ 993	-	-	-	-	-	-	-	-	-	-	-
1.2a	HSR on New Roadbed	per mile	\$ 1,059	12	12,708	17	18,003	5.1	5,401	-	-	-	34	36,112
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	12	17,904	53	79,076	4.8	7,162	45.3	67,558	-	115	171,699
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674	-	-	-	-	-	-	-	-	-	-	-
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	-	-	83.0	18,426	-	-	-	-	-	83	18,426
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	-	-	-	-	-	-	-	-	-	-	-
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	-	-	-	-	-	-	-	-	-	-	-
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	-	-	-	-
1.65	Passenger Siding	per mile	\$ 1,376	-	-	20	27,520	-	-	10	13,760	-	30	41,280
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	-	-	76	3,856	-	-	36.2	1,847	-	112	5,703
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	12	1,836	14	2,169	-	-	7	1,039	-	33	5,044
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	-	-	-	-
1.74	Decorative Fencing (both sides)	per mile	\$ 394	1	394	5	1,862	-	-	2	892	-	8	3,148
Total Track Costs					32,842		150,911		12,563		85,096			281,412
Turnouts														
4.1	#24 High Speed Turnout	each	\$ 450	-	-	8	3,600	-	-	4	1,800	-	12	5,400
4.2	#20 Turnout Timber	each	\$ 124	4	496	9	1,116	-	-	-	-	-	13	1,612
4.3	#10 Turnout Timber	each	\$ 69	-	-	-	-	-	-	-	-	-	-	-
4.4	#20 Turnout Concrete	each	\$ 249	14	3,486	9	2,241	-	-	-	-	-	23	5,727
4.5	#10 Turnout Concrete	each	\$ 118	4	472	4	472	-	-	-	-	-	8	944
Total Turnouts Cost					4,454		7,429		-		1,800			13,683
Curves														
9.1	Elevate & Surface Curves	per mile	\$ 58	-	-	3.55	206	-	-	-	-	-	4	206
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-	-	-	-
9.3	Elastic Fasteners	per mile	\$ 82	-	-	3.55	291	-	-	-	-	-	4	291
Total Curves Cost					-		711		-		-			711
Signals														
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268	1	1,268	4	5,072	-	-	-	-	-	5	6,340
8.2	Install CTC System (Single Track)	per mile	\$ 183	-	-	70	12,810	-	-	45.3	8,286	-	115	21,096
8.21	Install CTC System (Double Track)	per mile	\$ 300	12	3,600	-	-	-	-	-	-	-	12	3,600
8.3	Install PTC System	per mile	\$ 197	-	-	53	10,441	-	-	45.3	8,920	-	98	19,361
8.4	Electric Lock for Industry Turnout	each	\$ 103	4	412	4	412	-	-	-	-	-	8	824
8.5	Signals for Crossover	each	\$ 700	4	2,800	9	6,300	-	-	-	-	-	13	9,100
8.6	Signals for Turnout	each	\$ 400	10	4,000	-	-	-	-	-	-	-	10	4,000
Total Signals Cost					12,080		35,035		-		17,206			64,321
Stations / Facilities														
2.1	Full Service - New	each	\$ 1,000	1	1,000	-	-	-	-	-	-	-	1	1,000
2.2	Full Service - Renovated	each	\$ 500	-	-	2	1,000	-	-	2	1,000	1	500	2,500
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	-	-
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	1	1,000	-	-	-	-	-	2	2,000
2.6	Layover Facility (Detroit)	lump sum	\$ 5,544	-	-	-	-	-	-	-	-	1	5,544	5,544
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973	-	-	-	-	-	-	-	1	18,973
Total Station Cost					20,973		2,000		-		1,000		6,044	30,017

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CN with 110 mph Maximum Speed

TEMS

Revised on 11/08/02

			←----- MWRRS Cleveland Route -----→				MWRRS Detroit Route					Total		
Segment No.			Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
From - To			Cleveland to Berea		Berea to Toledo		Toledo to Vienna Jct.		Vienna Jct. to West Detroit		West Detroit to Detroit (Milw Jct)			
Host Carrier			NS		NS		NS		CN		CR Shared Assets			
Mileposts			MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 47.8		MP 4.92 to MP 50.2		MP 3 to 4.2			
Track Miles			12.3 miles		95.8 miles		9.9 miles		45.3 miles		5.3 miles		168.5 miles	
Maximum Authorized Speed			79 mph		110 mph		79 mph		110 mph		60 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under														
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-	-	-	-
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	-	2.00	6,108	-	-	4	12,216	-	-	6	18,324
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	-	16.00	12,960	-	-	38	30,780	-	-	54	43,740
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-	-	-
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	18.00	3,600	-	-	-	-	18	3,600
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-	-	-	-
5.73	Single Track on Flyover Structure	per LF	\$ 6	-	-	-	-	-	-	-	-	-	-	-
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	-	-	-	-	-	-	-
Total Bridges-under Cost				-	-	19,068	-	3,600	-	42,996	-	-	-	65,664
Bridges-over														
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	2.00	4,174	-	-	-	-	-	-	2	4,174
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	2.00	5,858	-	-	-	-	-	-	2	5,858
6.3	Two Lane Highway	each	\$ 1,903	-	2.00	3,806	-	-	-	-	-	-	2	3,806
6.4	Rail	each	\$ 6,110	-	1.00	6,110	-	-	-	-	-	-	1	6,110
Total Bridges-over Cost				-	-	19,948	-	-	-	-	-	-	-	19,948
Crossings														
7.1	Private Closure	each	\$ 83	-	5	415	-	-	1	83	-	-	6	498
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-	-	-	-
7.3	Four Quadrant Gates	each	\$ 288	-	17	4,896	-	-	-	-	-	-	17	4,896
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-	-	-	-
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	-	-	-	-
7.4b	Conventional Gates double mainline track	each	\$ 205	-	14	2,870	11	2,255	62	12,710	-	-	87	17,835
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	50	-	-	-	-	-	-	3	150
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	16	1,280	11	880	-	-	-	-	27	2,160
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	2,400	-	-	-	-	-	-	18	2,700
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	62	930	-	-	62	930
Total Crossings Cost				400	-	11,911	-	3,135	-	13,723	-	-	-	29,169
Segment Totals					70,749	247,013		19,298		161,822		6,044		504,925
Placeholders														
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	-	-	-	-	-	-	-	1	52,000
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	-	-	-	-	-	-	-	1	20,000
	CSX / NS grade separation near Toledo	lump sum	40,000	-	-	40,000	-	-	-	-	-	-	1	40,000
	Maumee River Bridge crossing	lump sum	50,000	-	-	50,000	-	-	-	-	-	-	1	50,000
	River Rouge Yard Track Reconfiguration and Capacity Enhancements	lump sum	40,000	-	-	-	-	-	1	40,000	-	-	1	40,000
	River Rouge Lift Bridge	lump sum	50,000	-	-	-	-	-	1	50,000	-	-	1	50,000
	Capacity Enhancements River Rouge to West Detroit	lump sum	20,000	-	-	-	-	-	1	20,000	-	-	1	20,000
	West Detroit to Beaubien Costs (from Lansing to Detroit Study)	lump sum	15,302	-	-	-	-	-	-	-	1	15,302	1	15,302
TOTAL					142,749	337,013		19,298		271,822		21,346		792,227
NOTES														
Assume 26' offset for new mainline track construction for speeds above 79 mph								Stations and Facilities	segment	Proposed Improvement				
Installation of PTC system does not include locomotive equipment and dispatch equipment.								Cleveland	1	Terminal - Renovated				
Cost Estimate does not include utility relocation.								Cleveland Airport	1	Full Service - New				
Corridor access with freight railroads to be negotiated; costs not included								Elyria	2	Full Service - Renovated				
Station costs are MWRRS allocation amounts								Sandusky	2	Full Service - Renovated				
Four Quadrant Gates all public crossings at speeds > 79mph								Toledo	2	Terminal - Renovated				
Conventional Gates all public crossings at speeds <= 79mph								Monroe	4	Full Service - Renovated				
Precast Panels with Rdway Improvements installed where track embankment is replaced								Wyandotte	4	Full Service - Renovated				
Precast Panels without Rdway Improvements installed where track embankment is not replaced								Detroit	5	Full Service - Renovated				
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.														

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 79 mph Maximum Speed

TEMS

Revised on 11/08/02

		←----- MWRRS Cleveland Route ----->						MWRRS Detroit Route								
		Segment No.	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total			
		From - To	Cleveland to Berea		Berea to Toledo		Toledo to Alexis		Alexis to Wayne Jct.		Wayne Jct. to Detroit (Milw Jct.)					
		Host Carrier	NS		NS		NS		CSX		NS, CR					
		Mileposts	MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 50.38		MP 130.7 to MP 90.2		MP 18 to 4.2					
		Track Miles	12.3 miles		95.8 miles		7.3 miles		40.5 miles		20.3 miles		176.2 miles			
		Maximum Authorized Speed	79 mph		110 mph		79 mph		79 mph		110 mph					
Item	0	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Trackwork																
1.1		HSR on Existing Roadbed	per mile \$	993	-	-	-	-	-	-	-	-	-	-	-	
1.2a		HSR on New Roadbed	per mile \$	1,059	12	12,708	17	18,003	5.1	5,401	-	-	-	34	36,112	
1.2b		HSR on New Roadbed & New Embankment	per mile \$	1,492	12	17,904	53	79,076	2.2	3,312	4.0	5,968	-	71	106,260	
1.2c		HSR on New Roadbed & New Embankment (Double Track)	per mile \$	2,674	-	-	-	-	-	-	-	-	-	-	-	
1.3		Timber & Surface w/ 33% Tie replacement	per mile \$	222	0.0	-	83.0	18,426	0.0	-	-	0.0	-	83	18,426	
1.4		Timber & Surface w/ 66% Tie Replacement	per mile \$	331	-	-	-	-	-	81.0	26,811	15	4,965	96	31,776	
1.5		Relay Track w/ 136# CWR	per mile \$	354	-	-	-	-	-	-	-	15	5,310	15	5,310	
1.6		Freight Siding	per mile \$	912	-	-	-	-	-	-	-	-	-	-	-	
1.65		Passenger Siding	per mile \$	1,376	-	-	20	27,520	-	-	10	13,760	-	30	41,280	
1.71		Fencing, 4 ft Woven Wire (both sides)	per mile \$	51	-	-	76	3,856	5.9	299	32.4	1,652	16.2	828	130	6,635
1.72		Fencing, 6 ft Chain Link (both sides)	per mile \$	153	12	1,836	14	2,169	1.1	168	6.1	929	3	466	36	5,568
1.73		Fencing, 10 ft Chain Link (both sides)	per mile \$	175	-	-	-	-	-	-	-	-	-	-	-	
1.74		Decorative Fencing (both sides)	per mile \$	394	1	394	5	1,862	0.4	144	2.0	798	1	400	9	3,598
0																
Total Track Costs					32,842		150,911		9,324		49,919		11,969		254,965	
0																
Turnouts																
4.1		#24 High Speed Turnout	each \$	450	-	-	8	3,600	-	-	-	-	-	8	3,600	
4.2		#20 Turnout Timber	each \$	124	4	496	9	1,116	3	372	4	496	-	20	2,480	
4.3		#10 Turnout Timber	each \$	69	-	-	0	-	3	207	-	-	-	3	207	
4.4		#20 Turnout Concrete	each \$	249	14	3,486	9	2,241	-	-	-	-	-	23	5,727	
4.5		#10 Turnout Concrete	each \$	118	4	472	4	472	-	-	-	-	-	8	944	
0																
Total Turnouts Cost					4,454		7,429		579		496		-		12,958	
0																
Curves																
9.1		Elevate & Surface Curves	per mile \$	58	-	-	3.55	206	-	-	-	-	-	4	206	
9.2		Curvature Reduction	per mile \$	393	-	-	0.00	-	-	-	-	-	-	-	-	
9.3		Elastic Fasteners	per mile \$	82	-	-	3.55	291	-	-	-	-	-	4	291	
9.5		Realign Track for Curves	lump sum \$	-	-	-	214	-	-	-	-	-	-	-	214	
Total Curves Cost					-		711		-		-		-		711	
0																
Signals																
8.1		Signals for Siding w/ High Speed Turnout	each \$	1,268	1	1,268	4	5,072	-	-	-	-	-	5	6,340	
8.2		Install CTC System (Single Track)	per mile \$	183	-	-	70	12,810	7	1,340	-	-	-	77	14,150	
8.21		Install CTC System (Double Track)	per mile \$	300	12	3,600	-	-	-	-	40.5	12,150	-	53	15,750	
8.3		Install PTC System	per mile \$	197	-	-	53	10,441	-	-	-	-	15	2,955	68	13,396
8.4		Electric Lock for Industry Turnout	each \$	103	4	412	4	412	3	309	-	-	-	11	1,133	
8.5		Signals for Crossover	each \$	700	4	2,800	9	6,300	-	-	-	-	-	13	9,100	
8.6		Signals for Turnout	each \$	400	10	4,000	-	-	3	1,200	-	-	-	13	5,200	
Total Signals Cost					12,080		35,035		2,849		12,150		2,955		65,069	

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 79 mph Maximum Speed

TEMS

Revised on 11/08/02

													MWRRS Cleveland Route		MWRRS Detroit Route									
													Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
													Cleveland to Berea		Berea to Toledo		Toledo to Alexis		Alexis to Wayne Jct.		Wayne Jct. to Detroit (Milw Jct.)			
													NS		NS		NS		CSX		NS, CR			
													MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 50.38		MP 130.7 to MP 90.2		MP 18 to 4.2			
													12.3 miles		95.8 miles		7.3 miles		40.5 miles		20.3 miles		176.2 miles	
													79 mph		110 mph		79 mph		79 mph		110 mph			
Item	0	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount									
Stations / Facilities																								
2.1	Full Service - New	each	\$ 1,000	1	1,000	-	-	-	-	-	-	1	1,000	2	2,000									
2.2	Full Service - Renovated	each	\$ 500	-	-	2	1,000	-	-	-	-	1	500	2	1,000									
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	-	-	-									
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	1	1,000	-	-	-	-	-	-	2	2,000									
2.6	Layover Facility (Detroit)	lump sum	\$ 6,536	-	-	-	-	-	-	-	-	1	6,536	1	6,536									
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973	-	-	-	-	-	-	-	-	1	18,973									
Total Station Cost					20,973		2,000		-		500		8,536		32,009									
Bridges-under																								
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-	-	-	-	-									
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-	-	-	-									
5.3	Two Lane Highway	each	\$ 3,054	-	-	2	6,108	-	-	-	-	1	3,054	3	9,162									
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-	-	-	-									
5.5	Minor river	each	\$ 810	-	-	16	12,960	-	-	-	-	-	-	16	12,960									
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-	-	-	-									
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	-	13	2,600	-	-	-	-	13	2,600									
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-	-	-	-									
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-	-	-	-	-									
5.73	Single Track on Flyover Structure	per LF	\$ 6	-	-	-	-	1,000	6,000	-	-	-	-	1,000	6,000									
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	2,000	6,000	-	-	-	-	2,000	6,000									
Total Bridges-under Cost					-		19,068		14,600		-		3,054		36,722									
Bridges-over																								
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	2	4,174	-	-	-	-	-	-	2	4,174									
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	2	5,858	-	-	-	-	-	-	2	5,858									
6.3	Two Lane Highway	each	\$ 1,903	-	-	2	3,806	-	-	-	-	-	-	2	3,806									
6.4	Rail	each	\$ 6,110	-	-	1	6,110	-	-	-	-	-	-	1	6,110									
Total Bridges-over Cost					-		19,948		-		-		-		19,948									
Crossings																								
7.1	Private Closure	each	\$ 83	-	-	5	415	-	-	-	-	-	-	5	415									
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-	-	-	-	-									
7.3	Four Quadrant Gates	each	\$ 288	-	-	17	4,896	-	-	-	-	-	-	17	4,896									
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-	4	600	4	600									
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	-	1	166	1	166									
7.4b	Conventional Gates double mainline track	each	\$ 205	-	-	14	2,870	8	1,640	22	4,510	-	-	44	9,020									
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	1	50	-	-	5	250	-	-	8	400									
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-	3	540	3	540									
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-	3	45	3	45									
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	-	16	1,280	-	-	-	-	-	-	16	1,280									
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	16	2,400	8	1,200	-	-	-	-	26	3,900									
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	27	405	-	-	27	405									
Total Crossings Cost					400		11,911		2,840		5,165		1,351		21,667									
Segment Totals					70,749		247,013		30,192		68,230		27,865		444,048									
Placeholders																								
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	0	-	-	-	-	-	-	-	1	52,000									
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	0	-	-	-	-	-	-	-	1	20,000									
	CSX / NS grade separation near Toledo	lump sum	40,000	0	0	1	40,000	-	-	-	-	-	-	1	40,000									
	Maumee River Bridge crossing	lump sum	50,000	0	0	1	50,000	-	-	-	-	-	-	1	50,000									
	West Detroit to Beaubien Costs (from Lansing to Detroit Study)	lump sum	15,302	0	-	0	-	-	-	-	-	1	15,302	1	15,302									
TOTAL					142,749		337,013		30,192		68,230		43,167		621,350									
NOTES																								
Cost Estimate does not include utility relocation.										Stations and Facilities	segment	Proposed Improvement												
Corridor access with freight railroads to be negotiated; costs not included										Cleveland	1	Terminal - Renovated												
Station costs are MWRRS allocation amounts										Cleveland Airport	1	Full Service - New												
Four Quadrant Gates all public crossings at speeds > 79mph										Elyria	2	Full Service - Renovated												
Conventional Gates all public crossings at speeds <= 79mph										Sandusky	2	Full Service - Renovated												
Precast Panels with Rdway Improvements installed where track embankment is replaced										Toledo	2	Terminal - Renovated												
Precast Panels without Rdway Improvements installed where track embankment is not replaced										Monroe	4	Full Service - Renovated												
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.										Detroit Airport	5	Full Service - New												
										Dearborn	5	Full Service - Renovated												
										Detroit	5	Full Service - Renovated												

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 90 mph Maximum Speed

TEMAS

Revised on 11/08/02

		MWRRS Cleveland Route						MWRRS Detroit Route						
		Segment No.	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
		From - To	Cleveland to Berea		Berea to Toledo		Toledo to Alexis		Alexis to Wayne Jct.		Wayne Jct. to Detroit (Milw Jct.)			
		Host Carrier	NS		NS		NS		CSX		NS, CR			
		Mileposts	MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 50.38		MP 130.7 to MP 90.2		MP 18 to 4.2			
		Track Miles	12.3 miles		95.8 miles		7.3 miles		40.5 miles		20.3 miles		176.2 miles	
		Maximum Authorized Speed	79 mph		110 mph		79 mph		90 mph		110 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork														
1.1	HSR on Existing Roadbed	per mile		\$ 993		-		-		-		-		-
1.2a	HSR on New Roadbed	per mile	12	\$ 1,059	17	12,708	5.1	5,401		-		-	34	36,112
1.2b	HSR on New Roadbed & New Embankment	per mile	12	\$ 1,492	53	17,904	2.2	3,312	4.0	5,968		-	71	106,260
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile		\$ 2,674		-		-		-		-		-
1.3	Timber & Surface w/ 33% Tie replacement	per mile		\$ 222	83.0	18,426		-		-		-	83	18,426
1.4	Timber & Surface w/ 66% Tie Replacement	per mile		\$ 331		-		-	81.0	26,811	15	4,965	96	31,776
1.5	Relay Track w/ 136# CWR	per mile		\$ 354		-		-		-	15	5,310	15	5,310
1.6	Freight Siding	per mile		\$ 912		-		-		-		-		-
1.65	Passenger Siding	per mile		\$ 1,376	20	27,520		-	10	13,760		-	30	41,280
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile		\$ 51	76	3,856	5.9	299	32.4	1,652	16.2	828	130	6,635
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	12	\$ 153	14	2,169	1.1	168	6.1	929	3	466	36	5,568
1.73	Fencing, 10 ft Chain Link (both sides)	per mile		\$ 175		-		-		-		-		-
1.74	Decorative Fencing (both sides)	per mile	1	\$ 394	5	1,862	0.4	144	2.0	798	1	400	9	3,598
Total Track Costs					32,842	150,911	9,324	49,919	11,969				254,965	
Turnouts														
4.1	#24 High Speed Turnout	each		\$ 450	8	3,600		-	4	1,800		-	12	5,400
4.2	#20 Turnout Timber	each	4	\$ 124	9	1,116	3	372		-		-	16	1,984
4.3	#10 Turnout Timber	each		\$ 69		-	3	207		-		-	3	207
4.4	#20 Turnout Concrete	each	14	\$ 249	9	2,241		-		-		-	23	5,727
4.5	#10 Turnout Concrete	each	4	\$ 118	4	472		-		-		-	8	944
Total Turnouts Cost					4,454	7,429	579	1,800	-				14,262	
Curves														
9.1	Elevate & Surface Curves	per mile		\$ 58	3.55	206		-		-		-	3.55	206
9.2	Curvature Reduction	per mile		\$ 393		-		-		-		-		-
9.3	Elastic Fasteners	per mile		\$ 82	3.55	291		-		-		-	3.55	291
9.5	Realign Track for Curves	lump sum		\$ -		214		-		-		-		214
Total Curves Cost					-	711	-	-	-	-	-	-	711	
Signals														
8.1	Signals for Siding w/ High Speed Turnout	each	1	\$ 1,268	4	5,072		-		-		-	5	6,340
8.2	Install CTC System (Single Track)	per mile		\$ 183	70	12,810	7.3	1,340		-		-	77	14,150
8.21	Install CTC System (Double Track)	per mile	12	\$ 300		-		-	40.5	12,150		-	53	15,750
8.3	Install PTC System	per mile		\$ 197	53	10,441		-	40.5	7,979	15	2,955	109	21,375
8.4	Electric Lock for Industry Turnout	each	4	\$ 103	4	412	3	309		-		-	11	1,133
8.5	Signals for Crossover	each	4	\$ 700	9	6,300		-		-		-	13	9,100
8.6	Signals for Turnout	each	10	\$ 400		-	3	1,200		-		-	13	5,200
Total Signals Cost					12,080	35,035	2,849	20,129	2,955				73,047	

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 90 mph Maximum Speed

TEMAS

Revised on 11/08/02

		MWRRS Cleveland Route						MWRRS Detroit Route							
		Segment No.	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total		
		From - To	Cleveland to Berea		Berea to Toledo		Toledo to Alexis		Alexis to Wayne Jct.		Wayne Jct. to Detroit (Milw Jct.)				
		Host Carrier	NS		NS		NS		CSX		NS, CR				
		Mileposts	MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 50.38		MP 130.7 to MP 90.2		MP 18 to 4.2				
		Track Miles	12.3 miles		95.8 miles		7.3 miles		40.5 miles		20.3 miles		176.2 miles		
		Maximum Authorized Speed	79 mph		110 mph		79 mph		90 mph		110 mph				
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Stations / Facilities															
2.1	Full Service - New	each	\$ 1,000	1	1,000	-	-	-	-	-	1	1,000	2	2,000	
2.2	Full Service - Renovated	each	\$ 500	-	-	2	1,000	-	-	1	500	2	1,000	5	2,500
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	-	-	
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	1	1,000	-	-	-	-	-	2	2,000	
2.6	Layover Facility (Detroit)	lump sum	\$ 6,536	-	-	-	-	-	-	-	1	6,536	1	6,536	
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973	-	-	-	-	-	-	-	1	18,973	
Total Station Cost				20,973	2,000	-	500	8,536					32,009		
Bridges-under															
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-	-	-	-	
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-	-	-	
5.3	Two Lane Highway	each	\$ 3,054	-	2.00	6,108	-	-	-	-	1	3,054	3	9,162	
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-	-	-	
5.5	Minor river	each	\$ 810	-	16.00	12,960	-	-	-	-	-	-	16	12,960	
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-	-	-	
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	13	2,600	-	-	-	-	13	2,600	
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-	-	-	
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-	-	-	-	
5.73	Single Track on Flyover Structure	per LF	\$ 6.0	-	-	-	1000	6,000	-	-	-	-	1,000	6,000	
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	2000	6,000	-	-	-	-	2,000	6,000	
Total Bridges-under Cost				-	19,068	14,600	-	3,054					36,722		
Bridges-over															
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	2.00	4,174	-	-	-	-	-	-	2	4,174	
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	2.00	5,858	-	-	-	-	-	-	2	5,858	
6.3	Two Lane Highway	each	\$ 1,903	-	2.00	3,806	-	-	-	-	-	-	2	3,806	
6.4	Rail	each	\$ 6,110	-	1.00	6,110	-	-	-	-	-	-	1	6,110	
Total Bridges-over Cost				-	19,948	-	-	-					19,948		
Crossings															
7.1	Private Closure	each	\$ 83	-	5	415	-	-	-	-	-	-	5	415	
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-	-	-	-	
7.3	Four Quadrant Gates	each	\$ 288	-	17	4,896	-	-	-	-	-	-	17	4,896	
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	4	600	4	600	
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	1	166	1	166	
7.4b	Conventional Gates double mainline track	each	\$ 205	-	14	2,870	8	1,640	22	4,510	-	-	44	9,020	
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	1	50	-	5	250	-	-	8	400	
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	3	540	3	540	
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	3	45	3	45	
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	16	1,280	-	-	-	-	-	-	16	1,280	
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	16	2,400	8	1,200	-	-	-	26	3,900	
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	27	405	-	-	27	405	
Total Crossings Cost				400	11,911	2,840	5,165	1,351					21,667		
Segment Totals				70,749	247,013	30,192	77,512	27,865					453,330		
Placeholders															
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	-	-	-	-	-	-	-	1	52,000	
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	-	-	-	-	-	-	-	1	20,000	
	CSX / NS grade separation near Toledo	lump sum	40,000	-	-	1	40,000	-	-	-	-	-	1	40,000	
	Maumee River Bridge crossing	lump sum	50,000	-	-	1	50,000	-	-	-	-	-	1	50,000	
	West Detroit to Beaubien Costs (from Lansing to Detroit Study)	lump sum	15,302	-	-	-	-	-	-	-	1	15,302	1	15,302	
TOTAL				142,749	337,013	30,192	77,512	43,167					630,632		
NOTES															
	Assume 26' offset for new mainline track construction for speeds above 79 mph								Stations and Facilities	segment	Proposed Improvement				
	Installation of PTC system does not include locomotive equipment and dispatch equipment.								Cleveland	1	Terminal - Renovated				
	Cost Estimate does not include utility relocation.								Cleveland Airport	1	Full Service - New				
	Corridor access with freight railroads to be negotiated; costs not included								Elyria	2	Full Service - Renovated				
	Station costs are MWRRS allocation amounts								Sandusky	2	Full Service - Renovated				
	Four Quadrant Gates all public crossings at speeds > 79mph								Toledo	2	Terminal - Renovated				
	Conventional Gates all public crossings at speeds <= 79mph								Monroe	4	Full Service - Renovated				
	Precast Panels with Rdway Improvements installed where track embankment is replaced								Detroit Airport	5	Full Service - New				
	Precast Panels without Rdway Improvements installed where track embankment is not replaced								Dearborn	5	Full Service - Renovated				
									Detroit	5	Full Service - Renovated				

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 110 mph Maximum Speed

Revised on 11/08/02



TEMS

MWRRS Cleveland Route													MWRRS Detroit Route		
Segment No.	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Total									
From - To	Cleveland to Berea	Berea to Toledo	Toledo to Alexis	Alexis to Wayne Jct.	Wayne Jct. to Detroit (Milw Jct.)										
Host Carrier	NS	NS	NS	CSX	NS, CR										
Mileposts	MP 181.7 - MP 194	MP 194 - MP 289.75	MP 57.7 to MP 50.38	MP 130.7 to MP 90.2	MP 18 to 4.2										
Track Miles	12.3 miles	95.8 miles	7.3 miles	40.5 miles	20.3 miles	176.2 miles									
Maximum Authorized Speed	79 mph	110 mph	79 mph	110 mph	110 mph										
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount			
Trackwork															
1.1	HSR on Existing Roadbed	per mile	\$ 993	-	-	-	-	-	-	-	-	-			
1.2a	HSR on New Roadbed	per mile	\$ 1,059	12	12,708	17	18,003	5.1	5,401	-	-	34	36,112		
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	12	17,904	53	79,076	2.2	3,312	40.5	60,426	-	108	160,718	
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674	-	-	-	-	-	-	-	-	-	-	-	
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	0.0	-	83.0	18,426	0.0	-	-	0.0	-	83	18,426	
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	-	-	-	-	-	-	-	15	4,965	15	4,965	
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	-	-	-	-	-	-	-	15	5,310	15	5,310	
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	-	-	-	-	
1.65	Passenger Siding	per mile	\$ 1,376	-	-	20	27,520	-	-	10	13,760	-	30	41,280	
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	-	-	76	3,856	5.9	299	32.4	1,652	16.2	828	130	6,635
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	12	1,836	14	2,169	1.1	168	6.1	929	3	466	36	5,568
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	-	-	-	-	-
1.74	Decorative Fencing (both sides)	per mile	\$ 394	1	394	5	1,862	0.4	144	2.0	798	1	400	9	3,598
0															
Total Track Costs				32,842	150,911	9,324	77,566	11,969			282,612				
0															
Turnouts															
4.1	#24 High Speed Turnout	each	\$ 450	0	-	8	3,600	0	-	4	1,800	-	12	5,400	
4.2	#20 Turnout Timber	each	\$ 124	4	496	9	1,116	3	372	3	372	-	19	2,356	
4.3	#10 Turnout Timber	each	\$ 69	0	-	0	-	3	207	3	207	-	6	414	
4.4	#20 Turnout Concrete	each	\$ 249	14	3,486	9	2,241	0	-	-	-	-	23	5,727	
4.5	#10 Turnout Concrete	each	\$ 118	4	472	4	472	0	-	-	-	-	8	944	
0															
Total Turnouts Cost				4,454	7,429	579	2,379	-			14,841				
0															
Curves															
9.1	Elevate & Surface Curves	per mile	\$ 58	-	-	4	206	-	-	-	-	-	4	206	
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-	-	-	-	
9.3	Elastic Fasteners	per mile	\$ 82	-	-	4	291	-	-	-	-	-	4	291	
9.5	Realign Track for Curves	lump sum	\$ -	-	-	214	-	-	-	-	-	-	-	214	
0															
Total Curves Cost				-	711	-	-	-			711				
0															
Signals															
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268	1	1,268	4	5,072	-	-	-	-	-	5	6,340	
8.2	Install CTC System (Single Track)	per mile	\$ 183	-	-	70	12,810	7	1,340	40.5	7,412	-	118	21,561	
8.21	Install CTC System (Double Track)	per mile	\$ 300	12	3,600	-	-	-	-	-	-	-	12	3,600	
8.3	Install PTC System	per mile	\$ 197	-	-	53	10,441	-	-	40.5	7,979	15	2,955	109	21,375
8.4	Electric Lock for Industry Turnout	each	\$ 103	4	412	4	412	3	309	3	309	-	14	1,442	
8.5	Signals for Crossover	each	\$ 700	4	2,800	9	6,300	-	-	-	-	-	13	9,100	
8.6	Signals for Turnout	each	\$ 400	10	4,000	-	-	3	1,200	3	1,200	-	16	6,400	
0															
Total Signals Cost				12,080	35,035	2,849	16,899	2,955			69,818				

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Detroit Route, Toledo to Detroit via CSX with 110 mph Maximum Speed

Revised on 11/08/02



TEMS

													MWRRS Cleveland Route		MWRRS Detroit Route									
													Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
													Cleveland to Berea		Berea to Toledo		Toledo to Alexis		Alexis to Wayne Jct.		Wayne Jct. to Detroit (Milw Jct.)			
													NS		NS		NS		CSX		NS, CR			
													MP 181.7 - MP 194		MP 194 - MP 289.75		MP 57.7 to MP 50.38		MP 130.7 to MP 90.2		MP 18 to 4.2			
													12.3 miles		95.8 miles		7.3 miles		40.5 miles		20.3 miles		176.2 miles	
													79 mph		110 mph		79 mph		110 mph		110 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount										
Stations / Facilities																								
2.1	Full Service - New	each	\$ 1,000	1	1,000	-	-	-	-	-	-	-	1	1,000	2	2,000								
2.2	Full Service - Renovated	each	\$ 500	-	-	2	1,000	-	-	-	-	1	500	2	1,000	5	2,500							
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	-	-	-	-								
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	1	1,000	-	-	-	-	-	-	-	2	2,000								
2.6	Layover Facility (Detroit)	lump sum	\$ 6,536	-	-	-	-	-	-	-	-	-	1	6,536	1	6,536								
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973	-	-	-	-	-	-	-	-	-	1	18,973								
Total Station Cost					20,973		2,000		-		500		8,536		32,009									
Bridges-under																								
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-	-	-	-	-	-								
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-	-	-	-	-	-								
5.3	Two Lane Highway	each	\$ 3,054	-	-	2	6,108	-	-	-	-	-	1	3,054	3	9,162								
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-	-	-	-	-	-								
5.5	Minor river	each	\$ 810	-	-	16	12,960	-	-	9	7,290	-	-	-	25	20,250								
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-	-	-	-	-	-								
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	-	13	2,600	-	-	-	-	-	13	2,600								
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-	-	-	-	-	-								
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	440	4,115	-	-	-	440	4,115								
5.73	Single Track on Flyover Structure	per LF	\$ 6	-	-	-	-	1,000	6,000	-	-	-	-	-	1,000	6,000								
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	2,000	6,000	-	-	-	-	-	2,000	6,000								
Total Bridges-under Cost					-		19,068		14,600		11,405		3,054		48,127									
Bridges-over																								
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	2	4,174	-	-	-	-	-	-	-	2	4,174								
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	2	5,858	-	-	-	-	-	-	-	2	5,858								
6.3	Two Lane Highway	each	\$ 1,903	-	-	2	3,806	-	-	-	-	-	-	-	2	3,806								
6.4	Rail	each	\$ 6,110	-	-	1	6,110	-	-	-	-	-	-	-	1	6,110								
Total Bridges-over Cost					-		19,948		-		-		-		19,948									
Crossings																								
7.1	Private Closure	each	\$ 83	-	-	5	415	-	-	-	-	-	-	-	5	415								
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-	-	-	-	-	-								
7.3	Four Quadrant Gates	each	\$ 288	-	-	17	4,896	-	-	-	-	-	-	-	17	4,896								
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-	-	4	600	4	600								
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	-	-	-	-	-	-	-	1	166	1	166								
7.4b	Conventional Gates double mainline track	each	\$ 205	-	-	14	2,870	8	1,640	58	11,890	-	-	-	80	16,400								
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	2	100	1	50	-	-	-	-	-	-	-	3	150								
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-	-	3	540	3	540								
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-	-	3	45	3	45								
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	-	16	1,280	-	-	-	-	-	-	-	16	1,280								
7.72	Precast Panels with Rdway Improvements	each	\$ 150	2	300	16	2,400	8	1,200	-	-	-	-	-	26	3,900								
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	58	870	-	-	-	58	870								
Total Crossings Cost					400		11,911		2,840		12,760		1,351		29,262									
Segment Totals					70,749		247,013		30,192		121,509		27,865		497,327									
Placeholders																								
	Cuyahoga River Bridge	lump sum	52,000	1	52,000	-	-	-	-	-	-	-	-	-	1	52,000								
	Brookpark Improvements (Ford Plant, Rockport Yard)	lump sum	20,000	1	20,000	-	-	-	-	-	-	-	-	-	1	20,000								
	CSX / NS grade separation near Toledo	lump sum	40,000	-	0	1	40,000	-	-	-	-	-	-	-	1	40,000								
	Maumee River Bridge crossing	lump sum	50,000	-	0	1	50,000	-	-	-	-	-	-	-	1	50,000								
	West Detroit to Beaubien Costs (from Lansing to Detroit Study)	lump sum	15,302	-	-	-	-	-	-	-	-	-	1	15,302	1	15,302								
TOTAL					142,749		337,013		30,192		121,509		43,167		674,629									
NOTES																								
	Assume 26' offset for new mainline track construction for speeds above 79 mph																							
	Installation of PTC system does not include locomotive equipment and dispatch equipment.																							
	Cost Estimate does not include utility relocation.																							
	Corridor access with freight railroads to be negotiated; costs not included																							
	Station costs are MWRRS allocation amounts																							
	Four Quadrant Gates all public crossings at speeds > 79mph																							
	Conventional Gates all public crossings at speeds <= 79mph																							
	Precast Panels with Rdway Improvements installed where track embankment is replaced																							
	Precast Panels without Rdway Improvements installed where track embankment is not replaced																							

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Pittsburgh via Alliance Route, 79 mph Maximum Speed

Revised on 11/08/02



TEMS

		Segment No.	Segment 1		Segment 2		Segment 3		Segment 4		Total	
		From - To	Cleveland to Ravenna		Ravenna to Alliance		Alliance to Beaver Falls		Beaver Falls to Pittsburgh			
		Host Carrier	NS		NS		NS		NS			
		Mileposts	MP 122.97 to MP 85.9		MP 85.9 to MP 67.1		MP 83.05 to MP 30.2		MP 30.2 to MP 0			
		Track Miles	37.1 miles		18.8 miles		52.9 miles		30.2 miles		138.9 miles	
		Maximum Authorized Speed	79 mph		79 mph		79 mph		79 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork												
1.1	HSR on Existing Roadbed	per mile		\$ 993		-		-		-		-
1.2a	HSR on New Roadbed	per mile	30.2	\$ 1,059		31,950		-		-	30	31,950
1.2b	HSR on New Roadbed & New Embankment	per mile	7	\$ 1,492		10,444		18.8	28,050	52.9	78,852	117,346
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile		\$ 2,674		-		-		-		-
1.3	Timber & Surface w/ 33% Tie replacement	per mile	60.3	\$ 222		13,395		37.6	8,347	105.70	23,465	51,912
1.4	Timber & Surface w/ 66% Tie Replacement	per mile		\$ 331		-		-		-		-
1.5	Relay Track w/ 136# CWR	per mile		\$ 354		-		-		-		-
1.6	Freight Siding	per mile		\$ 912		-		-		-		-
1.65	Passenger Siding	per mile	5	\$ 1,376		6,880		5	6,880	10	13,760	41,280
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	30	\$ 51		1,512		15	767	42	2,156	5,668
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	6	\$ 153		851		3	431	8	1,213	3,188
1.73	Fencing, 10 ft Chain Link (both sides)	per mile		\$ 175		-		-		-		-
1.74	Decorative Fencing (both sides)	per mile	2	\$ 394		730		1	370	3	1,041	2,737
Total Track Costs					65,763		44,846		120,488		22,985	254,081
Turnouts												
4.1	#24 High Speed Turnout	each		\$ 450		-		-		-		-
4.2	#20 Turnout Timber	each	7	\$ 124		868		2	248	4	496	2,108
4.3	#10 Turnout Timber	each	5	\$ 69		345		-	-	-	5	345
4.4	#20 Turnout Concrete	each		\$ 249		-		-		-		-
4.5	#10 Turnout Concrete	each		\$ 118		-		-		-		-
Total Turnouts Cost					1,213		248		496		496	2,453
Curves												
9.1	Elevate & Surface Curves	per mile		\$ 58		-		-		-		-
9.2	Curvature Reduction	per mile		\$ 393		-		-		-		-
9.3	Elastic Fasteners	per mile		\$ 82		-		-		-		-
Total Curves Cost					-		-		-		-	-
Signals												
8.1	Signals for Siding w/ High Speed Turnout	each		\$ 1,268		-		-		-		-
8.2	Install CTC System (Single Track)	per mile		\$ 183		-		-		-		-
8.21	Install CTC System (Double Track)	per mile		\$ 300		-		-		-		-
8.3	Install PTC System	per mile		\$ 197		-		-		-		-
8.4	Electric Lock for Industry Turnout	each	5	\$ 103		515		-		-	5	515
8.5	Signals for Crossover	each		\$ 700		-		-		-		-
8.6	Signals for Turnout	each	5	\$ 400		2,000		2	800	4	1,600	4,400
Total Signals Cost					2,515		800		1,600		-	4,915
Stations / Facilities												
2.1	Full Service - New	each	1	\$ 1,000		1,000		-		-	1	1,000
2.2	Full Service - Renovated	each		\$ 500		-	1	500	1	500	3	1,500
2.3	Terminal - New	each		\$ 2,000		-		-		-		-
2.4	Terminal - Renovated	each	1	\$ 1,000		1,000		-		1	1,000	2,000
2.6	Layover Facility (Pittsburgh)	lump sum		\$ 5,544		-		-		1	5,544	5,544
2.7	Service & Inspection Facility in Cleveland	lump sum	1	\$ 18,973		18,973		-		-	1	18,973
Total Station Cost					20,973		500		500		7,044	29,017

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Pittsburgh via Alliance Route, 79 mph Maximum Speed

Revised on 11/08/02

TEMS

			Segment No.	Segment 1	Segment 2	Segment 3	Segment 4				
			From - To	Cleveland to Ravenna	Ravenna to Alliance	Alliance to Beaver Falls	Beaver Falls to Pittsburgh	Total			
			Host Carrier	NS	NS	NS	NS				
			Mileposts	MP 122.97 to MP 85.9	MP 85.9 to MP 67.1	MP 83.05 to MP 30.2	MP 30.2 to MP 0				
			Track Miles	37.1 miles	18.8 miles	52.9 miles	30.2 miles	138.9 miles			
			Maximum Authorized Speed	79 mph	79 mph	79 mph	79 mph				
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Bridges-under											
5.1	Four Lane Urban Expressway	each	\$ 4,835	3	14,505	-	-	-	3	14,505	
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	4	16,100	-	4	16,100	
5.3	Two Lane Highway	each	\$ 3,054	35	106,890	7	21,378	25	76,350	67	204,618
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	
5.5	Minor river	each	\$ 810	6	4,860	3	2,430	6	4,860	15	12,150
5.6	Major River	each	\$ 8,098	-	-	1	8,098	-	1	8,098	
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	
5.73	Single Track on Flyover Structure	per LF	\$ 6.0	-	-	-	-	-	-	-	
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	-	-	-	
Total Bridges-under Cost					126,255	23,808	105,408	-		255,471	
Bridges-over											
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	2	4,174	-	2	4,174	
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	-	-	-	-	-	
6.3	Two Lane Highway	each	\$ 1,903	-	-	-	-	-	-	-	
6.4	Rail	each	\$ 6,110	-	-	-	-	-	-	-	
Total Bridges-over Cost					-	-	4,174	-		4,174	
Crossings											
7.1	Private Closure	each	\$ 83	-	-	-	-	-	-	-	
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	
7.3	Four Quadrant Gates	each	\$ 288	-	-	-	-	-	-	-	
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	
7.4a	Conventional Gates single mainline track	each	\$ 166	6	996	-	-	-	6	996	
7.4b	Conventional Gates double mainline track	each	\$ 205	-	-	-	-	-	-	-	
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	-	1	50	1	50	2	100	
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	
7.71	Precast Panels without Rdway Improvements	each	\$ 80	-	-	-	-	-	-	-	
7.72	Precast Panels with Rdway Improvements	each	\$ 150	6	900	19	2,850	38	5,700	63	9,450
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	-	
Total Crossings Cost					1,896	2,900	5,750	-		10,546	
Segment Totals					218,615	73,102	238,416	30,525		560,657	
Placeholder											
	Interlockings in Cleveland	lump sum	3,000	1	3,000	-	-	-	1	3,000	
	Connection from NS to Erie at CP Erie	lump sum	5,000	1	5,000	-	-	-	1	5,000	
	Connection from Erie to WE	lump sum	5,000	1	5,000	-	-	-	1	5,000	
	Connection from WE to NS in Bedford	lump sum	5,000	1	5,000	-	-	-	1	5,000	
	Special Excavation 10 miles	lump sum	20,000	-	-	1	20,000	-	1	20,000	
	Reconstruction of Turnpike Bridge	lump sum	30,000	-	-	1	30,000	-	1	30,000	
TOTAL					236,615	73,102	288,416	30,525		628,657	
NOTES											
Cost Estimate does not include utility relocation.						Stations and Facilities	Segment	Proposed Improvement			
Corridor access with freight railroads to be negotiated; costs not included						Cleveland	1	Terminal - Renovated			
Station costs are MWRRS allocation amounts						Hudson	1	Full Service - New			
Four Quadrant Gates all public crossings at speeds > 79mph						Alliance	2	Full Service - Renovated			
Conventional Gates all public crossings at speeds <= 79mph						Salem/Columbiana	3	Full Service - Renovated			
Precast Panels with Rdway Improvements installed where track embankment is replaced						North Pittsburgh	4	Full Service - Renovated			
Precast Panels without Rdway Improvements installed where track embankment is not replaced						Pittsburgh	4	Terminal - Renovated			
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes											

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Pittsburgh via Youngstown Route, 79 mph Maximum Speed

Revised on 11/08/02

TEMAS

Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork														
1.1	HSR on Existing Roadbed	per mile \$ 993	-	-	-	-	-	-	-	-	-	-	-	-
1.2a	HSR on New Roadbed	per mile \$ 1,059	28	29,652	-	-	-	-	-	-	-	-	28	29,652
1.2b	HSR on New Roadbed & New Embankment	per mile \$ 1,492	7	10,444	23.0	34,316	18.4	27,453	16.0	23,872	-	-	64	96,085
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile \$ 2,674	-	-	-	-	-	-	-	-	-	-	-	-
1.3	Timber & Surface w/ 33% Tie replacement	per mile \$ 222	56	12,463	-	-	-	-	-	-	21	4,762	78	17,225
1.4	Timber & Surface w/ 66% Tie Replacement	per mile \$ 331	-	-	-	-	-	-	-	-	26	8,606	26	8,606
1.5	Relay Track w/ 136# CWR	per mile \$ 354	-	-	-	-	-	-	-	-	-	-	-	-
1.6	Freight Siding	per mile \$ 912	-	-	-	-	-	-	-	-	-	-	-	-
1.65	Passenger Siding	per mile \$ 1,376	5	6,880	5	6,880	5	6,880	5	6,880	10	13,760	30	41,280
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile \$ 51	28	1,431	18	938	15	751	13	653	38	1,930	112	5,703
1.72	Fencing, 6 ft Chain Link (both sides)	per mile \$ 153	5	805	3	528	3	422	2	367	7	1,086	21	3,208
1.73	Fencing, 10 ft Chain Link (both sides)	per mile \$ 175	-	-	-	-	-	-	-	-	-	-	-	-
1.74	Decorative Fencing (both sides)	per mile \$ 394	2	691	1	453	1	362	1	315	2	932	7	2,753
Total Track Costs				62,366		43,115		35,868		32,087		31,075		204,512
Turnouts														
4.1	#24 High Speed Turnout	each \$ 450	-	-	-	-	-	-	-	-	-	-	-	-
4.2	#20 Turnout Timber	each \$ 124	7	868	2	248	2	248	2	248	4	496	17	2,108
4.3	#10 Turnout Timber	each \$ 69	5	345	-	-	-	-	-	-	-	-	5	345
4.4	#20 Turnout Concrete	each \$ 249	-	-	-	-	-	-	-	-	-	-	-	-
4.5	#10 Turnout Concrete	each \$ 118	-	-	-	-	-	-	-	-	-	-	-	-
Total Turnouts Cost				1,213		248		248		248		496		2,453
Curves														
9.1	Elevate & Surface Curves	per mile \$ 58	-	-	-	-	-	-	-	-	-	-	-	-
9.2	Curvature Reduction	per mile \$ 393	-	-	-	-	-	-	-	-	-	-	-	-
9.3	Elastic Fasteners	per mile \$ 82	-	-	-	-	-	-	-	-	-	-	-	-
Total Curves Cost				-		-		-		-		-		-
Signals														
8.1	Signals for Siding w/ High Speed Turnout	each \$ 1,268	-	-	-	-	-	-	-	-	-	-	-	-
8.2	Install CTC System (Single Track)	per mile \$ 183	-	-	23.0	4,209	18.4	3,367	16.0	2,928	-	-	57	10,504
8.21	Install CTC System (Double Track)	per mile \$ 300	-	-	-	-	-	-	-	-	-	-	-	-
8.3	Install PTC System	per mile \$ 197	-	-	-	-	-	-	-	-	-	-	-	-
8.4	Electric Lock for Industry Turnout	each \$ 103	5	515	-	-	-	-	-	-	-	-	5	515
8.5	Signals for Crossover	each \$ 700	-	-	-	-	-	-	-	-	-	-	-	-
8.6	Signals for Turnout	each \$ 400	5	2,000	-	-	-	-	-	-	-	-	5	2,000
Total Signals Cost				2,515		4,209		3,367		2,928		-		13,019
Stations / Facilities														
2.1	Full Service - New	each \$ 1,000	1	1,000	-	-	-	-	-	-	-	-	1	1,000
2.2	Full Service - Renovated	each \$ 500	-	-	-	-	2	1,000	-	-	1	500	3	1,500
2.3	Terminal - New	each \$ 2,000	-	-	-	-	-	-	-	-	-	-	-	-
2.4	Terminal - Renovated	each \$ 1,000	1	1,000	-	-	-	-	-	-	1	1,000	2	2,000
2.6	Layover Facility (Pittsburgh)	lump sum \$ 5,544	-	-	-	-	-	-	-	-	1	5,544	1	5,544
2.7	Service & Inspection Facility in Cleveland	lump sum \$ 18,973	1	18,973	-	-	-	-	-	-	-	-	1	18,973
Total Station Cost				20,973		-		1,000		-		7,044		29,017

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Pittsburgh via Youngstown Route, 79 mph Maximum Speed

Revised on 11/08/02

TEMS

Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total		
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Bridges-under															
5.1	Four Lane Urban Expressway	each \$ 4,835	3	14,505									3	14,505	
5.2	Four Lane Rural Expressway	each \$ 4,025													
5.3	Two Lane Highway	each \$ 3,054	35	106,890	2	6,108	2	6,108	7	21,378			46	140,484	
5.4	Rail	each \$ 3,054													
5.5	Minor river	each \$ 810	6	4,860	6	4,860	8	6,480	5	4,050			25	20,250	
5.6	Major River	each \$ 8,098													
5.71	Convert open deck bridge to ballast deck (single track)	per LF \$ 4.7													
5.72	Convert open deck bridge to ballast deck (double track)	per LF \$ 9.4													
5.73	Single Track on Flyover Structure	per LF \$ 6.0													
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF \$ 3.0													
Total Bridges-under Cost				126,255		10,968		12,588		25,428				175,239	
Bridges-over															
6.1	Four Lane Urban Expressway	each \$ 2,087													
6.2	Four Lane Rural Expressway	each \$ 2,929													
6.3	Two Lane Highway	each \$ 1,903					1	1,903	2	3,806			3	5,709	
6.4	Rail	each \$ 6,110													
Total Bridges-over Cost								1,903		3,806				5,709	
Crossings															
7.1	Private Closure	each \$ 83					1	83	1	83			2	166	
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each \$ 492													
7.3	Four Quadrant Gates	each \$ 288										1	288	1	288
7.31	Convert Dual Gates to Quad Gates	each \$ 150										3	450	3	450
7.4a	Conventional Gates single mainline track	each \$ 166	6	996	29	4,814	7	1,162	10	1,660			52	8,632	
7.4b	Conventional Gates double mainline track	each \$ 205													
7.41	Convert Flashers Only to Dual Gate	each \$ 50										2	100	2	100
7.5a	Single Gate with Median Barrier	each \$ 180													
7.5b	Convert Single Gate to Extended Arm	each \$ 15													
7.71	Precast Panels without Rdway Improvements	each \$ 80													
7.72	Precast Panels with Rdway Improvements	each \$ 150	6	900	0		0		10	1,500	6	900	22	3,300	
7.8	Michigan Type Grade Crossing Surface	each \$ 15													
Total Crossings Cost				1,896		4,814		1,245		3,243		1,738		12,936	
Segment Totals				215,218		63,354		56,219		67,740		40,353		442,885	
Placeholders															
	Interlockings in Cleveland	lump sum	3,000	1	3,000								1	3,000	
	Connection from NS to Erie at CP Erie	lump sum	5,000	1	5,000								1	5,000	
	Connection from Erie to WE	lump sum	5,000	1	5,000								1	5,000	
	Connection from WE to NS in Bedford	lump sum	5,000	1	5,000								1	5,000	
	Connection from NS to Freedom Secondary	lump sum	5,000			1	5,000						1	5,000	
	Connection at Warren from Pymatuning IT to Niles Sec	lump sum	5,000					1	5,000				1	5,000	
	Connection from PRR to PLE	lump sum	5,000					1	5,000				1	5,000	
	Connection from NS to PLE	lump sum	5,000						1	5,000			1	5,000	
TOTAL				233,218		68,354		66,219		72,740		40,353		480,885	
NOTES															
Assume 26' offset for new mainline track construction for speeds above 79 mph									Stations and Facilities	segment	Proposed Improvement				
Installation of PTC system does not include locomotive equipment and dispatch equipment.									Cleveland	1	Terminal - Renovated				
Cost Estimate does not include utility relocation.									Hudson	1	Full Service - New				
Corridor access with freight railroads to be negotiated; costs not included									Warren	3	Full Service - Renovated				
Station costs are MWRRS allocation amounts									Youngstown	3	Full Service - Renovated				
Four Quadrant Gates all public crossings at speeds > 79mph									North Pittsburgh	5	Full Service - Renovated				
Conventional Gates all public crossings at speeds <= 79mph									Pittsburgh	5	Terminal - Renovated				
Precast Panels with Rdway Improvements installed where track embankment is replaced															
Precast Panels without Rdway Improvements installed where track embankment is not replaced															
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.															

CLEVELAND HUB STUDY



Infrastructure Cost Estimate for Cleveland to Pittsburgh via Youngstown Route, 110 mph Maximum Speed

Revised on 11/08/02

TEMS

Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total		
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
			Segment No. Segment 1		Segment 2		Segment 3		Segment 4		Segment 5				
			From - To Cleveland to Ravenna		Ravenna to Warren		Warren to Youngstown		Youngstown to New Castle		New Castle to Pittsburgh				
			Host Carrier NS/WE		Abandoned ERIE Freedom Sec		Old PRR		Abandoned PLE (using CSX trackchart)		NS				
			Mileposts MP 122.97 to MP 88		MP 188 to MP 165		MP 49.6 to MP 0		MP 74 to MP 58		MP 75.75 to MP 0				
			Track Miles 35.1 miles		23.0 miles		18.4 miles		16.0 miles		47.3 miles		139.8 miles		
			Maximum Authorized Speed 79 mph		110 mph		125 mph		125 mph		79 mph				
			YR 2002 Unit Cost (1000s)												
			Quantity		Quantity		Quantity		Quantity		Quantity		Quantity		
			Amount		Amount		Amount		Amount		Amount		Amount		
Trackwork															
1.1	HSR on Existing Roadbed	per mile	\$ 993												
1.2a	HSR on New Roadbed	per mile	\$ 1,059	28	29,652								28	29,652	
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	7	10,444	23.0	34,316	18.4	27,453	16.0	23,872		64	96,085	
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674												
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	56.14	12,463						21.45	4,762	78	17,225	
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331								26.0	8,606	26	8,606	
1.5	Relay Track w/ 136# CWR	per mile	\$ 354												
1.6	Freight Siding	per mile	\$ 912												
1.65	Passenger Siding	per mile	\$ 1,376	5	6,880	5	6,880	5	6,880	5	6,880	10	13,760	30	41,280
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	28	1,431	18	938	15	751	13	653	38	1,930	112	5,703
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	5	805	3	528	3	422	2	367	7	1,086	21	3,208
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175												
1.74	Decorative Fencing (both sides)	per mile	\$ 394	2	691	1	453	1	362	1	315	2	932	7	2,753
Total Track Costs					62,366		43,115		35,868		32,087		31,075		204,512
Turnouts															
4.1	#24 High Speed Turnout	each	\$ 450			2	900	2	900	2	900		6	2,700	
4.2	#20 Turnout Timber	each	\$ 124	7	868							4	496	11	1,364
4.3	#10 Turnout Timber	each	\$ 69	5	345									5	345
4.4	#20 Turnout Concrete	each	\$ 249												
4.5	#10 Turnout Concrete	each	\$ 118												
Total Turnouts Cost					1,213		900		900		900		496		4,409
Curves															
9.1	Elevate & Surface Curves	per mile	\$ 58												
9.2	Curvature Reduction	per mile	\$ 393												
9.3	Elastic Fasteners	per mile	\$ 82												
Total Curves Cost					-		-		-		-		-		
Signals															
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268												
8.2	Install CTC System (Single Track)	per mile	\$ 183			23.0	4,209	18.4	3,367	16.0	2,928		57	10,504	
8.21	Install CTC System (Double Track)	per mile	\$ 300												
8.3	Install PTC System	per mile	\$ 197			23.0	4,531	18.4	3,625	16.0	3,152		57	11,308	
8.4	Electric Lock for Industry Turnout	each	\$ 103	5	515								5	515	
8.5	Signals for Crossover	each	\$ 700												
8.6	Signals for Turnout	each	\$ 400	5	2,000								5	2,000	
Total Signals Cost					2,515		8,740		6,992		6,080		-		24,327
Stations / Facilities															
2.1	Full Service - New	each	\$ 1,000	1	1,000								1	1,000	
2.2	Full Service - Renovated	each	\$ 500					2	1,000			1	500	3	1,500
2.3	Terminal - New	each	\$ 2,000												
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000							1	1,000	2	2,000
2.6	Layover Facility (Pittsburgh)	lump sum	\$ 5,544									1	5,544	1	5,544
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	1	18,973									1	18,973
Total Station Cost					20,973		-		1,000		-		7,044		29,017

CLEVELAND HUB STUDY



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TEMAS

		Segment No.		Segment 1		Segment 2		Segment 3		Segment 4		Segment 5		Total	
		From - To		Cleveland to Ravenna		Ravenna to Warren		Warren to Youngstown		Youngstown to New Castle		New Castle to Pittsburgh			
		Host Carrier		NS/WE		Abandoned ERIE Freedom Sec		Old PRR		Abandoned PLE (using CSX trackchart)		NS			
		Mileposts		MP 122.97 to MP 88		MP 188 to MP 165		MP 49.6 to MP 0		MP 74 to MP 58		MP 75.75 to MP 0		139.8 miles	
		Track Miles		35.1 miles		23.0 miles		18.4 miles		16.0 miles		47.3 miles			
		Maximum Authorized Speed		79 mph		110 mph		125 mph		125 mph		79 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Bridges-under															
5.1	Four Lane Urban Expressway	each	\$ 4,835	3	14,505		-		-		-		-	3	14,505
5.2	Four Lane Rural Expressway	each	\$ 4,025		-		-		-		-		-		-
5.3	Two Lane Highway	each	\$ 3,054	35	106,890	2	6,108	2	6,108	7	21,378		-	46	140,484
5.4	Rail	each	\$ 3,054		-		-		-		-		-		-
5.5	Minor river	each	\$ 810	6	4,860	6	4,860	8	6,480	5	4,050		-	25	20,250
5.6	Major River	each	\$ 8,098		-		-		-		-		-		-
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7		-		-		-		-		-		-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4		-		-		-		-		-		-
5.73	Single Track on Flyover Structure	per LF	\$ 6.0		-		-		-		-		-		-
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0		-		-		-		-		-		-
Total Bridges-under Cost					126,255		10,968		12,588		25,428		-		175,239
Bridges-over															
6.1	Four Lane Urban Expressway	each	\$ 2,087		-		-		-		-		-		-
6.2	Four Lane Rural Expressway	each	\$ 2,929		-		-		-		-		-		-
6.3	Two Lane Highway	each	\$ 1,903		-		-	1	1,903	2	3,806		-	3	5,709
6.4	Rail	each	\$ 6,110		-		-		-		-		-		-
Total Bridges-over Cost					-		-		1,903		3,806		-		5,709
Crossings															
7.1	Private Closure	each	\$ 83		-		-	1	83	1	83		-	2	166
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492		-		-		-		-		-		-
7.3	Four Quadrant Gates	each	\$ 288		-	29	8,352	7	2,016		-	1	288	37	10,656
7.31	Convert Dual Gates to Quad Gates	each	\$ 150		-		-		-		-	3	450	3	450
7.4a	Conventional Gates single mainline track	each	\$ 166	6	996		-		-	10	1,660		-	16	2,656
7.4b	Conventional Gates double mainline track	each	\$ 205		-		-		-		-		-		-
7.41	Convert Flashers Only to Dual Gate	each	\$ 50		-		-		-		-	2	100	2	100
7.5a	Single Gate with Median Barrier	each	\$ 180		-		-		-		-		-		-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15		-		-		-		-		-		-
7.71	Precast Panels without Rdway Improvements	each	\$ 80		-		-		-		-		-		-
7.72	Precast Panels with Rdway Improvements	each	\$ 150	6	900	29	4,350	7	1,050	10	1,500	6	900	58	8,700
7.8	Michigan Type Grade Crossing Surface	each	\$ 15		-		-		-		-		-		-
Total Crossings Cost					1,896		12,702		3,149		3,243		1,738		22,728
Segment Totals					215,218		76,425		62,400		71,544		40,353		465,941
Placeholders															
	Interlockings in Cleveland	lump sum	3,000	1	3,000		-		-		-		-	1	3,000
	Connection from NS to Erie at CP Erie	lump sum	5,000	1	5,000		-		-		-		-	1	5,000
	Connection from Erie to WE	lump sum	5,000	1	5,000		-		-		-		-	1	5,000
	Connection from WE to NS in Bedford	lump sum	5,000	1	5,000		-		-		-		-	1	5,000
	Connection from NS to Freedom Secondary	lump sum	5,000		-	1	5,000		-		-		-	1	5,000
	Connection at Warren from Pymatuning IT to Niles Sec	lump sum	5,000		-		-	1	5,000		-		-	1	5,000
	Connection from PRR to PLE	lump sum	5,000		-		-	1	5,000		-		-	1	5,000
	Connection from NS to PLE	lump sum	5,000		-		-		-	1	5,000		-	1	5,000
TOTAL					233,218		81,425		72,400		76,544		40,353		503,941
NOTES															
Assume 26' offset for new mainline track construction for speeds above 79 mph										Stations and Facilities		segment		Proposed Improvement	
Installation of PTC system does not include locomotive equipment and dispatch equipment.										Cleveland		1		Terminal - Renovated	
Cost Estimate does not include utility relocation.										Hudson		1		Full Service - New	
Corridor access with freight railroads to be negotiated; costs not included										Warren		3		Full Service - Renovated	
Station costs are MWRRS allocation amounts										Youngstown		3		Full Service - Renovated	
Four Quadrant Gates all public crossings at speeds > 79mph										North Pittsburgh		5		Full Service - Renovated	
Conventional Gates all public crossings at speeds <= 79mph										Pittsburgh		5		Terminal - Renovated	
Precast Panels with Rdway Improvements installed where track embankment is replaced															
Precast Panels without Rdway Improvements installed where track embankment is not replaced															
This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.															

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Toronto, 79 mph Maximum Speed

Revised on 10/14/02



TEMS

		Segment No.		Segment 1		Segment 2		Segment 3		Segment 4		Total	
		From - To		Cleveland to Erie		Erie to Buffalo		Buffalo to Niagara Falls Border		Niagara Falls Border to Toronto			
		Host Carrier		CSXT		CSXT		CSXT		CN			
		Mileposts		MP 181.7 to MP 90.7		MP 90.7 to MP 439.5		MP 0 to MP 75.8		MP 0 (Grimsby Sub) to MP 0 (Oakville Sub)		289.8 miles	
		Track Miles		91.0 miles		90.75 miles		25.11 miles		83.0 miles			
		Maximum Authorized Speed		79 mph		79 mph		79 mph		95 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Trackwork													
1.1	HSR on Existing Roadbed	per mile		\$ 993		-		-		-		-	
1.2a	HSR on New Roadbed	per mile	91.0	\$ 1,059	96,369	90.8	96,104				182	192,473	
1.2b	HSR on New Roadbed & New Embankment	per mile		\$ 1,492									
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile		\$ 2,674									
1.3	Timber & Surface w/ 33% Tie replacement	per mile	182	\$ 222	40,404	181.5	40,293	25.11	5,574		389	86,271	
1.4	Timber & Surface w/ 66% Tie Replacement	per mile		\$ 331				6.28	2,079		6	2,079	
1.5	Relay Track w/ 136# CWR	per mile		\$ 354				25.11	8,889		25	8,889	
1.6	Freight Siding	per mile		\$ 912									
1.65	Passenger Siding	per mile	20	\$ 1,376	27,520	20	27,520	5	6,880		45	61,920	
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	73	\$ 51	3,713	73	3,703	20	1,024		165	8,440	
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	14	\$ 153	2,088	14	2,083	4	576		31	4,747	
1.73	Fencing, 10 ft Chain Link (both sides)	per mile		\$ 175									
1.74	Decorative Fencing (both sides)	per mile	5	\$ 394	1,793	5	1,788	1	495		10	4,075	
Total Track Costs					171,887		171,490		25,517			368,895	
Turnouts													
4.1	#24 High Speed Turnout	each		\$ 450									
4.2	#20 Turnout Timber	each	23	\$ 124	2,852	15	1,860	2	248		40	4,960	
4.3	#10 Turnout Timber	each	15	\$ 69	1,035	7	483				22	1,518	
4.4	#20 Turnout Concrete	each		\$ 249									
4.5	#10 Turnout Concrete	each		\$ 118									
Total Turnouts Cost					3,887		2,343		248			6,478	
Curves													
9.1	Elevate & Surface Curves	per mile		\$ 58									
9.2	Curvature Reduction	per mile		\$ 393									
Total Curves Cost					-		-		-			-	
Signals													
8.1	Signals for Siding w/ High Speed Turnout	each		\$ 1,268									
8.2	Install CTC System (Single Track)	per mile		\$ 183									
8.21	Install CTC System (Double Track)	per mile		\$ 300									
8.3	Install PTC System	per mile		\$ 197									
8.4	Electric Lock for Industry Turnout	each	15	\$ 103	1,545	7	721				22	2,266	
8.5	Signals for Crossover	each		\$ 700									
8.6	Signals for Turnout	each	23	\$ 400	9,200	15	6,000	2	800		40	16,000	
Total Signals Cost					10,745		6,721		800			18,266	
Stations / Facilities													
2.1	Full Service - New	each		\$ 1,000						1	1,000	1	1,000
2.2	Full Service - Renovated	each	2	\$ 500	1,000	2	1,000	2	1,000	2	1,000	8	4,000
2.3	Terminal - New	each		\$ 2,000									
2.4	Terminal - Renovated	each	0.15	\$ 1,000	150					1	1,000	1	1,150
2.6	Layover Facility (Buffalo, Toronto)	lump sum		\$ 5,544		1	5,544			1	5,544	2	11,088
2.7	Service & Inspection Facility in Cleveland	lump sum	0.15	\$ 18,973	2,846							0	2,846
Total Station Cost					3,996		6,544		1,000		8,544		20,084

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Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under												
5.1	Four Lane Urban Expressway	each	\$ 4,835									
5.2	Four Lane Rural Expressway	each	\$ 4,025									
5.3	Two Lane Highway	each	\$ 3,054									
5.4	Rail	each	\$ 3,054									
5.5	Minor river	each	\$ 810									
5.6	Major River	each	\$ 8,098			1.00	8,098				1	8,098
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7									
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4									
5.73	Single Track on Flyover Structure	per LF	\$ 6.0	1000	6,000	1000	6,000				2,000	12,000
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	2000	6,000	2000	6,000				4,000	12,000
Total Bridges-under Cost				12,000		20,098						32,098
Bridges-over												
6.1	Four Lane Urban Expressway	each	\$ 2,087									
6.2	Four Lane Rural Expressway	each	\$ 2,929									
6.3	Two Lane Highway	each	\$ 1,903									
6.4	Rail	each	\$ 6,110									
Total Bridges-over Cost												
Crossings												
7.1	Private Closure	each	\$ 83									
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492									
7.3	Four Quadrant Gates	each	\$ 288									
7.31	Convert Dual Gates to Quad Gates	each	\$ 150									
7.4a	Conventional Gates single mainline track	each	\$ 166									
7.4b	Conventional Gates double mainline track	each	\$ 205	26	5,330	32	6,560				58	11,890
7.41	Convert Flashers Only to Dual Gate	each	\$ 50					1	50		1	50
7.5a	Single Gate with Median Barrier	each	\$ 180									
7.5b	Convert Single Gate to Extended Arm	each	\$ 15									
7.71	Precast Panels without Rdway Improvements	each	\$ 80					10	800		10	800
7.72	Precast Panels with Rdway Improvements	each	\$ 150	26	3,900	32	4,800				58	8,700
7.8	Michigan Type Grade Crossing Surface	each	\$ 15									
Total Crossings Cost				9,230		11,360		850				21,440
Segment Totals				211,745		218,556		28,415		8,544		467,261
Placeholders												
	Collinwood Yard Track Improvements and Capacity Enhancements	lump sum	20,000	1	20,000						1	20,000
	Grade Separation over NS Youngstown Line at Ashtabula	lump sum	18,000	1	18,000						1	18,000
	Ashtabula track realignment and signal modifications	lump sum	20,000	1	20,000						1	20,000
	CP 85 east of Erie track and signal reconfiguration	lump sum	25,000			1	25,000				1	25,000
	Interlockings for Co-mingling	lump sum	2,000	1	2,000			1	2,000		3	6,000
	Track Reconfiguration at Exchange Street Wye	lump sum	500			1	500				1	500
	Miscellaneous Improvements	lump sum	50,000							1	50,000	50,000
TOTAL				271,745		246,056		30,415		58,544		606,761
NOTES												
	Cost Estimate does not include utility relocation.							Stations and Facilities	segment	Proposed Improvement		
	Corridor access with freight railroads to be negotiated; costs not included							Cleveland	1	Terminal - Renovated		
	Station costs are MWRRS allocation amounts							Painesville	1	Full Service - Renovated		
	Four Quadrant Gates all public crossings at speeds > 79mph							Ashtabula	1	Full Service - Renovated		
	Conventional Gates all public crossings at speeds <= 79mph							Erie	2	Full Service - Renovated		
	Precast Panels with Rdway Improvements installed where track embankment is replaced							Dunkirk	2	Full Service - Renovated		
	Precast Panels without Rdway Improvements installed where track embankment is not replaced							Buffalo Exchange	3	Full Service - Renovated		
	This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.							Niagara Falls NY	3	Full Service - Renovated		
								Niagara Falls, ON	4	Full Service - Renovated		
								Hamilton, ON	4	Full Service - New		
								Oakville, ON	4	Full Service - Renovated		
								Toronto, ON	4	Terminal - Renovated		

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		Segment No.		Segment 1		Segment 2		Segment 3		Segment 4		Total	
		From - To		Cleveland to Erie		Erie to Buffalo		Buffalo to Niagara Falls Border		Niagara Falls Border to Toronto			
		Host Carrier		CSXT		CSXT		CSXT		CN			
		Mileposts		MP 181.7 to MP 90.7		MP 90.7 to MP 439.5		MP 0 to MP 75.8		MP 0 (Grimsby Sub) to MP 0 (Oakville Sub)		289.8 miles	
		Track Miles		91.0 miles		90.75 miles		25.11 miles		83.0 miles			
		Maximum Authorized Speed		110 mph		110 mph		79 mph		95 mph			
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Trackwork													
1.1	HSR on Existing Roadbed	per mile	\$ 993	-	-	-	-	-	-	-	-	-	
1.2a	HSR on New Roadbed	per mile	\$ 1,059	27.05	28,646	35.2	37,224	-	-	-	62	65,870	
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	63.95	95,413	55.6	82,955	-	-	-	120	178,369	
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674	-	-	-	-	-	-	-	-	-	
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	54.1	12,010	70.3	15,607	25.11	5,574	-	150	33,191	
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	-	-	-	-	6.28	2,079	-	6	2,079	
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	-	-	-	-	25.11	8,889	-	25	8,889	
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	-	-	
1.65	Passenger Siding	per mile	\$ 1,376	20	27,520	20	27,520	5	6,880	-	45	61,920	
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	73	3,713	73	3,703	20	1,024	-	165	8,440	
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	14	2,088	14	2,083	4	576	-	31	4,747	
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	-	-	
1.74	Decorative Fencing (both sides)	per mile	\$ 394	5	1,793	5	1,788	1	495	-	10	4,075	
Total Track Costs					171,184		170,879		25,517		-	367,580	
Turnouts													
4.1	#24 High Speed Turnout	each	\$ 450	8	3,600	8	3,600	-	-	-	16	7,200	
4.2	#20 Turnout Timber	each	\$ 124	15	1,860	7	868	2	248	-	24	2,976	
4.3	#10 Turnout Timber	each	\$ 69	15	1,035	7	483	-	-	-	22	1,518	
4.4	#20 Turnout Concrete	each	\$ 249	-	-	-	-	-	-	-	-	-	
4.5	#10 Turnout Concrete	each	\$ 118	-	-	-	-	-	-	-	-	-	
Total Turnouts Cost					6,495		4,951		248		-	11,694	
Curves													
9.1	Elevate & Surface Curves	per mile	\$ 58	-	-	-	-	-	-	-	-	-	
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-	-	
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-	-	
Total Curves Cost					-		-		-		-	-	
Signals													
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268	4	5,072	4	5,072	-	-	-	8	10,144	
8.2	Install CTC System (Single Track)	per mile	\$ 183	-	-	-	-	-	-	-	-	-	
8.21	Install CTC System (Double Track)	per mile	\$ 300	-	-	-	-	-	-	-	-	-	
8.3	Install PTC System	per mile	\$ 197	91.0	17,927	90.75	17,878	-	-	-	182	35,805	
8.4	Electric Lock for Industry Turnout	each	\$ 103	15	1,545	7	721	-	-	-	22	2,266	
8.5	Signals for Crossover	each	\$ 700	-	-	-	-	-	-	-	-	-	
8.6	Signals for Turnout	each	\$ 400	15	6,000	7	2,800	2	800	-	24	9,600	
Total Signals Cost					30,544		26,471		800		-	57,815	
Stations / Facilities													
2.1	Full Service - New	each	\$ 1,000	-	-	-	-	-	-	1	1,000	1	1,000
2.2	Full Service - Renovated	each	\$ 500	2	1,000	2	1,000	2	1,000	2	1,000	8	4,000
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-	-	
2.4	Terminal - Renovated	each	\$ 1,000	1	1,000	-	-	-	-	1	1,000	2	2,000
2.6	Layover Facility (Buffalo, Toronto)	lump sum	\$ 5,544	-	-	1	5,544	-	-	1	5,544	2	11,088
2.7	Service & Inspection Facility in Cleveland	lump sum	\$ 18,973	-	-	-	-	-	-	-	-	-	
Total Station Cost					2,000		6,544		1,000		8,544	18,088	

CLEVELAND HUB STUDY

Infrastructure Cost Estimate for Cleveland to Toronto, 110 mph Maximum Speed

Revised on 11/08/02



TEMS

Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under												
5.1	Four Lane Urban Expressway	each \$ 4,835	3	14,505	3	14,505					6	29,010
5.2	Four Lane Rural Expressway	each \$ 4,025		-		-					-	-
5.3	Two Lane Highway	each \$ 3,054	4	12,216	15	45,810					19	58,026
5.4	Rail	each \$ 3,054		-		-					-	-
5.5	Minor river	each \$ 810	12	9,720	24	19,440					36	29,160
5.6	Major River	each \$ 8,098		-	1	8,098					1	8,098
5.71	Convert open deck bridge to ballast deck (single track)	per LF \$ 4.7		-		-					-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF \$ 9.4		-		-					-	-
5.73	Single Track on Flyover Structure	per LF \$ 6.0	1000	6,000	1000	6,000					2,000	12,000
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF \$ 3.0	2000	6,000	2000	6,000					4,000	12,000
Total Bridges-under Cost				48,441		99,853						148,294
Bridges-over												
6.1	Four Lane Urban Expressway	each \$ 2,087		-		-					-	-
6.2	Four Lane Rural Expressway	each \$ 2,929		-		-					-	-
6.3	Two Lane Highway	each \$ 1,903		-		-					-	-
6.4	Rail	each \$ 6,110		-		-					-	-
Total Bridges-over Cost				-		-					-	-
Crossings												
7.1	Private Closure	each \$ 83		-		-					-	-
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each \$ 492		-		-					-	-
7.3	Four Quadrant Gates	each \$ 288	26	7,488	32	9,216					58	16,704
7.31	Convert Dual Gates to Quad Gates	each \$ 150	34	5,100	31	4,650					65	9,750
7.4a	Conventional Gates single mainline track	each \$ 166		-		-					-	-
7.4b	Conventional Gates double mainline track	each \$ 205	15	3,075	20	4,100					35	7,175
7.41	Convert Flashers Only to Dual Gate	each \$ 50		-		-	1	50			1	50
7.5a	Single Gate with Median Barrier	each \$ 180		-		-					-	-
7.5b	Convert Single Gate to Extended Arm	each \$ 15		-		-					-	-
7.71	Precast Panels without Rdway Improvements	each \$ 80		-		-	10	800			10	800
7.72	Precast Panels with Rdway Improvements	each \$ 150	75	11,250	83	12,450					158	23,700
7.8	Michigan Type Grade Crossing Surface	each \$ 15		-		-					-	-
Total Crossings Cost				26,913		30,416		850				58,179
Segment Totals				285,577		339,113		28,415			8,544	661,649
Placeholders												
	Collinwood Yard Track Improvements and Capacity Enhancements	lump sum	20,000	1	20,000		-				1	20,000
	Grade Separation over NS Youngstown Line at Ashtabula	lump sum	18,000	1	18,000		-				1	18,000
	Ashtabula track realignment and signal modifications	lump sum	20,000	1	20,000		-				1	20,000
	CP 85 east of Erie track and signal reconfiguration	lump sum	25,000		-	1	25,000				1	25,000
	Interlockings for Co-mingling	lump sum	2,000	1	2,000		1	2,000			3	6,000
	Track Reconfiguration at Exchange Street Wye	lump sum	500		-	1	500				1	500
	Miscellaneous Improvements	lump sum	50,000		-		-			1	50,000	50,000
TOTAL				345,577		366,613		30,415			58,544	801,149
NOTES												
	Assume 26' offset for new mainline track construction for speeds above 79 mph											
	Installation of PTC system does not include locomotive equipment and dispatch equipment.											
	Cost Estimate does not include utility relocation.											
	Corridor access with freight railroads to be negotiated; costs not included											
	Station costs are MWRRS allocation amounts											
	Four Quadrant Gates all public crossings at speeds > 79mph											
	Conventional Gates all public crossings at speeds <= 79mph											
	Precast Panels with Rdway Improvements installed where track embankment is replaced											
	Precast Panels without Rdway Improvements installed where track embankment is not replaced											
	This cost estimate represents the total cost for each segment; no allocations made for overlapping with other routes.											

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate Summary for Pittsburgh-Columbus-Ft. Wayne/Toledo with 79 mph Maximum Speed



Revised on 11/29/07

			Columbus to Fort Wayne		Columbus to Toledo		Pittsburgh to Columbus		Total		
Route Length			155.1 miles		63.1 miles		189.8 miles		408.0 miles		
Maximum Authorized Speed			79 MPH		79 MPH		79 MPH				
Item No.	Description	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork											
1.1	HSR on Existing Roadbed	per mile	\$ 993	25.2	25,024	-	-	40	39,720	65	\$ 64,744
1.2a	HSR on New Roadbed	per mile	\$ 1,059	48.6	51,467	5.9	6,248	-	-	55	\$ 57,716
1.2b	HSR on New Roadbed & New Embankmen	per mile	\$ 1,492	-	-	-	-	31	46,252	31	\$ 46,252
1.2c	HSR on New Roadbed & New Embankment (Double Track	per mile	\$ 2,674	-	-	-	-	-	-	-	\$ -
1.3	Timber & Surface w/ 33% Tie replacemen	per mile	\$ 222	-	-	-	-	-	-	-	\$ -
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	153.2	50,709	57.2	18,933	164	54,185	374	\$ 123,827
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	42	14,833	-	-	25	8,921	67	\$ 23,753
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	\$ -
1.65	Passenger Siding	per mile	\$ 1,376	-	-	10	13,760	-	-	10	\$ 13,760
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	-	-	-	-	-	-	-	\$ -
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	91	13,923	36	5,493	40	6,120	167	\$ 25,536
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	\$ -
1.74	Decorative Fencing (both sides)	per mile	\$ 394	-	-	-	-	-	-	-	\$ -
Total Track Costs					\$ 155,956		\$ 44,434		\$ 155,198		\$ 355,587
Turnouts and Crossovers											
4.1	#24 High Speed Turnout	each	\$ 450	-	-	-	-	-	-	-	\$ -
4.2	#20 Turnout Timber	each	\$ 124	24	2,976	3.0	372.0	12	1,488	39	\$ 4,836
4.3	#10 Turnout Timber	each	\$ 69	12	828	-	-	-	-	12	\$ 828
4.4	#20 Turnout Concrete	each	\$ 249	-	-	-	-	-	-	-	\$ -
4.5	#10 Turnout Concrete	each	\$ 118	-	-	-	-	-	-	-	\$ -
Total Turnouts Cost					\$ 3,804		\$ 372		\$ 1,488		\$ 5,664
Curves											
9.1	Elevate & Surface Curves	per mile	\$ 58	3	195	2.5	142.1	52.6	3,049.1	58	\$ 3,387
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	\$ -
9.3	Elastic Fasteners	per mile	\$ 82	-	-	-	-	-	-	-	\$ -
9.5	Realign Track for Curves (See Table G6 for Costs)	lump sum	varies	-	1,643	-	1,520.0	-	-	-	\$ 3,163
Total Curves Cost					\$ 1,838		\$ 1,662		\$ 3,049		\$ 6,550
Signals											
8.1	Signals for Siding w/ High Speed Turnou	each	\$ 1,268	4	5,072	1	1,268	4	5,072	9	\$ 11,412
8.2	Install CTC System (Single Track)	per mile	\$ 183	83.2	15,226	47.2	8,638	146.9	26,883	277	\$ 50,746
8.21	Install CTC System (Double Track)	per mile	\$ 300	71.9	21,570	15.9	4,770	42.9	12,870	131	\$ 39,210
8.3	Install PTC System	per mile	\$ 197	-	-	-	-	-	-	-	\$ -
8.4	Electric Lock for Industry Turnou	each	\$ 103	51	5,253	21	2,163.0	62	6,386	134	\$ 13,802
8.5	Signals for Crossover	each	\$ 700	7	4,900	-	-	-	-	7	\$ 4,900
8.6	Signals for Turnout	each	\$ 400	6	2,400	1	400.0	2	800	9	\$ 3,600
Total Signals Cost					\$ 54,421		\$ 17,239		\$ 52,011		\$ 123,670
Stations / Facilities											
2.1	Full Service - New	each	\$ 1,000	-	-	-	-	4	4,000.0	4	\$ 4,000
2.2	Full Service - Renovatec	each	\$ 500	2	2,000	-	-	-	-	2	\$ 1,000
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	\$ -
2.4	Terminal - Renovated	each	\$ 1,000	-	-	-	-	-	-	-	\$ -
Total Station Cost					\$ 2,000		\$ -		\$ 4,000		\$ 5,000

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS



Infrastructure Cost Estimate Summary for Pittsburgh-Columbus-Ft. Wayne/Toledo with 79 mph Maximum Speed

Revised on 11/29/07

				Columbus to Fort Wayne		Columbus to Toledo		Pittsburgh to Columbus		Total	
Route Length				155.1 miles		63.1 miles		189.8 miles		408.0 miles	
Maximum Authorized Speed				79 MPH		79 MPH		79 MPH			
Item No.	Description	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under											
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	4	12,216	3	9,162	-	-	7	21,378
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	25	20,250	4	3,240	-	-	29	23,490
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-
5.73	Ballasted Concrete Deck Replacement Bridge	per LF	\$ 2.1	-	-	-	-	-	-	-	-
5.8	Land Bridges	per LF	\$ 1.5	-	-	-	-	-	-	-	-
Total Bridges-under Cost					\$ 32,466		\$ 12,402		\$ -		\$ 44,868
Bridges-over											
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	1	2,087	-	-	1	2,087
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	-	-	-	-	-	-
6.3	Two Lane Highway	each	\$ 1,903	-	-	4	7,612	-	-	4	7,612
6.4	Rail	each	\$ 6,110	-	-	-	-	-	-	-	-
Total Bridges-over Cost					\$ -		\$ 9,699		\$ -		\$ 9,699
Crossings											
7.1	Private Closure	each	\$ 83	-	-	-	-	-	-	-	-
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-
7.3	Four Quadrant Gates	each	\$ 288	-	-	-	-	-	-	-	-
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-
7.4a	Conventional Gates single mainline track	each	\$ 166	183	30,378	91	15,106	103	17,098	377	62,582
7.4b	Conventional Gates double mainline track	each	\$ 205	3	615	4	820	3	615	10	2,050
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	20	1,000	14	700	28	1,400	62	3,100
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvement	each	\$ 80	232	18,560	102	8,160	127	10,160	461	36,880
7.72	Precast Panels with Rdway Improvement	each	\$ 150	-	-	-	-	-	-	-	-
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	-	-
7.9	Install CWT system	each	\$ 75	36	2,700	26	1,950	52	3,900	114	8,550
Total Crossings Cost					\$ 53,253		\$ 26,736		\$ 33,173		\$ 113,162
Subtotals					\$ 303,738		\$ 112,544		\$ 248,918		\$ 664,200
Placeholders					\$ 122,268		\$ 66,000		\$ 193,000		\$ 381,268
TOTAL					\$ 426,006		\$ 178,544		\$ 441,918		\$ 1,045,468
NOTES											
Columbus-Toledo and Columbus-Ft Wayne Routes overlap from Columbus to Dunkirk											
Columbus-Toledo Cost Estimate depicts Dunkirk-Toledo segment only											

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Columbus to Ft. Wayne Route via Buckeye Line, new Scioto Flyover & CSX with 79 mph Maximum Speed

Revised on 11/29/07



Share with Toledo Route											
Segment No.	Segment 1			Segment 2			Segment 3				
From - To	Columbus to CP Mounds			CP Mounds to Dunkirk			Dunkirk to Fort Wayne				
Host Carrier	Buckeye/CSXT/Scotslawn			CSXT Scotslawn Subdivision			CSXT Ft. Wayne Line				
Mileposts	CP 128 to MP 126.4			MP 126.4 to MP 61.2			MP 236.4 to MP 319.2				
Track Miles	7.0 miles			65.2 miles			82.9 miles				
Maximum Authorized Speed	35/50/79 mph			79 mph			79 mph				
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Total Quantity	Total Amount	
Trackwork											
1.1	HSR on Existing Roadbed	per mile	\$ 993	3.2	3,178	-	-	22.0	21,846	25	25,024
1.2a	HSR on New Roadbed	per mile	\$ 1,059	3.8	4,024	44.8	47,443	-	-	49	51,467
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492	-	-	-	-	-	-	-	-
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674	-	-	-	-	-	-	-	-
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222	-	-	-	-	-	-	-	-
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	5.1	1,688	65.2	21,581	82.9	27,440	153	50,709
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	-	-	-	-	42	14,833	42	14,833
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	-
1.65	Passenger Siding	per mile	\$ 1,376	-	-	-	-	-	-	-	-
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 61	-	-	-	-	-	-	-	-
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	7.0	1,071	32.0	4,896	52.0	7,956	91	13,923
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	-
1.74	Decorative Fencing (both sides)	per mile	\$ 394	-	-	-	-	-	-	-	-
Total Track Costs					9,961		73,920		72,075		155,956
Turnouts											
4.1	#24 High Speed Turnout	each	\$ 450	-	-	-	-	-	-	-	-
4.2	#20 Turnout Timber	each	\$ 124	5	620	13	1,612	6	744	24	2,976
4.3	#10 Turnout Timber	each	\$ 69	-	-	8	552	4	276	12	828
4.4	#20 Turnout Concrete	each	\$ 249	-	-	-	-	-	-	-	-
4.5	#10 Turnout Concrete	each	\$ 118	-	-	-	-	-	-	-	-
Total Turnouts Cost					620		2,164		1,020		3,804
Curves											
9.1	Elevate & Surface Curves	per mile	\$ 58	-	-	2.71	157	0.7	38	3.37	195
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	-
9.3	Elastic Fasteners	per mile	\$ 82	-	-	-	-	-	-	-	-
9.5	Realign Track for Curves	lump sum	\$ -	-	-	-	1,453	-	190	-	1,643
Total Curves Cost					-		1,610		228		1,838
Signals											
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268	-	-	-	-	4	5,072	4	5,072
8.2	Install CTC System (Single Track)	per mile	\$ 183	1.9	348	20.4	3,733	60.9	11,145	83.2	15,226
8.21	Install CTC System (Double Track)	per mile	\$ 300	5.1	1,530	44.8	13,440	22.0	6,600	71.9	21,570
8.3	Install PTC System	per mile	\$ 197	-	-	-	-	-	-	-	-
8.4	Electric Lock for Industry Turnout	each	\$ 103	2	206	22	2,266	27	2,781	51	5,253
8.5	Signals for Crossover	each	\$ 700	1	700	6	4,200	-	-	7	4,900
8.6	Signals for Turnout	each	\$ 400	3	1,200	1	400	2	800	6	2,400
Total Signals Cost					3,984		24,039		26,398		54,421
Stations / Facilities											
2.1	Full Service - New	each	\$ 1,000	-	-	1	1,000	1	1,000	2	2,000
2.2	Full Service - Renovated	each	\$ 500	-	-	-	-	-	-	-	-
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	-
2.4	Terminal - Renovated	each	\$ 1,000	-	-	-	-	-	-	-	-
Total Station Cost					-		1,000		1,000		2,000
Bridges-under											
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	4.00	12,216	-	-	-	-	4	12,216
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	-	-	25	20,250	-	-	25	20,250
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-
5.65	Bridge Rehabilitation	each	\$ 200	-	-	-	-	-	-	-	-
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	-	-	-	-	-	-	-	-
5.73	Single Track on Flyover Structure	per LF	\$ 6.0	-	-	-	-	-	-	-	-
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0	-	-	-	-	-	-	-	-
Total Bridges-under Cost					12,216		20,250		-		32,466
Bridges-over											
6.1	Four Lane Urban Expressway	each	\$ 2,087	-	-	-	-	-	-	-	-
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	-	-	-	-	-	-
6.3	Two Lane Highway	each	\$ 1,903	-	-	-	-	-	-	-	-
6.4	Rail	each	\$ 6,110	-	-	-	-	-	-	-	-
Total Bridges-over Cost					-		-		-		-
Crossings											
7.1	Private Closure	each	\$ 83	-	-	-	-	-	-	-	-
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-
7.3	Four Quadrant Gates	each	\$ 288	-	-	-	-	-	-	-	-
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	-	-	-	-	-	-	-	-
7.4a	Conventional Gates single mainline track	each	\$ 166	-	-	90	14,940	93	15,438	183	30,378
7.4b	Conventional Gates double mainline track	each	\$ 205	3	615	-	-	-	-	3	615
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	-	-	6	300	14	700	20	1,000
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvements	each	\$ 80	3	240	115	9,200	114	9,120	232	18,560
7.72	Precast Panels with Rdway Improvements	each	\$ 150	-	-	-	-	-	-	-	-
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	-	-
7.9	Install CWT system	each	\$ 75	-	-	4	300	32	2,400	36	2,700
Total Crossings Cost					855		24,740		27,658		53,253
Segment Totals					27,636		147,724		128,378		303,738
Placeholders											
	Columbus Scioto Flyover to CSXT and NS Cincinatti	lump sum	55,000	1	55,000	-	-	-	-	1	55,000
	CSXT Scotslawn Flyover at Ridgeway	lump sum	40,000	-	-	1	40,000	-	-	1	40,000
	NS Flyover at Mike	lump sum	20,000	-	-	-	-	1	20,000	1	20,000
	Mounds Diamond and Signals	lump sum	1,000	1	1,000	-	-	-	-	1	1,000
	Adjustment	lump sum	(9,048)	1	(9,048)	-	-	-	-	1	(9,048)
	Adjustment	lump sum	15,316	-	-	1	15,316	-	-	1	15,316

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS



Infrastructure Cost Estimate for Columbus to Ft. Wayne Route via Buckeye Line, new Scioto Flyover & CSX with 79 mph Maximum Speed

Revised on 11/29/07

		Share with Toledo Route							
Segment No.	From - To	Segment 1		Segment 2		Segment 3		Total	
Host Carrier	Mileposts	Buckeye/CSXT/Scottslawn		CP Mounds to Dunkirk		Dunkirk to Fort Wayne			
Track Miles		CP 128 to MP 126.4		CSXT Scottslawn Subdivision		MP 126.4 to MP 61.2		CSXT Ft. Wayne Line	
Maximum Authorized Speed		7.0 miles		65.2 miles		82.9 miles		155.1 miles	
		35/50/79 mph		79 mph		79 mph		79 mph	

Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
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TOTAL				74,588		203,040		148,378		426,006
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NOTES		Stations and Facilities	segment	Proposed Improvement
Cost Estimate does not include utility relocation.		Columbus CBD	1	part of previous Ohio study
Corridor access with freight railroads to be negotiated; costs not included		Marysville	2	assume full service new
Passenger and freight will operate on shared track		Lima	3	assume full service new
6 ft chain link fencing is installed in populated areas		Ft. Wayne	3	part of MWRRS study
CTC is required for passenger operations, estimate 1 electric lock every 3 mi				
PTC is not required				
Station costs are MWRRS allocation amounts				
Existing bridges are replaced where a second track is added, except on existing multiple track roadbed				
Existing bridges may remain open deck				
All curves must be resurfaced to increase superelevation or spiral length				
No crossings are closed				
Private crossings remaining are upgraded to receive new conventional gates				
All public crossings are upgraded to flashers, gates and CWT				
Precast Panels with Rdway Improvements are installed where track embankment is replaced at public crossings				
Precast Panels without Rdway Improvements are installed where track embankment is not replaced at public crossings				
Passing sidings are provided at 50 mile intervals				
Passing sidings use # 20 TO at 79 mph, #24 at speeds greater than 79 mph				
CWR is required for passenger operations				
10 mi passing siding is provided at Scottslawn MP 100-90 on new roadbed and bridges				
10 mi passing sidings are provided at MP 240-250 and 290-300 on existing DT roadbed				
1 mi industry sidings are provided at Convooy and Monroe to service grain elevators				
MWRRRI Program includes grade separation at Mike. Additional funds are provided to elevate the Columbus connection.				
MWRRRI grade separation at Mike must be reconfigured				
Speeds are limited from Columbus to Mounds				
Updated to reflect double track from Scioto to Mounds				
Updated to reflect double track from Mounds to Ridgeway				

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Columbus to Toledo 79 mph Maximum Speed

Revised on 11/30/07



SEGMENTS 1 & 2 ARE SAME AS FOR COLUMBUS TO FORT WAYNE ROUTE										
Item	Unit	YR 2002 Unit Cost (1000s)	Segment 3		Segment 4		Segment 5		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork			From - To		Host Carrier		Mileposts		Track Miles	
1.1 HSR on Existing Roadbed			Dunkirk to CP Stanley		CP Stanley to CP Vickers		VP Vickers to Toledo		Total	
1.2a HSR on New Roadbed			CSXT Toledo Branch Sub		CSXT Toledo Terminal Sub		NS Cleveland-Chicago Main		63.1 miles	
1.2b HSR on New Roadbed & New Embankment			MP 61.2 to MP 4.0		MP CTT 19.5 to MP CTT 21.9		MP 285 to MP 288.5		79 mph	
1.2c HSR on New Roadbed & New Embankment (Double Track)			57.2 miles		2.4 miles		3.5 miles		79 mph	
1.3 Timber & Surface w/ 33% Tie replacement			79 mph		45 mph		60 mph		79 mph	
1.4 Timber & Surface w/ 66% Tie Replacement			79 mph		45 mph		60 mph		79 mph	
1.5 Relay Track w/ 136# CWR			79 mph		45 mph		60 mph		79 mph	
1.6 Freight Siding			79 mph		45 mph		60 mph		79 mph	
1.65 Passenger Siding			79 mph		45 mph		60 mph		79 mph	
1.71 Fencing, 4 ft Woven Wire (both sides)			79 mph		45 mph		60 mph		79 mph	
1.72 Fencing, 6 ft Chain Link (both sides)			79 mph		45 mph		60 mph		79 mph	
1.73 Fencing, 10 ft Chain Link (both sides)			79 mph		45 mph		60 mph		79 mph	
1.74 Decorative Fencing (both sides)			79 mph		45 mph		60 mph		79 mph	
Total Track Costs			37,283		2,909		4,242		44,434	
Turnouts			248		124				372	
4.1 #24 High Speed Turnout			248		124				372	
4.2 #20 Turnout Timber			248		124				372	
4.3 #10 Turnout Timber			248		124				372	
4.4 #20 Turnout Concrete			248		124				372	
4.5 #10 Turnout Concrete			248		124				372	
Total Turnouts Cost			248		124				372	
Curves			1,662						1,662	
9.1 Elevate & Surface Curves			1,662						1,662	
9.2 Curvature Reduction			1,662						1,662	
9.3 Elastic Fasteners			1,662						1,662	
9.5 Realign Track for Curves			1,662						1,662	
Total Curves Cost			1,662						1,662	
Signals			14,863		1,223		1,153		17,239	
8.1 Signals for Siding w/ High Speed Turnout			14,863		1,223		1,153		17,239	
8.2 Install CTC System (Single Track)			14,863		1,223		1,153		17,239	
8.21 Install CTC System (Double Track)			14,863		1,223		1,153		17,239	
8.3 Install PTC System			14,863		1,223		1,153		17,239	
8.4 Electric Lock for Industry Turnout			14,863		1,223		1,153		17,239	
8.5 Signals for Crossover			14,863		1,223		1,153		17,239	
8.6 Signals for Turnout			14,863		1,223		1,153		17,239	
Total Signals Cost			14,863		1,223		1,153		17,239	
Stations / Facilities										
2.1 Full Service - New										
2.2 Full Service - Renovated										
2.3 Terminal - New										
2.4 Terminal - Renovated										
Total Station Cost										
Bridges-under			2,430		810		9,162		12,402	
5.1 Four Lane Urban Expressway			2,430		810		9,162		12,402	
5.2 Four Lane Rural Expressway			2,430		810		9,162		12,402	
5.3 Two Lane Highway			2,430		810		9,162		12,402	
5.4 Rail			2,430		810		9,162		12,402	
5.5 Minor river			2,430		810		9,162		12,402	
5.6 Major River			2,430		810		9,162		12,402	
5.65 Bridge Rehabilitation			2,430		810		9,162		12,402	
5.71 Convert open deck bridge to ballast deck (single track)			2,430		810		9,162		12,402	
5.72 Convert open deck bridge to ballast deck (double track)			2,430		810		9,162		12,402	
5.73 Single Track on Flyover Structure			2,430		810		9,162		12,402	
5.8 Single Track on Approach Embankment w/ Retaining Wall			2,430		810		9,162		12,402	
Total Bridges-under Cost			2,430		810		9,162		12,402	
Bridges-over			2,087				7,612		9,699	
6.1 Four Lane Urban Expressway			2,087				7,612		9,699	
6.2 Four Lane Rural Expressway			2,087				7,612		9,699	
6.3 Two Lane Highway			2,087				7,612		9,699	
6.4 Rail			2,087				7,612		9,699	
Total Bridges-over Cost			2,087				7,612		9,699	
Crossings			25,451		1,130		155		26,736	
7.1 Private Closure			25,451		1,130		155		26,736	
7.2 Four Quadrant Gates w/ Trapped Vehicle Detector			25,451		1,130		155		26,736	
7.3 Four Quadrant Gates			25,451		1,130		155		26,736	
7.31 Convert Dual Gates to Quad Gates			25,451		1,130		155		26,736	
7.4a Conventional Gates single mainline track			25,451		1,130		155		26,736	
7.4b Conventional Gates double mainline track			25,451		1,130		155		26,736	
7.41 Convert Flashers Only to Dual Gate			25,451		1,130		155		26,736	
7.5a Single Gate with Median Barrier			25,451		1,130		155		26,736	
7.5b Convert Single Gate to Extended Arm			25,451		1,130		155		26,736	
7.71 Precast Panels without Rdway Improvements			25,451		1,130		155		26,736	
7.72 Precast Panels with Rdway Improvements			25,451		1,130		155		26,736	
7.8 Michigan Type Grade Crossing Surface			25,451		1,130		155		26,736	
7.9 Install CWT system			25,451		1,130		155		26,736	
Total Crossings Cost			25,451		1,130		155		26,736	
Segment Totals			84,024		6,196		22,324		112,544	
Placeholders										

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Columbus to Toledo 79 mph Maximum Speed

Revised on 11/30/07



SEGMENTS 1 & 2 ARE SAME AS FOR COLUMBUS TO FORT WAYNE ROUTE										
			Segment No.	Segment 3		Segment 4		Segment 5		Total
			From - To	Dunkirk to CP Stanley		CP Stanley to CP Vickers		VP Vickers to Toledo		
			Host Carrier	CSXT Toledo Branch Sub		CSXT Toledo Terminal Sub		NS Cleveland-Chicago Main		
			Mileposts	MP 61.2 to MP 4.0		MP CTT 19.5 to MP CTT 21.9		MP 285 to MP 288.5		
			Track Miles	57.2 miles		2.4 miles		3.5 miles		63.1 miles
			Maximum Authorized Speed	79 mph		45 mph		60 mph		79 mph
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Flyover CSX at CP 34 Galatea	lump sum	40,000	1	40,000		-		-	1	40,000
CSXT TT Flyover NS and conn to NS mainline at Vickers	lump sum	20,000		-		-		-		-
Interlocking modifications at Stanley, Walbridge & Vickers	lump sum	6,000		-	1	6,000		-	1	6,000
Flyover NS at MP 38.9 Mortimer	lump sum	40,000	1	40,000		-		-	1	40,000
Adjustment	lump sum	(20,000)	1	(20,000)		-		-	1	(20,000)
				-		-		-		-
				-		-		-		-
				-		-		-		-
				-		-		-		-
				-		-		-		-
TOTAL				144,024		12,196		22,324		178,544
NOTES										
Cost Estimate does not include utility relocation.						Stations and Facilities		segment	Proposed Improvement	
Corridor access with freight railroads to be negotiated; costs not included						Findlay		3	Assume new full service	
Passenger and freight will operate on shared track						Toledo		6	part of MWRRS study	
6 ft chain link fencing is installed in populated areas										
CTC is required for passenger operations, estimate 1 electric lock for every 3 mi										
PTC is not required										
Station costs are MWRRS allocation amounts										
Existing bridges may remain open deck										
Where speeds > 79 mph, existing bridges are converted to ballasted deck										
All curves must be resurfaced to increase superelevation or spiral length										
Where speeds exceed 79 mph, 25 % of private crossings are closed										
No crossings are closed										
All public crossings are upgraded to flashers, gates and CWT										
Precast Panels with Rdway Improvements are installed where track embankment is replaced at public crossings										
Precast Panels without Rdway Improvements are installed where track embankment is not replaced at public crossings										
Passing sidings are provided at 50 mile intervals										
Passing sidings use # 20 TO at 79 mph, #24 at speeds greater than 79 mph										
CWR is required for passenger operations										
10 mi passing siding is provided at MP 40 to MP 30 on new roadbed and bridges										
Third track is provided from Stanley to Toledo station.										
New Maumee River Bridge is required. The cost is not included here.										
MWRRI program includes a Vickers grade separation. It is assumed that the MWRRI will provide an NS flyover the CSX, allowing an at grade connection to Columbus										

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Pittsburgh to Columbus Route with 79 mph Maximum Speed

Revised on 9/25/06



Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork			Esplan MP 5.3 to PRR MP 11.0 9.1 miles 60 mph		Walker's Mill to OCR Interchang PRR 38.5 miles 79 mph		OCR Interchange to Newark OCR 108.3 miles 79 mph		Newark to Columbus OCR Columbus & Newark Sub 33.9 miles 79 mph		169.8 miles 110 mph	
1.1	HSR on Existing Roadbed	per mile \$ 993			10.0	9,930	20.0	19,860	10.0	9,930	40	39,720
1.2a	HSR on New Roadbed	per mile \$ 1,059										
1.2b	HSR on New Roadbed & New Embankment	per mile \$ 1,492			29.0	43,268			2.0	2,984	31	46,252
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile \$ 2,674										
1.3	Timber & Surface w/ 33% Tie replacement	per mile \$ 222										
1.4	Timber & Surface w/ 66% Tie Replacement	per mile \$ 331										
1.5	Relay Track w/ 136# CWR	per mile \$ 354	12.0	3,972	9.5	3,145	108.3	35,847	33.9	11,221	164	54,185
1.6	Freight Siding	per mile \$ 912			2.5	885	20.7	7,328	2.0	708	25	8,921
1.65	Passenger Siding	per mile \$ 1,376										
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile \$ 51										
1.72	Fencing, 6 ft Chain Link (both sides)	per mile \$ 153	5	765	5	765	20	3,060	10	1,530	40	6,120
1.73	Fencing, 10 ft Chain Link (both sides)	per mile \$ 175										
1.74	Decorative Fencing (both sides)	per mile \$ 394										
Total Track Costs			4,737		57,993		66,095		26,373		155,198	
Turnouts												
4.1	#24 High Speed Turnout	each \$ 450										
4.2	#20 Turnout Timber	each \$ 124	2	248	2	248	4	496	4	496	12	1,488
4.3	#10 Turnout Timber	each \$ 69										
4.4	#20 Turnout Concrete	each \$ 249										
4.5	#10 Turnout Concrete	each \$ 118										
Total Turnouts Cost			248		248		496		496		1,488	
Curves												
9.1	Elevate & Surface Curves	per mile \$ 58	2.43	141	16.56	960	31.23	1,811	2.35	136	53	3,049
9.2	Curvature Reduction	per mile \$ 393										
9.3	Elastic Fasteners	per mile \$ 82										
9.5	Realign Track for Curves	lump sum \$ -										
Total Curves Cost			141		960		1,811		136		3,049	
Signals												
8.1	Signals for Siding w/ High Speed Turnout	each \$ 1,268			1	1,268	2	2,536	1	1,268	4	5,072
8.2	Install CTC System (Single Track)	per mile \$ 183	6.2	1,135	28.5	5,216	88.3	16,159	23.9	4,374	147	26,883
8.21	Install CTC System (Double Track)	per mile \$ 300	2.9	870	10.0	3,000	20.0	6,000	10.0	3,000	43	12,870
8.3	Install PTC System	per mile \$ 197										
8.4	Electric Lock for Industry Turnout	each \$ 103	3	309	13	1,339	36	3,708	10	1,030	62	6,386
8.5	Signals for Crossover	each \$ 700										
8.6	Signals for Turnout	each \$ 400							2	800	2	800
Total Signals Cost			2,314		10,823		28,403		10,472		52,011	
Stations / Facilities												
2.1	Full Service - New	each \$ 1,000			1	1,000	2	2,000	1	1,000	4	4,000
2.2	Full Service - Renovated	each \$ 500										
2.3	Terminal - New	each \$ 2,000										
2.4	Terminal - Renovated	each \$ 1,000										
Total Station Cost					1,000		2,000		1,000		4,000	
Bridges-under												
5.1	Four Lane Urban Expressway	each \$ 4,835										
5.2	Four Lane Rural Expressway	each \$ 4,025										
5.3	Two Lane Highway	each \$ 3,054										
5.4	Rail	each \$ 3,054										
5.5	Minor river	each \$ 810										
5.6	Major River	each \$ 8,098										
5.65	Bridge Rehabilitation	each \$ 200										
5.71	Convert open deck bridge to ballast deck (single track)	per LF \$ 4.7										
5.72	Convert open deck bridge to ballast deck (double track)	per LF \$ 9.4										
5.73	Single Track on Flyover Structure	per LF \$ 6.0										
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF \$ 3.0										
Total Bridges-under Cost												
Bridges-over												
6.1	Four Lane Urban Expressway	each \$ 2,087										
6.2	Four Lane Rural Expressway	each \$ 2,929										
6.3	Two Lane Highway	each \$ 1,903										
6.4	Rail	each \$ 6,110										
Total Bridges-over Cost												
Crossings												
7.1	Private Closure	each \$ 83										
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each \$ 492										
7.3	Four Quadrant Gates	each \$ 288										
7.31	Convert Dual Gates to Quad Gates	each \$ 150										
7.4a	Conventional Gates single mainline track	each \$ 166			6	996	86	14,276	11	1,826	103	17,098
7.4b	Conventional Gates double mainline track	each \$ 205	3	615							3	615
7.41	Convert Flashers Only to Dual Gate	each \$ 50	1	50	4	200	12	600	11	550	28	1,400
7.5a	Single Gate with Median Barrier	each \$ 180										
7.5b	Convert Single Gate to Extended Arm	each \$ 15										
7.71	Precast Panels without Rdway Improvements	each \$ 80	6	480	20	1,600	74	5,920	27	2,160	127	10,160
7.72	Precast Panels with Rdway Improvements	each \$ 150										
7.8	Michigan Type Grade Crossing Surface	each \$ 15										
7.9	Install CVT system	each \$ 75	3	225	14	1,050	29	2,175	6	450	52	3,900
Total Crossings Cost			1,370		3,846		22,971		4,986		33,173	
Segment Totals					8,810		74,869		121,776		43,463	
Placholders												
	Bridge over Ohio River adjacent to NS Mon Line OC bridge	lump sum \$ 50,000	1	50,000							1	50,000
	Multipurpose trail system	per mile \$ 1,500			29	43,500	11	16,500			40	60,000
	Bridge Improvements Ohio River at Weirton	\$ 5,000			1	5,000					1	5,000
	Gould Tunnel improvements	\$ 5,000					1	5,000			1	5,000
	Columbus Tunnel at I-670	\$ 45,000							1	45,000	1	45,000
	Bridge Improvements Tuscarawas River MP 108	\$ 5,000					1	5,000			1	5,000
	Bridge Improvements Muskingum River MP 127	\$ 5,000					1	5,000			1	5,000
	Roadway reconstruction at super-elevated crossing	\$ 3,000					4	12,000	2	6,000	6	18,000
TOTAL					58,810		123,369		165,276		94,463	
NOTES												
	Cost Estimate does not include utility relocation.								Stations and Facilities	segment	Proposed Improvement	
	Corridor access with freight railroads to be negotiated; costs not included								Pittsburgh	1	part of previous Ohio study	
	Passenger and freight will operate on shared track								Steubenville	2	Assume new full service	
	6 ft chain link fencing is installed in populated areas								Coshocton	3	Assume new full service	
	PTC is not required								Newark	3	Assume new full service	
	Station costs are MWRRS allocation amounts								Port Columbus Airport	4	Assume new full service	
	Existing bridges are replaced where a second track is added, except on existing multiple track roadbed								Columbus CBD	4	part of previous Ohio study	
	Existing bridges may remain open deck											
	All curves must be resurfaced to increase superelevation or spiral length											
	No crossings are closed											
	Private crossings remaining are upgraded to receive new conventional gates											
	All public crossings are upgraded to flashers, gates and CWT											
	Precast Panels with Rdway Improvements are installed where track embankment is replaced at public crossings											
	Precast Panels without Rdway Improvements are installed where track embankment is not replaced at public crossings											
	Passing sidings are provided at 50 mile intervals											

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS



Infrastructure Cost Estimate Summary for Pittsburgh-Columbus-Ft. Wayne/Toledo with 110 mph Maximum Speed

Revised on 12/04/07

			Columbus to Fort Wayne		Columbus to Toledo		Pittsburgh to Columbus		Total		
Route Length			155.1 miles		63.1 miles		189.8 miles		408.0 miles		
Maximum Authorized Speed			110 MPH		110 MPH		110 MPH				
Item No.	Description	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork											
1.1	HSR on Existing Roadbed	per mile	\$ 993	25.2	25,024	-	-	40	39,720	65	\$ 64,744
1.2a	HSR on New Roadbed	per mile	\$ 1,059	3.8	4,024	5.9	6,248	-	-	10	\$ 10,272
1.2b	HSR on New Roadbed & New Embankmen	per mile	\$ 1,492	44.8	66,842	-	-	31	46,252	76	\$ 113,094
1.2c	HSR on New Roadbed & New Embankment (Double Track	per mile	\$ 2,674	-	-	-	-	-	-	-	\$ -
1.3	Timber & Surface w/ 33% Tie replacemen	per mile	\$ 222	-	-	-	-	-	-	-	\$ -
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	108.4	35,880	57.2	18,933	164	54,185	329	\$ 108,998
1.5	Relay Track w/ 136# CWR	per mile	\$ 354	42	14,833	-	-	25	8,921	67	\$ 23,753
1.6	Freight Siding	per mile	\$ 912	-	-	-	-	-	-	-	\$ -
1.65	Passenger Siding	per mile	\$ 1,376	10	13,760	10	13,760	-	-	20	\$ 27,520
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51	64	3,269	27	1,387	77	3,937	169	\$ 8,594
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	91	13,923	36	5,493	40	6,120	167	\$ 25,536
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175	-	-	-	-	-	-	-	\$ -
1.74	Decorative Fencing (both sides)	per mile	\$ 394	-	-	-	-	-	-	-	\$ -
Total Track Costs					\$ 177,555		\$ 45,821		\$ 159,135		\$ 382,510
Turnouts and Crossovers											
4.1	#24 High Speed Turnout	each	\$ 450	8	3,600	2.0	900.0	4	1,800	14	\$ 6,300
4.2	#20 Turnout Timber	each	\$ 124	8	992	1.0	124.0	8	992	17	\$ 2,108
4.3	#10 Turnout Timber	each	\$ 69	4	276	-	-	-	-	4	\$ 276
4.4	#20 Turnout Concrete	each	\$ 249	-	-	-	-	-	-	-	\$ -
4.5	#10 Turnout Concrete	each	\$ 118	-	-	-	-	-	-	-	\$ -
Total Turnouts Cost					\$ 4,868		\$ 1,024		\$ 2,792		\$ 8,684
Curves											
9.1	Elevate & Surface Curves	per mile	\$ 58	3	195	2.5	142.1	52.6	3,049.1	58	\$ 3,387
9.2	Curvature Reduction	per mile	\$ 393	-	-	-	-	-	-	-	\$ -
9.3	Elastic Fasteners	per mile	\$ 82	-	-	-	-	-	-	-	\$ -
9.5	Realign Track for Curves (See Table G6 for Costs)	lump sum	varies	-	1,643	-	1,520.0	-	-	-	\$ 3,163
Total Curves Cost					\$ 1,838		\$ 1,662		\$ 3,049		\$ 6,550
Signals											
8.1	Signals for Siding w/ High Speed Turnou	each	\$ 1,268	6	7,608	1	1,268	4	5,072	11	\$ 13,948
8.2	Install CTC System (Single Track)	per mile	\$ 183	118.0	21,594	47.2	8,638	146.9	26,883	312	\$ 57,114
8.21	Install CTC System (Double Track)	per mile	\$ 300	37.1	11,130	15.9	4,770	42.9	12,870	96	\$ 28,770
8.3	Install PTC System	per mile	\$ 197	148.1	29,176	57.2	11,268	97.2	19,148	303	\$ 59,593
8.4	Electric Lock for Industry Turnou	each	\$ 103	51	5,253	21	2,163.0	62	6,386	134	\$ 13,802
8.5	Signals for Crossover	each	\$ 700	1	700	-	-	-	-	1	\$ 700
8.6	Signals for Turnout	each	\$ 400	6	2,400	1	400.0	2	800	9	\$ 3,600
Total Signals Cost					\$ 77,861		\$ 28,507		\$ 71,159		\$ 177,527
Stations / Facilities											
2.1	Full Service - New	each	\$ 1,000	-	-	-	-	4	4,000.0	4	\$ 4,000
2.2	Full Service - Renovatec	each	\$ 500	2	2,000	-	-	-	-	2	\$ 1,000
2.3	Terminal - New	each	\$ 2,000	-	-	-	-	-	-	-	\$ -
2.4	Terminal - Renovated	each	\$ 1,000	-	-	-	-	-	-	-	\$ -
Total Station Cost					\$ 2,000		\$ -		\$ 4,000		\$ 5,000

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS



Infrastructure Cost Estimate Summary for Pittsburgh-Columbus-Ft. Wayne/Toledo with 110 mph Maximum Speed

Revised on 12/04/07

				Columbus to Fort Wayne		Columbus to Toledo		Pittsburgh to Columbus		Total	
Route Length				155.1 miles		63.1 miles		189.8 miles		408.0 miles	
Maximum Authorized Speed				110 MPH		110 MPH		110 MPH			
Item No.	Description	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Bridges-under											
5.1	Four Lane Urban Expressway	each	\$ 4,835	-	-	-	-	-	-	-	-
5.2	Four Lane Rural Expressway	each	\$ 4,025	-	-	-	-	-	-	-	-
5.3	Two Lane Highway	each	\$ 3,054	4	12,216	3	9,162	-	-	7	21,378
5.4	Rail	each	\$ 3,054	-	-	-	-	-	-	-	-
5.5	Minor river	each	\$ 810	25	20,250	4	3,240	-	-	29	23,490
5.6	Major River	each	\$ 8,098	-	-	-	-	-	-	-	-
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7	-	-	-	-	-	-	-	-
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4	2,800	13,095	800	3,741	2,350	10,990	5,950	55,653
5.73	Ballasted Concrete Deck Replacement Bridge	per LF	\$ 2.1	-	-	-	-	-	-	-	-
5.8	Land Bridges	per LF	\$ 1.5	-	-	-	-	-	-	-	-
Total Bridges-under Cost					\$ 45,561		\$ 16,143		\$ 10,990		\$ 100,521
Bridges-over											
6.1	Four Lane Urban Expressway	each	\$ 2,087	2	4,174	1	2,087	-	-	3	6,261
6.2	Four Lane Rural Expressway	each	\$ 2,929	-	-	-	-	-	-	-	-
6.3	Two Lane Highway	each	\$ 1,903	-	-	4	7,612	-	-	4	7,612
6.4	Rail	each	\$ 6,110	-	-	-	-	-	-	-	-
Total Bridges-over Cost					\$ 4,174		\$ 9,699		\$ -		\$ 13,873
Crossings											
7.1	Private Closure	each	\$ 83	13	1,079	7	581	10	830	30	2,490
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492	-	-	-	-	-	-	-	-
7.3	Four Quadrant Gates	each	\$ 288	122	35,136	55	15,840	38	10,944	215	61,920
7.31	Convert Dual Gates to Quad Gates	each	\$ 150	24	3,600	6	900	18	2,700	48	7,200
7.4a	Conventional Gates single mainline track	each	\$ 166	53	8,798	37	6,142	67	11,122	157	26,062
7.4b	Conventional Gates double mainline track	each	\$ 205	3	615	4	820	3	615	10	2,050
7.41	Convert Flashers Only to Dual Gate	each	\$ 50	6	300	6	300	16	800	28	1,400
7.5a	Single Gate with Median Barrier	each	\$ 180	-	-	-	-	-	-	-	-
7.5b	Convert Single Gate to Extended Arm	each	\$ 15	-	-	-	-	-	-	-	-
7.71	Precast Panels without Rdway Improvement	each	\$ 80	165	13,200	128	10,240	176	14,080	469	37,520
7.72	Precast Panels with Rdway Improvement	each	\$ 150	64	9,600	-	-	-	-	64	9,600
7.8	Michigan Type Grade Crossing Surface	each	\$ 15	-	-	-	-	-	-	-	-
7.9	Install CWT system	each	\$ 75	21	1,575	20	1,500	40	3,000	81	6,075
Total Crossings Cost					73,903		36,323		44,091		\$ 154,317
Subtotals					387,759		139,180		295,216		848,982
Placeholders					106,952		66,000		193,000		365,952
TOTAL					494,711		205,180		488,216		1,214,934
NOTES											
Columbus-Toledo and Columbus-Ft Wayne Routes overlap from Columbus to Dunkirk											
Columbus-Toledo Cost Estimate depicts Dunkirk-Toledo segment only											

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS



Infrastructure Cost Estimate for Columbus to Ft. Wayne Route via Buckeye Line, new Scioto Flyover & CSX with 110 mph Maximum Speed

Revised on 11/30/07

Share with Toledo Route											
Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Total		
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Trackwork											
1.1	HSR on Existing Roadbed	per mile	\$ 993	3.2	3,178			22.0	21,846	25	25,024
1.2a	HSR on New Roadbed	per mile	\$ 1,059	3.8	4,024					4	4,024
1.2b	HSR on New Roadbed & New Embankment	per mile	\$ 1,492			44.8	66,842			45	66,842
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile	\$ 2,674								
1.3	Timber & Surface w/ 33% Tie replacement	per mile	\$ 222								
1.4	Timber & Surface w/ 66% Tie Replacement	per mile	\$ 331	5.1	1,688	20.4	6,752	82.9	27,440	108	35,880
1.5	Relay Track w/ 136# CWR	per mile	\$ 354					42	14,833	42	14,833
1.6	Freight Siding	per mile	\$ 912								
1.65	Passenger Siding	per mile	\$ 1,376								
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile	\$ 51			10	13,760			10	13,760
1.72	Fencing, 6 ft Chain Link (both sides)	per mile	\$ 153	7.0	1,071	32.0	4,896	30.9	1,576	64	3,269
1.73	Fencing, 10 ft Chain Link (both sides)	per mile	\$ 175					52.0	7,956	91	13,923
1.74	Decorative Fencing (both sides)	per mile	\$ 394								
Total Track Costs				9,961		93,943		73,650			177,555
Turnouts											
4.1	#24 High Speed Turnout	each	\$ 450			4	1,800		1,800	8	3,600
4.2	#20 Turnout Timber	each	\$ 124	5	620	1	124	2	248	8	992
4.3	#10 Turnout Timber	each	\$ 69					4	276	4	276
4.4	#20 Turnout Concrete	each	\$ 249								
4.5	#10 Turnout Concrete	each	\$ 118								
Total Turnouts Cost				620		1,924		2,324			4,868
Curves											
9.1	Elevate & Surface Curves	per mile	\$ 58			2.71	157	0.7	38	3.37	195
9.2	Curvature Reduction	per mile	\$ 393								
9.3	Elastic Fasteners	per mile	\$ 82								
9.5	Realign Track for Curves	lump sum	\$ -				1,453		190		1,643
Total Curves Cost						1,610		228			1,838
Signals											
8.1	Signals for Siding w/ High Speed Turnout	each	\$ 1,268			2	2,536	4	5,072	6	7,608
8.2	Install CTC System (Single Track)	per mile	\$ 183	1.9	348	55.2	10,102	60.9	11,145	118.0	21,594
8.21	Install CTC System (Double Track)	per mile	\$ 300	5	1,500	10.0	3,000	22.00	6,600	37.1	11,130
8.3	Install PTC System	per mile	\$ 197			65.2	12,844	82.9	16,331	148.1	29,176
8.4	Electric Lock for Industry Turnout	each	\$ 103	2	206	22	2,266	27	2,781	51	5,253
8.5	Signals for Crossover	each	\$ 700	1	700					1	700
8.6	Signals for Turnout	each	\$ 400	3	1,200	1	400	2	800	6	2,400
Total Signals Cost				3,984		31,148		42,729			77,861
Stations / Facilities											
2.1	Full Service - New	each	\$ 1,000			1	1,000	1	1,000	2	2,000
2.2	Full Service - Renovated	each	\$ 500								
2.3	Terminal - New	each	\$ 2,000								
2.4	Terminal - Renovated	each	\$ 1,000								
Total Station Cost						1,000		1,000			2,000
Bridges-under											
5.1	Four Lane Urban Expressway	each	\$ 4,835								
5.2	Four Lane Rural Expressway	each	\$ 4,025								
5.3	Two Lane Highway	each	\$ 3,054	4.00	12,216					4	12,216
5.4	Rail	each	\$ 3,054								
5.5	Minor river	each	\$ 810			25	20,250			25	20,250
5.6	Major River	each	\$ 8,098								
5.65	Bridge Rehabilitation	each	\$ 200								
5.71	Convert open deck bridge to ballast deck (single track)	per LF	\$ 4.7			500	2,338	2300	10,756	2,800	13,095
5.72	Convert open deck bridge to ballast deck (double track)	per LF	\$ 9.4								
5.73	Single Track on Flyover Structure	per LF	\$ 6.0								
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF	\$ 3.0								
Total Bridges-under Cost				12,216		22,588		10,756			45,561
Bridges-over											
6.1	Four Lane Urban Expressway	each	\$ 2,087			2	4,174			2	4,174
6.2	Four Lane Rural Expressway	each	\$ 2,929								
6.3	Two Lane Highway	each	\$ 1,903								
6.4	Rail	each	\$ 6,110								
Total Bridges-over Cost						4,174					4,174
Crossings											
7.1	Private Closure	each	\$ 83			7	581	6	498	13	1,079
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each	\$ 492								
7.3	Four Quadrant Gates	each	\$ 288			46	13,248	76	21,888	122	35,136
7.31	Convert Dual Gates to Quad Gates	each	\$ 150			6	900	18	2,700	24	3,600
7.4a	Conventional Gates single mainline track	each	\$ 166			30	4,980	23	3,818	53	8,798
7.4b	Conventional Gates double mainline track	each	\$ 205	3	615					3	615
7.41	Convert Flashers Only to Dual Gate	each	\$ 50			4	200	2	100	6	300
7.5a	Single Gate with Median Barrier	each	\$ 180								
7.5b	Convert Single Gate to Extended Arm	each	\$ 15								
7.71	Precast Panels without Rdway Improvements	each	\$ 80	3	240	29	2,320	133	10,640	165	13,200
7.72	Precast Panels with Rdway Improvements	each	\$ 150			64	9,600			64	9,600
7.8	Michigan Type Grade Crossing Surface	each	\$ 15								
7.9	Install CWT system	each	\$ 75			7	525	14	1,050	21	1,575
Total Crossings Cost				855		32,354		40,694			73,903
Segment Totals				27,636		188,742		171,382			387,759
Placeholders											
	Columbus Scioto Flyover to CSXT and NS Cincinatti	lump sum	55,000	1	55,000					1	55,000
	CSXT Scotslawn Flyover at Ridgeway	lump sum	40,000			1	40,000			1	40,000
	NS Flyover at Mike	lump sum	20,000					1	20,000	1	20,000
	Mounds Diamonds and Signals	lump sum	1,000	1	1,000					1	1,000

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Columbus to Toledo 110 mph Maximum Speed

Revised on 12/04/07



SEGMENTS 1 & 2 ARE SAME AS FOR COLUMBUS TO FORT WAYNE ROUTE										
Item	Unit	YR 2002 Unit Cost (1000s)	Segment 3		Segment 4		Segment 5		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Trackwork			From - To		Host Carrier		Mileposts		Track Miles	
1.1 HSR on Existing Roadbed			Dunkirk to CP Stanley		CP Stanley to CP Vickers		VP Vickers to Toledo		NS Cleveland-Chicago Main	
1.2a HSR on New Roadbed			CSXT Toledo Branch Sub		CSXT Toledo Terminal Sub		MP 285 to MP 288.5		63.1 miles	
1.2b HSR on New Roadbed & New Embankment			MP 61.2 to MP 4.0		MP CTT 19.5 to MP CTT 21.9		3.5 miles		110 mph	
1.2c HSR on New Roadbed & New Embankment (Double Track)			57.2 miles		2.4 miles		60 mph		110 mph	
1.3 Timber & Surface w/ 33% Tie replacement			110 mph		45 mph		60 mph		110 mph	
1.4 Timber & Surface w/ 66% Tie Replacement			110 mph		45 mph		60 mph		110 mph	
1.5 Relay Track w/ 136# CWR			110 mph		45 mph		60 mph		110 mph	
1.6 Freight Siding			110 mph		45 mph		60 mph		110 mph	
1.65 Passenger Siding			110 mph		45 mph		60 mph		110 mph	
1.71 Fencing, 4 ft Woven Wire (both sides)			110 mph		45 mph		60 mph		110 mph	
1.72 Fencing, 6 ft Chain Link (both sides)			110 mph		45 mph		60 mph		110 mph	
1.73 Fencing, 10 ft Chain Link (both sides)			110 mph		45 mph		60 mph		110 mph	
1.74 Decorative Fencing (both sides)			110 mph		45 mph		60 mph		110 mph	
Total Track Costs			38,670		2,909		4,242		45,821	
Turnouts										
4.1 #24 High Speed Turnout			2		1				2	
4.2 #20 Turnout Timber					1		124		1	
4.3 #10 Turnout Timber										
4.4 #20 Turnout Concrete										
4.5 #10 Turnout Concrete										
Total Turnouts Cost			900		124				1,024	
Curves										
9.1 Elevate & Surface Curves			2.5						2	
9.2 Curvature Reduction										
9.3 Elastic Fasteners										
9.5 Realign Track for Curves					1,520				1,520	
Total Curves Cost			1,662						1,662	
Signals										
8.1 Signals for Siding w/ High Speed Turnout			1						1	
8.2 Install CTC System (Single Track)			47.2		8,638				47	
8.21 Install CTC System (Double Track)			10.0		3,000		2.4		720	
8.3 Install PTC System			57.2		11,268				57	
8.4 Electric Lock for Industry Turnout			19		1,957		1		103	
8.5 Signals for Crossover							1		103	
8.6 Signals for Turnout							1		400	
Total Signals Cost			26,131		1,223		1,153		28,507	
Stations / Facilities										
2.1 Full Service - New										
2.2 Full Service - Renovated										
2.3 Terminal - New										
2.4 Terminal - Renovated										
Total Station Cost										
Bridges-under										
5.1 Four Lane Urban Expressway										
5.2 Four Lane Rural Expressway										
5.3 Two Lane Highway							3		9,162	
5.4 Rail										
5.5 Minor river			3		2,430		1		810	
5.6 Major River										
5.65 Bridge Rehabilitation										
5.71 Convert open deck bridge to ballast deck (single track)			800		3,741				800	
5.72 Convert open deck bridge to ballast deck (double track)										
5.73 Single Track on Flyover Structure										
5.8 Single Track on Approach Embankment w/ Retaining Wall										
Total Bridges-under Cost			6,171		810		9,162		16,143	
Bridges-over										
6.1 Four Lane Urban Expressway			1		2,087				1	
6.2 Four Lane Rural Expressway										
6.3 Two Lane Highway							4		7,612	
6.4 Rail										
Total Bridges-over Cost			2,087				7,612		9,699	
Crossings										
7.1 Private Closure			7		581				7	
7.2 Four Quadrant Gates w/ Trapped Vehicle Detector										
7.3 Four Quadrant Gates			55		15,840				55	
7.31 Convert Dual Gates to Quad Gates			6		900				6	
7.4a Conventional Gates single mainline track			37		6,142				37	
7.4b Conventional Gates double mainline track							4		820	
7.41 Convert Flashers Only to Dual Gate			6		300				6	
7.5a Single Gate with Median Barrier										
7.5b Convert Single Gate to Extended Arm										
7.71 Precast Panels without Rdway Improvements			121		9,680		6		480	
7.72 Precast Panels with Rdway Improvements							1		80	
7.8 Michigan Type Grade Crossing Surface										
7.9 Install CWT system			17		1,275		2		150	
Total Crossings Cost			34,718		1,450		155		36,323	
Segment Totals			110,340		6,516		22,324		139,180	
Placeholders										

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Columbus to Toledo 110 mph Maximum Speed

Revised on 12/04/07



SEGMENTS 1 & 2 ARE SAME AS FOR COLUMBUS TO FORT WAYNE ROUTE										
			Segment 3		Segment 4		Segment 5		Total	
Segment No.			Dunkirk to CP Stanley		CP Stanley to CP Vickers		VP Vickers to Toledo			
From - To			CSXT Toledo Branch Sub		CSXT Toledo Terminal Sub		NS Cleveland-Chicago Main			
Host Carrier			MP 61.2 to MP 4.0		MP CTT 19.5 to MP CTT 21.9		MP 285 to MP 288.5			
Mileposts			57.2 miles		2.4 miles		3.5 miles		63.1 miles	
Track Miles			110 mph		45 mph		60 mph		110 mph	
Maximum Authorized Speed										
Item	Unit	YR 2002 Unit Cost (1000s)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Flyover CSX at CP 34 Galatea	lump sum	40,000	1	40,000		-		-	1	40,000
CSXT TT Flyover NS and conn to NS mainline at Vickers	lump sum	20,000		-		-		-		-
Interlocking modifications at Stanley, Walbridge & Vickers	lump sum	6,000		-	1	6,000		-	1	6,000
Flyover NS at MP 38.9 Mortimer	lump sum	40,000	1	40,000		-		-	1	40,000
Adjustment	lump sum	(20,000)	1	(20,000)		-		-	1	(20,000)
				-		-		-		-
				-		-		-		-
				-		-		-		-
				-		-		-		-
				-		-		-		-
				-		-		-		-
TOTAL				170,340		12,516		22,324		205,180
NOTES										
Cost Estimate does not include utility relocation.					Stations and Facilities		segment	Proposed Improvement		
Corridor access with freight railroads to be negotiated; costs not included					Findlay		3	Assume new full service		
Generally, passenger and freight will operate on shared track except as noted herein					Toledo		6	part of MWRRS study		
6 ft chain link fencing is installed in populated areas. In rural areas, where speeds > 79 mph, 4 ft woven wire fence is installed.										
CTC is required for passenger operations, estimate 1 electric lock for every 3 mi										
PTC (in continuous segments) is required where speeds > 79 mph; costs do not include locomotive equipment and dispatch modifications										
Station costs are MWRRS allocation amounts										
Existing bridges are replaced where a second track is added, except on existing multiple track roadbed										
Where speeds > 79 mph, existing bridges are converted to ballasted deck										
All curves must be resurfaced to increase superelevation or spiral length										
Where speeds exceed 79 mph, 25 % of private crossings are closed										
Private crossings remaining are upgraded to receive new conventional gates										
Where speeds > 79 mph, public crossings are upgraded to 4Q gates. Where speeds < 79 mph, crossings are upgraded to flashers, gates and CWT										
Precast Panels with Rdway Improvements are installed where track embankment is replaced at public crossings										
Precast Panels without Rdway Improvements are installed where track embankment is not replaced at public crossings										
Passing sidings are provided at 50 mile intervals										
Passing sidings use # 20 TO at 79 mph, #24 at speeds greater than 79 mph										
CWR is required for passenger operations										
10 mi passing siding is provided at MP 40 to MP 30 on new roadbed and bridges										
Third track is provided from Stanley to Toledo station.										
New Maumee River Bridge is required. The cost is not included here.										
MWRRI program includes a Vickers grade separation. It is assumed that the MWRRI will provide an NS flyover the CSX, allowing an at grade connection to Columbus										

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Pittsburgh to Columbus Route with 110 mph Maximum Speed
 Revised on 9/25/06



Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Total		
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Trackwork													
1.1	HSR on Existing Roadbed	per mile \$ 993			10.0	9,930	20.0	19,860	10.0	9,930	40	39,720	
1.2a	HSR on New Roadbed	per mile \$ 1,059											
1.2b	HSR on New Roadbed & New Embankment	per mile \$ 1,492			29.0	43,268			2.0	2,984	31	46,252	
1.2c	HSR on New Roadbed & New Embankment (Double Track)	per mile \$ 2,674											
1.3	Timber & Surface w/ 33% Tie replacement	per mile \$ 222											
1.4	Timber & Surface w/ 66% Tie Replacement	per mile \$ 331											
1.5	Relay Track w/ 136# CWR	per mile \$ 354	12.0	3,972	9.5	3,145	108.3	35,847	33.9	11,221	164	54,185	
1.6	Freight Siding	per mile \$ 912			2.5	885	20.7	7,328	2.0	708	25	8,921	
1.65	Passenger Siding	per mile \$ 1,376											
1.71	Fencing, 4 ft Woven Wire (both sides)	per mile \$ 51					53.3	2,718	23.9	1,219	77	3,937	
1.72	Fencing, 6 ft Chain Link (both sides)	per mile \$ 153	5	765	5	765	20	3,060	10	1,530	40	6,120	
1.73	Fencing, 10 ft Chain Link (both sides)	per mile \$ 175											
1.74	Decorative Fencing (both sides)	per mile \$ 394											
Total Track Costs				4,737		57,993		68,813		27,592		159,135	
Turnouts													
4.1	#24 High Speed Turnout	each \$ 450						2	900	2	900	4	1,800
4.2	#20 Turnout Timber	each \$ 124	2	248	2	248	2	248	2	248	8	992	
4.3	#10 Turnout Timber	each \$ 69											
4.4	#20 Turnout Concrete	each \$ 249											
4.5	#10 Turnout Concrete	each \$ 118											
Total Turnouts Cost				248		248		1,148		1,148		2,792	
Curves													
9.1	Elevate & Surface Curves	per mile \$ 58	2.43	141	16.56	960	31.23	1,811	2.35	136	53	3,049	
9.2	Curvature Reduction	per mile \$ 393											
9.3	Elastic Fasteners	per mile \$ 82											
9.5	Realign Track for Curves	lump sum \$ -											
Total Curves Cost				141		960		1,811		136		3,049	
Signals													
8.1	Signals for Siding w/ High Speed Turnout	each \$ 1,268			1	1,268	2	2,536	1	1,268	4	5,072	
8.2	Install CTC System (Single Track)	per mile \$ 183	6.2	1,135	28.5	5,216	88.3	16,159	23.9	4,374	147	26,883	
8.21	Install CTC System (Double Track)	per mile \$ 300	2.9	870	10.0	3,000	20.0	6,000	10.0	3,000	43	12,870	
8.3	Install PTC System	per mile \$ 197					63.3	12,470	33.9	6,678	97	19,148	
8.4	Electric Lock for Industry Turnout	each \$ 103	3	309	13	1,339	36	3,708	10	1,030	62	6,386	
8.5	Signals for Crossover	each \$ 700											
8.6	Signals for Turnout	each \$ 400							2	800	2	800	
Total Signals Cost				2,314		10,823		40,873		17,150		71,159	
Stations / Facilities													
2.1	Full Service - New	each \$ 1,000			1	1,000	2	2,000	1	1,000	4	4,000	
2.2	Full Service - Renovated	each \$ 500											
2.3	Terminal - New	each \$ 2,000											
2.4	Terminal - Renovated	each \$ 1,000											
Total Station Cost						1,000		2,000		1,000		4,000	
Bridges-under													
5.1	Four Lane Urban Expressway	each \$ 4,835											
5.2	Four Lane Rural Expressway	each \$ 4,025											
5.3	Two Lane Highway	each \$ 3,054											
5.4	Rail	each \$ 3,054											
5.5	Minor river	each \$ 810											
5.6	Major River	each \$ 8,098											
5.65	Bridge Rehabilitation	each \$ 200											
5.71	Convert open deck bridge to ballast deck (single track)	per LF \$ 4.7					1350	6,314	1000	4,677	2,350	10,990	
5.72	Convert open deck bridge to ballast deck (double track)	per LF \$ 9.4											
5.73	Single Track on Flyover Structure	per LF \$ 6.0											
5.8	Single Track on Approach Embankment w/ Retaining Wall	per LF \$ 3.0											
Total Bridges-under Cost								6,314		4,677		10,990	
Bridges-over													
6.1	Four Lane Urban Expressway	each \$ 2,087											
6.2	Four Lane Rural Expressway	each \$ 2,929											
6.3	Two Lane Highway	each \$ 1,903											
6.4	Rail	each \$ 6,110											
Total Bridges-over Cost													
Crossings													
7.1	Private Closure	each \$ 83					10	830			10	830	
7.2	Four Quadrant Gates w/ Trapped Vehicle Detector	each \$ 492											
7.3	Four Quadrant Gates	each \$ 288					24	6,912	14.00	4,032	38	10,944	
7.31	Convert Dual Gates to Quad Gates	each \$ 150					12	1,800	6.00	900	16	2,700	
7.4a	Conventional Gates single mainline track	each \$ 166			6	996	59	9,794	2	332	67	11,122	
7.4b	Conventional Gates double mainline track	each \$ 205	3	615							3	615	
7.41	Convert Flashers Only to Dual Gate	each \$ 50	1	50	4	200	5	250	6	300	16	800	
7.5a	Single Gate with Median Barrier	each \$ 180											
7.5b	Convert Single Gate to Extended Arm	each \$ 15											
7.71	Precast Panels without Rdway Improvements	each \$ 80	7	560	24	1,920	117	9,360	28	2,240	176	14,080	
7.72	Precast Panels with Rdway Improvements	each \$ 150											
7.8	Michigan Type Grade Crossing Surface	each \$ 15											
7.9	Install CVT system	each \$ 75	3	225	14	1,050	17	1,275	6	450	40	3,000	
Total Crossings Cost				1,450		4,166		30,221		8,254		44,091	
Segment Totals				8,890		75,189		151,180		59,957		295,216	
Placholders													
	Bridge over Ohio River adjacent to NS Mon Line OC bridge	lump sum \$ 50,000	1	50,000							1	50,000	
	Multipurpose trail system	per mile \$ 1,500			29	43,500	11	16,500			40	60,000	
	Bridge Improvements Ohio River at Weirton	\$ 5,000			1	5,000					1	5,000	
	Gould Tunnel improvements	\$ 5,000					1	5,000			1	5,000	
	Columbus Tunnel at I-670	\$ 45,000							1	45,000	1	45,000	
	Bridge Improvements Tuscarawas River MP 108	\$ 5,000					1	5,000			1	5,000	
	Bridge Improvements Muskingum River MP 127	\$ 5,000					1	5,000			1	5,000	
	Roadway reconstruction at super-elevated crossing	\$ 3,000					4	12,000	2	6,000	6	18,000	
TOTAL				88,900		123,689		194,880		110,957		488,216	
NOTES													
	Cost Estimate does not include utility relocation.												
	Corridor access with freight railroads to be negotiated; costs not included												
	Generally, passenger and freight will operate on shared track except as noted herein												
	6 ft chain link fencing is installed in populated areas. In rural areas, where speeds > 79 mph, 4 ft woven wire fence is installed.												
	CTC is required for passenger operations, estimate 1 electric lock for every 3 mi												
	PTC (in continuous segments) is required where speeds > 79 mph; costs do not include locomotive equipment and dispatch modifications												
	Station costs are MWRRS allocation amounts												
	Existing bridges are replaced where a second track is added, except on existing multiple track roadbed												
	Where speeds > 79 mph, existing bridges are converted to ballasted deck												
	All curves must be resurfaced to increase super-elevation or spiral length												
	Where speeds exceed 79 mph, 25 % of private crossings are closed												
	Private crossings remaining are upgraded to receive new conventional gates												
	Where speeds > 79 mph, public crossings are upgraded to 40 gates. Where speeds < 79 mph, crossings are upgraded to flashers, gates and CVT												
	Precast Panels with Rdway Improvements are installed where track embankment is replaced at public crossings												
	Precast Panels without Rdway Improvements are installed where track embankment is not replaced at public crossings												
	Passing sidings are provided at 50 mile intervals												

OHIO HUB INCREMENTAL CORRIDOR ANALYSIS

Infrastructure Cost Estimate for Pittsburgh to Columbus Route with 110 mph Maximum Speed

Revised on 9/25/06



Item	Unit	YR 2002 Unit Cost (1000s)	Segment 1		Segment 2		Segment 3		Segment 4		Total	
			Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
From - To			Bridge to Walker's Mill		Walker's Mill to OCR Interchange		OCR Interchange to Newark		Newark to Columbus		Total	
Host Carrier			POC		PRR		OCR		OCR Columbus & Newark Sub			
Mileposts			Esplan MP 5.3 to PRR MP 11.0		PRR MP 11.0 to MP 49.5		MP 49.5 to MP 157.8		MP 104.1 to MP 138			
Track Miles			9.1 miles		38.5 miles		108.3 miles		33.9 miles		169.8 miles	
Maximum Authorized Speed			60 mph		79 mph		79 to MP 94.5/110 mph		110 mph		110 mph	
Passing sidings use # 20 TO at 79 mph, #24 at speeds greater than 79 mph												
CWR is required for passenger operations												
10 mi siding on exiss roadbed MP 20-30, MP 70-80, MP 125-135, C&N MP 115-125												
Pittsburgh Union Station to OC Mon bridge in MWRRR Costs												
A two mile yard bypass track and turnouts is provided at Newark												