CURVE 71 (FIFTH CURVE WEST GARDNERS CUT CURVE)

	SPEED (MPH)	DEGREE OF CURVE (Dc)	LENGTH OF SPIRAL (Ls,FT)	SUPERELEVATION (Ea,IN)	TANGENT (FT)	
					BEFORE	AFTER
EXISTING	50	4d30'0"	–	1	–	–
PROPOSED	60	3d10'0"	372	4.50	–	–

NOTES: CURVE IS TIGHTENED AND THROW APPROXIMATELY 13' INWARD

No.	Revisions	Date	By
01	REVISE TITLE & REVISION BLOCKS	01-13-23	TRH

AMTRAK®

AMTRAK NATIONAL NETWORK PLANNING DEPARTMENT
National Railroad Passenger Corporation
30th Street Station, Philadelphia, Pennsylvania 19104

	Date
JOSEPH BLACK, JEG QA/QC	09/07/2022
TR HICKEY, JEG PROJECT MGR	09/12/2022

Jacobs

SCRANTON–NYC INTERCITY PASSENGER RAIL INFRASTRUCTURE ASSESSMENT
CURVE 71
5TH CURVE WEST OF GARNDER CUT

Designed AB | Drawn MK | Checked JH | Date 1/13/22

File No:
Work Elem. No:
Sheet No. 19 OF 19
Dwg. No. 2E–19

FILE NAME:
PLOT SCALE:
STANDARD PEN TABLE:

Pocono Mainline Track Cost Estimates

APPENDIX

2F

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
TRACK COST ESTIMATES
POCONO MAINLINE TRACK UPGRADES IMPROVEMENTS
SUGGESTED PROGRAM

CROP & WELD CONTINUOULY WELDED RAIL

EXTENT OF INSTALLATION

From	MP 80.9	MP 84.0	MP 94.6	MP 111.9	MP 114.6	MP 125.0	MP 127.5
To	MP 81.6	MP 93.0	MP 100.4	MP 114.6	MP 118.5	MP 126.6	MP 133.5
Track-Feet (TFt)	3,696 TFt	47,520 TFt	30,624 TFt	14,256 TFt	20,592 TFt	8,448 TFt	31,680 TFt
Rail-Feet (RFt)	7,392 RFt	95,040 RFt	61,248 RFt	28,512 RFt	41,184 RFt	16,896 RFt	63,360 RFt

RAIL LOST IN CROPPING (10%)	
15,682 TFt	
31,363 RFt	

SUMMARY		
TOTAL TFt		156,816 TFt
TOTAL RFt		313,632 RFt
Flash Butt Welds		8,042 welds
COST Flash Butt Welds (@$400/weld)	$	3,216,738
6" Rail Anchors (@1.625 anchors/TFt)		254,826 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$	3,860,086
COST Replace Rail Crop-Loss (@$45.33/RFt)	$	1,421,694
CROP & WELD CWR (Materials & Set-Up)	**$**	**8,498,518**

NEW 136RE CONTINUOULY WELDED RAIL

EXTENT OF INSTALLATION

From	MP 74.3	MP 81.6	MP 100.4	MP 108.7	MP 118.5
To	MP 80.9	MP 82.3	MP 101.0	MP 111.9	MP 125.0
Track-Feet (TFt)	34,848 TFt	3,696 TFt	3,168 TFt	16,896 TFt	34,320 TFt
Rail-Feet (RFt)	69,696 RFt	7,392 RFt	6,336 RFt	33,792 RFt	68,640 RFt

SUMMARY		
TOTAL TFt		92,928 TFt
TOTAL RFt		185,856 RFt
COST New 136RE Rail (@$45.33/RFt)	$	8,424,852
Flash Butt Welds		129 welds
COST Flash Butt Welds (@$400/weld)	$	51,627
6" Rail Anchors (@1.625 anchors/TFt)		151,008 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$	61,952
COST Rail Recovered for Salvage (@$9.07/RFt)	$	(1,685,714)
NEW CWR (Materials & Set-Up)	**$**	**8,695,247**

NEW TRACK (136RE RAIL)

EXTENT OF INSTALLATION

From	E STROUD	BOILER	MONROE	TOBY	TOBY	TOBY	MOSCOW	HAT	SCRANTON
To	SIDING	RUNNER	RUNNER	RUNNER	YARD 1	YARD 2	SIDING 1	YARD	TERMINAL
Track-Feet (TFt)	4,224 TFt	8,976 TFt	40,656 TFt	3,500 TFt	2,500 TFt	3,500 TFt	2,640 TFt	1,500 TFt	1,000 TFt
Rail-Feet (RFt)	8,448 RFt	17,952 RFt	81,312 RFt	7,000 RFt	5,000 RFt	7,000 RFt	5,280 RFt	3,000 RFt	2,000 RFt
AREMA 3 Ballast Depth	1.5 ft	1.5 ft	1.5 ft	1.0 ft	1.0 ft	1.0 ft	1.5 ft	1.0 ft	1.5 ft
AREMA 3 Ballast	6,507 tons	13,828 tons	62,632 tons	3,691 tons	2,636 tons	3,691 tons	4,067 tons	1,582 tons	1,541 tons
Replacement Rail Type	*New Rail*	*New Rail*	*New Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*New Rail*	*Relay Rail*	*New Rail*
TOTAL Tie Count	2,599 ties	5,524 ties	25,019 ties	2,154 ties	1,538 ties	2,154 ties	1,625 ties	923 ties	615 ties
Good Ties	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tie Replacement	100%	100%	100%	100%	100%	100%	100%	100%	100%
Future Good Ties	100%	100%	100%	100%	100%	100%	100%	100%	100%
TOTAL New Ties	2,599 ties	5,524 ties	25,019 ties	2,154 ties	1,538 ties	2,154 ties	1,625 ties	923 ties	615 ties

SUMMARY		
TOTAL TFt		68,496 TFt
TOTAL RFt		136,992 RFt
		—
TOTAL Ballast		100,175 tons
		—
TOTAL Tie Count		42,151 ties
Good Ties		0%
Tie Replacement		100%
Future Good Ties		100%
TOTAL New Ties		42,151 ties
New 136RE Rail		107,712 RFt
136RE Relay Rail		29,280 RFt
COST New 136RE Rail (@$45.33/RFt)	$	4,882,585
COST 136RE Relay Rail (@$10/RFt)	$	292,800
COST AREMA 3 Ballast (@ $30/ton)	$	3,005,238
Flash Butt Welds		95 welds
COST Flash Butt Welds Cost (@$400/weld)	$	38,053
COST New Wood Ties (@ $80/tie)	$	3,372,111
6" Tie Plates (@ 2 plates/new tie)		84,303 plates
COST 6" Tie Plates (@ $24/plate)	$	2,023,266
Rail Spikes (@ 8 spikes/new tie)		337,211 spikes
COST Rail Spikes (@ $1.50/spike)	$	505,817
6" Rail Anchors (@1.625 anchors/TFt)		111,306 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$	45,664
NEW TRACK (Materials & Set-Up)	**$**	**14,165,534**

RELOCATE TRACKS

EXTENT OF INSTALLATION

From	MP 75.7	MP 78.8	MP 80.5	MP 85.8	MP 87.1	MP 88.4	MP 88.8	MP 89.6	MP 93.0	MP 94.0	MP 97.4
To	MP 75.8	MP 79.0	MP 82.3	MP 86.1	MP 87.4	MP 88.6	MP 89.3	MP 89.8	MP 93.3	MP 94.5	MP 97.7
Track-Feet (TFt)	528 TFt	1,056 TFt	9,504 TFt	1,584 TFt	1,584 TFt	1,056 TFt	2,640 TFt	1,056 TFt	1,584 TFt	2,640 TFt	1,584 TFt
Rail-Feet (RFt)	1,056 RFt	2,112 RFt	19,008 RFt	3,168 RFt	3,168 RFt	2,112 RFt	5,280 RFt	2,112 RFt	3,168 RFt	5,280 RFt	3,168 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft
AREMA 3 Ballast	259 tons	518 tons	4,662 tons	777 tons	777 tons	518 tons	1,295 tons	518 tons	777 tons	1,295 tons	777 tons

EXTENT OF INSTALLATION

From	MP 99.2	MP 99.4	MP 99.9	MP 100.4	MP 120.9	MP 121.6	MP 122.2	MP 123.2	MP 126.6	MP 127.0	MP 127.5
To	MP 99.3	MP 99.7	MP 100.2	MP 101.0	MP 121.1	MP 121.8	MP 122.3	MP 123.4	MP 126.8	MP 127.2	MP 127.9
Track-Feet (TFt)	528 TFt	1,584 TFt	1,584 TFt	3,168 TFt	1,056 TFt	1,056 TFt	528 TFt	1,056 TFt	1,056 TFt	1,056 TFt	2,112 TFt
Rail-Feet (RFt)	1,056 RFt	3,168 RFt	3,168 RFt	6,336 RFt	2,112 RFt	2,112 RFt	1,056 RFt	2,112 RFt	2,112 RFt	2,112 RFt	4,224 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft
AREMA 3 Ballast	259 tons	777 tons	777 tons	1,554 tons	518 tons	518 tons	259 tons	518 tons	518 tons	518 tons	1,036 tons

EXTENT OF INSTALLATION

From	MP 128.2	MP 128.6	MP 129.7
To	MP 128.4	MP 128.8	MP 130.0
Track-Feet (TFt)	1,056 TFt	1,056 TFt	1,584 TFt
Rail-Feet (RFt)	2,112 RFt	2,112 RFt	3,168 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft
AREMA 3 Ballast	518 tons	518 tons	777 tons

SUMMARY		
TOTAL TFt		43,296 TFt
TOTAL RFt		86,592 RFt
TOTAL Ballast		21,237 tons
COST AREMA 3 Ballast (@ $30/ton)	$	637,101
COST Drag Track to Alternate Trackbed (@ $25 /TFt	$	1,082,400
COST Raise Line & surface (@ $15/TFt)	$	649,440
RELOCATE TRACKS (Materials & Set-Up)	**$**	**2,368,941**

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
TRACK COST ESTIMATES
POCONO MAINLINE TRACK UPGRADES IMPROVEMENTS

SUGGESTED PROGRAM

NEW TIES

EXTENT OF INSTALLATION

From	MP 74.3	MP 78.3	MP 80.5	MP 84.0	MP 85.8	MP 94.7	MP 97.2	MP 108.7	MP 110.5	MP 112.5	MP 115.5
To	MP 78.3	MP 80.5	MP 82.3	MP 85.8	MP 94.7	MP 97.2	MP 101.0	MP 110.5	MP 112.5	MP 115.5	MP 120.3
Track-Feet (TFt)	21,120 TFt	11,616 TFt	9,504 TFt	9,504 TFt	46,992 TFt	13,200 TFt	20,064 TFt	9,504 TFt	10,560 TFt	15,840 TFt	25,344 TFt
Rail-Feet (RFt)	42,240 RFt	23,232 RFt	19,008 RFt	19,008 RFt	93,984 RFt	26,400 RFt	40,128 RFt	19,008 RFt	21,120 RFt	31,680 RFt	50,688 RFt
Wood Tie Count	12,997 ties	7,148 ties	5,849 ties	5,849 ties	28,918 ties	8,123 ties	12,347 ties	5,849 ties	6,498 ties	9,748 ties	15,596 ties
Accceptable Ties	65%	35%	45%	15%	45%	25%	40%	60%	25%	60%	30%
Ties to be Replaced	10%	40%	30%	60%	30%	50%	35%	15%	50%	15%	45%
Post-Rehab Acceptable Ties	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Wood Ties to be Replaced	1,300 ties	2,859 ties	1,755 ties	3,509 ties	8,675 ties	4,062 ties	4,321 ties	877 ties	3,249 ties	1,462 ties	7,018 ties

EXTENT OF INSTALLATION

From	MP 120.3	MP 123.3	MP 125.6	MP 130.0	MP 131.2
To	MP 123.3	MP 125.6	MP 130.0	MP 131.2	MP 132.5
Track-Feet (TFt)	15,840 TFt	12,144 TFt	23,232 TFt	6,336 TFt	6,864 TFt
Rail-Feet (RFt)	31,680 RFt	24,288 RFt	46,464 RFt	12,672 RFt	13,728 RFt
Wood Tie Count	9,748 ties	7,473 ties	14,297 ties	3,899 ties	4,224 ties
Accceptable Ties	50%	30%	50%	60%	25%
Ties to be Replaced	25%	45%	25%	15%	50%
Post-Rehab Acceptable Ties	75%	75%	75%	75%	75%
Wood Ties to be Replaced	2,437 ties	3,363 ties	3,574 ties	585 ties	2,112 ties

SUMMARY

TOTAL TFt	257,664 TFt
TOTAL RFt	515,328 RFt
TOTAL Ties	158,562 ties
PERCENT Ties Acceptable (Current)	43%
PERCENT Ties to be Replaced	32%
PERCENT Ties Acceptable (Post-Rehab)	75%
NUMBER Ties to be Replaced	51,159 ties
COST New Wood Ties (@ $80/tie)	$ 4,092,731
6" Tie Plates (@ 2 plates/new tie)	317,125 plates
COST 6" Tie Plates (@ $24/plate)	$ 7,610,998
Tie Plates for Salvage	317,125 plates
COST 6" Tie Plates (@ $4/plate)	$ (1,268,500)
Rail Spikes (@ 8 spikes/new tie)	51,159 spikes
COST Rail Spikes (@ $1.50/spike)	$ 76,739
6" Rail Anchors (@1.625 anchors/Tft)	188 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$ (751)
COST Dispose Old Wood Ties (@ $10/tie)	$ 511,591
NEW TIES (Materials & Set-Up)	**$ 7,912,793**

RESTORE SUPERELEVATION AND SPIRALS

EXTENT OF INSTALLATION

From	MP 80.9	MP 84.0	MP 94.6	MP 111.9	MP 114.6	MP 125.0	MP 127.5
To	MP 81.6	MP 93.0	MP 100.4	MP 114.6	MP 118.5	MP 126.6	MP 133.5
Track-Feet (TFt)	3,696 TFt	47,520 TFt	30,624 TFt	14,256 TFt	20,592 TFt	8,448 TFt	31,680 TFt
Rail-Feet (RFt)	7,392 RFt	95,040 RFt	61,248 RFt	28,512 RFt	41,184 RFt	16,896 RFt	63,360 RFt
AREMA 3 Ballast Depth	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft
AREMA 3 Ballast	1,562 tons	1,041 tons	1,197 tons	1,406 tons	1,458 tons	1,197 tons	3,592 tons

SUMMARY

	156,816 TFt
	313,632 RFt
TOTAL Ballast Added	11,454 tons
COST AREMA 3 Ballast (@ $30/ton)	$ 343,621
COST Raise Line & surface (@ $15/TFt)	$ 2,352,240
RESTORE SUPERELEVATION & SPIRALS (Materials & Set-Up)	**$ 2,695,861**

RESTORE RIGHT-OF-WAY CONDITION

	RESTORE BALLAST SHOULDERS			BRUSH CUTTING			PLOW ROAD	ABDN TIES
	EXTENT OF INSTALLATION			EXTENT OF INSTALLATION			EXTENT	EXTENT
From	MP 74.3	MP 85.8	MP 111.5	MP 74.3	MP 82.4	MP 114.9	MP 79.0	MP 79.0
To	MP 77.1	MP 99.1	MP 131.5	MP 81.3	MP 112.3	MP 131.5	MP 131.5	MP 131.5
Track-Feet (TFt)	14,784 TFt	70,224 TFt	105,600 TFt	36,960 TFt	157,872 TFt	87,648 TFt	277,200 TFt	170,585 ties
Rail-Feet (RFt)	29,568 RFt	140,448 RFt	211,200 RFt		54 TMi @ $25,000/TMi		@ $10/TFt	@ $10/tie
AREMA 3 Ballast Depth	0.0 ft	0.0 ft	0.0 ft		$ 1,337,500		$ 2,772,000	$ 1,705,846
AREMA 3 Ballast	3,496 tons	13,856 tons	23,050 tons					

SUMMARY

	750,288 TFt
	381,216 RFt
	40,402 tons
COST AREMA 3 Ballast (@ $30/ton)	$ 1,212,045
COST Raise Line & surface (@ $15/TFt)	$ 11,254,320
COST BRUSH CUTTING	$ 1,337,500
COST PLOW OFF BALLAST FOR ACCESS ROAD	$ 2,772,000
COST DISPOSE OF ABANDONED TIES	$ 1,705,846
RESTORE RIGHT-OF-WAY (Materials & Set-Up)	**$ 12,466,365**

SPECIAL WORK

SLATEFORD JCT., #10	Handthrown	$80,000
STROUDSBURG EAST, #20	Power	$250,000
STROUDSBURG WEST, #24	Power	$350,000
GRAVEL EAST, #10	Handthrown	$80,000
GRAVEL WEST, #10	Handthrown	$80,000
GRAVEL WEST MOW, #10	Handthrown	$80,000
BESTWAY LUMBER, #10	Handthrown	$80,000
MILL EAST, #10	Handthrown	$80,000
MILL EAST MOW, #10	Handthrown	$80,000
MONADNOCK EAST, #10	Handthrown	$80,000
TOBYHANNA 1, #10	Handthrown	$80,000
TOBYHANNA 2, #10	Handthrown	$80,000
TOBYHANNA 3, #10	Handthrown	$80,000
TOBYHANNA 4, #10	Handthrown	$80,000
TOBYHANNA 5, #10	Handthrown	$80,000
TOBYHANNA 6, #10	Handthrown	$80,000
TOBYHANNA WEST, #15	Power	$200,000
MOSCOW EAST, #24	Power	$350,000
MOSCOW WEST, #24	Power	$350,000
RIDGE MOW, #10	Handthrown	$80,000
SCRANTON, #10	Handthrown	$80,000
STEAMTOWN, #10	Power	$80,000
STEAMTOWN, #10	Power	$80,000
INTERMODAL 1, #10	Power	$80,000
INTERMODAL 2, #11	Power	$80,000
Special Work (Materials & Set-Up)		**$3,100,000**

AT-GRADE CROSSING SURFACE IMPROVEMENTS

Does not include crossing work at locations where extensive track superelevation is also needed..

Location	Scope	Extent	Est. Cost
F East University	Rehab 3 track crossing	96	$ 38,400
J Main Street/PA Route 507	Rehab 1 track crossing	38	$ 15,200
O Browns Hill Road	Rehab 1 track crossing	76	$ 30,400
R Courtland Street/PA Route 309	Add 1 track crossing	85	$ 34,000
S East Broad Street	Rehab 1 track/Add 1 track crossing	76	$ 30,400
T Analomink Street	Rehab 1 track/Add 1 track crossing	100	$ 40,000
V Forge Street	Rehab 1 track/Add 1 track crossing	76	$ 30,400
At-Grade Crosssing Surface Improvements (Materials & Set-Up)			**$ 218,800**

COST SUMMARY

SUGGESTED PROGRAM

CROP & WELD CONTINUOUS WELDED RAIL	$ 8,498,518
NEW CONTINUOUS WELDED RAIL	$ 8,695,247
NEW TRACK (136RE CWR)	$ 14,165,534
RELOCATE TRACK	$ 2,368,941
NEW TIES	$ 7,912,793
RESTORE SUPERELEVATION AND SPIRALS	$ 2,695,861
RESTORE RIGHT-OF-WAY CONDITION	$ 12,466,365
SPECIAL WORK	$ 3,100,000
CROSSING SURFACE IMPROVEMENTS	$ 218,800
TOTAL (Materials & Set-Up)	**$ 60,122,059**
ROM Labor & Soft Costs	**$ 120,244,119**

TOTAL (Materials & Set-Up) *does not inlclude labor, ovehead, labor, overhead, profit, insurance, general conditions, design engineering. These are included in* ***ROM*** *(Rough Order of Magniture)* ***Labor & Soft Costs*** *through a multiplier of 2*

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
TRACK COST ESTIMATES
POCONO MAINLINE TRACK UPGRADES IMPROVEMENTS
MINIMUM PROGRAM

CROP & WELD CONTINUOULY WELDED RAIL

EXTENT OF INSTALLATION							
From	MP 80.9	MP 84.0	MP 94.6	MP 111.9	MP 114.6	MP 125.0	MP 127.5
To	MP 81.6	MP 93.0	MP 100.4	MP 114.6	MP 118.5	MP 126.6	MP 133.5
Track-Feet (TFt)	3,696 TFt	47,520 TFt	30,624 TFt	14,256 TFt	20,592 TFt	8,448 TFt	31,680 TFt
Rail-Feet (RFt)	7,392 RFt	95,040 RFt	61,248 RFt	28,512 RFt	41,184 RFt	16,896 RFt	63,360 RFt

SUGGESTED PROGRAM SCOPE REDUCED
PROSPECTIVE REDUCTIONS HIGHLIGHTED IN RED TYPE

RAIL LOST IN CROPPING (10%)	Initial Scope Reduced to 0%	SUMMARY
0 TFt	TOTAL TFt	0 TFt
0 RFt	TOTAL RFt	0 RFt
	Flash Butt Welds	0 welds
	COST Flash Butt Welds (@$400/weld)	$ -
	6" Rail Anchors (@1.625 anchors/TFt)	0 anchors
	COST 6" Rail Anchors (@$1.20/anchor)	$ -
	COST Replace Rail Crop-Loss (@$45.33/RFt)	$ -
	CROP & WELD CWR (Materials & Set-Up)	**$ -**

NEW 136RE CONTINUOULY WELDED RAIL

EXTENT OF INSTALLATION					
From	MP 74.3	MP 81.6	MP 100.4	MP 108.7	MP 118.5
To	MP 80.9	MP 82.3	MP 101.0	MP 111.9	MP 125.0
Track-Feet (TFt)	34,848 TFt	3,696 TFt	3,168 TFt	16,896 TFt	34,320 TFt
Rail-Feet (RFt)	69,696 RFt	7,392 RFt	6,336 RFt	33,792 RFt	68,640 RFt

SUGGESTED PROGRAM SCOPE REDUCED
PROSPECTIVE REDUCTIONS HIGHLIGHTED IN RED TYPE

Initial Scope Reduced to 33%	SUMMARY
TOTAL TFt	30,666 TFt
TOTAL RFt	61,332 RFt
COST New 136RE Rail (@$45.33/RFt)	$ 2,780,201
Flash Butt Welds	43 welds
COST Flash Butt Welds (@$400/weld)	$ 17,037
6" Rail Anchors (@1.625 anchors/TFt)	49,833 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$ 20,444
COST Rail Recovered for Salvage (@$9.07/RFt)	$ (556,286)
NEW CWR (Materials & Set-Up)	**$ 2,817,682**

NEW TRACK (136RE RAIL)

EXTENT OF INSTALLATION										
From	MP 81.1	MP 82.3	MP 101.0	TOBY RUNNER	TOBY YARD 1	TOBY YARD 2	MOSCOW SIDING 1	HAT YARD	SCRANTON TERMINAL	
To	MP 81.9	MP 84.0	MP 108.7							
Track-Feet (TFt)	4,224 TFt	8,976 TFt	40,656 TFt	3,500 TFt	2,500 TFt	3,500 TFt	2,640 TFt	1,500 TFt	1,000 TFt	TOTAL TFt
Rail-Feet (RFt)	8,448 RFt	17,952 RFt	81,312 RFt	7,000 RFt	5,000 RFt	7,000 RFt	5,280 RFt	3,000 RFt	2,000 RFt	TOTAL RFt
AREMA 3 Ballast Depth	1.0 ft	1.0 ft	1.0 ft	1.0 ft	1.0 ft	1.0 ft	1.0 ft	1.0 ft	1.0 ft	
AREMA 3 Ballast	4,455 tons	9,466 tons	42,875 tons	3,691 tons	2,636 tons	3,691 tons	2,784 tons	1,582 tons	1,055 tons	TOTAL Ballast
Replacement Rail Type	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	*Relay Rail*	
TOTAL Tie Count	2,599 ties	5,524 ties	25,019 ties	2,154 ties	1,538 ties	2,154 ties	1,625 ties	923 ties	615 ties	TOTAL Tie Count
Good Ties	0%	0%	0%	0%	0%	0%	0%	0%	0%	Good Ties
Tie Replacement	100%	100%	100%	100%	100%	100%	100%	100%	100%	Tie Replacement
Future Good Ties	100%	100%	100%	100%	100%	100%	100%	100%	100%	Future Good Ties
TOTAL New Ties	2,599 ties	5,524 ties	25,019 ties	2,154 ties	1,538 ties	2,154 ties	1,625 ties	923 ties	615 ties	TOTAL New Ties

SUGGESTED PROGRAM SCOPE REDUCED
PROSPECTIVE REDUCTIONS HIGHLIGHTED IN RED TYPE

SUMMARY
68,496 TFt
136,992 RFt
—
72,234 tons
—
42,151 ties
0%
100%
100%
42,151 ties
0 RFt
136,992 RFt
$ -
$ 1,369,920
$ 2,167,025
95 welds
$ 38,053
$ 3,372,111
84,303 plates
$ 2,023,266
337,211 spikes
$ 505,817
111,306 anchors
$ 45,664
$ 9,521,856

RELOCATE TRACKS

EXTENT OF INSTALLATION											
From	MP 75.7	MP 78.8	MP 80.5	MP 85.8	MP 87.1	MP 88.4	MP 88.8	MP 89.6	MP 93.0	MP 94.0	MP 97.4
To	MP 75.8	MP 79.0	MP 82.3	MP 86.1	MP 87.4	MP 88.6	MP 89.3	MP 89.8	MP 93.3	MP 94.5	MP 97.7
Track-Feet (TFt)	528 TFt	1,056 TFt	9,504 TFt	1,584 TFt	1,584 TFt	1,056 TFt	2,640 TFt	1,056 TFt	1,584 TFt	2,640 TFt	1,584 TFt
Rail-Feet (RFt)	1,056 RFt	2,112 RFt	19,008 RFt	3,168 RFt	3,168 RFt	2,112 RFt	5,280 RFt	2,112 RFt	3,168 RFt	5,280 RFt	3,168 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft
AREMA 3 Ballast	259 tons	518 tons	4,662 tons	777 tons	777 tons	518 tons	1,295 tons	518 tons	777 tons	1,295 tons	777 tons

EXTENT OF INSTALLATION											
From	MP 99.2	MP 99.4	MP 99.9	MP 100.4	MP 120.9	MP 121.6	MP 122.2	MP 123.2	MP 126.6	MP 127.0	MP 127.5
To	MP 99.3	MP 99.7	MP 100.2	MP 101.0	MP 121.1	MP 121.8	MP 122.3	MP 123.4	MP 126.8	MP 127.2	MP 127.9
Track-Feet (TFt)	528 TFt	1,584 TFt	1,584 TFt	3,168 TFt	1,056 TFt	1,056 TFt	528 TFt	1,056 TFt	1,056 TFt	1,056 TFt	2,112 TFt
Rail-Feet (RFt)	1,056 RFt	3,168 RFt	3,168 RFt	6,336 RFt	2,112 RFt	2,112 RFt	1,056 RFt	2,112 RFt	2,112 RFt	2,112 RFt	4,224 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft	0.8 ft
AREMA 3 Ballast	259 tons	777 tons	777 tons	1,554 tons	518 tons	518 tons	259 tons	518 tons	518 tons	518 tons	1,036 tons

EXTENT OF INSTALLATION				SUMMARY
From	MP 128.2	MP 128.6	MP 129.7	
To	MP 128.4	MP 128.8	MP 130.0	
Track-Feet (TFt)	1,056 TFt	1,056 TFt	1,584 TFt	TOTAL TFt 43,296 TFt
Rail-Feet (RFt)	2,112 RFt	2,112 RFt	3,168 RFt	TOTAL RFt 86,592 RFt
AREMA 3 Ballast Depth	0.8 ft	0.8 ft	0.8 ft	TOTAL Ballast 21,237 tons
AREMA 3 Ballast	518 tons	518 tons	777 tons	

COST AREMA 3 Ballast (@ $30/ton)	$ 637,101
COST Drag Track to Alternate Trackbed (@ $25 /TFt	$ 1,082,400
COST Raise Line & surface (@ $15/TFt)	$ 649,440
RELOCATE TRACKS (Materials & Set-Up)	**$ 2,368,941**

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
TRACK COST ESTIMATES
POCONO MAINLINE TRACK UPGRADES IMPROVEMENTS
MINIMUM PROGRAM

NEW TIES

EXTENT OF INSTALLATION

From	MP 74.3	MP 78.3	MP 80.5	MP 84.0	MP 85.8	MP 94.7	MP 97.2	MP 108.7	MP 110.5	MP 112.5	MP 115.5
To	MP 78.3	MP 80.5	MP 82.3	MP 85.8	MP 94.7	MP 97.2	MP 101.0	MP 110.5	MP 112.5	MP 115.5	MP 120.3
Track-Feet (TFt)	21,120 TFt	11,616 TFt	9,504 TFt	9,504 TFt	46,992 TFt	13,200 TFt	20,064 TFt	9,504 TFt	10,560 TFt	15,840 TFt	25,344 TFt
Rail-Feet (RFt)	42,240 RFt	23,232 RFt	19,008 RFt	19,008 RFt	93,984 RFt	26,400 RFt	40,128 RFt	19,008 RFt	21,120 RFt	31,680 RFt	50,688 RFt
Wood Tie Count	12,997 ties	7,148 ties	5,849 ties	5,849 ties	28,918 ties	8,123 ties	12,347 ties	5,849 ties	6,498 ties	9,748 ties	15,596 ties
Accceptable Ties	65%	35%	45%	15%	45%	25%	40%	60%	25%	60%	30%
Ties to be Replaced	0%	30%	20%	50%	20%	40%	25%	5%	40%	5%	35%
Post-Rehab Acceptable Ties	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Wood Ties to be Replaced	0 ties	2,144 ties	1,170 ties	2,924 ties	5,784 ties	3,249 ties	3,087 ties	292 ties	2,599 ties	487 ties	5,459 ties

EXTENT OF INSTALLATION

From	MP 120.3	MP 123.3	MP 125.6	MP 130.0	MP 131.2
To	MP 123.3	MP 125.6	MP 130.0	MP 131.2	MP 132.5
Track-Feet (TFt)	15,840 TFt	12,144 TFt	23,232 TFt	6,336 TFt	6,864 TFt
Rail-Feet (RFt)	31,680 RFt	24,288 RFt	46,464 RFt	12,672 RFt	13,728 RFt
Wood Tie Count	9,748 ties	7,473 ties	14,297 ties	3,899 ties	4,224 ties
Accceptable Ties	50%	30%	50%	60%	25%
Ties to be Replaced	15%	35%	15%	5%	40%
Post-Rehab Acceptable Ties	65%	65%	65%	65%	65%
Wood Ties to be Replaced	1,462 ties	2,616 ties	2,144 ties	195 ties	1,690 ties

SUMMARY

TOTAL TFt	257,664 TFt
TOTAL RFt	515,328 RFt
TOTAL Ties	158,562 ties
PERCENT Ties Acceptable (Current)	38%
PERCENT Ties to be Replaced	22%
PERCENT Ties Acceptable (Post-Rehab)	60%
NUMBER Ties to be Replaced	35,303 ties
COST New Wood Ties (@ $80/tie)	$ 2,824,231
6" Tie Plates (@ 2 plates/new tie)	317,125 plates
COST 6" Tie Plates (@ $24/plate)	$ 7,610,998
Tie Plates for Salvage	317,125 plates
COST 6" Tie Plates (@ $4/plate)	$ (1,268,500)
Rail Spikes (@ 8 spikes/new tie)	35,303 spikes
COST Rail Spikes (@ $1.50/spike)	$ 52,954
6" Rail Anchors (@1.625 anchors/Tft)	188 anchors
COST 6" Rail Anchors (@$1.20/anchor)	$ (751)
COST Dispose Old Wood Ties (@ $10/tie)	$ 353,029
NEW TIES (Materials & Set-Up)	**$ 7,714,589**

SUGGESTED PROGRAM SCOPE REDUCED

PROSPECTIVE REDUCTIONS HIGHLIGHTED IN RED TYPE

RESTORE SUPERELEVATION AND SPIRALS

EXTENT OF INSTALLATION

From	MP 80.9	MP 84.0	MP 94.6	MP 111.9	MP 114.6	MP 125.0	MP 127.5
To	MP 81.6	MP 93.0	MP 100.4	MP 114.6	MP 118.5	MP 126.6	MP 133.5
Track-Feet (TFt)	3,696 TFt	47,520 TFt	30,624 TFt	14,256 TFt	20,592 TFt	8,448 TFt	31,680 TFt
Rail-Feet (RFt)	7,392 RFt	95,040 RFt	61,248 RFt	28,512 RFt	41,184 RFt	16,896 RFt	63,360 RFt
AREMA 3 Ballast Depth	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft	0.2 ft
AREMA 3 Ballast	1,562 tons	1,041 tons	1,197 tons	1,406 tons	1,458 tons	1,197 tons	3,592 tons

SUMMARY

TOTAL TFt	156,816 TFt
TOTAL RFt	313,632 RFt
TOTAL Ballast Added	11,454 tons
COST AREMA 3 Ballast (@ $30/ton)	$ 343,621
COST Raise Line & surface (@ $15/TFt)	$ 2,352,240
RESTORE SUPERELEVATION & SPIRALS (Materials & Set-Up)	**$ 2,695,861**

RESTORE RIGHT-OF-WAY CONDITION

SUGGESTED PROGRAM SCOPE DEFFERED

SPECIAL WORK

SLATEFORD JCT., #10	Handthrown	$80,000
STROUDSBURG EAST, #20	Power	$250,000
STROUDSBURG WEST, #24	Power	$350,000
GRAVEL EAST, #10	Handthrown	$80,000
GRAVEL WEST, #10	Handthrown	$80,000
GRAVEL WEST MOW, #10	Handthrown	$80,000
BESTWAY LUMBER, #10	Handthrown	$80,000
MILL EAST, #10	Handthrown	$80,000
MILL EAST MOW, #10	Handthrown	$80,000
MONADNOCK EAST, #10	Handthrown	$80,000
TOBYHANNA 1, #10	Handthrown	$80,000
TOBYHANNA 2, #10	Handthrown	$80,000
TOBYHANNA 3, #10	Handthrown	$80,000
TOBYHANNA 4, #10	Handthrown	$80,000
TOBYHANNA 5, #10	Handthrown	$80,000
TOBYHANNA 6, #10	Handthrown	$80,000
TOBYHANNA WEST, #15	Power	$200,000
MOSCOW EAST, #24	Power	$350,000
MOSCOW WEST, #24	Power	$350,000
RIDGE MOW, #10	Handthrown	$80,000
SCRANTON, #10	Handthrown	$80,000
STEAMTOWN, #10	Power	$80,000
STEAMTOWN, #10	Power	$80,000
INTERMODAL 1, #10	Power	$80,000
INTERMODAL 2, #11	Power	$80,000
		$3,100,000

AT-GRADE CROSSING SURFACE IMPROVEMENTS

Does not include crossing work at locations where extensive track superelevation is also needed..

Location	Scope	Extent	Est. Cost
F East University	Rehab 3 track crossing	96	$ 38,400
J Main Street/PA Route 507	Rehab 1 track crossing	38	$ 15,200
O Browns Hill Road	Rehab 1 track crossing	76	$ 30,400
R Courtland Street/PA Route 309	Add 1 track crossing	85	$ 34,000
S East Broad Street	Rehab 1 track/Add 1 track crossing	76	$ 30,400
T Analomink Street	Rehab 1 track/Add 1 track crossing	100	$ 40,000
V Forge Street	Rehab 1 track/Add 1 track crossing	76	$ 30,400
At-Grade Crosssing Surface Improvements (Materials & Set-Up)			**$ 218,800**

COST SUMMARY

MINIMUM PROGRAM

CROP & WELD CONTINUOUS WELDED RAIL		—
NEW CONTINUOUS WELDED RAIL	$	2,817,682
NEW TRACK (136RE CWR)	$	9,521,856
RELOCATE TRACK	$	2,368,941
NEW TIES	$	7,714,589
RESTORE SUPERELEVATION AND SPIRALS	$	2,695,861
RESTORE RIGHT-OF-WAY CONDITION		—
SPECIAL WORK	$	3,100,000
CROSSING SURFACE IMPROVEMENTS	$	218,800
TOTAL (Materials & Set-Up)	**$**	**28,437,729**
With ROM LABOR	**$**	**56,875,458**

TOTAL (Materials & Set-Up) *does not inlclude labor, ovehead, labor, overhead, profit, insurance, general conditions, design engineering. These are included in* ***ROM*** *(Rough Order of Magniture)* ***Labor & Soft Costs*** *through a multiplier of 2*

3

Pocono Mainline Structures Assessment

Scranton-New York City Intercity Passenger Rail Analysis Infrastructure Assessment

TECHNICAL REPORT

Prepared for the Amtrak National Network Planning Department

3
STRUCTURES

APPENDICES

3
STRUCTURES

Amtrak engaged Jacobs Engineering Group, Inc., to assess just over 60 route miles of rail line owned by Pennsylvania Northeast Railroad Authority (PNRRA) , a joint authority of Monroe and Lackawanna Counties, between Scranton and the Delaware Water Gap for its suitability for intercity passenger train operations. The purpose of the assessment is to provide cost estimates for economically bringing the line up to FRA Track Class 3 or 4 condition (where geometry permits) based upon existing records supplemented with field sampling and investigation.

This technical report focuses primarily on structures and associated infrastructure assets, consisting of an inventory of structural assets accompanied by an evaluation as to their present suitability to support passenger train operations and the degree of work necessary to make them passenger train ready including estimated costs for design and construction.

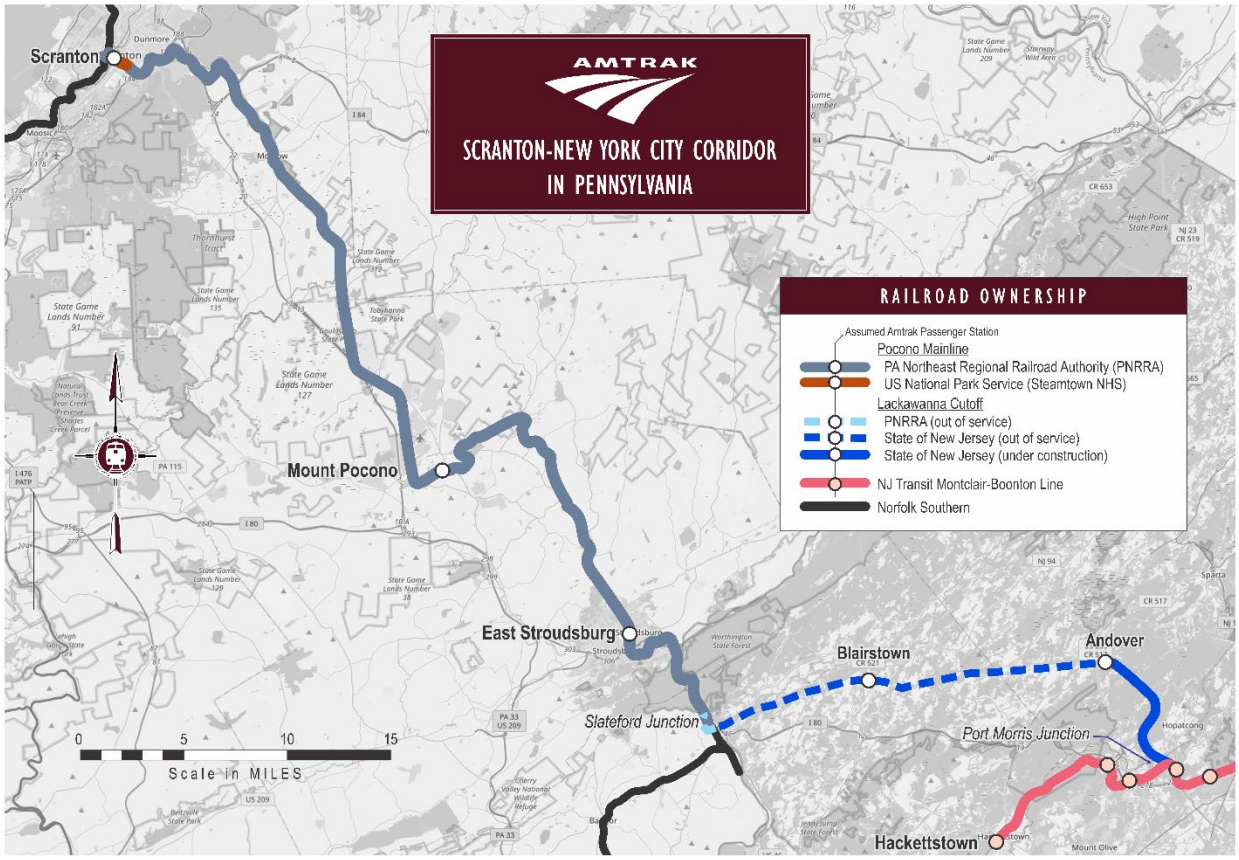
This technical report presents an inventory of structural assets, such as railroad bridge spans, culverts, railroad-owned overhead structures, tunnels, and other items that may emerge in scoping the route, accompanied by an evaluation of their present suitability to support passenger train operations, the degree of work necessary to remediate major deficiencies and make them passenger train ready, including estimated costs for design and construction.

This technical report presents a preliminary analysis and cost estimate for upgrades to railroad structures and related infrastructure on the former Delaware, Lackawanna & Western Railroad (DL&W) main line between Milepost (MP) 134.00 in Scranton, PA and MP 73.75 in Slateford, PA, referred to hereinafter as the "Pocono Mainline".

1. BACKGROUND

The PNRRA Pocono Mainline was originally the historic Delaware Lackawanna and Western Railroad Company (DL&W) Scranton Division Main Line, opened in 1856 and was also known as the "Route of Phoebe Snow" and the "Road of Anthracite" (see Figure 3-1). The former mainline stretches 60.25 miles from a connection to the Norfolk Southern (NS) Stroudsburg Secondary Track on the Delaware River at Slateford Junction (Milepost (MP) 73.75) to dual connections in Scranton with the NS Sunbury Line at BLOOM and HYDE PARK (MP 133.9 and MP 134.0, respectively). Train operations on the Pocono Mainline are currently conducted by the Delaware-Lackawanna Railroad Company, Inc. (D-L), a subsidiary of the Genesee Valley Transportation Company (GVT).

Figure 3-1. Pocono Mainline



The majority of the Pocono Mainline is owned by the PNRRA except about a mile in Scranton owned by the United States National Park Service (NPS) as part of its Steamtown National Historic Site (NHS). The PNRRA owns from the SCRANTON block station marker (MP 132.75) east to the end of track at the SLATE block station marker (MP 73.75) and from the Cliff Street undergrade bridge (MP 133.76) west to the connections with NS at BLOOM and HYDE PARK

This assessment summarizes physical improvements and estimated costs associated with upgrades to undergrade bridges on the Pocono Mainline bridge inventory list as well as overhead, railroad-owned signal bridges. Most structures are on PNRRA right-of-way. A few are on United States National Park Service (NPS) property as part of its Steamtown National Historic Site. Bridge Inspections on the line are being performed by GVT on a consistent cycle.

Undergrade (UG) Bridges on the line are of various types including concrete/stone arches, steel deck girders, steel through girders, cast slabs, rail-top slabs particular to the Lackawanna railroad, and a tunnel cut through stone. Undergrade Bridges in the territory traverse water of high velocity, highways, roadways, and other rail lines.

Overhead (OH) structures of significance to this assessment are truss type signal bridges (the signals on the overhead bridges are out of service).

2. DISCUSSION

2.1. Bridge Inspection & Evaluation

For this assessment, each undergrade bridge on the bridge list was visited by a team of three. The team consisted of Anthony Fazio, PE (Jacobs Engineering), Louis Duarte, PE (Jacobs Engineering), and GVT Chief of Capital Jeff Marshall, PE. GVT Chief of Capital guided the team to the location of each structure in the most efficient and productive manner.

For each structure, a visual assessment was conducted, with any upgrades needed documented in the *Pocono Mainline Structures Assessment Report* (Appendix 3A). The most prevalent conditions observed for which funding should be applied were tie deck upgrades and reactive aggregate concrete repairs. Other noted conditions include evidence of scour in some locations (note that a scour inspection was not performed, but settlement was evident to the eye near high velocity water), bridges that were struck by motor vehicle traffic, and vegetation overgrowth.

2.2. Inspection Results

UG structures were sorted into three broad categories depending on condition:

1. No Action. These are 11 UG structures for which no capital upgrades are not recommended at this time.
2. Immediate Action. These are mostly safety-critical improvements to 31 UG structures and 19 OH structures for which completion is recommended before the start of intercity passenger rail service, amounting to $14.7 million.

   Immediate Action items consist primarily of tie-decks to support higher train speeds. Note that tie-decks (i.e., bridge timbers) are considered part of the bridge structure as common railroad practice. Also, reactive aggregate concrete is prevalent on the rail line and should be replaced in critical bridge structure areas such as bridge bearings. Other areas that do not present safety hazards with reactive concrete should be treated or even monitored. Vegetation growth is considerably high due to the nature of the region. The vegetation will eventually produce problems with the concrete structures, as the roots of the trees will burrow into the concrete. The vegetation removal could be lumped into one separate program for a savings in administrative efforts.

   Overhead signal bridges should be removed or repaired. Evident repairs include removal of signals and repairs to some chords of trusses due to section loss. Exceptions are within Steamtown limits where signals may be historic, in such case stability of signal masts should be inspected with a hands-on inspection if not already done.
3. Future Actions. These are non-safety-critical improvements recommended for 26 UG structures and 19 OH structurers for which completion can be deferred for up to ten years following the start of intercity passenger rail service, amounting to $13.5 million.

2.3. Cedar Avenue UG Bridge

Of particular interest was the Cedar Avenue UG bridge (MP 133.27), a single-track ballasted deck railroad bridge owned by NPS. This particular bridge received a more scrutiny than other structures

due to the operational bottle-neck its single track created by its strategic location and the potential that it could be remedied with relatively little effort.

The bridge carries track in a critical area of single-track territory in a terminal district. Inside this 'district', Amtrak, NPS, D-L, freight, and an electric trolley operate. Amtrak asked whether it would be cost-effective to double-track the crossing to alleviate the capacity constraints.

The original configuration was two tracks with a shared girder between the adjacent tracks. In 1991 plans were drafted to replace this structure by the Federal Highway Administration, and the original three-girder superstructure was replaced with a ballasted deck two-girder bridge system. The girder gauge for the new structure is approximately 28 feet and span length is approximately 66 feet. Images of both the current structure (Figures 3-1 & 3-2) and original structure (Figure 3-3) are shown in the Exhibits section below.

Two possible approaches were considered to double-track the Cedar Avenue bridge :

1. Replace the bridge superstructure. Such a level of effort would require full steel design, assessment of abutment and soil, long term street closure, leased space from the University of Scranton in adjacent parking lot, potential abutment repairs, and short-term railroad outage so that the existing superstructure can be demolished and entirely replaced on top of the existing substructure. This option would be costly and should be the last resort.
2. Double track the existing structure. Girder gauge is approximately 28 feet. as illustrated in Figure 3. Knee braces protrude inward from the girder centerline by approximately 3 feet on each side. The knee braces narrow the superstructure clearance 'gauge' at rail top to approximately 22 feet. These knee braces function to resist torsional forces on the main girders and cannot simply be removed.

The possibility of installing a second track across the bridge is dependent upon:

- Clearance approvals by NPS, D-L, and Amtrak.
- Waiver of regulatory clearance requirements from the PA PUC.
- "Rating" the bridge with two pieces of equipment on the bridge that create the highest stress on that particular span length, one piece of equipment on each track. This would determine if the bridge can handle the loads of a second track with equipment.
- Re-align track to reduce any curvature before and after the bridge such that track is close to tangent with little to no superelevation across structure. This concept would increase clearances and would likely be required for a completely new structure anyway.
- Operating rule adjustments for railroad access to the bridge (i.e., a Special Instruction for the bridge occupancy—special wide loads/steam engines which would permit occupancy by one train at a time). This is not unusual for large railroads, typical called dimensional loads.

The potential cross-section configuration would create 12-foot track center across the bridge would be as noted below (Figure 3-4).

3. CONCLUSIONS

3.1. Cost Estimates

This technical report presents changes and upgrades to structural assets deemed necessary adapt the existing PNRRA Pocono Mainline to safely and reliably accommodate shared operations by Amtrak intercity passenger trains, D-L freights train, and NPS Steamtown excursions.

The degree of work set out in the technical report and accompanying cost estimate represents a *Suggested Program* directed to achieving Amtrak's operating goals along with reducing life-cycle maintenance costs for the physical plant. Cost estimates including soft costs (contingency, design, mobilization) were developed for each structure are summarized in Table 3.1 and documented in greater detail in the *Pocono Mainline Structures Cost Estimates* (Appendix 3B).

This technical report also considers an *Minimum Program* to reduce the initial amount of capital outlay prior to the start of revenue service. In effect, that consists of deferring work on the 26 non-safety-critical "Future Action" structures to the decade following the start of revenue service.

Table 3.1. Structures Cost Estimate Summary

	SUGGESTED PROGRAM	MINIMUM PROGRAM
NO ACTION STRUCTURES (13)	—	—
IMMEDIATE ACTION STRUCTURES (33)	$ 16,739,084	$ 16,739,084
FUTURE ACTION STRUCTURES (26)	$ 13,414,274	—
TOTAL	**$ 30,153,358**	**$ 16,739,084**

3.2. Cedar Avenue UG Bridge

Either alternative discussed above would significantly increase operational flexibility. Drawings reviewed at the Steamtown National Park Service office indicate a 21-foot girder gauge (Figures 3-5 & 3-6) , however, this appears not to reflect the final "as built" configuration, as verified in the field (i.e.: a much wider girder gage is seen in aerial imagery). Further investigation would be required in the 30% design phase if Scenario 2 is pursued, but double-tracking the current bridge does appear feasible at the present level of design for this assessment.

A subsequent investigation would first "model" the bridge with an overlay of the appropriate AREMA Clearance Plate. If the assumed two-track configuration on the existing bridge proves sufficient for the passage of trains on adjacent tracks, the bridge will then require Cooper Rating for two-track service. If the structure does not allow for adjacent service due to lateral clearance, structural modifications would be assessed, including reducing the sizes of knee braces and adding supplemental knee braces. Also, interlocking the signals on the adjacent tracks on the bridge could be considered to enforce Special Instructions and restricted clearances for the movement of Dimensional Loads.

Scenario 1 would be a more costly option as it would entail full superstructure replacement, possibly with shared center girder configuration on the existing bridge abutments (Figures 3-7 & 3-8).

4. EXHIBITS

Figure 3-1. Current Cedar Avenue UG Bridge Structure (post-1991)

Figure 3-2. Aerial image of Cedar Avenue UG Bridge (note broad girder gauge)

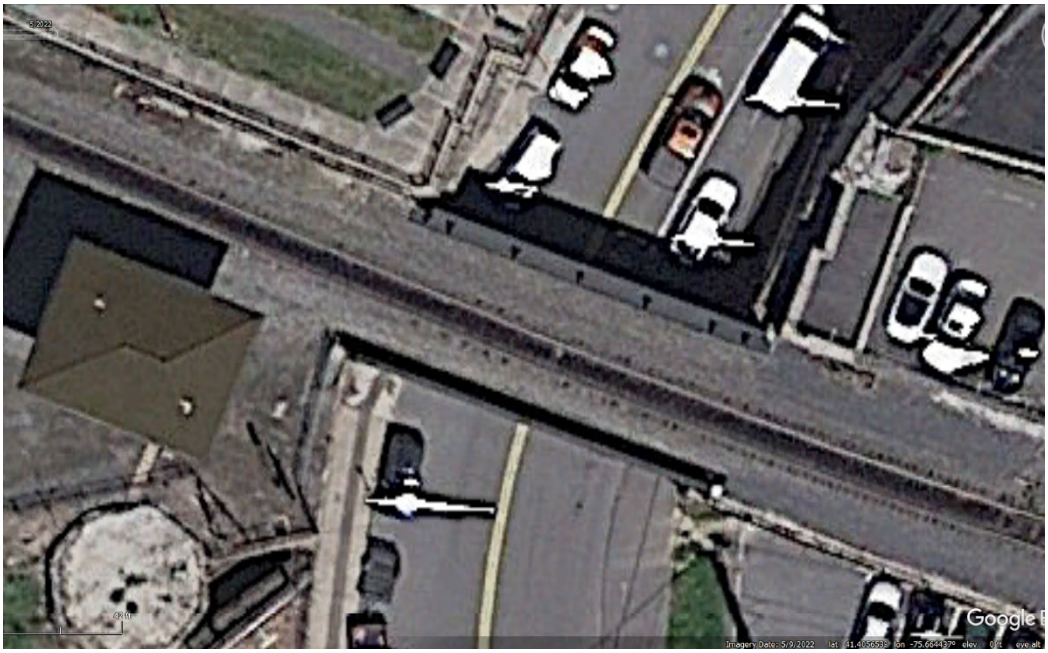


Figure 3-3.
Original Cedar Avenue UG Bridge Structure (pre-1991)

Figure 3-4
Potential Double-Track Confiuraiton for Cedar Avenue UG Bridge

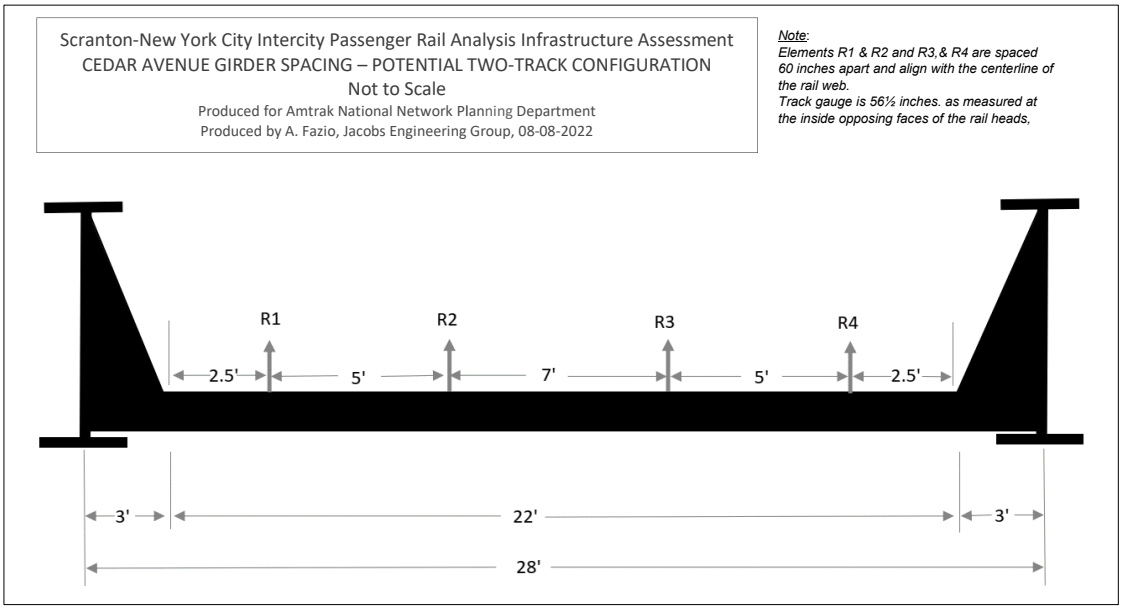


Figure 3-5. 1991 Proposed PennDOT Bridge Cross-Section

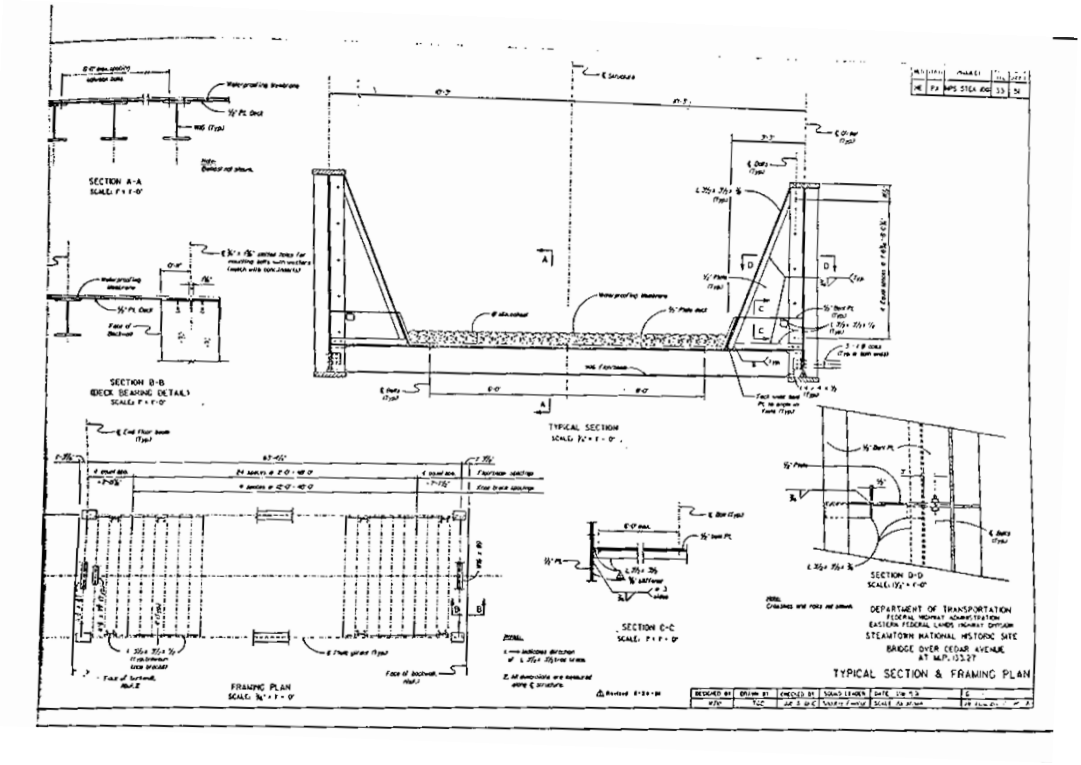


Figure 3-6. 1991 Proposed PennDOT Bridge Plan & Profile

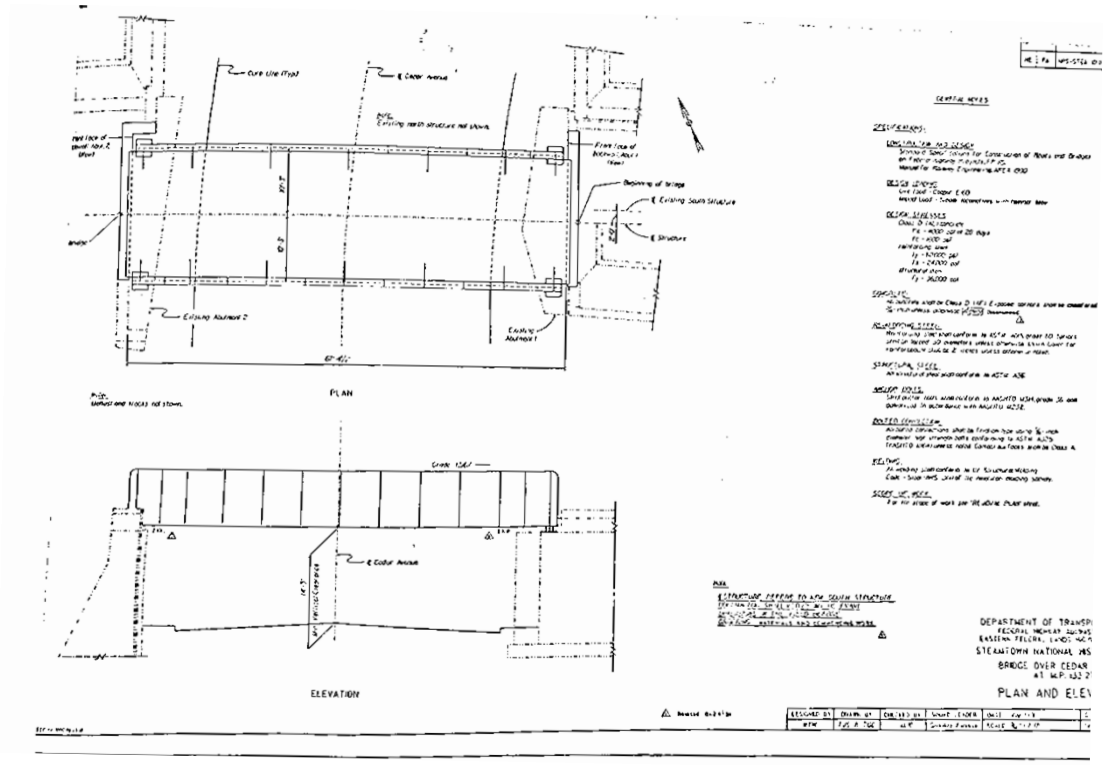


Figure 3-7. West Abutment

Figure 3-8. East Abutment

Pocono Mainline Structures Field Notes

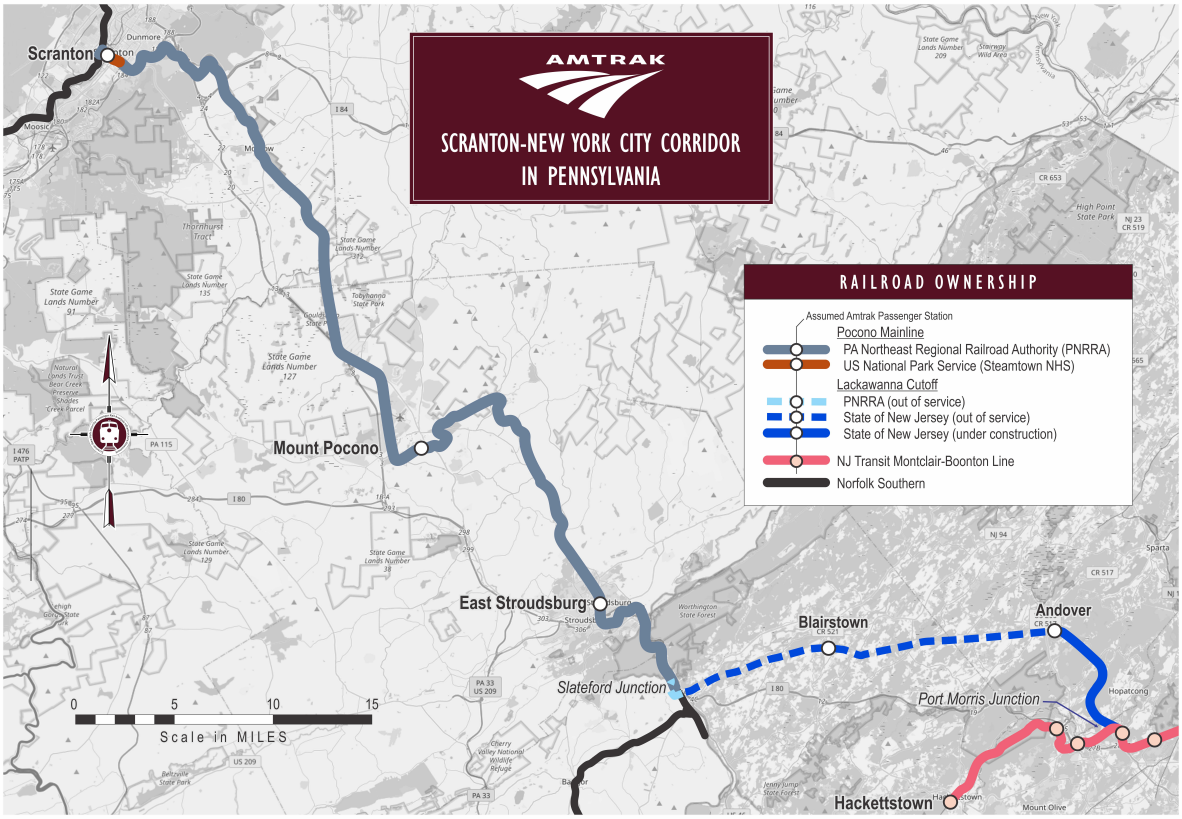
APPENDIX

3A

INSPECTION FIELD NOTES

The PNRRA Pocono Mainline was originally the historic Delaware Lackawanna and Western Railroad Company (DL&W) Scranton Division Main Line, opened in 1856 and was also known as the "Route of Phoebe Snow" and the "Road of Anthracite." The former mainline stretches 60.25 miles from a connection to the Norfolk Southern (NS) Stroudsburg Secondary Track at its east end on the Delaware River at Slateford Junction (Milepost (MP) 73.75) to its dual connections in Scranton with the NS Sunbury Line at BLOOM and HYDE PARK (MP 133.9 and MP 134.0, respectively). Train operations on the Pocono Mainline are currently conducted by the Delaware-Lackawanna Railroad Company, Inc. (D-L), a subsidiary of the Genesee Valley Transportation Company (GVT).

Figure 3A-1 POCONO MAINLINE



Amtrak engaged Jacobs Engineering Group, Inc, to assess the condition of existing structural assets on the Pocono Mainline and to determine the extent of physical improvements and their estimated costs necessary to upgrade the line for Amtrak intercity rail service. Pertinent assets include:

- Undergrade (UG) bridges of various types including concrete/stone arches, steel deck girders, steel through girders, cast slabs, rail-top slabs particular to the Lackawanna railroad, and a tunnel cut through stone. Undergrade Bridges in the territory traverse water of high velocity, highways, roadways, and other rail lines.
- Overhead (OH) structures of significance, in particular truss type signal bridges (the signals on which are out-of-service).
- The Nay Aug Tunnel.

Bridge Inspections on the line are routinely performed by GVT staff on a periodic basis. A special inspection of structural assets was conducted on May 25th and 26th, 2202. For this special inspection, each undergrade bridge on the GVT bridge list was visited by an engineering team of three. The team consisted of Anthony Fazio, PE (Jacobs Engineering), Louis Duarte, PE (Jacobs Engineering), and GVT Chief of Capital Jeff Marshall, PE. GVT Chief of Capital guided the team to the location of each structure in the most efficient and productive manner.

For each structure, a visual assessment was conducted and any upgrade needs were documented. The most prevalent conditions observed for were tie deck upgrades and reactive aggregate concrete repairs. Other noted conditions include evidence of scour in some locations (note that a scour inspection was not performed, but settlement was evident to the eye near high velocity water), bridges struck by motor vehicles, and vegetation overgrowth.

GVT provided a list of pipes and culverts. This list is included at the end of these field notes for reference. They were not, however, independently verified or inspected in the field.

POCONO MAINLINE STRUCTURAL ASSETS INSPECTED

UNDERGRADE BRIDGE 73.99
UNDERGRADE BRIDGE 74.52
UNDERGRADE BRIDGE 77.50
UNDERGRADE BRIDGE 78.66
UNDERGRADE BRIDGE 81.38
UNDERGRADE BRIDGE 82.83
UNDERGRADE BRIDGE 86.06
UNDERGRADE BRIDGE 86.31
UNDERGRADE BRIDGE 87.37
UNDERGRADE BRIDGE 90.95
UNDERGRADE BRIDGE 97.26
UNDERGRADE BRIDGE 98.40
UNDERGRADE BRIDGE 100.26
UNDERGRADE BRIDGE 102.90
UNDERGRADE BRIDGE 104.34
UNDERGRADE BRIDGE 107.05
UNDERGRADE BRIDGE 107.39
UNDERGRADE BRIDGE 107.44
UNDERGRADE BRIDGE 108.35
UNDERGRADE BRIDGE 112.17
UNDERGRADE BRIDGE 113.52
UNDERGRADE BRIDGE 115.36
UNDERGRADE BRIDGE 117.76
UNDERGRADE BRIDGE 117.80
UNDERGRADE BRIDGE 118.51
UNDERGRADE BRIDGE 118.93
UNDERGRADE BRIDGE 119.59
UNDERGRADE BRIDGE 120.42
UNDERGRADE BRIDGE 120.47
UNDERGRADE BRIDGE 130.22
UNDERGRADE BRIDGE 130.78
UNDERGRADE BRIDGE 130.89
UNDERGRADE BRIDGE 131.10
NAY AUG TUNNEL (at 131.60))
UNDERGRADE BRIDGE 131.80
UNDERGRADE BRIDGE 133.29
UNDERGRADE BRIDGE 133.40
UNDERPASS (at 133.75)
UNDERGRADE BRIDGE 133.79

UNDERGRADE BRIDGE 73.99

INSPECTION	
DATE	MAY 16, 2023
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 73.99
PLACEMENT	UNDERGRADE
TYPE	RAILTOP
SPANNING	CREEK
MATERIAL	CONCRETE
LENGTH	28 FT
WIDTH	
TRACKS	1
GENERAL CONDITION	SCOUR SETTLEMENT

IMMEDIATE REPAIR NEEDS	
JOINT PRESSURE INJECTION	150 SF
STEEL RAILINGS	56 LF
RIP RAP/SCOUR PROTECTION	30 LF

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

Overall looking South

West Abutment scour settlement

UNDERGRADE BRIDGE 73.99

CONTINUED

OVERALL LOOKING NORTH

LOOKING SE AT CENTER PIER

UNDERGRADE BRIDGE 74.52

INSPECTION	
DATE	MAY 16, 2023
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 74.52
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
LENGTH	14 FT
TRACKS	1
GENERAL CONDITION	SOUTHSIDE INLET CLOGGED WITH BOULDERS & SILT

IMMEDIATE REPAIR NEEDS
RIP RAP/SCOUR PROTECTION

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

Overall looking South

Overall looking North

UNDERGRADE BRIDGE 77.50

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 77.50
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	BROADHEAD CREEK
MATERIAL	STEEL DECK PLATE GIRDER
LENGTH	39 FT 6 IN
WIDTH	26 FT 8 IN
TRACKS	1 (FORMERLY 2)
GENERAL CONDITION	WINGWALLS CRACKED SE ABUTMENT CORNER IS CRACKED & SPALLED

IMMEDIATE REPAIR NEEDS	
STEEL RAILING	40 LF
REPOUR EAST ABUTMENT	24 CY

FUTURE (5-10 YRS) REPAIR NEEDS
PAINT GIRDERS, CLEAR DEBRIS FROM BRIDGE SEATS, DECK REPLACEMENT (15 TIMBERS)

OVERALL LOOKING WEST

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 77.50

CONTINUED

EAST ABUTMENT, SOME CRACKS

OVERALL WEST ABUTMENT

UNDERGRADE BRIDGE 78.66

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 78.66
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	BROADHEAD CREEK
MATERIAL	STEEL THRU GIRDER
LENGTH	39 FT 7 IN
WIDTH	22 FT 7 IN
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION. RUSTING AND SCALING ON STEEL MEMBERS; INTERMEDIATE STIFFENERS HAVE SECTION LOSS; PAINT SYSTEM DETERIORATED; PIERS ON GOOD CONDITION; SECTION LOSS IN FLOOR BEAMS; STRINGERS, AND KNEE BRACES; STEEL REPAIRS TO FLOOR BEAMS AND STRINGERS

IMMEDIATE REPAIR NEEDS	
STEEL RAILING	1000 LF
TIE DECK	300 EA

OVERALL LOOKING WEST

HOLES IN KNEE BRACES

FUTURE (5-10 YRS) REPAIR NEEDS
. PAINT GIRDERS; CONTINUE STEEL REPAIRS

UNDERGRADE BRIDGE 78.66

CONTINUED

BEARING AT SE CORNER OF ABUTMENT

INTERMEDIATE STIFFENER CORROSION NORTH GIRDER

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 81.38

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 81.38
PLACEMENT	UNDERGRADE
TYPE	8-FT STONE ARCH
SPANNING	STREAM
MATERIAL	MASONRY
LENGTH	8-FT ARCH
WIDTH	
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION; SOUTH SIDE PAVED OVER BY PARKING LOT, ONLY KEYSTONE VISIBLE; SYSTEM; SYSTEM NOW UNDERGROUND; GOOD FLOW

IMMEDIATE REPAIR NEEDS	
TIE DECK	300 EA

OVERALL LOOKING WEST

OVERALL LOOKING SOUTH

FUTURE (5-10 YRS) REPAIR NEEDS
. NONE

UNDERGRADE BRIDGE 82.83

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 82.83
PLACEMENT	UNDERGRADE
TYPE	18-FT CONCRETE & STONE ARCH
SPANNING	SAMBO CREEK
MATERIAL	MASONRY
LENGTH	18-FT ARCH
WIDTH	
TRACKS	1

GENERAL CONDITION
GOOD FLOW; OVERALL CONCRETE IN FAIR CONDITION; LEAKY JOINTS; STONE ARCH IS LEAKING
REPLACE RAILING ON SOUTH SIDE; NO RAILING ON NORTH SIDE

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	600 SF
STEEL RAILING	150 LF

OVERALL LOOKING NORTHEAST

OVERALL LOOKING SOUTHWEST

FUTURE (5-10 YRS) REPAIR NEEDS
. SCOUR PROTECTION ADDRESS SPALLING

UNDERGRADE BRIDGE 86.06

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 86.06
PLACEMENT	UNDERGRADE
TYPE	STEEL GIRDER
SPANNING	CREEK
MATERIAL	STEEL
LENGTH	107 FT 6 IN
WIDTH	28 FT
TRACKS	1

GENERAL CONDITION
SOME RAILING MISSING
SAFETY WALK MISSING
PAINT SYSTEM DETERIORATED
RUSTING AND SCALING
SOME LOSS OF SECTION

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	440 SF
STEEL RAILING	220 LF
WALKWAY GRATING	330 SF

OVERALL LOOKING WEST FROM NORTH PARAPET

OVERALL LOOKING WEST FROM SOUTH PARAPET

FUTURE (5-10 YRS) REPAIR NEEDS
. PAINT GIRDERS SCOUR INSPECTION

UNDERGRADE BRIDGE 86.31 (CHERRY LANE RD)

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 86.31
PLACEMENT	UNDERGRADE
TYPE	BOX SLAB
SPANNING	CHERRY LANE RD (SR1002)
MATERIAL	CONCRETE
LENGTH	61 FT FROM ROAD
WIDTH	17 FT 6 IN FROM ROAD
CLEARANCE	10 FT 8 IN
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION
MINOR SPALLING
SE WINGWALL CRACKED & DISPLACED
BUILT IN 1911

IMMEDIATE REPAIR NEEDS	
STEEL RAILING	36 LF
APPROACH CLEARANCE SIGNS	2 EA

FUTURE (5-10 YRS) REPAIR NEEDS
. SPALLING REPAIRS

OVERALL LOOKING NORTH FROM ROAD

OVERALL LOOKING SOUTH FROM ROAD

UNDERGRADE BRIDGE 86.31

CONTINUED

TYPICAL SPALLS

SE WINGWALL CRACKED & DISPLACED

UNDERGRADE BRIDGE 87.37 (PA ROUTE 101)

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 87.37
PLACEMENT	UNDERGRADE
TYPE	2 33 FT CONCRETE ARCHES
SPANNING	PA ROUTE 101
MATERIAL	CONCRETE
LENGTH	245 FT 10 IN FROM ROAD
WIDTH	37 FT 11 IN FROM ROAD
TRACKS	1

GENERAL CONDITION
LEAKY JOINT THROUGH RIVER TUBE
SPALLS THROUGHOUT RIVER TUBE

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
SPALLING REPAIRS (APPROXIMATELY 800 SF) JOINT REPAIR (APPROXIMATELY 1700 LF)

OVERALL LOOKING SOUTH

TYPICAL JOINT LEAKAGE

UNDERGRADE BRIDGE 87.37

CONTINUED

LOOKING SOUTH ALONG EAST GIRDER

LOOKING NORTH ALONG EAST GIRDER

UNDERGRADE BRIDGE 90.95

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 90.95
PLACEMENT	UNDERGRADE
TYPE	STONE BOX CULVERT
SPANNING	STREAM
MATERIAL	MASONRY
LENGTH	3 FT X 5 FT STONE BOX
WIDTH	
TRACKS	1

GENERAL CONDITION
DEBRIS AND SILT SOUTH HEADWALL
NORTH HEADWALL COLLAPSED

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	50 SF
REBUILD NORTH HEADWALL	7.5 CY

FUTURE (5-10 YRS) REPAIR NEEDS

.
SLIP LINE EXISTING BARRELL

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 95.05

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 95.05
PLACEMENT	UNDERGRADE
TYPE	6 FT STONE ARCH
SPANNING	STREAM
MATERIAL	MASONRY
LENGTH	6 FT BOX ARCH
WIDTH	
TRACKS	1

GENERAL CONDITION
MINOR SPALL ON NORTH SIDE
GOOD FLOW
SOUTH SIDE HEADWALL PARTLY COLLAPSED
POUR NEW HEADWALL FOR EXTENDED SHOULDER UP TOP

IMMEDIATE REPAIR NEEDS	
POUR NEW SOUTH HEADWALL	2 CY

FUTURE (5-10 YRS) REPAIR NEEDS
. NONE

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 97.26

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 97.26
PLACEMENT	UNDERGRADE
TYPE	17 FT STONE/CONCRETE ARCH & CORRUGATED METAL PIPE
SPANNING	CREEK
MATERIAL	MASONRY & METAL
DIMENSIONS	17 FT ARCH 10 FT CORRUGATED PIPE
TRACKS	1

GENERAL CONDITION
STONE ARCH IN GOOD CONDITION
GOOD FLOW
STONE CULVERT BECOMES CONCRETE ABOUT HALFWAY

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
. REPOINT BARREL OF ARCH SCOUR INSPECTION

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH THROUGH EAST TUBE

UNDERGRADE BRIDGE 98.40 (PA ROUTE 940)

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 98.40
PLACEMENT	UNDERGRADE
TYPE	CONCRETE & STEEL
SPANNING	PA ROUTE 940
MATERIAL	CONCRETE & STEEL
LENGTH	39 FT 7 IN FROM ROAD
WIDTH	42 FT 8 IN FROM ROAD
CLEARANCE	14 FT 3 IN
TRACKS	1
GENERAL CONDITION OVERALL GOOD CONDITION RAILING DAMAGED ON SOUTH SIDE	

IMMEDIATE REPAIR NEEDS	
STEEL RAILING	8 LF

FUTURE (5-10 YRS) REPAIR NEEDS
. NONE

OVERALL LOOKING NORTH

OVERALL LOOKING EAST

UNDERGRADE BRIDGE 100.26 (PA ROUTE 611)

INSPECTION	
DATE	MAY 16, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	64°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 100.26
PLACEMENT	UNDERGRADE
TYPE	STEEL THROUGH GIRDER
SPANNING	PA ROUTE 611
MATERIAL	STEEL
LENGTH	59 FT 1 IN FROM ROAD
WIDTH	42 FT 0 IN FROM ROAD
CLEARANCE	
TRACKS	1

GENERAL CONDITION
RAILING ON SE CORNER DETERIORATED / PARTLY COLLAPSED
REBUILD SE WINGWALL CAP
BRIDGE SEAT CAP DETERIORATED ON EAST ABUTMENT

IMMEDIATE REPAIR NEEDS	
SURFACE SPALLING	200 SF
STEEL RAILING	40 LF
CONCRETE WINGWALL CAP	1.5 CY
CONCRETE BRIDGE SEAT	2.5 CY

FUTURE (5-10 YRS) REPAIR NEEDS
PAINT STEEL GIRDERS

RAILING DETERIORATED ON SE SIDE

LOOKING NE; DAMAGED MEMBER

UNDERGRADE BRIDGE 100.26

CONTINUED

DETERIORATED SE WINGWALL

DETERIORATED BRIDGE SEAT ON EAST ABUTMENT

OVERALL LOOKING SOUTH.....

UNDERGRADE BRIDGE 102.90

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 102.90
PLACEMENT	UNDERGRADE
TYPE	20 FT STEEL I-BEAM
SPANNING	LAKE OUTLET
MATERIAL	STEEL
LENGTH	62 FT 7 IN
WIDTH	20 FT 3 IN
CLEARANCE	
TRACKS	3 (2 ABANDONED)

GENERAL CONDITION
STEEL IN GOOD CONDITION
SCOUR ON THE ABUTMENTS
GOOD FLOW

IMMEDIATE REPAIR NEEDS	
TIE DECK	14 EA

FUTURE (5-10 YRS) REPAIR NEEDS
. NONE

OVERALL LOOKING NORTH

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 102.90

CONTINUED

OVERALL LOOKING WEST

SW BEARING

UNDERGRADE BRIDGE 104.34

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 104.34
PLACEMENT	UNDERGRADE
TYPE	14 FT STONE & CONCRETE
SPANNING	CREEK
MATERIAL	MASONRY
LENGTH	14 FT ARCH
WIDTH	
CLEARANCE	
TRACKS	3 (2 ABANDONED)
GENERAL CONDITION CRACKS & SPALLS GOOD FLOW	

IMMEDIATE REPAIR NEEDS	
STEEL RAILING	40 LF

FUTURE (5-10 YRS) REPAIR NEEDS
. SCOUR INSPECTION

OVERALL LOOKING NORTH

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 107.05 (LAUREL DR)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 107.05
PLACEMENT	UNDERGRADE
TYPE	CONCRETE SLAB
SPANNING	LAUREL DR
MATERIAL	CONCRETE
LENGTH	69 FT 0 IN FROM ROAD
WIDTH	23 FT 6 IN FROM ROAD
CLEARANCE	11 FT 6 IN
TRACKS	1

GENERAL CONDITION
WINGWALLS SPALLED
DECK IS IN GOOD CONDITION
METAL PLATING BOLTED TO HEADWALLS

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
REBUILD NORTH AND SOUTH PARAPET WALLS (APPROXIMATELY 7 CY)

OVERALL LOOKING NORTH

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 107.05

CONTINUED

OVERALL LOOKING EAST FROM NORTH SIDE

OVERALL LOOKING EAST FROM SOUTH SIDE

UNDERGRADE BRIDGE 107.39

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 107.05
PLACEMENT	UNDERGRADE
TYPE	47 FT CONCRETE ARCH
SPANNING	STREAM
MATERIAL	CONCRETE
LENGTH	47 FT ARCH
WIDTH	
CLEARANCE	
TRACKS	1
GENERAL CONDITION SUBSTANTIAL SPALL THROUGHOUT WINGWALLS	

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	140 SF
STEEL RAILING	120 LF

FUTURE (5-10 YRS) REPAIR NEEDS
.SURFACE SPALL REPAIR (APPROXIMATELY 300 SF)

OVERALL LOOKING NORTH

WINGWALL SPALL DETAIL LOOKING NORTH

UNDERGRADE BRIDGE 107.44 (MILL ST)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 107.44
PLACEMENT	UNDERGRADE
TYPE	STEEL DECK PLATE GIRDER
SPANNING	MILL ST
MATERIAL	STEEL
LENGTH	47 FT 1 IN FROM TOP
WIDTH	11 FT 3 IN FROM TOP
CLEARANCE	12 FT 2 IN
TRACKS	1
GENERAL CONDITION ABUTMENTS SPALLED AND CRACKED BUILT IN 1905	

IMMEDIATE REPAIR NEEDS	
REBUILD PARTIAL BRIDGE SEAT	2.5 CY

FUTURE (5-10 YRS) REPAIR NEEDS
. SURFACE SPALL REPAIR TIE DECK (APPROXIMATELY 16 TIMBERS

OVERALL LOOKING NORTH

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 107.44

CONTINUED

WEST ABUTMENT SPALLING UNDER BEARINGS

OVERALL LOOKING WEST

UNDERGRADE BRIDGE 108.35 (PA ROUTE 611)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 108.35
PLACEMENT	UNDERGRADE
TYPE	STEEL DECK GIRDER
SPANNING	PA ROUTE 611
MATERIAL	STEEL
LENGTH	41 FT 2 IN FROM TOP
WIDTH	35 FT 7 IN FROM TOP
CLEARANCE	14 FT 4 IN
TRACKS	1
GENERAL CONDITION ABUTMENTS IN GOOD CONDITION BUILT IN 1961	

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING NORTH

OVERALL LOOKING WEST

UNDERGRADE BRIDGE 108.35

CONTINUED

UNDERSIDE OF BRIDGE

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 112.17

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 112.17
PLACEMENT	UNDERGRADE
TYPE	CONCRETE FLANK BOX CULVERT WITH MIDDLE-ARCH SPILLWAY
SPANNING	STREAM
MATERIAL	CONCRETE
DIMENSION	5 FT BOX
TRACKS	1
GENERAL CONDITION GOOD FLOW NORTH SIDE IN GOOD CONDITION BUILT IN 1911	

IMMEDIATE REPAIR NEEDS
None

FUTURE (5-10 YRS) REPAIR NEEDS
SCOUR INSPECTION

SOUTH HEADWALL

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 113.52

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 113.52
PLACEMENT	UNDERGRADE
TYPE	STEEL DECK PLATE GIRDER
SPANNING	LAKE OUTLET
MATERIAL	STEEL
LENGTH	58 FT 9 IN
WIDTH	38 FT 0 IN
TRACKS	4 (3 ABANDONED)
GENERAL CONDITION STEEL AND TIES ON ONE ACTIVE TRACK IN GOOD CONDITION	

IMMEDIATE REPAIR NEEDS
None

OVERALL LOOKING SOUTHEAST

WEST ABUTMENT BRIDGE SEAT

FUTURE (5-10 YRS) REPAIR NEEDS
SCOUR INSPECTION

UNDERGRADE BRIDGE 113.52

CONTINUED

OVERALL LOOKING WEST

UNDERGRADE BRIDGE 115.36

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 115.36
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSION	4 FT BOX
TRACKS	4 (3 ABANDONED)

GENERAL CONDITION
NORTH & SOUTH HEADWALLS ARE SPALLED
CULVERT IS CLEAR
MINOR SPALLING THROUGHOUT

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING EAST

OVERALL LOOKING NORTHEAST

UNDERGRADE BRIDGE 115.36

CONTINUED

DETAIL LOOKING SOUTH

CULVERT INTERIOR LOOKING SOUTH

UNDERGRADE BRIDGE 117.76

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 117.76
PLACEMENT	UNDERGRADE
TYPE	CONCRETE ARCH CULVER WITH SPILLWAY
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSION	16 FT ARCH
TRACKS	4 (3 ABANDONED)

GENERAL CONDITION
LARGE CRACK IN NORTHEAST WINGWALL
NORTH SIDE BADLY SPALLED, SCOURED UP TO 5 FT ABOVE WATER LINE
GOOD FLOW

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	120 SF
STEEL RAILING	10 LF
SCOUR INSPECTION	YES
POUR NEW BENCH WALLS (2)	4 CY
REPAIR NORTHEAST WINGWALL	5.5 CY

FUTURE (5-10 YRS) REPAIR NEEDS
SCOUR INSPECTION

OVERALL LOOKING SOUTHEAST

WEST ABUTMENT BRIDGE SEAT

UNDERGRADE BRIDGE 117.80 (JUBILEE RD)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 117.80
PLACEMENT	UNDERGRADE
TYPE	STEEL DECK PLATE GIRDER
SPANNING	JUBILEE RD
MATERIAL	STEEL
LENGTH	43 FT FROM THE ROAD
WIDTH	20 FT 5 IN FROM THE ROAD
CLEARANCE	10 FT 11 IN
TRACKS	3 (2 ABANDONED)

GENERAL CONDITION
ABUTMENTS BADLY SPALLED; DIAGONAL BRACES ARE RUSTY; PAINT SYSTEM DETERIORATED; GUSSET PLATES RUSTED THROUGH; LOW VERTICAL CLEARANCE

IMMEDIATE REPAIR NEEDS	
APPROACH CLEARANCE SIGNS	2 EA

FUTURE (5-10 YRS) REPAIR NEEDS

REPLACE SPAN ANAS ABUTMENTS WITH NEW THOUGH GIRDER AFTER SEVERAL REPORTED BRIDGE STRIKES;

OVERALL LOOKING EAST

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 117.80

CONTINUED

WEST ABUTMENT

UNDERSIDE

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 118.51

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 118.51
PLACEMENT	UNDERGRADE
TYPE	CONCRETE ARCH CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSION	18 FT ARCH
TRACKS	1

GENERAL CONDITION
NORTH HEADWALL HAS SPALLS
SOUTH HEADWALL HAS SPALLS & EXPOSED REBAR
SCOUR ON NORTH AND SOUTH SIDES
LONG DEEP SPALL ON NORTH SIDE

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	80 SF
STEEL RAILINGS	40 LF

FUTURE (5-10 YRS) REPAIR NEEDS

REPAIR DEEP SPALL (EXCAVATE FROM TOP)
SPALL REPAIR (APPROXIMATELY 500 SF)
REPAIR PARAPET

OVERALL LOOKING NORTHEAST

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 118.51

CONTINUED

LARGE DEEP SPALL ON NORTH HEADWALL

UNDERGRADE BRIDGE 118.93

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 118.93
PLACEMENT	UNDERGRADE
TYPE	STEEL GIRDER
SPANNING	ABANDONED ROAD
MATERIAL	STEEL
LENGTH	24 FT 6 IN (ACTIVE SOPAN
WIDTH	12 FT 3 IN (ACTIVE SPAN)
TRACKS	1

GENERAL CONDITION
1907 DATE STAMP
FORMER 3 TRACK SPAN; 2 ABANDONED & IN POOR CONDITION
ABUTMENTS ARE SPALLED
PAINT SYSTEM DETERIORATED
GUSSET PLATES DETERIORATED
BACKWALLS DETERIORATED

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	80 LF
TIE DECK	21 EA
REPAIR BRIDGE SEATS	12 CY
NEW BACKWALLS	16.5 CY

FUTURE (5-10 YRS) REPAIR NEEDS

PAINT GIRDERS
REPAIR DETERIORATED GUSSET PLATES

OVERALL LOOKING WEST

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 118.93 (CONTINUED)

EAST ABUTMENT SOUTH GIRDER

WEST ABUTMENT SOUTH GIRDER

EAST ABUTMENT CENTER GIRDER

WEST ABUTMENT BRIDGE SEAT NORTH GIRDER

EAST ABUTMENT CENTER GIRDER

EAST ABUTMENT BRIDGE NORTH GIRDER

UNDERSIDE

UNDERGRADE BRIDGE 119.59

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 119.59
PLACEMENT	UNDERGRADE
TYPE	CONCRETE ARCH CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSION	13 FT ARCH
TRACKS	1

GENERAL CONDITION
SCOUR AT BOTTOM OF ARCH
CRIB WAL =L FAILURE ON NW CORNER
CRACKS ON ARCH CEILING

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
REBUILD CRIB WALL SPALL REPAIRS SCOUR INSPECTION VEGETATION REMOVAL

OVERALL LOOKING SOUTHWEST

LOOKING SOUTH THROUGH CULVERT

UNDERGRADE BRIDGE 119.59

CONTINUED

SPALLING IN WEST CULVERT WALL

UNDERGRADE BRIDGE 120.42

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 120.42
PLACEMENT	UNDERGRADE
TYPE	STONE ARCH CULVERT
SPANNING	CREEK
MATERIAL	MASONRY
DIMENSION	16 FT ARCH
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION; GOOD FLOW;
LEAKY JOINTS THROUGHOUT
15 FT OF COVER

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 120.47 (MARKET ST)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 120.47
PLACEMENT	UNDERGRADE
TYPE	CONCRETE FLAT TOP
SPANNING	MARKET ST
MATERIAL	CONCRETE
LENGTH	42 FT
WIDTH	59 FT 1 IN
CLEARANCE	12 FT 2 IN
TRACKS	1

GENERAL CONDITION
SMALL CRACKS THROUGHOUT
BRIDGE HAS BEEN PATCHED
MINOR SPALLING THROUGHOUT
OVERALL GOOD CONDITION

IMMEDIATE REPAIR NEEDS	
STEEL RAILINGS	42 LF
GUARD RAIL	200 LF

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 127.00

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 127.00
PLACEMENT	UNDERGRADE
TYPE	STONE & CONCRETE ARCH & 2 STEEL OVERFLOW PIPES
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSION	20 FT ARCH / 10 IN PIPES
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION; GOOD FLOW
CRACKS IN RETAINING WALL & OVER THE ARCH. PARTIAL COLLAPSE IN NORTHEAST CORNER OF WINGWALL.

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	10 SF
REPAIR WINGWALLS	200 LF
POUR NEW BENCH WALL ALONG NE WINGWALL	50 LF

FUTURE (5-10 YRS) REPAIR NEEDS
COAT INSIDE OF STONE ARCH CULVERT (APPROXIMATELY 2500 SF)

NORTHSIDE HEADWALL WITH METAL PIPE

NORTHEAST CORNER OF WINGWALL

UNDERGRADE BRIDGE 129.51

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 129.59
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
LENGTH	7 FT 6 IN
WIDTH	7 FT 0 IN
TRACKS	1

GENERAL CONDITION
SCOUR ALONG BOTTOM
ABUTMENTS ARE SPALLED
9 FT OF FILL ON TOP

IMMEDIATE REPAIR NEEDS	
RIP RAP BACKFILL	10 CY
NEW HEADWALL EXTENSION WITH WINGWALLS	10 CY
POUR NEW BENCH WALLS	4 CY

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 130.22

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 130.22
PLACEMENT	UNDERGRADE
TYPE	STEEL DECK PLATE GIRDER
SPANNING	ROARING BROOK
MATERIAL	STEEL
LENGTH	59 FT 0 IN
WIDTH	14 FT 0 IN
SEPARATION	5 FT 5 IN
TRACKS	1

GENERAL CONDITION
SIGNIFICANT SPALLING UNDER SW BEARING OF ABANDONED SPAN; PAINT SYSTEM DETERIORATED; RUST & MINOR SCALING; RAILING OKAY; SPALLING ON W ABUTMENT

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	40 SF
NEW ABUTMENT WALLS & BRIDGE SEAT	25 CY
NEW BRIDGE SEATS	10 CY
REBUILD NW WINGWALL	10 CY

FUTURE (5-10 YRS) REPAIR NEEDS
PAINT GIRDERS SCOUR INSPECTION

WEST ABUTMENT SPALLING

NORTHWEST WINGWALL

UNDERGRADE BRIDGE 130.22

CONTINUED

EAST ABUTMENT WALL UNDER ABANDONED SPAN

SOUTHEAST BEARING

UNDERGRADE BRIDGE 130.32

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 130.32
PLACEMENT	UNDERGRADE
TYPE	RAIL TOP BOX CULVERT
SPANNING	CREEK
MATERIAL	CONCRETE
DIMENSIONS	8 FT BOX CULVERT
TRACKS	1
GENERAL CONDITION OVERALL GOOD CONDITION GOOD FLOW	

IMMEDIATE REPAIR NEEDS	
REMOVE SILT FROM INLET	1 CY

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

LOOKING SOUTH AT HEADWALL

CULVERT INTERIOR LOOKING SOUTH

UNDERGRADE BRIDGE 130.22

CONTINUED

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 130.76

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 130.76
PLACEMENT	UNDERGRADE
TYPE	CONCRETE ARCH
SPANNING	STREAM
MATERIAL	CONCRETE
DIMENSIONS	24 FT ARCH
TRACKS	1

GENERAL CONDITION
SEVERAL CRACKS IN EAST HEADWALL
LEAKY JOINTS INSIDE
WEST HEADWALL CRACKED AND SPALLED

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	40 LF
STEEL RAILINGS	50 LF

FUTURE (5-10 YRS) REPAIR NEEDS
SCOUR INSPECTION SPALL REPAIRS (APPROXIMATELY 100 SF) CRACK REPAIRS (APPROXIMATELY 50 LF)

OVERALL LOOKING WEST

EAST HEADWALL LOOKING WEST

UNDERGRADE BRIDGE 130.78

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 130.78
PLACEMENT	UNDERGRADE
TYPE	STEEL THROUGH GIRDER
SPANNING	ROARING BROOK
MATERIAL	STEEL
LENGTH	59 FT 3 IN
WIDTH	13 FT 9 IN
TRACKS	1

GENERAL CONDITION
COMPONENTS HAVE BEEN REPLACED INCLUDING FLOOR BEAMS
PAINT SYSTEM DETERIORATED
NORTHWEST ABUTMENT DETERIORATED
DATE STAMPED 1924

IMMEDIATE REPAIR NEEDS	
STEEL RAILINGS	50 LF
TIE DECK	48 EA

FUTURE (5-10 YRS) REPAIR NEEDS
PAINT GIRDERS SPALL REPAIRS (APPROXIMATELY 100 SF)

NORTH GIRDER

CENTER GIRDER

UNDERGRADE BRIDGE 130.78

CONTINUED

NORTHWEST CORNER OF ABUTMENT

UNDERGRADE BRIDGE 130.89

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 130.89
PLACEMENT	UNDERGRADE
TYPE	STEEL THR GIRDER
SPANNING	ROARING BROOK
MATERIAL	STEEL
LENGTH	59 FT 0 IN
WIDTH	13 FT 9 IN
TRACKS	1

GENERAL CONDITION
ABUTMENTS HAVE LARGE CRACKS & SPALLS
SW ABUTMENT WALL PARTLY COLLAPSED
POSSIBLE SCOUR ON WEST ABUTMENT WALL
VEGETATIVE GROWTH ON BRIDGE SEATS

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	200 SF
SEAL CRACKS	100 LF
PARTIAL ABUTMENT REPAIR	76 CY
TIE DECK	48 EA
SCOUR INSPECTION	YES
POUR NEW BENCH WALL	17 CY

OVERALL LOOKING WEST

BETWEEN BRIDGES LOOKING EAST

FUTURE (5-10 YRS) REPAIR NEEDS
POUR NEW BRIDGE SEATS SPALL RECEIPTS)

UNDERGRADE BRIDGE 130.89

CONTINUED

SIDE OF BRIDGE LOOKING EAST

SOUTHWEST ABUTMENT WALL

BRIDGE SEAT ON EAST ABUTMENT LOOKING NORTH

UNDERGRADE BRIDGE 131.10 (ASH ST)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 131.10
PLACEMENT	UNDERGRADE
TYPE	CONCRETE SLAB
SPANNING	ASH ST
MATERIAL	CONCRETE
LENGTH	59 FT 9 IN
WIDTH	39 FT 10 IN
TRACKS	1

GENERAL CONDITION
OVERALL GOOD CONDITION
MINOR SPALLING AND CRACKS
FASCIA CRACKED AND SPALLED

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	1500 SF
STEEL RAILINGS	80 LF
APPROACH CLEARANCE SIGNS	2 EA

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING NORTH

OVERALL LOOKING SOUTH

UNDERGRADE BRIDGE 131.10

CONTINUED

OVERALL LOOKING WEST

OVERALL LOOKING EAST

NAY AUG TUNNEL

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 131.60
PLACEMENT	TUNNEL
TYPE	TWIN-BORE ROCK TUNNEL
SPANNING	NAY AUG HILL
MATERIAL	MINED ROCK TUNNEL CONCRETE HEADWALL AT WEST ENTRANCE, PARTIAL CONCRETE RETAINING WALL ON SOUTH SIDE
LENGTH	759 FT 1 IN
WIDTH	28 FT 1 IN
TRACKS	2 ACTIVE (S BORE ABANDONED)

GENERAL CONDITION
OVERALL GOOD CONDITION; MINOR HEAD WALL DETERIORATION AT WEST ENTRANCE; APPROX. 300 ROCK BOLTS IN CEILING

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	1500 SF
TUNNEL INSPECTION	

FUTURE (5-10 YRS) REPAIR NEEDS
INSTALL ADDITIONAL ROCK BOLTS

NORTH BORE LOOKING EAST

SOUTH BORE (ABANDONED) LOOKING EAST

NAY AUG TUNNEL

CONTINUED

SOUTH BORE (ABANDONED) LOOKING WEST

NORTH BORE LOOKING WEST

ROCK BOLTS IN THE CEILING AT WEST ENTRANCE NORTH BORE

UNDERGRADE BRIDGE 131.80

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 131.80
PLACEMENT	UNDERGRADE
TYPE	DUAL-SPAN STEEL GIRDER
SPANNING	ROARING BROOK
MATERIAL	STEEL
LENGTH	103 FT 10 IN ALONG TK
WIDTH	15 FT 11 IN (EACH BRIDGE)
SEPARATION	5 FT 6 IN
TRACKS	2

GENERAL CONDITION
OVERALL GOOD CONDITION
DETERIORATED BOTTOM LATERALS AND GUSSET PLATES
RUSTING AND SCALING ON GIRDERS

IMMEDIATE REPAIR NEEDS	
TIE DECK	160 EA

FUTURE (5-10 YRS) REPAIR NEEDS
PAINT GIRDERS RESTORE BOTTOM LATERALS AND GUSSET PLATES

OVERALL LOOKING EAST

LOOKING EST ALONG NORTH SIDE OF SPAN

UNDERGRADE BRIDGE 133.00 (BIDEN EXPRESSWAY)

INSPECTION	
DATE	JANUARY 15, 2023
WEATHER	SUNNY
TEMPERATURE	60°
INSPECTOR	HICKEY

STRUCTURE	
LOCATION	MILEPOST 133.00
PLACEMENT	UNDERGRADE
TYPE	DECK PLATE GIRDER
SPANNING	US 11 BIDEN EXPRESSWAY
MATERIAL	STEEL/ CONCRETE
LENGTH	102 FT
WIDTH	75 FT
CLEARANCE	
TRACKS	2
GENERAL CONDITION OVERALL EXCELLENT CONDITION; OPENED 1964; PENNDOT MAINTENANCE	

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

UNDERSIDE OF BRIDGE LOOKING EAST

UNDERGRADE BRIDGE 133.29 (CEDAR AV)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 133.29
PLACEMENT	UNDERGRADE
TYPE	BALLASTED DECK THROUGH PLATE GIRDER
SPANNING	CEDAR AV
MATERIAL	STEEL
LENGTH	57 FT 0 IN ALONG TRACK
WIDTH	30 FT 0 IN ALONG TRACK
CLEARANCE	14 FT 2 IN
TRACKS	1

GENERAL CONDITION
OVERALL EXCELLENT CONDITION; RAILINGS GOOD CONDITION; FRESHLY PAINTED
REPLACE FORMER SPAN; OPENED ~1991

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

UNDERSIDE OF BRIDGE LOOKING WEST

UNDERGRADE BRIDGE 133.40 (SOUTH WASHINGTON AV)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 133.40
PLACEMENT	UNDERGRADE
TYPE	BALLASTED DECK THROUGH PLATE GIRDER
SPANNING	SOUTH WASHINGTON AV
MATERIAL	STEEL
LENGTH	61 FT 0 IN ALONG TRACK
WIDTH	40 FT 4 IN ALONG TRACK
CLEARANCE	14 FT 0 IN
TRACKS	1

GENERAL CONDITION
OVERALL EXCELLENT CONDITION; FRESHLY PAINTED; REHABILITATED WITH NEW PINS, BEARINGS, ETC. RAILINGS IN GOOD CONDITION

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

OVERALL LOOKING SOUTH

OVERALL LOOKING NORTH

UNDERGRADE BRIDGE 133.40

CONTINUED

UNDERSIDE OF BRIDGE LOOKING EAST

UNDERGRADE BRIDGE 133.75 (PEDESTRIAN UNDERPASS)

INSPECTION	
DATE	JANUARY 15, 2023
WEATHER	SUNNY
TEMPERATURE	60°
INSPECTOR(S)	HICKEY

STRUCTURE	
LOCATION	MILEPOST 173.75
PLACEMENT	UNDERGRADE
TYPE	RAILTOP
SPANNING	PEDESTRIAN CROSSING
MATERIAL	CONCRETE
LENGTH	19 FT
WIDTH	160 FT
TRACKS	3
GENERAL CONDITION EXCELLENT CONDITION; NOT IN SERVICE	

IMMEDIATE REPAIR NEEDS
NONE

FUTURE (5-10 YRS) REPAIR NEEDS
NONE

NORTH SIDE RAMP LOOKING SOUTH

UNDERPASS LOOKING SOUTH

SOUTHSIDE RAMP LOOKING NORTH

UNDERGRADE BRIDGE 133.79 (LACKAWANNA RIVER/6 SPANS)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATION	MILEPOST 133.79
PLACEMENT	UNDERGRADE
TYPE	PLATE GIRDER – 6 SPANS
FEATURE SPANNED & LENGTHS	1. CLIFF ST (90 FT) 2. D-L CARBONDALE (85 FT) 3. LACKAWANNA RIVER (135 FT) 4. BIKE PATH (60 FT) 5. VACANT (35 FT) 6. N 7TH AV (45 FT)
MATERIAL	STEEL
TRACKS	1
GENERAL CONDITION MINOR SPALLING ON ABUTMENT & PIERS (SPANS 1 – 3) DETERIORATED FASCIA ON SPAN 4 (BIKE PATH)	

IMMEDIATE REPAIR NEEDS	
CLEAR DEBRIS,. VEGETATION	0 SF
SURFACE SPALLING	0 SF
JOINT PRESSURE INJECTION	0 SF
REPAIR DECK HOLES (SPAN 4)	1 CY
REPAIR SPALLED PARAPETS	150 LF
REPAIR PIER SEAT (SPAN 4)	1 CY

OVERALL SPAN 1 (CLIFF ST)

OVERALL SPAN 2 (D-L CARBONDALE LINE)

FUTURE (5-10 YRS) REPAIR NEEDS
INSPECT BRIDGE DECKS (SPANS 4 & 5) REMOVE DETERIORATED ENCASEMENT (SPAN 5) WATERPROOF BRIDGE DECKS (SPANS 4 & 5) REPOINT BLOCK PIERS (SPANS 5 & 6) APPROX 300 LF

UNDERGRADE BRIDGE 133.79 (CONTINUED)

LONG VIEW LOOKING NORTH OF MULTIPLE SPANS

SOUTH SIDE NEAR BIKE PATH (SPAN 5)

UNDERSIDE OF BRIDGE DECK (SPAN 4)

UNDERMINED BEARING NEAR BIKE PATH (SPAN 5)

PROTECTIVE NETTING

OVERHEAD SIGNAL BRIDGES (19 Installations)

INSPECTION	
DATE	MAY 25, 2022
WEATHER	PARTLY CLOUDY
TEMPERATURE	60°
INSPECTOR(S)	FAZIO, DUARTE, MARSHALL

STRUCTURE	
LOCATIONS (19)	MILEPOST 81.76 / 82.45 / 83.30 / 83.67 / 101.90 / 104.45 / 106.01 / 108.89 / 110.78 / 116.79 / 118.67 / 120.67 / 122.22 / 124.01 / 125.90 / 127.66 / 129.56 / 132.12 / 132.90
PLACEMENT	OVERHEAD
TYPE	SIGNAL BRIDGE
DIMENSIONS	± 35 FT VERTICAL CLEARANCE
MATERIAL	STEEL
GENERAL CONDITION VARIES; TYPICALLY FAIR	

IMMEDIATE REPAIR NEEDS	
REMOVE DEFUNCT SIGNALS	87 EA

FUTURE (5-10 YRS) REPAIR NEEDS
INSPECT SIGNAL BRIDGES

TYPICAL DL&W SIGNAL BRIDGE

UNDERGRADE PIPES & CULVERTS (73 Locations)

	LOCATION	DIMENSIONS	TYPE
1	MP 75.20	Undetermined	Stone Box
2	MP 76.00	Undetermined	Pipe
3	MP 76.52	2' x 3'	Concrete Box
4	MP 76.62	16"	Pipe
5	MP 76.90	2' x 3'	Stone Box
6	MP 77.11	36"	Pipe
7	MP 77.23	24"	Pipe
8	MP 77.24	12"	Pipe
9	MP 77.90	3' x 3'	Stone Box
10	MP 78.20	2.5' x 3'	Stone Box
11	MP 79.35	24"	Pipe
12	MP 80.86	Undetermined	
13	MP 81.74	3' x 3.5'	Stone Box
14	MP 82.13	3' x 4'	Concrete Box
15	MP 82.57	2' x 3'	Stone Box
16	MP 83.00	Undetermined	
17	MP 84.14	3' x 3'	Stone Box
18	MP 84.46	Undetermined	Stone Box
19	MP 85.19	3' x 4'	Stone Box
20	MP 86.68	24"	Pipe
21	MP 88.57	2' x 3.5'	Stone Box
22	MP 89.06	Undetermined	Pipe
23	MP 89.81	2'4" x 3'6"	Box
24	MP 90.08	24"	Pipe
25	MP 90.16	24"	Pipe
26	MP 90.95	3' x 5'	Box
27	MP 92.13	3'	Arch
28	MP 92.58	2' x 2'	Stone Box
29	MP 92.84	2'5"	Stone Box
30	MP 93.45	2' x 6'	Stone Box
31	MP 93.71	24"	Pipe
32	MP 94.23	3'5" x 5'	Stone Box
33	MP 94.53	2 each 24"	Pipe
34	MP 96.65	2' x 2'	Stone Box
35	MP 100.43	48"	Pipe
36	MP 100.60	36"	Pipe
37	MP 100.91	2' x 2'5"	Stone Box

	LOCATION	DIMENSIONS	TYPE
38	MP 101.51	2 each 24"	Pipe
39	MP 110.29	24"	Pipe
40	MP 110.43	1'5" x 3'	Stone Box
41	MP 100.62	36"	Concrete Box
42	MP 114.13	2'6" x 2'6"	Stone Box
43	MP 115.36	4' x 5'	Concrete Box
44	MP 115.75	24"	Pipe
45	MP 116.21	24"	Pipe
46	MP 116.76	24"	Pipe
47	MP 118.07	36"	Pipe
48	MP 119.37	24"	Pipe
49	MP 119.85	1'5" x 2'	Box
50	MP 121.54	4' x 4'	Stone Box
51	MP 122.24	30"	Pipe
52	MP 122.52	3' x 3'	Stone Box
53	MP 122.91	3' x 4'	Concrete Box
54	MP 123.25	20"	Pipe
55	MP 123.46	24"	Pipe
56	MP 123.76	Undetermined	
57	MP 123.98	4'7"	Box
58	MP 124.27	3' x 3'	Box
59	MP 125.06	2' x 3'	Box
60	MP 125.06	30"	Pipe
60	MP 125.27	3' x 3.5'	Stone Box
61	MP 127.33	24"	Pipe
62	MP 127.40	36"	Pipe
63	MP 128.20	24"	Pipe
64	MP 128.46	26"	Pipe
65	MP 128.53	36"	Pipe
66	MP 129.54	24"	Pipe
67	MP 129.84	3'3" x 2'5"	Concrete Box
68	MP 131.32	Undetermined	
69	MP 131.47	2'4"	Pipe
70	MP 132.06	20"	Pipe
71	MP 132.40	24"	Pipe
72	MP 132.51	20"	Pipe
73	MP 132.52	36"	Pipe

This list is included for reference but was not independently verified or inspected.

Source: GVT Engineering

Pocono Mainline Structures Cost Estimates

APPENDIX

3B

NO ACTION

The following Pocono Mainline structures were determined to not require significant immediate or future corrective actions within the next ten years.

UNDERGRADE BRIDGE 81.38

UNDERGRADE BRIDGE 97.26

UNDERGRADE BRIDGE 107.05

UNDERGRADE BRIDGE 108.35

UNDERGRADE BRIDGE 112.17

UNDERGRADE BRIDGE 113.52

UNDERGRADE BRIDGE 115.36

UNDERGRADE BRIDGE 119.59

UNDERGRADE BRIDGE 120.42

UNDERGRADE BRIDGE 133.00 (BIDEN EXPRESSWAY)

UNDERGRADE BRIDGE 133.29 (CEDAR AV)

UNDERGRADE BRIDGE 133.40 (S WASHINGTON AV)

UNDERGRADE BRIDGE 133.75 (PEDESTRIAN UNDERPASS)

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT

POCONO MAINLINE STRUCTURAL COST ESTIMATE

IMMEDIATE ACTION ITEMS

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	EXT TOTALS	ESTIMATE
UNDERGRADE BRIDGE 73.99						
1000120	Pressure Injection of Concrete Joints	150	LF	$268	$40,137	$178,319
1000130	Steel Railing	56	LF	$1,023	$57,270	
1000140	Rip Rap Scour Protection	30	LF	$2,697	$80,912	
UNDERGRADE BRIDGE 74.52						
1000210	Clearing Site (debris, vegetation, etc.)	4	CY	$13,855	$55,419	$55,419
UNDERGRADE BRIDGE 77.50						
1000320	Steel Railing	40	LF	$1,136	$45,446	$455,777
1000330	Repour East Abutment	24	CY	$17,097	$410,331	
UNDERGRADE BRIDGE 78.66						
1000420	Emergency guard rail (500 ft. 2 sides)	1000	LF	$50	$50,000	$1,700,099
1000430	Tie deck	300	EA	$5,500	$1,650,099	
UNDERGRADE BRIDGE 81.38						
1000520	Tie deck	300	SF	$5,500	$1,650,000	$1,650,000
UNDERGRADE BRIDGE 82.83						
1000610	Clearing Site (debris, vegetation, etc.)	600	SF	$150	$90,000	$260,421
1000620	Steel Railing	150	LF	$1,136	$170,421	
UNDERGRADE BRIDGE 86.06						
1000710	Clearing Site (debris, vegetation, etc.)	440	SF	$150	$66,000	$472,229
1000720	Walkway Grating	330	SF	$474	$156,278	
1000730	Steel Railing	220	LF	$1,136	$249,951	
UNDERGRADE BRIDGE 86.31						
1000820	Steel Railing	36	LF	$1,136	$40,901	$44,697
1000830	Approach Clearance signs	2	EA	$1,898	$3,796	
UNDERGRADE BRIDGE 90.95						
1000910	Clearing Site (debris, vegetation, etc.)	50	CF	$2,158	$107,882	$226,078
1000920	Rebuild North Headwall	7.5	CY	$15,759	$118,196	
UNDERGRADE BRIDGE 95.05						
1001020	Pour new south headwall	2	CY	$37,985	$75,971	$75,971
UNDERGRADE BRIDGE 98.40						
1001220	Steel Railing	8	LF	$1,732	$13,855	$13,855
UNDERGRADE BRIDGE 100.26						
1001320	Concrete Surface Spalls	200	SF	$430	$86,010	$310,031
1001330	Steel Railing	40	LF	$1,136	$45,446	
1001340	Concrete Wingwall Cap	1.5	CY	$27,294	$40,942	
1001350	Concrete Bridge Seat	2.5	CY	$55,053	$137,633	
UNDERGRADE BRIDGE 102.90						
1001420	Tie deck	14	EA	$5,500	$77,005	$77,005
UNDERGRADE BRIDGE 104.34						
1001520	Steel Railings	40	LF	$1,136	$45,446	$45,446
UNDERGRADE BRIDGE 107.39						
1001710	Clearing Site (debris, vegetation, etc.)	140	LF	$396	$55,419	$191,756
1001720	Steel Railing	120	LF	$1,136	$136,337	
UNDERGRADE BRIDGE 107.44						
1001820	Rebuild partial bridge seat	2.5	CY	$56,392	$140,979	$140,979

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT

POCONO MAINLINE STRUCTURAL COST ESTIMATE

IMMEDIATE ACTION ITEMS

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	EXT TOTALS	ESTIMATE
UNDERGRADE BRIDGE 117.76						
1002310	Clearing Site (debris, vegetation, etc.)	120	LF	$1,269	$152,224	$509,371
1002320	Steel Railing	40	LF	$1,136	$45,446	
1002330	Pour new bench walls, each side	4	CY	$36,138	$144,553	
1002340	Repair North East wingwall	5.5	CY	$27,031	$148,673	
1002350	Scour Inspection	1	LS	$18,476	$18,476	
UNDERGRADE BRIDGE 117.80						
1002420	Approach clearance warning signs	2	EA	$2,217	$4,434	$4,434
UNDERGRADE BRIDGE 118.51						
1002510	Clearing Site (debris, vegetation, etc.)	80	LF	$1,381	$110,473	$155,918
1002520	Steel Railings	40	LF	$1,136	$45,446	
UNDERGRADE BRIDGE 118.93						
1002701	Clearing Site (debris, vegetation, etc.)	80	LF	$1,381	$110,473	$1,105,700
1002720	Tie Deck	21	EA	$5,500	$115,507	
1002730	Repour Bridge Seats	12	CY	$41,707	$500,484	
1002740	New Backwalls	16.5	CY	$22,984	$379,237	
UNDERGRADE BRIDGE 120.47						
1003020	Steel Railing	42	LF	$1,136	$47,718	$243,178
1003030	Guard Rail (Highway)	200	LF	$977	$195,460	
UNDERGRADE BRIDGE 127.00						
1003110	Clearing Site (debris, vegetation, etc.)	10	CY	$10,788	$107,882	$371,080
1003120	Repoint Wingwalls	200	LF	$412	$82,492	
1003130	Pour new bench wall along NE wingwall	50	LF	$3,614	$180,706	
UNDERGRADE BRIDGE 129.51						
1003220	Rip Rap Backfill	10	CY	$2,830	$28,301	$434,086
1003230	New Headwall Extension with wingwalls	10	CY	$26,122	$261,219	
1003240	Pour new bench walls	4	CY	$36,142	$144,566	
UNDERGRADE BRIDGE 130.22						
1003310	Clearing Site (debris, vegetation, etc.)	40	SF	$1,349	$53,941	$1,646,892
1003320	New Abutment walls and bridge seat	25	CY	$36,141	$903,527	
1003330	New bridge seats	10	CY	$42,821	$428,205	
1003340	Rebuild NW wingwall	10	CY	$26,122	$261,219	
UNDERGRADE BRIDGE 130.32						
1003420	Remove silt from inlet	1	CY	$53,941	$53,941	$53,941
UNDERGRADE BRIDGE 130.76						
1003310	Clearing Site (debris, vegetation, etc.)	40	SF	$135	$5,400	$62,207
1003520	Steel Railing	50	LF	1136.14	$56,807	
UNDERGRADE BRIDGE 130.78						
1003620	Steel Railing	50	LF	$1,136	$56,807	$320,823
1003630	Tie deck	48	EA	$5,500	$264,016	

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT

POCONO MAINLINE STRUCTURAL COST ESTIMATE

IMMEDIATE ACTION ITEMS

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	EXT TOTALS	ESTIMATE
UNDERGRADE BRIDGE 130.89						
1003710	Clearing Site (debris, vegetation, etc.)	200	SF	$135	$26,970	$2,026,335
1003720	Seal Concrete Cracks	100	LF	$412	$41,246	
1003730	Partial Abutment Repair	76	CY	$17,479	$1,328,410	
1003740	Tie Deck	48	EA	$5,500	$264,016	
1003750	Pour new Bench wall	17	CY	$20,425	$347,217	
1003760	Scour Inspection	1	LS	$18,476	$18,476	
UNDERGRADE BRIDGE 131.10						
1003810	Clearing Site (debris, vegetation, etc.)	1500	SF	$108	$161,820	$256,507
1003820	Clearance signs	2	EA	$1,898	$3,796	
1003830	Steel Railings	80	LF	$1,136	$90,891	
NAY AUG TUNNEL (MP 131.60)						
1003910	Clearing Site (debris, vegetation, etc.)	1500	SF	$108	$161,820	$217,247
1003320	Tunnel Inspection	1	SF	$55,427	$55,427	
UNDERGRADE BRIDGE 131.80						
1004020	Tie deck	160	EA	$5,500	$880,053	$880,053
OVERHEAD BRIDGE 132.85 WEST UNIVERSITY PEDESTRIAN CROSSING						
1004032	NEW Overhead Pedestrian Crossing 85ft span	1	LS	$2,254,051	$2,254,051	$2,254,051
UNDERGRADE BRIDGE 133.79 (LACKAWANNA RIVER/6 SPANS)						
1004320	Repair hole in bridge deck (Span 4)	1	CY	$21,613	$21,613	$232,681
1004330	Repair spalled parapets	150	LF	$723	$108,419	
1004340	Repair pier seat (span 4)	1	CY	$102,649	$102,649	
OVERHEAD BRIDGES 81.76, 82.45, 83.30, 83.67, 101.90, 104.45, 106.01, 108.89, 110.78, 116.79, 118.67, 120.67, 122.22, 124.01,125.90, 127.66, 129.56, 132.12 & 132.90						
1004410	Remove approximately three signals per structure	19	EA	$3,500	$66,500	$66,500

GRAND TOTAL – IMMEDIATE ACTION ESTIMATE: $16,739,084

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT

POCONO MAINLINE STRUCTURAL COST ESTIMATE

FUTURE ACTION ITEMS

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	EXT TOTALS	ESTIMATE
UNDERGRADE BRIDGE 77.50						
2000110	Paint girders	1	LS	$620,788	$620,788	$718,290
2000120	Clear debris from bridge seats	1	LS	$14,998	$14,998	
2000130	Tie deck replacement (15 Timbers)	15	EA	$5,500	$82,505	
UNDERGRADE BRIDGE 78.66						
2000210	Paint girders	1	LS	$620,788	$620,788	$1,620,788
2000220	Continue steel repairs	1	LS	$1,000,000	$1,000,000	
UNDERGRADE BRIDGE 82.83						
2000310	Scour protection	1	LS	$55,419	$55,419	$137,912
2000320	Address spalling, leaking joints	1	LS	$82,492	$82,492	
UNDERGRADE BRIDGE 86.06						
2000410	Paint Girders	1	LS	$620,788	$620,788	$639,264
2000420	Scour Inspection	1	LS	$18,476	$18,476	
UNDERGRADE BRIDGE 86.31						
2000510	Spall repairs	1	LS	$129,014	$129,014	$129,014
UNDERGRADE BRIDGE 87.37						
2000530	Spall Repair	800	SF	$430	$344,040	$798,943
2000540	Joint Repair	1700	LF	$268	$454,903	
UNDERGRADE BRIDGE 90.95						
2000610	Slipline existing barrell	1	LS	$36,952	$36,952	$36,952
UNDERGRADE BRIDGE 97.26						
2000810	Repoint barrel of arch	1	LS	$82,492	$82,492	$100,968
2000820	Scour inspection	1	LS	$18,476	$18,476	
UNDERGRADE BRIDGE 100.26						
2000910	Paint Steel Girders	1	LS	$620,788	$620,788	$620,788
UNDERGRADE BRIDGE 104.34						
2001010	Scour Inspection	1	LS	$18,476	$18,476	$18,476
UNDERGRADE BRIDGE 107.05						
2001110	Rebuild North and South parapet walls	7	CY	$26,121	$182,850	$182,850
UNDERGRADE BRIDGE 107.39						
2001210	Surface spall repair	300	SF	$430	$129,015	$129,015
UNDERGRADE BRIDGE 107.44						
2001310	Surface spall repairs	1	LS	$86,009	$86,009	$174,015
2001320	Tie deck (approximately 16 timbers)	16	EA	$5,500	$88,005	
UNDERGRADE BRIDGE 112.17						
2001510	Scour Inspection	1	LS	$18,476	$18,476	$18,476
UNDERGRADE BRIDGE 117.76						
2001710	Scour Inspection	1	LS	$18,476	$18,476	$18,476
UNDERGRADE BRIDGE 117.80						
2001810	Replace span and abutments with new through gider	1	LS	$3,177,842	$3,177,842	$3,177,842
UNDERGRADE BRIDGE 118.51						
2001910	Repair deep spall (excavate from the top)	1	LS	$86,009	$86,009	$208,970
2001920	Spall repairs (approximately 500 SF)	1	LS	$86,009	$86,009	
2001930	Raise parapet	1	LS	$36,952	$36,952	
UNDERGRADE BRIDGE 118.93						
2002110	Paint girders	1	LS	$620,788	$620,788	$731,643
2002120	Repair deteriorated gusset plates	1	LS	$110,855	$110,855	

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
POCONO MAINLINE STRUCTURAL COST ESTIMATE

FUTURE ACTION ITEMS

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	EXT TOTALS	ESTIMATE
UNDERGRADE BRIDGE 119.59						
2002210	Possibly re-build crib wall	1	LS	$261,219	$261,219	$419,645
2002220	Spall repairs	1	LS	$86,009	$86,009	
2002230	Scour Inspection	1	LS	$18,476	$18,476	
2002240	Vegetation removal	1	LS	$53,941	$53,941	
UNDERGRADE BRIDGE 127.00						
2002410	Coat inside of stone arch culvert	2500	SF	$22	$55,425	$55,425
UNDERGRADE BRIDGE 130.22						
2002510	Paint girders	1	LS	$620,788	$620,788	$639,264
2002520	Scour Inspection	1	LS	$18,476	$18,476	
UNDERGRADE BRIDGE 130.76						
2002610	Scour inspection	1	LS	$18,476	$18,476	$82,104
2002620	Spall repairs (approximately 100 SF)	100	SF	$430	$43,005	
2002630	Crack repairs (approximately 50 LF)	50	LF	$412	$20,623	
UNDERGRADE BRIDGE 130.78						
2002710	Paint girders	1	LS	$620,788	$620,788	$663,793
2002720	Spall Repair (approximately 100 SF)	100	SF	$430	$43,005	
UNDERGRADE BRIDGE 130.89						
2002810	Repour new bridge seats	1	LS	$261,219	$261,219	$347,228
2002820	Spall repairs	1	LS	$86,009	$86,009	
UNDERGRADE BRIDGE 131.60						
2002910	Install additional Rock Bolt	100	EA	$2,400	$240,000	$240,000
UNDERGRADE BRIDGE 131.80						
2003010	Paint girders	1	LS	$620,788	$620,788	$1,314,135
2003020	Restore bottom laterals and gusset plates	1	LS	$250,000	$250,000	
2003310	Inspect bridge decks (Spans 4 and 5)	1	LS	$18,476	$18,476	
2003320	Remove deteriorated concrete encasement (Span 5)	1	LS	$92,379	$92,379	
2003330	Waterproof bridge decks (Spans 4 and 5)	1	LS	$250,000	$250,000	
2003340	Repoint block piers (Spans 5 and6) approx 300 LF	1	LS	$82,492	$82,492	
OVERHEAD BRIDGES 81.76, 82.45, 83.30, 83.67, 101.90, 104.45, 106.01, 108.89, 110.78, 116.79, 118.67, 120.67, 122.22, 124.01, 125.90, 127.66, 129.56, 132.12 & 132.90						
2003410	Inspect, repair/remove signal bridges	19	EA	$10,000	$190,000	$190,000

GRAND TOTAL – FUTURE ACTIONS ESTIMATE: $13,414,274

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
POCONO MAINLINE STRUCTURAL COST ESTIMATE

SUMMARY

	SUGGESTED PROGRAM	MINIMUM PROGRAM
NO ACTION STRUCTURES (13)	—	—
IMMEDIATE ACTION STRUCTURES (33)	$ 16,739,084	$ 16,739,084
FUTURE ACTION STRUCTURES (26)	$ 13,414,274	—
TOTAL	**$ 30,153,358**	**$ 16,739,084**

4

Pocono Mainline Signals & Communications Assessment

Scranton-New York City Intercity Passenger Rail Analysis Infrastructure Assessment

TECHNICAL REPORT

Prepared for the Amtrak National Network Planning Department

4
SIGNALS & COMMUNICATIONS

APPENDICES

4
SIGNALS & COMMUNICATIONS

Amtrak engaged Jacobs Engineering Group, Inc., to assess just over 60 route miles of rail line owned by Pennsylvania Northeast Regional Railroad Authority (PNRRA), a joint authority of Monroe and Lackawanna Counties, between Scranton and the Delaware Water Gap for its suitability for intercity passenger train operations. The purpose of the assessment is to provide cost estimates for economically bringing the line up to FRA Track Class 3 or 4 condition (where geometry permits) based upon existing records supplemented with field sampling and investigation.

This technical report focuses primarily on signal and communications assets including train control and highway warning devices, accompanied by an evaluation as to their present suitability to support passenger train operations and the degree of work necessary to make them passenger train ready including estimated costs for design and construction.

This technical report is organized around discussion of two core topics:

1. Train Control System Needs Assessment
2. At-Grade Crossing Protection Condition Assessment

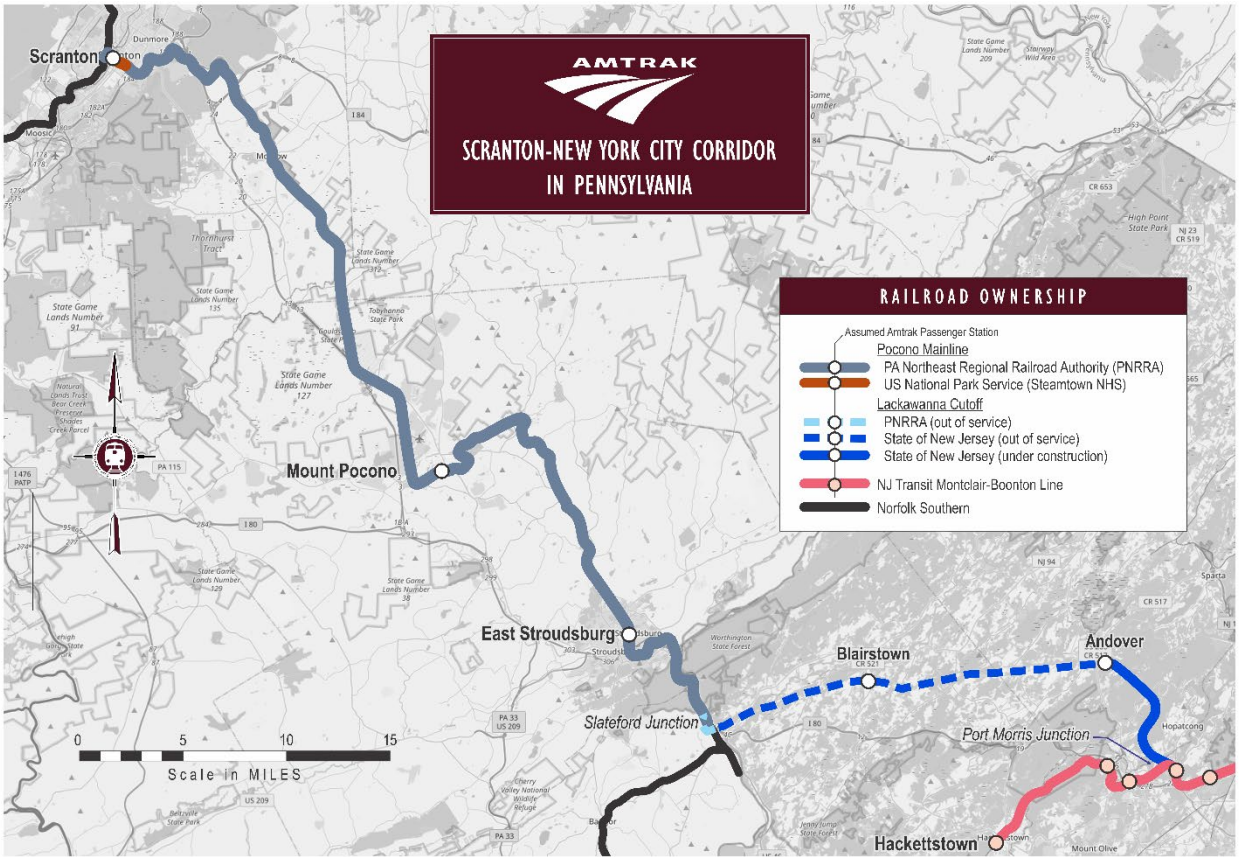
1. TRAIN CONTROL SYSTEMS NEED ASSESSMENT

This portion of the technical memorandum presents a preliminary analysis of train control systems needs for the Pocono Mainline, based on the assumed future track and operational configurations described in previous technical reports, to support the reintroduction of passenger service.

1.1. BACKGROUND

The PNRRA Pocono Mainline was originally the historic Delaware Lackawanna and Western Railroad Company (DL&W) Scranton Division Main Line, opened in 1856 and was also known as the "Route of Phoebe Snow" and the "Road of Anthracite" (see Figure 2-1). The former mainline stretches 60.25 miles from a connection to the Norfolk Southern (NS) Stroudsburg Secondary Track on the Delaware River at Slateford Junction (Milepost (MP) 73.75) to dual connections in Scranton with the NS Sunbury Line at BLOOM and HYDE PARK (MP 133.9 and MP 134.0, respectively). Train operations on the Pocono Mainline are currently conducted by the Delaware-Lackawanna Railroad Company, Inc. (D-L), a subsidiary of the Genesee Valley Transportation Company (GVT).

Figure 4-1. Pocono Mainline



The majority of the Pocono Mainline is owned by the PNRRA except about a mile in Scranton owned by the United States National Park Service (NPS) as part of its Steamtown National Historic Site (NHS). The PNRRA owns from the SCRANTON block station marker (MP 132.75) east to the end of track at the SLATE block station marker (MP 73.75) and from the Cliff Street undergrade bridge (MP 133.76) west to the connections with NS at BLOOM and HYDE PARK

This section of the former DL&W main line in Northeast Pennsylvania was originally a densely trafficked multiple track mainline, fully signaled on a very wide and generous roadbed, designed to simultaneously host long, slow coal drags and some of the higher-speed passenger trains for its day. The Pocono Mainline today is a single-tracked "dark railroad" with no existing train control signaling. Track is currently maintained to standards consistent with FRA Track Class 2, which permits a maximum authorized speed (MAS) of 30 mph for passenger trains / 25 mph for freight.

Amtrak, however, aspires for higher, more commercially-competitive passenger speeds. It has proposed upgrading the track to Class 3 and 4 conditions (for 60 and 80 mph MAS, respectively) where grades and curvature permit (see Figure 4-2).[1]

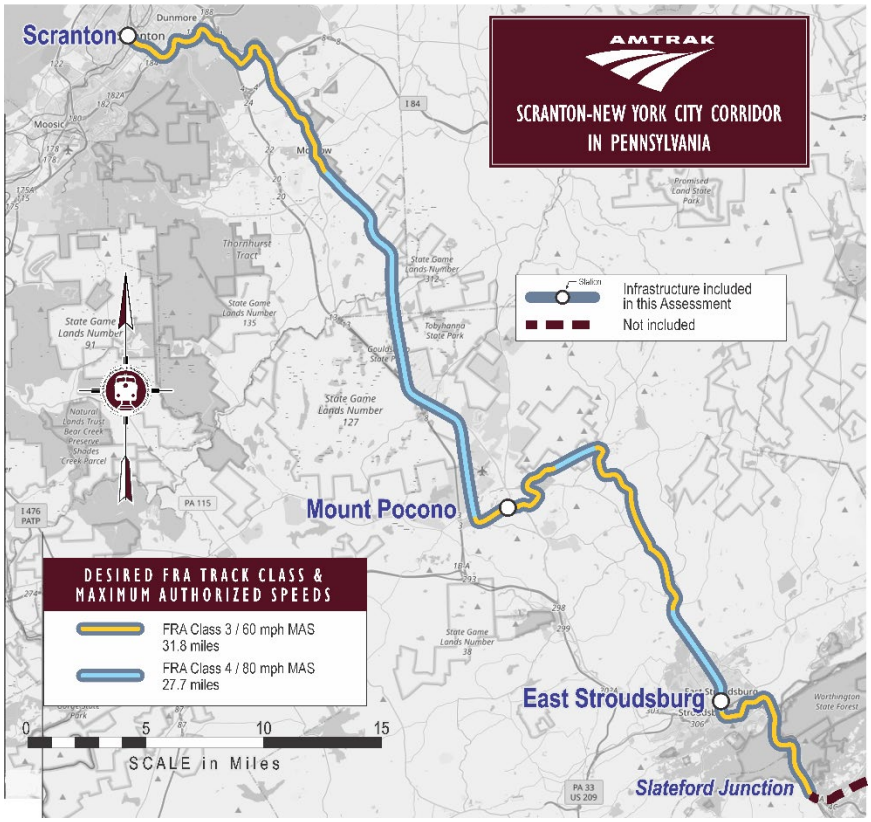
All train movements over the Pocono Mainline are governed by the D-L system timetable (see Appendix 1C to Technical Report 1—Corridor Overview & Design Assumptions) in accordance with the Northeast Operating

[1] The feasibility and extent of speed upgrades are discussed in Technical Report 2—Track.

Rules Advisory Committee (NORAC) rulebook. The D-L system timetable divides the Pocono Mainline into two component parts, each governed by a different set of operating rules:

1. Pocono Main Line Track, which runs 57.7 miles from NAY AUG (MP 131.45) on the outskirts of Scranton to SLATE (MP 73.75) and owned by PNRRA. Form D Control System (DCS) rules are in effect from NAY AUG to GAP (MP 76.0) while Rule 98 (Movement on a Running Track) is in effect from GAP to SLATE.
2. Scranton Running Track, which runs 2.55 miles within Scranton between NAY AUG and BLOOM (MP 133.90) and HYDE PARK (MP 134.00)—two legs of a wye connecting the Pocono Mainline to the NS Sunbury Line. Rule 97 (Movement on a Track Not Governed by ABS, DCS, or Interlocking Rules)is in effect from BLOOM and HYDE PARK to NAY AUG.

Figure 4-2. Proposed Track Speed Upgrades



The new Pocono Mainline physical and operational configuration must safely and efficiently accommodate the existing volume of D-L freight interchange operations, car classification, and daytime customer freight switching volumes as well as anticipated NPS movements without impacting Amtrak operations.

1.2. DISCUSSION

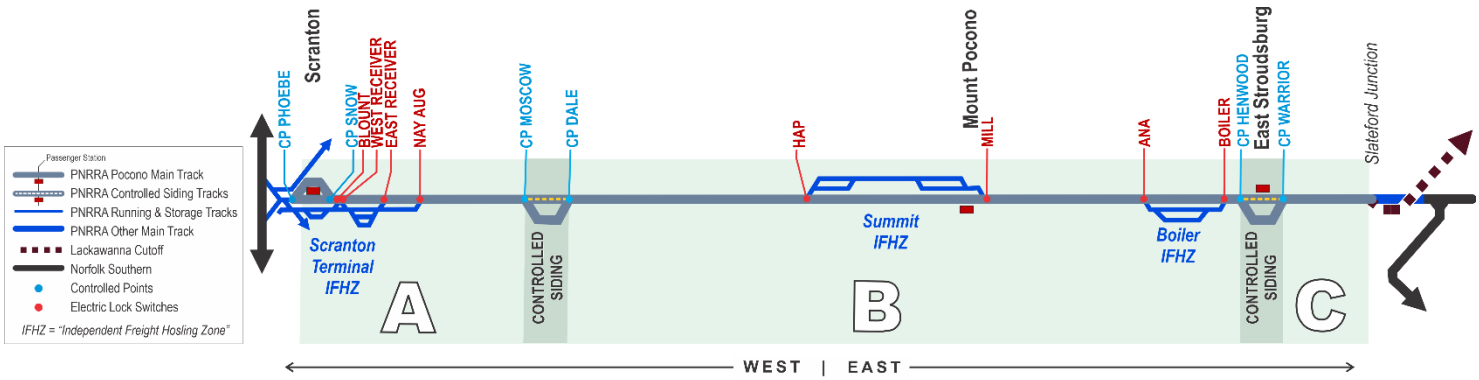
1.2.1. Assumed Operational Configuration

Upon review of the combined operating requirements of Amtrak, D-L, and the NPS, it was assumed that the Pocono Mainline tracks and operations would be divided into various combinations of three operational elements illustrated rated schematically in Figure 4-3 as required by situational requirements.

1.2.1.1. POCONO MAIN TRACK (SCRANTON-SLATEFORD JUNCTION)

Upgrade at least one continuous track between Scranton and Slateford Junction designated as the Pocono Main Track for priority use by Amtrak but available for use by D-L and NPS when Amtrak is not present. The main track will be improved to condition consistent with FRA Class 3 or 4 standards for higher speed operation and signalized with Positive Train Control (PTC) and Automatic Block Signals (ABS).

Figure 4-3. Assumed Pocono Mainline Operational Configuration



1.2.1.2. *CONTROLLED SIDINGS (MOSCOW & EAST STROUDSBURG)*

The Pocono Main Track is separable into three absolute positive blocks (designated "A", "B" & "C" in schematic Figure 4-3) by signal-controlled sidings at Moscow and East Stroudsburg. Although it is preferred that all trains be equipped for PTC, this configuration facilitates the special movement of rolling stock without PTC within the limits of an absolute positive block established between controlled sidings concurrently with PTC-equipped Amtrak, D-L, and NPS trains operating elsewhere on the Pocono Mainline.

1.2.1.3. *INDEPENDENT FREIGHT HOSTLING ZONES (SCRANTON CENTRAL, SUMMIT & BOILER)*

An Independent Freight Hostling Zone (IFHZ) is an assembly of running, storage and other tracks in areas of concentrated shipper activity set apart from the main track by remotely operated switches at controlled points or electric-locked switches on timers. These zones coincide with the areas wherein customers are clustered. Behind the protection of electric-locked switches, D-L can freely service and shift shippers within a zone under Rule 97 without interaction or interference with Amtrak movements on the main track.

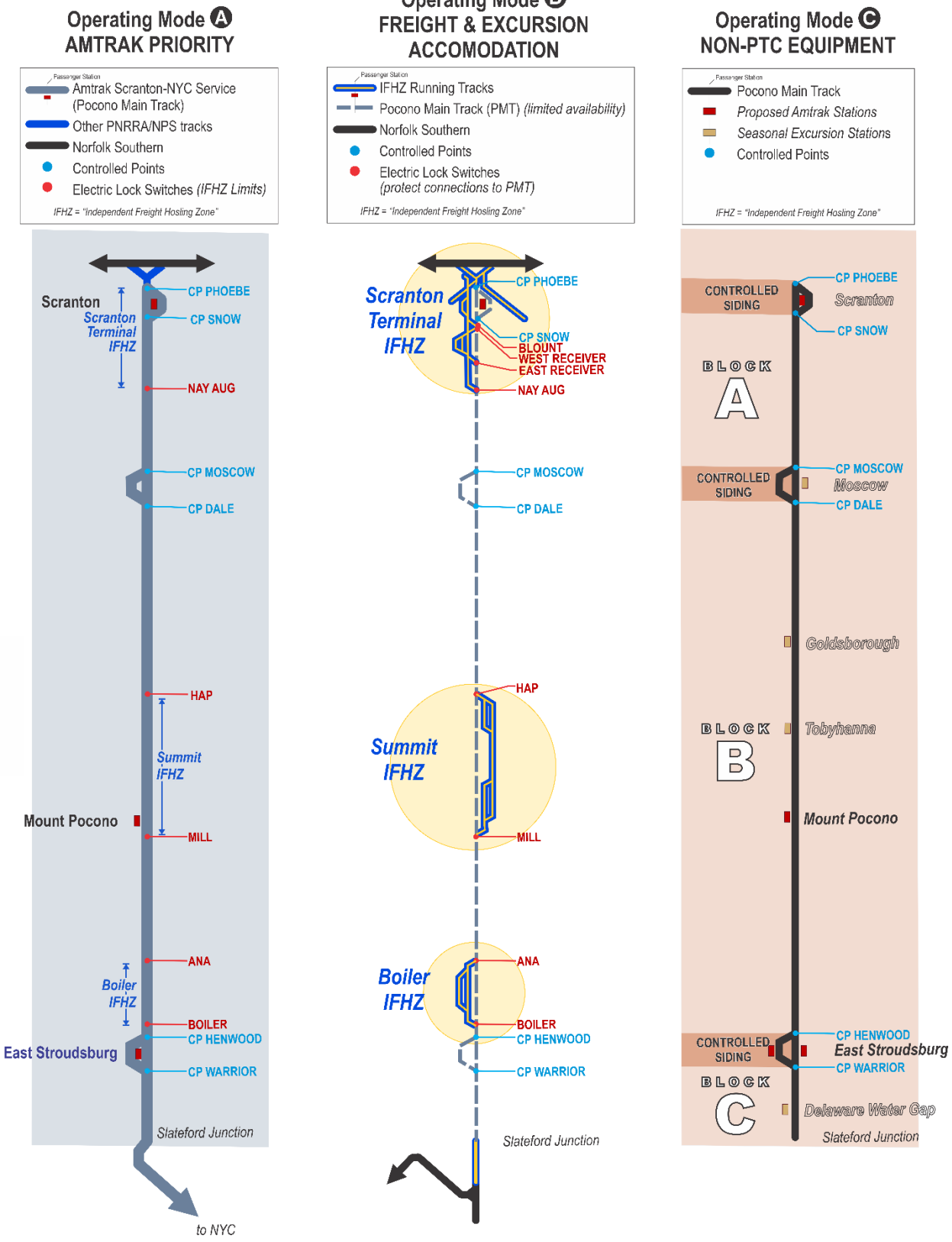
Three IFHZs were assumed for the Pocono Mainline:

1. Scranton Terminal, a 2.55-mile zone in Scranton extending from the connection with the NS Sunbury Line at BLOOM and HYDE PARK to NAY AUG;
2. Summit, a 7.75-mile zone encompassing Tobyhanna and Mount Pocono extending from Hap (MP 108.75) to MILL (MP 101.0); and
3. Boiler, a 2.56-mile zone north of East Stroudsburg extending from ANA (MP 85.0) to Boiler East (MP 82.44).

1.2.2. Assumed Operational Modes

With the three groups of operational elements and their associated signal systems as described in Section 1.2.1.1 in place, dispatch can configure the Pocono Mainline into one or two combinations of operating modes (see Figure 4-4), depending on what combination of Amtrak, freight, and excursion trains need to be accommodated at the moment.

Figure 4-4. Assumed Pocono Mainline Operating Modes



1.2.2.1. OPERATING MODE Ⓐ – AMTRAK PRIORITY

Operating Mode Ⓐ creates virtual continuous single track with two intermediate passing siding the length of the Pocono Mainline optimized for Amtrak service, with movements protected by PTC overlaid atop an underlying ABS system for broken rail protection. When in effect, it provides Amtrak movements priority use of the Pocono Main Track, while PTC-equipped freight and excursion trains are either [1] moving within an IFHZ behind an electric locked switch (Operating Mode Ⓑ), [2] stationary in a Controlled Siding, or [3] following the Amtrak move.

Note: Operating Modes Ⓐ and Ⓒ are mutually exclusive.

1.2.2.2. OPERATING MODE Ⓑ – FREIGHT & EXCURSION ACCOMMODATION

Operating Mode Ⓑ creates three zones of unsignalized running tracks and sidings separated from Amtrak movements of the Pocono Main Track by electric locked switches (Operating Mode Ⓐ) where freight operations can be conducted without affecting parallel Amtrak moves. When Amtrak trains are not present, freight and excursion trains equipped with PTC can also make use of the Pocono Main Line,

1.2.2.3. OPERATING MODE Ⓒ – NON-PTC EQUIPMENT

Operating Mode Ⓒ is the least flexible mode, configuring the Pocono Main Track into three fixed absolute positive blocks controlled by fixed interlocking signals at the entrance and exit to/from Controlled Sidings. This is a restricted operating mode optimized for the operation of excursion trains that are not equipped with PTC to safely operate at speed over the Pocono Main Track

Note: Operating Modes Ⓐ and Ⓒ are mutually exclusive.

1.3. RECOMMENDED ACTIONS

Introducing Amtrak service over the Pocono Mainline will require installation of a Centralized Traffic Control (CTC) signal system and Positive Train Control (PTC), an electronic system that helps enforce train speed limits and signal indications. The recommended approach is based on Northeast Corridor-type positive train control (PTC) or "ACSES" (Advanced Civil Speed Enforcement System) with the intent that, by doing so, the challenges of interoperability and compatibility will be reduced. It also eliminates the need to equip rolling stock with dual PTC systems in order to traverse NJ Transit lines enroute to and from Penn Station New York.

An ACSES system with Enhanced Automatic Train Control (E-ATC).was assumed for costing estimating purposes to provide the requisite PTC and CTC functions for the Pocono Main Track. An automatic block signal (ABS) system underlying the E-ATC system will, in conjunction with the "enhanced" train control features, provide all carriers in the corridor with a fully-integrated capability to meet the full requirements of PTC and CTC.

The ABS system includes integrated cab signal system (CSS) displays installed in locomotives and cabs, possibly supplemented by intermediate wayside signals between Controlled Points. Both CSS variations were considered and costed: one with and the other without wayside signals. The former is slightly less expensive and more vandal-resistant, while the latter under certain circumstances can provide more operating flexibility. The costs for both CSS variants were estimated.

In order to benefit from PTC and CTC and avoid the strictures of Operating Mode Ⓒ, each carrier must equip its locomotives or cabs for ACSES.

2. AT-GRADE CROSSING PROTECTION CONDITION ASSESSMENT

This portion of the technical memorandum presents a preliminary analysis of the protection devices at roadway crossings on the Pocono Mainline and the need for upgrades and replacements to support the reintroduction of higher-speed passenger rail service.

This analysis does not consider the condition of the roadway surface at crossings or which crossings, if any, should be eliminated. Those discussions can be found separately in Technical Reports 2 and 1, respectively.

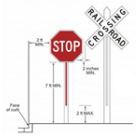
Figure 4-6. Existing Crossing Pocono Mainline At-Grade Crossing Devices by Type

None

Number of Crossings: 3

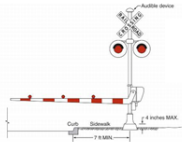
Crossbucks only

Number of Crossings: 5



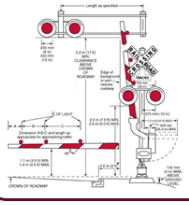
Type 1: Crossbucks & Stop Sign

Number of Crossings: 0



Type 2: Crossbucks, Flashing Lights, Bell & Gates

Number of Crossings: 14



Type 3 :Crossbucks, Flashing Lights, Bell & Gates with Cantilevered Gantry

Number of Crossings: 1

2.1. BACKGROUND

As part of upgrading the Pocono Mainline, the existing protection devices at crossings were inventoried and assessed to determine the degree of work required at each grade crossing to support the introduction of intercity passenger rail.

There are 23 at-grade crossings on the Pocono Mainline, six of which are for pedestrians only (see Figure 4-5). Most of the crossings (81%) are clustered in close proximity to one another in Scranton or East Stroudsburg. Most (88%) are also equipped with active crossing protection (lights, bells, and gates) .The present distribution of protection devices across the Pocono Mainline are summarized in Figure 4-6.

The Pocono Mainline is wholly in the Commonwealth of Pennsylvania and is at-grade highway crossings are under the jurisdiction of the commonwealth's Public Utility Commission and Department of Transportation (PennDOT). Local jurisdiction divided between PennDOT Districts 4-0 and 5-0 (Lackawanna and Monroe Counties, respectively.

The PennDOT Grade Crossing Unit (GCU) performs engineering and administrative liaison between the local district, PUC, and the Railroads through their District Grade Crossing Engineers/Administrators (DGCE/A) for both Section 130 Safety improvement projects at grade crossings and department highway/bridge projects involving railroad facilities. PennDOT requirements and procedures regarding crossings are detailed in the PennDOT Grade Crossing Manual (Publication 371)[2] and appropriate parts of 23 CFR regulations.

[2] Available at https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20371.pdf

Figure 4-1. Recommended Actions for Pocono Mainline At-Grade Crossings

ID #	Milepost	AAR Number	Name	Municipality	TRAINS			HIGHWAY		TRACKS		Protection
					Day	Night	Speed	AADT	Speed	Existing	Future	
A	133.75	930998N	Access Driveway	Scranton	10	10	n/a	n/a	10	10	1	
B	133.54	971131H	Boardwalk	Scranton	**TRUNCATE AT TROLLEY STOP:** divert peds to underpass							
C	133.18	930997G	West Station	Scranton	**CLOSE**: divert pedestrians to Lackawanna Avenue sidewalk							
D	133.10	930996A	East Station	Scranton	**CLOSE**: divert pedestrians to Biden Expressway sidewalk							
E	132.85	930995T	West University	Scranton	**CLOSE**: replace with OH pedestrian bridge							
F	132.65	926809H	East University	Scranton	8	6	40		10	3	3	
G	131.35	926808B	Myrtle St	Scranton	8	6	50	1000	10	1	1	
H	120.58	968379R	Moscow Station	Moscow	**CLOSE**: limited supervised use allowed under Rule SS-1							
I	114.92	931182J	PA Route 346 (Lehigh Rd)	Lehigh	6	4	80	844	35	1	1	
J	112.87	264061V	PA Route 507 (Main St)	Gouldsboro	6	4	80	3371	35	1	1	
K	107.61	264059U	PA Route 423 (Church St)	Tobyhanna	8	6	80	2431	35	1	2	
L	102.54	264055S	PA Route 940 (Summit Av)	Pocono Summit	8	6	80	377	35	1	2	
M	97.37	264050H	Devil's Hole Rd	Paradise	6	4	45	518	25	1	1	
N	92.27	264048G	Henry's Crossing Rd	Paradise	6	4	55	518	25	1	1	
O	90.17	264047A	Browns Hill Rd	Paradise	5	3	75	518	15	1	1	
P	83.21	264039H	Mill Creek Rd	E. Stroudsburg	6	4	75	5456	40	2	3	
Q	82.32	264038B	PA Rte 309 (N Courtland St)	E. Stroudsburg	6	4	60	11969	35	1	1	
R	82.15	264037U	Burson St	E. Stroudsburg	**CLOSE**: divert traffic to adjacent crossings							
S	81.93	264036M	E Broad St	E. Stroudsburg	6	4	60	1302	25	2	2	
T	81.66	264035F	Analomink St	E. Stroudsburg	6	4	60	302	25	1	2	
U	81.57	930992X	Danbury Depot	E. Stroudsburg	**CLOSE**: divert pedestrians to Analomink St crossing							
V	80.70	923747C	Forge Rd	E. Stroudsburg	6	4	45	1000	25	1	1	
W	77.83	264034Y	River Rd	Del. Water Gap	6	4	60	518	40	1	1	

CROSSING TYPE: # - Highway crossing # - Pedestrian only crossing

CROSSING PROTECTION: Crossbucks only; Type 1 (Crossbucks & stop sign); Type 2 (Crossbucks, lights, bells & gates); Type 3 (Crossbucks, lights, bells & gates with gantry)

Change from existing; Eliminate Crossing

Roles and responsibilities are typically split between PennDOT and the railroad(s) as follows:

- PennDOT will:
  - Prepare designs for bridge projects
  - Review design prepared by Railroad
  - File PUC Application
  - Issue Construction NTP
  - Inspect materials and construction
  - Reimburse Railroad for documented costs
  - Maintain highway on crossing approaches
- The Railroad(s) will:
  - Prepare designs for Safety Projects
  - Prepare cost estimate
  - Perform construction
  - Certify compliance with Buy America requirements
  - Maintain rail facilities through crossing
  - Maintains highway crossing surface within two feet of the outside rails

Relevant details regarding existing protection devices for at-grade crossings on the Pocono Mainline are provided in Table 4-1 based on railroad and FRA records, confirmed through direct field observations, along with recommended for upgrades, eliminations, and other changes.

The Exhibit section of this report reviews the details and recommendations for each crossing.

2.2. DISCUSSION

Upon review, all six pedestrian crossings are suggested to be closed for safety reasons due to their incompatibility with the higher train speeds proposed by Amtrak and the ready availability of alternate crossing opportunities. One highway crossing (Ⓡ Burson Street in East Stroudsburg) is also recommended due to its low traffic volume, the ready availability of alternative crossings nearby, and incompatibility with the additional superelevation needed at its location needed for curve speed relief. One private crossing in Scranton is only used by D-L employee and on a track not used by Amtrak.

Of the remaining 15 crossings, Amtrak's plans to significantly increase train speeds from a 25 MPH MAS to 80 MPH will also require extending the length of track circuits for existing crossing protection devices. Occupancy detectors are suggested to be added and—owing to the mountainous terrain and the relatively limited sight lines on most crossing approaches—crossing signal devices be upgraded to Type 3 with overhead cantilevered gantries for higher visibility.

2.3. RECOMMENDED ACTIONS

- Close six pedestrian crossings
- Close one highway crossing
- Add Type 1 protection (crossbucks and stop sign) to private crossing adjacent to D-L tower
- One private crossing in Scranton is only used by D-L employee and on a track not used by Amtrak.
- Extend approach track circuits for 15 highway crossings to reflect higher train speeds and add occupancy detectors.
- Upgrade to Type 2 crossing protection at 14 highway crossings to Type 3 protection with overhead cantilevered gantries.
- Refresh MUTCD approach signage and pavement markings at all crossings.

3. CONCLUSIONS

This technical report has presented changes and upgrades to signal and communication infrastructure assets deemed necessary to adapt the existing PNRRA Pocono Mainline to safely and reliably accommodate shared operations by Amtrak intercity passenger trains, D-L freights train, and NPS Steamtown excursions. It specifically addresses the complexity of combining three very different methods of operation in a predominately single-track railroad environment.

The degree of work set out in the technical report and accompanying cost estimate represents the *Suggested Program*, designed to achieving Amtrak's operating goals. The report also considers a *Minimum Program* that would reduce the initial amount of capital outlay prior to the start of revenue service by eliminating wayside ABS block signals between CPs (wayside signals would be retained at Interlockings).

3.1. COST ESTIMATES

Cost estimates including soft costs (contingency, design, mobilization) were prepared for track and associated infrastructure assets and documented in the *Pocono Mainline Track Cost Estimates* (Appendix 2F). and summarized in Table 4-2.

Table 4-2. Signals & Communications Cost Estimate Summary

	SUGGESTED PROGRAM	MINIMUM PROGRAM
TRAIN CONTROL IMPROVEMENTS	$ 15,945,000	$ 14,545,000
CROSSING PROTECTION IMPROVEMENTS	$ 2,750,000	$ 2,750,000
TOTAL (Materials & Set-Up)	**$ 18,695,000**	**$ 17,295,000**
ROM Estimate with Labor	**$ 24,303,500**	**$ 22,483,500**

3.1.1. Rolling Stock Modifications for PTC

Estimating the cost of modifying existing rolling stock for PTC operation is beyond the scope of this report. Recent installations suggest the following unit costs as guidelines:

- $50,000 per unit for ACSES-equipped Amtrak units for system upgrades to access the new line;
- $150,000 per unit for diesel-electric locomotives not previously equipped for ACSES; and
- $120,000 per unit for historic steam locomotives.

4. EXHIBITS

The assumed actions for at-grade crossings are detailed in the following exhibits.

A EMPLOYEE CROSSING

LOCATION: MP 133.75

CURRENT PROTECTION:
Crossbucks only

OBSERVATIONS:
Extension of Cliff Street.
Employee only crossing
Does not cross a track that Amtrak would use.

RECOMMENDATION:
Upgrade to Type 1 (add stop sign to crossbucks)
Add "Authorized Personnel Only": sign

B BOARDWALK (Pedestrian Only)

LOCATION: MP 133.54

CURRENT PROTECTION:
Crossbucks only

OBSERVATIONS:
Pedestrian-only crossing.
Access to Steamtown/Electric City trolley excursion platform.
North end connection to Lackawanna Transit Center lot gated and usually locked..
North end would be blocked by Amtrak trains and platform.

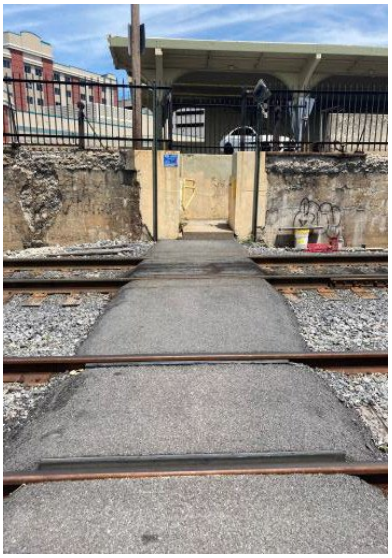
RECOMMENDATIONS:
Truncate crossing at excursion platform.
Divert through pedestrians to existing underpass adjacent to Bridge 60 Tower.

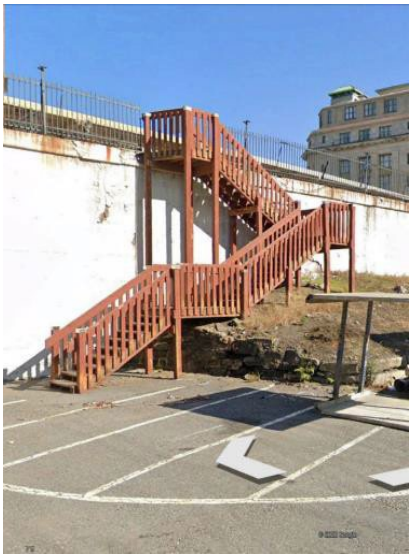
C WEST STATION (Pedestrian Only)

LOCATION: MP 133.18

CURRENT PROTECTION:
Crossbucks only

OBSERVATIONS:
Pedestrian-only crossing.
Circuitous, non-ADA path.
Unprotected crossing of two 50 MPH tracks.
Not a good candidate for grade-separation.
Alterative path available nearby.
On sidewalk adjacent to Lackawanna Avenue





RECOMMENDATION:
CLOSE CROSSING

D EAST STATION (Pedestrian Only)

LOCATION: MP 133.10

CURRENT PROTECTION:
Crossbucks only

OBSERVATIONS:
Pedestrian-only crossing.
Circuitous, non-ADA path.
Unprotected crossing of two 50 MPH tracks.
Alterative path available nearby.
on sidewalk adjacent to Biden Expressway

RECOMMENDATION:
CLOSE CROSSING

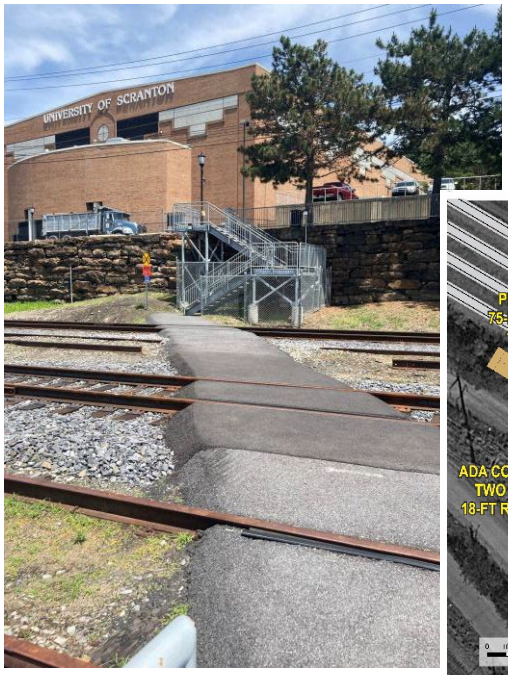
E WEST UNIVERSITY (Pedestrian Only)

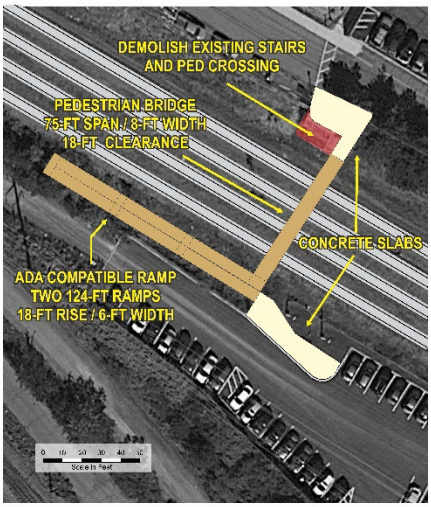
LOCATION: MP 132.85

CURRENT PROTECTION:
Crossbucks

OBSERVATIONS:
Pedestrian-only crossing.
4-track mid-yard crossing.
No alterative path available.
Grade separation candidate.

RECOMMENDATION:
Replace with pedestrian bridge with ADA ramps





F EAST UNIVERSITY

LOCATION: MP 132.65

CURRENT PROTECTION:
Crossbucks

OBSERVATIONS:
Three tracks (Pocono Main Track, Scranton Running Track, Hat Yard #1). Hat Yard #2 ends at crossing.

RECOMMENDATION:
Add Type 3 devices.
Add trigger circuitry for train approach on Pocono Main Track. Movement on running and yard racks will be key activated or flagged by train crew.

G MYRTLE STREET

LOCATION: MP 131.35

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 50 MPH..

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

H MOSCOW STATION (Pedestrian Only)

LOCATION: MP 120.58

CURRENT PROTECTION:
None

OBSERVATIONS:
Pedestrian-only crossing used in the event of an excursion train at Moscow on track farthest from station.
Unprotected crossing of 80 MPH track.

RECOMMENDATION:
Close crossing for routine use.
May be temporary reactivated under train crew supervision and Positive Protection established in accordance with GVT Special Instruction (Rule ss-1).

.

I LEHIGH ROAD (PA ROUTE 346)

LOCATION: MP 114.92

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 80 MPH..

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

J MAIN STREET (PA ROUTE 507)

LOCATION: MP 112.87

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 80 MPH...

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

K CHURCH STREET (PA ROUTE 423)

LOCATION: MP 107.61

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 80 MPH.
Additional track assumed at crossing.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

L SUMMIT AVENUE (PA ROUTE 940)

LOCATION: MP 102.87

CURRENT PROTECTION:
Type 3 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 80 MPH.
Additional track assumed at crossing.

RECOMMENDATION:
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

M DEVIL'S HOLE ROAD

LOCATION: MP 97.37

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

N HENRY'S CROSSING ROAD

LOCATION: MP 92.27

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

O BROWNS HILL ROAD

LOCATION: MP 90.17

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

P MILL CREEK ROAD

LOCATION: MP 83.21

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 80 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

Q NORTH COURTLAND STREET (PA ROUTE 309)

LOCATION: MP 82.32

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

R BURSON ROAD

LOCATION: MP 83.21

CURRENT

PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.
Minor short (425 feet) local street on curve. Alternate crossings >¼ mile to either side. Location on curve limits superelevation for speed increase.

RECOMMENDATION:
CLOSE CROSSING

S EAST BROAD STREET

LOCATION: MP 81.93

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
No sidewalks.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

T ANALOMINK STREET

LOCATION: MP 81.66

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
Sidewalks at crossing.
Train speeds increasing to 80 MPH.
Additional track assumed at crossing.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

U DANBURY DEPOT (Pedestrian Only)

LOCATION: MP 81.57

CURRENT PROTECTION:
None

OBSERVATIONS:
Pedestrian-only crossing.
Blocked by assumed Amtrak platforms.
Alterative path available nearby.

RECOMMENDATION:
CLOSE CROSSING
Divert pedestrians to Analomink Street crossing..

V FORGE ROAD

LOCATION: MP 80.70

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
Sidewalk on north side.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors.

W RIVER ROAD DEPOT

LOCATION: MP 81.57

CURRENT PROTECTION:
Type 2 with Type C approach circuits

OBSERVATIONS:
Sidewalk on south side.
Train speeds increasing to 60 MPH.

RECOMMENDATION:
Upgrade devices to Type 3
Recalculate/modify approach circuits for higher speeds.
Add highway crossing occupancy predictors

Pocono Mainline Signals & Communications Cost Estimates

APPENDIX

4A

SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
POCONO MAINLINE UPGRADES AND IMPROVEMENTS
SIGNALS & COMMUNICATIONS COST ESTIMATE

SUGGESTED PROGRAM

ITEM	QTY	UNIT PRICE	EXTENDED PRICE
TRAIN CONTROL			
Snow Melters	6	$ 60,000	$ 360,000
ABS Block (with Waysides)	28	$ 275,000	$ 7,700,000
CP (End of Siding)	5	$ 900,000	$ 4,500,000
CP (End of Line)	1	$ 75,000	$ 75,000
Electric Locked Switch	13	$ 130,000	$ 1,690,000
Hazard Detector	3	$ 140,000	$ 420,000
Undergrade WiFi (792 ft)	1	$ 75,000	$ 75,000
Communications Tower	9	$ 125,000	$ 1,125,000
SUBTOTAL Train Control (Material & Labor)			$ 15,945,000
ROADWAY CROSSING PROTECTION			
Crossing Upgrade to Type 3 (1 Track)	10	$ 175,000	$ 1,750,000
Crossing Upgrade to Type 3 (2 Tracks)	3	$ 200,000	$ 600,000
Crossing Upgrade to Type 3 (2 Tracks) Existing Cantilever Gantry	1	$ 175,000	$ 175,000
Crossing Upgrade (3 Tracks)	1	$ 225,000	$ 225,000
SUBTOTAL Highway Crossing Protection (Material & Labor)			$ 2,750,000
SUBTOTAL (Material & Labor)			$ 18,695,000
TOTAL with Contingency & Soft Costs			$ 24,303,500

MINIMUM PROGRAM

ITEM	QTY	UNIT PRICE	EXTENDED PRICE
TRAIN CONTROL			
Snow Melters	$ 6	$ 60,000	$ 360,000
ABS Block (without Wayside Signals)	$ 28	$ 225,000	$ 6,300,000
CP (End of Siding)	$ 5	$ 900,000	$ 4,500,000
CP (End of Line)	$ 1	$ 75,000	$ 75,000
Electric Locked Switch	$ 13	$ 130,000	$ 1,690,000
Hazard Detector	$ 3	$ 140,000	$ 420,000
Undergrade WiFi (792 ft)	$ 1	$ 75,000	$ 75,000
Communication Tower	$ 9	$ 125,000	$ 1,125,000
SUBTOTAL Train Control (Material & Labor)			$ 14,545,000
ROADWAY CROSSING PROTECTION			
Crossing Upgrade to Type 3 (1 Track)	10	$ 175,000	$ 1,750,000
Crossing Upgrade to Type 3 (2 Tracks)	3	$ 200,000	$ 600,000
Crossing Upgrade to Type 3 (2 Tracks) with Existing Cantilever Gantry	1	$ 175,000	$ 175,000
Crossing Upgrade to Type 3 (3 Tracks)	1	$ 225,000	$ 225,000
SUBTOTAL Highway Crossing Protection (Material & Labor)			$ 2,750,000
SUBTOTAL (Material & Labor)			$ 17,295,000
TOTAL with Contingency & Soft Costs			$ 22,483,500

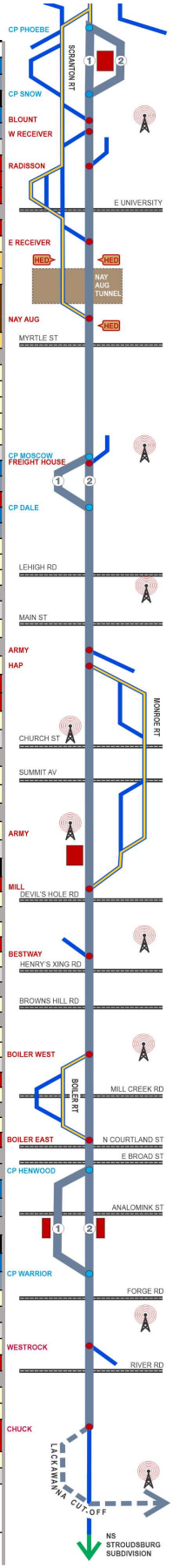
SCRANTON-NEW YORK INTERCITY PASSENGER RAIL ANALYSIS INFRASTRUCTURE ASSESSMENT
SIGNAL AND COMMUNICATIONS COST ESTIMATES
GRAHICAL REPRESENTATION OF S&C IMPROVEMENTS

SUGGESTED PROGRAM

ACSES POSITIVE TRAIN CONTROL WITH WAYSIDE SIGNALS

Milepost	Location	Feature	Cost (est.)
+C5:E8033.7	CP PHOEBE	CP (End of Line)	$ 75,000
133.52	CP PHOEBE	Snow Melters	$ 60,000
133.73	SCRANTON	Passenger Station	
133.52	CP SNOW	CP (End of Siding)	$ 900,000
133.52	CP SNOW	Snow Melters	$ 60,000
133.52	COMMUNICATIONS TOWER (Elevation 736 ft)		$ 125,000
133.33	BLOUNT	Electric Locked Switch	$ 130,000
133.19	WEST RECEIVER	Electric Locked Switch	$ 130,000
132.89	RADISSON	Electric Locked Switch	$ 130,000
132.63	EAST UNIVERSITY (3 TRACKS)	Roadway Crossing	$ 225,000
132.55	EAST RECEIVER	Electric Locked Switch	$ 130,000
132.00	1320/1321 Signal	ABS with Waysides	$ 275,000
131.88	Tunnel West Portal 1	Hazard Detector	$ 140,000
131.88	Tunnel West Portal 2	Hazard Detector	$ 140,000
131.76	NAY AUG TUNNEL	Undergrade WiFi (792 ft)	$ 75,000
131.64	Tunnel East Portal	Hazard Detector	$ 140,000
131.35	MYRTLE ST (1 TRACK)	Roadway Crossing	$ 175,000
130.00	1300/1301 Signal	ABS with Waysides	$ 275,000
128.00	1280 /1281 Signal	ABS with Waysides	$ 275,000
126.00	1260/1261 Signal	ABS with Waysides	$ 275,000
124.00	1240/1241 Signal	ABS with Waysides	$ 275,000
122.00	1220/1221 Signal	ABS with Waysides	$ 275,000
122.00	COMMUNICATIONS TOWER (Elevation 1187 ft)		$ 125,000
120.90	CP MOSCOW	CP (End of Siding)	$ 900,000
120.90	CP MOSCOW	Snow Melters	$ 60,000
132.55	FREIGHT HOUSE	Electric Locked Switch	$ 130,000
120.37	CP DALE	CP (End of Siding)	$ 900,000
120.37	CP DALE	Snow Melters	$ 60,000
118.00	1880/1881 Signal	ABS with Waysides	$ 275,000
116.00	1600/1661 Signal	ABS with Waysides	$ 275,000
114.00	1400/1441 Signal	ABS with Waysides	$ 275,000
114.92	LEHIGH RD (1 TRACK)	Roadway Crossing	$ 175,000
122.00	COMMUNICATIONS TOWER (Elevation 1886 ft)		$ 125,000
112.00	1200/1201 Signal	ABS with Waysides	$ 275,000
112.87	MAIN ST (1 TRACK)	Roadway Crossing	$ 175,000
110.00	1100/1101 Signal	ABS with Waysides	$ 275,000
109.85	ARMY	Electric Locked Switch	$ 130,000
108.75	HAP	Electric Locked Switch	$ 130,000
108.00	1080/1081 Signal	ABS with Waysides	$ 275,000
108.00	COMMUNICATIONS TOWER (Elevation 1968 ft)		$ 125,000
107.61	CHURCH ST (2 TRACKS)	Roadway Crossing	$ 200,000
106.00	1060/1061 Signal	ABS with Waysides	$ 275,000
104.00	1040/1041 Signal	ABS with Waysides	$ 275,000
102.54	SUMMIT AV (2 TRACKS)	Roadway Crossing	$ 175,000
102.00	1020/1021 Signal	ABS with Waysides	$ 275,000
101.00	COMMUNICATIONS TOWER (Elevation 1882 ft)		$ 125,000
101.45	MOUNT POCONO	PASSENGER STATION	
101.00	MILL	Electric Locked Switch	$ 130,000
98.00	980/981 Signal	ABS with Waysides	$ 275,000
97.37	DEVIL'S HOLE (1 TRACK)	Roadway Crossing	$ 175,000
96.00	960/961 Signal	ABS with Waysides	$ 275,000
94.15	BESTWAY	Electric Locked Switch	$ 130,000
94.00	940/941 Signal	ABS with Waysides	$ 275,000
94.00	COMMUNICATIONS TOWER (Elevation 1200 ft)		$ 125,000
92.27	HENRY'S CROSSING RD (1 TK)	Roadway Crossing	$ 175,000
92.00	920/921 Signal	ABS with Waysides	$ 275,000
90.17	BROWN HILL RD (1 TRACK)	Roadway Crossing	$ 175,000
90.00	900/901 Signal	ABS with Waysides	$ 275,000
88.00	880/881 Signal	ABS with Waysides	$ 275,000
87.00	COMMUNICATIONS TOWER (Elevation 558 ft)		$ 125,000
85.00	BOILER WEST	Electric Locked Switch	$ 130,000
85.00	850/851 Signal	ABS with Waysides	$ 275,000
83.21	MILL CREEK RD (2 Tracks)	Roadway Crossing	$ 200,000
83.00	830/831 Signal	ABS with Waysides	$ 275,000
82.44	BOILER EAST	Electric Locked Switch	$ 130,000
82.32	N COURTLAND ST (1 TRACK)	Roadway Crossing	$ 175,000
81.93	BROAD ST (1 TRACK)	Roadway Crossing	$ 175,000
81.90	CP HENWOOD	CP (End of Siding)	$ 900,000
81.90	CP HENWOOD	Snow Melters	$ 60,000
81.66	ANALOMINK ST (2 TRACKS)	Roadway Crossing	$ 200,000
81.60	EAST STROUDSBURG	PASSENGER STATION	
81.05	CP WARRIOR	CP (End of Siding)	$ 900,000
81.05	CP WARRIOR	Snow Melters	$ 60,000
81.00	810/811 Signal	ABS with Waysides	$ 275,000
80.70	FORGE RD (1 TRACK)	Roadway Crossing	$ 175,000
80.00	COMMUNICATIONS TOWER (Elevation 350 ft)		$ 125,000
79.00	790/791 Signal	ABS with Waysides	$ 275,000
78.60	WESTROCK	Electric Locked Switch	$ 130,000
77.83	RIVER RD	Roadway Crossing	$ 175,000
77.00	770/771 Signal	ABS with Waysides	$ 275,000
75.00	750/751 Signal	ABS with Waysides	$ 275,000
74.49	CHUCK (Connection to Lackawanna Cut-Off)	Electric Locked Switch	$ 130,000
73.00	730/731 Signal	ABS with Waysides	$ 275,000
73.00	COMMUNICATIONS TOWER (Elevation 316 ft)		$ 125,000

Train Control	$ 15,945,000
Roadway Crossings	$ 2,750,000
SUBTOTAL	$ 18,695,000
TOTAL with Contingency & Soft Costs	$ 24,303,500



MINIMUM PROGRAM

ACSES POSITIVE TRAIN CONTROL WITHOUT WAYSIDE SIGNALS

Milepost	Location	Feature	Cost (est.)
133.78	CP PHOEBE	CP (End of Line)	$ 75,000
133.52	CP PHOEBE	Snow Melters	$ 60,000
133.73	SCRANTON	Passenger Station	
133.52	CP SNOW	CP (End of Siding)	$ 900,000
133.52	CP SNOW	Snow Melters	$ 60,000
133.52	COMMUNICATIONS TOWER (Elevation 736 ft)		$ 125,000
133.33	BLOUNT	Electric Locked Switch	$ 130,000
133.19	WEST RECEIVER	Electric Locked Switch	$ 130,000
132.89	RADISSON	Electric Locked Switch	$ 130,000
132.63	EAST UNIVERSITY (3 TRACKS)	Roadway Crossing	$ 225,000
132.55	EAST RECEIVER	Electric Locked Switch	$ 130,000
132.00	1320/1321 Signal	ABS	$ 225,000
131.88	Tunnel West Portal 1	Hazard Detector	$ 140,000
131.88	Tunnel West Portal 2	Hazard Detector	$ 140,000
131.76	NAY AUG TUNNEL	Undergrade WiFI (792 ft)	$ 75,000
131.64	Tunnel East Portal	Hazard Detector	$ 140,000
131.35	MYRTLE ST (1 TRACK)	Roadway Crossing	$ 175,000
130.00	1300/1301 Signal	ABS	$ 225,000
128.00	1280 /1281 Signal	ABS	$ 225,000
126.00	1260/1261 Signal	ABS	$ 225,000
124.00	1240/1241 Signal	ABS	$ 225,000
122.00	1220/1221 Signal	ABS	$ 225,000
122.00	COMMUNICATIONS TOWER (Elevation 1187 ft)		$ 125,000
120.90	CP MOSCOW	CP (End of Siding)	$ 900,000
120.90	CP MOSCOW	Snow Melters	$ 60,000
132.55	FREIGHT HOUSE	Electric Locked Switch	$ 130,000
120.37	CP DALE	CP (End of Siding)	$ 900,000
120.37	CP DALE	Snow Melters	$ 60,000
118.00	1880/1881 Signal	ABS	$ 225,000
116.00	1600/1661 Signal	ABS	$ 225,000
114.00	1400/1441 Signal	ABS	$ 225,000
114.92	LEHIGH RD (1 TRACK)	Roadway Crossing	$ 175,000
122.00	COMMUNICATIONS TOWER (Elevation 1886 ft)		$ 125,000
112.00	1200/1201 Signal	ABS	$ 225,000
112.87	MAIN ST (1 TRACK)	Roadway Crossing	$ 175,000
110.00	1100/1101 Signal	ABS	$ 225,000
109.85	ARMY	Electric Locked Switch	$ 130,000
108.75	HAP	Electric Locked Switch	$ 130,000
108.00	1080/1081 Signal	ABS	$ 225,000
108.00	COMMUNICATIONS TOWER (Elevation 1968 ft)		$ 125,000
107.61	CHURCH ST (2 TRACKS)	RR Xing	$ 200,000
106.00	1060/1061 Signal	ABS	$ 225,000
104.00	1040/1041 Signal	ABS	$ 225,000
102.54	SUMMIT AV (2 TRACKS)	Roadway Crossing	$ 175,000
102.00	1020/1021 Signal	ABS	$ 225,000
101.00	COMMUNICATIONS TOWER (Elevation 1882 ft)		$ 125,000
101.45	MOUNT POCONO	PASSENGER STATION	
101.00	MILL	Electric Locked Switch	$ 130,000
98.00	980/981 Signal	ABS	$ 225,000
97.37	DEVIL'S HOLE (1 TRACK)	Roadway Crossing	$ 175,000
96.00	960/961 Signal	ABS	$ 225,000
94.15	BESTWAY	Electric Locked Switch	$ 130,000
94.00	940/941 Signal	ABS	$ 225,000
94.00	COMMUNICATIONS TOWER (Elevation 1200 ft)		$ 125,000
92.27	HENRY'S CROSSING RD (1 TK)	Roadway Crossing	$ 175,000
92.00	920/921 Signal	ABS	$ 225,000
90.17	BROWN HILL RD (1 TRACK)	Roadway Crossing	$ 175,000
90.00	900/901 Signal	ABS	$ 225,000
88.00	880/881 Signal	ABS	$ 225,000
87.00	COMMUNICATIONS TOWER (Elevation 558 ft)		$ 125,000
85.00	BOILER WEST	Electric Locked Switch	$ 130,000
85.00	850/851 Signal	ABS	$ 225,000
83.21	MILL CREEK RD (2 Tracks)	Roadway Crossing	$ 200,000
83.00	830/831 Signal	ABS	$ 225,000
82.44	BOILER EAST	Electric Locked Switch	$ 130,000
82.32	N COURTLAND ST (1 TRACK)	Roadway Crossing	$ 175,000
81.93	BROAD ST (1 TRACK)	Roadway Crossing	$ 175,000
81.90	CP HENWOOD	CP (End of Siding)	$ 900,000
81.90	CP HENWOOD	Snow Melters	$ 60,000
81.66	ANALOMINK ST (2 TRACKS)	Roadway Crossing	$ 200,000
81.60	EAST STROUDSBURG	PASSENGER STATION	
81.05	CP WARRIOR	CP (End of Siding)	$ 900,000
81.05	CP WARRIOR	Snow Melters	$ 60,000
81.00	810/811 Signal	ABS	$ 225,000
80.7	FORGE RD (1 TRACK)	Roadway Crossing	$ 175,000
80.00	COMMUNICATIONS TOWER (Elevation 350 ft)		$ 125,000
79.00	790/791 Signal	ABS	$ 225,000
78.60	WESTROCK	Electric Locked Switch	$ 130,000
77.83	RIVER RD	Roadway Crossing	$ 175,000
77.00	770/771 Signal	ABS	$ 225,000
75.00	750/751 Signal	ABS	$ 225,000
74.49	CHUCK (Connection to Lackawanna Cut-Off)	Electric Locked Switch	$ 130,000
73.00	730/731 Signal	ABS	$ 225,000
73.00	COMMUNICATIONS TOWER (Elevation 316 ft)		$ 125,000

Train Control	$ 14,545,000
Roadway Crossings	$ 2,750,000
SUBTOTAL	$ 17,295,000
TOTAL with Contingency & Soft Costs	$ 22,483,500


Scranton-New York Intercity Passenger Rail Analysis Infrastructure Assessment

3

Pocono Mainline Structures Assessment

4

Pocono Mainline Signals & Communications Assessment

Conceptual Scranton Station Plan & Profile

USING EXISTING PEDESTRIAN UNDERPASS

APPENDIX

1C

Pocono Mainline Track Chart

EXISTING CONDITIONS

APPENDIX

2A

Pocono Mainline Track Chart

ASSUMED IMPROVEMENTS

APPENDIX

2B

EXCERPTS FROM
1951 DL&WRR
Employee Timetable

APPENDIX

2C

Assumed Track Speed Improvements through Curves

WITH SUGGESTED SPECIAL INSTRUCTIONS FOR AMTRAK NORTHEAST CORRIDOR EMPLOYEE TIMETABLES

APPENDIX

2D

Assumed Track Speed Improvements through Curves

APPLIED TO 1914 DL&W RIGHT-OF-WAY AND TRACK MAPS

APPENDIX

2E

Pocono Mainline Track Cost Estimates

APPENDIX

2F

Pocono Mainline Structures Field Notes

APPENDIX

3A

Pocono Mainline Structures Cost Estimates

APPENDIX

3B

Pocono Mainline Signals & Communications Cost Estimates

APPENDIX

4A


Scranton-New York Intercity Passenger Rail Analysis Infrastructure Assessment