

Item #	Item	Description	Unit	QTY	
1 System Integrator Costs					
1A	Non-recurring engineering	detailed software simulation of network design w/coverage & throughput for Wayside Interface Units (WIU)	LS	1	\$525,000
1B	Field Installation	Installation of WIU hardware, software, electronics rack, antenna, cabling & labor	EA	110	\$5,775,000
1C	Wayside Equipment Costs	Wayside Interface Units	EA	110	\$4,042,500
		Wayside data radios & related software (license & communication manager)	EA	110	\$1,815,000
1D	Test Equipment & Special Tools		EA	1	\$131,250
1E	Testing	Testing from wayside to and from base station & testing from locomotive or cab car to & from wayside	LS	1	\$180,000
1F	Spare Equipment	PTC wayside data radios & related software (license & communication manager)	EA	5	\$78,750
		Wayside antennas, power supplies, cables & assemblies, etc.	EA	5	\$26,250
1G	Warranty	Warranties for components used wherever applicable	EA	1	\$100,000
1H	Oversight, PM, etc.		EA	1	\$4,367,822
	Subtotal				\$17,041,572
2 System Integrator Communication Component					
2A	Non-recurring engineering	Drive test radio coverage studies (wayside)and site surveys	LS	1	\$110,000
		Detailed software simulation of network design with coverage & throughput analysis	LS	1	\$275,000
2B	Field Installation: Labor, Equipment, & Miscellaneous material	Installation of base station kits (towers, base station antenna, radio enclosures, labor hours, building permits, cabling)	EA	15	\$2,145,000
		Installation of base station at initialization points for Wi-Fi (towers, antennas, radios, comm, backhaul, etc.)	EA	2	\$209,000
2C	Communication Equipment Costs	Base station kits (towers, base station antenna, radio enclosures, cables & accessories)	EA	15	\$1,764,000
		Base station at initialization points for Wi-Fi (towers, antennas, radios, comm, backhaul, etc.)	EA	2	\$84,000
		PTC base station data radio (license & communication manager)	EA	15	\$236,250
2D	Test Equipment & Special Tools		EA	1	\$105,000
2E	Testing	Testing from locomotive to cab and to and from base station	LS	1	\$120,000
2F	Spare Equipment	Base station PTC data radios	EA	2	\$31,500
		Wi-Fi base station equipment	EA	1	\$42,000
2G	Warranty		EA	1	\$105,000
2H	Oversight, PM, etc.		EA	1	\$1,801,323
	Subtotal				\$7,028,073
3 220 MHz Spectrum Acquisition Costs					
3A	Legal Services	Assist in securing bandwidth & licensing requirements	LS	1	\$52,500
3B	220MHz Spectrum Acquisition	Transaction price	LS	1	\$525,000
3C	Oversight, PM, etc.		EA	1	\$199,027
	Subtotal				\$776,527

4 System Integrator Back Office System					
4A	Non-recurring engineering	Engineering of network, planning, installation & maintenance planning	LS	1	\$1,050,000
4B	Field Installation	Installation costs for PTC server, Ethernet switches, laptops, etc.	EA	1	\$262,500
4C	Back office system equipment costs	PTC server, Ethernet switches, etc.	LS	1	\$525,000
4D	Test equipment & special tools		Lot	1	\$21,000
4E	Testing	Pre-testing back office system before commissioning	LS	1	\$450,000
4F	Spare equipment	back office servers & hardware	Lot	1	\$52,500
4G	Warranty	Warranties for components	EA	1	\$210,000
4H	Oversight, PM, etc.		EA	1	\$886,057
					\$3,457,057
5 System Integrator Onboard System					
5A	Non-recurring engineering	Integration, installation of PTC onboard system & interfaces	LS	1	\$546,000
		Detailed software tool design, simulation, throughput, analysis, etc.	LS	1	
5B	Field Installation	Installation costs for onboard equipment	EA	17	\$535,000
5C	Onboard system equipment costs	Onboard material kits	EA	17	\$981,750
		PTC 220 MHz data radio onboard vehicles	EA	17	\$267,750
5D	Tool equipment & special tools	System simulator, portable test equipment	EA	1	\$131,250
5E	Testing	Shop qualification testing for integrated onboard PTC system	EA	17	\$204,000
		Installed qualification testing for onboard PTC system in cab car			
		Installed qualification testing for onboard PTC system in locomotive			
5F	Spare Equipment	PTC data radio onboard vehicle	EA	5	\$78,750
		Onboard material kits	EA	1	\$52,500
5G	Warranty	Warranties of components	EA	1	\$105,000
5H	Oversight, PM, etc.		EA	1	\$1,000,304
					\$3,902,304
6 System Integrator FRA Documentation & Technical Support					
6A	System integrator safety documentation	PTC development plan	LS	1	\$480,000
		PTC development plan modifications			
		PTC Safety plan			
		PTC Safety plan modifications			
6B	Oversight, PM, etc.		EA	1	\$165,425
					\$645,425
7 System Integrator Training DART staff & Contract Operator					
7A	Wayside system	Materials	LS	1	\$52,500
		Training type	course		
7B	Back Office system	Materials	LS	1	\$52,500

		Training type	course		
7C	Onboard system	Materials	LS	1	\$52,500
		Training type	course		
7D	Communication system		EA	1	\$52,500
7E	Oversight, PM, etc.				\$72,373
					\$282,373
8	System Integrator Project Admin, G&A, insurance, etc.				
8A	Project Administration		LS	1	\$1,092,000
8B	G & A		LS	1	\$1,684,480
8C	Bonding & insurance		LS	1	\$200,000
8D	System Integrator		LS	1	\$1,203,200
8E	Oversight, PM, etc.				\$1,440,465
					\$5,620,145
9	DART Project Supplemental Costs: Contract Operator Support				
9A	Intergrated PTC system testing	Full line check	HR	2000	\$210,000
9B	Hi-rail test vehicle testing	Hi-rail vehicle & operator costs	Days	20	\$21,000
9C	Oversight, PM, etc.				\$79,611
					\$310,611
	Escalation				\$1,854,435
	Risk Factor				\$4,635,992
					Total for Complete PTC Project
					\$45,554,514
					Funding requested for items 1,2,3 that impact/benefit Amtrak
					\$24,846,172
					54.54%
					Difference (Local Match)
					\$20,708,342
					45.46%