Intermediate Scale Wayside Power



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We need to take power from solar and put it into powering our vehicles.



Catenary systems are messy and batteries are limited.





Wayside power is a power pickup system.



Our design is based on the 4th rail system.



Wayside Power Design Breakdown



Our Main Objective was to Provide the Propulsion, Steering, Braking, and Active Suspension with 48V



Collector Shoe Must be in Constant Contact with the Current and Return Rails



The Wayside System Must be Modular and Mobile



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Reduce the Risk of Electrical Shock



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Our First Attempt at Pipe Bending Was a Disappointment



After Several Iterations We Arrived at a Reliable Method for Bending Pipes



3D Printing Turned Out to be Expensive and Unreliable



The Wooden Brackets Required a New Design to Increase Structural Strength





Cutting Slots in our Pipes was a Very Involved Process





After Using a Table Saw and a Pneumatic Saw the Pipe Cutting was Finished with a Rotary Tool



Changes to Budget and Design Goals Required a New Solution for Conductive Rail Material



We Fabricated our own Conductive Rails to Save Money





Our overall cost for the project

DETAILED BILL OF MATERIAL (BoM)														
No		MATERIAL	QTY	PRICE \$	MANUFACTURER	SUPPL	TOT	FAL COST \$						
1	1" X 10 FT	PVC SCHEDULE 40 CONDUIT PIPE	40	\$ 3.17	JM EAGLE	THE HOME	DEPOT	\$	126.80					
2	FAST DRY 10.1 OZ.	TOTAL CO	ST	Ś 6	54.30	DEPOT	\$	49.92						
3	200FT OF 4 GUAG		· · ·		Ý V	0 1100	DEPOT	\$	278.00					
4	WOOD	TAXES (~10	J%)		Ş	65.43	DEPOT	\$	14.85					
5	SPRI	GRAND TO	тΔι		\$ 7	19 73		\$	5.74					
6		GRAND TO		,	γ,	15.75	Ļ	\$	100.00					
7		PNEUATIC SAW	1	\$ 78.99	-	AMAZ	ON	Ś	78.99					
						TOTAL	COST	\$	654.30					
						TAXES (^	~10%)	\$	65.43					
				GRAND	TOTAL	\$	719.73							

We successfully designed a new method to power the Spartan Superway





We learned time management and communication are very important

Wayside Rail	Start Date	End Date	Time (Days)	%	Team	Alt Color	Dec-20	Deo-26	Jan-1	Jan-7	Jan-13	Jan-19	Jan-25	Jan-31	Feb-8	Feb-12	Feb-18	Feb-24	Mar-1	Mar-7	Mar-13	Mar-19	Mar-26	Mar-31	Apr-8	Apr-12	Apr-18	Apr-24	Apr-30 I	May-8 I	May-12 M	lay-18
Part Purchasing	20-Dec	20-Apr	122	100	All																											
Purchase	20-Dec	20-Apr	122	100	All																											
Fabrication	10-Feb	27-Mar	46	100	All																											
Bend PVC Pipes	10-Feb	30-Mar	49	100	All																											
Supports Brack et	1-Apr	14-Apr	13	100	All																											
Collector Shoe	1-Apr	14-Apr	13	100	All																											
Flatten Wires	31-Mar	15-Apr	15	100	All																											
Assemble Parts	15-Mar	17-Apr	33	100	All																											
Assemble Wayside Tracks	15-Mar	17-Apr	33	100	All																											
Integration	28-Mar	20-Apr	23	1	All																											
Integrate Wayside with New Track	28-Mar	15-May	48	1	All																											
Integrate Collector Shoe with Bogie	28-Mar	15-May	48	1	All																											
Testing/Debugging and Integration of Solar	2-Apr	22-Apr	20	100	All																											
Testing Wayside	8-Apr	17-Apr	9	100	All																											
Debugging (Tentative)	15-Apr	20-Apr	5	1	All																											
Final Touches	15-Apr	17-May	32	1	All																											

Next Steps would be to integrate solar energy to power the wayside rail



Further Recommendation is to use a third rail configuration



Our design was able to intensify the power supplying method for sustainable transportation





Thank you for your time



