



# Railroad Engineering & Construction Cost Benchmarks

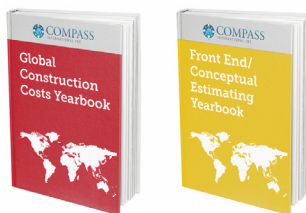
## USA Location - 2017 Cost Basis:

New & Refurbished High Speed Rail Track costs per Mile / Km, Traffic Control Systems, Signals, Freight Siding Cost Metrics, Detailed Design & Construction Management / Inspection historical benchmarks.

| New Railroad Costs:  | \$ Low Cost per Mile | \$ High Cost per Mile | \$ Low Cost per Km | \$ High Cost per Km |
|--|----------------------|-----------------------|--------------------|---------------------|
| High speed single track on new stone railroad stone bed      | 1,595,000            | 1,815,000             | 996,875            | 1,134,375           |
| High speed single track on existing stone railroad stone bed | 1,265,000            | 1,485,000             | 790,625            | 928,125             |
| High speed double track on new stone railroad stone bed      | 2,310,000            | 2,640,000             | 1,443,750          | 1,650,000           |
| High speed double track on existing stone railroad stone bed | 2,200,000            | 2,530,000             | 1,375,000          | 1,581,250           |
| Install a Centralized traffic control system - single track  | 247,500              | 302,500               | 154,685            | 189,065             |
| Install a Centralized traffic control system - double track  | 357,500              | 412,500               | 223,450            | 257,825             |
| Track Repairs / Improvements                                 | \$ Low Cost per Mile | \$ High Cost per Mile | \$ Low Cost per Km | \$ High Cost per Km |
| 25% replace timber railroad ties & stone                     | 220,000              | 330,000               | 137,500            | 206,250             |
| 50% replace timber railroad ties & stone                     | 330,000              | 440,000               | 206,250            | 275,000             |
| 75% replace timber railroad ties & stone                     | 440,000              | 550,000               | 275,000            | 343,750             |
| 25% replace PCC railroad ties & stone                        | 275,000              | 385,000               | 171,875            | 240,625             |
| 50% replace PCC railroad ties & stone                        | 385,000              | 495,000               | 240,625            | 309,375             |
| 75% replace PCC railroad ties & stone                        | 495,000              | 605,000               | 309,375            | 378,125             |
| Chain link fencing 8' high(includes both sides)              | 165,000              | 220,000               | 103,125            | 137,500             |
| Individual Items   | \$ Low Cost          | \$ High Cost          |                    |                     |
| High speed turnout - Each                                    | 605,000              | 848,750               |                    |                     |

|  |               |               |
|--|---------------|---------------|
| Freight / Passenger siding 1 to 2.5 miles in length - Each                               | 1,650,000     | 3,425,000     |
| Signals - Each   | 2,950         | 8,835         |
| Crossing barrier / gate - Each   | 11,000        | 22,500        |
| Road bed stone ballast 1" to 1.50" cost per ton (supply only) - Ton                      | 30.25         | 42.25         |
| Rail 100 pound LF (supply only) - Lin Ft   | 33.15         | 39.25         |
| Pre-Cast Concrete (PCC) ties, 8'6" long x 15" wide x 10" deep -each (supply only) - Each | 185           | 235           |
| Timber railroad ties, pressured treated 8'6" x 8" x 6" (supply only) - each              | 74.25         | 98.25         |
| Tie plates - each (supply only)  | 10.75         | 14.25         |
| Track bolts - each (supply only)   | 3.55          | 5.15          |
| Rail spikes - each (supply only)   | 1.045         | 1.45          |
| Rail stop - each (supply only)   | 950           | 1,500         |
| Resurface & re-align existing single line track - LF                                     | 19.25         | 28.25         |
| <b>Detailed Design and Construction Management Fees</b>                                  | <b>Low %</b>  | <b>High %</b> |
| Detailed Design  | 5.25%         | 7.50%         |
| Construction Management and Inspection   | 3.50%         | 4.75%         |
| Owner Engineering / Oversight  | 1.25%         | 2.25%         |
| <b>Total</b>   | <b>10.00%</b> | <b>14.50%</b> |

If you have any questions or comments on this cost per square foot & square meter benchmark report please contact:  
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