

The Liverpool & Manchester Railway: Construction

The Museum of Science and Industry in Manchester occupies much of the former Liverpool Road Station site, which was built as the Manchester terminus of the Liverpool & Manchester Railway (L&MR). When the L&MR opened in 1830, it became the world's first purpose-built passenger railway.

Planning the Railway

By 1820, the canals and roads serving Manchester were inadequate for the volume of trade created by rapid industrial expansion. Liverpool, the port of entry for American raw cotton, was the major transshipment point for Manchester's trade. Consequently, Manchester manufacturers and Liverpool merchants were united in the desire to improve the flow of trade. In 1822, a committee was set up to promote the construction of a railway between the two towns.

The first step was to survey the route. William James, one of the initiators of the Railway, took on this task, but initial progress was slow. In 1824, George Stephenson was appointed as Engineer and took over the surveying. As the engineer of the nearly complete Stockton and Darlington Railway and an experienced locomotive builder, Stephenson was an obvious choice. Meanwhile, the Railway Committee rallied support for the venture to counter the considerable opposition from landowners, farmers, canal operators and road carriers.

In February 1825, the Committee successfully petitioned Parliament for the introduction of a private bill. Unfortunately, close examination by the parliamentary committee revealed serious flaws in Stephenson's survey and the Bill was withdrawn. Stephenson was replaced by George and John Rennie, who appointed Charles Vignoles to carry out a new survey. The second Bill was introduced in February 1826, approved by Parliament and given royal assent in May.

Construction

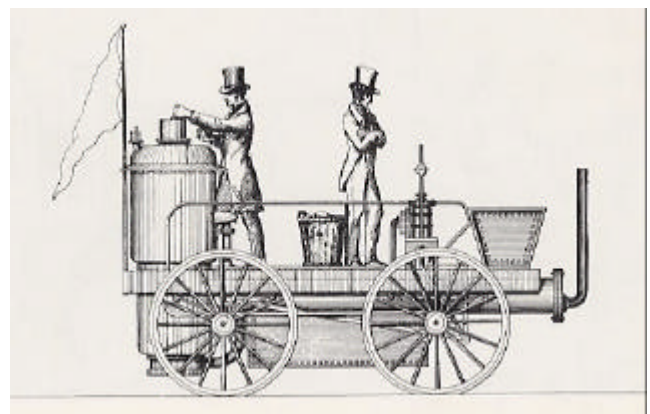
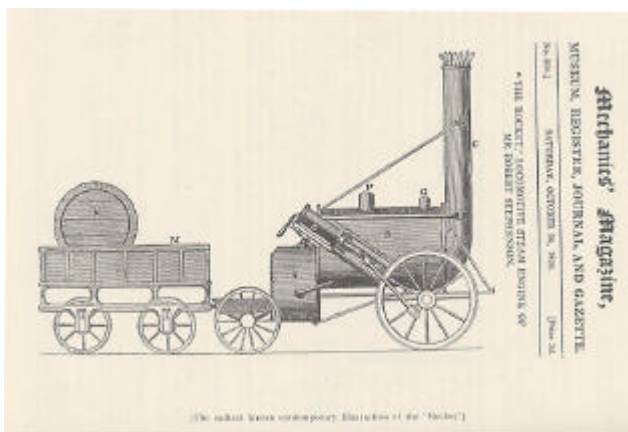


In spite of the failure of his survey, George Stephenson was appointed as Chief Engineer to the L&MR Company. Construction work began in the summer of 1826. Although the land between Manchester and Liverpool is fairly flat, the route involved about nine miles of embankment, 13 miles of cutting and the construction of 63 bridges. The most dramatic feature of the railway was the 18m (60ft) high Sankey Viaduct, designed by Jesse Hartley.

However, the biggest challenge was the 6.5-kilometre (4-mile) crossing of Chat Moss, a 2,000-hectare (5,000-acre) stretch of peat marsh. Giving evidence for the opponents of the first Bill, the civil engineer Francis Giles remarked that 'no engineer in his senses would go through Chat Moss'. The original intention was to drain a tract of marsh and stabilise it by the tipping of spoil. When this failed, the solution was to create a 'floating' bed of larch trunks and branches, covered with brushwood, heather and moss, and topped with a layer of earth, sand, shingles and cinders. The construction of this stretch of track took three and a half years.

The Rainhill Trials

The L&MR Company had favoured some form of steam propulsion from the beginning, but delayed making a decision for as long as possible. Essentially, the choice lay between horse traction, stationary engines with rope haulage, steam locomotives or a combination of these methods. Stephenson argued strongly that a stationary engine solution would be both expensive, given the number required, and risky, given that the failure of any one engine would stop all traffic. Finally, in April 1828 the directors decided to resolve the issue by holding a competition to find a 'Locomotive engine which shall be a decided improvement on those now in use', with a prize of £500 for the winner.



Novelty

The competition entrants were tested at Rainhill in October 1829. There were four steam locomotives: *Rocket*, *Novelty*, *Sans Pareil* and *Perseverance*. The entry list was completed by *Cycloped*, powered by two horses, and the *Manumotive Carriage*, powered by two men. Each locomotive was required to haul three times its own weight over a distance of 70 miles (112km), in the form of 20 return trips, and at a speed of at least 10 miles (16km) per hour. The Rainhill Trials attracted huge crowds, estimated at in excess of 10,000 people. Braithwaite and Ericsson's *Novelty* was the public's favourite, but the clear winner was Stephenson's *Rocket*, the only entrant to satisfy all of the requirements. This was enough to convince the Directors to adopt steam locomotives for the L&MR.

For more information:

- Read** Carlson, Robert E. *The Liverpool and Manchester Railway Project, 1821-1831*. Newton Abbot, UK: David & Charles, 1972.
 Thomas, Ronald H. G. *The Liverpool and Manchester Railway*. London: B. T. Batsford, 1980.
- Visit** The Museum's *Liverpool and Manchester Railway Exhibition* in the former Second Class Booking Hall of the Station Building.