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The Beginnings of American Railroads and Mapping

Railways were introduced in England in the seventeenth century as a way to reduce friction in moving heavily loaded wheeled vehicles. The first North American "gravity road," as it was called, was erected in 1764 for military purposes at the Niagara portage in Lewiston, New York. The builder was Capt. John Montessor, a British engineer known to students of historical cartography as a mapmaker.

Surveying and mapping activities flourished in the United States as people began moving inland over the inadequately mapped continent. The settlement of the frontier, the development of agriculture, and the exploitation of natural resources generated a demand for new ways to move people and goods from one place to another. Privately owned toll or turnpike roads were followed first by steamships on the navigable rivers and by the construction of canals and then in the 1830s by the introduction of railroads for steam-powered trains.^[1]

The earliest survey map in the United States that shows a commercial "tramroad" was drawn in Pennsylvania in October 1809 by John Thomson and was entitled "Draft Exhibiting . . . the Railroad as Contemplated by Thomas Leiper Esq. From His Stone Saw-Mill and Quarries on Crum Creek to His Landing on Ridley Creek." Thomas Leiper was a wealthy Philadelphia tobacconist and friend of Thomas Jefferson, who owned stone quarries near Chester. Using his survey map, Thomson helped Reading Howell, the project engineer and a well-known mapmaker, construct the first practical wooden tracks for a tramroad. Thomson was a notable land surveyor



Right Half of James Hayward's 1828 plan of a survey for the proposed Boston and Providence Railway. This is the earliest topographic strip map in the Library showing a railroad survey. These lines were originally intended for horse drawn trains.

who earlier had worked with the Holland Land Company. He was the father of the famous civil engineer and longtime president of the Pennsylvania Railroad, John Edgar Thomson, who was himself a mapmaker. In 1873 the younger Thomson donated his father's 1809 map to the Delaware County Institute of Science to substantiate the claim that the map and Leiper's railroad were the first such work in North America.[2]

In 1826 a commercial tramroad was surveyed and constructed at Quincy, Massachusetts, by Gridley Bryant, with the machinery for it developed by Solomon Willard. It used horsepower to haul granite needed for building the Bunker Hill Monument from the quarries at Quincy, four miles to the wharf on the Neponset River.[3]

These early uses of railways gave little hint that a revolution in methods of transportation was underway. James Watt's improvements in the steam engine were adapted by John Fitch in 1787 to propel a ship on the Delaware River, and by James Rumsey in the same year on the Potomac River. Fitch, an American inventor and surveyor, had published his "Map of the Northwest" two years earlier to finance the building of a commercial steamboat. With Robert Fulton's *Clermont* and a boat built by John Stevens, the use of steam power for vessels became firmly established. Railroads and steam propulsion developed separately, and it was not until the one system adopted the technology of the other that railroads began to flourish.

John Stevens is considered to be the father of American railroads. In 1826 Stevens demonstrated the feasibility of steam locomotion on a circular experimental track constructed on his estate in Hoboken, New Jersey, three years before George Stephenson perfected a practical steam locomotive in England. The first railroad charter in North America was granted to Stevens in 1815.[4] Grants to others followed, and work soon began on the first operational railroads.



First edition of G.K. Warren's "hurried compilation," indicating the routes of the Pacific railroad surveys. The map was appended to the U.S. War Department's official report to Congress. (1857)

Surveying, mapping, and construction started on the Baltimore and Ohio in 1830, and fourteen miles of track were opened before the year ended. This roadbed was extended in 1831 to Frederick, Maryland, and, in 1832, to Point of Rocks. Until 1831, when a locomotive of American manufacture was placed in service, the B & O relied upon horsepower.

Soon joining the B & O as operating lines were the Mohawk and Hudson, opened in September 1830, the Saratoga, opened in July 1832, and the South Carolina Canal and Rail Road Company, whose 136 miles of track, completed to Hamburg, constituted, in 1833, the longest steam railroad in the world. The Columbia Railroad of Pennsylvania, completed in 1834, and the Boston and Providence, completed in June 1835, were other early lines. Surveys for, and construction of, tracks for these and other pioneer railroads not only created demands for special mapping but also induced mapmakers to show the progress of surveys and completed lines on general maps and on maps in "travelers guides".

Planning and construction of railroads in the United States progressed rapidly and haphazardly, without direction or supervision from the states that granted charters to construct them. Before 1840 most surveys were made for short passenger lines which proved to be financially unprofitable. Because steam-powered railroads had stiff competition from canal companies, many partially completed lines were abandoned. It was not until the Boston and Lowell Railroad diverted traffic from the Middlesex Canal that the success of the new mode of transportation was assured. The industrial and commercial depression and the panic of 1837 slowed railroad construction. Interest was revived, however, with completion of the Western Railroad of Massachusetts in 1843. This line conclusively demonstrated the feasibility of transporting agricultural products and other commodities by rail for long distances at low cost.

Early railroad surveys and construction were financed by private investors. Before the 1850 land grant to the Illinois Central Railroad, indirect federal subsidies were provided by the federal government in the form of route surveys made by army engineers. In the 1824 General Survey Bill to establish works of internal improvements, railroads were not specifically mentioned. Part of the appropriation under this act for the succeeding year, however, was used for "Examinations and surveys to ascertain the practicability of uniting the head-waters of the Kanawha with the James river and the Roanoke river, by Canals or Rail-Roads."[\[5\]](#)

In his *Congressional History of Railways*, Louis H. Haney credits these surveys as being the first to receive federal aid. He </collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/notes/> that such grants to states and corporations for railway surveys became routine before the act was repealed in 1838.

The earliest printed map in the collections of the Library of Congress based on government surveys conducted for a state-owned railroad is "Map of the Country Embracing the Various Routes Surveyed for the Western & Atlantic Rail Road of Georgia, 1837". The surveys were made under the direction of Lt. Col. Stephen H. Long, chief engineer, who ten years earlier had surveyed the routes for the Baltimore and Ohio[\[6\]](#). Work on the 138-mile Georgia route from Atlanta to Chattanooga started in 1841, and by 1850 the line was open to traffic. Its strategic location made it a key supply route for the Confederacy. It was on this line that the famous "Andrews Raid" of April 1862 occurred when Union soldiers disguised as railroad employees captured the locomotive known as the *General*.[\[7\]](#)