

Early Canal Projects in the UK

Introduction

This paper does not seek to analyze the problem of inaccurate estimates and poor project cost control identified in ***Cost Overruns on Early Canal & Railway Projects***¹, rather its focus is to look at some of the earliest canal and *navigation* projects constructed in the United Kingdom. Where possible the contractual and management processes used in their construction will be identified.

The commercial benefit of water transport has been clearly understood for centuries; Adam Smith, in his *Wealth of Nations* (1776) wrote: “As by means of water-carriage a more extensive market is opened to every sort of industry than what land carriage alone can afford, so it is upon the sea coast, and along the banks of navigable rivers that industry of every kind naturally begins to subdivide and improve itself, and it is frequently not till a very long time after those improvements extend themselves to the inland parts of the country. A broad wheeled wagon attended by two men, and drawn by eight horses, in about six weeks time carries and brings back between London and Edinburgh near four ton weight of goods. In about the same time a ship navigated by six or eight men, and sailing between the ports of London and Leith, frequently carries and brings back two hundred ton weight of goods. Six or eight men, therefore, by the help of water carriage, can carry and bring back in the same time the same quantity of goods between London and Edinburgh, as fifty broad wheeled wagons attended by a hundred men and four hundred horses.”

This paper looks at a sample of the projects undertaken before, and during the peak period for constructing river navigations which was from around 1680 to 1756, and new canal construction from the 1770s through to the 1830s. From the 1840s, competition from steam powered railways caused a steady decline in canal usage and profitability with commercial traffic largely extinct by the 1930s².

Engineering early canal projects

As discussed in ***The Origins and History of Cost Engineering***³, the building of canals and navigations⁴ involved significant engineering and surveying challenges to identify a viable route with manageable gradients and then cost the engineering works needed to deliver the project. On the earliest of the projects discussed below, this was very much dependent on the skills of the engineer appointed to undertake the work.

In the case of navigations, to a large extent the route and gradient was determined by the river or stream that was being made navigable. The shift to building true canals that were routed away from, and between,

¹ For a discussion on the cost issues experienced on railway projects at the start of the industrial revolution see ***Cost Overruns on Early Canal & Railway Projects***:

https://mosaicprojects.com.au/PDF_Papers/P207_Canal+Wagonway_Cost_Overruns.pdf

² To see the events discussed in this paper in a comprehensive historical timeline download ***Project Management - A Historical Timeline***:

https://mosaicprojects.com.au/PDF_Papers/P212_Historical_Timeline.pdf

³ Download ***The Origins and History of Cost Engineering***:

https://mosaicprojects.com.au/PDF_Papers/P207_Cost_History.pdf

⁴ Navigations were generally improvements to natural rivers to allow navigation by commercial craft.

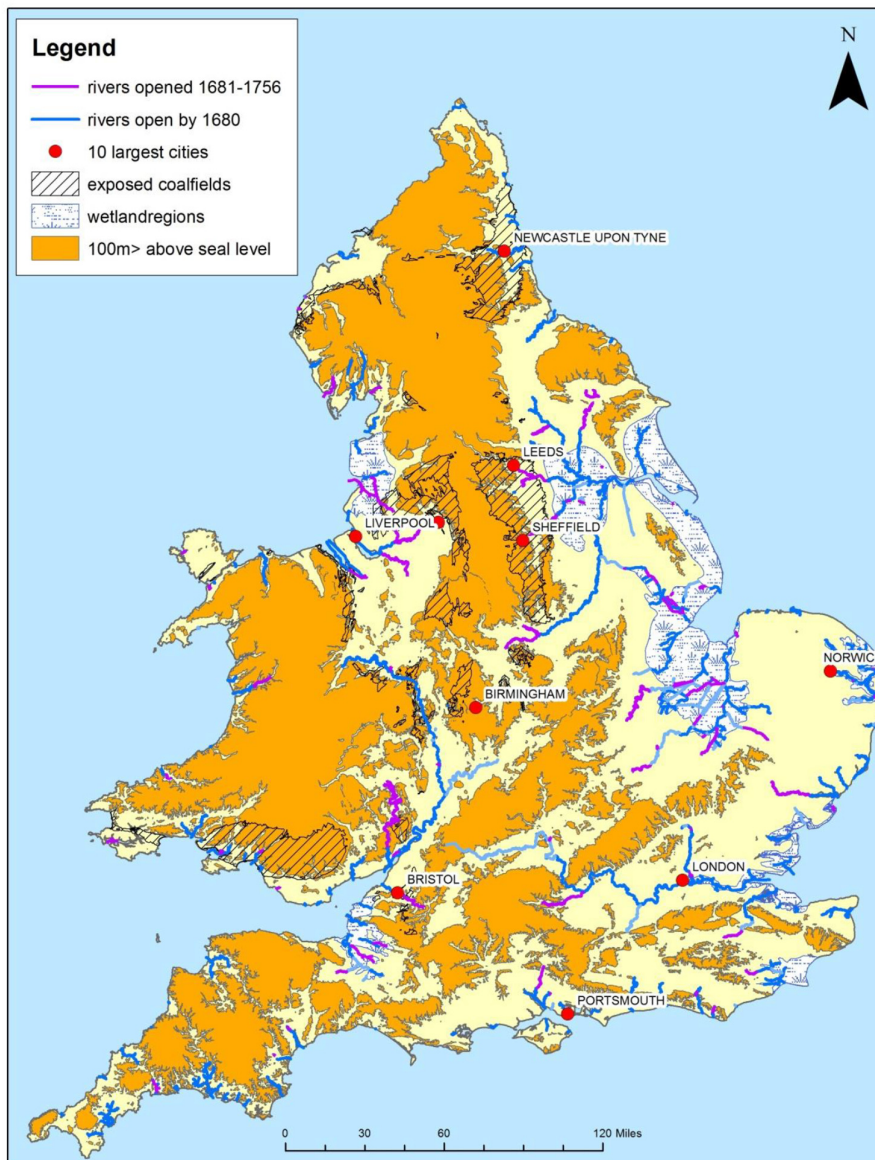


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rivers, added significant additional challenges for the engineer to determine the optimum route, identify water sources for the top levels, and then design the canal to operate efficiently.

The use of natural rivers for trade peaked in the 13th century, followed by a period of decline in both extent and quality through to 1600. Human interference appears to be a central cause of this contraction in navigable rivers including the construction of mill weirs, bridges, and agriculture affecting siltation. Despite this decline, the waterways and coastal shipping remained important to the growth of centers such as London.

From 1601 to 1680 the network of navigable rivers in England and Wales started to expand, with the transport of coal being one of the major factors driving the expansion. But despite many proposals approved by legislation, the actual level of river improvement achieved by 1680 was still relatively modest,



with most projects geographically concentrated in the south and east of England and only of local importance.

This changed in the period from 1681 to 1756, with river navigations extending across England and Wales. New navigable drainage channels were cut and old water courses upgraded with many rivers being returned to their 13th century status. These river navigations carried coal, manufactured goods, and agricultural produce in steadily increasing quantities to supply the growing towns and metropolitan centers.

By 1756 the stock of economically significant rivers that could easily be made navigable was dwindling, with most of the viable linkages between resource centers, markets, and/or ports having been constructed.

The first proper canal, opened in 1757⁵.

⁵ This section is a brief summary of *Navigable waterways and the economy of England and Wales: 1600-1835*, Max Satchell. Download from:

https://mosaicprojects.com.au/PDF_Papers/P207_Navigable_waterways_of_England_and_Wales.pdf

Early canals & navigations

Until the industrial revolution, proper canals were not particularly important in the UK, most waterborne transport used the sea, natural rivers, and from the 17th century, enhanced river *navigations*. Most of the significant developments in true canal construction occurred in China and Europe⁶. The pound lock which is still in use today is said to have been invented in China by Chhiao Wei-Yo, in the year 983, and the miter gate, an important part of many canal locks, is credited to Leonardo Da Vinci (1452 - 1519)⁷.

Roman canals

The earliest canals in the UK were integrated with natural rivers. The earliest example that is still largely intact, is the Fossdyke (or Foss Dyke), built by the Romans in around 120 AD, to connect the River Witham to the River Trent for both drainage and navigation⁸. After the departure of the Roman army the works decayed until the channel was scoured out in 1121 during the reign of Henry I. Over the next few centuries, the Fossdyke silted up several more times becoming almost unusable until cleansed again.

From 1620 on, the Fossdyke is recorded as being privately owned; it changed hands several times but was never profitable. It was not until 1744, when Richard Ellison created and maintained a reliable channel that profits started to flow⁹. During the canal boom, Fossdyke generated £3000 per year, mainly from the transport of coal, but there is little information on the costs of cleaning and rebuilding¹⁰. As with most projected in this era, the work seems to have been directed by the owner for his personal benefit.

The Romans also constructed the Caer (or Car), an 80-mile-long (128km) water channel that runs from Cambridge to Lincoln, crossing through Peterborough, connecting the fenlands of Cambridgeshire and Lincolnshire with the major Roman markets of Lincoln and York. The canal was constructed around AD 125 during the reign of Emperor Hadrian, for drainage, and presumably commerce. Excavations in 1990 uncovered the remains of Roman boats, cargo pottery and coal from the Midlands in one section. Today, this structure only remains as a drainage ditch.

In the absence of locks, the Roman canals needed generally flat land allowing very shallow gradients and a smooth flow of water.

Middle level navigations

The Middle Level Navigations continued efforts to drain the fens. They are a network of waterways primarily used for land drainage, which lie in The Fens between the Rivers Nene and Great Ouse, and

⁶ For more on the first few thousand years of development in Europe and Asia see: ***The First Canals***: https://mosaicprojects.com.au/Mag_Articles/AA036_The_First_Canals.pdf

⁷ For more on the development of the technology used by canal builders see ***Early Canals, The Evolution of the Technology***: https://mosaicprojects.com.au/Mag_Articles/AA035_Early_Canals_The_Technology.pdf

⁸ The use of the dykes as transport routs by the Romans is questioned by some historians due to the lack of evidence. Others point to the widespread use of barges by the Romans to transport goods in Europe and the routing of the dykes to suggest it is highly unlikely the Romans would have ignored this simple and efficient means of transporting cargo.

⁹ Fossdyke is still used as a navigable waterway, see: <https://canalrivertrust.org.uk/enjoy-the-waterways/canal-and-river-network/fossdyke-navigation>

¹⁰ Rethinking the Industrial Revolution: Five Centuries of Transition from Agrarian to Industrial Capitalism in England. By Michael Andrew Žmolek: <https://books.google.com.au/books?id=-RKaAAAQBAJ>



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between the cities of Peterborough and Cambridge. The first part of the navigations was started in 1480, when the Bishop of Ely, John Morton, constructed a 12-mile (19 km) straight cut from Stanground to Guyhirne to provide the waters of the River Nene with a more direct route to the sea.

The Middle Level was given its name by the Dutch engineer Cornelius Vermuyden in 1642, who subsequently constructed several drainage channels to make the area suitable for agriculture. Water levels were always managed to allow navigation, and Commissioners were established in 1754 to maintain the waterways and collect tolls from commercial traffic. Today, the navigations are managed by the Middle Level Commissioners, who are responsible for about 120 miles (190 km) of waterway, of which around 100 miles (160 km) are navigable. The Commissioners are also responsible for six locks and a number of pumping stations, and are the fourth largest navigation authority in Great Britain¹¹.

Early canalized rivers

In the post-medieval period, some rivers were canalized to enhance, or extend the use of boat traffic to transport goods. These are generally called *navigations*, but the term is applied inconsistently.

The Exeter Ship Canal is a canal leading from (and beside) the River Exe to Exeter Quay in the city of Exeter, Devon, England. Exeter is situated some 9 miles inland from the sea, on the river Exe. From its founding in Roman times, the River Exe was tidal and navigable up to the city walls and Exeter was a busy port. This navigation was closed by the construction of a weir to power a watermill in the 1270s. The navigation was reopened from 1290, only to be blocked again by a new weir built in 1317. For the next 250 years the city petitioned the King to have the waterway reopened, but it was not until 1550 that Edward VI finally granted permission. But by then it was too late, the river channel had silted up.

In 1563, Exeter traders employed John Trew of Glamorgan to build a canal to bypass the weirs and rejoin the River Exe in the center of the city where a quay would be built. Work began in February 1564, and was completed in Autumn 1566 or early 1567. This was the first canal built in England since the Roman times and remains in use today. The original canal had three locks with vertical gates; these were the first pound locks to be built in Britain.



An example of a vertical lock gate

This first canal could only be entered at certain states of the tide, so in 1677 the canal was extended and the entrance was moved downstream to Topsham. Then in 1701 the canal was deepened and widened to

¹¹ For more on the Middle Level Navigations see: https://en.wikipedia.org/wiki/Middle_Level_Navigations

allow the passage of ocean-going ships up to 200 tons deadweight. At the same time the number of locks on the canal was reduced to one¹². The final deepening and widening of the canal occurred in the 1830s¹³.

Records of the time suggest that John Trew was paid his expenses for the canal rather than a contract price. The later extensions, improvements and deepening needed to make the canal viable, were estimated, but the works were delayed and the subject of fraud and other challenges making any cost comparison immaterial.

The River Welland, in Lincolnshire, was another of the rivers on which improvements were authorized by an act of Parliament during the reign of Queen Elizabeth I. The Act was granted in 1571, but there is no evidence that any work was carried out under the terms of the act. The powers were revived in 1620, when Stamford Corporation was given permission to build a new artificial cut, which would run from the eastern edge of Stamford, to Market Deeping, where it would rejoin the river.

The corporation estimated that it would cost £2,000 to carry out the work, and the act enabled them to charge tolls for its use, set initially at three pence per lock. The decision was ratified in 1623 by a grant of James I, and the corporation expected to have the work completed by 1627. However, they were unable to find a suitable contractor to carry out the work.

The corporation failed to reach agreement on terms with David Cecil in 1636, and two other potential contractors after that. Nothing happened until 1664, when an Alderman from Stamford called Daniel Wigmore took the job. He built the cut and 12 locks, which included the High Lock and the Low Lock on the river at Deeping St James, at a cost of £5,000. The length of the cut was 6.5 miles (10.5 km), although the length of the canal is usually quoted as 9.5 miles (15.3 km), to include the improved river sections at both ends. When it was opened in 1670, the cut was the longest canal with locks in the country. In return for his expenditure, Wigmore was given the lease of the tolls for the next 80 years, for which he paid a rent of one shilling. Despite the cost increase from £2,000 to £5,000, the canal was very profitable for many years enabling trade between The Wash and Stamford, a distance 34 miles (55 km), the lower 24.4 miles (39.3 km) using the course of the Welland river¹⁴.

The concept of improving the navigability of rivers continued intermittently, mainly determined by the suitability of the waterways. For example, the **Aire and Calder Navigation** was approved in 1699 and first opened in 1704. These canalized sections of the Rivers Aire and Calder in West Yorkshire, England were progressively improved and continued in commercial use through to 1986.

Examples of some early 'true' canals¹⁵

The canal projects discussed in Cost Overruns on Early Canal & Railway Projects, were some of the first true canals constructed in the UK. Their construction occurred in the same general timeframe as the first part of the industrial revolution.

Richard Arkwright is credited with building the prototype of the modern factory in 1769 when he established Cromford Mill as the world's first water-powered cotton spinning mill. Water powered factories

¹² *Exeter Ship Canal, The First Four Hundred Years*. www.exeter.gov.uk.

¹³ See: <https://www.friendsofexetershipcanal.co.uk/history>

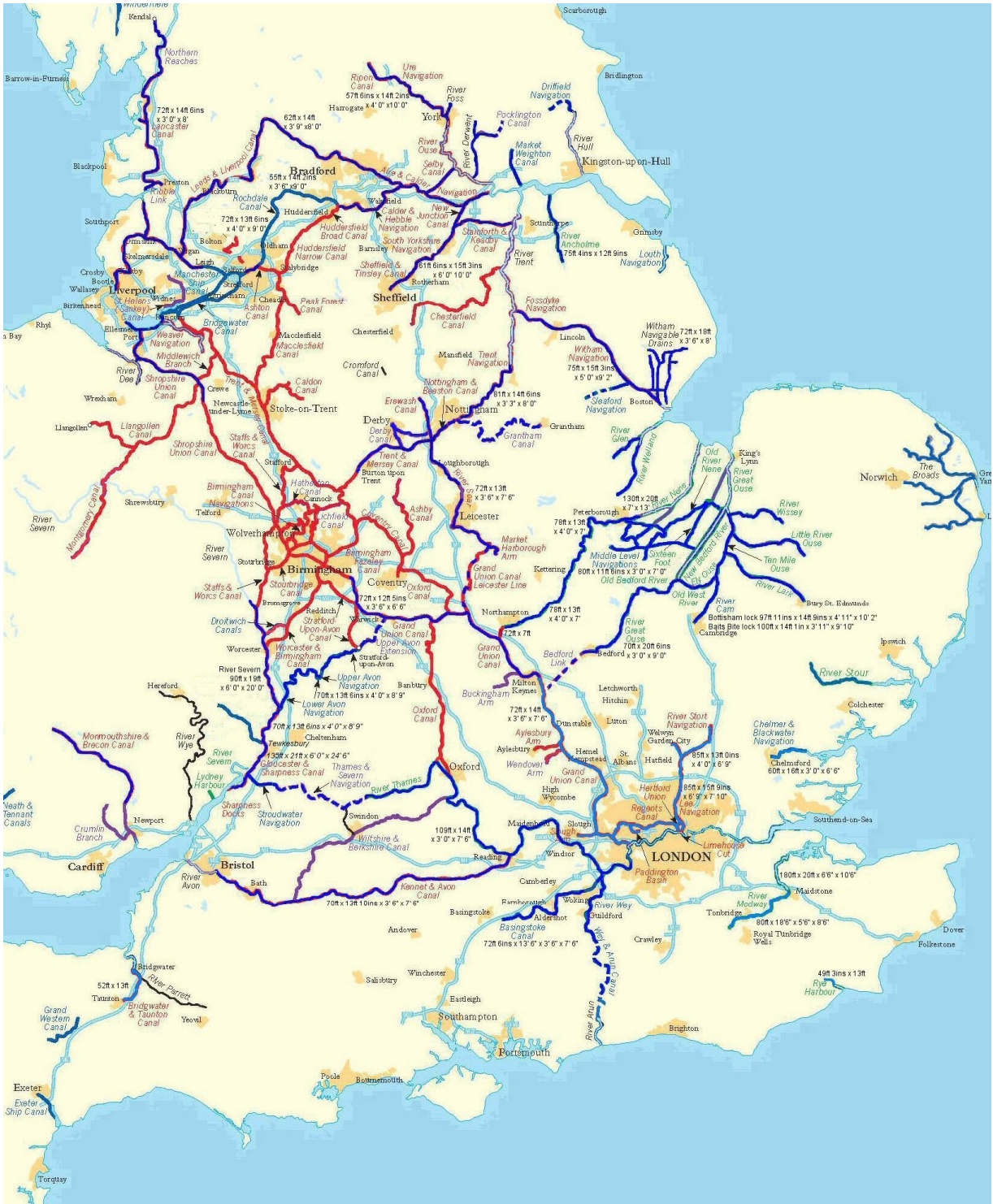
¹⁴ *Civil Engineering Heritage: Eastern and central England* edited by E. A. Labrum: <https://books.google.com.au/books?id=Offz1NSDt0C>

¹⁵ The difference between a *navigation* and a *true canal* used in this paper is that the former is directly connected to a natural river and shares a common drainage. Whereas true canals are built independent of any river and may cross between rivers.



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quickly spread along suitable rivers, to be replaced with steam power from the late 18th century onwards. These factories created a demand for the transport of both raw and manufactured materials that drove the expansion in demand for canals and the wagonways discussed in *The First Railway Projects*¹⁶.



¹⁶ Download *The First Railway Projects* from:
https://mosaicprojects.com.au/PDF_Papers/P207_The_first_railway_projects.pdf



Early Canal Projects in the UK

The canals discussed in *Cost Overruns on Early Canal & Railway Projects* are the **Newry Canal**, opened in 1742, the **Sankey Canal**, also known as the Sankey Brooke Navigation, opened in 1757, the **Bridgewater Canal**, opened in 1761; these are the first of the true canals built in the UK. Also included are **The Staffordshire and Worcestershire Canal** opened in 1771 and the **Stroudwater Navigation**, opened in 1779. The primary cargo transported on each of the canals was coal, although from the earliest days, other cargos and passengers were also important.

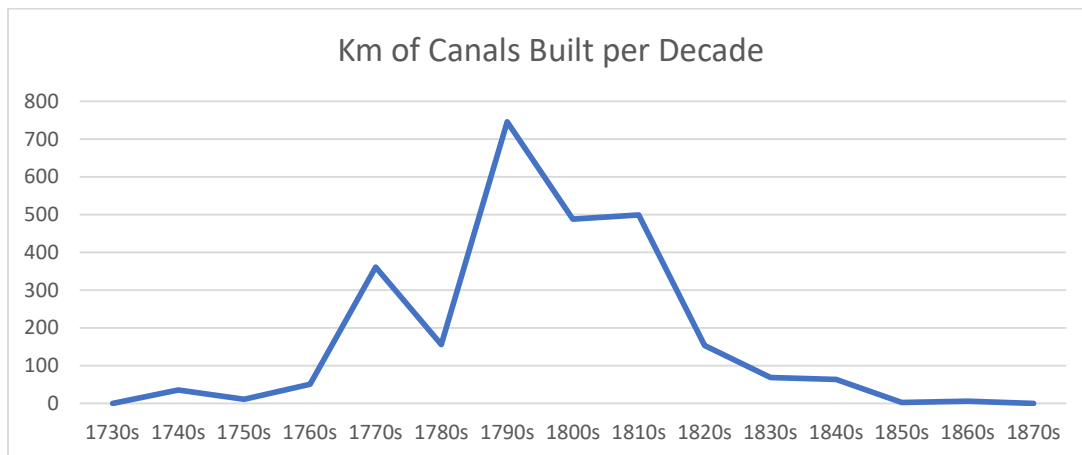
By the 1770s, the short-lived canal mania discussed below was in full swing. However, the people involved in the engineering design and construction of the canals were literally learning-on-the-job. For example, the line of the Sankey canal was surveyed by Henry Berry and William Taylor for a fee of £66, and then Berry was appointed engineer for the navigation based on his experience working on the Newry Canal, in Northern Ireland.

From the 1760s onward, networking of the canals was seen as profitable, the route of the Bridgewater canal was changed to connect with the Trent and Mersey canal, and it was subsequently connected to the Leeds and Liverpool canal and the Rochdale canals. This trend continued throughout the canal building period creating a large network of which some 2200 miles (3,500 Km) of navigable rivers and canals remain in use today.

Some of the engineering is impressive, the Standedge tunnel on the Huddersfield Narrow Canal (built between 1794 and 1811) remains the longest (over 3 miles), deepest, and highest canal tunnel. When the tunnel opened in 1811, the construction time had increased from 5 to 17 years and the cost of construction was £123,804 a vast sum¹⁷! However, the lessons learned building canals undoubtedly helped with the railway boom that followed¹⁸.

Probably the only prudent decision made by the UK government during the period of the canal boom, followed by the railway boom, was to prevent the canal companies from creating monopolies. All canal barges paid the same toll (usually based on tonnage), and the best way for a canal company to make money was to attract as much traffic as possible. Networking canals was a win-win for both the canal companies and the barge owners.

Canal Mania



¹⁷ For more on the Standedge Tunnel see: <http://www.penninewaterways.co.uk/huddersfield/standedge3.htm>

¹⁸ For the *railway boom* see: https://mosaicprojects.com.au/PDF_Papers/P207_Canal+Wagonway_Cost_Overruns.pdf (page 9)



The success of the Sanky and Bridgewater canals sparked a period of frenetic canal building between the 1780s and 1810s which would become known as 'canal mania'. A partial list of the canals built in the UK in this period is included in **Attachment A** below.

The canal mania period was short lived, starting in the 1760s it was over by the 1820s (although canals under construction tended to be completed over the next few years)¹⁹. At its peak over 70 Km of canal were being completed each year, with all of the work being done by hand, assisted by horses.

The only significant canal built after the period graphed above was the Manchester Ship Canal from Liverpool to Manchester, opened in 1894. This canal was designed to allow ocean going cargo vessels to bypass the Liverpool docks (and charges) to unload in Manchester. It was the first (and in the UK, only) major canal built using mechanical excavators for most of the work.

Conclusions

This paper is intended to augment the information contained in:

- *The Origins and History of Cost Engineering*²⁰
- *Cost Overruns on Early Canal & Railway Projects*²¹

The canal boom was triggered by the successful, and profitable, building of a couple of canals. The majority of the rest of the canals were built to meet specific needs for the transportation of goods and materials. The 'canal advantage' over roads being reliability, predictability, cost per ton/mile, and a smooth ride.

The massive and ever-increasing demand for coal to fuel the industrial revolution was the major driver for the construction of the canal network, but the need to transport pottery and other fragile merchandise from the midlands to the rapidly expanding middle classes in London and other cities was another.

The cost/benefit of the canals over the poorly maintained roads of the time justified the cost of building with only a very few canals failing to make a profit in the good times. The end of the building boom and the end of the good times was caused by the next paradigm shift in transportation, the introduction of steam powered railways.

The scale of the engineering projects outlined above, and the mines, canals and railways, and the industries they enabled, kick-started the industrial revolution. And the professional engineers involved in the canal construction works developed the foundations of modern project engineering and management, organizing 1000s of workers to construct major engineering works in a way that had not been done before.

¹⁹ A list of the canals in the UK can be found at: https://en.wikipedia.org/wiki/List_of_canals_of_the_United_Kingdom

²⁰ Download *The Origins and History of Cost Engineering*:
https://mosaicprojects.com.au/PDF_Papers/P207_Cost_History.pdf

²¹ For a discussion on the cost issues experienced on railway projects at the start of the industrial revolution see *Cost Overruns on Early Canal & Railway Projects*:
https://mosaicprojects.com.au/PDF_Papers/P207_Canal+Wagonway_Cost_Overruns.pdf



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Attachment A – UK Canals

UK Canals	Length Km	Locks	Where	Opened
Newry Canal	34	12	N. Ireland	1742
Beverley Beck	1	1	England NE	1744
Sankey Canal	24	11	England NW	1757
Blyth Navigation	11	6	England EA	1761
Bridgewater Canal	64	0	England NW	1761
Carlingwark Lane Canal	2	0	Scotland	1765
Limehouse Cut	3	0	England SE	1766
Donnington Wood Canal	9		England	1767
Driffield Navigation, East Yorkshire	18	6	England NE	1767
Sir John Glynne's Canal	2		England	1768
Kidwelly and Llanelly Canal	29	8	Wales	1768
Coventry Canal	53	13	England M	1769
Stort Navigation	22	15	England SE	1769
Wednesbury Old Canal[4]	7	3	England M	1769
Dudley Canal	17		England M	1770
Louth Navigation	19	8	England NE	1770
Droitwich Canal	12	15	England M	1771
Birmingham Canal Navigations	48	34	England M	1772
Staffordshire and Worcestershire Canal	74	43	England NM	1772
Stevenston Canal	4	0	Scotland	1772
Ripon Canal	4	3	England NE	1773
Bradford Canal	6	10	England	1774
Oxford Canal	126	43	England M	1774
Selby Canal	10	2	England NE	1776
Sir Nigel Gresley's Canal	5	0	England	1776
Chesterfield Canal	73	62	England NE	1777
Trent and Mersey Canal	150	76	England NE	1777
Caldon Canal	29	17	England NM	1779
Erewash Canal	19	14	England NE	1779
Stourbridge Canal	13	21	England M	1779
Stroudwater Navigation	13	13	England SW	1779
Huddersfield Broad Canal	6	9	England NE	1780
Shannon–Erne Waterway	63	16	N. Ireland	1780
Eardington Forge Canal	1	1	England	1782
Market Weighton Canal	15	1	England NE	1782
Walsall Canal	15	16	England M	1785
Arbury Canals	10	13	England	1786
Coalisland Canal	12	7	N. Ireland	1787
Ketley Canal	2	1	England	1788
Wombidge Canal	3	1	England	1788
Birmingham and Fazeley Canal	33	44	England M	1789



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UK Canals	Length Km	Locks	Where	Opened
Pidcock's Canal	2	3	England	1789
Thames and Severn Canal	46	44	England SW	1789
Forth and Clyde Canal	56	38	Scotland	1790
Glan-y-wern Canal	2		Wales	1790
Shropshire Canal	17	3	England	1791
Fairbottom Branch Canal	2	0	England NW	1792
Hollinwood Branch Canal	7	4	England NW	1792
Stover Canal	3	5	England	1792
Strabane Canal	6	2	N. Ireland	1792
Caistor Canal	6	6	England N	1793
Derby and Sandiacre Canal	23	9	England NE	1793
Ipswich and Stowmarket Navigation	26	15	England EA	1793
Andover Canal	35	24	England S	1794
Basingstoke Canal	51	29	England S	1794
Calder and Hebble Navigation	35	38	England NE	1794
Charnwood Forest Canal	10		England	1794
Cromford Canal	23	14	England	1794
Leominster Canal	29	16	England	1794
River Soar Navigation	35	18	England EM	1794
Sleaford Navigation	20	7	England NE	1794
Warwick and Napton Canal	23	25	England M	1794
Warwick and Birmingham Canal	39	28	England M	1794
Monkland Canal	20	18	Scotland	1794
Petworth Canal	2	2	England	1795
Neath and Tennant Canal	35	21	Wales	1795
Ashton Canal	6	18	England NW	1796
Coombe Hill Canal	4	1	England	1796
Derby Canal	23	17	England NE	1796
Nottingham Canal	24	18	England NE	1796
Nutbrook Canal	7	13	England	1796
Ulverston Canal	2	1	England	1796
Monmouthshire, Brecon and Abergavenny Canal	56	48	Wales	1796
Chelmer and Blackwater Navigation	22	13	England EA	1797
Cinderford Canal	2	0	England	1797
Grantham Canal	53	18	England EM	1797
Lancaster Canal	98	14	England NW	1797
Lichfield Canal	11	30	England M	1797
Manchester Bolton & Bury Canal	21	17	England NW	1797
Melton Mowbray Navigation	18	12	England EM	1797
Shrewsbury Canal	40	34	England W	1797
Stockport Branch Canal	8	0	England NW	1797
Wyrley and Essington Canal	38	39	England M	1797
Herefordshire and Gloucestershire Canal	55	22	England W	1798
Glamorganshire Canal	40	52	Wales	1798



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UK Canals	Length Km	Locks	Where	Opened
Swansea Canal	27	36	Wales	1798
Barnsley Canal	23	15	England NW	1799
Digbeth Branch Canal	2	6	England M	1799
Fletcher's Canal	2	2	England	1800
Grand Junction Canal	208	90	England M	1800
Newcastle-under-Lyme Canal	6	0	England	1800
Rochdale Canal	51	91	England NW	1800
Islington Branch Canal	1	0	England NW	1801
Horncastle Canal	18	12	England	1802
Oakham Canal	25	18	England	1802
Salisbury and Southampton Canal	21	16	England	1802
Sheffield and South Yorkshire Navigation	45	24	England NE	1802
Somerset Coal Canal	29		England SW	1802
Stainforth and Keadby Canal	24	3	England NE	1802
Stratford-upon-Avon Canal	41	56	England M	1802
Lagan Canal	43	27	N. Ireland	1802
Tavistock Canal	6	2	England	1803
Ashby-de-la-Zouch Canal	35	0	England M	1804
Black Bear Canal	13		England	1804
Dearne and Dove Canal	16	19	England NE	1804
Royal Military Canal	31	0	England SE	1804
City Canal	2	2	England	1805
Leven Canal	5	1	England	1805
Peak Forest Canal	24	16	England NW	1805
Aberdeenshire Canal	29	18	Scotland	1805
Leicestershire and Northamptonshire Union Canal	77	22	England EM	1807
Llangollen Canal	75	21	England W	1808
Llangollen Canal	74	21	Wales	1808
Croydon Canal	15	28	England	1809
Kennet and Avon Canal	139	105	England SW	1810
Grand Surrey Canal	6	1	England	1810
Wilts and Berks Canal	84	42	England SW	1810
Huddersfield Narrow Canal	32	74	England NE	1811
Uttoxeter Canal	21	19	England NM	1811
Glasgow, Paisley and Johnstone Canal	18	0	Scotland	1811
Ouse Navigation	35	19	England	1812
Aberdare Canal	11	2	Wales	1812
Grand Union Canal (old)	39	17	England EM	1814
Tremadoc Canal	2	0	England	1815
Worcester and Birmingham Canal	48	58	England M	1815
Leeds and Liverpool Canal	229	105	England N	1816
Wey and Arun Junction Canal[25]	37	26	England S	1816
Dingwall Canal	2	0	Scotland	1816



Early Canal Projects in the UK

UK Canals	Length Km	Locks	Where	Opened
Newport Pagnell Canal	2	7	England	1817
Crinan Canal	14	15	Scotland	1817
Pocklington Canal	15	9	England NE	1818
Regent's Canal	14	13	England SE	1820
Broharris Canal	3		N. Ireland	1820
Lydney Canal	2	1	England SW	1821
Montgomery Canal	53	24	England W	1821
Montgomery Canal	53	24	Wales	1821
Chichester Canal	7	3	England S	1822
Galton's Canal	2	1	England	1822
Caledonian Canal	100	29	Scotland	1822
Union Canal[30]	51	3	Scotland	1822
Bude Canal	56	2	England SW	1823
Portsmouth and Arundel Canal	45	6	England	1823
Thames and Medway Canal	10	1	England SE	1824
Cann Quarry Canal	3		England	1825
Grosvenor Canal	1	1	England	1825
Baybridge Canal	6	2	England	1826
Gloucester and Sharpness Canal	27	2	England SW	1826
North Walsham & Dilham Canal	12	6	England EA	1826
Bridgwater and Taunton Canal, Somerset	23	6	England SW	1827
Rolle Canal	10	2	England	1827
Kensington Canal	3	1	England	1828
Liskeard and Looe Union Canal	10	25	England	1828
Hertford Union Canal	2	3	England SE	1830
Macclesfield Canal	42	13	England NW	1831
Beaumont Cut	1	0	England	1832
Glastonbury Canal	23	2	England	1834
Shropshire Union Canal	123	51	England NM	1835
Grand Western Canal	17	0	England SW	1838
Westport Canal	5	1	England	1840
Chard Canal	22	4	England	1842
Ulster Canal	74	26	N. Ireland	1842
Hackney Canal	1	1	England	1843
Birmingham and Warwick Junction Canal	4	6	England M	1844
Tame Valley Canal	14	13	England M	1844
Bentley Canal	5	10	England	1845
Par Canal	4	3	England	1847
Southwick Ship Canal	3	1	England SE	1855
Hatherton Canal	6	8	England NM	1860
Manchester Ship Canal	60	5	England NW	1894
New Junction Canal	9	1	England NE	1905
Ribble Link	5	9	England NW	2002

