

Development of Grand Junction Canal in Berkhamsted, 1760-1825

This step in the national transport revolution was conducted under the shadow of the French Revolutionary War in 1793 when coastal shipping became vulnerable and movement of goods was brought inland. Earlier successful canal-building ventures had captured the attention of investors and speculators; canal mania was underway and local aristocracy and gentry were in the forefront, influencing decisions about transport, either to exploit mineral wealth or to ensure that traffic was diverted outside their estates (unless they could see advantages with allowing passage across their land). The Grand Junction Canal was particularly versatile in handling full size narrow boats and barges; it was the longest wide-gauge canal in Britain and traders benefited from lower transport costs for non-time-dependent and bulky items.

Before the canal

Whereas there was a usable road before the turnpike, the River Bulbourne was not commercially viable for bulk carriage of freight prior to the canal. It was referred to as a winterbourne river in the upper reaches because it often dried out during the summer.¹ An analysis of peat deposits has revealed that an undeveloped area adjacent to the river was waterlogged and boggy from early times, probably due to the construction of the millpond at Upper Mill which was one of two mills recorded in Domesday.² It was this tendency to flood that caused severe problems for the town that were alleviated only with the arrival of the canal.

The Bridgewater family was influential in the affairs of the turnpike trust, but the Duke of Bridgewater was better known as the “father of inland navigation”.³ The Bridgewater Canal connected his coal mines at Worsley with the river Mersey and opened up new markets for his coal. He was commended by Arthur Young as “one of those truly great men, with the soul to execute what they have the genius to plan”.⁴ His ambitious and risky scheme brought him to the brink of

¹ Dacorum Environmental Forum Water Group, ‘River Bulbourne’, *Dacorum Water News*, http://www.defwatergroup.org.uk/defwg_LWN_10.php (accessed Mar 2011)

²J.R. Hunn, *Archaeological evaluation: land at Castle Mill Berkhamsted Hertfordshire* (2003) [Unpublished report, Archaeological Services & Consultancy]

³ Inscription on the Bridgewater monument at Ashridge, Hertfordshire

⁴ K.R. Fairclough, ‘Egerton, Francis, third duke of Bridgewater (1736–1803)’, *Oxford Dictionary of National Biography* (Oxford, 2009) <http://www.oxforddnb.com/view/article/8584> (accessed Mar 2011)

ruin but with the help of his engineer James Brindley, he succeeded in 1776 and this was the inspiration for subsequent canal builders.

Initiation and development of the canal

The first step in the initiation of the Grand Junction Canal was for promoters to advertise in newspapers. In July 1792, “the Friends to this Undertaking” were invited to prepare their application to Parliament.⁵ By October, at a meeting in Northampton, the chairman William Praed reported on the chief engineer William Jessop’s proposed route from the Oxford canal in Braunston via several towns in Northampton, Buckingham, Bedford, Hertfordshire, back into Buckingham and on to Middlesex, along with several collateral cuts (navigable channels) including Watford.⁶ In June 1793 the first general meeting of proprietors was held in pursuance of the Act, which was passed in April. A committee was appointed along with sub-committees for lower and upper districts, the treasurer was allowed cash “in discharge of demands” and names were put forward for the role of clerk. It was resolved that landowners along the route would be admitted as proprietors and allotted shares according to guidelines in the Act.⁷ In preparation for the second general meeting, a section of the Act was published to apprise proprietors of the procedure for logging names and numbers of shares in the company book and for issuing share tickets accordingly.⁸ At this meeting, arrangements were made for a delegation to attend the next meeting of the Oxford canal company, which was proposing a rival scheme.⁹

Were self-interested local gentry to the fore? According to McCahill, referring to the Black Country: “noble landlords served on committees and invested in ventures that would move their coal, iron, or limestone to hungry markets as cheaply as possible”; they supported canal bills in Parliament and influenced timings and routes to suit their own needs.¹⁰ Few aristocrats in Hertfordshire had minerals to transport (including the Duke of Bridgewater), but investment opportunities did not pass them by. A meeting was held in Watford in 1792 to discuss the line of the canal and thanks were extended to the Earls of Essex and Clarendon “for their liberal and disinterested assistance to the Undertaking, by

⁵ British Library, ‘Meeting notice’, *St James Chronicle*, issue 4892 (8 Jul 1792)

⁶ British Library, ‘Northampton’, *St James Chronicle*, issue 4937 (27 Oct 1792)

⁷ TNA, ‘General meeting 1’, *GJC minute books*, RAIL 830 39 (1 Jun 1793)

⁸ British Library, ‘General meeting 2’, *St James Chronicle*, issue 5066 (24 Aug 1793)

⁹ TNA, ‘General meeting 2’, *GJC minute books*, RAIL 830 39 (5 Sep 1793)

¹⁰ M.W. McCahill, ‘Peers, Patronage and the Industrial Revolution, 1760-1800’, *Journal of British Studies*, vol.16, no.1 (Autumn, 1976), p.88

permitting it to pass through their respective properties.”¹¹ With the incentive available to landowners of one share for each eighth of a mile of land that was cut through (to a maximum of ten shares), allowing the canal to cross their land was hardly disinterested and as both earls were members of the committee, they had a say in running the company. Furthermore, in 1794 Praed was authorized to offer Essex £12,000 as compensation and for the purchase of land through Cassiobury Park; this was rejected as inadequate and the amount was raised to £15,000. The final settlement with Clarendon was £5,000 (no land was purchased).¹² He insisted that the canal bridge in Grove Park should be built in keeping with the elegance of his estate and no boatmen were allowed to set foot on his land. Notwithstanding the compensation payments made to local landowners by securing this new route, the company avoided the expense of a 900-yard tunnel through high ground at Langleybury with associated locks, and an embankment aqueduct at Kings Langley.¹³ John Rooper was High Sheriff of Hertfordshire and resident of Berkhamsted castle. He served on a sub-committee which influenced decisions for the Lower District (the northern half of the canal).¹⁴ He was awarded nine shares but applied to the general committee for ten on the basis of his surveyor’s measurement of the length of cut expected through his land.¹⁵ Thus local landowners were in a good position to profit from the proximity of the canal and they freely influenced decisions that were likely to affect their interests by procuring seats on the company’s committees.

At the height of canal mania, it was easy to raise capital. At the Northampton meeting (referred to above), it was reported that subscriptions of £361,900 had been raised, not including those to be collected from landowners. This fulfilled the requirements for a substantial proportion of shares to be subscribed prior to the Act, which empowered the company to raise £500,000 in shares of £100 each, with provision for a further £100,000 if necessary.¹⁶ Reminders of payments of interest on subscriptions were often placed in newspapers.

Toll collection for investors and maintenance

Revenue was collected via tolls. Gauging was the process used for measuring tonnage from the amount of water displaced when a boat was loaded with cargo.

¹¹ British Library, ‘Watford meeting’, *Star*, issue 1391 (23 Oct 1792)

¹² A.H. Faulkner, *The Grand Junction Canal* (Newton Abbot, 1972), pp.31-32

¹³ ‘Altering route through Hertfordshire’, *Acts of Parliament for GJC*, 35 Geo III cap 8 (5 Mar 1795)

¹⁴ TNA, ‘Lower District’, *GJC minute books*, RAIL 830 39 (1 Jun 1793), p.16

¹⁵ TNA, ‘Rooper shares’, *GJC minute books*, RAIL 830 39 (5 Sep 1793), p.34

¹⁶ J. Phillips, *A General History of Inland Navigation*, 4th edition (London, 1803), p.307

Information was stored in tables which have survived from 1804 for the Grand Junction canal. The toll was calculated per ton per mile according to the type of goods being carried, ranging from lime and limestone at a farthing through livestock or other types of mineral at a halfpenny, coal and coke at three-halfpence and other goods at a penny. Special rates applied when joining or leaving the Thames or the Oxford Canal. Military movements, timber, gravel and manure were exempt from rates and tolls, provided no locks were passed. After construction costs, ongoing expenses included compensation of up to £10,000 per year for Oxford Canal's loss of trade as their proposal for the rival scheme to by-pass the Thames, known as the Hampton Gay canal, had failed. This generous agreement effectively halted opposition that might have delayed development, and ensured cooperation in linking to the Oxford Canal at Braunston; surveyors for the Grand Junction were able to appropriate their proposed route through Uxbridge rather than via Watford and Harrow.¹⁷ Landowners with less than a furlong (220 yards) cut for the canal were offered a gratuity of £20 per 100 yards upon valuation. In contrast to donations of land to develop the turnpike, the Grand Junction Company had to buy it. In 1794, Mr Harcourt sold just over seven acres at Pendley for £600 (worth £34,000 today).¹⁸

A profitable venture with aesthetic advantages

Benefits of the Grand Junction Canal were advertised at the time as opening a communication from London to "the Northern and Western parts of the Kingdom... which from its course through a number of considerable trading towns, must in a short time be very advantageous to the holders of Shares."¹⁹ Profit was at the heart of this business. Vested interests were rife; investors were keen to maximize their earnings and favoured high tolls, whilst merchants were equally keen to keep their freight costs low. In 1802, company status was reported as fluctuating; shares stood at £150 but had ranged from £65 to £210, with complaints of lack of water and anticipating the extension to the Thames.²⁰ The company applied to Parliament for permission to raise a further £400,000 for the Blisworth tunnel and an aqueduct over the river Ouse. The final capital invested in the project was £1.8 million, which means that it was originally underestimated by 260 per cent. Inflation and the rise in wage rates following the Napoleonic Wars was partly to blame, along with overcoming technical difficulties (constructing tunnels and retaining water in the system) and building new branches. The return to investors was relatively modest at the outset due to

¹⁷ E.C.R. Hadfield, 'The Thames Navigation and the Canals, 1770-1830', *Economic History Review*, vol.14, no.2 (1944), p.176

¹⁸ TNA, 'Pendley land', *GJC minute books*, RAIL 830 39 (28 Mar 1794)

¹⁹ British Library, 'Benefits', *Morning Post*, issue 6413 (9 Nov 1793)

²⁰ Phillips, *Inland Navigation*, p.310

high construction costs, but dividends were maintained at a higher level in later years (except for a sharp drop in 1816, a year of heavy expenditure) because surplus cash was paid out rather than retained in the business.²¹ Tonnage revenue began to pour in from 1795; just a trickle when the first 12 miles were navigable between Brentford and Uxbridge but reaching nearly £200,000 per year by 1825 (Fig.4).

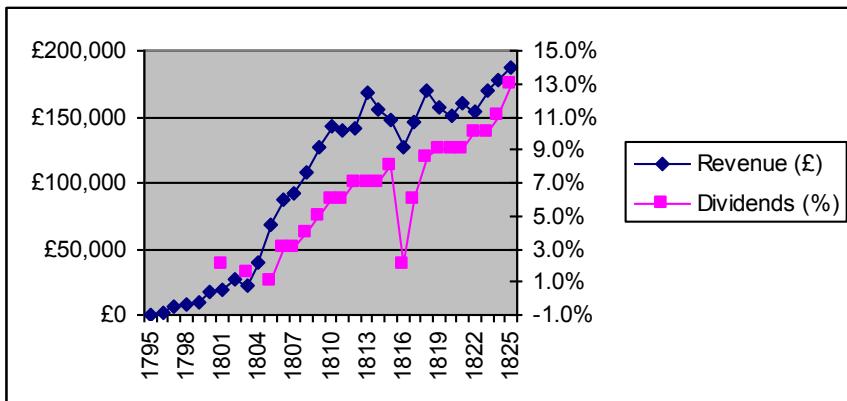


Fig.1: Tonnage revenue & dividends for Grand Junction Canal²²

In terms of advantages over other forms of transport, the canal lowered freight costs for non-time-dependent and bulky items. The haulage capacity of one horse was in excess of 80 tons on a canal barge on calm waters as compared to about one ton in a four-wheeled waggon on a good road or 10 tons on rails or tram tracks. Horses worked from dawn to dusk drawing narrow boats with an average 25-31 tons of cargo for 20-26 miles per day; fly boats ran faster services in relays overnight, transporting perishable goods.²³ With water levels being controlled by reservoirs and locks, canals were operable when natural waterways were hampered by drought or flood. The section of Grand Junction Canal from Brentford to Berkhamsted was opened in September 1798 and to Tring early the following year.

²¹ S.J. Hudson, *Attitudes to Investment Risk Amongst West Midland Canal and Railway Company Investors, 1760-1850* (Warwick, 2001), pp.95-6

²² Faulkner, *Grand Junction*, pp.224-5 [figures from Appendix 2: Tables of Dividends, Revenue and Tonnages]

²³ D.T. Smith, *The horse on the cut* (Cambridge, 1982), p.46

Despite concerns about containing the burgeoning scope within financial limits, the canal was seen by investors as a profitable venture, with advantages over other forms of income. William Cobbett noted in 1802 that “the parliamentary wise-acres... after eighteen years of intense application, have discovered... that the navigation on the stormy seas is less lucrative and more hazardous than that on the grand junction canal...”²⁴ A month after the initiation of the canal, a subscription was raised and filled within hours for the Leicester and Harborough navigation to join the canal at Braunston; such was the enthusiasm to profit from the canal network.²⁵ On a page of advertisements in 1795 (which includes a new stamp duty for wearing hair powder) the canal was described as “that great Work of Public Utility, and individual Advantage... which is in great forwardness”.²⁶ In 1796, “immense additional trade” was anticipated with the “vast superiority... of wide or *River Boats*, over narrow boats... to bring all the trade of the Staffordshire Potteries, &c. to London... by which the necessity of transhipping, and all the unavoidable losses attending it, to a vast annual amount, will be avoided.”²⁷

The proximity of the canal was seen as a benefit both aesthetically and economically when advertising properties. In 1778, Pilkington Manor was described with rich meadow land “through which runs a transparent trout stream” and by 1810 when the Manor was again on the market, there was the same rich meadow land “through which the Grand Junction Canal flows”.²⁸ In 1800 the sale of timber at Whelpleyhill farm near Berkhamsted was advertised “with a hard Road to the Grand Junction Canal” and in 1802 in Bovingdon “coals abundantly supplied by the Grand Junction Canal”.²⁹ In 1808, evidently from an elevated position with walled gardens “the principal front commanding a pleasing view of the country, the Grand Junction Canal and Berkhamstead Castle”, this substantial property sounds like Berkhamsted Place, depicted in Fig.1.³⁰ Phillips described the canals of England by referring to amendments to Acts of Parliament; the Grand Junction Canal was “this magnificent and

²⁴ British Library, *Cobbetts Annual Register* (18 Sep 1802), p.241

²⁵ British Library, ‘Leicester & Harborough’, *St James Chronicle*, issue 4905 (7 Aug 1792)

²⁶ British Library, ‘Shares advertisement’, *Whitehall Evening Post*, issue 7572 (23 May 1795)

²⁷ British Library, ‘Benefits of GJC’, *Morning Chronicle*, issue 8445 (3 Nov 1786)

²⁸ British Library, ‘Pilkington sale’, *Morning Post*, issue 1882 (29 Oct 1778) and *Morning Chronicle*, issue 12775 (20 Apr 1810)

²⁹ British Library, ‘Whelpleyhill’, *Oracle*, issue 22236 (5 Mar 1800);
British Library, ‘Bovingdon Lodge’, *Morning Post*, issue 10606 (01 Oct 1802)

³⁰ British Library, ‘House sale’, *Morning Post*, issue 11616 (19 Apr 1808)

wonderful undertaking... it unites so great a length of interior country so near to the metropolis.”³¹ It seems the canal was welcomed both locally and nationally.

New technology applied by contracted professionals

New technologies evolved with the canal. The highest point was at Tring summit, 382 feet above sea level, requiring a cutting 1.5 miles long and 20-25 feet deep.³² Engineer James Barnes wrote in his progress report in 1797 that although the “deep cutting at Tring stands exceedingly well”, there was a section at its base where the soil was soft and water-logged and necessitated driving “headways round the backs of the slips” to drain the area. In most of Hertfordshire, he had been able to use the clay dug out of the channel for “puddling” and it was only in this section that the earth was too porous for lining purposes.³³ Similarly, it became apparent in a drought in the early 1800s that something must be done to prevent leakage from the Wendover Arm (a navigable feeder) and also to replenish water supplies around the highest points in the canal and over the next few years, reservoirs were built at Wilstone, Marsworth, Startopsend and Tringford.³⁴ Pumping-stations were built on the Wendover Arm, but pumping was later centralized at Tringford, using a state-of-the-art Boulton & Watt beam steam engine at a cost of £3,120.³⁵ In 1805, an experiment was conducted in Berkhamsted. Two side pounds or reservoirs were built beside the canal connected by sluices to the lock, resulting in saving half the water needed to fill the lock, with the loss of “three minutes and a half only” for the passing barges.³⁶ It seems the operation of these locks was complicated and despite this favourable test they added to the journey time, so side pounds later fell out of favour. In 1819, close to the Cow Roast beside the canal, there were two “water-gauge houses” inhabited by a Grand Junction Company employee and a representative of the Duke of Northumberland. They recorded the height of water at all hours of the day, and the times of the different boats passing the locks.³⁷

³¹ Phillips, *Inland Navigation*, p.304

³² Branch Johnson, *Hertfordshire*, p.203

³³ TNA, ‘Barnes report’, *GJC minute books*, RAIL 830 39 (15 Nov 1797), p.35

³⁴ British Waterways, *Map of Tring reservoirs*

<http://www.waterscape.com/media/documents/22132.pdf> (accessed Jul 2011)

³⁵ Faulkner, *Grand Junction*, p.135

³⁶ British Library, ‘Canal Navigation’, *Lancaster Gazette*, issue 202 (27 Apr 1805)

³⁷ Hassell, *Tour of GJC*, pp.19-20

Disadvantages of the canal

The canal brought disadvantages as well as benefits. People were well used to modifications to the road system but building the canal was a major upheaval. Local historian Percy Birtchnell wrote: “an army of ‘navigators’ (the canal labourers who added the word ‘navvy’ to our language) descended upon the district, living in special camps and offending staid townspeople by their drunken orgies.”³⁸ In 1816 a case was brought by John Dickinson against the Grand Junction Canal for the diversion of water from the Gade and Bulbourne rivers, which turned the wheels of his extensive paper mills at Apsley (downstream from Berkhamsted). Despite engineers’ assertions that there was no loss of water to the mills, damages of £3,000 were awarded to Dickinson after protracted litigation.³⁹ The canal was not a serious contender with road transport for passenger services, nor did the advantages of preserving livestock in prime condition for the London market detract significantly from droving.

Despite technical difficulties, some opposition and financial concerns, the Grand Junction Canal enabled bulky goods to be transported at reduced freight costs and the company achieved respectable profits for its shareholders in the end.

What if Berkhamsted had not been on the main route for turnpike and canal construction? According to Sweet, places that previously enjoyed good business could be stranded “high and dry in the interstices of the new communications network”.⁴⁰ Local towns were awake to the possibility of missing out on the benefits of the transport revolution. Just one mile of canal would have brought Hemel in to the waterways network, but despite the town’s lobbying, the company refused to act. Similarly, a proposed nine-mile stretch including 20 locks to connect with Chesham was not economically viable.⁴¹ Meanwhile the collateral cut to Watford included in the original planned route was never built, perhaps because of the expense of crossing the lands of local aristocracy.

The heyday of the canals was soon over with the arrival of the railway in 1838. Ironically, most of the raw materials used to build the railway were transported by canal providing a boost to business, but it soon became apparent that the railways posed a serious threat.

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³⁸ Birtchnell, *Short History*, pp.84-85

³⁹ British Library, ‘Apsley Mills’, *Ipswich Journal*, issue 4142 (3 Aug 1816)

⁴⁰ R. Sweet, *The English Town 1680-1840: Government, Society & Culture* (Harlow, 1999), p.100

⁴¹ A. Faulkner, *The Grand Union Canal in Hertfordshire* (Hatfield, 1993), pp.9-10