The Channel Tunnel

Jake Humphrey

1 Introduction

The concept of a man-made undersea tunnel connecting England and France has existed since the early 1800s, but it was not until 1986 that the construction effort resulting in the present Channel Tunnel was started.

Since its opening in 1994, the Channel Tunnel, affectionately nicknamed *The Chunnel*, has transported over 300 million passengers and 300 million tonnes of freight between England and France across the English Channel.

As a work of engineering, the Tunnel is rather impressive. The only precedent of its type was the Seikan Tunnel in Japan. The Tunnel comprises two main rail tunnels and one service tunnel between them. The boring itself made use of a stratum of chalk marl, conducive to tunneling. All its have acheivements have contributed to its designation as one of the Seven Wonders of the Modern World by the American Society of Civil Engineers.

The Channel Tunnel offers both freight and passenger access, the latter being operated by Eurostar International Ltd, in addition to a roll-on roll-off shuttle service for road vehicles named Eurotunnel Le Shuttle.

This document seeks to give the reader (having a background in an engineering discipline) an overview of the history, construction, and operation of the Channel

Tunnel, and an insight into its impact on transport infrastructure and the economy in England and France.

2 History of Channel Crossing

2.1 Pre-tunnel

The earliest proposal for connecting England and France beneath the Channel was made by Albert Mathieu, a French mining engineer, in 1802, and included oil-lamp illumination and an artificial island midway across for changing the horses of one's carriage.[1]

In 1834 eccentric French engineer and entrepreneur Aimé Thomé de Gamond proposed his first projects for a railway line beneath the English Channel. It was met with indifference from both English and French authorities, who at the time preferred to stay separated from their neighbours.

Gamond presented another proposal to the French Emperor Napoleon III in 1856 detailing a rail line from Cap Gris-Nez to Eastwater Point with a port/airshaft on the Varne sandbank at a cost of 170 million francs, or less than £7 million in the money of the time.[2]

Gamond proposed a total of seven designs over his lifetime. In 1867 his proposal was finally accepted by Napoleon III and Queen Victoria but was brought to an abrupt end by the Franco-Prussian War of 1870. Sadly, Gamond never saw his dream realised; he died ruined and humiliated in 1876[3]

Ironically, this same year an official Anglo-French protocol was established for a cross-Channel railway tunnel[4], and in 1881, the Anglo-French Submarine Railway Company conducted preliminary exploratory work on both the English

and French sides. A couple of pilot tunnels no longer than 2km each were dug when the project was abandoned in May 1882, over fears that the tunnel would compromise English national security.

The idea was next brought up nearly 40 years later, after the First World War, at the Paris Peace Conference in 1919, by British Prime Minister David Lloyd George. The suggestion was made as assurance that Britain was willing to defend France in the event of another German attack. However, the proposal was not taken seriously by the French and nothing ever came of it.

Another undeveloped proposal made in 1929 estimated the cost of construction to be about $150. Military concerns of both nations had been addressed in the proposal, which included floodable sections of the tunnel to block access by either side. However, military leaders were not convinced. In addition, some English objected to the *tourism* the project's completion would bring, which would supposedly ruin England's "splendid isolation" and "make England a holiday resort for hordes of more or less undesirable people, who would introduce foreign customs, deface the countryside, and otherwise interrupt English habits of living".[5]

With air power gaining dominance in the military, a tunnel's affect on national security became less and less significant. In 1955, British and French governements began to support technical and geological surveys. This culminated in a government-funded project to dig twin tunnels, designed to accommodate car shuttle wagons, on either side of a service tunnel. Construction began in 1974, but was cancelled by the British governement in January 1975 due to growing concerns over EEC membership and the national economy.

In 1981 British Prime Minister Margaret Thatcher and French President François Mitterand agreed set up a group inviting private companies to put forward propo-

sitions. Over the next few years several projects were submitted including a 4.5km suspension bridge, holding a road encased in a tube, a drive-through tunnel, and the high-speed rail link that was ultimately selected and which exists today.

2.2 Construction of the Tunnel

3 Operation

4 Impact

4.1 England

4.2 France

5 Conclusion

References

[1] How the Channel Tunnel was Built — Eurotunnel Le Shuttle
`eurotunnel.com/build`
Fetched 2015-06-20.

[2] *The New York Times*. 7 August 1866.
`http://query.nytimes.com/mem/archive-free/pdf?res=`
`9A00EFD9133DE53BBC4F53DFBE66838D679FDE`
Fetched 2015-06-20.

[3] Aimé Thomé de Gamond on Wikipedia
en.wikipedia.org/wiki/Aim%C3%A9_Thom%C3%A9_de_Gamond
Fetched 2015-06-20.

[4] *The Brisbane Courier*. 1 March 1876.
trove.nla.gov.au/ndp/del/article/1398039
Fetched 2015-06-20.

[5] *Popular Mechanics* May 1929, pp. 767–768
books.google.com/books?id=wN4DAAAAMBAJ&pg=PA767&dq=Popular+Science+1930+plane+%22Popular+Mechanics%22&hl=en&ei=fxBvTp7pAoyhtwfhqq33CQ&sa=X&oi=book_result&ct=result&resnum=8&ved=0CEQQ6AEwBzgU#v=onepage&q&f=true
Fetched 2015-06-20.