*Strategic Management*, 9e: Chapter 7 study guide

Maglev: Shanghai’s innovative new transport system

Opened in December 2002 in the presence of the Chinese premier and the German chancellor, the Maglev railway is the fastest public transport system in the world. It runs between Pudong Airport and the city of Shanghai but, unfortunately, has not carried as many passengers as expected. Just what are the implications for innovation?

Maglev background

‘Maglev’ means *electromagnetic levitation* and refers to a system whereby a public transport carriage runs on railway-like tracks. Magnetism holds the carriage in the air just above the track itself so that there is very little friction between the track and the carriage – unlike a normal carriage that sits on the track itself. The power for the system is in the track rather than carried on board, so that the carriages are also lighter than normal. The resulting low friction means that much greater acceleration, higher speeds and very smooth rides are possible. Maglev is faster than the Japanese ‘Bullet Train’ – the *Shinkansen* – and faster than the French and German high-speed trains, *TGV* and *ICE*, respectively. But the system does require a special track and carriages and, until the Shanghai development, had not been used on a large commercial scale anywhere else in the world. It was originally a British patent but was developed commercially by a German company who persuaded the Chinese authorities to experiment with the new system in 2000.

Shanghai, People’s Republic of China

With a population of around 18 million, Shanghai is one of China’s great cities, both as a commercial port and as the major centre of commercial and financial activity in Eastern China. To provide room for substantial further growth, the city decided in the early 1990s to develop an area of muddy agricultural land east of the existing city. The *Pudong* area – with its massive skyscrapers, television tower, apartments and hotels – was then built over a 10-year period. Unquestionably, this development took considerable imagination on the part of the city’s leading officials and its developers and it paid off in terms of the city’s increased wealth, status and urban renewal.

Shanghai’s existing airport was located south west of the city and could not cope with the resulting increased demand for both internal and international air travel. It was therefore decided to build a completely new airport on the other side of the city, beyond Pudong, and 30 km (19 miles) from the city centre. The new airport would be connected to the city with a new rapid transit system. Maglev was chosen and built at a cost of $1.2 billion in the relatively short time of two and a half years for a complex project. In addition to the Maglev, the authorities also built motorways to allow taxis and buses to carry passengers and visitors to the airport. A single journey to the airport by taxi costs around $10–15 and takes at least 1 hour, depending on the time of day – Shanghai’s tunnels and flyovers under and over the river system can be very crowded at peak periods.

Maglev trains run on specially built overhead double tracks. They run every 20 minutes between 08.30 and 17.30 and can carry 440 people in modern comfortable carriages. The journey takes around 8 minutes to cover 30 kilometres at speeds up to 430 km/hour (270 miles/hour). Unfortunately, for planning reasons, the track does not end in the centre of Shanghai but finishes several kilometres outside. It stops next to one of Shanghai’s busy subway stations, Longyang Road. Passengers therefore must leave the Maglev and carry their bags and cases down into the subway before buying a ticket for the rest of the short journey into the centre of town.

Maglev prices and financial situation

For the first experimental year 2003, the Maglev tickets were priced at 75 yuan (about $9) for a single journey. The final subway ride was a small, additional cost for those wishing to continue into the city centre. Unfortunately, the trains were running with an average of only 73 passengers per trip for the first year, so it was decided to reduce the fare to 50 yuan in Spring 2004. Even with this reduction, the Maglev was still only carrying around 8,000 passengers per day during 2004. This brought revenues of around 130 million yuan annually – ‘less than half the yearly bank loan interest at over 300 million yuan’. Essentially, this meant that the Maglev was not covering its cost of capital and needed to be subsidised by the city’s transport authority.

What of the future?

With the Summer Olympic Games coming to Beijing in 2008, the authorities were exploring upgrading the existing rail track between Beijing and Shanghai. Initially, it was thought that the Maglev system might be used because it would shorten the 14-hour journey time dramatically. But other systems – including the Shinkansen, the TGV and ICE – were also under consideration. After much debate, it was decided that the Maglev would be too expensive: the technology was still only proven over relatively short distances and the capital costs were high at $30 billion. However, despite this decision, it was then proposed to extend the Maglev to the new Shanghai World Exhibition site and onwards to Shanghai’s second airport south west of the city. After protests from residents worried about harmful magnetic rays and after considering the costs and feasibility, all further extensions were cancelled.

The Maglev train still has some experimental interest but China’s high-speed rail development has now moved along a totally different path. High-speed rail has become a major investment area in China using designs based on the Japanese Shinkansen and the European ICE trains and acquired as result of technology transfer agreements with foreign suppliers. By 2012, China had the largest high-speed rail network in the world and was even bidding for overseas export contracts. At the same time, the Maglev had become essentially a technical footnote in the history of Chinese high-speed rail.

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1. Sources for Maglev case: Visits by author to Shanghai, June 2004 and April 2007. *Financial Times*, 28 June 2003, p 8; 5 July 2003, p M5; 7 August 2003, p 7; 5 November 2008, p 25; 24 September 2010, p 11; 6 January 2011, p 23; 9 February 2011, p 22; 11 April 2011, p 3 of Rail and Transport section; www.shairport.com/en; *China People’s Daily*, 31 December 2002 ‘World’s first commercial Maglev line debuts in Shanghai’; *Shenzen Daily*, 15 April 2004 ‘Shanghai Maglev ticket prices cut by 1/3’. See also http://englishpeople.com.cn ‘Rail track beats Maglev in Beijing-Shanghai high speed railway’; www.cnn.com/2004/TRAVEL/Shanghai Maglev – 30 November 2004 ‘Shanghai to extend Maglev rail’; http://en.ce.cn/Industries/Transport/200412/15/ ‘German Maglev technology abandoned?’ [↑](#endnote-ref-1)