The Railway Metropolis

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How Planners, Politicians and Developers
Shaped Modern London

Michael Schabas

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About the Author

Michael Schabas lived in London for a year as a teenager but grew up mostly in Toronto, a city with lots of cars and a small but well-used “subway”. After earning degrees in Architecture (University of Toronto) and Transport Planning (Harvard Kennedy School), he worked on rail projects in Vancouver and Honolulu. He came to London in 1988 to work for the Canary Wharf developers, and was involved in promoting the Jubilee Line Extension and upgrading the Docklands Light Railway. He then worked as a consultant, advising the London Docklands Development Corporation and several east London boroughs promoting extensions to the East London Line, which eventually became a key part of the Overground. He helped residents at King’s Cross fight British Rail’s plans to demolish their neighbourhood to build the Channel Tunnel Rail Link (now HS1), and built the case to use St Pancras as the new terminal. He was then retained by another part of British Rail to develop the idea. In 1994, the Department of Transport retained him to review the Crossrail project, and find ways to improve access to London airports. In 1995, he founded GB Railways, winning the Anglia Railways franchise when British Rail was privatised. Over seven years, GB Railways procured £100 million worth of new trains, doubling service frequencies and passenger ridership, and eliminating the need for subsidies. It launched three new train companies – GB Railfreight, Hull Trains and Great Southern Railway (Australia) – that continue to this day, and briefly operated an experimental “London Crosslink” service between Chelmsford and Basingstoke. After GB Railways was taken over by FirstGroup plc, he returned to consulting and is now a partner of First Class Partnerships, a rail strategy consultancy advising on projects around the world.

A Note on Terminology and References

The organisation responsible for planning and delivering London’s public transport has had many names. It was the London Passenger Transport Board (1933–1948), London Transport Executive (1948–1963), London Transport Board (1963–1970), London Transport Executive (1970–1984), London Regional Transport (1984–2000) and now Transport for London (2000–). In the 1980s, London Underground Limited was established as a separate wholly owned subsidiary of LT, which it remains. To avoid confusion, I usually refer to all of these organisations as London Transport or LT, even where the actual name at the time being described was different. When writing about the organisation at central government responsible for public transport I usually refer to DfT or the Department for Transport, although the portfolio has been sometimes combined with other functions.

Many of the schemes described in this book have had more than one name. The “River Line” became the “Fleet Line” and then finally the Jubilee Line. The Channel Tunnel Rail Link is now HS1, while the East London Line became part of the “RingRail” scheme that is now known as London Overground. Shortly before publication, LT announced that Crossrail would be known as the “Elizabeth” Line. With this one exception, I use the name in use in 2016, when this book went to press, even if it was not the name at the time I am describing.

Footnotes are identified in the usual way with ^{superscript}; they provide further detail or explanation that may be of interest to some readers. Endnotes are identified with ^{superscript italics} and provide sources and references for further information.

Glossary of Acronyms

ATO	Automatic Train Operation	ELRiC	East London River Crossing
BA	British Airways (the UK airline created by merging BEA and BOAC)	ELRS	East London Rail Study
BAA	British Airports Authority (and then BAA plc)	EMU	Electric Multiple Unit
BCV	Bakerloo Central Victoria	EPS	European Passenger Services
BEA	British European Airways	ERTMS	European Rail Traffic Management System (a version of CBTC)
BNOC	British National Oil Company	ExCeL	Exhibition Centre London
BOAC	British Overseas Airways Corporation	GE	Great Eastern
BR or BRB	British Rail or British Railways Board	GEC	General Electric Company
CAA	Civil Aviation Authority	GLA	Greater London Authority
CBTC	Communications-Based Train Control	GLC	Greater London Council
CLRL	Cross London Rail Links	HEX	Heathrow Express
CLRS	Central London Rail Study	HFA	Halcrow Fox Associates
CTRL	Channel Tunnel Rail Link (now HS1)	HS1	High Speed 1 (originally the Channel Tunnel Rail Link)
CWG	Canary Wharf Group	HS2	High Speed 2 (proposed)
DB	Deutsche Bahn (German railway company)	HST	High Speed Train
DBOT	Design, Build, Operate and Transfer	IOC	International Olympic Committee
DfT	Department for Transport (formerly Department of Transport, Environment, etc.)	JLE	Jubilee Line Extension
DLR	Docklands Light Railway	JLW	James Lang Wootton
ELL	East London Line	JNP	Jubilee Northern Piccadilly
ELLG	East London Line Group	KCC	Kent County Council
		LASAS	London Airports Surface Access Study

LCC	London County Council (predecessor to the GLC)	PFI	Private Finance Initiative
LCR	London & Continental Railways	PLA	Port of London Authority
LDDC	London Docklands Development Corporation	PPP	Public Private Partnership
LGVs	Lignes à Grande Vitesse	PSDs	Platform Screen Doors
LOB	Location of Offices Bureau	PUG	Passenger UpGrade
LOROL	London Overground Rail Operations Limited	RACHEL	Rail Alternative to the Channel Tunnel
LT	London Transport (also London Regional Transport and TfL)	SELTrac	Standard Elektrik Lorenz Trac (a proprietary CBTC system)
LT&S	London, Tilbury & Southend (railway line)	SPC	Special Purpose Company
LTS	London Travel Study	SRA	Strategic Rail Authority
LUL	London Underground Limited	SSL	Sub-Surface Lines
MBO	Management Buy-Out	SSRA	Shadow Strategic Rail Authority
MMC	Monopolies & Mergers Commission	T&H	Tottenham & Hampstead (railway line)
MoD	Ministry of Defence	T&W Act	Transport & Works Act
NAO	National Audit Office	TALIS	Thames Alternative Link to the International Rail System
NATM	New Austrian Tunnelling Method	TfL	Transport for London
NBC	National Bus Company	TGV	Trains à Grande Vitesse
NLL	North London Line	TOC	Train Operating Company
NSE	Network SouthEast (a division of BR)	UTDC	Urban Transportation Development Corporation
O&Y	Olympia & York (Canary Wharf) Developments Limited	UTS	Underground Ticketing System
OPO	One-Person Operation	W&GR	Waterloo & Greenwich Railway
PAC	Public Accounts Committee	WEB	Wider Economic Benefit
		WRA_tH	Western Rail Access to Heathrow

An aerial photograph of London, showing a dense urban landscape with a complex network of railway tracks and stations. The tracks run diagonally across the frame, with various buildings and structures interspersed. The image is used as a background for the book's title page.

Preface

Building a City Where the “Rich” Use Public Transport

The story of London's development is, more than that of any other city, the story of its railways. Although many cities now boast larger populations and larger “metro” systems, no city has more railway lines, with more trains from more stations. With about 25 million people living in the London “commuter-shed”, extending from the English Channel to the Midlands, the city is the world's largest and richest urban agglomeration. London also is less dependent on the automobile than any other megacity. No other city grew so large before widespread car ownership. Inner London lacks an express road system, or even the wide avenues of New York or Paris. It is a city built by merchants, not princes, with streets built for trade, not parades. So there is road capacity only for a tiny fraction of demand. It does now have an orbital motorway and a few radial trunk roads, but even these are narrower than equivalent roads in other cities. Railways, not roads, are the skeleton on which the flesh and fabric of London have grown. It is truly a place where the “rich” use public transport. In the morning commute, wealthy professionals ride alongside builders and students. During the day, trains are crowded with foreign visitors. In the early evening, it is not uncommon to see men in dinner jackets on the tube.

Many people know that suburban growth has been strictly constrained since the 1930s by a “green belt”. The central London Congestion Charge, introduced in 2003, is known around the world, although few cities have copied it, and the impact has, in fact, been limited. Less widely known is that developers have been forbidden from building car parks in central London since the 1960s. British taxes on car ownership and use are among the highest in the world.

Green belt policy has had an enormous and unintended impact on the housing market, restraining new construction and ultimately, by the end of the century, causing severe house price inflation. But it has also helped the viability of passenger railways. Commuters, rich and poor, take the tube, bus, or bicycle to work in central London. About half a million people now travel every day into central London from the “Home Counties”, towns in and beyond the green belt. Planning policies have forced homes to be built close to existing towns, and thus with convenient access to rail stations. One unintended consequence of green belt policy is that commuting distances are relatively long, and distance favours rail over road.

Despite – or perhaps because of – such restrictive policies, London has retained and strengthened its position as the leading “world city”, pre-eminent in finance, medicine, education, art, entertainment, publishing, and many other sectors. Its continued growth and prosperity have only been possible because the railways have also been improved and expanded. The costs have been huge, but so have the benefits.

Railways can be designed well or badly. Engineers, planners, operators, property developers and politicians make decisions that shape the city for centuries to come. Mistakes that are made in a moment can affect travellers for decades or centuries. Sometimes they are the result of conscious action, which may be recognised later as brilliant foresight or an expensive mistake. More often, opportunities are simply missed, just failures of vision. Some errors are never even recognised as such; the operators who inherit the system assume there must have been a good reason it was done “this way”. Stations can be beautiful yet poorly located (or even entirely unnecessary). Railway lines can be fast but circuitously routed. Passengers never know that their trip is longer, less convenient, or their taxes higher, because of somebody’s blunder half a century ago. Engineering and planning decisions can add massively to costs, often with little or no benefit. Sometimes, a cheaper solution would even have offered a better solution. Railways are an industry where the “production line” is visible for all to see, yet operational shortcomings are often less than obvious and even counter-intuitive to the politicians who approve them and the engineers who build them. Too often, railway builders have repeated mistakes of previous generations.

To build better for the future, you need to understand the past. Railways are unlike other infrastructures, such as communication cables, water pipes and power lines. They cannot be easily abandoned or replaced. Old railways occupy valuable space but also provide irreplaceable corridors that can be reused. Once built, railways are hard to change, because thousands of passengers come to depend on them. Whereas car traffic can “find its own level”, spreading across a network and using additional capacity as

it is created, rail track capacity is only useful if trains operate on it. Cars can usually transfer between local roads, expressways and motorways fairly easily. Railway technology can be more efficient, but it is also less flexible. Roads can be upgraded incrementally, but rail investment usually requires coordinated changes to track, signalling and rolling stock. Rail interchanges can be easy, or difficult, depending on the cleverness of the designers and topographic circumstances. Lines may cross on a map, but unless there is an interchange station passengers cannot travel between them. A junction or curve may become a permanent speed and capacity constraint. Once built, it may be impractical to ever change it.

Many books have been written about London’s railways. Popular histories describe the promotion and development of the earliest lines, rich with anecdotes of struggles between heroic engineers and less scrupulous politicians and financiers. Lavishly illustrated books are published about the design and architecture, the stations and trains and even the iconic tube map. Technical tomes examine specific aspects of the planning or engineering. There are many books directed at railway “enthusiasts”, presenting encyclopaedic detail about trains and stations, but often little discussion of why any of this really matters. General histories of London and its development touch on issues of politics and finance, and mention rail projects and their impacts. While they describe what was built, they rarely explain why. They usually do not discuss the routes and technology choices that were considered, why a specific solution was adopted, and whether it was, in retrospect, the right choice.

As government and technology have become more complex, planning and design of network improvements have come under the de facto control of technocrats, who make decisions as to the schemes that should be studied and promoted. But if there are fewer villains, there are also fewer heroes. While the decision as to whether a scheme should be funded and proceed is made by elected politicians, they do not always have the time or inclination to understand all implications of the choices. Expensive mistakes are made, and valuable opportunities are missed.

Details of planning, technology choice, design and funding of the railway projects, are usually not well documented, and often misunderstood or intentionally obfuscated. Transport planners tend to use “black box” computer models to support their recommendations, and often the scheme that ranks best in the model only does so because of an obscure or implicit assumption that has never been debated and may even be wrong. Engineering issues are complex, crossing several disciplines, and often not even well understood by the so-called experts. Funding arrangements are opaque, and even commercially confidential. Inflation makes it difficult to evaluate historic costs, while traffic forecasts are based on assumptions that rarely correspond to the outcome.

A few organisations, such as London Transport and the London Docklands Development Corporation, have produced semi-official histories of specific projects. While rich in detail, these usually avoid critical analysis as to whether schemes delivered as promised, and they rarely speculate as to what might have happened if different choices had been made. There

is sometimes reference to cost–benefit analysis, although usually without much explanation or understanding of how or why it is used, and what it tells us.

This book is about how London turned its aging and often rundown railways into the best system in the world. There is a chapter on each of the lines that have been added since 1980, explaining why each was built, whether it has proved worthwhile, and whether it could have been done better. I tell how planners, politicians and developers decided what railways to build, where to build them, and how to fund and operate them. It is a story of successes and failures, bold and brilliant strategies, bumbling mistakes and expensive “white elephants”. The railway infrastructure takes centre stage, but I also consider changing operating practices, fares and management that have been critical to the transformation of the metropolis’s transport system.

I have tried to focus on the design and planning decisions that can have wider lessons for planners and policymakers. Readers seeking comprehensive historical or technical detail on specific projects should refer to the source materials.

The network continues to grow, and investment has even accelerated in the last decade. My hope is that, by telling the stories of why it was done the way it was done, and the result, we might learn how to do it better.

I draw on public and private documents, archives, recollections and recent interviews with more than fifty people who were involved in one way or another in the development of modern London’s railways. The time period covered is, more or less, from the election of the Thatcher government and the resurgence of London as a World City through to the present day. I worked in some way on most of the rail projects in this period, although not usually within the project “establishment”. I had contact with most of the key decision makers. Sometimes I was able to make constructive input; more often I was just close enough to see the implications, good and bad, of the decisions that were made by others.

Many of the key decision shapers are now retired. Among those who are still active, memories are fading. If the history of London’s railways during this important period is to be written, now is the time. Long enough has passed that people have been able to speak fairly freely about the guilty as well as the heroes. And people (including the author) have come to accept and even regret some of the mistakes they have made, while also celebrating the many successes. I have not concealed where I had personal involvement, but I have avoided making this a memoir.

The story of London’s railways since 1945 is one of innovative planning (both of the “city” and the “transport” variety), but with plans rarely implemented as originally envisaged. New technology, and new funding and delivery structures, have been adopted with varying degrees of success, often because policy makers (both elected and unelected) have not fully understood the choices and their implications.

In the late 1940s, post-war optimism produced a wave of expensive and impractical schemes. Reality soon set in and the mood switched to

austerity. Prosperity returned in the 1960s, 1980s, and 2000s, interrupted by gloomy recessions. In each boom, old rail schemes were revived and hurriedly reviewed, with a few proceeding to implementation, sometimes but not always adapted to new and changing needs and opportunities. At each stage, planners tried to devise solutions that would solve the problems left from the past and address the needs they saw in the future. Politicians struggled to find the money, not just to expand the system but often just to keep the existing lines running and in reasonable repair. Sometimes failures in planning and politics resulted in “white elephants” – railways built at great expense that obviously did not deliver commensurate benefits. More often, compromises were reached or schemes salvaged to deliver acceptable solutions, albeit perhaps not the best that would have been possible if all parties had understood all the opportunities. In some cases, success ultimately surpassed expectations.

While London newspapers regularly complain of a failure to “invest in infrastructure”, the actual expenditure in rail has been enormous. Three large and essentially new railways have been built since 1980: the Docklands Light Railway, the Jubilee Line Extension and High Speed 1. A fourth, Crossrail, is nearing completion. Each of these is a multi-billion pound project. Two other projects, London Overground and Thameslink, run mostly over infrastructure dating from the 19th century, but have involved short sections of new construction and reconfiguration of services with a scale and cost that makes them comparable to new lines. Several smaller rail

schemes have been developed to serve London’s airports. Various other parts of the suburban rail network have been reconfigured, most notably around Croydon where extensive light rail Tramlink has been developed. Billions more have been spent re-equipping and rebuilding the 40-plus existing rail lines that serve the London metropolis, greatly expanding the capacity and reach of the network. These schemes have mostly been developed incrementally, less because of a failure to plan at all but more in response to changing, unexpected and perhaps fundamentally unpredictable new opportunities.

In comparison with, say, France, Britain is sometimes not thought to be very good at “big projects”. But the results would suggest that this is not perhaps such a bad thing: rail transport in London is as extensive, effective and efficient as in any megacity. Although Victorian origins are often still visible, London truly now has a modern rail system. Looking back, the first four decades of the century, up to 1939, were the “Golden Age” of London Transport. The nascent tube network was integrated and extended across the metropolis. In contrast, the four decades after the war were, in many ways, a period of managed decline. There was sporadic investment, but in the context of rising costs and declining ridership. But it was also a period of adjustment, when planners, railway operators and politicians learned to manage and ultimately compete with the automobile, and to address other technological and social changes that dramatically affected the environment in which railways operated. This is the subject of the next chapter.

Opposite — The ten-track rail corridor into London Bridge is one of the busiest in the world. This photo from around 2013 was taken after completion of the 95-storey “Shard” tower, but before reconfiguration of the tracks and rebuilding of the station for the Thameslink project, as described in Chapter 14.

- Key to lines**
- London Underground lines
 - Bakerloo
 - Central
 - Circle
 - District
 - Hammersmith & City
 - Jubilee
 - Metropolitan
 - Northern
 - Piccadilly
 - Victoria
 - Waterloo & City
 - Interchanges
 - National Rail lines (ceased in black. All routes are shown excluding limited services)
 - c2c
 - First Capital Connect
 - First Great Western
 - Greater Anglia
 - Heathrow Connect
 - Heathrow Express
 - London Midland
 - Southeastern
 - Southern
 - South West Trains
 - Interchanges
 - Crossrail
 - Future
 - London Overground
 - Future
 - Docklands Light Railway
 - Tramlink