The Rail Transport Case Study, 2013

By Gerald Wood
### Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of diagrams</td>
<td>v</td>
</tr>
<tr>
<td>Introduction: how to use this resource</td>
<td>vi</td>
</tr>
<tr>
<td>Chapter 1 Introduction to rail transport</td>
<td>1</td>
</tr>
<tr>
<td>The technology of rail</td>
<td>1</td>
</tr>
<tr>
<td>Ownership of UK railways: 150 years of experimentation</td>
<td>4</td>
</tr>
<tr>
<td>The current market structure of UK rail travel</td>
<td>7</td>
</tr>
<tr>
<td>UK rail travel: who pays?</td>
<td>8</td>
</tr>
<tr>
<td>UK rail travel: is the industry allocatively efficient?</td>
<td>10</td>
</tr>
<tr>
<td>The relationship in the UK between road and rail travel</td>
<td>11</td>
</tr>
<tr>
<td>UK rail: some current debates</td>
<td>12</td>
</tr>
<tr>
<td>The cost structure of rail travel</td>
<td>13</td>
</tr>
<tr>
<td>International rail: the biggest players</td>
<td>15</td>
</tr>
<tr>
<td>Questions for thought</td>
<td>17</td>
</tr>
<tr>
<td>Chapter 2 Linking rail transport to the Unit 4b specification</td>
<td>19</td>
</tr>
<tr>
<td>Do markets always work?</td>
<td>19</td>
</tr>
<tr>
<td>What market failure means</td>
<td>19</td>
</tr>
<tr>
<td>What externalities are and how they affect an economy</td>
<td>20</td>
</tr>
<tr>
<td>To what extent are externalities acceptable?</td>
<td>21</td>
</tr>
<tr>
<td>What can the government do about it?</td>
<td>22</td>
</tr>
<tr>
<td>Should markets be regulated?</td>
<td>24</td>
</tr>
<tr>
<td>Why regulation is needed</td>
<td>24</td>
</tr>
<tr>
<td>What the government does</td>
<td>25</td>
</tr>
<tr>
<td>The effects of these policies and implications for business</td>
<td>28</td>
</tr>
<tr>
<td>Can the government control the economy?</td>
<td>29</td>
</tr>
<tr>
<td>What the government does</td>
<td>29</td>
</tr>
<tr>
<td>The effectiveness of government action</td>
<td>33</td>
</tr>
<tr>
<td>Should the government intervene in society, and what effects will it have?</td>
<td>36</td>
</tr>
<tr>
<td>Why the government redistributes wealth</td>
<td>36</td>
</tr>
<tr>
<td>How and why the gov't intervenes; the extent to which it should</td>
<td>38</td>
</tr>
<tr>
<td>The implications for business</td>
<td>39</td>
</tr>
<tr>
<td>Questions for thought</td>
<td>40</td>
</tr>
</tbody>
</table>
Chapter 3 Detailed commentary on the Case Study

How rail usage has changed over the past 25 years
  Evidence G: Passenger kilometres travelled
  Evidence H: Passenger journeys

The market structure of Britain’s railways
  Evidence C: Public subsidy for rail users must end
  Evidence D: EU Directive 91/440
  Evidence E: Labour calls for review of trains contract awarded to Siemens

Rail journeys: value for money for the travelling public?
  Evidence A: UK has ‘most expensive train fares in Europe’
  Evidence I: Commuters face overcrowding

Got £32 billion to spare? HS2
  Evidence B: High speed rail
  Evidence F: Campaign for Better Transport warns gov’t over high speed rail

Questions for thought

Chapter 4 Practice papers
  Practice Paper 1
  Practice paper 2

Appendix 1: Answers
  Chapter 1
  Chapter 2
  Chapter 3
  Chapter 4, Practice Paper 1
  Chapter 4, Practice Paper 2

Appendix 2: Glossary

Appendix 3: CD contents
  Chapters 1-2, Chapter 3 footnotes and diagrams, appendices
  Quiz 1: on the specification, linked to road transport
  Quiz 2: on the pre-release material

for more resources on this syllabus see www.anketelltraining.com
<table>
<thead>
<tr>
<th>List of diagrams</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 1 Introduction to rail transport</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1 The Diolkos</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Wooden rail tracks; George Stephenson's steam engine</td>
<td>2</td>
</tr>
<tr>
<td>1.3 Steam train; advertisement for French TGV</td>
<td>3</td>
</tr>
<tr>
<td>1.4 The Shanghai maglev; artist's impression of a vac train tube</td>
<td>3</td>
</tr>
<tr>
<td>1.5 Share certificates from 19th century British railway ventures</td>
<td>4</td>
</tr>
<tr>
<td>1.6 Rail nationalisation and privatisation</td>
<td>5</td>
</tr>
<tr>
<td>1.7 Tilting trains</td>
<td>6</td>
</tr>
<tr>
<td>1.8 The costs of rail travel</td>
<td>8</td>
</tr>
<tr>
<td>1.9 Permitted increases in regulated fares</td>
<td>9</td>
</tr>
<tr>
<td>1.10 British passenger travel, classified by transport mode</td>
<td>11</td>
</tr>
<tr>
<td>1.11 Financing rail networks</td>
<td>13</td>
</tr>
<tr>
<td>1.12 The rail networks of USA, China, Japan and the UK</td>
<td>16</td>
</tr>
<tr>
<td><strong>Chapter 2 Linking rail transport to the Unit 4b specification</strong></td>
<td>19</td>
</tr>
<tr>
<td>2.1 Externalities following an increase in rail use</td>
<td>21</td>
</tr>
<tr>
<td>2.2 British road and rail fatalities, 1961-2010</td>
<td>27</td>
</tr>
<tr>
<td>2.3 Inflation and economic growth in the UK, 1950-2011</td>
<td>29</td>
</tr>
<tr>
<td>2.4 Illustrating demand management; an outward shift in AD</td>
<td>30</td>
</tr>
<tr>
<td>2.5 Examples of fiscal policy</td>
<td>31</td>
</tr>
<tr>
<td>2.6 Examples of monetary policy</td>
<td>32</td>
</tr>
<tr>
<td>2.7 Examples of supply-side policies</td>
<td>32</td>
</tr>
<tr>
<td>2.8 Projected GDP growth in UK from 2012</td>
<td>33</td>
</tr>
<tr>
<td>2.9 Government &amp; rail transport: dealing with market failure</td>
<td>39</td>
</tr>
<tr>
<td><strong>Chapter 3 Detailed commentary on the Case Study</strong></td>
<td>41</td>
</tr>
<tr>
<td>3.1 Rail passenger kilometres and rail journeys, extended to 2011</td>
<td>42</td>
</tr>
<tr>
<td>3.2 Number of journeys in Britain by transport mode, 2010</td>
<td>43</td>
</tr>
<tr>
<td>3.3 Number of passenger-kilometres in Britain by transport mode, 2010</td>
<td>43</td>
</tr>
<tr>
<td>3.4 The growth in rail usage: Evidence G and H compared</td>
<td>44</td>
</tr>
<tr>
<td>3.5 Profit and loss on the French railway network</td>
<td>53</td>
</tr>
<tr>
<td>3.6 Route of HS1</td>
<td>58</td>
</tr>
<tr>
<td>3.7 Proposed Y-shaped route of HS2</td>
<td>59</td>
</tr>
<tr>
<td>3.8 Time savings from a completed HS2</td>
<td>61</td>
</tr>
<tr>
<td>3.9 Who has reservations about HS2 and why?</td>
<td>63</td>
</tr>
<tr>
<td>3.10 The environmental impact of HS2</td>
<td>64</td>
</tr>
<tr>
<td>3.11 Route of Crossrail, due to open in 2018</td>
<td>65</td>
</tr>
<tr>
<td>3.12 The Thameslink upgrade program, 2007-2018</td>
<td>66</td>
</tr>
</tbody>
</table>

for more resources on this syllabus see www.anketelltraining.com
Introduction: how to use this resource

**Who is it for?**
Students sitting the 2013 Unit 4b examination as part of the Economics and Business Studies A level examined by Edexcel, and their teachers.

**What principles lie behind it?**
The basic principle is that the best way to do well in the Unit 4b examination is for students to immerse themselves both in the Pre-release material and the industry on which it is based. Reading around the industry will increase student confidence, and generate interest. Furthermore, the best way to revise the Unit 4 specification is to see if you can apply it in the context of a particular industry. An ability to do this will result in a far deeper understanding than if principles have been learned without any practical application. However, it must be emphasised that the examination is on the specification, and not rail transport itself.

**So how do I actually use it?**
Each of the main chapters contains enough material (and questions) for at least three or four hours work, either in a class room context or for private study – or a combination of the two. They are not lesson plans, but contain all the background material teachers need to create their own lesson plans. The questions assume some basic knowledge of the Unit 4b specification, and the AS course.

**Chapter 1** provides a background to rail transport in the UK. It should be accessible to students straight from the AS course.

**Chapter 2** goes through the specification line by line, applying it to rail transport. It can be used either as an introduction to the course, or as a means of revising its content.

**Chapter 3** examines the Pre-release material itself, which needs to be read alongside this chapter. Reading through this chapter and answering the questions that follow provide an in-depth look at the Pre-release material.

**Chapter 4** consists of two sample papers in the format used by Edexcel in 2012. Students need their own copy of the Pre-release material.

**Appendix 1:** extended answers on all the previous chapters, with additional information.

**Appendix 2:** a handy glossary of common rail transport terms.

**CD contents:** two Power Point quizzes, covering both the specification linked to rail transport, and the pre-release material. It also contains Chapters 1 and 2, and the diagrams and footnotes from Chapter 3.

**Do I need anything else?**
You need the Pre-release material.

Gerald Wood 20th November 2012
Chapter 1 Introduction to rail transport

The technology of rail

In this section we look briefly at the history of technological development in rail transport. The use of metal for rails and for wheels has been one major innovation, while the switch in power source from animals and humans to steam and then to diesel and electricity has been the other major change. Apart from that, the technology of rail works very much as it did in the time of Socrates. The railway is a bit like the bicycle in that it is a brilliantly simple idea, and succeeding generations have – until the recent ongoing development of magnetic levitation (maglev) technology – only found it possible to modify, rather than radically alter, the core concept.

Parallel tracks

The oldest known railway is the Diolkos. Operational for roughly 600 years leading up to the birth of Christ, it ran over the Isthmus of Corinth. It thereby connected the Aegean Sea between Greece and Turkey with the Ionian Sea between Greece and Italy. It was used to haul cargoes, and possibly small ships, from one sea to the next, and was powered either by oxen or human slaves. The feature that made it a railway, rather than a road, are the grooves cut into the limestone, which guided the trolleys on which the cargoes rode. It does, therefore, count as a railway “in the basic sense of a prepared track which so guides the vehicles running on it that they cannot leave the track”.¹

Figure 1.1 The remains of the Diolkos (left); map of today’s Greece with a dot indicating the Isthmus of Corinth across whose neck the railway was located (right)

Wooden rails

Railways began appearing in Europe in the 14th century. For several hundred years, they ran on wooden rails, which needed replacing at frequent intervals as they wore out. Typically, one set of wooden rails was nailed on top of another, so that when the top set were about to wear through they could be replaced without disturbing the railway’s foundations. Commonly used to transport coal from the mine head to ships (and later to canals), they relied on human or animal power just as the Diolkos had two thousand years before. Gravity was also used, as these were essentially one-way operations. In many instances the railway could be designed to make the most of gravity so that full wagonloads rolled down to the coast or canal, and only the empty wagons needed to be hauled back up the hill.

¹ http://en.wikipedia.org/wiki/Diolkos

for more resources on this syllabus see www.anketelltraining.com
Metal rails and steam power
The next major innovation was metal rails. Much longer-lasting than wood, they were first made out of iron in the early nineteenth century, then steel from the 1850s onwards. However, the key innovation which led to the rapid expansion of rail was the steam engine. The first-ever steam engine, known as The Rocket, was built in 1829 by George Stephenson. It ran on the first railway open to members of the public, the Stockton to Darlington Railway. This was also a milestone in the development of rail, as passengers went on to become an important source of revenue alongside freight. Over the next 25 years, over 7,000 miles of railways were built in the UK, all based on this new technology. Steam engines were in common use in Britain well into the 1960s, and were still used extensively in China up until the first decade of the twenty-first century.

Figure 1.2 Wooden rail tracks (left); George Stephenson’s steam engine ‘Rocket’ of 1829 (right)

Electric and diesel power
However, steam engines are labour intensive, requiring large numbers of operatives to clean the engines and load the coal. They have, therefore, been largely superseded by locomotives running on either diesel, or on electricity, which is provided by overhead cables or by a third rail. Electrification first took place on tramways. These are metal rails dug into road surfaces, on which specialised buses, known as trams, run. These were mainly horse-drawn up until the First World War (1914-18), after which they were steadily electrified. In the case of conventional railways, the major move away from coal took place after the Second World War (1939-45), when rising wage rates made labour-intensive steam power less attractive.2 This is basically the technology that railways in Britain still use. Those 7,000 miles of track laid by Victorian entrepreneurs are still in use, accommodating trains powered by electricity or diesel rather than steam.

Higher speeds
The next stage in the development of rail train was the high-speed train. Obviously, the definition of ‘high speed’ has tended to creep up over time, with Britain’s InterCity 125 once considered high speed, but now considered merely normal. For speeds much above 125 mph, new tracks normally have to be built, because existing tracks have curves which are too tight to accommodate these higher speeds. The trains would come off the rails at the bends, though the maximum speed on curved tracks can be raised to some extent through the use of tilting trains.

Japan showed what could be done with its Shinkansen or ‘bullet train’ which opened for service in 1964 between Tokyo and Osaka. Partly financed by the World Bank, the trains ran on newly-laid track. The motivation for building it was the Japanese government’s unwillingness to become too dependent on cars, which needed petrol which could only be imported from abroad. Running at a top speed of 210 kph (130 mph) this does not qualify as high-speed by today’s standards. A faster network was also constructed from the 1970s in France, known as TGV (Train à Grande Vitesse, i.e. high speed train), and subsequently in Belgium,

2 http://en.wikipedia.org/wiki/Rail_travel

for more resources on this syllabus see www.anketelltraining.com
Germany, Spain and Italy. Average speeds of 170 mph are common, and have since 2000 been matched on new high speed rail lines in South Korea, Taiwan and notably in China. Italy is currently running some new French-designed trains with a top speed of 225 mph.

Figure 1.3 Steam train on Talyllyn railway, Wales (left); advertisement for French TGV (right)

Future technologies
There have been some experiments with magnetic levitation (maglev) technology. This uses magnets to raise the train a few millimetres above the track in order to reduce friction and to eliminate wear and tear on rail and train alike. The magnets may also be used to provide forward propulsion as well. Commercial systems are still in their infancy, although a 19 mile stretch has operated in Shanghai since 2004. The technology carries with it the potential to go very fast. For example, in 2011 the Japanese government approved the first stages of a maglev line from Tokyo to Osaka with a planned operating speed of 300 mph.

More exotic still is the possibility of putting maglev trains in vacuum tubes, which would eliminate air resistance and make speeds of several thousand mph possible. Whether these ‘vac trains’ will ever be built is open to question; but the possibility of ‘space travel on earth’ as it has been called is fascinating.\(^3\)


for more resources on this syllabus see www.anketelltraining.com
Ownership of UK railways: 150 years of experimentation

Mine owners
The history of road and rail has been very different. Roads have evolved gradually over millennia. Footpaths were widened to take more travellers, and purpose-built roads constructed by the Romans to take armies. Horse riders and horse-drawn carriages then followed, with tarred surfaces coming in with motor cars in the late nineteenth century. Roads are a classic ‘public good’, one from which it is difficult to exclude consumers, both because of the costs involved in setting up tolls and because of the culture of free access that has built up over centuries. They have, therefore, been commonly paid for out of general taxation, with the toll road (and the private road) being very much the exception. By contrast, railways began as purely commercial enterprises owned by the proprietors of coal mines. They simply represented a capital investment that reduced transport costs from the pit-head to the nearest river, canal or port that could take the coal onwards. Such early rail systems have either disappeared, or been turned into tourist attractions such as the Talyllyn railway shown in Figure 1.3.

Limited companies
However, with the development of the steam engine, dozens of limited companies were set up in the UK to exploit the radical new technology, financed by eager members of the public looking for a good return on their savings. Shares in railway companies in the 1840s showed all the characteristics of internet stocks around 1995-2000: wild enthusiasm leading to a speculative bubble, a crash, fortunes made and lost. With a fifty-year head start over the motor vehicle, and with the speed of the railways giving them a decisive advantage over canals, they became the dominant form of freight transport and took increasing numbers of passengers too.

Figure 1.5 Share certificates from nineteenth century British railway ventures

Consolidation
During World War I (1914-18), the railways were run by the government as part of the war effort, and it soon became clear that the economies of scale were such that the railway network would develop faster under less fragmented ownership. Railways were, in effect, a natural monopoly. So after the war, the hundred or so companies with their 19,000 miles of track were merged into just four by an Act of Parliament. Each had a London base, and served the South of England, the West, the North & East, and the Midlands & Scotland respectively. However, the emergence of motorised vehicles - the truck, the coach and the car – soon did to railways what railways had done to canals a century before. Investment in railways no longer made sense as

for more resources on this syllabus see www.anketelltraining.com
profits were low. From the late 1920s onwards, the rail system shrunk until, by the 1970s, Britain was left with the main inter-city routes and commuter lines into the big cities, and especially into London.\footnote{http://en.wikipedia.org/wiki/History_of_rail_transport_in_Great_Britain}

**Nationalisation**

After World War II (1939-45), the incoming Labour government took into public ownership whole swathes of private industry in a process known as nationalisation. Coal, electricity, gas, road haulage and the railways were all subject to compulsory purchase by the government during 1947-49. However, changes in ownership could not alter the underlying advantages of road transport, and the newly-formed British Railways was soon making losses. Additionally, it acquired the reputation for poor service which is common to virtually all state monopolies.

**Figure 1.6 Rail nationalisation and privatisation: first logo of the newly-nationalised British Railways in 1948 (left); protest against rail privatisation (right)**

**Privatisation**

After roughly 50 years of government ownership, rail was returned to the private sector over 1994-97. The selling off of state assets to the private sector is known as privatisation. Its leading exponent was Margaret Thatcher, Prime Minister from 1979 to 1990. During her time as Prime Minister gas, electricity, water, telecommunications, airports, airlines, cars, steel, ship-building, sugar, buses and 2 million council houses were all sold off in a program that was widely imitated around the world. It is fair to say that the program represented an historic rolling back of the state, based on the now-widely-accepted belief that business people almost always run enterprises more efficiently than governments. The railway network was one of the last privatisations in this series, and was carried out under Margaret Thatcher’s successor, John Major.\footnote{http://en.wikipedia.org/wiki/List_of_privatizations#1970s}

**Separating train and track ownership**

British Rail could have been sold off as one large company, or sold off as four regional companies. The latter option would have restored the ownership pattern existing before nationalisation, where four regional monopolies ran independent networks. However, by the 1990s there was a better understanding of the benefits of competition than had existed 50 years before, so the preferred plan was to introduce as much competition as possible.

The problem is that the rail network forms a classic ‘network monopoly’ just like water pipes, gas pipes, telephone wires and the electricity grid. The point about these services is that the more people they serve, the cheaper they become to provide per person, so bigger companies will always push out smaller companies until only one is left. We could probably add to that list of network monopolies computer operating systems

for more resources on this syllabus see www.anketelltraining.com
The proposed solution was to separate the rail tracks, which formed a natural monopoly, from the trains themselves which could in theory be run in competition with each other. After all, we have a single road network, on which lots of taxi firms and road hauliers compete. Why should we not have a single rail network with lots of competing train companies? So the rail lines were sold off in 1994 to anyone who wanted to buy shares in a new company called Railtrack, while the train timetable was split up into 25 fixed-term franchises for which interested parties were invited to bid. Most of the franchises were awarded over 1995-97 to bus companies like Stagecoach, MTL (Merseytravel) and National Express, or to newly-formed companies whose directors had a bus industry background, like Prism Rail.

The current ownership model

The pattern of a single owner of the track and competing companies owning and running trains still exists. Privatisation was completed in 1997, just before the arrival of an incoming Labour government, which had threatened to halt it. The current system, therefore, has three main parts.

- The track itself, owned by a single company. First this was Railtrack, now Network Rail.
- Train Operating Companies (TOCs) run the trains on defined parts of the network on a franchise basis for limited periods. In addition, a few extra trains are run by “open access operators” in the gaps between the TOC’s trains.
- The trains themselves (the ‘rolling stock’) are owned by three rolling stock companies, known as ROSCOs. They are Angel Trains Ltd, Eversholt Rail Group and Porterbrook Leasing Company Ltd. The ROSCOs lease out their trains to the TOCs.

Labour, in power from 1997 to 2010, was opposed in principle to a national asset – the rail network – being run for private profit. When four people were killed in the Hatfield rail crash of 2000, caused by an inadequately maintained track, Railtrack was held to account. For if the company was allowed to make money from running a national network, should they not also be held responsible for its condition? A very expensive program of track maintenance was imposed on Railtrack, together with over 1,200 emergency speed restrictions across the network.

The company never recovered financially from this setback, and was replaced by the government in 2002 with a state monopoly called Network Rail. Network Rail is a ‘not-for-dividend’ company, and any profits it makes must be ploughed back into the rail network. Effectively, it is a branch of the government. As with most monopoly providers, it operates under supervision – in this case provided by the ORR (Office of Rail Regulation).

Figure 1.7 Tilting trains, as leased by Virgin from 2004. Virgin lost the West Coast franchise in August 2012, but the DfT has admitted its bidding process was flawed, and is re-running the process

---

8 [http://www.networkrail.co.uk/aspx/713.aspx](http://www.networkrail.co.uk/aspx/713.aspx)

for more resources on this syllabus see [www.anketelltraining.com](http://www.anketelltraining.com)
The current market structure of UK rail travel

The market structure is, therefore, one of a government-controlled network monopoly of rail tracks on which rival train operating companies compete for franchises over 19 defined regions. The network monopoly is, as already mentioned, owned and run by a not-for-dividend company called Network Rail, which is supervised by the Office of Rail Regulation (ORR). The ORR is a government department, with 300 staff and an annual budget of £18 million, and is responsible for the efficient and safe running of the rail network and for competition issues. An example of the way this works is provided by the fine Network Rail is currently facing (September 2012) for failing to hit agreed targets for improvements in train punctuality.

Competition among train operators is generated by holding regular competitions for the right to run trains over 19 defined regions. The bidding process itself is overseen by the Department for Transport (DfT). One example is the recent bid for the West Coast mainline franchise from 2013-2026. Controversially, the current franchisee Virgin Trains lost out to First Group, who offered £5.5 billion i.e. £423 million a year. While Richard Branson of Virgin has appealed to the courts, forcing the DfT to order a re-run of the bidding, the bidding process does show that competition is working reasonably well. The government has sensibly kept out of running most train services directly, so that at least some of the benefits of competition are achieved.

However, in many respects competition is far from perfect. New franchisees have to take on all the employees of the former franchisee. In other words, employment rights are protected: the employees simply switch uniforms. Then the trains themselves are hired from one of just three companies, known collectively as rolling stock companies (ROSCOS). Additionally, rail fares are still largely controlled by government. The reasoning behind this may be that, on busy commuter routes, the franchisees hold an element of monopoly power.

Furthermore, there is no competition in the running of the rail network itself, with Network Rail operating as a monopoly. It may be that this is unavoidable, as there is a strong argument for saying that the rail network is a natural monopoly. That said, prior to 1947 the train companies ran the rail network too, and this gave them an incentive to reduce costs, which may be absent from Network Rail. The government is currently proposing to break up Network Rail into regions, so that each part may be benchmarked against the others.

In conclusion, the current market structure of rail travel may be the best that can be achieved. While recognising the natural monopoly of the rail tracks themselves, there has been a serious attempt to generate competition among train operators. The 19 regions are able to support a variety of train companies, whose presence then ensures that competition for franchises, as they fall vacant, is fierce. The current system also lends itself to increased competition from overseas operators. The Financial Times reports that the “rail sector is facing unprecedented turnover in operators as more than half of the franchises are due to be renewed in the next three years. The four listed UK transport groups – FirstGroup, Go-Ahead, National Express and Stagecoach – are facing growing competition from foreign-based, state-controlled operators.”

Furthermore, the EU has taken the view that this is the ownership structure that it wishes member states to adopt, with the hope of encouraging competition between train companies across the continent.
UK Rail travel: who pays?

Tax-payer or traveller?
The short answer is that UK fare-paying passengers pay 66% (two-thirds) of the cost, with the remaining one-third paid for by the taxpayer, primarily through a government grant to Network Rail. The full figures from 2010 are as follows:

Figure 1.8 The costs of rail travel

<table>
<thead>
<tr>
<th>Sector</th>
<th>Cost to government</th>
<th>Cost to passenger</th>
<th>Total</th>
<th>Billion passenger miles</th>
<th>Cost to government per passenger mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long distance rail</td>
<td>£693m (25% of total costs)</td>
<td>£2,079m (75% of total costs)</td>
<td>£2,272m</td>
<td>9.4</td>
<td>7.3 pence</td>
</tr>
<tr>
<td>London &amp; South-East</td>
<td>£760m (19%)</td>
<td>£3,240m (81%)</td>
<td>£4,000m</td>
<td>15.7</td>
<td>4.8 pence</td>
</tr>
<tr>
<td>Regions</td>
<td>£1,873m (61%)</td>
<td>£1,197m (39%)</td>
<td>£3,070m</td>
<td>6.0</td>
<td>31.1 pence</td>
</tr>
<tr>
<td>Totals</td>
<td>£3,326m (34%)</td>
<td>£6,516m (66%)</td>
<td>£9,842m</td>
<td>31.1</td>
<td>10.7 pence</td>
</tr>
</tbody>
</table>

As you can see, the commuter lines around London and the inter-city network pay three-quarters or more of their total costs, but the regional services are heavily subsidised to the tune of 61% of total cost. The 31 pence per mile subsidy for regional rail travel is not far off the 40 pence per mile that the tax authorities allowed individuals to claim (in 2010) for using their private cars for business purposes. Put another way, it would not be too much of an exaggeration to say that it would be cheaper for the government to close down regional rail travel altogether, and pay former passengers to make those journeys by car instead.

One aspect of the regional rail problem is the sheer number of stations that are hardly used. The least-used 50% of stations in Britain serve just 3% of rail passenger numbers. Their continued operation represents an enormous per capita subsidy to a tiny number of people.

These figures also give some insight into why train travel has never taken off in the United States, given that country’s traditional free market approach. On purely financial grounds, most passenger rail operations – with the possible exception of commuter lines into major cities – make little sense. Furthermore, with the longer inter-city distances in the US, trains will always find it difficult to compete with air travel. Freight is a different story. Without the expense of running a defined passenger timetable, and without effective competition from airlines due to the weight-to-value ratio of raw materials, these trains criss-cross the US, carrying 38% of all freight in 2000, compared with just 8% of freight in the EU where shorter distances give an advantage to the truck over the train.

Train Operating Companies (TOCs) or Network Rail?
Potential franchisees have to submit a detailed plan showing how they intend to run the service and are told what the minimum service levels must be, particularly with respect to train frequency. They then submit a bid, saying how much they are prepared to pay for the privilege. The Department for Transport does not have to accept the highest bid, but – other things equal – will do so. So for example they received four bids for the South-Western franchise in 2007 for £501 million, £515 million, £636 million and £1,193 million

---


for more resources on this syllabus see www.anketelltraining.com
respectively. The franchise was awarded to the existing operator, Stagecoach, who had also put in the highest bid.

The fare-paying passengers then pay for the entire running costs of the franchisee, and for their profits. However, the franchisee also pays Network Rail an access charge for using the rail network, but these access charges do not cover the full cost of running the network. The remainder of the cost is, as already stated, paid for by government grant.

**Who decides the level of rail fares?**

Rail fares are divided up into those which are regulated by the government, and those which are not. Regulated fares are allowed to increase each January by the inflation rate (as measured by the RPI the previous July) plus or minus an agreed percentage. It should be noted that these permitted fare increases only refer to the average regulated fare increase, which gives a train operating company considerable discretion to increase some fares by a lot more. The allowable regulated fare increases have been:

**Figure 1.9 Permitted increases in regulated fares**

<table>
<thead>
<tr>
<th>Year</th>
<th>Permitted increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995-98</td>
<td>RPI</td>
</tr>
<tr>
<td>1999-2003</td>
<td>RPI – 1%</td>
</tr>
<tr>
<td>2004-12</td>
<td>RPI + 1%</td>
</tr>
<tr>
<td>Jan 2013</td>
<td>RPI + 3%</td>
</tr>
</tbody>
</table>

The recent rise in permitted fare increases to RPI + 3% (now withdrawn) was part of the government’s long-term strategy of reducing the amount by which the taxpayer has to subsidise the railways, which we saw in Figure 1.8 was over £3 billion. In fact, the government announced that the new RPI + 3% increase would come into effect from 2012 but got cold feet when the RPI for the previous July came in at a very high 5% pa, which – with RPI + 3% – would have resulted in regulated fares increasing by 8%. Now they have got cold feet and returned the permitted increase to RPI + 1% yet again! These flip-flops indicate how politically sensitive fare increases are. Once the government has taken responsibility for controlling rail fares, it opens itself up to passenger pressure groups who – understandably – exercise their democratic right to embarrass the government by highlighting any fare increases they feel to be unreasonable. Which is most of them.

Regulated fares include saver returns, standard returns and commuter season tickets into the London area. Unregulated fares include all first class tickets and ‘advance purchase’ fares. However, there are practical obstacles in the way of train companies putting up unregulated fares by whatever they like. In particular, if a train company has been told what to charge for a standard return, it can hardly charge more for a ticket purchased in advance or nobody would buy one.

*******************************************************************************

END OF CHAPTER 1 SAMPLE

19 Except for some regional routes, which the government subsidises on social grounds.
20 On October 7th 2012, the government announced that the permitted fare increases in 2013 and 2014 would be reduced to RPI + 1%. The result of this is that the proposed RPI + 3% will never have been put into effect over any of the three years for which this increase was originally intended.

for more resources on this syllabus see [www.anketelltraining.com](http://www.anketelltraining.com)
Chapter 2  Linking rail transport to the Unit 4b specification

HOW TO USE THIS CHAPTER
In this chapter, each main heading and numbered side heading corresponds to a specification (i.e. syllabus) heading in Unit 4b, which is the unit linked to the pre-release material on rail transport in 2013. It is followed by an explanation of the term, which is then illustrated with reference to rail transport, where appropriate. Students also need to revise the AS content for both A2 examinations as well. The purpose of this chapter is to provide a handy revision/reinforcement tool for students. If students know and understand everything in here, then they will have a sound knowledge of the background needed for the Unit 4b examination.

Remember, you do not have to learn the specific examples from rail transport used to illustrate the economic and business theory. But they should be useful background for your understanding both of rail transport, and of the technical terms themselves.

4.3.1b DO MARKETS ALWAYS WORK?
In both this section and the following one (4.3.2b) the specification deals with the same fundamental concept of market failure and the government’s response to it. In this section, the market failures addressed are those caused by externalities, both external costs and external benefits. There is also a brief reference to inequality and to the absence of information as possible market failures. In 4.3.2b, the market failure addressed is monopoly power.

What market failure means

1. Less than optimum allocation of resources
In a world of scarcity, any economy has to produce an enormous variety of goods and services. When the inputs (or ‘resources’ or ‘factors of production’) of land, labour and capital are distributed between (i.e. ‘allocated to’) the various industries in the proportions necessary to achieve the maximum benefit, then the economy is said to enjoy “optimum allocation of resources” or “Pareto efficiency”. For example, we need just the right amount of rail transport relative to the amount of other transport modes – and indeed everything else – for ‘optimal allocation of resources’ to be achieved. In those cases where the free market does not achieve this outcome, then ‘market failure’ has occurred.

2. Public goods
There is one class of goods known as ‘public goods’, which a free market would not produce at all. The two examples given in the specification are defence and lighthouses. The argument is that since the benefit generated by these goods is available to everyone, then there is no private benefit which would enable entrepreneurs to sell them – so they don’t get produced at all. While, for example, a security guard produces an exclusive private benefit to the household or company whose premises he is guarding, there is no similar exclusive private benefit from having a standing army – the benefit is thinly spread over the entire population. Public goods are therefore a very clear example of a ‘less than optimal allocation of resources’ leading to market failure. The free market will allocate no resources whatsoever to the production of an army, even though society as a whole may gain enormous benefit from being defended. In response to this market failure, governments provide public goods out of general taxation.

The rail network is not a public good since access to it can be effectively controlled through ticketing and barriers. However, because one of its substitutes – road transport – is a public good, it may be the case that road transport is over-utilised as drivers are not paying the full external costs of the congestion they create. As a consequence of this, rail transport could be under-utilised.

3. Merit goods
Merit goods are a further example of the failure of the free market to produce an optimal allocation of resources. In the case of these goods, there is a private benefit to the buyer, so entrepreneurs will indeed produce the good or service. But there is also an external benefit, which neither buyer nor seller has an incentive to take into account. So the free market’s allocation of resources to industries producing merit goods will be too small. The examples given in the specification are health and education. Within these fields, inoculation provides a clear example of a merit good. For example, by being inoculated against swine flu, the individual not only reduces the risk of catching it himself (a private benefit) but also reduces the risk
of passing it on to someone else (an external benefit). The government responds to the market failure created by merit goods by encouraging their consumption in one of a number of ways – in the case of inoculations often by providing them free at the point of take-up.

In the case of rail transport, it may be viewed as a merit good. Train use reduces congestion on the roads. However, we should be careful not to count the benefits of switching from private cars to rail transport twice over. If private cars are ‘demerit’ goods because of the external costs they generate, then the appropriate response is to tax their use. This will cause a switch to rail transport without the need for an additional subsidy for the rail network. Rail transport does not produce an external benefit in its own right.

4. Demerit goods
Demerit goods are another example of the failure of the free market to produce an optimal allocation of resources. As its name suggests, they are the mirror image of merit goods. While merit goods produce both an external and a private benefit, demerit goods produce a private benefit but an external cost. This time, it is the external cost which neither buyer nor seller considers, so the free market allocation of resources to these industries is too large to be optimal. Examples given in the specification are drugs and pollution. So while a coal-fired power station produces an undoubted private benefit to the purchasers of electricity, its CO2 emissions contribute to global warming, which will ultimately cost us dear. The government responds to the market failure created by demerit goods by seeking to restrict their consumption – for example by taxation – to reduce the output of the industry to its allocatively efficient level.

While rail transport is probably a merit good, as explained above, there are some external costs associated with its use. These are some CO2 emissions – more from diesel-powered trains than electrified ones – and also some deterioration in property values of neighbourhoods around London’s main railway stations such as Paddington and Kings Cross. These have become associated with prostitution, a sure means of driving down house prices.

5. Equity and equality
See 4.3.4b on this topic, paragraphs 39 to 43.

6. Social costs and benefits
The social costs of any product is the sum of the private costs (i.e. the normal costs of production) and the external costs – if there are any - which fall on other people. In the case of rail transport, the private cost would be the cost of buying the ticket. The external costs of rail travel are relatively small: some CO2 emissions but less than the alternative of travel by car.

Equally, the social benefits of any product are the sum of the private benefits that the individual gets through travelling by rail and the external benefits – if there are any – which other people receive. It is the presence of significant external benefits which makes a good a ‘merit good’ – or, in the absence of corresponding private benefits, a ‘public good’. Taken together, external costs and external benefits are known as ‘externalities’.

How do externalities affect an economy? As already indicated, in both cases they lead to market failure. In the case of an industry that generates significant external costs, the industry will, under free market conditions, grow to above its optimal size. Conversely, in the case of an industry that generates significant external benefits the industry will, under free market conditions, be below its optimal size. In the case of rail transport, we have identified a major external benefit in the form of reduced road congestion but little in the way of external costs.

Technical note: in a confusing development, the term ‘social costs’ is being used more and more to mean ‘external costs’ rather than ‘external costs plus private costs’. The same is true of ‘social benefits’.

7. Examples of externalities, economic, environmental and social
We have already made the key distinction between external costs and external benefits. Another way of looking at externalities is to ask on whom the externality falls. If it falls on other businesses, it is sometimes referred to as an ‘economic’ externality, if on neighbours as a ‘social’ externality, and if the impact is first felt by the natural environment then an ‘environmental’ externality. Figure 2.1 below gives some examples:

for more resources on this syllabus see www.anketelltraining.com
**Figure 2.1 Externalities following an increase in rail use**

<table>
<thead>
<tr>
<th>Economic</th>
<th>Social</th>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility of unwise investments in prestige projects – possibly HS2?</td>
<td>More long-distance commuting creating ‘commuter towns’ with few social activities</td>
<td>Decline in property values around main rail stations</td>
</tr>
<tr>
<td>Increased economic activity near rail stations</td>
<td>Greater ability to visit friends in other cities</td>
<td>Reduced CO2 emissions, if travellers substitute out of cars and into trains</td>
</tr>
</tbody>
</table>

All these costs and benefits are ‘external’ in the sense that they are not costs that the train operators pay, nor benefits that accrue to the individuals who travel by train.

### 8. Difficulties in measuring externalities

Private costs and benefits are relatively easy to measure. Companies employ accountants to work out their private costs. Consumers who shop regularly develop a fairly clear idea of how much something is worth to them, i.e. their private benefit. But externalities are by their very nature spread out over a much wider population, and attempts to express their cash value have to be treated with caution.

For example, a project like HS2 will generate external benefits near its few stations as companies are attracted by faster travel to London. However, there will be considerable external costs along its route in the form of increased noise and loss of natural landscape.

### 9. Impact of externalities in short versus long run

Another factor making it difficult to measure externalities is the time period over which they make their impact. A decision, for example, to open one primary school and close another may generate both external costs and external benefits for decades to come.

In the case of major rail construction projects, many of the external costs will be ‘front-loaded’. The actual building works will cause considerable disruption. However, the external benefits may last for decades to come. For example, we are still enjoying benefits arising from the mid-nineteenth century construction of the UK rail network.

### To what extent are externalities acceptable?

The assumption behind this question is that we are dealing with external costs, rather than external benefits. No-one is going to object to an external benefit! That said, the question is a good one. The fact that a good or service generates an external cost in either its production or consumption is not a reason to prohibit the good altogether. After all, a comprehensive public transport network brings immense benefits.

### 10. Social benefit and social cost

As we have seen above, the existence of externalities in any industry leads to a situation where the private decisions of households and firms cannot be relied upon to produce an industry of the optimal size, the size that will generate most net benefit (i.e. benefits minus costs). One way of looking at these merit and demerit goods is for the government to try and decide what the optimal level of production is – and then use the powers at its disposal to ‘tweak’ the size of the industry in question.

END OF CHAPTER 2 SAMPLE

for more resources on this syllabus see www.anketelltraining.com
Chapter 3 Detailed commentary on the Case Study

How to use this chapter
It is essential that you have the pre-release material in front of you when you read this chapter.

You need to go into the examination with a thorough grasp of the contents of the case study and the issues that it raises. The commentary below discusses some of these issues - there will be others that readers will find for themselves. In the days before the examination, students may wish to read through this commentary together with the case study and then sit down and write out between two and five key points from each piece of Evidence.

If you read and understand Chapters 1 to 3, you will have a good grasp both of the specification (also known as the syllabus) and of its application to rail transport.

Summary of pre-release material
With no less than nine pieces of pre-release material to consider, it may be helpful to list them in logical order so that we can see the big picture. This is done below:

Pre-release material on rail transport

<table>
<thead>
<tr>
<th>Evidence</th>
<th>How rail usage has changed over the past 25 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Passenger kilometres travelled, Great Britain annual data 1987 to 2009 (billions)</td>
</tr>
<tr>
<td>H</td>
<td>Passenger journeys, Great Britain annual data 1985-6 to 2008-9 (millions)</td>
</tr>
<tr>
<td></td>
<td><strong>The market structure of Britain’s railways</strong></td>
</tr>
<tr>
<td>C</td>
<td>Public subsidy for rail users must end</td>
</tr>
<tr>
<td>D</td>
<td>EU Directive 91/440 – Development of the Community’s railways</td>
</tr>
<tr>
<td>E</td>
<td>Labour calls for review of trains contract awarded to Siemens</td>
</tr>
<tr>
<td></td>
<td><strong>Rail journeys: value for money for the travelling public?</strong></td>
</tr>
<tr>
<td>A</td>
<td>UK has ‘most expensive train fares in Europe’</td>
</tr>
<tr>
<td>I</td>
<td>Commuters face overcrowding</td>
</tr>
<tr>
<td></td>
<td><strong>Got £32 billion to spare? HS2</strong></td>
</tr>
<tr>
<td>B</td>
<td>High Speed Rail</td>
</tr>
<tr>
<td>F</td>
<td>Campaign for Better Transport warns government over high speed rail</td>
</tr>
</tbody>
</table>

We shall consider the pre-release material in the above order, grouping the articles together as shown here.
How rail usage has changed over the past 25 years – Evidence G and H

Rail journeys and rail kilometres doubled over 1994-2011
The pattern of rail usage is shown over roughly the same time period in Evidence G and H, whether measured by passenger-kilometres as in Evidence G, or passenger journeys as in Evidence H. In both cases, rail usage fell to a low in 1994, following the 1990-92 recession. It has since moved sharply upwards.

In the diagrams below, the figures are updated to 2011. From these figures we can see that there was a slight slowdown in rail usage in 2009, reflecting the sharp downturn in the economy in 2008-09. Since then, rail travel has recovered strongly. By 2011, rail travel – whether measured by passenger journeys or passenger kilometres – had doubled since 1994.

Figure 3.1 – Rail passenger kilometres and rail journeys, extended to 2011

Rail journeys still account for only a small proportion of overall travel
While the growth in rail usage over the past 25 years is impressive, rail remains comparatively unimportant as a mode of transport. The 1,465 million rail journeys in 2011 only work out at 24 journeys per person per year out of the GB population of 60.7 million. This comes to just 3% of the 800 trips taken per person per year. As the Transport Secretary Philip Hammond, says in Evidence C, “only 12% of the population use trains”.

24 http://www.dft.gov.uk/statistics/tables/NTS0301

for more resources on this syllabus see www.anketelltraining.com
Figure 3.2 below shows that the car is the dominant form of transport accounting for 64% of all journeys, with walking taking another 22%. Rail is fourth after buses, followed by cycling.

**Figure 3.2 The number of journeys undertaken in Great Britain by transport mode, 2010**

![Mode share - average number of trips: Great Britain, 2010](image)

In terms of passenger-kilometres travelled, rail comes in at a more significant 9%. On this measure, rail comes in at second place, though still a long way behind cars on 78%. Rail trips are substantially longer than the average journey, if only because the time and trouble spent getting to a rail station is only worth it if the proposed rail journey is of a reasonable length. The length of the average train journey explains why 9% of all passenger-kilometres take place on the railways while only 3% of journeys use rail.

**Figure 3.3 The number of passenger-kilometres undertaken by transport mode, 2010**

![Mode share - average distance travelled: Great Britain, 2010](image)

The average length of a rail journey stayed the same

You will see in Evidence G and H (summarised in Figure 3.1) that rail passenger-kilometres and rail journeys grew in much the same pattern over 1985-2011. This reflects the fact that the typical length of a rail journey hardly changed over this time period, staying within the range of 39-42 kilometres (24 to 26 miles).

The comparatively short length of the average train trip reflects the fact that commuting by train accounts for the bulk of the train journeys, not inter-city travel. It is worth noting in this regard that ‘rail travel’ includes the London underground as well as surface travel.

---


for more resources on this syllabus see www.anketelltraining.com
The diagram below shows how closely the pattern of passenger-kilometres (in Evidence G) has followed that of rail passenger journeys (in Evidence H). The slightly faster increase in the number of rail journeys relative to the number of rail passenger-kilometres shows that short-distance commuter travel has grown slightly faster than long-distance inter-city travel.

Both rail journeys and rail passenger-kilometres have been given a value of 100 in 1985.

**Figure 3.4 The growth in rail usage: Evidence G and Evidence H compared**

<table>
<thead>
<tr>
<th>GB passenger journeys (1985=100)</th>
<th>GB rail passenger kilometres travelled (1985=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>1985</td>
</tr>
<tr>
<td>1995</td>
<td>1995</td>
</tr>
<tr>
<td>2005</td>
<td>2005</td>
</tr>
<tr>
<td>2015</td>
<td>2015</td>
</tr>
</tbody>
</table>

**Conclusions**

Since the mid-1990s, Britain’s use of rail travel has doubled. However, the proportion of passenger-kilometres accounted for by rail has increased by much less. The market share of rail travel appears to have increased in the order of 7% to 9% of all kilometres travelled while average journey lengths have stayed the same – within a mile or so of 25 miles (40 kilometres).  

Outside of both London commuting, and business people making regular inter-city trips, rail travel is not widely used. With only 12% of the population using trains, train travel remains a distinctly minority activity. The car remains the dominant mode of transport.

END OF CHAPTER 3 SAMPLE

---

26 See, for example, Figure 1.3 on page 9, where the lower figure of 7% market share for rail travel (as opposed to 9% in Figure 3.3 above) may reflect the exclusion of the London Underground from the figures

for more resources on this syllabus see www.anketelltraining.com
Chapter 4 – Practice papers

HOW TO USE THIS CHAPTER

The practice papers can be used as mock examinations, or to go through for homework or in class.

Good answers will have the following features:

- They will demonstrate a sound knowledge and understanding of the specification
- That knowledge will be applied, so that the exact question asked is answered
- For Questions 1 to 6, there will be normally be references to the Additional Evidence J provided in Section A and/or to the pre-release material
- There will be extensive references to the pre-release material in Section B, Question 7
- Where analysis and evaluation is needed, both sides of the argument will be addressed, and the answer will end with a balanced and informed conclusion.

The format of these sample papers follows that of the examinations in 2012. Section A consists of six questions for a total of 30 marks and provides one piece of Additional Evidence, labeled J. Section B consists of one question (in two parts) for a total of 50 marks, and is based on the pre-release material.

The sample mark scheme gives the following weighting to Sections A and B. Note the focus in Section B on providing analysis and evaluation, accounting for 38 out of the 50 available marks.

<table>
<thead>
<tr>
<th></th>
<th>Knowledge</th>
<th>Application</th>
<th>Analysis</th>
<th>Evaluation</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section A (Q’s 1-6)</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Section B (Q 7)</td>
<td>6</td>
<td>6</td>
<td>18</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Totals</td>
<td>16</td>
<td>16</td>
<td>24</td>
<td>24</td>
<td>80</td>
</tr>
</tbody>
</table>

With 35 minutes to do Section A, and 55 minutes to do Section B, students have one minute per mark, with 5 minutes to spare in each section. In Section A, this 5 minutes needs to be spent reading the Additional Evidence J. In Section B, it should be spent constructing brief plans for the two pieces of extended writing required.

Note 1: With online marking, it is likely that every question will be marked by a different person. There is therefore no point in referring to one answer in another. If a line of argument is relevant in separate questions, then it should be repeated.

Note 2: The amount of detail provided in the suggested answers to these Practice Papers is more than a student could be expected to know. These suggested answers should be seen as an additional source of information, not as a realistic example of what a good student might write.

*******************************************************************************
*********
******************************************

END OF CHAPTER 4 SAMPLE

for more resources on this syllabus see www.anketelltraining.com
Appendix 1: Answers

The questions we are considering form part of a political debate, and are therefore highly contentious. This means that there is usually no such thing as a single ‘right’ answer. In places, these suggested answers will reflect the author’s personal views. Students should be aware that it is the quality of their analysis and evaluation that will be assessed, not the particular conclusions which they reach.

Chapter 1

1.1 The three largest economies in the world are the USA, China and Japan. How might we explain their totally different patterns of rail usage? (10)

Rail is a very cheap way of transporting large numbers of people. It is therefore not surprising that China, with its 1.3 billion people and relatively low standard of living, should have developed the largest rail passenger network in the world. By contrast, the USA is much less densely populated and much richer: the car and the aeroplane are the transport modes of choice.

However, both China and the USA are large countries. There is no transport mode that can equal rail for the bulk transport of freight overland for long distances of 1,000 miles or more, so it is understandable that both countries have developed extensive rail freight networks.

In the case of Japan, their geography of a few, very large cities a few hundred miles apart made the development of rail travel a natural choice. The high-density nature of those cities also makes rail commuting a time-efficient choice, while a more communal, less individualistic approach to life has meant that rail continues to occupy a significant place in transport habits alongside the car.

In conclusion, the variables of distance, population density and GDP per head all have a bearing on the extent to which rail systems develop, alongside the extent to which a free-market philosophy has taken hold within a country. Japan’s combination of medium inter-city distances, a dense population, a high GDP per head and a collective outlook on life have all combined to give Japanese rail a uniquely high market share of passenger-miles travelled compared to other countries.

1.2 Figure 1.1 shows that all sections of the UK rail network make a loss. Should this be a cause for concern? (10)

Loss-making enterprises may be economically justified if there are significant external benefits to go alongside the private benefits that bring in revenue. In the case of rail in Britain, the greatest external benefit is the reduction in congestion on the roads. In the absence of a proper system of road pricing to reflect those external costs, subsidising the alternative of rail and bus travel is another way of achieving a proper balance between the various transport modes – i.e. of achieving allocative efficiency.

However, such arguments work best where the congestion is most severe i.e. in London and the South-East where the subsidy is relatively low at 25% of total costs. It works much less well in the regions where the congestion avoided is less and the subsidy is a massive 61% of total costs. We do, therefore, need to look carefully at regional lines to see whether their continued subsidy can be justified. And we should be comfortable with the government’s plans to raise the real price of train travel substantially so we can find out how much of this subsidy is necessary.
**7b. Evaluate the options open to the government to deal with market failure in rail transport. (30)**

As discussed in 7a, there are multiple instances of market failure, and the government will need multiple approaches in response. Beginning with the external benefits caused by train travel through the reduction of congestion, one response could be to subsidise train travel. That way, the external benefit could be internalised. However, the subsidy would need to be targeted on those routes where train travel really does reduce congestion. This applies particularly to the commuter routes into London and other major cities.

The point here is that these should be specific subsidies for specific routes – not a general subsidy for rail travel as such. In this respect, the current subsidy for Network Rail sends the wrong message. There should be no presumption that rail travel is always a “good thing” worthy of public support. Rather, we should identify specific external benefits on specific routes and respond by granting subsidies there. These could be given to the train operating companies, which would respond by paying more to win the franchises as they would now be worth more. In this way, the subsidies would end up supporting the cost of running the rail network.

One outcome of this approach would be that many regional rail services like Trans-Pennine Express would probably have to close. But who is to say that they should stay open? They do not carry nearly enough passengers to pay for themselves, nor do they reduce congestion as they do not, on the whole, follow commuter routes. Instead, we would end up with a rail network more like America’s where rail does what rail does best – namely provide a fast and efficient method of commuting into major conurbations. This would also achieve Philip Hammond’s objective in Evidence C of cutting the current “£5.2 bn a year state subsidy”. The point is not that subsidies should be eliminated, but rather that any subsidy should be tailored to address a precise external benefit.

On the market failures caused by information asymmetry, there may be a case for the competition authorities, in this case the OFT and/or the ORR, enforcing a simplified fare structure if they feel passengers are being put at a serious disadvantage. This approach is currently (November 2012) being discussed with respect to gas and electricity tariffs, where the OFT has taken the view that the pricing structure is so complex, and changes so frequently, that consumers often end up on a tariff that costs them more than they need to pay.

Moving on to market structures, the EU Directive in Evidence D speaks of the need for an “increasingly competitive market”. In the case of bidding for rail franchises, Evidence J suggests that the process could be made more competitive if operating companies had to cover their losses if demand increases failed to materialise, as well as taking the profits if it did. The current bidding system incentivises bidders to exaggerate the likely size of the increase in demand for rail travel, knowing that they can walk away from the operation if these prove optimistic.

However, the greatest potential market failure is the monopoly that is Network Rail. This is difficult to address because the network economies of scale mean that it is a natural monopoly. There are, though, a number of steps that could be taken to encourage efficient maintenance of the tracks. The first would be to split the network up into regions, and manage each region independently. This would enable the Office of Rail Regulation (ORR), which supervises the network, to compare the performance of one region with another, and penalize the least efficient regions.

Taking this idea one step further, there is no reason why the operating companies which win the 15-year contracts to run the trains should not also run their section of the track. This was, after all, the way the system was run between the two world wars where each regional train operator (such as Great Western Railways) also maintained (and indeed owned) the track on which its trains ran. Such an outcome would not amount to a series of regional monopolies (like the water companies), because the 15-year bidding process would still impose an element of competition on the whole process.

In conclusion, there are a number of approaches that the government could adopt to deal with market failure within rail transport. None of them would be popular with those who would lose out, and the government would need both firmness and clarity of purpose to carry them through. Closing some railway lines will never

******************************************************************************************************

END OF APPENDIX 1 SAMPLE

for more resources on this syllabus see www.anketelltraining.com
Appendix 2: Glossary

Access charges: the money paid by train operating companies to the owners of the rail network, that is, Network Rail.

British Railways: the name for the newly-nationalised rail system from 1948. In 1965 the name was shortened to British Rail, and this remained in use until rail privatisation in 1997.


Department for Transport (DfT): government department with enormous power over the country’s transport network. Among its rail responsibilities are running the franchise bidding for sections of the rail network, and owning HS2 Ltd.

EU directive 91/440: lays out the EU’s plans for the future development of rail systems in Europe. Based around the goals of competition and inter-operability, it specified that country’s rail networks should be separate from the train operating companies, and that the rail networks should also be distinct from government. Furthermore, new rolling stock should be designed to run across the EU.

Franchise bidding: the process by which train operating companies compete to run trains on specific sections of the network over a time frame of 15 years or so.

Freight trains: are trains carrying goods, not people. This is the cheapest way to carry many types of freight over distances of 1,000 miles or more, and so is much used for cross-continental travel in Russia, China and the USA.

Gauge: see rail gauge.

High speed rail 1 (HS1): the high-speed track connecting St Pancras London with the Channel Tunnel.

High speed rail 2 (HS2): the proposed Y-shaped high-speed track which would connect St Pancras London and HS1 to Birmingham (known as Section 1), and then on to Manchester and Sheffield (Section 2).

HS2 Ltd: the company owned by the DfT, which is promoting and planning HS2.

Inter-city: rail travel between city centres; also used as a brand name for these rail services.

Inter-operability: the ability of rolling stock to run across the EU’s rail network. Most British rolling stock can run on Continental railways, but not the other way round as most of Britain’s railways have a smaller loading gauge than the Continent.

Light rail: smaller and slower rail systems such as the London Underground. They normally form commuter networks.

Loading gauge: is the maximum width and height for trains on a specific rail network. This will be determined by the dimensions of tunnels and other elements of the rail network. The Continent has a larger loading gauge than Britain, whose rail network was built first and on a smaller scale. HS1 and the proposed HS2 together with the Channel Tunnel use the continental loading gauge.
**Maglev:** train systems using magnetic levitation to keep them a few millimetres above the track, thereby eliminating friction between the train and the track. Maglev is currently used in a minor way in Shanghai. Japan is planning a maglev line from Tokyo to Osaka running at 300 mph.

**Network Rail:** the ‘not-for-dividend’ company that has owned the rail network since 2002. It is financed by a combination of track access agreements from the **train operating companies**, and government grant.

**Office of Rail Regulation (ORR):** the government department which supervises **Network Rail** to ensure the safe running of the rail network. It is also responsible for rail competition issues, together with the OFT.

**Passenger journeys:** the number of separate journeys undertaken by individuals, normally measured over a year. These may be plotted over time, and/or broken down by **transport mode**.

**Passenger kilometres:** see **passenger miles**.

**Passenger miles:** the number of miles travelled by all travellers. Passenger miles are equal to the number of passenger journeys multiplied by the average distance of each journey. They may also be measured in **passenger kilometres**. The concept is used both for rail travel and for travel more generally.

**Rail gauge:** the distance between the insides of two tracks on a railway. Over all of Europe (except Russia and Finland) the standard gauge is 4 foot 8.5 inches (143.5 cm). Trains are normally built for just one rail gauge, and cannot operate on others.

**Rail network:** the fixed infrastructure of the rail tracks, signalling and rail stations. The British rail network is currently owned by **Network Rail**.

**Railtrack:** the private company owning the rail network from 1997 until its closure in 2002.

**Rolling Stock Companies (ROSCOS):** the three companies which own the trains (the ‘rolling stock’) on the rail network, and lease them to the **TOCs**.

**TGV:** *Train à Grande Vitesse*, the name for French high-speed trains.

**Tilting trains:** a train whose carriages tilt inwards when going round curves. This enables trains to go faster than they otherwise could. They were introduced in 2004 on the West Coast main line.

**Train Operating Companies (TOCs):** the commercial enterprises which run train services on specific parts of the **rail network**, having won the right to so through the process of **franchise bidding**.

**Transport mode:** The method of transport used. For example, rail is a transport mode as are the car, the aeroplane, the bicycle and on foot.

**Vac trains:** an as-yet undeveloped technology, which entails putting trains in vacuum tubes and thereby making speeds of several thousand mph possible.