

TRANSPORT AND ECONOMIC DEVELOPMENT

EE381/382



- **The links between economic development and levels of both freight and passenger transport**
- **Issues surrounding the direction of causation between the two, specifically the differences between demand led and supply led effects**
- **Research on the topic of the impact of transport improvements and economic development in order to assess the actual impact of transport on economic growth (Reading assignment 😊)**
- **Look at transport's role in the operation of the local economy**



- **World Trade Organization (WTO) was founded on 1 January 1995 and the successor to the General Agreement on Tariffs and Trade (GATT)**
- **WTO is an international organization that oversees trade agreements between its members**
- **The creation of the original GATT in 1947, this has seen a progressive reduction in the institutional barriers to trade and has been largely responsible for what we now refer to as the global economy**

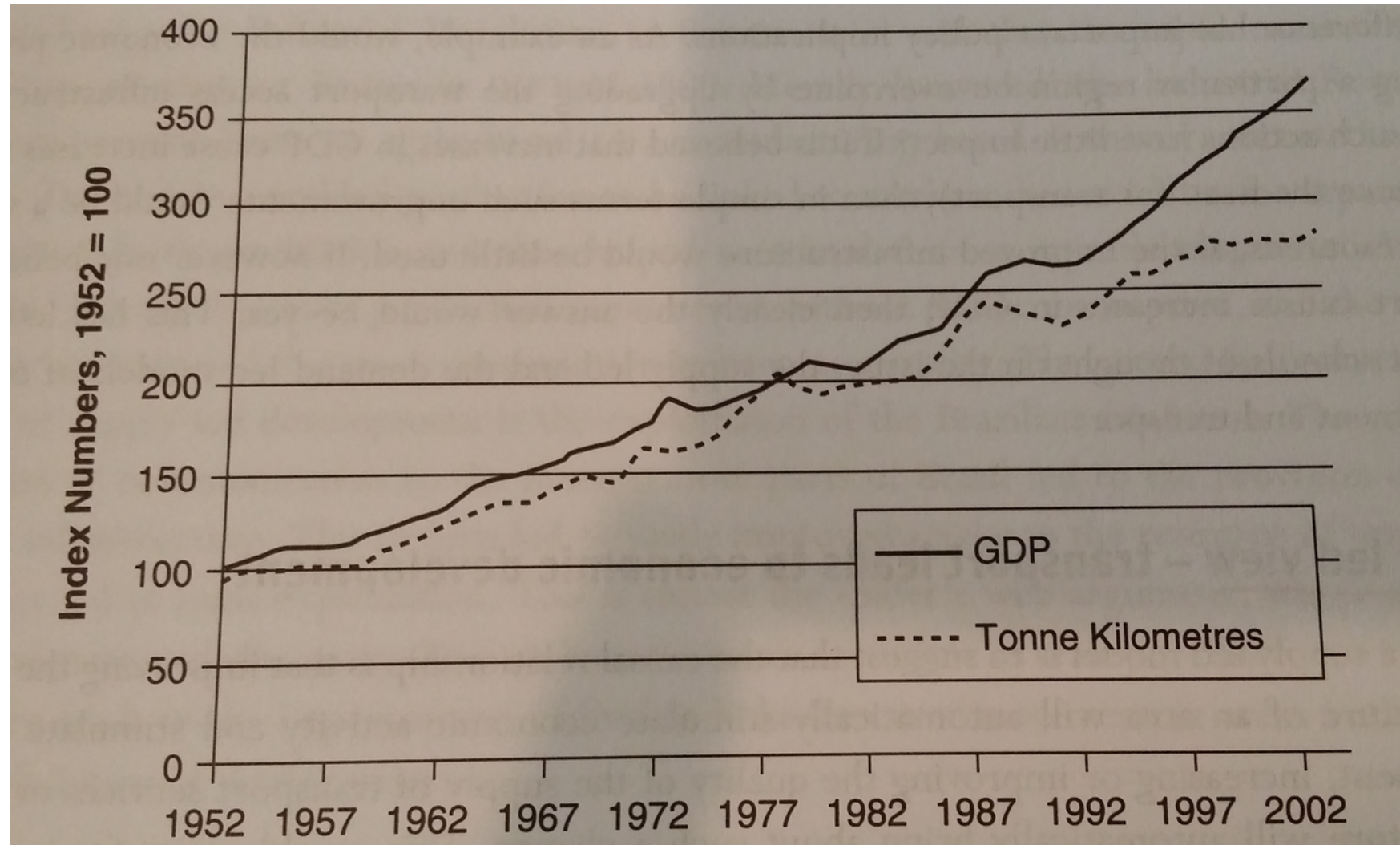


THE LINK BETWEEN TRANSPORT LEVELS AND ECONOMIC WEALTH

- **GDP is an important measure of National income and in very simple terms is the aggregation of everyone's income**
- **The real driving force behind the increase has been society's continued evolution and movement away from a subsistence-based economy towards one with an ever increasing demand for more material goods and services**
- **These can only be provided through trade, either international or domestic, both of which then generate a demand for transport**



FREIGHT TRANSPORT AND REAL GDP, GREAT BRITAIN, 1953 TO 2004



Source: Cowie, J. (2010) compiled from Dft (2007) and Eurostat Figures.



SUPPLY LED VIEW — TRANSPORT LEADS TO ECONOMIC DEVELOPMENT

- **Widening of markets, increased production and multiplier effects**
 - **The provision of high quality transport facilities leads to the widening of markets, rather than being restricted to selling in local markets that are easily accessible, the range of potential markets will be expanded**
- **Indirect effects on employment in construction and operation**
 - **Major infrastructure improvements such as the new roads and railway line — create an increase in the demand for local labor both in the construction of such systems as well as their operation once in place**



DEMAND LED MODELS – ECONOMIC DEVELOPMENT DRIVES DEMAND FOR TRANSPORT

Revealed demand

- **Is expressed in the journeys that are actually made or the goods that are transported using the existing infrastructure**
- **If this increases, it may be found that the existing infrastructure requires upgrading in order to cope with the current level of demand**



LATENT DEMAND

- Segment of the demand curve to the right of the equilibrium point
- Latent demand exists where there is a demand but one that cannot be satisfied due to inadequacies in the existing infrastructure
- Individuals may wish to travel to a particular location, however, the basic demand, but the cost in terms of the time that it would take to actually get there more than offsets any benefit gained from undertaking the journey. As a consequence, the journey is not made.
- If, however the current provision is improved, then the cost of the travelling would fall and hence some of those who had not previously travelled will now make the journey



- **Under a supply led view, improving transport services and/or upgrading the infrastructure is a necessary and sufficient condition for improved transport to lead to economic development**
- **Under a demand led view, it is a necessary but not sufficient condition. There has to be a basic derived demand for transport services in order for transport developments to then facilitate economic development**

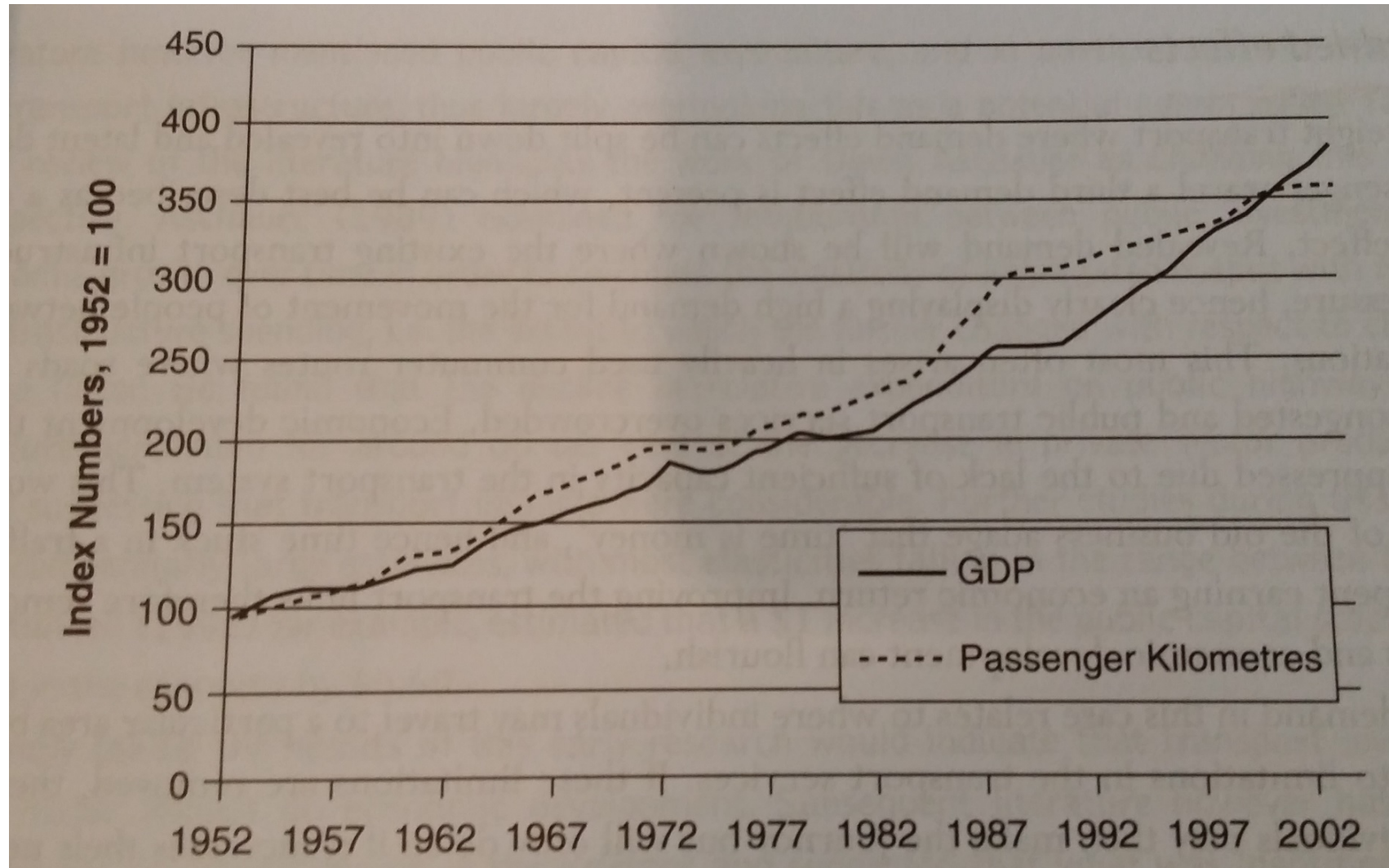


THE ROLE OF PASSENGER TRANSPORT IN ECONOMIC DEVELOPMENT

- The role of freight transport in economic development is clear and found upon the principle that trade is never a zero sum game, what may not be so evident is the role played by passenger transport
- The mid to late 1980s- a period in UK economic history which has now become known as 'the Lawson Boom' – a period of unsustainable economic growth overseen by the then Chancellor of the Exchequer, Nigel Lawson, and cited as an economic miracle at the time.
- The Lawson Boom appears to have effectively halted the closeness of the association between economic progress and passenger transport for some 15 years before it appeared to have resumed in the late 1990s



GDP AND PASSENGER KILOMETRES TRAVELLED, GREAT BRITAIN, 1953 TO 2004



Source: Cowie, J. (2010) compiled from Dft (2007) and Eurostat Figures.



SUPPLY-LED EFFECTS

- Under a supply-led effect the simple act of upgrading existing transport links will increase passenger travel and thereby increase GDP
- If people don't have a motivation to travel to a particular location, then building a new road won't make any difference
- Over the last few years, Britain and many other countries have seen a rise in the commuter belt zone — areas that lie around the main economic centres from which people commute
- As the upgrade of links between the centre and the commuter belt has caused people to move out to those areas



DEMAND-LED EFFECTS

- **Revealed demand**
 - Where the existing transport infrastructure is under pressure, hence clearly displaying a high demand for the movement of people between two given locations
 - This most often arises in heavily used commuter routes where roads become severely congested and public transport services overcrowded
- **Latent demand**
 - Individual may travel to a particular area but do not do so due to limitations in the transport services
- **Derived demand effects**
 - Increased wealth generally creates a demand for more leisure activities, or ever more sophisticated leisure activities

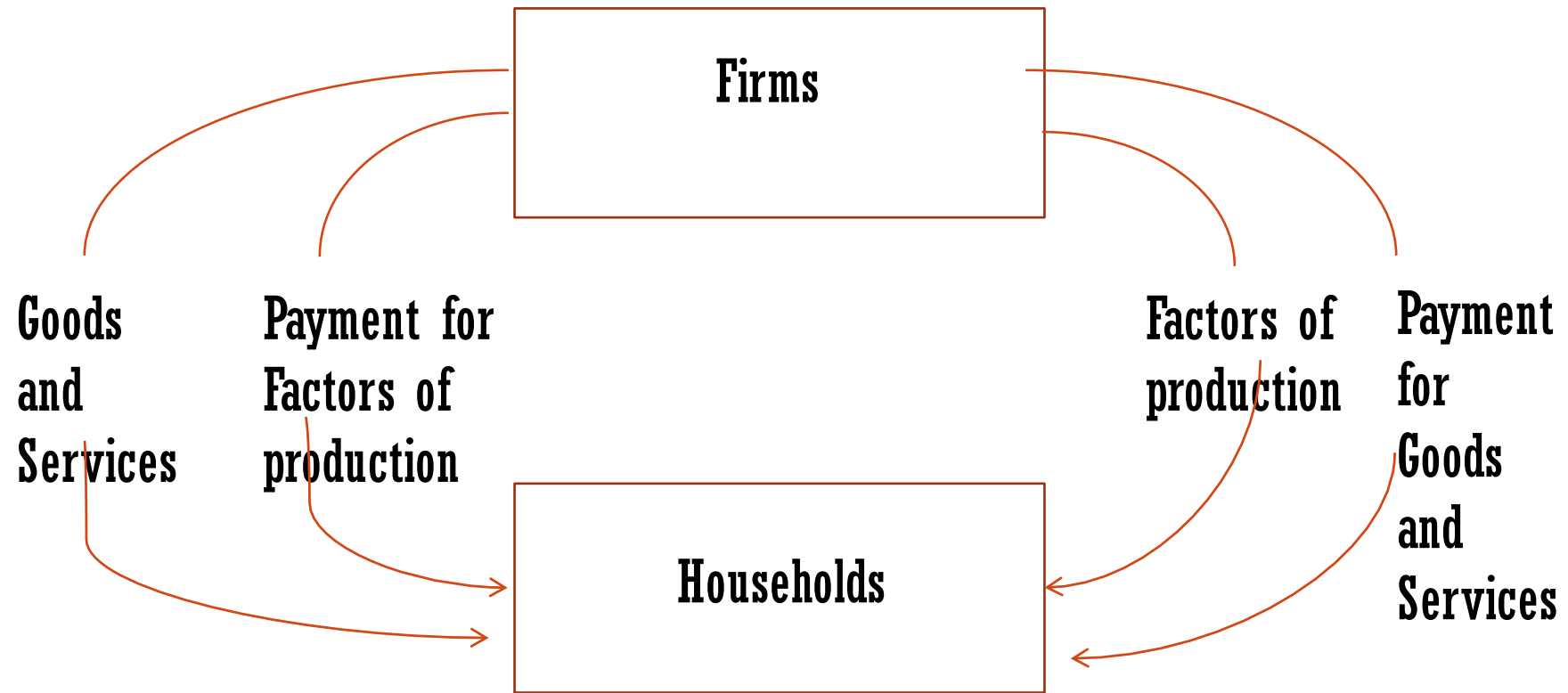


TRANSPORT AND THE LOCAL ECONOMY

- An efficient transport system allows these flows to take place for more easily and leads to more of the actual 'value' or wealth creation, to be transferred from one part of the economy to another
- As a consequence the benefits of trade can be maximized and the local economy enhanced



SIMPLIFIED VERSION OF THE LOCAL ECONOMY



At the level of the local economy an efficient transport system allows

- **The easier movement of labor from households to firms**
- **The easier movement of goods and services from firms to firms**
- **The easier movement of goods and services from firms to households**
- **The easier switch of labor from one firm to another and the easier switch of goods and services from firms to households**



CASE STUDY



THE LOCAL ECONOMY, TRANSPORT AND THE EDINBURGH HOUSING MARKET



- **Concerns the problems surrounding the Edinburgh housing market**
- **On average the city of Edinburgh has the highest house prices in Scotland**
- **Despite the onset of falling house prices in the British housing market due to the credit squeeze, house prices in Edinburgh appear to be holding up better than most areas in Scotland. Nevertheless, this is partly as a consequence of the housing market problems in Edinburgh and the general 'overheating' of the market**



AVERAGE HOUSE PRICES BY LOCAL AUTHORITY AREA, TOP 10, APR TO JUN 2008

Rank	County	Aver price	Quarter	Annual
1	Edinburgh, city of	221,209	6.3%	5.9%
2	East Renfrewshire	215,805	7.1%	6.2%
3	East Dunbartonshire	198,352	10.2%	8.9%
4	Aberdeenshire	197,353	5.4%	12.0%
5	East Lothian	192,747	3.8%	0.1%
6	Perth And Kinross	178,701	5.3%	10.8%
7	Stirling	178,249	-8.5%	2.5%
8	Aberdeen City	173,730	1.7%	4.7%
9	Midlothian	170,889	4.2%	1.3%
10	Scottish Borders	162,988	-2.3%	1.0%

Source: Cowie, J. (2010) Edited from BBC (2008)




- **If house prices are higher in Edinburgh than elsewhere in the country then fewer people can afford to live there**
- **Local employers may struggle to fill vacancies, not only at the lower end of the labor market but also in the middle and higher income categories as those best qualified are put off by higher housing costs**



- **This will have two possible direct impact upon the local labor market**
 - **It may result in wage rising in order to attract the ‘right’ people. Higher wages are required to offset higher house prices or the increased travel costs and inconvenience factors encountered in order to work in the Edinburgh area**
 - **Lesser qualified but available individuals will be employed**
- **Either way, the local economy in the longer term may suffer through higher costs in the production of goods or services**
- **If Edinburgh cannot always draw on the local labor market, therefore, firm within the city will have to look further afield to attract the ‘right’ kind of people at the ‘right’ kind of wages**



- Part of the problem however is **Edinburgh's physical location**, as to the immediate north of the city lies the Forth estuary and to the south the Pentland Hills with the largely rural Borders are beyond that.
- The nearest crossing point on the Forth estuary lies six miles to the west of Edinburgh. This consists of a road crossing that opened in 1964 that is now managed by the Forth Estuary Transport Authority (FETA), and a rail crossing, the Forth Bridge, now maintained and operated by Network Rail
- This severely restricts access to the North, with long delays experienced on the road bridge around peak times, which begin at around 7 am in the morning and last long into the early evening 

- **To summarized, this case has outlined the overheating housing market in Edinburgh, heavy congestion in the city centre, and increased pressure on transport links to the north and west of the city. What is outlined below are the main transport initiatives currently being undertaken to help overcome these problem:**



1. A second Forth road crossing. After much debate and discussion the approval for a second road crossing the Forth was given in Feb 2007.
 - Serious doubts currently exist concerning the available capacity of the existing bridge in the future, due to the condition of the suspension cables, which have been found to be suffering from corrosion
 - **Demand-led** scheme- current capacity is under severe strain, and hence it could be argued that economic activity is being limited by the capacity of the bridge



2. Re-opening of the Waverly Railway Line to the south of Edinburgh

- To improve links between Edinburgh and the Borders and to bring the Borders area into a viable commuting distance to Edinburgh
- Road links in the area tend to be limited
- The promoters of the project claim there will be £130 m investment in new housing stock associated with the project. They predict that the project will result in 1,800 new homes in the Borders and Midlothian as well as greatly enhancing the already proposed 2,200 new houses in Shawfair just to the south of Edinburgh
- **A supply-led** development — this may lead to some population shift to the Borders and enable some of the wealth being generated in Edinburgh to be spread to the Borders area



3. The construction of a light rapid transit system (LRT) in Edinburgh under the title of 'Tram for Edinburgh'

- **The new LRT system is to run from the Airport on the west side of Edinburgh, through the city centre and down to Leith on the north east of the city.**
- **The scheme's promoters cite the forecasted increase of 30,000 new jobs in the city by 2015 as one of the main reasons for construction of the LRT, as well as the linking with several park and ride sites to the city centre**
- **A city-located scheme**
- **This can be primarily viewed as a demand led initiative, as whilst bus services are on the whole heavily used, with some exceptions they are not under pressure, whilst the transport infrastructure, namely the roads, are.**
- **However, it does have some strong aspects of supply led characteristics, as improving links into the city will result in increases in travel around the city**



CLASS EXERCISE

SUPPLY AND DEMAND LED TRANSPORT INITIATIVES

Listed below are nine major transport projects from the very old to the very new and even those that are currently still at the planning stage. Whilst it is difficult to clearly define such projects as either **demand led** or **supply led**, some will display more characteristics of the former whilst others will be more akin to the latter.

In this exercise you are asked to simply divide these into these two categories and to consider the reasons why you came to that particular view.

Note that in many cases you do not need to know the specific regarding the particular transport project to come to an educated guess.



- 1. CrossRail – this project is to build two new railway connections under central London. CrossRail 1, approved in 2007, will run east-west and is due to open in 2017. It will complement Thameslink services, which commenced north-south rail services through the re-opened Snow Hill tunnel in 1989**
- 2. The Channel Tunnel that was opened in 1995 and links British to France**
- 3. The opening of the M6 Toll motorway around Birmingham in December 2003, thus effectively providing a Birmingham by-pass and considerably reducing through journey times**



- 4. The Great Belt Link, opened in 1995 between the island of Zealand and (in effect) the rest of Denmark, and providing a road and a rail link**

- 5. The Skye Bridge – this linked mainland Scotland to the island of Skye and was opened in 1995, originally with a highly controversial toll (i.e. only slightly cheaper than the former ferry fare) that was eventually abolished at the end of 2004**

- 6. The Golden Gate Bridge across the opening of San Francisco Bay, completed in 1937, which provided the first fixed link northwards out of San Francisco**



- 7. The opening of phase one of the high-speed train line (the TGV Est) from Paris to the west of Nancy in June 2007. The link is also served by Germany's Inter City Express (ICE) high speed trains. Phase two, which will take the line all the way to Strasbourg near the German border, will not be completed until around 2014. TGV Est is sometimes referred to TGV EstEuropeen.**
- 8. The construction of a container terminal at the port of Mundra on the Gujarat coast in North West India. This will be the port's first container terminal**
- 9. The Jubilee line extension, opened in 1999, which connected the London Underground system to then developing Docklands area in London**



THE GLOBAL PICTURE

- **Transport requires infrastructure as well as vessels, planes and vehicles, to move goods and people around the globe**



GDP AND MERCHANDISE TRADE BY REGION, 2005-07 (ANNUAL PERCENT CHANGE AT CONSTANT PRICES)

	GDP			Exports			Imports		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
World	3.3	3.7	3.4	6.5	8.5	5.5	6.5	8	5.5
North America	3.1	3	2.3	6	8.5	5.5	6.5	6	2.5
USA	3.1	2.9	2.2	7	10.5	7	5.5	5.5	1
South and Central America	5.6	6	6.3	8	4	5	14	15	20
Europe	1.9	2.9	2.8	4	7.5	3.5	4.5	7.5	3.5
EU (27)	1.8	3	2.7	4.5	7.5	3	4	7	3
Commonwealth of Independent States	6.7	7.5	8.4	3.5	6	6	18	21.5	18
Africa and Middle East	5.6	5.5	5.5	4.5	1.5	0.5	14.5	6.5	12.5
Asia	4.2	4.7	4.7	11	13	11.5	8	8.5	8.5
China	10.4	11.1	11.4	25	22	19.5	11.5	16.5	13.5
Japan	1.9	2.4	2.1	5	10	9	2.5	2.5	1
India	9.0	9.7	9.1	21.5	11	10.5	28.5	9.5	13
Newly industrialized economies(4)	4.9	5.5	5.6	8	12.5	8.5	5	8.5	7



WORLD SEABORNE TRADE BY TYPES OF CARGO AND COUNTRY GROUPS, ANNUAL, 1985-2011 (METRIC TONS IN MILLIONS)

CARGO TYPE	Year						
	1985	1990	1995	2000	2005	2010	2011
Crude Oil loaded	1049	1287	1532	1605	1857	1787.68	1762.37
Petroleum products and gas loaded	410	468	518	558	565	983.75	1033.51
Dry cargo loaded	1895	2253	2601	3821	4687	5637.47	5951.86
Total goods loaded	3330	4008	4651	5984	7109	8408.90	8747.74
Crude Oil unloaded	1128	1315	1550	1633	1854	1933.23	1907.03
Petroleum products and gas unloaded	367	466	508	513	573	979.18	1038.62
Dry cargo unloaded	1938	2365	2685	4097	4696	5531.42	5823.65
Total goods unloaded	3433	4126	4743	6242	7122	8443.83	8769.30

Source: UNCTAD, UNCTADstat



THE WORLD'S LARGEST CONTAINER PORTS

Rank	Port, Country	Volume 2010 (million-TEUS)	Volume 2011 (million-TEUS)
1	Shanghai, China	29.07	31.74
2	Singapore, Singapore	28.43	29.94
3	Hong Kong, China	23.70	24.38
4	Shenzhen, China	22.51	22.57
5	Busan, South Korea	14.18	16.17
6	Ningbo-Zhoushan, China	13.14	14.72
7	Guangzhou Harbor, China	12.55	14.26
8	Qingdao, China	12.01	13.02
9	Jebel Ali, Dubai, United Arab Emirates	11.60	13.01
10	Rotterdam, Netherlands	11.14	11.88

Source: World Shipping Council website



WHAT IS TEU?

- **The Twenty-foot equivalent unit (TEU)**
- **Often used to describe the capacity of container ships and container terminals**
- **A standard-sized metal box which can be transferred between different modes of transportation, such as ships, trains, and trucks**



TRANSPORT AT THE NATIONAL LEVEL

A major component of the national output and accounts for a large part of national expenditure in most developed countries

Examples:

- >14.5% of national expenditure in Great Britain



WEEKLY HOUSEHOLD EXPENDITURE IN GREAT BRITAIN (2001/2002)

Average weekly expenditure all households (pounds)	
Food & non-alcoholic drinks	41.80
Alcoholic drink, tobacco & narcotics	11.40
Clothing and footwear	22.90
Housing, fuel and power	35.90
Household goods & services	30.50
Health	4.50
Transport	57.80
Communication	10.40
Recreation and culture	54.10
Education	5.60
Restaurants and hotels	33.40
Miscellaneous goods and services	30.70
Other expenditure items	59.50
Total	398.30



US PASSENGER TRANSPORT BY MODE (2007)

Mode of passenger transport	Passenger-miles (millions)	Percent
Highway-total	4,884,557	88.79
Passenger vehicles, motorcycles	4,520,810	82.18
Trucks	222,836	4.05
Buses	162,908	2.96
Air carriers	583,689	10.61
Rail- total	30,972	0.56
Transit	16,118	0.29
Commuter	9,473	0.17
Intercity / Amtrak	5,381	0.10
All other modes (e.g. ferryboats)	2,091	0.04

Source: Button, K. (2010).



LOCAL TRANSPORT

Urban transport

- Traffic congestion problems
- Public transport use and levels of car ownership



INDICATORS OF PUBLIC TRANSPORT COMPETITIVENESS IN VARIOUS CITIES WHERE PUBLIC TRANSPORT (PT) MARKET SHARE GREW BETWEEN 1995 AND 2001

		London*	Madrid	Vienna	Singapore	Hong Kong	Paris
Market share of motorised and mechanised journeys by PT (%)	1995	23.9	27.2	43.2	44.2	71.8	27.1
	2001	26.8	30.2	46.6	45.7	73.9	27.5
Annual number of journeys on public transport per inhabitant*	90-95	345	250	490	480	545	260
	96-01	390	290	495	485	525	310
Average annual investment (% of GDP)	1995	1.13	0.88	1.07	0.44	0.37	0.45
	2001	0.64	0.81	0.62	0.84	1.00	0.32
Length of reserved routes (km/millions of inhabitants)	1995	172	84.5	174	22.5	17.5	149.5
	2001	176	92.5	185	29.5	22.5	151.5
PT speed (in km/h)	1995	31.3	28.5	24.9	27.0	26.4	31.6
	2001	34.6	30.7	27.0	28.6	26.0	30.9
PT vehicle x km/hectare per inhabitant	1995	145	67.5	87	110	146	71.5
	2001	157	85	106	112	172	84
PT vehicle x km per hectare	1995	7,850	4,500	5,850	10,300	46,700	3,400
	2001	8,650	4,750	7,100	11,500	49,200	3,400

* traffic including non-residents



INDICATORS OF PUBLIC TRANSPORT COMPETITIVENESS FOR EASTERN EUROPEAN AND FAR EASTERN CITIES WHERE PUBLIC TRANSPORT (PT) MARKET SHARE IS 50% OR HIGHER

	Singapore	Prague	Budapest	Moscow	Warsaw	Hong Kong
Market share of motorised and mechanised journeys by PT (%)	45.7	54.2	55.9	63.6	64.0	73.9
Number of cars for every 1,000 inhabitants	125	535	330	190	380	50
Parking spaces/jobs in the CBD	165	45	95	30	60	25*
PT place x km per inhabitant	14,300	16,100	11,100	17,400	8,900	16,100
PT place x km per hectare (in thousands)	1.460	705	515	2,800	460	4.620
Length of reserved routes (km/million inhabitants)	29.5	235	197	40	178	22.5
Proportion of PT rail services as a% of place x km	40	72.5	64.5	84	46	31.5
PT commercial speed (km/h)	28.6	28.6	21.2	36.6	23.1	26.0
PT speed door-to-door (km/h)	13.3	16.2	13.1	21.0	-	12.0

* excluding car parks of firms and retail businesses



CAR OWNERSHIP PER 1000 POPULATION IN SELECTION COUNTRIES (2006)

Country	Car ownership	Country	Car ownership
USA	765	Greece	329
Luxembourg	686	South Korea	293
Malaysia	641	Israel	263
Australia	619	Hungary	262
Italy	566	Poland	261
Canada	563	South Africa	146
Japan	543	Mexico	138
Norway	494	India	12
Belgium	484	China	10
Spain	471	Pakistan	8
UK	426	Bangladesh	2
Netherlands	417	Ethiopia	1
Denmark	408		

Source: United Nations



DURABLE GOODS FOR 1,000 HOUSEHOLDS (2006 OR MOST RECENT PRIOR YEAR)

	China		India	
	Urban	Rural	Urban	Rural
Automobiles	4.3		4	0.7
Bicycles	117.6	98.4	51.9	57.2
Cameras	48	3.7		
Computers	47.2			
Microwave ovens	50.6			
Motorcycles	20.4	44.6	28.3	7.9
Refrigerators	91.8	22.5	30.8	4.8
Telephones	93.3	64.1		
Mobile telephones	137.4	89.4	70.4	27.5
Televisions	137.4	89.4	70.4	27.5
Video disc players	70.2		8.2	1.7
Washing machines	96.8	43	12.5	0.9



REFERENCES

- Cowie, J. (2010). **The Economics of Transport**. Routledge.
- Button, K. (2010). **Transport Economics**. 3rd ed. Edward Elgar Publishing Ltd.
- International Civil Aviation Organization website
- Vivier, J. (2006). **Mobility in Cities Database Analysis and Recommendation**. International Association of Public Transport.

