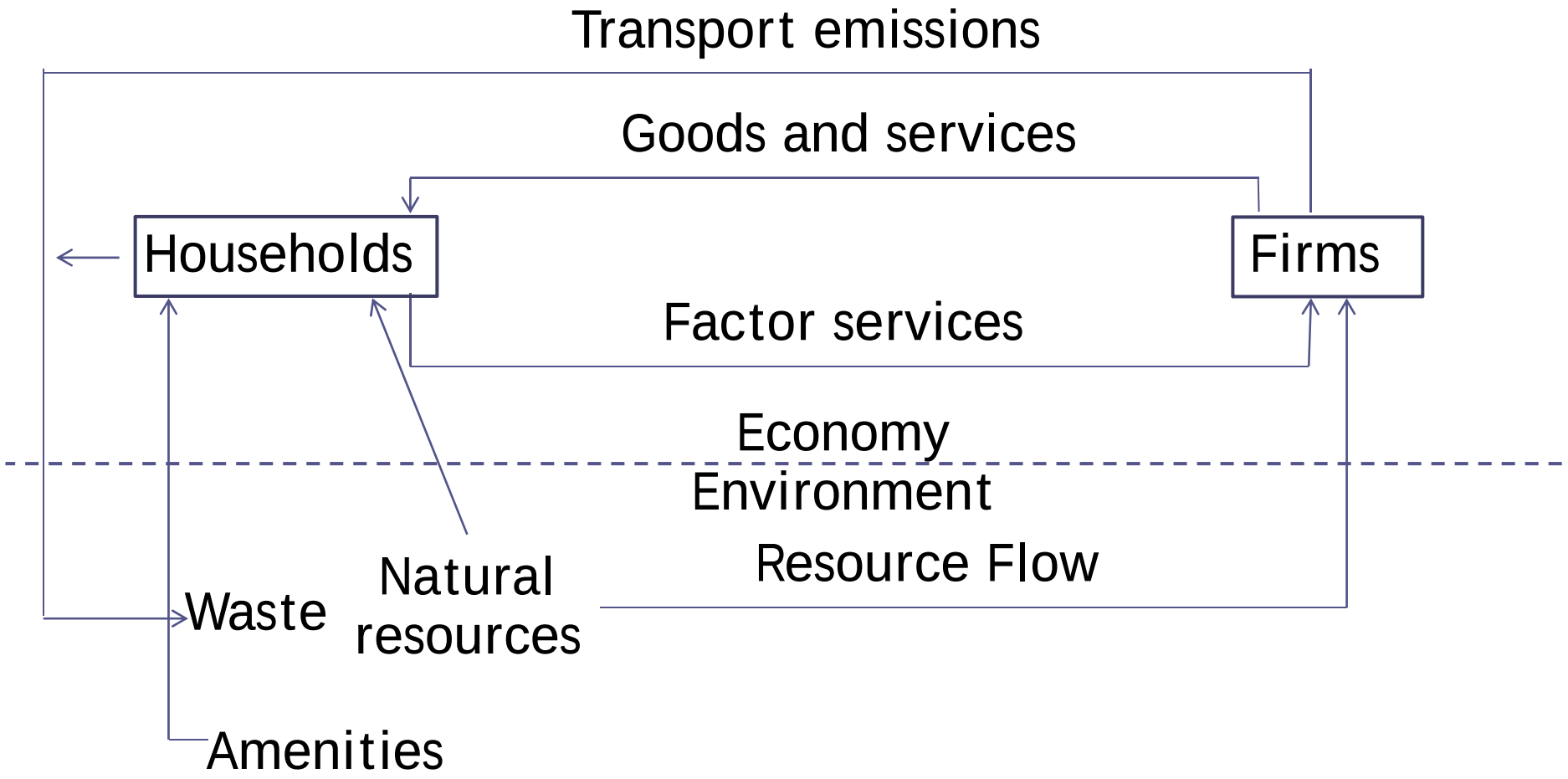
Transport and the natural environment

EE 382

- To utilize economic theory as a means of analyzing the relationship between transport and the environment
- Outline the background to the general environment problem
- Develop an economic model of pollution and explores the types of measures which could be implemented as a means of dealing with the problem

The macro economy and the environment



Source: Cowie J. (2010).

The environment, transport and the economy can be linked in three ways

- Natural resources
  - Transport makes use of natural resources –oil
- Waste products
  - Transport emissions
- Amenity services
  - Provides households with benefits such as recreational space and areas of natural beauty

- There is a need to break the link between the economy and its related transport activities, and the environment, which could be argued is unsustainable

- **Sustainable transport** – the ability to meet society's need to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values, today or in the future (WBCSD, 2002)

Case study

Aviation and the environment

Traffic(in thousands) at UK airports: 1990-2006

	1990	1994	1998	2002	2006
International:					
UK operators	479	529	655	753	808
Foreign operators	340	403	480	543	713
Domestic:	301	308	331	364	427
TOTAL:	1,120	1,240	1,476	1,660	1,948
Of which:					
Gatwick	189	182	240	234	254
Heathrow	368	412	441	460	471
Luton	40	17	44	55	79
Stansted	24	58	102	152	190
Birmingham	66	71	88	112	109
East Midlands	29	33	39	49	56
Manchester	122	146	162	178	213
Edinburgh	48	61	72	105	116
Belfast	38	33	37	38	48

Source: Cowie J. (2010). Adapted from DFT statistics

Pollution emissions from transport and other end users in the UK: 1995-2005

Pollution type	1995	1997	1999	2001	2003	2005	% of 2005 total
Nitrogen oxides:							
Road transport	1,098	1,014	900	749	636	549	34
Civil aircraft	4.4	4.9	6.3	7.3	7.5	9.1	0.6
All transport	1,204	1,127	1,004	840	756	684	42
Non transport users	1,180	1,030	965	988	972	983	58
Carbon monoxide:							
Road transport	4,180	3,664	3,003	2,128	1,594	1,124	46
Civil aircraft	31	39	47	59	47	58	2.4
All transport	4,224	3,717	3,065	2,200	1,655	1,199	50
Non transport users	2,072	1,957	1,875	1,691	1,292	1,218	50
Sulphur dioxide							
Road transport	52	28	14	4.2	4	3	0.4
Civil aircraft	0.3	0.5	0.4	0.5	0.5	0.6	0.1
All transport	83	58	39	23	31	43	6
94Non transport users	2,239	1,583	1,188	1,096	960	660	94

Pollution emissions from transport and other end users in the UK: 1995-2005 (cont.)

Pollution type	1995	1997	1999	2001	2003	2005	% of 2005 total
Particulates (PM 10):							
Road transport	54	47	43	38	36	34	22
Civil aircraft	0.1	0.1	0.1	0.1	0.1	0.1	0.1
All transport	59	53	48	42	42	41	27
Non transport users	179	161	149	136	113	109	73

Source: Cowie J. (2010). Adapted from DFT statistics

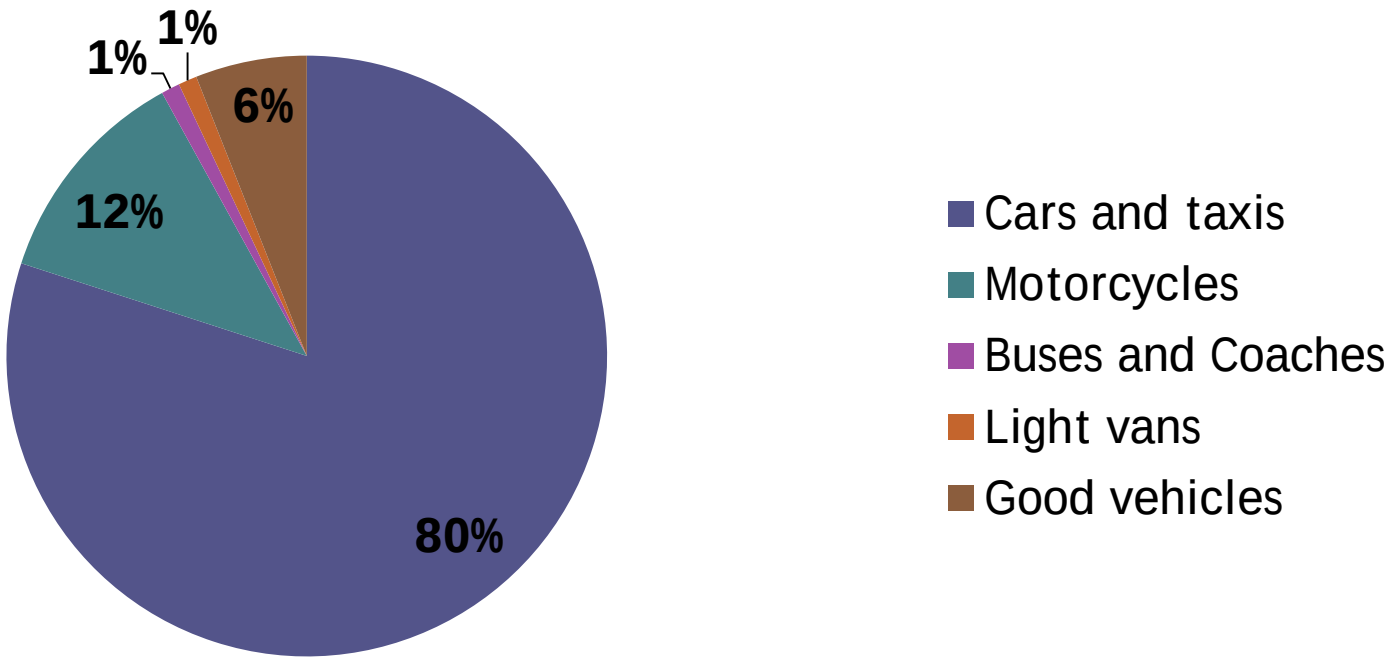
Freight transport and the environment

Two particular problems for the road haulage sector is that

- Its relative share of nitrogen oxides has been growing considerably as more private cars have been fitted with catalytic converters

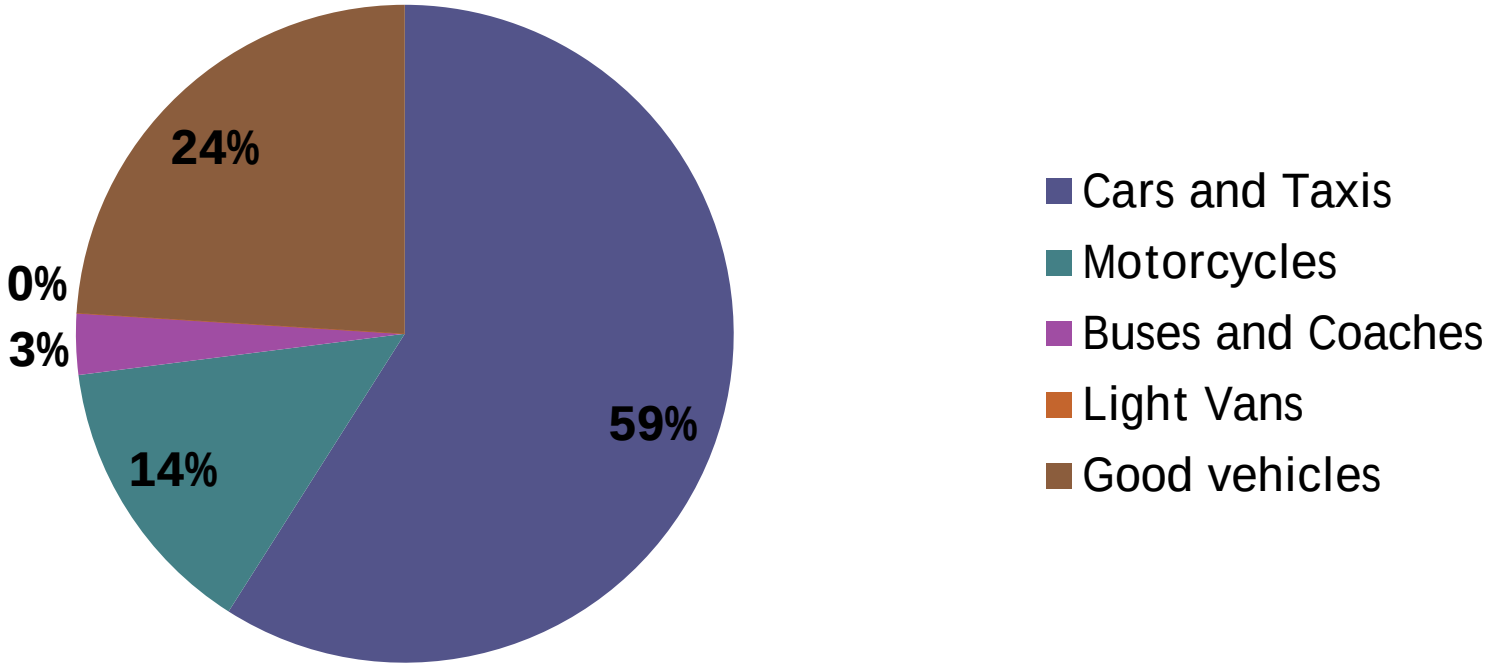
- Its share of carbon dioxide will also probably become a relative greater problem as cars become more fuel efficient

Share of road traffic by mode (2005)



Source: Cowie J. (2010). Drawn from DFT statistics

Share of CO2 Emissions by Mode (2005)



Source: Cowie J. (2010). Drawn from DFT statistics

Case study

Is it really road haulage that is bad for the environment?

- The road haulage is a major contributor to the deterioration of the natural environment, far more so than any other land-based individual transport mode

- This case study attempts to give some insight into the wider problems that may result as a consequence of significantly reducing the reliance on the mode, as this in turn brings into focus the issues involved in attempting to lessen transport's impact on the environment

- Road haulage has an almost complete monopoly at the lower levels of the supply chain in the delivery of retail suppliers, hence any impact of reduced haulage levels would be most actually felt at that end of the supply chain

- McKinnon (2006) evaluates 4 forms of substitution that could occurs in the face of an absence or reduction of road haulage levels
  - Production substitution
  - Modal substitution
  - Vehicle substitution
  - Locational substitution

Reference

- Cowie J. (2010). The Economics of Transport. Routledge.