Trends in Transport Intensity across Europe

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Transport energy use and transport volumes have closely followed trends in economic activity over recent decades. This is not the case however for total energy consumption (across all sectors of the economy), which is not now increasing in many countries even though economic growth is still taking place. Some kind of decoupling has occurred. If this decoupling were to take place in the transport sector, it would present opportunities to reduce the consumption of energy and other resources without reducing economic competitiveness. Decoupling would also offer opportunities for the reduction of congestion and transport emissions. Consequently, there is increasing interest in how decoupling can occur. Although the decoupling of economic activity and total energy consumption has been reported for a number of European countries, the extent to which transport demand and economy activity has been decoupled has not been examined in so much detail.
Using international statistical sources for all European countries and detailed data for the UK, this paper explores the extent to which transport demand is currently linked with economic indicators (such as Gross Domestic Product and Index of Sustainable Economic Welfare) and examines whether this link has changed over time. The paper contributes to understanding about the definition of transport intensity and the relationships between transport demand and economic activity in Europe.

1. Introduction

Transport energy use and transport volumes have closely followed trends in economic activity over recent decades. This is not the case however for total energy consumption (across all sectors of the economy), which is not now increasing in many countries even though economic growth is still taking place (see for example Jänicke *et al.*, 1989). The current rate of increase in transport volumes is outstripping the rate of improvement in environmental technology for transport, resulting in increasing environmental problems in

the transport sector. Evidence presented in this paper suggests that there are few signs of improvement in transport intensity (defined in this paper in terms of transport volumes, transport energy consumption and/or economic growth). There is an increasing environmental case for improving transport intensity (i.e. 'doing more with less' as a means of reducing pollution, resource use and waste) as well as an increasing political desire to improve transport intensity (i.e. promoting economic growth without increasing transport volumes, energy use and associated social and environmental external costs).

A number of recent statements at the national and international level have drawn attention to the fact that measures to improve transport intensity need to be actively pursued. In the UK, for example, the 1996 Green Paper on Transport explicitly recognised that much greater effort needs to be made to improve transport intensity (UK Department of Transport, 1996)[1]. More recently, the Standing Advisory Committee on Trunk Road Assessment has examined the issue of transport intensity in the UK and the prospects for greater transport intensity in the future (SACTRA, 1999).

Although the term is relatively widely used, there is no single definition of transport intensity or established way of measuring it. This paper identifies a number of measurable indicators of transport intensity and examines how these indicators have changed over time in Europe as a whole and in EU Member States. Trends in these indicators are variable for all EU Member States: some suggest improvements in transport intensity whilst others suggest the reverse.

Some of the indicators of transport intensity examined in this paper relate transport volumes with economic growth and therefore provide a way of examining whether there has been any *decoupling* between economy activity and transport volumes. The paper goes on to examine the extent to which different measures of economic activity have an effect on the indicators of transport intensity, using data from the UK.

2. Trends in Transport Intensity across Europe

Two distinct types of measures of transport intensity are examined here: measures of *transport energy efficiency* and measures of *economic efficiency* (relative to transport volumes). The first and more commonly encountered category of transport intensity measures are defined according to energy consumption as a ratio of passenger movements, freight movements or a combination of both (using the concepts of *net mass movement*[2] and *gross mass movement*[3], discussed in more detail by Peake, 1994). Authors such as Scholl *et al.*, (1996) and Michaelis and Davidson (1996) use this type of measures when referring to

[1] The 1998 Transport White Paper repeats this commitment to improve transport intensity (UK Department of the Environment, Transport and the Regions, 1998).

[2] The net mass movement of people and goods is calculated using a method similar to Peake (1994): by dividing total passenger-kilometres by 11.11 (on the assumption that people with luggage weigh 90 kilogrammes on average) and adding this figure to the total volume of freight moved (in tonne-kilometres). Note that the assumption about average weight per passenger here is substantially different to that used by Peake (1994), who assumed an average weight of 50 kilogrammes, which seems quite a low estimate.

[3] The calculation of gross mass movement of people and goods is similar to the calculation of *net mass movement* but also includes the mass of the vehicles used to carry the people and goods and the movements of empty vehicles.

transport intensity. The second category of transport intensity measures are defined according to economic activity as a ratio of passenger movements, freight movements or a combination of both (again using the concepts of *net mass movement* and *gross mass movement*). SACTRA (1999) use this type of measure when referring to transport intensity. One of the commonly used and most widely available measures of economic activity, Gross Domestic Product (GDP), provides a way of comparing economic activity in different countries. However, this measure has a number of limitations when considering issues of welfare or sustainability (see the following section).

Between 1970 and 1995, GDP per capita in the EU increased by 65% – similar to the rate of increase in freight transport per capita and net mass movement per capita (Table 1). Transport energy consumption per capita and passenger travel distance per capita increased more rapidly in the EU during this period. Transport energy consumption increased by 91% between 1970 and 1995, whilst travel distance per capita increased by 94%.

Examples of a range of indicators for transport intensity (three indicators of transport energy efficiency and four indicators of economic efficiency) are presented in Table 2. Beside these indicators are data (calculated from the data in Table 1) which illustrate trends for the EU as a whole between 1970 and 1995. Some data indicate reductions in transport intensity whilst others indicate little overall change. The ratio of transport energy consumption per passenger-kilometre remained fairly constant between 1970 and 1995, whilst the ratios of transport energy consumption per tonne-kilometre and transport energy consumption per net mass movement increased, indicating that transport energy efficiency decreased[4]. Between 1970 and 1995, the ratios of GDP per tonne-kilometre and GDP per net mass movement remained fairly constant, whilst the ratios of GDP per passenger-kilometre and GDP per unit of transport energy consumption decreased, indicating that transport economic efficiency decreased. Thus, the overall picture of transport intensity using this selection of indicators is one of stability or decline, depending on the choice of indicators.

Table 1. Transport and Economic Trends in Europe, 1970-1995

		1970 (EU15[5])	1995 (EU15)	% change 1970-1995
GDP per capita[6]	(constant 1987 US$)	8,787	14,527	65%
Energy consumption per capita	(tonnes of oil equivalent)	0.40	0.77	91%
Travel distance per capita	(kilometres per person per year)	6.20	12.04	94%
Freight transport per capita	(tonne-km per person per year)	2.61	4.10	57%
Net mass movement per capita	(tonne-km per person per year)	3.17	5.18	63%

Sources: European Commission (1997); OECD (1992); OECD (1997); World Bank (1998).

[4] Further disaggregation of the energy consumption data is necessary in order to determine energy efficiency trends in the freight and passenger sectors.

[5] Only 6 countries were part of the European Community in 1970 but for comparison purposes, the data for 1970 and 1995 relate to the 15 countries that are currently members of the European Union.

[6] GDP per capita for 1970 and 1995 was calculated using data for all countries that are currently members of the European Union with the exception of Germany, where comparable GDP data for 1970 was not available.

Table 2. Indicators of Transport Intensity in Europe, 1970-1995

Type of Measure	Indicator of Transport Intensity	1970 (EU15[7])	1995 (EU15)	% change 1970-1995
Transport Energy Efficiency[8]	Transport energy consumption per passenger-kilometre	64.8	63.6	-2%
	Transport energy consumption per tonne-kilometre	153.6	186.8	22%
	Transport energy consumption per net mass movement	159.4	192.5	21%
Economic Efficiency[9]	GDP per passenger-kilometre	1.47	1.19	-19%
	GDP per tonne-kilometre	3.74	3.82	2%
	GDP per net mass movement	3.87	3.93	2%
	GDP per unit of transport energy consumption	22.6	19.1	-15%

Sources: European Commission (1997); OECD (1992); OECD (1997); World Bank (1998).

Transport intensity trends across individual European countries show a substantial amount of diversity from the trends for Europe as a whole. Most of the 15 EU countries have experienced quite individual trends in transport intensity between 1970 and 1995 (Table 3) and few common patterns in transport intensity trends between 1970 and 1995 are obvious. SACTRA (1999) observe that '*traffic intensity, however measured, shows very considerable variation from country to country*'. Some indicators of transport intensity used here (such as transport energy consumption per passenger-kilometre or GDP per tonne-kilometre) show improvements in the majority of EU Member States between 1970 and 1995, whilst other indicators (such as transport energy consumption per tonne-kilometre or GDP per unit of transport energy consumption) show worsening trends in transport intensity in many EU countries. The trends in the seven measures of transport intensity for each country often do not follow the same direction – some indicators suggest that transport intensity is increasing whilst others suggest the reverse. No country in the EU can claim substantial increases in transport intensity between 1970 and 1995 across all seven indicators. On the other hand, no country in the EU experienced substantial decreases in transport intensity between 1970 and 1995 across all seven indicators. There is a certain amount of evidence for the decoupling of economic activity and transport volumes between 1970 and 1995 in some countries (such as Finland and Ireland) although transport energy efficiency decreased over the came period in these countries, at least according to some indicators. Measures of economic efficiency suggest some evidence of worsening trends in countries such as Belgium, Denmark and Spain. Only Italy experienced an improvement in *transport energy efficiency* according to the three indicators. Luxembourg was the only country to experience a decline in *transport energy efficiency* according to the three indicators used here. Across Europe as a whole, the indicators tend to suggest that transport intensity became less efficient between 1970 and

[7] Only 6 countries were part of the European Community in 1970 but for comparison purposes, the data for 1970 and 1995 relate to the 15 countries that are currently members of the European Union.

[8] Note that these figures refer to *total* transport energy consumption (across both passenger and freight transport sectors) and further disaggregation of the energy consumption data is obviously necessary in order to determine energy efficiency trends in the freight and passenger sectors.

[9] The four economic efficiency measures were calculated using data for all countries that are currently members of the European Union with the exception of Germany, where comparable GDP data for 1970 was not available.

1995. This corresponds with Peake's observation that transport intensity has become less and less efficient over the last 40 years (Peake, 1994).

Table 3. Summary of Transport Intensity Trends in Europe, 1970-1995

	Transport Energy Efficiency			Transport Economic Efficiency			
	TEC/ pass-km	*TEC/ tonne-km*	*TEC/ net mass movement*	*GDP/ pass-km*	*GDP/ tonne-km*	*GDP/ net mass movement*	*GDP/ TEC*
Austria	✓	–	–	✗	–	–	–
Belgium	–	✗	–	–	✗	✗	✗
Denmark	✓	✓	✓	✗	✗	✗	–
Finland	–	✗	✗	–	✓	✓	–
France	–	✗	✗	✗	✓	✓	✗
Germany	–	✗	✗	n.a.	n.a.	n.a.	n.a.
Greece	✓	✗	✗	✗	–	✗	✗
Ireland	✓	✗	✗	–	✓	✓	✓
Italy	✓	✓	✓	✗	✗	✗	✗
Luxembourg	✗	✗	✗	✓	✓	✓	✗
Netherlands	–	✗	✗	✗	✓	✓	✗
Portugal	✓	✗	✗	✗	✓	–	✗
Spain	✗	–	–	✗	✗	✗	✗
Sweden	✓	✗	–	✗	–	–	–
UK	–	✗	✗	–	–	–	–
EU	**–**	**✗**	**✗**	**✗**	**–**	**–**	**✗**

✓ denotes an increase in transport intensity of more than 10 per cent between 1970 and 1995[10]
– denotes little change in transport intensity (less than 10 per cent change) between 1970 and 1995
✗ denotes a decrease in transport intensity of more than 10 per cent between 1970 and 1995[11]
GDP Gross Domestic Product
TEC Transport Energy Consumption

Comparing the most recent measures of transport intensity (1995 values) with the European average, few common patterns are obvious here either (Table 4). For many countries, some indicators suggest that transport intensity is more efficient than the EU average whilst others suggest the reverse. No country in the EU can claim to be substantially more efficient than the EU average across all seven indicators of transport intensity. Equally, however, no country is less efficient than the EU average across all seven indicators. This corresponds with SACTRA's observation that '*there is no overwhelming evidence that 'efficient' countries are consistently marked by high, low, increasing or decreasing levels of transport intensity*' (SACTRA, 1999).

[10] An increase in transport intensity means either:
i) a decrease in the energy efficiency value (i.e. less energy used per unit of transport movement or per unit of transport energy consumption); or
ii) an increase in the economic efficiency value (i.e. more economic activity per unit of transport movement or per unit of transport energy consumption).

[11] A decrease in transport intensity means either:
i) an increase in the energy efficiency value (i.e. more energy used per unit of transport movement or per unit of transport energy consumption); or
ii) a decrease in the economic efficiency value (i.e. less economic activity per unit of transport movement or per unit of transport energy consumption).

Table 4. Summary of Transport Intensity Measures in Europe relative to the EU average (1995 figures)

	Transport Energy Efficiency			Transport Economic Efficiency			
	TEC/ pass-km	*TEC/ tonne-km*	*TEC/ net mass movement*	*GDP/ pass-km*	*GDP/ tonne-km*	*GDP/ net mass movement*	*GDP/ TEC*
Austria	–	more	more	more	–	less	more
Belgium	more	less	less	more	less	less	–
Denmark	–	less	less	more	more	more	more
Finland	–	more	more	more	less	less	more
France	–	less	more	–	more	–	more
Germany	–	more	more	n.a.	n.a.	n.a.	n.a.
Greece	–	less	less	less	–	less	less
Ireland	more	less	less	less	more	more	–
Italy	more	–	more	–	–	less	more
Luxembourg	less	less	less	more	more	more	less
Netherlands	–	–	more	more	–	less	more
Portugal	more	less	–	less	–	less	less
Spain	less	more	more	–	less	less	less
Sweden	–	more	more	more	–	less	more
UK	–	less	more	–	more	less	less

more denotes more efficient than the European average (by more than 10 per cent)[12]
– denotes close to the European average (within 10 per cent)
less denotes less efficient than the European average (by more than 10 per cent)[13]
GDP Gross Domestic Product
TEC Transport Energy Consumption

The summary from this analysis is variability both over time (between 1970 and 1995) and at a single point in time (1995). Different EU countries have followed different paths and are at different stages in terms of economic and social development. The measures of transport intensity for individual countries are dependent on economic trends as well as travel trends and overall transport demand (influenced by geography, land use characteristics, socio-economic factors, transport infrastructure and so on). This variability of transport intensity indicators across European Member States also reflects the crudeness of the measures used and the limitations of the available data. The variability is an issue which has been noted elsewhere (such as SACTRA, 1999). Some forecasts assume that transport intensity will reduce over time (even though past trends show increases in transport intensity more often than not), believing that vehicle saturation may lead to improvements in transport intensity (see for example SACTRA, 1999).

The question of whether there can be growth in economic activity without increases in transport demand and/or energy consumption (i.e. whether decoupling or delinking can occur) has parallels with the current debates about the Environmental Kuznets Curve

[12] More efficient transport intensity means either:
i) less energy used per unit of transport movement or per unit of transport energy consumption; or
ii) more economic activity per unit of transport movement or per unit of transport energy consumption.

[13] Less efficient transport intensity means either:
i) more energy used per unit of transport movement or per unit of transport energy consumption; or
ii) less economic activity per unit of transport movement or per unit of transport energy consumption.

(EKC)[14]. Proponents of the EKC theory argue that there is an inverted U-shaped relationship between economic growth and environmental degradation (Figure 1). An explanation of this theory is that poorer countries often regard high levels of environmental degradation and pollution as an acceptable cost of economic growth but when a country has attained a sufficiently high standard of living, greater attention is then given to the environment and proportional spending on environmental quality increases. Although there is some evidence to support the EKC relationship for certain types of environmental degradation, this relationship does not hold for all types of environmental degradation (see for example Arrow *et al.*, 1995 or Stern *et al.*, 1996). Carbon dioxide emissions, for example, do not appear to fit the EKC hypothesis (IBRD, 1992). Moomaw and Tullis (1994) show that while per capita carbon dioxide emissions increase with per capita income, the experience in individual countries over time is highly variable and dependent on the structure of the economy. They conclude that there are development paths which can decouple economic growth from carbon dioxide emissions but adequate institutions are also necessary – decoupling is not just a natural consequence of economic growth.

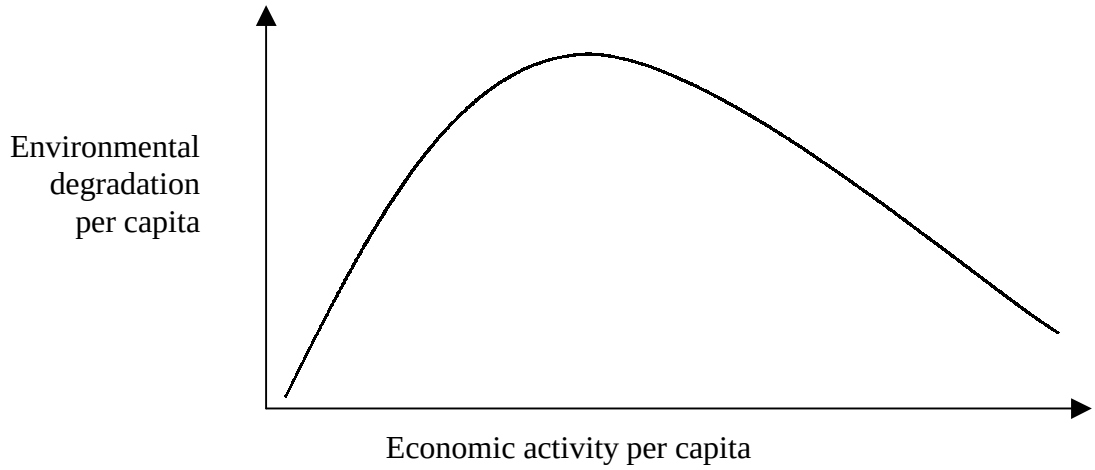


Figure 1. The Environmental Kuznets Curve (EKC)

Looking at European data, it does not appear that transport demand or transport energy consumption fit the EKC hypothesis either. In recent decades, GDP has increased in all EU countries, and transport demand and transport energy consumption have both continued to increase. It is clear that decoupling transport demand and transport energy from economic growth (as in the case of carbon dioxide emissions) will not occur by simply allowing the economy to grow. A number of other factors that might play an important role in decoupling are identified by IBRD (1992) and include: (a) the types of goods and services produced; (b) the efficiency of the use of inputs (raw materials); (c) the ability to substitute for scarce resources; and (d) the ability to use clean technologies and implement clean management techniques.

[14]The Environmental Kuznets Curve (EKC) is named after Kuznets who suggested an inverted U-shaped relationship between the inequality in the distribution of income and the level of income (Kuznets, 1955).

3. Trends in Transport Intensity in the United Kingdom

Recent trends in transport intensity in the United Kingdom are examined here in more detail in order to observe how measures of transport have changed over time and also to identify the extent to which different measures of economic activity have an effect on the indicators of transport intensity. Two specific measures of economic activity are examined: Gross Domestic Product (GDP), a 'conventional' and commonly-used measure; and the Index of Sustainable Economic Welfare (ISEW), an 'alternative' measure, which accounts for some externalities included in conventional measures of economic activity.

3.1 Transport intensity calculated using 'conventional' measures of economic activity

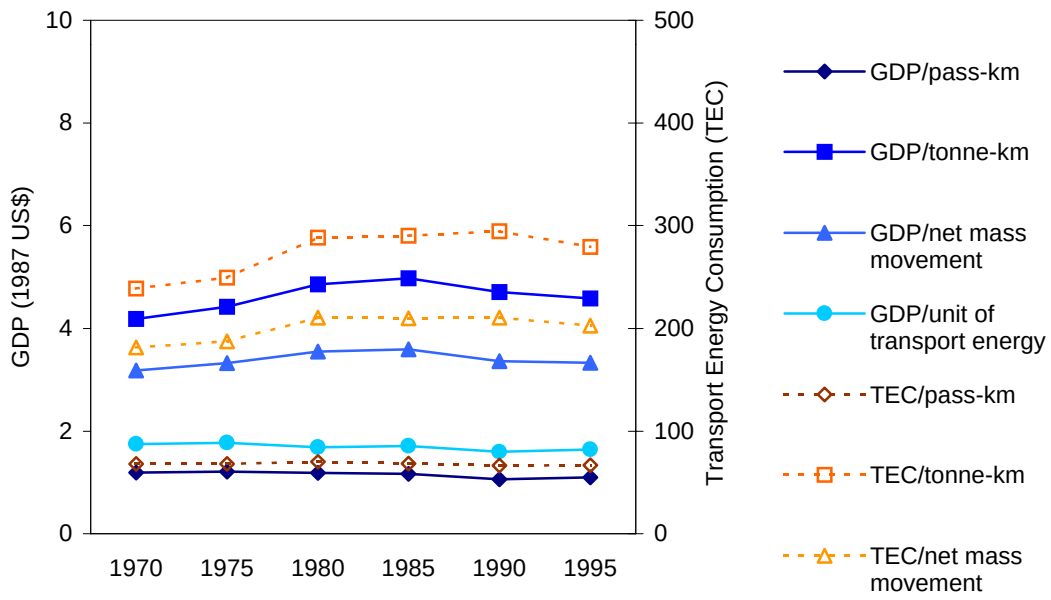
The UK's GDP per capita stayed at a very similar level as the EU average over recent decades and increased at a similar rate as the EU average between 1970 and 1995 (Table 5). Transport energy consumption in the UK increased at a slower rate than across the EU as a whole between 1970 and 1995 but was still higher than the EU average in 1995. Travel distance per capita in the UK was higher than the EU average in 1970 but was close to the EU average by 1995 due to a slower rate of growth than the EU as a whole. Freight transport per capita increased at a slower rate in the UK than the EU as a whole between 1970 and 1995 and was substantially lower than the EU average in 1995.

Table 5. Transport and Economic Trends in the UK, 1970-1995

		1970	1995	% change 1970-1995
GDP per capita	(constant 1987 US$)	8,463	13,431	59%
Transport energy use per capita	(tonnes of oil equivalent)	0.48	0.82	69%
Travel distance per capita	(kilometres per person per year)	7.10	12.27	73%
Freight transport per capita	(tonne-kilometres per person per year)	2.02	2.93	45%
Net mass movement per capita	(tonne-kilometres per person per year)	2.38	3.54	49%

Sources: European Commission (1997); OECD (1992); OECD (1997); World Bank (1998).

Most indicators of transport intensity do not show large changes in the UK between 1970 and 1995 (Figure 2). Measures of transport *economic efficiency* such as GDP per tonne-kilometre and GDP per net mass movement experienced a small increase in efficiency between 1970 and 1995. Measures of transport *energy efficiency* such as transport energy consumption per tonne-kilometre and transport energy consumption per net mass movement experienced a small decrease in efficiency between 1970 and 1995[6]. In comparison to other EU countries, transport intensity in the UK has remained relatively unchanged between 1970 and 1995. These trends would suggest that regulatory and technical changes have only been sufficient to counteract the shifts towards more energy intensive modes that have occurred during this period, resulting in little overall change in transport energy efficiency in the UK between 1970 and 1995. Even though transport energy efficiency did not change very much in the UK between 1970 and 1995, transport energy consumption increased by 69%, due mainly to increases in transport distance (rather than increases in the number of journeys).



Note: solid lines refer to the left hand scale and broken lines refer to the right hand scale

Figure 2. Transport Intensity for the UK using 'conventional' economic indicators, 1970-1995

3.2 Transport intensity calculated using 'alternative' measures of economic activity

The use of GDP has a number of limitations when considering issues of welfare or sustainability, since its calculation includes spending on actions such as pollution clean-up and medical treatment for road accident victims (for more detail, see Anderson, 1991 or Jackson and Marks, 1994). Hanley *et al.*, (1999) identify a number of alternative measures of economic activity such as Net National Product, genuine savings, net primary productivity, the Index of Sustainable Economic Welfare and Genuine Progress Indicator. At present, there is insufficient information to calculate and compare transport intensity using these indicators across European Member States. However, a small amount of alternative economic data for the UK is available and this is used here to calculate other measures of UK transport intensity. These measures are then compared against the transport intensity measures for the UK calculated with GDP data (presented above).

Daly and Cobb (1990) developed the Index of Sustainable Economic Welfare in the United States as an alternative indicator of national economic activity. The ISEW adjusts national economic data to account for a variety of social and environmental factors not normally included in measures of economic activity. In the UK, Jackson and Marks (1994) used a similar method as Daly and Cobb to calculate UK values of ISEW between 1950 and 1990[15].

[15] According to Jackson and Marks (1994), the Index of Sustainable Economic Welfare can be roughly expressed by the following equation:
ISEW = personal consumption + non-defensive public expenditures - defensive private expenditures + capital formation - costs of environmental degradation + services from domestic labour - depreciation of natural capital

The ISEW data from Jackson and Marks' study are used here in order to examine the extent to which alternative measures of economic activity have an effect on indicators of transport intensity.

As noted in the previous section, most indicators of transport intensity in the UK experienced little change between 1970 and 1995. However, quite different trends in transport intensity are apparent using the ISEW data. Indicators of transport intensity based on the ISEW data suggest that there was an increase in transport intensity between 1970 and 1975 but then there was a very substantial reduction in transport intensity up to 1990. All three measures of transport intensity using ISEW data decreased by more than a half between 1970 and 1990 (Figure 3). Hence, the use of alternative measures of economic activity may lead to very different trends in transport intensity, as the case of the UK illustrates.

The trends in economic efficiency using ISEW follow quite a similar pattern to the trends in ISEW – increasing up to the mid-1970s and declining quite substantially since then. Increasing depletion of non-renewable resources, long-term environmental damage and ozone depletion costs are important reasons for this downturn (Jackson and Marks, 1994). In addition, Jackson and Marks (1994) calculate that the inequality of income distribution also increased since the mid-1970s in the UK. This inequality is important to the Index of Sustainable Economic Welfare because it affects the personal consumption figure used in the calculations of ISEW.

4. Conclusions

Transport energy use and transport volumes have closely followed trends in economic activity over recent decades. This is not the case however for total energy consumption (across all sectors of the economy), which is not now increasing in many countries even though economic growth is still taking place. There is an increasing environmental case for improving transport intensity (i.e. 'doing more with less' as a means of reducing pollution, resource use and waste) as well as an increasing political desire to improve transport intensity (i.e. promoting economic growth without increasing transport volumes, energy use and associated social and environmental external costs).

Although the term is relatively widely used, there is no single definition of transport intensity or established way of measuring it. This paper has identified a number of measurable indicators of transport intensity and examined how these indicators have changed over time in Europe as a whole and in the United Kingdom.

Two distinct types of measures of transport intensity have been identified in this paper: measures of *transport energy efficiency* and measures of *economic efficiency* (relative to transport volumes). The first and more commonly encountered category of transport intensity measures were defined according to energy consumption as a ratio of passenger movements, freight movements or a combination of both. The second category of transport intensity measures were defined according to economic activity as a ratio of passenger movements, freight movements or a combination of both. This second category of indicators provides a way of examining whether there has been any *decoupling* between economy activity and transport volumes.

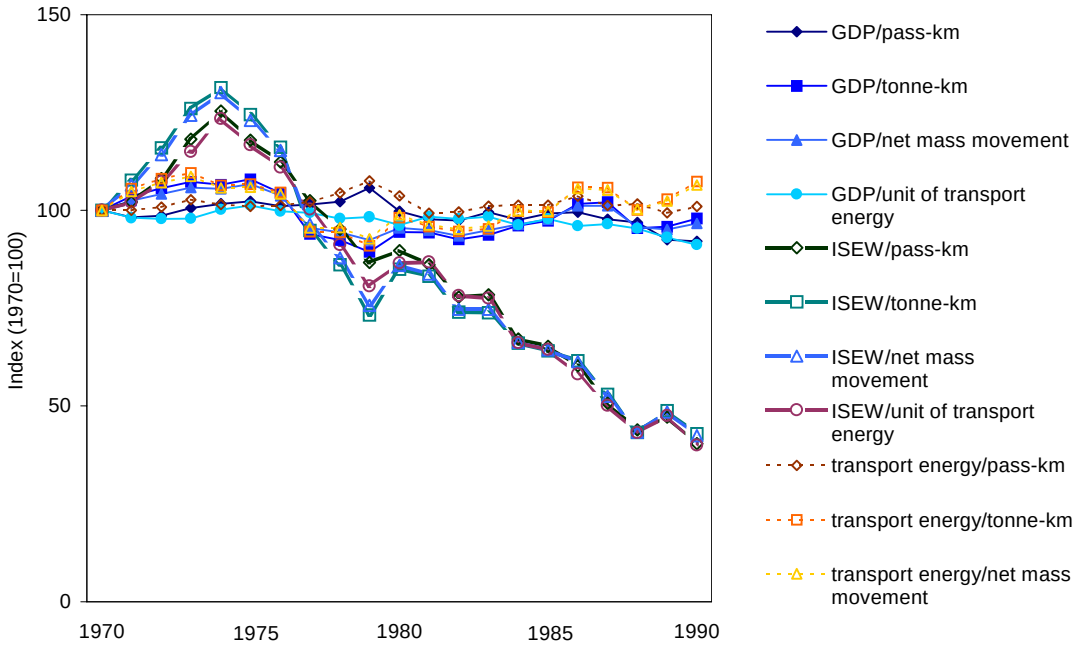


Figure 3. Transport intensity for the UK using 'conventional' and 'alternative' economic indicators, 1970-1990

The trends in the seven measures of transport intensity often do not follow the same direction: some indicators suggest that transport intensity is increasing whilst others suggest the reverse. No EU Member State can claim increases in transport intensity between 1970 and 1995 across all seven indicators. Equally, no EU Member State has experienced decreases in transport intensity across all seven indicators between 1970 and 1995. Analysis of the seven measures of transport intensity across the EU shows variability both over time (between 1970 and 1995) and at a single point in time (1995). Different EU countries have followed different paths (and it would be an interesting exercise to identify some of the driving forces behind the trends in different countries). Trends in transport energy efficiency in EU countries over recent decades are not the source for much optimism for the future. There were few signs of improvement in transport energy efficiency in EU countries between 1970 and 1995. In addition, the growth in transport distance at the same time as little change in transport energy efficiency has led to large overall increases transport energy consumption during this period.

It does not appear that transport demand or transport energy consumption fit the Environmental Kuznets Curve (EKC) hypothesis. In recent decades, GDP has increased in all EU countries, and transport demand and transport energy consumption have both continued to increase. It is clear that decoupling transport demand and transport energy from economic growth (as in the case of carbon dioxide emissions) will not occur by simply allowing the economy to grow. There are a number of other important policy issues that must be considered if decoupling is to take place. These include issues as diverse as land use planning, economic policy, education and support for research and development. Decoupling will require policies to change mobility patterns, change production and distribution processes, and influence lifestyles and the choice of products.

The interval between 1970 and 1995 represents an interesting period of study. Transport grew at a rapid rate during this period, as did energy consumption, congestion and emissions. Policy experienced large shifts: energy policy was realigned by the 1970s oil crises, whilst transport policy moved (albeit slowly) from a 'predict and provide' approach to one which has begun to embrace the concepts of demand management. There is nothing special about the base year chosen for this paper (1970) except that it provides a reference point for a long-term assessment of trends in transport intensity and decoupling.

Using the example of the UK, the paper has shown how alternative measures of economic activity (such as ISEW) instead of more conventional measures (such as GDP) may lead to very different trends in transport intensity. The indicators of ISEW relative to transport volumes showed substantial decreases between 1970 and 1990. The three measures of economic efficiency using the ISEW data experienced decreases of more than a half between 1970 and 1990, particularly from the mid-1970s onwards, from which time ISEW values have decreased.

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