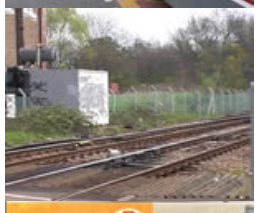
Metropolitan Transport Research Unit








Lorry Road User Charging (LRUC)

A way forward for the UK

October 2010

Contents

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Summary and Conclusions

***Government policy**:* The coalition agreement makes a commitment to "work towards" a scheme for Lorry Road User Charging (**LRUC**). National road user charging for all vehicles is, however, not to be considered in this Parliament. This means that a scheme can now be developed which is clearly focussed on specific road freight transport objectives.

***Objectives**:* The lead objective for Government is stated as:
"ensure a fairer arrangement for UK hauliers"

Obviously this will need to be achieved in the context of other transport objectives, in particular to:

- improve road safety
- reduce greenhouse gas emissions
- minimise external costs such as local air pollution, noise and congestion.
- support the economy

***Designing a scheme**:* There are several key parameters which should guide the design of an LRUC scheme for the UK:

- a focus on road user charging and avoidance of "mission creep"
- being objectives led not technology led: keeping the systems as simple as possible compatible with the objectives
- minimising costs of operation and enforcement for Government and the haulage industry
- addressing the inequalities between UK and non-UK hauliers in international and domestic traffic (cabotage)
- doing so in such a way that is compatible with reducing greenhouse gas emissions and external costs in general
- helping to raise HGV operating standards
- improving conditions for drivers away from base

***European experience**:* A majority of countries in Europe charge HGVs for use of at least some roads, either through traditional motorway tolls (France, Spain, Italy) or through electronic HGV user charging (Switzerland, Germany, Austria, Czech Republic, Slovakia). There are plans for several more schemes. Systems have been in place for some time and thus proven technology is available at low cost.

The outcomes from the two longest running schemes are positive, in terms of improving efficiency and reducing external costs, as well as raising revenue. Less empty running has played a key role in both countries. Targeted measures to support the national haulage industry, such as training and vehicle improvements, have been funded through the German HGV toll scheme, with the agreement of the European Commission. These currently tend to give greater support to small and medium sized haulage firms.

***Way forward for the UK**:* The simplest scheme would charge for the time spent on any road in the UK. This could use a displayable windscreen ticket

(vignette). However, this would be relatively ineffective in relation to any objectives, raise enforcement issues, could run into EU limits on charging, and be quite costly to implement and run.

A simple vehicle type and distance based charge on all roads would be far more cost effective. While not a perfect match with objectives, distance is vastly superior to time alone. Applied to all roads it would avoid the issue of diversion from motorways, which is particularly serious the UK. The technology is well proven and, in the case of the Swiss model, to a large extent self-enforcing. This scheme should, at least initially, cover only Great Britain and not Northern Ireland, to avoid cross border issues between Northern Ireland and the Irish Republic.

To achieve the objective of a level playing field between UK and other EU hauliers would require a charge which would generate greater revenue from HGVs than at present. This revenue could be used in whole or in part to support the UK haulage industry, specifically to assist current operators to become more efficient, and thus more competitive, and less polluting. However, care must be taken in compensating UK hauliers: a fuel duty rebate, whether for all hauliers or for UK hauliers alone, is unlikely to be compatible with EU competition rules and was not pursued in the German Maut scheme for this reason. However, from the German experience there could be other compensatory mechanisms for the UK haulage industry with wider benefits. Elements which could be part of a final package include:

- improved and comprehensively located facilities for drivers away from base
- financial support for the new Certificate of Professional Competence (CPC) driver training requirements and beyond
- support for small operators through training and IT equipment
- tax rebates for hauliers to join return load schemes linked to above
- support for vehicle modifications to save fuel
- scrappage payments where more fuel efficient HGVs are purchased
- reduction of annual vehicle excise duty to the lowest permitted amount
- UK toll rebates (open to all operators in EU Member States)

Overall conclusions

1. The UK is increasingly out of step with the rest of the EU in terms of charging HGVs directly for infrastructure use. Most other EU countries have or are developing charging schemes for heavy lorries.

2. This has not helped the UK haulage industry to compete for international traffic which starts or ends in the UK and a growing amount of national goods traffic (cabotage).

3. A scheme which is sufficient to achieve objectives of fairness, while not causing detriment to other economic and environmental objectives, is practical within the current Parliament. It would be in keeping with the Coalition commitment and other transport objectives.

1 Introduction

There can be many different reasons for developing Lorry Road User Charging (**LRUC**). Governments may wish to:

- raise revenue for general purposes
- encourage some behaviours and discourage others
- compensate for some costs (for example congestion or pollution) not charged to users at present
- ensure that all road users are charged fairly and that some do not avoid paying their costs.

The last one is linked to the idea of supporting fair competition in the market for road goods transport, not just between UK operators in the UK, but between all operators from within EU who undertake work in this country.

At the moment, the Government has various other methods to meet these aims. For example, fuel and vehicle excise duties raise revenue while reflecting emissions, and vehicle licensing, testing and enforcement seek to encourage safety in an equitable way. The operator licensing system in particular, and the new driver qualifications (Certificate of Professional Competence: **CPC**), raise standards in the industry which are also designed to protect public safety. There are active associations both for public hauliers[1] and own account operators[2].

However, there are also major omissions. There is ongoing discussion about how far different sized vehicles meet, or do not meet, their environmental and congestion costs, and about the increasing share of road freight captured by vehicles which do not pay either fuel or vehicle excise duty in the UK. This problem has developed following the opening up of the haulage market across the EU and is explored in detail later in this report.

In addition, there are many small and medium sized haulage companies in the UK which help to create a highly competitive and flexible market in road freight. There are a range of demands on these companies at their base both in terms of administrative and technical expertise. Away from home, the demands extend to the need for appropriate, and widely available, facilities when vehicles are parked during the day or night, and for driver training.

Coalition agreement and EU context

The current Government is committed to preparing a scheme for LRUC in the following terms:
"We will work towards the introduction of a new system of HGV road user charging to ensure a fairer arrangement for UK hauliers."

It is clear that this targets the issue of non-UK hauliers not paying UK tax or otherwise contributing to the upkeep of UK roads,

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1 Road Haulage Association - **RHA**

2 Freight Transport Association – **FTA**, which also includes other modes

Many other countries have taken steps to address lorry charging. There are now different approaches in place across the EU which charge HGVs for road use: motorway tolls in France, Spain and Italy, "in vehicle" distance charging[3] in Germany, Austria, the Czech Republic, Slovakia and Switzerland. The latter has special arrangements which integrate the freight market with the EU, for example allowing Swiss operators access to EU haulage markets. The UK started to develop its own scheme in 2002, but this was dropped in 2005. Other countries are actively developing lorry charging schemes, including France, Belgium and Denmark.

There are two important points to be made. First, the UK is now somewhat out of step in terms of the way that HGVs are charged for road use. This is increasingly important in the context of the growing EU-wide open market in road freight. This supports the Coalition commitment to develop LRUC. Secondly, there is now a wide range of post-implementation experience available to assist in the design of a practical UK system.

Approach for this report

This report explores the extent of the problem in relation to fairness and goes on to examine how this could be addressed. However, this has to be approached without endangering other objectives such as safety. The proposals seek to find a pathway which achieves greater fairness while helping to raise industry standards and address some of the problems which operators and drivers face on a daily basis.

This is done in the context of achieving the greatest possible transparency for operators and public alike. Thus there has to be a balance between simplicity and achieving all objectives. The previous proposals for LRUC in the UK, announced in 2002, would have created a system which was capable of great sophistication but was highly complex and very expensive. In its response to a Select Committee report in July 2005, the Government abandoned LRUC as a separate scheme and said that HGVs would be included in a national user charging scheme. However, this was not progressed nationally or in specific locations (such as Manchester), and the Coalition has said it will not take such proposals forward in this Parliament. The London Congestion Charge, and the Low Emissions Zone (which targets HGVs) has however generated useful information on technical, administrative and legal issues.

The UK studies for LRUC are nevertheless informative, particularly when reviewed in the light of data from the schemes which did proceed elsewhere in Europe. It is now possible to examine the alternatives for a stand alone scheme which can take into account a more established range of technologies proven in operation. There is also data from the existing schemes on impacts and issues such as costs and enforcement.

Where do we want to get to?

[3] Using an on board unit or OBU

Underlying any scheme there should be some clear and comprehensible objectives. At the highest level these would be: supporting the economy; ensuring public safety; improving the environment; and addressing climate change.

These can then be translated into more detailed operational objectives such as:

- ensuring fair competition between UK and non-UK operators, within the UK,
- ensuring fair competition in the UK between operators irrespective of size,
- ensuring non UK operators contribute to the costs they impose on UK roads
- keeping the costs of operating any scheme proportional to the benefits,
- reducing accidents by a specified amount,
- reducing other external costs of road use such as congestion and pollution,
- achieving minimum working standards and facilities for employees, in this case particularly while away from base,
- raising skill levels across the whole road freight industry,
- ensuring smooth implementation of new standards coming into force,
- supporting employers to engage in new efficiency initiatives[4],
- reducing the amount of greenhouse gas emissions per tonne of freight delivered.

These objectives can be achieved by implementing specific regulatory or fiscal measures (usually both). The key measure is cost effectiveness in achieving the objectives.

An LRUC scheme for the UK should aim to address the current gaps in achieving these objectives while minimising administrative or financial cost.

[4] These can include improving load factors, driver training and vehicle modification

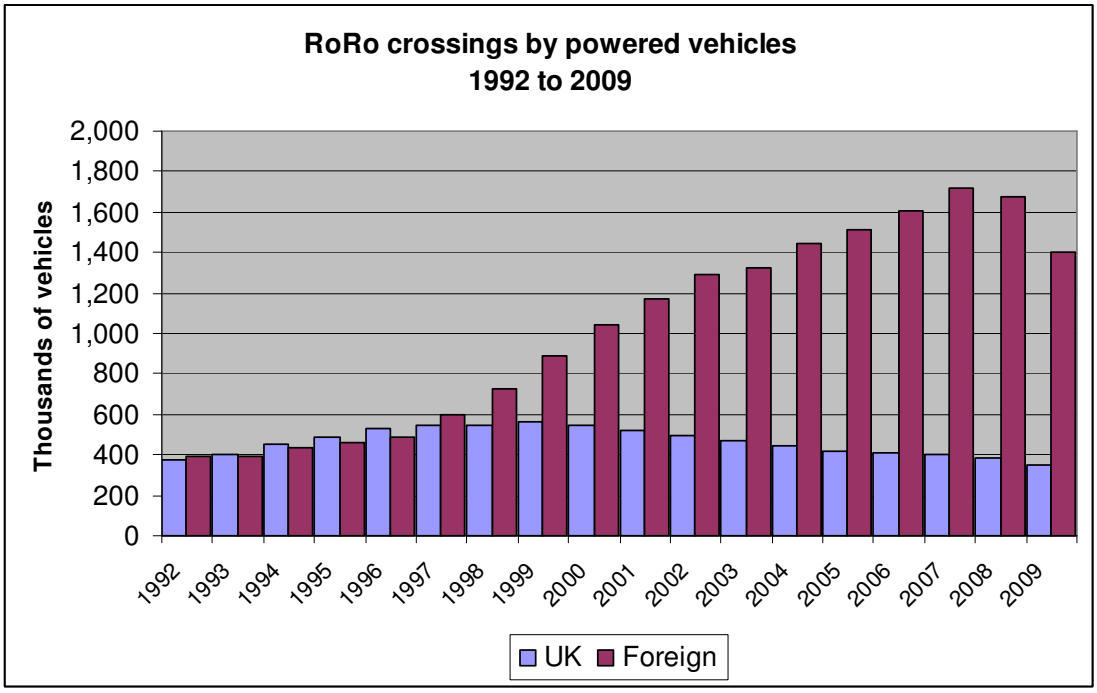
2 International comparisons and recent trends

Overview of the cross border market

Foreign registered vehicles from the EU are now allowed free access into the UK to collect or deliver goods and are able to compete for internal freight movements (cabotage).

This increased openness has led to major increases in the use of EU vehicles based outside the UK for goods on roll on roll off (RoRo) ferries. For example, in the early 1990s the split was fairly even, but since then foreign based vehicle use has quadrupled while UK vehicle use declined in real terms. This is shown in chart 1 below.

Chart 1



There has also been a change in the use of foreign vehicles, with those from new EU members growing strongly. While this is logical following accession, the road haulage industry in the new member states has been able to gain a significant amount of EU goods traffic entering or leaving the UK.

In addition, there are now a significant number of drivers who are not from the same country as the vehicle operator. This is also skewed to the new member states.

Overall there has been a major increase in the presence of foreign vehicles and a major increase in their market share for cross border goods traffic with the UK.

These effects are shown in charts 2 and 3 below. Both are sourced from the DfT's Survey of Foreign Vehicles, 2009.

Chart 2

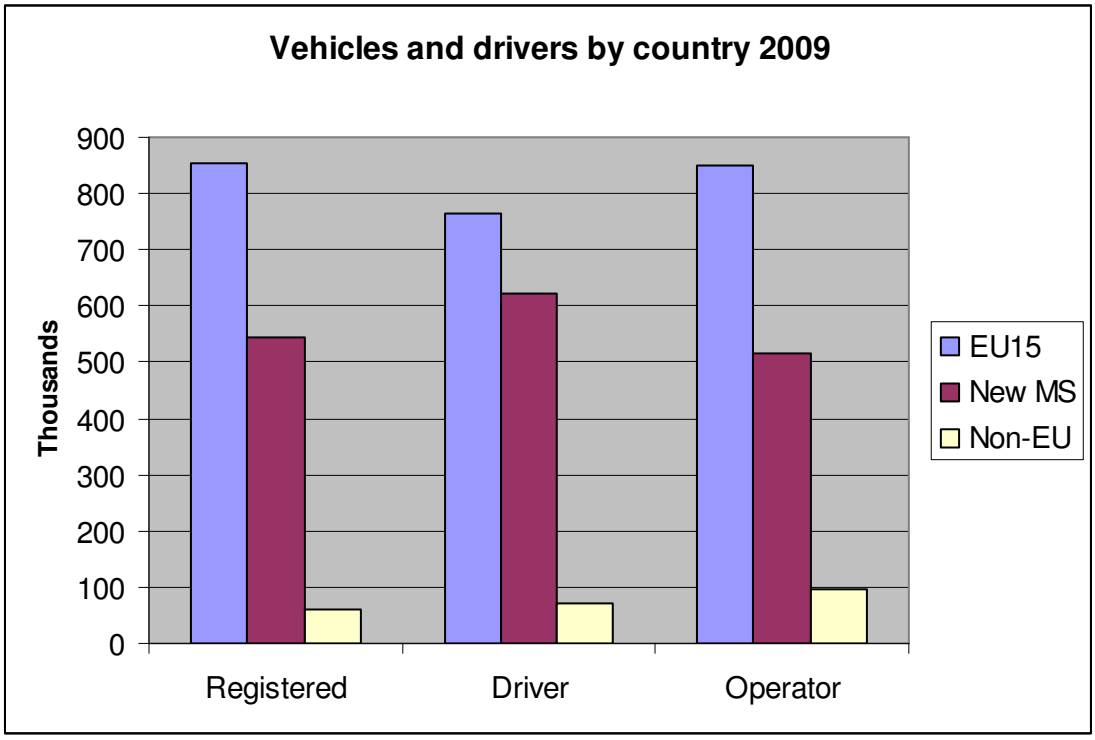
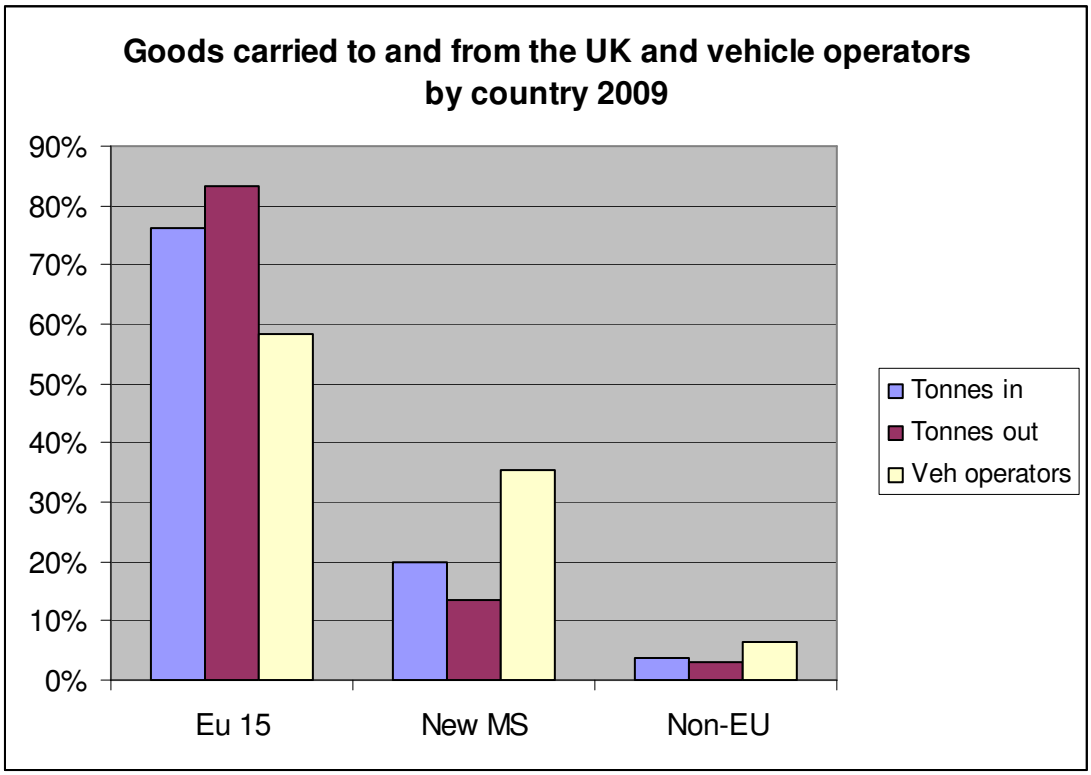


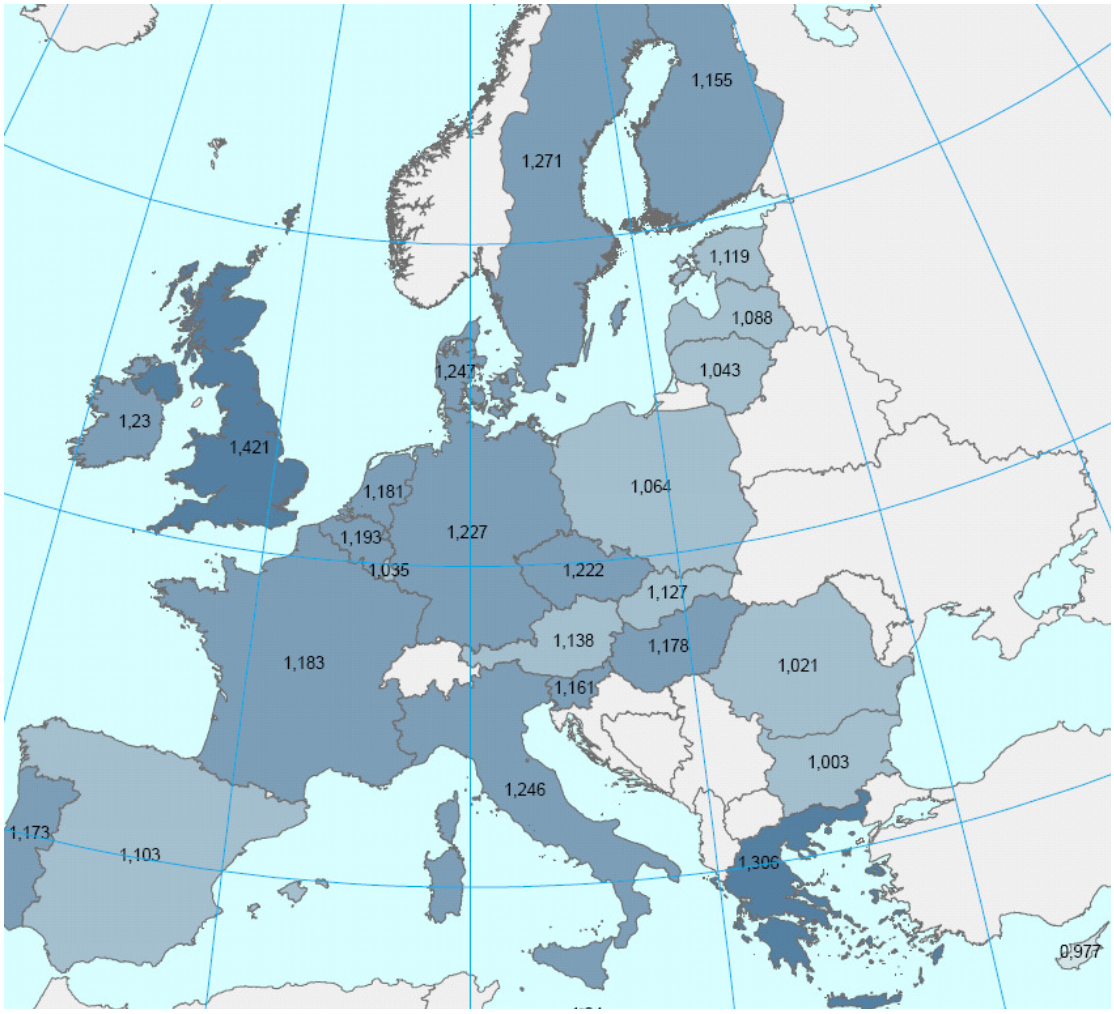
Chart 3



Industry reactions and fuel price

As would be expected, the decline both in market share and absolute terms (see Chart 1), has resulted in considerable concern from the UK haulage industry. One reason frequently put forward is that fuel prices are lower in other EU countries. This illustrated in the Figure below.

Figure 1
Retail pump price of diesel (€) for EU countries May 2010



Source: European Commission, DG ENER Stats

Of course, most companies will reclaim VAT on their fuel and this suggests even greater differences in the real operating cost to companies.

VAT rates also vary and this is reflected in the price of fuel at the pump for non-registered users.

It should be noted that duties (as opposed to a general sales tax such as VAT) are sometimes said to reflect environmental or third party costs, and the price of carbon. It is not at all clear that this link is correct either historically or in terms of quantified impacts in the individual countries.

The following table illustrates the retail price and indirect taxes. It is immediately obvious that the range of indirect tax collected is very significant, with the UK well ahead. For example, UK indirect tax is over twice that in Poland, Romania or Bulgaria, and 40-60% higher than closer neighbours such as France, Belgium, Germany and the Netherlands.

Table 1
Indirect tax and retail price per 1,000 litres, EU member states
Euros, May 2010

	Automotive gas oil (diesel)	
	Indirect tax (no VAT)	Pump Price
Austria	386.18	1,116.00
Belgium	392.89	1,134.00
Bulgaria	306.78	979.85
Cyprus	255.70	966.47
Czech Republic	429.33	1,216.94
Denmark	389.95	1,224.54
Estonia	392.93	1,119.41
Finland	330.12	1,127.60
France	427.90	1,144.60
Germany	470.40	1,226.00
Greece	422.89	1,288.00
Hungary	365.02	1,162.11
Ireland	469.20	1,230.00
Italy	423.00	1,216.10
Latvia	330.04	1,064.88
Lithuania	274.27	1,009.24
Luxembourg	310.00	974.92
Malta	352.40	1,040.00
Netherlands	437.70	1,157.00
Poland	314.29	1,070.33
Portugal	364.41	1,154.00
Romania	299.05	1,017.81
Slovakia	368.00	1,120.00
Slovenia	419.00	1,166.00
Spain	340.36	1,066.01
Sweden	450.90	1,255.33
United Kingdom	673.91	1,422.95

Source: Europa statistical observatory Oil Bulletin:
http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm

This of course does not include variations between states in terms of training, pay and other conditions. Thus there appears to be little consistency of approach to duties as a whole, nor in their application to address externalities.

A clear pattern has emerged with two key features. The first is that UK cross border road goods traffic is increasingly dominated by foreign vehicles. The second is that these vehicles are not necessarily based in the countries that the goods come from or go to. While some internationalisation of road goods

traffic is to be expected, this does not seem to be a reflection of normal competition, but of differences in tax and regulatory structures.

The growth of user pricing for road freight

In this context the logic behind proposals for additional national charges for heavy goods vehicle use is easier to understand. Thus there are now distance based schemes in Germany, Austria and Slovakia and others are being progressed. Outside the EU, but in the centre of it, Switzerland introduced its own system in 2001.

In addition, countries which do not have an HGV charging regime, such as France and Spain, have extensive motorway tolls with higher rates for HGVs. In fact France is developing a lorry charging scheme to cover main roads not currently tolled, and other countries such as Belgium and Denmark are also developing schemes.

While individual journeys vary, the effect of the German scheme is equivalent to an indirect tax of about €0.37 to €0.40 per litre of fuel for a heavy articulated vehicle. This means that on the motorway network, with their charging scheme, Germany is raising more indirect tax than the UK. The effects of this are explored in the next chapter.

Foreign vehicles and safe UK operation

A final issue which needs to be included is that of safety. In the UK, there has been some discussion about the difficulties of safety enforcement and the particular issues caused by some vehicles and on some corridors. For example, accident investigators Accident Exchange estimated that almost half the accidents on the M25 are caused by foreign lorries. In April 2009 legislation was introduced to allow on the spot fines. There is early evidence that this may be having a positive impact, for example Kent Police report a fall in accidents on their busiest route from the Channel ports.

The Transport Select Committee also highlighted such problems in its 2009 report on VOSA, for example pointing out that Ports did not allow inspectors to examine vehicles on their premises. The Government responded that it did not wish to use legislation to ensure access to ports but was pursuing other solutions. However, this remains unresolved.

There have been several reports concerning foreign registered lorries, one by the Association of British Insurers suggested that accidents in which they were involved went up 10% in 2009. This updated their earlier report showing a 47% rise between 2001 and 2006. Many of these accidents involve the larger blind spots caused by left hand drive heavy lorries, often referred to as “sideswiping”. TRL have published a comprehensive study of the issue and ways of improving the situation, although problems would be likely to remain.

There could therefore be associated benefits in terms of other safety as part of the enforcement process for LRUC. Because of the nature of HGV

operation, a poor approach to safety, for example, leads to more than one infringement. Within the industry there is support for robust action on the minority who are unable to meet the requirements of operating such large vehicles safely.

3 Developing practical options for LRUC

Balancing outcomes and staying focussed

Before considering the options in more detail, it is important to note that there are always trade offs in scheme design. One is between simplicity of use and targeting the desired outcomes precisely. Another is between theoretical completeness or accuracy, and ease of enforcement.

In addition to achieving the right balance, there is a need to distinguish between added benefits which might arise from an LRUC scheme, and deliberately adding in new features which are not central to achieving the main objectives. This type of "mission creep" is far from unknown in projects which involve a high technological or IT content. As well as making it less clear why the project is proceeding, there tends to be an adverse impact, often unexpectedly severe, both on costs and implementation time.

Transport is also an area where some standards of construction have historical roots and the risk here is that equipment will be over engineered. Again this leads to higher costs. A mobile phone, for example, is not designed to last the lifetime of a heavy lorry and if it were it would not only raise the cost, but mean that upgrading the equipment in the light of experience is harder to justify. The Swiss and Czech on-board units, for example, have proved robust but are relatively cheap.

Keeping it simple

Transparency is an important principle in itself, both for industry and the public, and for their elected representatives. It is linked to the need for any system to be as small a burden as possible on the users, and as cost effective as possible in terms of operation.

This is an issue because of the potential complexity of any comprehensive system. For example, in terms of social welfare it may be ideal to represent every cost perfectly **in real time**. In terms of goods vehicles, this could require charges based on:

- infrastructure costs (influenced by type of road construction),
- congestion level (differing by road type and time of day),
- emissions,
- noise,
- sensitivity to external effects (i.e. who is affected in the areas through which the vehicle travels).

All of these would need to be applied to distance travelled and time spent on each type of road and related to the specific characteristics of each vehicle.

At the moment, the UK relies on fuel duty, and the higher consumption of fuel by the heaviest vehicles, as a proxy for external costs. This is, however, only an indirect link between fuel use and such factors. There is extensive

literature on the issue of externalities[5], and this is not the subject of this study. However, this whole issue has been complicated by the rules which have opened up the road freight market to EU registered vehicles to undertake work in the UK. At the same time, as already noted, a majority of EU countries have put non-fuel based charging systems in place, whether motorway tolls or specific LRUC schemes.

The result of this is that the current UK structure for achieving transport objectives, and for maximising net benefits, is not being applied to an increasing number of vehicles operating in the UK. In this case, opening up the road freight market across the EU has not been accompanied by Europe wide harmonisation of all the operational and employment regulations and taxes.

The issue here is to assess different approaches in terms of the proportion of impacts addressed, compared to their practicality, the latter including:

- ease of understanding,
- fairness and consistency with national and international agreements,
- technological reliability,
- enforcement,
- operational costs compared to revenues, and
- cost implications and impacts for the freight industry.

From the ideal to the realistic

Whether a new system will be worthwhile requires the following areas of assessment:

- how well the proposed rules and/or charges reflect the many detailed impacts identified;
- an implementation and continuation package including adjustments to the existing system (often this aspect is completely omitted);
- an impact assessment, both for users and those who are currently bearing the cost, including options for the above; and
- comparison with the existing system.

This would need to be carried out in broad terms for the various options available.

The detailed effects described above can be used to define a first set of possible factors which could be used as a basis for a new framework. These are:

- road construction and type
- split between entry cost and marginal cost
- level of congestion
- time spent
- distance travelled
- vehicles included or excluded from the system
- vehicle characteristics.

[5] *Plowden and Buchan 1995, Nash et al 2003, Mckinnon 2007, Buchan 2008*

Clearly, several of these are linked, for example road type and congestion, and time and distance. Distance, road construction and vehicle characteristics are major factors in infrastructure costs; time, distance, vehicle type and level of congestion are important for emissions and potential pollution impact; areas through which roads pass are important for actual local pollution impact. There are wider impacts on location, and choice of port, that relate to marginal cost and which vehicles are included (for example omitting non-UK registered vehicles).

Potentially this could lead to a highly complex system in terms of technology, enforcement and user acceptability. All of this creates risk in terms of implementation and operation.

The key challenge therefore, is to create a system which maximises its effectiveness in dealing with the issues and reducing external costs, while minimising the administrative and user costs as well as operational risks.

Possible systems

This report examines various options starting with the simplest methods available. However, there is one simplification to be considered which overlays the rest. This is whether the scheme should cover the UK or Great Britain. A UK scheme including Northern Ireland would cause additional complexity because of cross border effects, and in particular the high permeability of the North/South border. The natural sea barrier effectively reduces the access points and thus a more cost effective scheme boundary. It would still be possible to include Northern Ireland hauliers in any support package and, by loosening the link between LRUC and the compensation package described below, this may actually reduce the legal risk in relation to EU competition rules. Extending charging to Northern Ireland would probably have to be done in discussion with the Republic of Ireland to resolve cross border issues.

The list below describes key approaches to LRUC, although some simple options have their own practical difficulties, for example enforcement. A few examples are given below:

- *Coarse Time Based:* paper windscreen ticket or electronic equivalent, daily charge, monthly or yearly discount[6].
- *Stratified Time Based:* as above but peak or off peak use only[7].
- *Time Based Road Type:* data on where the vehicle is operating needed either for on-board or remote charging
- *Distance Based:* reading from tachograph or on-board vehicle unit
- *Distance Road Type Based:* on-board vehicle unit with data on where the vehicle is operating needed either for on-board or remote charging[8]

[6] For example Euro Vignette system, windscreen ticket also basis of original Singapore all vehicle road pricing scheme (peak hour only)

[7] Would relate better to congestion but may be problems for HGVs as opposed to private cars

[8] This could use average costs on different road types, such as motorway, A, B, C etc.

- *Dynamic or "real time" Congestion Based*: on board unit interacting with continuous or time delayed congestion monitoring.
- *Partial Congestion Based:* as above but congestion monitoring where available (probably motorways) and switching to average values for other road types
- *Total Time, Distance, Place (Congestion Based):* data on where and when vehicle is operating + congestion data, again recorded either remotely or on board.

It can be seen from the above that the simplest approach is time based with no distinction between road types, followed by distance based, again charging the same across the whole network. Such a system is simpler than trying, for example, to apply a scheme to motorways only, and probably better at achieving the objectives. This is because problems of diversion are avoided and some external costs (including maintenance) are actually higher off the motorway network.

In addition to the above, there will be a range of options for implementing and administering the system. For example, existing regulatory or charging frameworks could be used or expanded as well as new systems. Existing technology such as GPS tracking or camera recognition could be used for vehicle location. A completely new system of vehicle tags and roadside beacons could be used.

Possible technologies

It is clear from the above that there are basic choices about the technology to be used. A windscreen ticket is essentially a coarse time based system, and this can be automated, for example the London Congestion Charge. However, the number plate recognition used has been expensive to set up and the area controlled is small and well defined. Enforcement is also expensive and other users have no idea whether a vehicle has paid or not (important for low-cost, self-regulated enforcement).

The main choice in terms of equipment is whether the unit in the vehicle sends data continuously which is used remotely to calculate a charge, or whether it stores data which calculates the charge and this is accessed regularly for charging purposes.

For example, if a wide range of parameters are included, calculating the charge on board requires a unit which has full mapping and congestion (either real time or averaged) data and can use this to calculate costs. Fewer parameters mean this is feasible with only time or distance – both could be included in a far simpler device.

To give a better idea of the difference, the former would resemble a modern netbook, the latter a mobile phone of a couple of years ago.

If a wide range of parameters are used but calculated remotely, other issues need to be considered. For example, there are security issues over a third

party having data on where goods vehicles are. At present, high value consignments are often tracked by operators, but they take great pains to ensure that there is limited access to such information. If it is calculated remotely, the cost to the user is also less transparent.

There are two final issues concerned with complex on board units. The first is inflexibility due to the high capital cost of each unit and the need to make it robust. The second is linked to the first. The more functions required, the more difficult it becomes to make units completely interoperable between EU countries. This will grow in importance and is the subject of EU initiatives including the EETS Directive. There are already EU requirements on charging systems to avoid delays at the borders of Member States.

There is clearly a trade off between high capital cost and longevity of the unit. Thus a whole of life cost will need to be calculated to produce a technical specification. The German on-board units cost around €400 but will probably last 10 years.

It is now possible to summarise the key options and their complexity in the following chart.

Chart 3.1
LRUC parameters and level of complexity

Key	Simplest	Medium	High	Very high

All HGVs	Coarse time	Stratified Time	By distance	By road sensitivity
All roads				
By road classification				
By congestion				

1 Road type parameter examples: motorway/trunk/urban
2 High is if all roads are included – see discussion below
3 Road sensitivity parameter examples: environment (people affected), safety

Suitable options for the UK

At present it is clear that the simplest methods would be an electronic version of the paper vignette or a scheme similar to the Swiss on board unit. Since distance provides a much better fit with most of the impacts that are at issue, the all roads distance option is to be preferred.

Moving up a level of complexity, a simple time parameter is likely to miss real congestion across extensive parts of the network and may even lead to

inefficient driver time choice. The time and road type combination is less likely to reflect real costs than distance. Distance by road type could offer an improvement, but this introduces problems in the UK where there are alternative routes. If charges on a motorway were less than other roads (due to less congestion, lower environmental sensitivity and fewer accidents per mile) there would be a strong incentive to use them. However, if only motorways were charged, the incentive would be reversed. In order to avoid this, the system would have to include the whole road network. If differential charges were to be applied an new level of complexity would be added.

In this sense, the inclusion of a general road classification parameter is a simplified version of a more detailed sensitivity analysis, which would be applied independent of classification. The UK has many systems, for example, M, A, B, C, trunk, principal, primary, urban, rural etc., all of which have very different characteristics within each class.

Such a sensitivity analysis might be possible through local authorities or using mapping techniques plus extensive public involvement and consultation. Given the UK's unsuccessful experience of trying to do this on a limited scale for lorry routeing, the magnitude of such a task should not be underestimated.

This discussion suggests that a simple distance based approach for all roads is the least complex, and has the lowest risk in terms of unexpected consequences.

This could be achieved through a simple on board unit, which simply calculates distance using GPS or data from an electronic tachograph. The latter is likely to be slightly less accurate but would provide a powerful cross check if GPS is used. Such units are likely to be similar or lower cost than simple mobile phones. The Swiss unit is well proven and the next section of this report explores this system and its effects in more detail. The German Maut is also described in detail since this represents a slightly more sophisticated approach in terms of the technology used.

4 Impact of LRUC in Germany and Switzerland

National statistics are always driven by a wide variety of economic and industry specific causes. However, it is possible to discern some clear trends in relation to the Swiss and German schemes. These represent the longest established schemes and affect a very large number of vehicles.

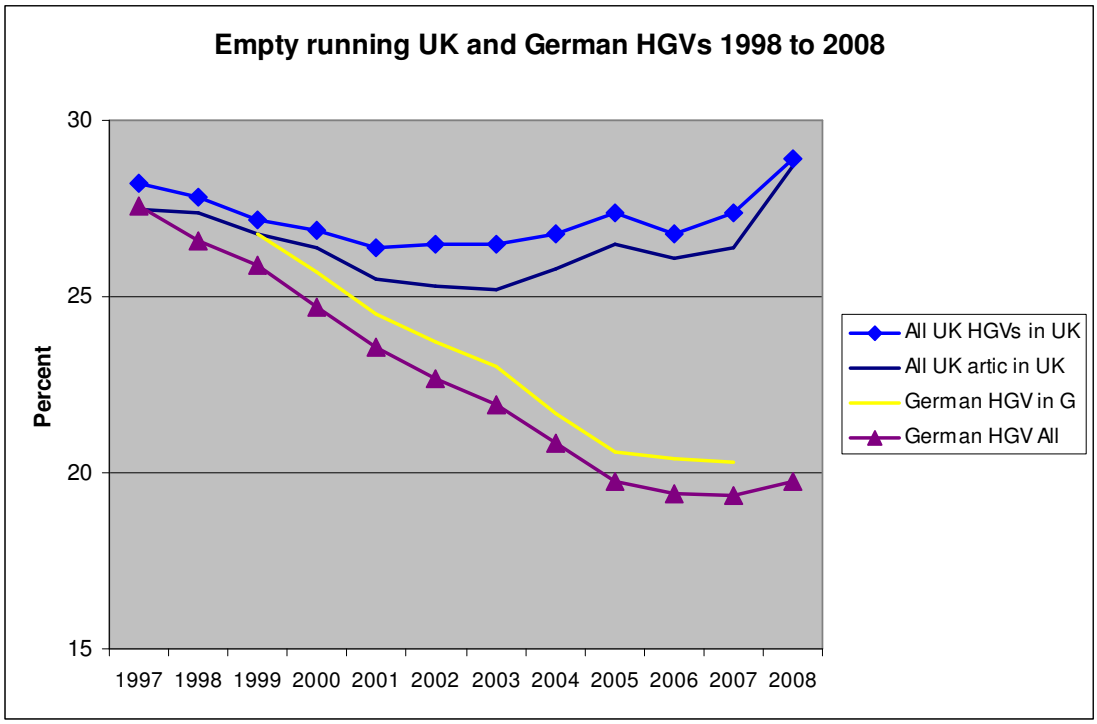
Empty running in Germany

The chart below shows the striking progress made in Germany and tracks the change over time. The yellow line is the most comparable German statistic to the UK survey, but has slightly less available time series data. The shape of the trend is, however, very similar.

As well as the reduction of empty running by German HGVs, the recession in 2008 did not appear to cause empty running to increase on the same scale as in the UK. The hypothesis would be that a system which was maximising backloads would continue to work in all economic conditions. On the other hand, a less effective system would lead to more under utilisation as a short term reaction to the recession.

This suggests a need to encourage the UK market to innovate in this area and could form part of a package to support the industry. It is relatively inexpensive.

Chart 4.1



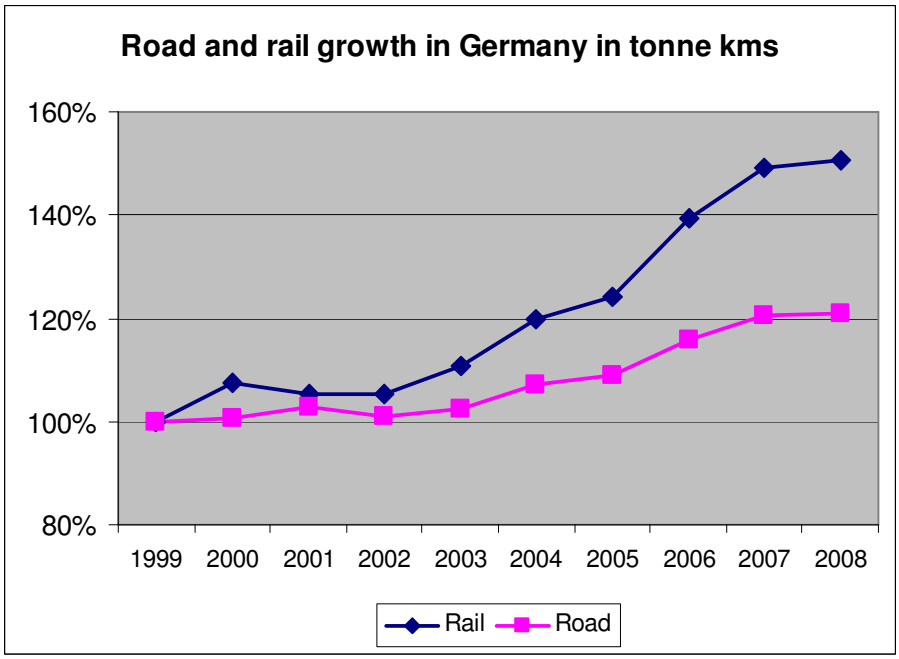
Source: *BAG Jahrebericht (Annual Report) 2005 and 2008*
CSRGT UK 2007 and 2008

Rail and road competition

The following chart shows the growth of rail and road in recent years. The figures for 2009 are, however, likely to show a greater decline for rail than road due to falls in the exports of manufactured goods.

Overall, the higher rate of increase for rail clearly parallels the introduction of the MAUT in January 2005.

Chart 4.2



Source: BAG Yearbook

Use of Maut income

One interesting feature of the Maut system is that a package of financial support was given to German operators and agreed with the EU. This did not include fuel duty rebates – the European Commission made clear that in its view such rebates, whether for all hauliers or purely for German ones, were not likely to meet legal requirements.

The basic structure was:
Maximum per company of €33,000 for 3 years.
Within which the maximum per year per "measure" is:

for vehicles:	€2,000
for individual employees:	€800
for efficiency initiatives:	€1,400

Thus in year one a haulier with 10 vehicles could spend €10,000 on general vehicle improvements, €14,000 on fitting streamlining or computer based return load systems, and €8,000 on driver training. While assisting all small and medium hauliers, those with up to 20 vehicles are most likely to benefit.

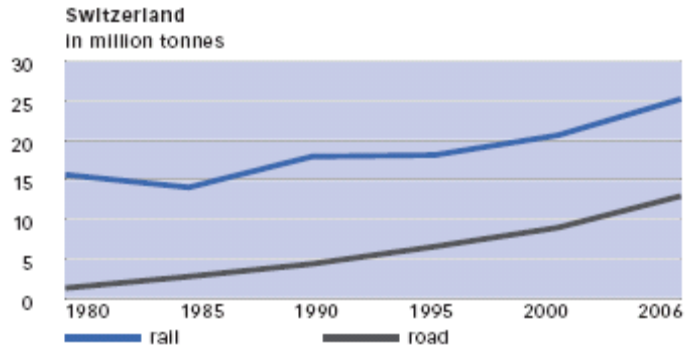
There are 79,100 operators in this category (83% of total), operating 216,800 HGVs (60% of total).

Swiss data

The Swiss scheme was introduced in 2001 following a national referendum and combined an increase in maximum vehicle gross weight, from 28 to 40 tonnes, with the new distance and vehicle type charge.

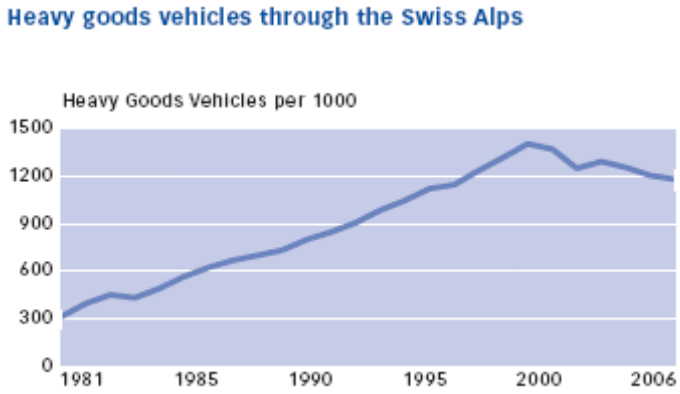
Overall, this has led to fewer vehicle kilometres both in absolute terms and in relation to predicted growth. Transalpine figures are shown in the chart below.

Chart 4.3 *Transalpine goods traffic*



This has been achieved with a reduction in vehicle flows. This is shown below.

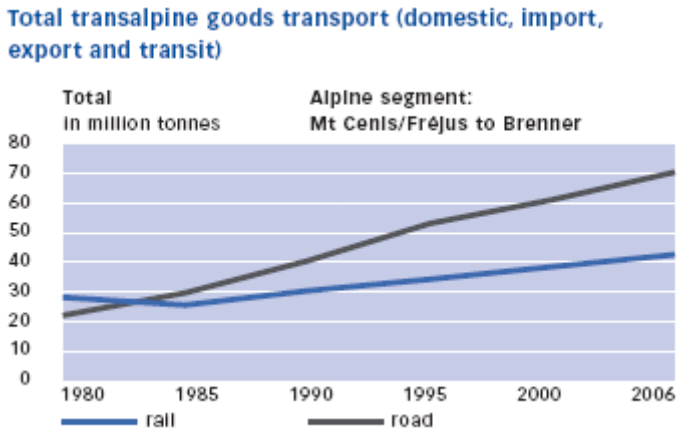
Chart 4.4



Note: the slight uneveness was due to temporary closures of the Gotthard and Monte Olimpino rail tunnel in the early years and of Gotthard again in 2006

Thus an increase since 1990 of 160% in terms of tonnes, has only required an increase in vehicles of 30%. Since the scheme was introduced, there has been a fall in Transalpine vehicles of 16%, but 40% more tonnes are being carried. As can be seen from Chart 4.3, rail's share of this traffic has grown as fast as road. On the other Transalpine crossings rail has fallen. This is shown in Chart 4.5.

Chart 4.5



It should also be noted that the EU co-operation with the scheme was partly because the Swiss 28 tonne limit was believed to be causing diversions through Member States. Some traffic did return to Swiss Transalpine routes, but the charge ensured that this was not excessive and that vehicles were used efficiently.

Income from the Swiss scheme is considerable and is being used to support major new Transalpine rail freight capacity.

Conclusions

Both studies illustrate positive trends in terms of efficiency and that rail freight has grown with road, more or less equally in Switzerland (though this will change as new capacity comes forward) but ahead of road in Germany, at least up to the deepest part of the recession.

The German package, including the use of income from the charging, is interesting and was agreed with the European Commission. A detailed UK package could be designed within similar financial limits. However, because of the structure of the UK industry, in particular the larger number of smaller operators, the total would be higher. This could balance out the major part of a charge set, for example, at around the German level.

5 Conclusions and way forward for the UK

EU context

All proposals for the UK must be seen within the context of the EU framework on competition, harmonisation and the Directive concerning charges on international road freight (the Eurovignette Directive).

The latter has been revised and sets out some rules about charges to be applied. For example, minimum rates of annual duty have to be charged in the UK (and in other EU states)[9]. Unfortunately, these are specified in euros and, although exchange rate changes of less than 5% don't have to be reflected by member states, this has been exceeded in terms of sterling in recent times.

This makes it difficult to calculate exactly what the minimum rate should be in sterling, but it appears that there is some room for reducing the UK annual duty if LRUC is introduced. The ideal would be to remove standing charges altogether and replace them with use based charges. In the original proposals to revise the Directive, it was intended that member states would be able to reduce annual duties if other charging systems were put in place. This was not included and creates problems for the final harmonisation of road freight taxation by the Commission, as highlighted in this report.

As regards a simple time based vignette, the Directive limits the charge to €11 per day[10]. Again the sterling value has risen by 20% in the last two years due to exchange rate changes. This creates another uncertainty factor in assessing any eurovignette based approach.

Overall, any scheme would have to be discussed with the Commission and this was clearly the case with the German and Swiss schemes (even though Switzerland is outside the EU).

Overall conclusions

The simplest scheme would charge for the time spent on any road in the UK (or GB if Northern Ireland is excluded, as above). This could use a displayable windscreen ticket (vignette). However, this would be relatively ineffective in relation to any objectives, raise enforcement issues, could run into EU limits on charging, and be quite costly to implement and run.

A simple vehicle type and distance based charge on all roads would be far more cost effective. While not a perfect match with objectives, distance is vastly superior to time alone. Applied to all roads it would avoid the issue of diversion from motorways, which is particularly serious the UK. The technology is well proven and, in the case of the Swiss model, to a large extent self-enforcing.

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9 Annex I

10 Annex II

For such a system the technology is available, inexpensive, and proven over many years. The UK would "draw on what works" and it could be implemented within the current Parliament.

To create a level playing field between UK and EU hauliers from outside the UK would require a charge which would generate greater revenue from HGVs than at present. A charge of between 5p and 15p per kilometre, varied by maximum plated size and weight, plus a discount for the highest Euro standards, would be comparable to the German level and justifiable in terms of external costs.

However, the Government has made it clear that lorry charging is about a fairer deal for UK hauliers, in the context of fair charging for the use of the UK road network. Improving the position of UK operators is unlikely to be achieved by charging alone, and, given the increase in income, this creates the opportunity to support the industry more positively. There has been a lot of discussion about how this support could be achieved. In this, great care is required in relation to the EU framework on competition. This seeks to prevent simple financial mechanisms which would benefit UK hauliers but not be available to hauliers registered in other EU Member States. Thus a fuel duty rebate for UK hauliers is unlikely to be acceptable to the EU Commission and this was borne out by their discussions with the German Government over their scheme. Paying a rebate to non-UK hauliers as well (in other words, giving a rebate on fuel bought in the UK by any haulier) would also on German experience not be acceptable to the Commission and, would negate a key purpose of the scheme, to reduce non UK hauliers' underpayment for using the UK road system.

However, there are a range of actions which can be taken, and there is now some practical experience of this, again in relation to the German HGV tolling system (the Maut). Building on this German experience, elements which could be part of a final package include:

- improved and comprehensively located facilities for drivers away from base
- financial support for the new Certificate of Professional Competence (CPC) driver training requirements and beyond
- support for small operators through training and IT equipment
- tax rebates for hauliers to join return load schemes linked to above
- support for vehicle modifications to save fuel
- scrappage payments where more fuel efficient HGVs are purchased
- reduction of annual vehicle excise duty to the minimum permitted amount
- UK toll rebates (open to operators from all EU Member States)

If every UK operator participated in such a package to a similar level to the German scheme, this would enable a payback of around £1.5 to 2 billion a year for at least three years. Following on from this, reductions in annual vehicle duty could be sought to provide a longer term financial package. However, it would not be possible to guarantee that the scheme will be revenue neutral for all UK hauliers. In fact, the measures suggested, based on

the German scheme, are likely to benefit the smaller hauliers most, and help them invest to reduce costs and improve their efficiency. These are precisely the firms most vulnerable to foreign competition and to the general impact of the recession.

Talk of revenue neutrality in any case obscures the overall picture. The haulage industry, like any other, will always be expected to contribute something in taxation. Ultimately, the Government will have to decide how much overall revenue it wants from the road haulage sector, and how to raise this – lorry charging will allow much more flexibility in raising revenue, and also provide options for well targeted support to improve efficiency and standards in UK haulage firms.

In assessing the full impact of a scheme, the effect on modal competition needs to be considered. The potential transfer of some freight to rail is clear, and in Germany road freight continued to grow after charging was introduced, but at a slower rate than rail.

In addition, there would be changes in choice of port of entry, essentially a sea/road mode switch. There are significant environmental and road user benefits from such changes. Previous research using the National Freight Model[11] have illustrated this and could be easily recalculated using a specific LRUC proposal.

A final question is the impact on the haulage industry itself. The scheme would support modernisation, higher standards of maintenance and safety, and more efficient vehicle use. Any reduction in the level of vehicle kilometres needed to carry goods to and from the UK which resulted from these changes should be balanced against the significant potential for UK hauliers to compete for international business. Just considering international goods traffic with an origin or destination in the UK on its own, there is a substantial opportunity for UK companies to compete more effectively, as shown in Chart 1 earlier in this report. The LRUC package set out in this report would enable them to do so.

[11] MDS Transmodal, December 2006