Effects of Eurovignette directive Dir. 1999/62/EC as amended by Dir. 2006/38/EC

Country report Sweden

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Preface

The European Commission has to present a report to the European Parliament and the Council on the implementation and effects of the Eurovignette directive on the taxation of heavy goods vehicles including its contribution to the objectives of a sustainable transport policy. Member States are obliged to forward the necessary information for the report to the Commission.

The Swedish National Road and Transport Research Institute VTI has compiled the information for Sweden on behalf of the Swedish Transport Administration (Trafikverket). The question catalogue developed by the Commission has been followed. See Annex 1: Report according to Article 11 of Directive 1999/62/EC. Stefan Grudemo was the contact for the Swedish Transport Administration.

The work has been carried out by Inge Vierth and Kristofer Odolinski during October and November 2010. We thank the officers at the Swedish Transport Administration, the Swedish Transport Agency (Transportstyrelsen), Transport Analysis (Trafikanalys) and Swedish Road Haulage Association (Sveriges Åkeriföretag) who answered our questions on short notice.

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Quality review

Internal peer review was performed 18 November 2010 by the research director of the project manager Gunnar Lindberg, VTI. Inge Vierth has made alterations to the final manuscript of the report 29 November 2010. Gunnar Lindberg examined and approved the report for publication on 30 November 2010.
Table of contents

Summary ................................................................................................................................. 5
Sammanfattning (Summary in Swedish) ............................................................................... 7
1  Currently applied charging systems including relevant rates ........................................ 9
   1.1 Vehicle tax ................................................................................................................. 9
   1.2 Tolls .......................................................................................................................... 11
   1.3 Vignettes ................................................................................................................... 13
   1.4 Regulatory charges ................................................................................................. 14
2  Future charging schemes ................................................................................................. 15
3  Developments in technology ......................................................................................... 16
   3.1 Simplification of payment method ........................................................................... 16
   3.2 Number of charging systems .................................................................................... 17
   3.3 Interoperability with toll/user charge systems in neighboring countries .............. 17
4  Trends in traffic density ................................................................................................ 18
   4.1 Average v-km per vehicle category and transport/network ..................................... 18
   4.2 Average v-km per vehicle category and period ........................................................ 20
5  Use of vehicles of more than 3.5 and less than 12 tonnes ........................................... 22
   5.1 Purchase of vehicles of over 3.5 and under 12 tonnes ............................................. 22
   5.2 V-km of vehicles of over 3.5 and under 12 tonnes on TEN-T network .................... 22
6  Impact on internal market .............................................................................................. 25
   6.1 Impact on internal market (perception of the Member States) ................................. 25
   6.2 Evolution of cost structure of road haulage undertakings ........................................ 27
7  Levels of investment in the sector ................................................................................ 30
   7.1 Revenues collected from road charging ................................................................. 30
   7.2 Expenditures ............................................................................................................ 30
8  Contribution of the sector to objectives of sustainable transport policy ....................... 33
   8.1 Toll differentiation according to EURO-emission standards of vehicles ................. 33
   8.2 Annual average number of v-km by EURO-emission class ..................................... 33
   8.3 Number of heavy goods vehicles by EURO-emission class ................................... 34
   8.4 Average vehicle load ............................................................................................... 35
References ............................................................................................................................ 38

TABLE 1: VEHICLE TAX TABLE FOR HEAVY GOODS VEHICLES 2010 ................................................................. 10
TABLE 2 FEES FOR PASSAGE OF ÖRESUND BRIDGE DEPENDING ON NUMBER OF TRIPS PER YEAR ......................... 12
TABLE 3 EUROPEAN HIGHWAYS IN SWEDEN WITHIN THE EUROVIGNETTE ......................................................... 13
TABLE 4 EUROVIGNETTE CHARGES BY NUMBER OF AXLES AND EURO-CLASS 2010 ......................................................... 14
TABLE 5 CHANGES IN V-KM FOR HEAVY GOODS VEHICLES, PASSENGER CARS AND ALL VEHICLES .............................. 20
TABLE 6 MILLION V-KM IN SWEDEN ACCORDING TO METHOD BASED ON TRAFFIC COUNTS ........................................... 21
TABLE 7 MILLION V-KM IN SWEDEN BASED ON DATA FROM THE VEHICLE INSPECTION .............................................. 21
TABLE 8 MILLION V-KM OF VEHICLES OF OVER 3.5 AND UNDER 12 TONNES ON TEN-T, ESTIMATION METHOD ONE .................. 23
TABLE 9 MILLION V-KM OF VEHICLES OF OVER 3.5 AND UNDER 12 TONNES ON THE TEN-T, ESTIMATION METHOD TWO .... 23
TABLE 10 EXPORT AND IMPORT TO/FROM EU 27 IN TONNES AND SEK, INDEX, 2006:100 ......................................................... 25
TABLE 11 FOREIGN VEHICLES IN SWEDEN AND SWEDISH VEHICLES ABROAD 2006 ......................................................... 25
TABLE 12 SHARES OF COST COMPONENTS OF TOTAL ROAD HAULAGE COSTS 2006 – 2010 .................................................. 28
TABLE 13 REVENUES COLLECTED FROM ROAD TRAFFIC, MILLION € .................................................................................. 30
TABLE 14 REVENUES FROM THE ÖRESUND BRIDGE AND THE SVINESUND CONNECTION, MILLION € .......................... 30
TABLE 15 MAXIMUM EMISSIONS (g/WH) FOR ENVIRONMENTAL CLASS FOR HEAVY VEHICLES .................................................. 33

FIGURE 1 MILLION V-KM BY HEAVY GOODS VEHICLES AND PASSENGER CARS ON STATE OWNED ROAD NETWORK, 2006 ....... 19
FIGURE 2 PURCHASE OF VEHICLES OF OVER 3.5 TONNES 2006–2009 .............................................................................. 22
FIGURE 3 TEN-T NETWORK IN SWEDEN ...................................................................................................................... 24
FIGURE 4 COSTS OF ROAD HAULAGE 2006 – 2010 (INDEX MAY 2006: 100) ................................................................. 28
FIGURE 5 EXPENDITURES ON TRANSPORT IN TOTAL (MILLION € PER YEAR) 2001 – 2009 ........................................................... 31
FIGURE 6 EXPENDITURES IN TRANSPORT INFRASTRUCTURE (MILLION € PER YEAR) 2001 – 2009 .................................................. 31
FIGURE 7 EXPENDITURES IN ROAD INFRASTRUCTURE (MILLION € PER YEAR) 2001 – 2009 ...................................................... 32
FIGURE 8 SHARE OF EXPENDITURES IN ROAD AND OTHER INFRASTRUCTURE 2001–2009 .................................................... 32
FIGURE 9 ANNUAL AVERAGE NUMBER OF V-KM OF HEAVY GOODS BY EMISSION CLASS ................................................. 34
FIGURE 10 NUMBER OF VEHICLES BY EMISSION CLASS DECEMBER 31, 2006 – DECEMBER 31, 2009 ................................. 35
FIGURE 11 AVERAGE VEHICLE LOAD FOR DOMESTIC AND INTERNATIONAL TRANSPORTS 2006 – 2009 ................................................. 36
FIGURE 12 AVERAGE VEHICLE LOAD PER VEHICLE BY EMISSION CLASS 2009 .......................................................... 36
FIGURE 13 AVERAGE VEHICLE LOAD IN DOMESTIC TRANSPORT BY AGE OF VEHICLE 2006 – 2009 ................................................. 37
Summary

The basis for the national report is the request in article 11 of the Eurovignette directive (Directive 1999/62/EC as amended by Dir. 2006/38/EC). “No later than 10 June 2011, the Commission shall present a report to the European Parliament and the Council on the implementation and effects of this Directive, taking account of developments in technology and the trend in traffic density, including the use of vehicles of more than 3.5 and less than 12 tonnes, and evaluating its impact on the internal market, including on island, landlocked and peripheral regions of the Community, levels of investment in the sector and its contribution to the objectives of a sustainable transport policy. Member States shall forward the necessary information for the report to the Commission no later than 10 December 2010.” In the country report for Sweden the question catalogue developed by the Commission has been followed.
Effekter av Eurovinjettdirektivet Direktiv 1999/62/EG enligt ändring genom Direktiv 2006/38/EG – Svensk rapport
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Sammanfattning (Summary in Swedish)

1 Currently applied charging systems including relevant rates

1.1 Vehicle tax


The size of the tax depends on different aspects such as the vehicle category, taxation weight, fuel and carbon dioxide emissions. In some cases the number of axles, coupling device, and for which purpose the vehicle is used can also be the basis for the size of the vehicle tax. (Skatteverket, 2010a). According to the Road Traffic Tax Act (2006:227) the following vehicle categories are taxable: passenger cars, lorries, buses, motorcycles, tractors, public works vehicles, cross-country trailers and trailers.

Goods vehicles

Goods vehicles are divided into light goods vehicles with a gross vehicle weight of not more than 3.5 tonnes and heavy goods vehicles with a gross vehicle weight above 3.5 tonnes. The vehicle tax for heavy goods vehicles depends on taxation weight, fuel, number of axles, coupling device, and if the lorry is liable to the road user charge according to Act (1997:1137) on road user charge for certain heavy vehicles (Skatteverket, 2010). In October 6, 2006 a lower vehicle tax was introduced for heavy goods road vehicles that complied with certain emission standards (Environmental class MK 2005, which corresponds to EU’s EURO 4 and higher standards). This tax reduction was removed in October 1, 2009. (Transportstyrelsen, 2010a)

Taxation weight

The taxation weight differs depending on the vehicle category. For tractors and public works vehicles the taxation weight is the vehicle’s unladen weight. The taxation weight for heavy buses, heavy goods vehicles, cross-country trailers and other trailers, except semi-trailers, is the gross vehicle weight. For semi-trailers the taxation weight is the part of the vehicle’s gross vehicle weight that rests on the fixed axles. Regarding vehicles that can be equipped with coachworks, the taxation weight is calculated for the coachwork that yields the highest gross vehicle weight if a heavy goods vehicle, cross-country trailer or trailer, can be equipped with several different coachworks. (Road Traffic Tax Act (2006:227)). Semi-trailers with a taxation weight over 3 tonnes are not taxable if they are driven with diesel-fuelled passenger cars, lorries or buses. (Skatteverket, 2010a)

Fuel

The taxation differs between heavy goods vehicles that can be diesel-fuelled and heavy goods vehicles that cannot be diesel-fuelled.

Coupling device

The coupling device between heavy goods vehicles and trailers affects the taxation of the vehicles. The taxation differs depending on if the heavy goods vehicle has a coupling device for a semi-trailer or some other coupling device. (Road Traffic Tax Act (2006:227))
Use of the vehicle

Depending on the use of the vehicle, it can be exempted from the road user charge levied on certain heavy goods vehicles which affects the vehicle tax (For more information about the road user charge and criteria for exemption, see section 1.4).

Vehicle tax tables

The current vehicle tax tables for heavy goods vehicles appear in the vehicle tax tables from the Swedish Tax Agency. These tax tables will change according to Act (2009:1468) and come into force January 1, 2011. (Skatteverket, 2010b). In the vehicle categories 2–6 in the tax table presented below, the tax increases with the taxation weight which increases with a weight interval of 999 kg. The tax is annual. We use the exchange rate of 10 SEK/€ as a proxy. The rate was in the interval 9,07 SEK/€ – 11,17 SEK/€ between January 2006 and October 2010. (Statistiska centralbyrån, 2010)

Table 1 Vehicle tax table for heavy goods vehicles 2010.

<table>
<thead>
<tr>
<th>Category Description</th>
<th>Taxation weight</th>
<th>Tax, SEK</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicles which are not diesel-fuelled</td>
<td>Taxation weight, 3 501 kilogram</td>
<td>Tax, SEK 984 (about € 98)</td>
<td></td>
</tr>
<tr>
<td>2. Vehicles which can be diesel-fuelled, with a coupling device for semi-trailer, exempted from road user charge</td>
<td>- with two axles Taxation weight, 3 501 - 5 999 kilogram Tax, SEK 3 403 (about € 340)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight category for this type is 14 000-18 000 kg, imposed tax is SEK 19 511 (about € 1 951).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 - with three or more axles</td>
<td>Taxation weight, 3 501 - 4 999 kilogram Tax, SEK 2 936 (about € 294)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight category for this type is 31 000 - 32 000 kg, and the imposed tax is SEK 40 732 (about € 4 073).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Vehicles which can be diesel-fuelled, with a coupling device for semi-trailer, liable to the road user charge</td>
<td>- with two axles Taxation weight, 7 000 - 7 999 kilogram Tax, SEK 1 891 (about € 189)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 18 000 kg, and the imposed tax is SEK 14 238 (about € 1 424).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 - with three or more axles</td>
<td>Taxation weight, 7 000 - 17 999 kilogram Tax, SEK 5 080 (about € 508)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 32 000 kg, and the imposed tax is SEK 32 058 (about € 3 206)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Vehicles which can be diesel-fuelled, without a coupling device, exempted from the road user charge</td>
<td>- with two axles Taxation weight, 3 501 - 8 999 kilogram Tax, SEK 2 662 (about € 266)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight category for this type is 17 000 - 18 000 kg, and the imposed tax is SEK 11 984 (about € 1 198)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 - with three and more axles</td>
<td>Taxation weight, 3 501 - 11 999 kilogram Tax, SEK 2 455 (about € 246)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight category for this type is 31 000 - 32 000 kg, and the imposed tax is SEK 31 803 (about € 3 180).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Vehicles which can be diesel-fuelled, with any other coupling device than a coupling device for a semi-trailer, liable to the road user charge</td>
<td>- with two axles Taxation weight, 7 000 - 12 999 kilogram Tax, SEK 345 (about € 35)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 18 000 kg, and the imposed tax is SEK 3 750 (about € 375).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 - with three or more axles</td>
<td>Taxation weight, 7 000 – 16 999 kilogram Tax, SEK 575 (about € 58)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 32 000 kg, and the imposed tax is SEK 22 999 (about € 2 300)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Vehicles which can be diesel-fuelled, without a coupling device, liable the road user charge</td>
<td>- with two axles Taxation weight, 12 000 - 12 999 kilogram Tax, SEK 347 (about € 35)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 18 000 kg, and the imposed tax is SEK 7 960 (about € 796)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 - with three axles</td>
<td>Taxation weight, 12 000-16 999 kilogram Tax, SEK 604 (about € 60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 26 000 kg, and the imposed tax is 16 889 (about € 1 689)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2 - with four or more axles</td>
<td>Taxation weight, 12 000 - 16 999 kilogram Tax, SEK 1 229 (about € 123)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest taxation weight for this type is 32 000 kg, and the tax imposed is SEK 22 999 (about € 2 300)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.2 Tolls

According to the Public Road Act (1971:948) it is possible to finance new roads with certain tolls. There are two such road tolls in Sweden; the Svinesund Connection and the Öresund Bridge. (Skatteverket, 2010)

The Svinesund Connection

The Svinesund Connection is a cross-border project between Sweden and Norway. An average of 15,000 vehicles cross the Svinesund bridge every day. The old Svinesund bridge was opened in 1946. In order to handle an increasing traffic, especially the heavy goods traffic, a new Svinesund bridge was constructed and opened for traffic in June 2005. The Svinesund Connection became a toll road in July 2005 and will continue to be a toll road for the next 20 years in order to finance the project. The toll road includes two kilometers of motorway in Sweden, 4.3 kilometers of motorway in Norway, a 704 meter long bridge and the old Svinesund bridge. The toll charger is Bro- og Tunnelselskapet AS. (Svinesundsforbindelsen, 2010a)

The fee for vehicles with a gross vehicle weight of not more than 3.5 tonnes is SEK 24 (about € 2.4) for a one way trip. Vehicles with a gross vehicle weight above 3.5 tonnes are charged SEK 120 (about 12 €). Motorcycles and mopeds are exempted from the fee. There is a 13 percent discount for all vehicles with an AutoPass\(^1\) on-board unit. Vehicles with a maximum total weight of 3.5 tonnes or less, and carrying an AutoPass on-board unit, are only charged for the first 16 crossings in any calendar month. (Svinesundsforbindelsen, 2010b)

The Öresund Bridge

The Öresund Bridge is a cross-border project between Sweden and Denmark and connects Copenhagen and the city of Malmö. The bridge was opened for traffic in July 2000. The Öresund connection consists of two approach bridges, a high bridge, an artificial island and a tunnel. The Öresund Bridge is owned and operated by the Öresundsbro Consortium with the objective to repay the bridge’s loans within 30 years after its opening. (Öresundsbron, 2010a)

The toll fees for heavy goods vehicles vary depending on the number of trips per year. There is a discount for companies that have the “ÖresundBusiness” contract which requires electronic fee collection. (Öresundsbron, 2010b)

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\(^1\) AutoPass is an electronic payment system in Norway. Foreign vehicles can also use an AutoPass tag as means of payment. Sweden and Denmark have the BroBizz system which is included in the Easy Go Service (see section 3.3).
Table 2  Fees for passage of Öresund Bridge depending on number of trips per year.

<table>
<thead>
<tr>
<th>Lorries 9-20 meter</th>
<th>€ excl 25% VAT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single trips per year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-500</td>
<td>56,50</td>
<td></td>
</tr>
<tr>
<td>501-2000</td>
<td>53,90</td>
<td></td>
</tr>
<tr>
<td>2001-10 000</td>
<td>51,20</td>
<td></td>
</tr>
<tr>
<td>10 001-</td>
<td>49,20</td>
<td></td>
</tr>
<tr>
<td>Lorries over 20 meters</td>
<td>€ excl 25% VAT</td>
<td></td>
</tr>
<tr>
<td>Single trips per year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-500</td>
<td>84,60</td>
<td></td>
</tr>
<tr>
<td>501-2000</td>
<td>80,90</td>
<td></td>
</tr>
<tr>
<td>2001-10 000</td>
<td>76,80</td>
<td></td>
</tr>
<tr>
<td>10 001-</td>
<td>73,70</td>
<td></td>
</tr>
</tbody>
</table>

Source: Øresundsbro Konsortiet

When the toll fee is paid with cash, the toll fee is € 134 for a lorry between 9 and 20 meters, and € 201 for a lorry over 20 meters. The same toll fees apply for customers using the interoperable electronic fee collection system EasyGo (see section 3.3).

**Stockholm congestion tax**

The congestion tax is regulated by the Congestion Charge Act (2004:629). The annex in the Congestion Charge Act (2004:629) regulates the placing of the control points (payment stations) and the size of the tax.

The Stockholm congestion tax is a charge levied on vehicles entering and exiting central Stockholm. After a trial period between January 3, 2006 and July 31, 2006, the Swedish Parliament approved of an implementation of a congestion tax on a permanent basis and the tax came into effect on August 1, 2007. The purpose of the congestion tax is to reduce traffic congestion, contribute to improvements in the environment in Stockholm and to raise money for new investments in the transport network in Stockholm. The Swedish Transport Agency is responsible for the design and operation of the technical system and also the information on methods of payment, discount, hours of operation etc. (Stockholm stad, 2010).

The congestion tax is charged for vehicles registered in Sweden that are driven into and out of central Stockholm, Mondays to Fridays between 06.30 and 18.29. The tax is not charged on weekends or public holidays, on a day preceding a public holiday or during the month of July which is the most common holiday month in Sweden. Vehicles are automatically registered at control points during the periods when congestion tax is charged. Each passage into or out of central Stockholm costs SEK 10, 15 or 20 (about € 1, 1.5 and 2), depending on the time of day. The maximum amount per day and vehicle is SEK 60 (about € 6). (Transportstyrelsen, 2010b)

The following vehicles are exempted from the congestion tax (Transportstyrelsen, 2010c): emergency vehicles, buses having a total weight of at least 14 tonnes, diplomat-
registered vehicles, motorcycles, foreign-registered vehicles, military vehicles, vehicles that according to details contained in the Swedish Road Traffic Registry of the Swedish Transport Agency are equipped with technology for being run: a) completely or partly on electricity or a gas other than liquefied petroleum gas (LPG) or b) on a fuel blend that predominantly comprises alcohol.

1.3 Vignettes

Sweden is as Denmark, Belgium, Luxemburg and The Netherlands connected to the Eurovignette system for road user charge. A charge paid in one of these countries is valid for the other countries’ road network. (Transportstyrelsen, 2010d)

The road user charge is levied on heavy goods vehicles with a gross vehicle weight at 12 tonnes and above. Heavy goods vehicles equipped with a coupling device and with a gross vehicle weight at 7 tonnes and above are also liable to the road user charge as their gross vehicle weight can be least 12 tonnes. The charge for heavy goods vehicles that are registered in Sweden is applied for the entire road network and the charge is levied once every year.

For vehicles registered in other countries the charge is levied for a calendar day, week, month or a year (Act (1997:1137) on road user charges for certain heavy vehicles). The charge is levied only for the use of all highways and the European highways E 10, E 12 and E 14 and also certain routes on E 4, E 22, and E 65. (Skatteverket, 2010). The length of the roads within the Eurovignette is about 4 000 km (SIKA, 2000).

Table 3 European highways in Sweden within the Eurovignette.

<table>
<thead>
<tr>
<th>Route</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>E 4</td>
<td>Uppsala</td>
<td>Finnish border</td>
</tr>
<tr>
<td>E 10</td>
<td>Töre</td>
<td>Norwegian border</td>
</tr>
<tr>
<td>E 12</td>
<td>Holmsund</td>
<td>Norwegian border</td>
</tr>
<tr>
<td>E 14</td>
<td>Sundsvall</td>
<td>Norwegian border</td>
</tr>
<tr>
<td>E 22</td>
<td>Karlskrona</td>
<td>Norrköping</td>
</tr>
<tr>
<td>E 65</td>
<td>Svedala</td>
<td>Ystad</td>
</tr>
</tbody>
</table>

Source: Act (1997:1137) on road user charge for certain heavy vehicles

Certain heavy goods vehicles with a gross vehicle weight at 12 tonnes are exempted from the road user charge. Vehicles that belong to the Swedish Army, the Police, the State or a municipality are exempted from the road user charge, as well as vehicles intended to be used for civil protection or road maintenance. A heavy goods vehicle that is 30 years or older and non-commercial is also exempted from the road user charge. (Act (1997:1137) on road user charges for certain heavy vehicles). The size of the road user charge depends on the number of axles and which EURO emission class the heavy goods vehicle belongs to. A heavy goods vehicle with a coupling device is exempted up to and including July 2012 for vehicles that were entered in the Swedish Road Traffic Registry prior to 1 January 2009. Vehicles entered after this date are not exempt from congestion tax (Transportstyrelsen).
assigned to the group of vehicles with four or more axles. Road user charge table 2010 according to Act (1997:1137) on road user charges for certain heavy vehicles:

Table 4 Eurovignette charges by number of axles and EURO-class 2010.

<table>
<thead>
<tr>
<th>Number of axles</th>
<th>EURO emission class</th>
<th>Road user charge, € per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or three</td>
<td>EURO 0</td>
<td>960</td>
</tr>
<tr>
<td>Two or three</td>
<td>EURO 1</td>
<td>850</td>
</tr>
<tr>
<td>Two or three</td>
<td>EURO 2 or cleaner</td>
<td>750</td>
</tr>
<tr>
<td>Four or more</td>
<td>EURO 0</td>
<td>1550</td>
</tr>
<tr>
<td>Four or more</td>
<td>EURO 1</td>
<td>1400</td>
</tr>
<tr>
<td>Four or more</td>
<td>EURO 2 or cleaner</td>
<td>1250</td>
</tr>
</tbody>
</table>

1.4 Regulatory charges

For the time being road haulage companies do not pay regulatory charges of importance, these charges are not included in the cost calculation tool of the Swedish Road Haulage Association, (see Table 12). But there is a proposal (Transportstyrelsen, 2010c) for supervision fees (tillsynsavgifter) and fees for verification of driving and rest periods (avgifter för kontroll av kör- och vilotider) from 2011.
2 Future charging schemes

In May 2010 the Swedish Parliament approved of a congestion tax in Gothenburg, a tax that will come into effect in January 2013. A congestion tax will be charged for Swedish-registered vehicles that are driven into and out of central Gothenburg, Mondays to Fridays between 06.00 and 18.29. The tax will not be charged on Saturdays, weekends or public holidays, on a day preceding a public holiday or during the month of July. (Transportstyrelsen, 2010f). The purpose of the congestion tax in Gothenburg is to reduce traffic congestion and co-finance infrastructure investments in the region (Trafikverket, 2010a).

The cost for a passage into or out of central Gothenburg will be SEK 8, 13 or 18 (about € 0.8, 1.3 and 1.8), depending on the time of the day. The maximum amount per day and vehicle will be SEK 60 (about € 6). The exemptions from the congestion tax applied in Stockholm will also be applied in Gothenburg. (Transportstyrelsen, 2010f)

Future tolls are discussed in several places (Trafikverket, 2010b):

- In Sundsvall, a bridge over Sundsvallsfjärden is going to be built and the ambition is that it will be finished in 2014. There will be no tolls on passenger cars. However, according to a proposition there will be a charge on heavy goods vehicles. The toll for a heavy goods vehicle will be SEK 100 (about 10 €) and SEK 50 (about € 5) for a light goods vehicle. The proposition must be approved by the Swedish Government. (Trafikverket, 2010c)

- In December 2009 the Swedish Transport Administration and the municipality of Nacka (close to Stockholm) set up an agreement on co-financing that comprises road user charges for the Skuru Bridge. The construction of the bridge is planned to start in 2013.

- There are discussions on a toll arrangement in Motala in order to finance the bridge over Motalaviken. The construction started in 2010 and is planned to be completed in 2013.

- The construction of Masmolänken in Stockholm is planned to start in 2016 and it will be 3.5 km long with a 1 km long tunnel. There are discussions on a toll arrangement for the tunnel.

- A new road construction in the city of Norrköping will connect European Highway Routes 22 and 4 (E22 and E24), and also the national roads 51 and 55/56. A bridge over Motala ström with a toll arrangement is included in the project. The construction of the project is planned to start in 2016.

- There are also discussions on building a tunnel through Åsberget in the city of Örnsköldsvik. This tunnel will be a part of the European Highway Route 4 (E4). A final decision for the construction of the tunnel has not been made.
3 Developments in technology

3.1 Simplification of payment method

Vehicle tax

From 1974 to 2009 a label (Kontrollmärke) has been used for all road vehicles. The Swedish Transport Agency, responsible for the vehicle register, sent the label to the vehicle owners after they had paid the vehicle tax. The owners put it on the vehicle’s number plate. Police and others could by a look on the number plate check if the vehicle tax had been paid.

1 January 2010 the label was abolished (Transportstyrelsen, 2010g) in order to reduce costs. The cost for the system was SEK 55 million (about € 5.5 million) per year. The tradeoff between reduced administrative costs for the Swedish Transport Agency and worse monitoring and control possibilities for the police has been discussed (Vägverket, 2008).

Eurovignette

As mentioned above, for vehicles not registered in Sweden, the Eurovignette is paid per day, week, month or year. Since October 1, 2008 road haulage companies can book Eurovignettes online via an internet portal (Eurovignettes, 2010). The company AGES sells vignettes on behalf of the Eurovignette countries. A previous registration is not required; the vignette is stored electronically and there is no need for drivers to carry further paper documents with them. Fuel, fleet and credit cards are accepted as means of payment.

Congestion tax in Stockholm

In 2006 (during the trial) and 2007 the Stockholm congestion tax was paid per passage. The annual system costs were about SEK 450 million (about € 45 million). Several measures have been undertaken to simplify the payment method and to reduce costs:

- July 2007: printing in-house
- January 2008: customer service in-house
- August 2008: monthly invoices to vehicle owners. This means that more operation and maintenance of payment system is carried out in-house
- January 2009: operation and maintenance of the toll booths in-house
- May 2010: operation and maintenance of remainder system in-house.

The measures led to a reduction of the annual operating costs by about 60 percent. The costs decreased from SEK 450 million (about € 45 million) in 2006/2007 to about SEK 190 million (about € 19 million) in 2010. (Löfdahl, 2010)

Tolls

The use of the interoperable electronic fee collection system EasyGo (see section 3.3) at the Öresund Bridge and the Svinesund Connection has advantages for customers: one On Board Unit payment means one contract and one invoice.
3.2 Number of charging systems

Besides the vehicle tax and the Eurovignette (that are applied for the whole road network for Swedish heavy goods vehicles) there are charging systems for the Stockholm congestion tax and tolls over the Öresund Bridge and the Svinesund Connection. The tolls on the bridges are part of the EasyGo system (see section 3.3).

3.3 Interoperability with toll/user charge systems in neighboring countries

The Öresund Bridge (2000) and the Svinesund Connection (2005) were opened with electronic fee collection. Electronic fee collection was earlier introduced in Norway (1987) and in Denmark (1998). In 2007 the EasyGo service was introduced – securing Scandinavian interoperability for electronic fee collection (Easygo, 2010). EasyGo is a joint venture between 40 toll chargers, including several ferry operators, in the three Scandinavian countries. Three of the 40 chargers are between Sweden and Norway (Svinesund Connection) and between Sweden and Denmark (Öresund Bridge and the ferry between Helsingborg and Helsingör). The EasyGo service is offered to customers by their local toll service provider. The service is offered to more than 2.4 million customers in Norway, Sweden and Denmark.

The Eurovignette is accepted in all five Eurovignette countries, i.e. if a transport goes through several Eurovignette countries only one valid vignette is needed.
4 Trends in traffic density

The Swedish Transport Administration\(^3\) carries out traffic measurements which give information on the vehicle kilometers (v-km) performed on the state-owned road network. Through sample measurements the Swedish Transport Administration can estimate the trends in traffic density. (Trafikverket, 2010d)

The Swedish road network consists of 98 400 km state-owned roads, 46 500 km municipal roads, 75 900 km private roads with state subsidies, and numerous private roads without state subsidies. Only the state-owned roads are included in the measurements conducted by the Swedish Transport Administration (Trafikverket, 2010e). The roads in the measurements are categorised as:

- Europavägar (European Highways)
- Övriga riksvägar (Other national roads)
- Primära länsvägar (Primary county roads)
- Övriga länsvägar (Other county roads).

The measurements do not specifically take account of the v-km performed on the TEN-T network in Sweden, and there are no other available statistics on the v-km on that road network. Because of the differentiation of the vehicles in the traffic measurements (as described in section 4.1), the estimation of the v-km of heavy goods vehicles over 3.5 and less than 12 tonnes on the TEN-T network in Sweden is fairly uncertain (see section 5.1).

4.1 Average v-km per vehicle category and transport/network

The basic data for the estimation of changes in v-km are gathered from about 80 measurement points. The vehicle categories presented in the estimations are heavy vehicles and passenger cars. The differentiation between passenger cars and heavy vehicles in the traffic measurements are based on the wheelbase. The heavy vehicle category includes heavy goods vehicles and buses with a wheel base between 330 cm and 1 050 cm. Heavy goods vehicles with a coupling device, with more than two axles and a wheel base between 80 and 1 050 cm, are also included in the heavy vehicle category. (SIKA, 2004)

The latest report on vehicle kilometers on the state-owned road network was finished in 2008 and reflects the v-km in 2006. The traffic on the European Highways and national roads were mostly measured in 2006. The main part of the primary county roads was measured in 2005 and the measurements on the other county roads are from varying time periods. Traffic data from time periods earlier than 2006 has not been projected. (Vägverket, 2008)

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\(^3\) The Swedish Transport Administration began to operate April 1, 2010. It is a public authority that takes on responsibility for long-term planning of the transport system for road, rail, maritime and air traffic. The authority is also responsible for the construction, operation and maintenance of public roads and railways. The Swedish Transport Administration includes activities and operations that before April 1, 2010 were undertaken by the Swedish Rail Administration and the Swedish Road Administration, as well as certain activities that were undertaken by the Swedish Maritime Administration and the Swedish Institute for Transport and Communications Analysis.
In the report by the Swedish Road Administration (Vägverket (2008)) the v-km are presented for different regions. The authors of the present report have summarized the figures for the entire state-owned road network. About eleven percent of all v-km are performed by heavy goods vehicles. The share is higher on the European Highways (13 percent) and other national roads (twelve percent). 47 percent of heavy goods vehicles’ v-km are performed on European Highways, 27 percent of heavy goods vehicles’ v-km are performed on other national roads.

![Figure 1 Million v-km by heavy goods vehicles and passenger cars on state owned road network, 2006.](image)

The changes in vehicle kilometers on the state-owned road network are presented annually by the Swedish Transport Administration. The change is presented as a percentage with a confidence interval (see Table 5). The confidence level is 95 percent. (Vägverket, Trafikarbetets förändring 2006–2007, 2008) (Vägverket, Trafikarbetets förändring 2007–2008, 2009) (Vägverket, Trafikarbetets förändring 2008–2009, 2010) (Trafikverket, 2010f) (Holmgren, 2010)
Table 5  Changes in v-km for heavy goods vehicles, passenger cars and all vehicles.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heavy vehicles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Highways</td>
<td>+5.9 ± 1.0</td>
<td>+0.5 ± 1.4</td>
<td>-5.1 ± 2.6</td>
</tr>
<tr>
<td>Other national roads</td>
<td>+4.0 ± 2.7</td>
<td>+0.5 ± 3.5</td>
<td>-6.1 ± 1.7</td>
</tr>
<tr>
<td>Primary county roads</td>
<td>+6.5 ± 2.5</td>
<td>-1.2 ± 4.0</td>
<td>-2.9 ± 2.2</td>
</tr>
<tr>
<td>Other county roads</td>
<td>+5.1 ± 2.6</td>
<td>-0.5 ± 2.7</td>
<td>-0.1 ± 3.6</td>
</tr>
<tr>
<td>All roads</td>
<td>+5.3 ± 1.1</td>
<td>0.0 ± 1.4</td>
<td>-3.9 ± 1.3</td>
</tr>
<tr>
<td><strong>Passenger cars</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Highways</td>
<td>+3.7 ± 0.9</td>
<td>-0.4 ± 0.7</td>
<td>+1.1 ± 0.8</td>
</tr>
<tr>
<td>Other national roads</td>
<td>+1.8 ± 1.4</td>
<td>-1.2 ± 1.6</td>
<td>+1.2 ± 0.7</td>
</tr>
<tr>
<td>Primary county roads</td>
<td>+1.5 ± 0.9</td>
<td>-2.0 ± 1.5</td>
<td>+0.4 ± 0.7</td>
</tr>
<tr>
<td>Other county roads</td>
<td>+1.7 ± 1.0</td>
<td>-0.6 ± 0.9</td>
<td>+0.9 ± 1.2</td>
</tr>
<tr>
<td>All roads</td>
<td>+2.4 ± 0.6</td>
<td>-0.9 ± 0.6</td>
<td>+1.0 ± 0.4</td>
</tr>
<tr>
<td><strong>All vehicles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Highways</td>
<td>+4.0 ± 0.8</td>
<td>-0.3 ± 0.7</td>
<td>+0.1 ± 0.7</td>
</tr>
<tr>
<td>Other national roads</td>
<td>+2.1 ± 1.4</td>
<td>-1.0 ± 1.7</td>
<td>+0.3 ± 0.7</td>
</tr>
<tr>
<td>Primary county roads</td>
<td>+2.1 ± 0.9</td>
<td>-1.9 ± 1.8</td>
<td>-0.2 ± 0.7</td>
</tr>
<tr>
<td>Other county roads</td>
<td>+2.0 ± 1.0</td>
<td>-0.7 ± 0.8</td>
<td>+0.8 ± 1.2</td>
</tr>
<tr>
<td>All roads</td>
<td>+2.8 ± 0.5</td>
<td>-0.8 ± 0.6</td>
<td>+0.2 ± 0.4</td>
</tr>
</tbody>
</table>

The change in v-km 2008 compared to 2007 was negative for all vehicles on state-owned roads, except a slight increase for heavy goods vehicles on European Highways and on other national roads. The change in vehicle kilometers for heavy vehicles was negative 2009 compared to 2008, whereas the change in vehicle kilometers for passenger cars had a slight upturn.

4.2 Average v-km per vehicle category and period

The Swedish Institute for Transport and Communications Analysis (SIKA)\(^4\) assigned the Swedish National Road and Transport Research Institute (VTI) to develop an estimation model for vehicle kilometers in the late 1990s. Since then VTI has been commissioned to estimate the annual vehicle kilometer for different vehicle types. (Björketun & Nilsson, 2007)

Transport Analysis presents estimations of the v-km from two different estimation methods (Trafikanalys 2010a) (Trafikanalys 2010b). One model is based on the measurements made by the Swedish Transport Administration. The v-km for all vehicles from a previous year are multiplied with the estimated change in v-km. The v-km on the state-owned road network are revaluated to reflect the vehicle kilometers on

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\(^4\) SIKA was closed down in March 2010 and the work is now conducted by Transport Analysis (Trafikanalys). Transport Analysis is a Swedish agency for transport policy analysis, responsible to the Ministry of Enterprise, energy and communications. The agency analyses and evaluates proposed and implemented measures within the sphere of transport policy. Transport Analysis is also responsible for official statistics in the transport and communication sectors.
all roads in Sweden. The distribution of the vehicle kilometers to the different vehicles is based on the number of different vehicles registered in Sweden. (Björketun & Nilsson, 2007)

Table 6 Million v-km in Sweden according to method based on traffic counts.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycles</td>
<td>754</td>
<td>812</td>
<td>828</td>
<td>842</td>
</tr>
<tr>
<td>Passenger cars</td>
<td>62 980</td>
<td>64 391</td>
<td>63 658</td>
<td>63 731</td>
</tr>
<tr>
<td>Heavy goods vehicles</td>
<td>10 740</td>
<td>11 378</td>
<td>11 497</td>
<td>11 564</td>
</tr>
<tr>
<td>≤ 3.5 tonnes</td>
<td>6 403</td>
<td>6 787</td>
<td>6 890</td>
<td>6 963</td>
</tr>
<tr>
<td>&gt; 3.5t - ≤ 16 tonnes</td>
<td>486</td>
<td>482</td>
<td>458</td>
<td>442</td>
</tr>
<tr>
<td>&gt;16t - ≤ 26 tonnes</td>
<td>1 569</td>
<td>1 573</td>
<td>1 484</td>
<td>1 398</td>
</tr>
<tr>
<td>&gt; 26 tonnes</td>
<td>2 282</td>
<td>2 536</td>
<td>2 665</td>
<td>2 761</td>
</tr>
<tr>
<td>Buses</td>
<td>872</td>
<td>876</td>
<td>852</td>
<td>852</td>
</tr>
<tr>
<td>Total</td>
<td>75 346</td>
<td>77 456</td>
<td>77 456</td>
<td>76 990</td>
</tr>
</tbody>
</table>

Source: Trafikanalys

The other estimation model is based on the mileage of the vehicles that the motor vehicle inspection registers during inspection. The information is then matched with the vehicle register.

Table 7 Million v-km in Sweden based on data from the vehicle inspection.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycles</td>
<td>707</td>
<td>726</td>
<td>689</td>
<td>-</td>
</tr>
<tr>
<td>Passenger cars</td>
<td>63 979</td>
<td>66 028</td>
<td>67 715</td>
<td>64 716</td>
</tr>
<tr>
<td>Heavy goods vehicles</td>
<td>10 918</td>
<td>11 640</td>
<td>11 897</td>
<td>11 626</td>
</tr>
<tr>
<td>≤ 3.5 tonnes</td>
<td>6 666</td>
<td>7 240</td>
<td>7 569</td>
<td>7 545</td>
</tr>
<tr>
<td>&gt; 3.5t - ≤ 12 tonnes</td>
<td>347</td>
<td>340</td>
<td>324</td>
<td>299</td>
</tr>
<tr>
<td>&gt; 12 tonnes -</td>
<td>3 905</td>
<td>4 060</td>
<td>4 004</td>
<td>3 782</td>
</tr>
<tr>
<td>Buses</td>
<td>923</td>
<td>930</td>
<td>897</td>
<td>916</td>
</tr>
<tr>
<td>Total</td>
<td>76 257</td>
<td>79 324</td>
<td>81 198</td>
<td>77 258</td>
</tr>
</tbody>
</table>

Source: Trafikanalys

5 V-km of motorcycles in 2009 is not available.
5 Use of vehicles of more than 3.5 and less than 12 tonnes

5.1 Purchase of vehicles of over 3.5 and under 12 tonnes

In 2006 about 7 000 heavy goods vehicles over 3.5 tonnes were purchased. This number increased by about ten percent between 2006 and 2007, was constant in 2008 and decreased by about 22 percent between 2008 and 2009. Until September 2010, 3 759 vehicles have been purchased during that year. Between 15 percent (2006) and 13 percent (2009) of the vehicles are vehicles between 3.5 tonnes and 12 tonnes.

Source: Trafikanalys

Figure 2 Purchase of vehicles of over 3.5 tonnes 2006–2009.

5.2 V-km of vehicles of over 3.5 and under 12 tonnes on TEN-T network

The TEN-T network in Sweden consists of the European Highways E4, E6, E10, E14, E18, E20\(^6\), E22, E65, E45\(^7\) and the national road 40 (Regeringen, 2010). Currently there are no available statistics on the v-km for heavy goods vehicles over 3.5 and less than 12 tonnes on the TEN-T network in Sweden. It is possible to estimate roughly the v-km of heavy goods vehicles (over 3.5 and under 12 tonnes) on the TEN-T network. This is done by using the v-km on the European Highways and other national roads measured in 2006 (see Figure 1) and then project the v-km in 2007–2009 using the changes in v-km (see Table 5). The road lengths of the European Highways and the national roads, as well as the road length of the TEN-T network, are also used in the estimations. The road length of the TEN-T network in Sweden is about 5 870 km (see Figure 3). (European Commission Mobility & Transport, 2010)

There are two calculation methods which give different results, so the figures should be handled with caution.

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\(^6\) The sections Örebro-Stockholm and Göteborg-Öresund bridge (national border)

\(^7\) The section Göteborg-Gällivare/Malmberget
There are two calculation methods which give different results, so the figures should be handled with caution.

One method is to use the share of the v-km of all vehicles that the heavy goods vehicles of over 3.5 and under 12 tonnes performed during 2006 – 2009, based on the v-km from the vehicle inspections (see Table 8).

Table 8 Million v-km of vehicles of over 3.5 and under 12 tonnes on TEN-T, estimation method one.

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>v-km</td>
<td>88</td>
<td>86</td>
<td>80</td>
<td>77</td>
</tr>
</tbody>
</table>

The other method is based on the v-km for heavy goods vehicles according to the vehicle category used by the Swedish Transport Administration in their measurements of the v-km on the state owned network. However, the heavy vehicle category includes all vehicles with a wheelbase over 330 cm, thus both heavy goods vehicles and buses with a wheelbase over 330 cm are included. Therefore the share of v-km of heavy goods vehicles (including buses) that the heavy goods vehicles of over 3.5 and under 12 tonnes performed during 2006–2009 is used in the calculation, based on the v-km from the vehicle inspections (see Table 7).

Table 9 Million v-km of vehicles of over 3.5 and under 12 tonnes on the TEN-T, estimation method two.

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>v-km</td>
<td>74</td>
<td>72</td>
<td>68</td>
<td>61</td>
</tr>
</tbody>
</table>
Source: European Commission Mobility & Transport

Figure 3 TEN-T network in Sweden.
6 Impact on internal market

6.1 Impact on internal market (perception of the Member States)

The charging systems in Sweden (vehicle tax, Eurovignette, Stockholm congestion tax and the tolls on the Öresund Bridge and the Svinesund Connection) have a limited impact on the European internal market. Sweden’s foreign trade to/from the 27 EU Member States has increased between 2006 and 2007. The decrease in tonnes (2008 and 2009) and in SEK (2009) is caused by the economic recession.

<table>
<thead>
<tr>
<th>Table 10</th>
<th>Export and import to/from EU 27 in tonnes and SEK, Index, 2006:100.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>Export and Import to/from EU 27 (tonnes)</td>
<td>100</td>
</tr>
<tr>
<td>Export and Import to/from EU 27 (SEK)</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Statistics Sweden (SCB).

In 2006 vehicles registered in other countries (mainly Finland, Norway, Denmark and Germany) performed about 7.7 billion tonne-km in Sweden (SIKA, 2008). Around 18 percent of the 2.4 billion v-km on Swedish roads were carried out by foreign vehicles. Foreign vehicles transported about 24.4 million tonnes goods, whereof import and export stood for 46 percent each and cabotage for eight percent.

Table 11 shows that foreign road haulage companies carried out more transports in Sweden than Swedish vehicles abroad. In 2006 foreign vehicles performed two times as much tonne-km (three times as much for cabotage) in Sweden as Swedish vehicles abroad and the foreign vehicles transported two times as much tonnes in Sweden as the Swedish vehicles abroad.

<table>
<thead>
<tr>
<th>Table 11 Foreign vehicles in Sweden and Swedish vehicles abroad 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign vehicles in Sweden</td>
</tr>
<tr>
<td>Tonnes goods transported</td>
</tr>
<tr>
<td>Tonne-km in other than home country</td>
</tr>
<tr>
<td>Thereof tonne-km cabotage</td>
</tr>
</tbody>
</table>

Source: SIKA

In 2006 about 175 000 transit trips through Sweden were carried out by foreign vehicles. Most of them were registered in Finland (19 percent) followed by Poland, Norway and Germany (all about 13 percent). About 2.7 million tonnes goods were transported through Sweden, which can be compared to 32.4 million tonnes in import and export (and about 343 million tonnes in domestic transport). A statistics report about the road transports performed by foreign vehicles after 2006 is not available. There is though an indication that the share of transports performed by foreign vehicles increased between 2004 and 2006 (SIKA, 2008).
Stockholm congestion tax

The fact that the Stockholm congestion tax is only paid by vehicles registered in Sweden can increase the share of the foreign vehicles performing transports in Sweden. The impact is assumed to be limited as the share of domestic tonne-km (with Swedish vehicles) to/from Stockholm county, which is larger than the zone in central Stockholm where congestion tax is paid, is only about 20 percent.

There is a tradeoff between the actual simple system that is connected to the Swedish vehicle register, that only includes Swedish vehicles, and a more advanced and expensive system that also includes vehicles outside Sweden.

Öresund Bridge and Svinesund Connection

The opening of the Öresund Bridge, that is funded by road and rail charges, in 2000 resulted in an rise in traffic. All traffic across the Öresund (on the bridge and ferries) grew by an average of ten percent each year during the period 2001 – 2007 (Öresundsbro Konsortiet, 2010). In 2009, four percent of the traffic on the Öresund Bridge was accounted for by heavy goods vehicles (on average of 817 vehicles per day). From 2001 to 2009, heavy goods vehicle traffic rose by 94 percent due to two factors: first, the Öresund Bridge’s role as a key international route between Scandinavia and the rest of Europe, and secondly, because many businesses have reviewed their location and logistics requirements (Öresundsbro Konsortiet, 2010). The economic downturn led to a 13 percent fall for heavy goods vehicles in 2009.

The Svinesund Connection, that is funded via charges for road vehicles, was opened in 2005. The European Highway Route 6 (E6) goes over the Svinesund Connection and is important for international traffic between Sweden/European Union and Norway. According to a report by Transportøkonomisk institutt (Hovi, Madlslien, Aslildsen, & Jadar Andersen, 2008) road haulage across the border into Norway is increasing, and permanent growth is expected to increase as an effect of increasing trade with the EU in general and with the new member states in particular. There are no specific impact studies for the E6 and the Svinesund Connection.

The building of the privately funded fixed link over the Öresund and the new Svinesund Bridge facilitates transport and trade between Sweden and the rest of the EU as well as Norway. The impact is though mainly related to Scandinavia and quite limited in relation to the total European internal market. The discounts for frequent users of the bridges over the Öresund for heavy goods vehicles mean tentatively that the charges are lower for road haulage companies from Sweden and Denmark. (The discount for the Svinesund Connection is only for light vehicles (less than 3.5 tonnes)).

Vehicle tax and Eurovignette

As Figure 4 below shows, the share of the vehicle tax and Eurovignette corresponds to less than one percent each of the total transport costs. The payment methods for these charges are simple compared to the systems for distance based charges. The distance based charges in centrally located countries (as Germany, Austria and Switzerland) are much higher than the Eurovignette charges. These higher charges can justify more expensive payment systems. The centrally located countries have a much higher share of transit transports than Sweden and the charges levied in those countries are of great importance for a huge part of the Swedish import and export.
Peripheral regions

A conclusion is that the current directive, and more so in its proposed new form, with its possibility to levy (high) tolls based on average infrastructure cost (and external cost) and a low maximum limit for the user charge will benefit, in terms of possible revenues, Member States which levy tolls. Peripheral regions with low density traffic will find it too expensive to introduce an advanced toll system and may be restricted to the (low) user charge.

However, it is perfectly possible that, with an economic efficiency objective, the toll or user charge should be lower in peripheral regions. In fact, article 7.1a gives a Member State the possibility to exempt a part of the trans-European road network from tolls or user charges as long as it doesn’t result in any distortion against international traffic. Sweden has used this exemption for the TEN network in peripheral parts of Sweden (for the road inland road from Western Sweden to Kiruna, see Figure 3). It is difficult to see that this result in any distortion against international traffic.

Islands

The current directive allows tolls and user charges on the same road if the road is a bridge, a tunnel or a part of a mountain pass. This gives a possibility to introduce high charges on road links to islands. In Sweden the derogation is used for the Öresund Bridge and the Svinesund bridge and it is also planned for the bridges in Sundsvall and Motala. Currently, the Swedish practice does not affect islands in particular.

Modal competition

A comparison between the current directive, which is based on average infrastructure cost, and the railway directive (2001/14), which regulates the charge more to the marginal infrastructure cost, suggests that it is possible to charge road vehicles to a higher degree than rail traffic. This creates an unbalanced market situation.

6.2 Evolution of cost structure of road haulage undertakings

The evolution of the cost structure of road haulage undertakings is presented for two typical vehicle types used in long distance transport of general cargo: vehicles of max 60 tonnes and 40 tonnes of total weight. Costs are given for the month of May which is assumed to be an average month. The information is based on the index series of the Swedish Road Haulage Association (Aspholmer, 2010). Costs for both vehicle types increased by about 17 percent between 2006 and 2008. The costs dropped by about ten percent points in 2009 and increased by about five percent points in 2010. (The costs increased by about 13 percent between 2006 and 2010.)
Vehicle tax and the Eurovignette stand for about two percent (60 tonnes vehicles) and about 1.5 percent (40 tonnes vehicles) of the total costs. The share has decreased as all cost components, except for interest costs, have increased more than the vehicle tax and the Eurovignette. The Eurovignette is influenced by the exchange rate between SEK and €.

Table 12 Shares of cost components of total road haulage costs 2006–2010.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>long distance general cargo vehicle (max 60 tonnes)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>10,2%</td>
<td>10,7%</td>
<td>9,8%</td>
<td>11,2%</td>
<td>10,9%</td>
</tr>
<tr>
<td>Interest costs</td>
<td>3,6%</td>
<td>4,7%</td>
<td>4,8%</td>
<td>2,7%</td>
<td>2,5%</td>
</tr>
<tr>
<td>Vehicle tax, Eurovignette</td>
<td>2,0%</td>
<td>2,0%</td>
<td>1,7%</td>
<td>1,9%</td>
<td>1,8%</td>
</tr>
<tr>
<td>Insurance</td>
<td>5,3%</td>
<td>5,2%</td>
<td>5,2%</td>
<td>5,3%</td>
<td>5,2%</td>
</tr>
<tr>
<td>Salary</td>
<td>33,7%</td>
<td>34,3%</td>
<td>31,2%</td>
<td>34,9%</td>
<td>33,9%</td>
</tr>
<tr>
<td>Administration</td>
<td>7,3%</td>
<td>7,3%</td>
<td>6,6%</td>
<td>7,5%</td>
<td>7,2%</td>
</tr>
<tr>
<td>Tires</td>
<td>2,6%</td>
<td>2,7%</td>
<td>2,4%</td>
<td>2,8%</td>
<td>2,8%</td>
</tr>
<tr>
<td>Diesel</td>
<td>26,2%</td>
<td>23,9%</td>
<td>29,8%</td>
<td>24,2%</td>
<td>26,2%</td>
</tr>
<tr>
<td>Repair</td>
<td>9,1%</td>
<td>9,2%</td>
<td>8,5%</td>
<td>9,4%</td>
<td>9,6%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>long distance general cargo vehicle (max 40 tonnes)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>5,8%</td>
<td>6,2%</td>
<td>5,6%</td>
<td>6,4%</td>
<td>6,2%</td>
</tr>
<tr>
<td>Interest</td>
<td>1,9%</td>
<td>2,5%</td>
<td>2,5%</td>
<td>1,4%</td>
<td>1,3%</td>
</tr>
<tr>
<td>Vehicle tax, Eurovignette</td>
<td>1,6%</td>
<td>1,6%</td>
<td>1,4%</td>
<td>1,5%</td>
<td>1,5%</td>
</tr>
<tr>
<td>Insurance</td>
<td>5,9%</td>
<td>5,8%</td>
<td>5,6%</td>
<td>5,7%</td>
<td>5,5%</td>
</tr>
<tr>
<td>Salary</td>
<td>39,3%</td>
<td>40,6%</td>
<td>36,4%</td>
<td>41,0%</td>
<td>39,6%</td>
</tr>
<tr>
<td>Administration</td>
<td>5,4%</td>
<td>5,4%</td>
<td>4,9%</td>
<td>5,6%</td>
<td>5,3%</td>
</tr>
<tr>
<td>Tires</td>
<td>1,7%</td>
<td>1,8%</td>
<td>1,6%</td>
<td>1,8%</td>
<td>1,8%</td>
</tr>
<tr>
<td>Diesel</td>
<td>31,4%</td>
<td>28,9%</td>
<td>35,5%</td>
<td>29,1%</td>
<td>31,3%</td>
</tr>
<tr>
<td>Repair</td>
<td>7,1%</td>
<td>7,2%</td>
<td>6,6%</td>
<td>7,4%</td>
<td>7,4%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Sveriges Åkeriföretag
The Stockholm congestion tax and the tolls on the Öresund Bridge and Svinesund Connection are only relevant for specific transports to/from Denmark and Norway as well as transports to/from the centre of Stockholm. These charges are not included in the cost calculation series of the Swedish Road Haulage Association. These types of taxes and tolls are in most cases directly passed to the shippers (Aspholmer, 2010).
7 Levels of investment in the sector

7.1 Revenues collected from road charging

The revenues collected from road charging are a part of the revenues from road traffic tax which also includes vehicle tax, congestion tax and tax on civil liability auto insurance premiums. The revenues collected from tax on civil liability auto insurance were € 164 million in 2007. The forecasted outcome in 2008 is € 327 and € 302 million in 2009.

Table 13 Revenues collected from road traffic, million €.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>Forecasted outcome 2008</th>
<th>Forecasted outcome 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle tax (all road vehicles)</td>
<td>1 057</td>
<td>1 035</td>
<td>1 129</td>
<td>1 168</td>
</tr>
<tr>
<td>Road charging (Eurovignette)</td>
<td>72</td>
<td>75</td>
<td>78</td>
<td>89</td>
</tr>
<tr>
<td>Stockholm congestion tax (all vehicles)</td>
<td>49</td>
<td>35</td>
<td>69</td>
<td>79</td>
</tr>
<tr>
<td>Total</td>
<td>1 178</td>
<td>1 145</td>
<td>1 276</td>
<td>1 336</td>
</tr>
</tbody>
</table>

Source: Specifikation av statens inkomster 2008 och 2009

The revenues collected from the Öresund Bridge and the Svinesund Connection can be found in the annual reports of Öresundsbro Konsortiet (Öresundsbron, 2010c) and the annual reports on activities in the state subject to charging (Ekonomistyrningsverket, 2010).

Table 14 Revenues from the Öresund Bridge and the Svinesund Connection, million €.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svinesund Connection</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Öresund Bridge</td>
<td>152</td>
<td>175</td>
<td>212</td>
<td>200</td>
</tr>
<tr>
<td>Road</td>
<td>99</td>
<td>118</td>
<td>144</td>
<td>135</td>
</tr>
<tr>
<td>Railway</td>
<td>51</td>
<td>54</td>
<td>65</td>
<td>62</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

7.2 Expenditures

Only the government’s contributions at the federal level are considered in the presented expenditures spent on transport infrastructure and road infrastructure. New large infrastructure investments are often financed by loans. In general, government’s contributions are used to pay off these loans. However, as mentioned in section 1.2, some investments are financed via tolls. One has to keep in mind that some payments of loans in 2006–2009 consider infrastructure investments made before 2006. In order to give a fair view of the annual expenditures spent on transport infrastructure and road infrastructure, the expenditures are presented for 2001–2009. The great increase in expenditures spent on transport in 2008 (see Figure 5 and Figure 6) is caused by an extra contribution from the government for repayment of loans for infrastructure investments. (Regeringen, 2008)
extra contribution from the government for repayment of loans for infrastructure investments. (Regeringen, 2008)

7.2.1 Transport in general

The expenditures spent on transport in general, according to the Central Government’s annual reports, are contributions to the transport policy area (transportpolitik) and transport subsidies for regional development (transportbidrag).

Figure 5 Expenditures on transport in total (million € per year) 2001–2009.


7.2.2 Transport infrastructure

According to the Central Government’s annual reports and the annual reports of the Swedish National Rail Administration and the Swedish National Road Administration, the expenditures spent on transport infrastructure are:

Figure 6 Expenditures in transport infrastructure (million € per year) 2001–2009
7.2.3 Road transport infrastructure

According to the Central Government annual reports and the annual reports of Swedish National Road Administration, the expenditures spent on road transport infrastructure are:

![Figure 7 Expenditures in road infrastructure (million € per year) 2001–2009.](image)

Figure 7 shows that at least over 50 percent of the infrastructure investments were investments in the road network during 2001–2009.

![Figure 8 Share of expenditures in road and other infrastructure 2001–2009.](image)

Figure 8 shows that at least over 50 percent of the infrastructure investments were investments in the road network during 2001–2009.
8 Contribution of the sector to objectives of sustainable transport policy

8.1 Toll differentiation according to EURO-emission standards of vehicles

There is no toll differentiation according to EURO-emission standards of vehicles in Sweden except for the differentiation for the Eurovignette and until October 1, 2009 for the vehicles tax for new heavy goods vehicles. The tolls on the Öresund and Svinestund bridge and the Stockholm congestion tax are paid per passage. On the Öresund Connection the fees for heavy goods vehicles are differentiated by the length of the vehicle. Vehicles equipped with technology for being run completely or partly on electricity or a gas other than liquefied petroleum gas or a fuel blend that predominantly comprises alcohol do not have to pay congestion tax in Stockholm.

8.2 Annual average number of v-km by EURO-emission class

The Swedish environmental classes do not totally correspond to the EURO-classes of the EU. There are differences for class 1 to 3 that have lower requirements than EURO 3. The EEV-class (Enhanced Environmentally Friendly Vehicles) is a voluntary standard with lower emissions than EURO 5. The EEV-vehicles can also be adopted to ethanol.

*Table 15 Maximum emissions (g/Wh) for environmental class for heavy vehicles*

<table>
<thead>
<tr>
<th>Environmental class (Miljöklass)</th>
<th>CO</th>
<th>HC (not metan)</th>
<th>NOx</th>
<th>Particles</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO 3 (Mk 2000)</td>
<td>5,45</td>
<td>0,78</td>
<td>5,00</td>
<td>0,16/0,21</td>
</tr>
<tr>
<td>EURO 4 (Mk 2005)</td>
<td>4,00</td>
<td>0,55</td>
<td>3,50</td>
<td>0,03</td>
</tr>
<tr>
<td>EURO 5 (Mk 2008)</td>
<td>4,00</td>
<td>0,55</td>
<td>2,00</td>
<td>0,03</td>
</tr>
<tr>
<td>Enhanced Environmentally Friendly Vehicles (Mk EEV)</td>
<td>3,00</td>
<td>0,40</td>
<td>2,00</td>
<td>0,02</td>
</tr>
</tbody>
</table>

Source: Transportstyrelsen

Figure 9 shows that the in Sweden registered EURO 3 vehicles performed the highest average number of v-km in 2006 (84 200 v-km), 2007 (99 990 v-km) and 2008 (83 540 v-km). In 2009 EURO 4 vehicles performed out more (average number of v-km 80 880 v-km) than EURO 3 vehicles (average number of v-km 71 530 v-km).
For a high share of old vehicles the emission class is not known. About 90 percent of these vehicles were registered before 1993 the year when environmental classes were introduced.

### 8.3 Number of heavy goods vehicles by EURO-emission class

In total about 80 000 heavy goods vehicles are in traffic, and about 50 000 vehicles are deregistered by December 31, 2006 – 2009 (see Figure 10). As expected the cleaner vehicles are more used in traffic. In 2009 more than half of the vehicles in traffic and only six percent of the deregistered vehicles had at least EURO 3. For the vehicles in traffic the share of EURO 4 vehicles increased from two percent (2006) to 23 percent (2009) and the share of EURO 5 from one percent (2007) to 17 percent (2009).
Both registered and deregistered vehicles included, the share of EURO 4 vehicles increased from one percent (2006) to 14 percent (2009) and the share of EURO 5 vehicles increased from nearly 0 percent (2007) to six percent (2009).

### 8.4 Average vehicle load

The average vehicle load is generally higher for international transports (about eleven tonnes per vehicle) than for domestic transports (about nine tonnes per vehicle). This is due the fact that border crossing transports generally are longer and that the incentives to fill the vehicles increase by distance. The lower average load factor for domestic transports is also explained by the high share of small vehicles in domestic transport. The load factor for the largest vehicles used in domestic transport is about 16 tonnes per vehicle and the load factor for the largest vehicles used in international transport is about twelve tonnes per vehicle. Due to the dominance of domestic transports the average load factor is close to the load factor for domestic transports. We are aware of the fact that volume often is the limiting factor, but do not have information about the average vehicle load in m$^3$.

Figure 11 shows the average vehicle load in tonnes for national and international transports and including all vehicles resp. only loaded vehicles. (The load factor can be increased by increasing the number of tonnes per vehicle and by decreasing the number of empty v-km).
Figure 11 Average vehicle load for domestic and international transports 2006–2009.

Figure 12 presents the average vehicle load per vehicle by emission class 2009. Generally cleaner vehicles carry more tonnes per vehicle. Due to the limited number of observations in some segments (there are only about 460 international transports in total) the figures have to be handled with caution.

Figure 12 Average vehicle load per vehicle by emission class 2009.

We do not have information about the load factor by emission class before 2009. But Figure 13 shows that more tonnes per vehicle are transported by vehicles up to four years than by the vehicles over five years of age. The average vehicle load for older vehicles increased during the recession 2009.

Figure 13 Average vehicle load for domestic and international transports 2006–2009.
Figure 13  Average vehicle load in domestic transport by age of vehicle 2006–2009.
References


Report according to Article 11 of Directive 1999/62/EC
(room document)

According to the first paragraph of Article 11, the Commission has to present a report to the EP and the Council on the implementation and effects of Directive 1999/62/EC as amended by Directive 2006/38/EC, including its contribution to the objectives of a sustainable transport policy, no later than 10 June 2011. Member States are obliged to forward the necessary information for the report to the Commission no later than 10 December 2010.

Having regard to the discussions in the meetings of the Committee established under Article 9c of Directive 1999/62 held on 3 March 2008 and 1 December 2008 and comments received from Member States, the following structure of the report is envisaged:

1. Implementation of the Directive

1.1 Current situation

1.1.1 Transposition of the Directive
1.1.2 Description of the current charging schemes
1.1.3 Developments in technology
1.1.4 Trends in traffic density
1.1.5 Use of vehicles of more than 3.5 and less than 12 tonnes

1.2 Future charging schemes

2. Effects of the Directive

2.1 Impact on the internal market, including on island, landlocked and peripheral regions

2.2 Impact on levels of investment in the sector

2.3 Impact on the objectives of a sustainable transport policy

In order to enable the Commission to deliver the report, the following information is to be provided or checked by the Member States (the Commission plans to send a separate letter, including the formal request and the format to respect when reporting, by mid-July):

VTI notat 20A-2010
1. Currently applied charging systems including relevant rates
   *(this covers also bridges and tunnels)*
   - vehicle tax
   - tolls
   - vignettes
   - regulatory charges

2. Future charging schemes (optional)
   - plans for new tolling arrangements/vignette schemes

3. Developments in technology
   *(implementation of Article 7(5) of the Directive)*

   Available indicators or information for 2006 - 2010:
   - simplification of the payment methods, administrative costs savings/savings of time,
   - number of charging systems in the Member States (user charges, tolls, variety of toll systems),
   - interoperability with the toll/user charge systems in neighbouring countries.

4. Trends in traffic density

   Available indicators for 2006 - 2010:
   - annual average v-km per vehicle category (local, international, in transit and on TEN-T road network),
   - annual average v-km per vehicle category at different periods of day, type of day or season.

5. Use of vehicles of more than 3.5 and less than 12 tonnes

   Available indicators for 2006 - 2010:
   - annual data concerning the purchase of the vehicles of more than 3.5 and less than 12 tonnes,
   - annual data concerning the number of v-km of the vehicles of more than 3.5 and less than 12 tonnes on TEN-T road network.

6. Impact on internal market, including on island, landlocked and peripheral regions

   Available information for 2006 - 2010:
   - impact on internal market (perception of the Member States).

   Available indicators or information for 2006 - 2010:
   - evolution of cost structure of road haulage undertakings (e.g. share of taxes and charges on the total costs of road haulage undertakings).
7. Levels of investment in the sector

Available indicators for 2006 - 2010:

– annual data on revenues collected from road charging,
– annual data on expenditures spent on:
  – transport in general,
  – transport infrastructure,
  – road transport infrastructure.

8. Contribution of the sector to the objectives of a sustainable transport policy

Available indicators for 2006 - 2010:

– application of toll differentiation according to EURO emission standards of vehicles especially to new tolling arrangements,
– annual average number of v-km of heavy goods vehicles by EURO emission class,
– number of heavy goods vehicles by EURO emission class,
– average vehicle load.
VTI är ett oberoende och internationellt framstående forskningsinstitut som arbetar med forskning och utveckling inom transportsektorn. Vi arbetar med samtliga trafikslag och kärnkompetensen finns inom områdena säkerhet, ekonomi, miljö, trafik- och transportanalys, beteende och samspelet mellan människa-fordon-transportsystem samt inom vägkonstruktion, drift och underhåll. VTI är världssatsande inom ett flertal områden, till exempel simulatorteknik. VTI har tjänster som sträcker sig från förstudier, oberoende kvalificerade utredningar och expertutlåtanden till projektledning samt forskning och utveckling. Vår tekniska utrustning består bland annat av körsimulatörer för väg- och järnvägstrafik, väglaboratorium, däckprovningsanläggning, krockbanor och mycket mer. Vi kan även erbjuda ett brett utbud av kurser och seminarier inom transportområdet.

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