



FINAL REPORT

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# **Assessment of Vignette Systems for Private Vehicles applied in Member States**

Prepared for:

**Directorate-General for Mobility and Transport  
European Commission**

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the use and information of the client to whom it is addressed.*

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## EXECUTIVE SUMMARY

### *Introduction and Objectives*

Booz & Company was commissioned to assess the approach taken by seven European Union (EU) Member States in applying vignette charges to private vehicles. This assessment was to consider how these systems are consistent with the objectives of the European Union Treaty and European Transport Policy. In addition, recommendations were sought on how to improve such systems. Information and data about the vignette systems was sought from Austria, Bulgaria, the Czech Republic, Hungary, Romania, Slovakia and Slovenia. Analysis in this report is based primarily on this information.

### *Scope of the Vignettes*

Vignette systems are a form of road charging that sells set periods of access to a defined road network based on time. Whilst not directly related to usage, the economic assumption is that charges for vignettes will reflect the average amount of usage undertaken on the charged network in that set period of time. Vignette systems have been in operation for some years in EU Member States. The key objectives Member States cite in having such systems are to help recover the costs of road infrastructure, including funding ongoing improvements and maintenance of the charged infrastructure.

### *Requirements of Vignette Systems*

No specific EU legislation exists to guide the development of private vehicle vignettes, although heavy vehicle vignettes are regulated by Directive 1999/62/EC (“the Eurovignette Directive”). However, the vignette systems for private vehicles still need to be compliant with the EU Treaty and EU jurisprudence, in particular the principles of non-discrimination and proportionality.

### *Definitions of non-discrimination and proportionality*

It is a core principle of membership of the European Union that Member States must not discriminate against EU citizens from other Member States, as this would hinder the free movement of people and goods across the EU. Whilst Member States do not explicitly discriminate between foreign and national motorists with vignettes, they may do so implicitly through price or procedures that disproportionately impact upon foreign motorists.

Forms of discrimination can be economic (charging excessively for short term users compared to long term users), social (not providing adequate information through signage in foreign languages at border areas) and technical (not providing adequate payment options suitable for foreign motorists).

Proportionality is a principle derived from European Court of Justice jurisprudence that a measure taken by a public body should be in proportion to what is essential to achieve the particular objective. For vignettes, the key application of this principle is that vignette price schedules should be proportionate to the degree of road usage and relative administrative costs. It is also important for enforcement procedures and penalties to be proportionate to harm done and to the need for deterrent.

### *Scope, Validity, Price and Revenue across surveyed Member States*

The scope and prices of the seven schemes surveyed range considerably. Table 0-1 below summarises the extent of the charged networks, revenue from vignettes and the lowest and highest prices available for vignettes in those Member States.

	Austria	Bulgaria	Czech Rep.	Hungary	Romania	Slovakia	Slovenia
Size of vignette road network (km)	2,170	19,400	1,087	555	16,000	467	592
Revenue from vignettes (2009 million Euros)	347.8	13.9	117.8	89.3	80.1	33.1	115.6
Lowest priced vignette product (Euro)	7.90	5.00	10.00	4.30/5.70	3.00	4.90	15.00
Highest priced vignette product (Euro)	76.20	34.00	47.00	137.80	28.00	36.50	95.00

Sources: Eurostat, Questionnaire responses from Member States

**Table 0-1: Summary of Vignette systems**

Two countries have vignette systems that cover a substantial part of the national road network (Bulgaria and Romania), but the majority of vignette systems cover only motorways or motorways and major highways. Vignette prices vary considerably. The most expensive short term product (Slovenia's one week vignette at 15 Euro) is five times the price of the cheapest (Romania's one week vignette at 3 Euro). Similarly the most expensive annual product (Hungary's at 137.80 Euro) is nearly five times the price of the cheapest (Romania's at 28 Euro). Minimum periods available for vignettes are variously 4 days (offered by Hungary only), 7 days or 10 days. All countries offer a maximum period of a year. In no cases does any system offer a day pass for simple transit trips. As such, Slovenia charges the highest price for transit trips, and also appears to have the shortest average transit distance length (at around 200km). While Bulgaria and Romania have the cheapest prices, their national networks also have relatively low proportions of motorway/expressway standard routes, and likely to be of a lower standard than networks in Slovenia.

Enforcement revenue is not a significant contribution towards the total revenue of the Member States surveyed, except for Romania<sup>1</sup>, which gains 20% of total revenue from enforcement. This appears to indicate poor levels of compliance and high levels of capture of violations, indicating that deterrence from violating the scheme is poor.

Most revenue comes from sales of annual vignettes, and it can be assumed these are purchased largely by nationals of those countries. The sole exception is Hungary, which gains almost half of its revenue from its cheapest product: the four day vignette. This appears to reflect the high price of the annual vignette relative to the price of shorter term products in Hungary.

### *Operating Cost Variations Across Countries*

Of the five countries that provided operating cost information, Austria and Slovenia reported the lowest cost per vignette sold, at levels that are similar to, or lower than,

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<sup>1</sup> No comment can be made on Bulgaria as no revenue information was provided.

electronic tolling system costs (between €0.06 and €0.24 per vignette sold). The other three countries reported operating costs that ranged from around €1.00 to €2.50. However, the information received was too diverse to give any firm indication of why operating costs varied by country without a detailed investigation into what is included in such costs.

#### *Traffic Impacts*

The impact of vignette systems on traffic was minor in all Member States surveyed, although some noted positive impacts in reducing congestion (but in one case this was due to replacing manual toll barriers with the vignette).

#### *Non National traffic issues*

A broad assessment of the proportion of foreign traffic in the surveyed Member States indicates that Slovenia has the highest proportion (39%) whilst Romania has the lowest (12%), indicating that the impact of Slovenia's (relatively expensive) short term vignette on non-national motorists will be proportionately greater.

All of the vignette systems utilised retail outlets near border locations and on highways, with some including retail outlets in neighbouring countries. Most offered payment by debit and credit card and in various currencies, although some did not allow payment in a neighbouring Member State's national currency. Those with electronic vignettes allowed for pre-purchase online or by SMS, which offers a major advantage over the need to buy sticker vignettes.

#### *Assessment against Non-Discrimination and Proportionality principles*

The vignette systems were assessed against the principles of non-discrimination and proportionality, as well as against overall European Transport Policy objectives.

#### *Non Discrimination*

Overall, the Member States that have vignette systems most consistent with the non-discrimination principle are Austria, the Czech Republic and Hungary. However, all have scope for further improvement.

Whilst Austria and the Czech Republic perform best by having a wide range of payment options and outlets, and information available in languages of neighbouring Member States, the shortest period products they offer are 10 day vignettes. This would appear to be poorly-suited to the needs of motorists undertaking short (e.g. weekend) trips or transit trips. Hungary has the best product for transit or short term visitors in the form of a 4 day vignette, but apply a surcharge to that vignette product over the summer months (which is not applied to 10 day or monthly vignettes bought during that period). This could be seen as discriminating against motorists who only visit or transit Hungary for short periods.

Some Member States do not provide signage in the languages of the bordering Member States to advise of the vignette requirements. This could be seen as being discriminatory as it may lead to foreign-users transgressing the rules unaware and hence leaving them open to being fined.

### *Non Discrimination: Best Practice Recommendations*

For Member States to better achieve consistency with the non-discrimination principle they should ensure they have products that suit the travel patterns of short term visitors and transit users. In addition, adequate signage should be provided in languages of all bordering Member States to ensure that motorists are fully aware of vignette requirements and how to pay. Payment options should also be convenient, include credit and debit card options, and be available at all times for motorists to purchase vignettes. Finally, enforcement procedures should be applied fairly across national and non-national motorists, with enforcement efforts focused not on foreign motorists in particular, but on locations where a high proportion of violations are noted.

### *Proportionality*

A key measure of proportionality is the extent to which the range of vignette prices for different periods were proportionate according to likely patterns of usage by those buying those products. This was measured by dividing the vignette price by its validity period and comparing the ratio between equivalent daily price of the shortest term product (most likely to be bought by foreign users) with the equivalent daily price of the longest term product (most likely to be bought by nationals). Table 0-2 below shows that Austria and Hungary have the lowest ratio between products, with the shortest term products offering a daily price at between 3 and 4 times the daily price of the annual product. In contrast, Bulgaria, the Czech Republic and Slovenia have the highest prices for short-term vignettes compared with the prices charged for annual vignettes.

	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
Ratio of average daily cost of vignette between shortest and longest product	3.8	7.7	7.8	3.3	5.6	7.0	8.2

**Table 0-2: Ratio between shortest and longest term vignette prices**

In the absence of any data on cost allocation methodologies to justify the variance between prices of products, it is difficult to determine if there is any economic correlation between price and cost imposed by those users. However it would appear unlikely that differences in cost are of such a margin to justify the larger differences in short term vs. long term proportionality of pricing.

Another concern with proportionality is the practice of issuing fines that must be paid instantly to Police officers when motorists are found to be without a vignette. Austria, Slovakia and Slovenia all include this approach, and Slovenia are known to have confiscated documentation from motorists in some instances. This would appear to be disproportionately onerous as a response to vignette violations, and would be a particular concern for non-national motorists. The size of the fines varies across Member States from relatively low fines in some Member States to fines that are twenty times the price of the cheapest vignette in both the Czech Republic and Slovakia. An additional concern is the high proportion of revenue generated from enforcement in Romania (20%) resulting from high levels of non-compliance, indicating that they are not successful in deterring violators and perhaps rely on fines to generate a disproportionate amount of revenue. It is also worth noting that no assessment could be made of Bulgaria regarding enforcement procedures or penalties as information was not provided.

### *Proportionality Best Practice Recommendations*

For Member States to achieve better consistency with the proportionality principle they should determine vignette prices based on a transparent cost-allocation methodology that relates price for vignette products to average road usage by purchasers of different vignette products. In addition, penalty levels and procedures should not include fines that are required to be paid instantly, or the confiscation of documentation. Member States should co-ordinate to facilitate cross-border enforcement of vignettes and establish databases for enforcement units to identify vehicles that have repeat violations of the vignette. Enforcement policies and procedures should be focussed on encouraging compliance with the vignette schemes rather than on catching people who have not paid.

### *Consistency with European Transport Policy objectives*

All of the vignette systems surveyed are generally consistent with European Transport Policy objectives since they implement the user pays principle. However none of the Member States surveyed provided information about their cost allocation methodology so it is not possible to determine how accurately the prices are set to meet this principle. Two of the Member States surveyed use newer technologies for their vignette systems (Hungary and Romania) that offer some advantages to users in terms of convenience. None of the Member States surveyed charged differentially on the basis of the polluter pays principle, and none provided a cross-border vignette product. Better consistency with European Transport Policy objectives could be achieved if Member States considered differential pricing for vignettes according to vehicle Euro ratings, and considered offering vignette products that accommodate the most popular cross-border trips.

### *Summary of Recommendations for an Optimum Private Vehicle Vignette System*

No Member State was found to have an “optimum” vignette system, with each system having scope for improvement in terms of meeting EU principles and policies. However, of those assessed, schemes in Austria and Hungary were found to be better than others, whereas the Slovenian scheme performs relatively poorly.

Recommendations for an optimum vignette system are as follows:

- Establish a range of vignette products to suit the needs of the key groups of users, including a single day vignette;
- Vignettes should be set based on a transparent methodology to raise revenue based on allocating costs according to road usage. Vignette rates should vary based upon usage over different time durations and with a factor to take into account environmental rating of vehicle engines;
- Provide plenty of clear information, in the languages of all bordering Member States, on vignette requirements and prices, and where and how to purchase vignettes. This information should be available online, on signage prior to accessing the charged network, and at locations convenient for motorists;
- Payment outlets should be conveniently located to charged networks, have long opening hours and a wide range of payment options including debit and credit cards, and payment in cash in currencies of neighbouring Member States. Outlets should include self-serve kiosks where appropriate;



- Online and phone payment options should also be available for purchase in advance of a journey;
- Enforcement procedures should offer flexibility for motorists to comply with the vignette rather than face a penalty if a genuine error appears to have occurred. Enforcement procedures should allow for payment of fines in person or by post, with Member States able to facilitate cross-border enforcement of fines;
- The European Commission could usefully facilitate cross-border enforcement of vignette fines, and cross-border purchase of multi-national vignettes for private vehicles.

# 1. INTRODUCTION

## 1.1 GENERAL REPORT

This report assesses the approach taken by seven European Union (EU) Member States in applying “vignette” charges to private vehicles, and assesses to what extent these vignette systems are consistent with the objectives of the Treaty on European Union (“the Treaty”) and the European Transport Policy. Unless otherwise indicated, data obtained to undertake this study has originated from questionnaires supplied to the surveyed Member States.<sup>2</sup>

## 1.2 VIGNETTE SYSTEMS

There are various types of road charging in existence across Europe, including:

- Conventional road tolls, with a price applied to a particular section of road;
- Road user charging across a network, with charges typically based on distance; and,
- Vignettes, time-based charges based on increments of at least one day.

Vignettes are considered to be “user charges” rather than tolls since they relate to a specified charge being paid for the right to use the relevant infrastructure for a given period of time.<sup>3</sup> Conversely, a toll is defined as a specified amount payable for a vehicle, and is related to the use of a specific section of infrastructure of a set distance travelled.<sup>4</sup>

A vignette is a time-based charge for the use of a national highway network. The vignette is essentially a “ticket” to use the network for a set period of days, months or up to a year. Such a charge is typically intended to contribute towards the capital and operating costs of the highway, and may also be intended to reflect the environmental cost imposed by that vehicle. In order to be compliant with the Treaty, the vignette system should be applied equally to national, foreign visitor and foreign transit traffic.

There are several advantages of using vignette systems for charging road users. Vignettes are relatively simple to implement and for users to understand and are therefore less likely to be controversial or confusing (as it is easy to understand buying a right to use a network). Unlike manual road charging schemes, vignettes charge for network use without the need for barriers, with the only imposition on free movement being the need to take time to purchase a vignette. Unlike electronic road charging schemes, there is no need to install expensive roadside equipment for enforcement or for equipment to be installed inside vehicles. Vignettes have a close parallel with vehicle ownership taxes, but have the advantage of being able to be bought to reflect periods of actual road use, rather than being a charge to just own a vehicle. In addition, as vignettes need to be bought to access a network, they can readily be required of foreign motorists, who may otherwise not pay fuel taxes in the country (by purchasing fuel in a neighbouring country) nor pay annual vehicle registration fees (as foreign vehicles need not be registered in countries they visit for short periods).

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<sup>2</sup> None of the data provided has been independently verified, so any reliance on this information should be made in this context.

<sup>3</sup> Directive 1999/62/EC Article 2(c)

<sup>4</sup> Directive 1999/62/EC Article 2(b)

This element enables revenue to be raised from all users, but also contains the potential for vignette charges to be structured to disadvantage foreign motorists, particularly by setting vignette charges that disproportionately recover revenue from those who purchase vignettes for short term periods.

The disadvantages of vignette systems relate to the technology used and to the limitations of time based charging based on longer periods of permission to access the network rather than on actual access. Vignette systems that use paper tickets or stickers displayed in the windscreen impose a requirement on motorists to purchase the vignette in person or by post, which imposes a cost in time and convenience. Not all trips may be at times or locations where such a purchase is possible (Electronic vignette systems can improve on this by allowing users to pre-purchase vignettes based on number plates).

Since a vignette is a charge based on a time period only, it cannot reflect localised variations in external costs, such as congestion. The charges may recover infrastructure costs and be able to reflect broad environmental impact, but they are unlikely to be effective as a demand management tool unless prices are highly punitive (which affects overall demand, not simply demand at congested times).

Vignette systems may better reflect the costs of road usage compared to annual vehicle ownership taxes, but do not reflect the direct impact of road pricing by distance, time and place. Vignettes are a cost effective alternative to extensive tolling on major motorways, but they cannot easily reflect variations in infrastructure (or other) costs. Vignettes essentially offer a lower cost, simple alternative to sophisticated road pricing systems which are capable of providing a better link between payment for road use and the road use itself.

The seven EU Member States with vignette systems for private vehicle that have been surveyed in this study are Austria, Bulgaria, Czech Republic, Hungary, Romania, Slovak Republic and Slovenia.

### 1.3 OBJECTIVES OF THE STUDY

The European Commission has engaged Booz & Company to assess the vignette systems for private vehicles applied in seven Member States, especially in light of the European Transport Policy, and to develop objective criteria for assessing their compliance with the European Transport Policy and with the core principles of the Treaty.

This study therefore:

- *Describes the possible benefits of road user charging using the vignette system;*
- *Identifies and rank the factors most important to users;*
- *Provides a summary of the existing vignette systems for private vehicles applied in 7 Member States (Austria, Bulgaria, Czech Republic, Hungary, Romania, Slovenia and Slovakia);*
- *Identifies objective criteria to assess vignette systems against the key principles of the Treaty;*
- *Identifies objective criteria to assess vignette systems against European Transport Policy objectives;*
- *Assesses the existing vignette systems against the identified criteria; and*
- *Recommends an optimum structure of vignette system for private vehicles.*

## 2. EUROPEAN TRANSPORT POLICY

### 2.1 INTRODUCTION

The context of this study arises from the European Transport Policy (ETP), which promotes the application of “the user pays” principle to the use of road infrastructure in EU Member States in line with the principles of the Treaty.

Since the EU’s inception, an effective common transport policy has been a primary objective for supporting the functioning of the EU. The overriding goal of the common transport policy is to remove obstacles between Member States in order to provide for the free movement of persons and goods<sup>5</sup>, whilst avoiding discrimination or distortion of competition.

Road tolls for the private and commercial use of roads are common in many EU Member States. A vignette system is an extension of this, and allows or requires the road user to pay a charge in advance for a fixed period of time, allowing that user legal access to roads for several days or up to a year at a time. The word “vignette” refers, literally, to the small coloured stickers that are affixed to car windscreens to signify the payment of a charge for road use in some Member States. The vignette allows access to specific roads, such as designated highways, or may in fact form a general charge on all road users irrespective of whether or not they use major roads.

Road charging schemes, such as the vignette system, are intended to ensure that the costs of road use are borne by the actual users of the infrastructure rather than spread across all tax payers. The use of vignette schemes is therefore consistent, in-principle, with the ETP. However, no European Commission (EC) legislation exists to provide oversight for the charging of private vehicles (passenger cars, motorcycles and light commercial vehicles below 3.5 tonnes) in accordance with either the Treaty or the ETP.

This Chapter provides a summary of those aspects of the ETP and the Treaty that are relevant to the charging of private vehicles.

### 2.2 DEVELOPMENTS IN EUROPEAN TRANSPORT POLICY

Over the last two decades, the EC has developed a series of White Papers that have each outlined, at the time, the current situation and the Commission’s future vision for the European transport system, along with the supporting policy measures and implementation programmes.

In 2001, the EC published its White Paper, *European Transport Policy for 2010: Time to Decide*, which introduced a range of policy measures related to user charging across each of the transport modes to support the Commission’s objectives for transport. The 2001 White Paper’s high level priorities included:

- Shifting the balance between the modes of transport;
- Eliminating bottlenecks;

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<sup>5</sup> Europa Glossary ([http://europa.eu/scadplus/glossary/common\\_transport\\_policy\\_en.htm](http://europa.eu/scadplus/glossary/common_transport_policy_en.htm))

- Placing users at the heart of transport policy; and
- Managing the globalisation of transport.

The Commission's priority of 'placing users at the heart of transport policy' is the area of most relevance for road user charging, and the user pays principle. In order to meet this objective, the White Paper refers to a specific policy of 'adopting a policy on the effective charging of transport'. The intention is influence the environmental externalities generated from transport by encouraging more environmentally friendly vehicles and behaviour.

Adopting a policy on the effective charging of transport can also support the other priority areas identified in the White Paper. For example, the priority of 'shifting the balance between the modes of transport' is also highly relevant to road charging, since the pricing of roads is a key factor in achieving 'modal neutrality' by charging road users for the use of transport infrastructure similar to how users face such costs for other modes of transport.

### 2.3 THE USER PAYS AND POLLUTER PAYS PRINCIPLES

National governments and the Commission are increasingly conscious of the external costs that transport use imposes on society. For purposes of equity and economic efficiency, many EU Member States have therefore pursued measures to recover expenditure on road network infrastructure from road users.

Adopting a policy on effective charging of transport is directly related to the implementation of the user pays principles across the transport sector. According to the White Paper, the fundamental principle of infrastructure charging is that, for both private and commercial users, the charge for using infrastructure must cover the costs associated with the building and operating transport infrastructure, as well as the various external costs transport imposes on society (i.e. costs associated with air pollution and congestion).

User charging policies are especially relevant for the roads sector, where infrastructure costs are significant and external costs are large, particularly environmental and congestion costs. Failure to recover costs adequately from road users would constitute a form of subsidy for road transport, and hence encourage road use at levels beyond what is considered efficient for economic, environmental and social reasons. Such a subsidy can have negative environmental consequences by encouraging people to choose the private car over rail or bus when both rail and bus impose a smaller environmental cost per passenger. In addition, poor recovery of infrastructure costs can negatively affect the ability of governments to maintain an adequate standard of road maintenance, leading to wider economic and social costs such as increased journey times and accidents.

In addition, in order to ensure that the system is equitable, a Member State should be transparent about the degree to which vignette charges reflect road infrastructure costs. An efficient and equitable scheme will apply recognised and traceable methods for estimating actual infrastructure costs and will appropriately allocate those costs to vehicle types and by vehicle usage. Where revenue is collected that exceeds total cost, an equitable scheme will efficiently and proportionately allocate that additional revenue to be collected from the various vehicle types according to usage.

## 2.4 MEASURES TO SUPPORT EFFECTIVE CHARGING

The 2001 White Paper introduced a number of specific measures to support the adoption of a policy on effective charging for transport, including:

- Adopting infrastructure charging on all transport modes and internalising external costs;
- Implementing uniform commercial road transport fuel taxation;
- Ensuring the interoperability of electronic road charging systems; and
- Harmonising fuel taxes.

An important consideration in the implementation of these measures is that decisions on taxes and charges are still made at the local level by Member States or local/regional authorities. In fact, many national governments have recognised the benefits of applying the user pays principle in the development of charging schemes for roads and other transport modes, and as such, a number of Member States have implemented various forms of road charging systems (including vignettes for private vehicle use) prior to, and irrespective of, the ETP. In this context, the role of the Commission is not to impose road charging, but to facilitate the move toward more efficient infrastructure pricing by providing specific rules in relation to the principles of the Treaty.

Over the last ten or so years, the EC has adopted a number of Directives as part of its legislative agenda for measures supporting the effective charging of road use, particularly in relation to the charging of heavy vehicles.

Directive 1999/62/EC and its 2006 amendment, the “Eurovignette Directive”, has provided direction to Member States on the use of road user charging to recover the costs of wear and tear of road networks imposed by vehicles over 3.5 tonnes. A feature of these Directives is that they provide for tolls to recover of infrastructure costs (and the administration costs of the charging system) only (i.e. they do not include the recovery of external costs) but do allow Member States to incentivise the use of environmentally friendly vehicles through differential charging by emission class. This Directive requires that vignette rates for heavy vehicles shall be in proportion to the duration of the use made of the infrastructure.

The Commission has also proposed that tolls be able to be calculated based not only on infrastructure costs but also the cost of traffic-based air pollution and noise. In addition, it would allow a wider differentiation of toll rates at constant revenue so Member States can better manage traffic and reduce congestion. This is likely to more broadly encapsulate the polluter pays principle (although this only applies to heavy vehicles).

The Commission has also released additional transport strategies, and developed a number of technical studies and stakeholder consultations, which have been aimed at supporting transport policies in the context of sustainable development and the full internalisation of external costs. However the short-term legislative agenda has focussed on cost recovery from heavy vehicles and Directives specifically related to the charging of private vehicles do not exist. Progress has, however, been made in relation to promoting the interoperability of road charging in Member States, via Directive 2004/52/EC on the interoperability of any electronic road toll system in the Community.

## 2.5 FUTURE TRANSPORT POLICY

*A Sustainable Future for Transport* (2009) sets the scene for the development of the Commission's future transport policy and the publication of the next White Paper. This publication evaluates the trends and challenges for the ETP, and presents objectives and policies to support the ETP goal to establish a sustainable transport system that meets society's economic, social and environmental needs and is conducive to an inclusive society and a fully integrated and competitive Europe.

It is expected that the next White Paper will re-affirm the Commission's commitment to appropriate infrastructure pricing, with *A Sustainable Future for Transport* including 'smart prices as traffic signals' as one of its headline policy objectives. These policies will aim to ensure that personal travel choices and future government infrastructure investments are guided by efficient pricing signals, including the potential to charge for externalities.

### 3. EUROPEAN UNION LEGISLATION

If tolls or road user charges are levied on private vehicles, Member States should respect the basic principles of the Treaty and, given the international nature of road transport within the European Union, Member States should ensure that the imposition of tolls or vignettes is proportionate and does not discriminate, directly or indirectly, on the grounds of nationality or the country of residence of road users (Article 18 of the Treaty).

The principle of non-discrimination is derived from the Treaty and related to this is the principle of proportionality, derived from European Court of Justice case law.

#### 3.1 NON-DISCRIMINATION

A fundamental tenet of the European Treaty is the prohibition of discrimination based on nationality amongst Member States. In principle, EU citizens are entitled to “free movement” to travel to any other EU Member State, and so Member States must ensure that they do not create explicit or implicit discriminatory barriers on such movement by, for example, inappropriately charging occasional users comparatively more than regular users of the road network, since regular users are more likely to be nationals.

Discrimination could be an issue if road users are unfairly penalised for choosing shorter term vignettes, i.e. the price of that vignette is significantly higher than longer term products, at a level that exceeds the additional marginal costs (administrative and operational) that these users impose. Similarly, if vignette periods that correspond with the average transit time of visitors are not available, forcing these road users to pay higher charges, then discrimination can be said to exist.

#### 3.2 PROPORTIONALITY

Proportionality is the principle derived from European Court of Justice jurisprudence that a measure taken by a public body should be in proportion to what is essential to achieve the particular objective. In other words, the burden upon those who must comply should not be greater than is necessary. Whilst the principle can be applied across all dimensions of a vignette system, the key considerations we have identified are:

- The price schedule of vignettes should be proportionate to the degree of road usage (short-term vignette compared with long-term vignette);
- The measures taken for enforcement (procedures and penalties) should be proportionate to the “harm done” and the level of deterrent necessary;<sup>6</sup>
- There should be proportionality between revenue collected and the value obtained by users (network quality, customer service);<sup>7</sup> and
- There should be proportionality between recovery of costs (including administrative costs) and the prices charged to users.

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<sup>6</sup> This could be measured by measuring the ratio of fine to the vignette itself.

<sup>7</sup> However, the principle of subsidiarity allows for recovery of revenue beyond cost.



The most important of these considerations is the principle that road users should be charged in proportion to their use of the road network. Road users should not therefore be charged at a rate that subsidises the road use of other drivers.

On enforcement, the principle of proportionality means that while it may be reasonable to stop vehicles to check whether valid vignettes have been purchased, it may not be so reasonable to detain a vehicle until a penalty is paid. Most other motor vehicle offences enforced at the roadside are safety oriented, whereas non-purchase of a vignette has an impact on revenue only. Similarly, penalties should be set in proportion to the harm done (loss of revenue and cost of enforcement) with a deterrent factor on top. Such penalties should not be more severe than penalties for safety-related offences (e.g. speeding) and should be a reasonable multiple of the price of the vignette itself (e.g. fines might be equal to between 5 and 10 times the minimum vignette price).

The proportionality principle relates to value in that it is a reasonable expectation that higher priced vignettes should result in motorists being able to access more roads or roads of a high standard that are well maintained. In addition, motorists may expect higher priced vignettes to be sold with a greater degree of customer service, information and payment options.

The proportionality principle can also mean that administrative costs should be proportionally allocated depending on the relative costs of different types of users (e.g. occasional users are likely to impose greater cost per vignette than regular users), and infrastructure costs, which should be disaggregated and allocated across the various user types according to the total cost they impose. There should be a clear relationship between the costs of historic and future investments and the price paid by road users.

The principle of proportionality is related to non-discrimination in that a failure to set proportionate prices may, de facto, form a kind of discrimination against certain categories of users. For example, if vignette prices for short term users (who are more likely to be foreign transit or visiting motorists) are disproportionately high compared to vignettes for long term users (who are more likely to be nationals of the country concerned), then this lack of proportionality is effectively a form of discrimination against short term vignette users. As such, issues of proportionality can, inter alia, be issues of non-discrimination.

### 3.3 DIRECTIVES ON HGV CHARGING

A number of EC Directives have been passed to provide Member States with a framework for introducing road user charging, and to ensure that such schemes are consistent with the European Treaty. Directive 1999/62/EC (updated by Directive 2006/38/EC) on “the charging of heavy goods vehicles for the use of certain infrastructures” was intended to facilitate Trans-European trade and encourage optimal use of existing transport networks, whilst promoting the “user pays” and “polluter pays” principles and ensuring that road user charges are applied in a non-discriminatory manner. The Directive is known as the “Eurovignette” Directive and the focus of the Directive has been to ensure that HGV charges do not over-recover infrastructure costs from HGV users, and that the principle of proportionality is therefore upheld. The Directive is subject to ongoing revision, with the latest update allowing for the further implementation of the polluter pays principle through the internalisation of air and noise pollution costs in the setting of HGV charges.

Directives relating specifically to the charging of private vehicles have not yet been adopted. However, the guidance provided in the Eurovignette Directive for setting toll levels is relevant when setting charges for private vehicles, since Member States will generally wish to apply higher charges to HGVs than to private cars.

Directive 2004/52/EC on “the interoperability of electronic road toll systems” was intended to enable road users to pay road charges across different countries using a single on-board unit and a single contract with a provider of tolling services. The Directive is consistent with the European Union’s principle of free movement of persons since it eliminates the need for road users to stop at Member State boundaries and removes the need for a road user to buy more than one piece of charging equipment. The Directive is not currently relevant to any of the private vehicle vignette systems since on-board units are not used for the charging of private vehicles in any of the Member States. However, a number of the relevant Member States have stated that they have plans to implement electronic collection systems for private vehicles in the near future.

## 4. USER REQUIREMENTS

### 4.1.1 Introduction

Chapter 3 of the EU White Paper “European Transport Policy for 2010” is called “Placing Users at the Heart of Transport Policy”. Whilst vignette systems are not explicitly referred to, the key principles of this chapter relate to ease of movement for people and to the standardisation of information, signage and traffic law enforcement.<sup>8</sup>

Vignettes are essentially a time based “pass” to use part, or all, of a national road network. The nature of these products is such that users are more likely to be motivated by the avoidance of enforcement action for non-compliance, rather than by positively seeing the vignette as the purchase of access to the road network. In this sense vignettes are unlike most consumer purchases. Users are likely to perceive the purchase of vignettes in a similar manner to the purchase of time for parking.

Vignette users can be broadly differentiated across two dimensions:

- National and foreign users; and
- Regular and irregular users.

Below is an assessment of the key requirements that users are likely to expect from a vignette system.

### 4.1.2 Ranking

The key factors below have been ranked in order of importance as follows:

1. Price (as this can affect whether or not to drive at all);
2. Compliance and Enforcement (understanding how to comply with the requirement to have a vignette, and an enforcement procedure that is fair and reasonable);
3. Convenience (ease by which compliance can be undertaken); and
4. Transnational compatibility (ability to use vignettes across more than one country).

Vignettes that are fairly priced, with a wide range of time options, with easy to obtain information and options for payment and that apply across borders have high standards of user acceptability. Those that offer few product options by time, with information not easily provided (or only in one language), with a poor range of payment outlets, options and coverage, would be said to have poor standards of user acceptability.

This assessment of user requirements is based on the Consultants’ understanding of public acceptability of road user charging systems. However the rankings could be verified by undertaking surveys within the relevant Member States.

### 4.1.3 Price

The most important concern for users is the price paid for the period of usage of the road network. As with other purchases, the higher the price, the less likely one is to make a purchase. The price of the vignette becomes one factor in the decision to choose private

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<sup>8</sup> The White Paper relates these principles to safety objectives (p.67) however they are relevant to vignettes and traffic compliance issues

motoring in a certain country. For foreign users of a vignette system, high prices may discourage private motoring in a country or through a country, or may be paid but seen as poor value for money.

The two key dimensions of price relevant to users are the actual price of each vignette product, and the range of vignette product prices available according to different time periods.

Vignette users are likely to compare prices to those paid in other countries to use roads (whether vignettes, tolls or even the price of fuel). Substantial variations in vignette prices across countries are a key concern, particularly if standards of roads subject to vignettes do not vary considerably. Prices need to be proportionate to the usage of the network and the quality of the network. Unless there are transparent justifications for such variations (or offsetting variations such as lower fuel taxes), those countries with higher vignettes may be seen as charging private motorists excessively.

It is important that users can purchase vignette “products” that reflect the actual time periods over which they want to drive on networks. The greater the range of time period options available (and relative prices), the greater the ability of users to purchase a vignette that meets their needs. For example, a motorist wishing to use a network over a four day period would ideally be able to buy a vignette for that period alone, rather than having to purchase a vignette for a whole week. Vignette systems that offer greater flexibility to buy vignettes for different periods are ranked higher in terms of meeting user requirements.

When purchasing a vignette, a motorist will want that vignette to allow them access to as large a network as possible. Schemes should therefore be structured so that the charged road network can be accessed by purchasing one vignette, rather than requiring multiple products for different sections of the network. In any case, it should be very clear what is required. This ensures that the system is both user-friendly and easy to comply with.

#### **4.1.4 Compliance and Enforcement**

Once a motorist has decided to purchase a vignette, the next requirement is for them to have adequate information to understand how to be compliant with the rules of use.

As there are penalties for non-compliance, motorists can reasonably expect that the requirements for them to purchase vignettes will be easy to understand and that the information will be readily available.

Information about the vignette should include:

- Information on which vehicles are liable to purchase a vignette;
- The roads that require purchases of vignettes;
- Vignette product options and prices;
- How to purchase vignettes;
- How to seek further information; and
- Penalties for non-compliance.

Such information should ideally be available through multiple outlets including the internet, leaflets at tourism information points and retail outlets, and roadside signage. This information should be available readily outside the country concerned (and in particular in

advance of accessing roads subject to the vignette). Information should, at a minimum, be provided in the national language and the languages of bordering countries. This ensures that any reasonable motorist entering the network of a country that is subject to a vignette should know what is required to be compliant.

Signage should be provided to direct motorists to where they can purchase a vignette, and it must be made clear that a vignette is required to avoid enforcement action.

Information about non-compliance and enforcement processes is also important. Motorists should be provided with information regarding the entity responsible for enforcement and the exact value of the likely maximum fine. This is to ensure transparency and confidence that enforcement will be applied consistently. Users should be assured that the principles of non-discrimination and proportionality will be adhered to, with nationals and foreign users being treated consistently and enforcement procedures applied that are proportionate to the “harm done” and the level of deterrent necessary. Users may therefore regard that minor infringements (such as being an hour over time for a valid vignette) should be penalised at a lower level than other violations (such as not having a vignette). Motorists will not expect to pay a fine instantly when stopped by the police, or to have driving licence or passport confiscated or be subject to processes that are disproportionate (being more proportionate to matters of the safety of others rather than non-payment of a charge).

#### **4.1.5 Convenience**

Once a user understands what is required then the key concern is being able to comply by purchase of a vignette. A scheme must be convenient for users to comply with the principle of proportionality, since it must not place an unnecessary burden on the user. The principle of non-discrimination is also important, since a scheme must offer convenient use for all motorists, and not place a greater burden on non-nationals.

There are several key dimensions to the process of purchasing a vignette:

- Payment outlet types;
- Geographical spread of payment outlets;
- Opening hours for payment outlets;
- Payment options at all payment outlets;
- Available currencies; and,
- Type of vignette proof available.

Payment outlet types encompass retail outlets, self-service kiosks, telephone and online retailing. Clearly users will prefer the widest range of options, but telephone and online options may be less suitable for systems which require a sticker to be displayed than for systems that use electronic records only, since stickers will need to be sent out or collected by the motorist. As a minimum, users should expect to be able to access retail outlets where they can ask questions about the appropriate vignette to purchase, or have information about the vignette readily available in multiple languages. The presence of a retail outlet will also provide a temporary user with the opportunity to receive a vignette at the point of purchase. Another option is for vignettes to be sold at roadside self-serve kiosks.

The geographical spread of payment outlets refers to the range of locations for retail and self-service kiosks. Ideally, such outlets should be available near all points of entry onto the

vignette network. The key consideration is that no motorist should be in a position where they have no reasonable option to obtain a vignette before driving on such roads, or that access to a retail outlet to buy a vignette involves a significant diversion. Having convenience stores or service stations offer vignettes (as both are likely to be well signposted and of interest to motorists) would be seen as highly desirable.

The opening hours for retail outlets are also important, since motorists who drive at night or on weekends do not want to face being unable to buy a vignette because of limited opening hours.

A wide range of payment options is important with both cash and credit cards being essential minimum options. Most motorists will travel with at least one of those. Debit cards are also highly desirable, and other online payment options (e.g. PayPal) if online transactions are accepted. However, cheques are increasingly obsolete and less important as a payment option.

An important user requirement of a scheme is the availability to pay in at least the currencies of the country concerned and the bordering Member States, and with a reasonable currency conversion applied. If cash is the only payment option offered, cash should be accepted in both neighbouring currencies and in major currencies, such as the Euro. Ideally currency should not be a barrier to buying vignettes and prices in different currencies should be transparent. It is reasonably proportionate to offer payment options for users from other countries that are commonly used for purchase of other products at borders.

Finally, the type of proof required for a vignette can have a significant impact upon the ease of compliance and the convenience of purchasing a vignette. The simplest approach would be that the transaction merely records the vehicle's number plate and eligible days for access to the network, and allows the user to obtain a receipt for proof of purchase by printing online or by another means. Therefore a vignette should simply be a record of payment related to a number plate that enables the enforcers of vignettes to be able to identify those who have not paid.

#### **4.1.6 Transnational compatibility**

Assuming a user is satisfied with the price, adequately informed about how to comply and finds purchasing relatively easy, then being able to purchase a vignette that goes beyond one country would simply be seen as an added convenience. Regular international users of vignettes in multiple countries and occasional users would all benefit from being able to purchase vignettes that cover travel across multiple countries. This is assuming such vignettes would not be much more expensive than buying them separately for each country. The key benefit being savings on transactions as well as assurance that such a vignette would ensure compliance in all countries that it is valid for. This may have particular value if high numbers of users from neighbouring Member States drove regularly across borders and so required vignettes for both Member States. Trans-border vignettes would aid the promotion of employment and retail commerce across borders, especially where physical borders had been removed because of the Schengen Agreement.

## 5. EXISTING VIGNETTE SYSTEMS FOR PRIVATE VEHICLES

### 5.1 INTRODUCTION

To assess the seven existing vignette systems effectively, a questionnaire was issued to a representative at the Transport Ministry in each relevant Member State. Questions were structured around the following areas:

- The Purpose and Scope of the Vignette System;
- Price of the Vignette;
- Vignette Sales, Revenues and Operating Costs;
- User Convenience;
- Compliance and Enforcement;
- Impact of the System; and,
- Future Plans.

Responses varied by State, and clarification questions were issued to most respondents.

This chapter commences with an overview, comparing key aspects of the vignette system across the seven countries. It then provides information on each topic area broken down by country.

The data collected provides an understanding of why and how the vignette systems operate, and enables the schemes to be compared across Member States. This comparison provides the background on which to base recommendations for an optimum structure of private vehicle vignette.

It should be noted upfront that the standard and quantity of information received varied from country to country. In addition, for some countries, supplementary information was easily accessible over the internet. Despite our efforts at consistency, the information presented here cannot always be readily compared across all Member States, hence some countries have more extensive sections than others.

### 5.2 OVERVIEW OF VIGNETTE SYSTEMS

This section gives an overview of the key comparable aspects of the seven vignette systems. More qualitative aspects, such as government policy, user friendliness and implementation issues are explored in more detail in the individual country sections.

#### 5.2.1 *The Purpose and Scope of the Vignette System*

Each of the Member States surveyed indicated the main policy objective behind their vignette system was related to road infrastructure cost recovery. None of the States have vignette policies related to the recovery of externalities, although improvements in road safety and reductions in vehicle emissions are recognised benefits for some of the schemes.

In the majority of countries, the vignette system covers only motorways, highways and expressways. In the case of Romania and Bulgaria, all national roads are covered, but this still excludes local roads, for example those maintained at a local level.

	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
Size of total road network (km)	110,749	40,231 <sup>9</sup>	133,177	160,057 <sup>10</sup>	88,047	43,888	39,496
Size of vignette road network (km)	2,170	19,400	1,087	555	16,000	467	592
% of roads in vignette system	2%	48%	1%	<1%	18%	1%	1%

**Table 5-1: Total Size of Road Network and Vignette charged roads<sup>11</sup>**

### 5.2.2 Price of the Vignette

There is some variation in the way that charge levels are set across Member States. Whilst all of the Member States set charges by law or regulation, the factors influencing decisions on those charges include costs of infrastructure provision and users' willingness to pay. No Member States explained in detail the basis for vignette price calculations, although there may be some value in undertaking more detailed investigation of this.

Table 5-2 gives the minimum charge and the minimum duration of vignettes across the seven countries. This is relevant to foreign visitors since they are, on the whole, likely to require a vignette for a brief period, for example if on holiday or transiting through the country.

	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
Minimum price	€7.9	€5	€10	€4.30/€5.70	€3	€4.9	€15
Minimum days	10	7	10	4	7	7	7

**Table 5-2: Minimum Price & Days for Vignettes<sup>12</sup>**

As the table illustrates, there is a large difference (a factor of 5) between the highest and lowest minimum charge offered by the Member States surveyed. A person travelling through Slovenia would have to pay 15 Euros, while someone travelling through Romania would only have to pay three Euros, even though the average transit distance in Slovenia is significantly shorter than in Romania. Hungary is the only country to vary prices by season, by increasing the price of the four-day pass during summer.

Another way of considering the comparative price of the vignettes amongst the Member States considered, is to look at the price of transiting the country as illustrated in the table below.

<sup>9</sup> CIA World Factbook 2010.

<sup>10</sup> CIA World Factbook 2010.

<sup>11</sup> Source: EUROSTAT 2008 and Member States' response to Booz & Company Questionnaire.

<sup>12</sup> Source: Member States' response to Booz & Company Questionnaire.



	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
Typical transit length (km) <sup>13</sup>	300	450	450	400	700	400	200
Price for two-way trip within nine days (EUR)	7.90	10.00	10.00	9.40	6.00	9.80	30.00
Typical transit price / 100km (EUR) <sup>14</sup>	1.32	1.11	1.11	1.18	0.43	1.23	7.50

**Table 5-3: Transit Lengths and Price on a Distance Basis<sup>15</sup>**

The smallest country considered, Slovenia, has the highest price for transit, both absolutely and on a distance basis. By contrast, the largest country, Romania, has the lowest price.

The price of vignettes can also be considered on an average daily basis, that is, the price of the vignette divided by the number of days it offers access to the vignette system<sup>16</sup>. The table below gives this information for the shortest term vignette available in that country (between 4 and 10 days), and the longest term vignette (365 days). A ratio of the average daily price for short term compared with long term is also calculated, and this provides an indication of whether the shorter term products are priced proportionately compared to the longer term products. The issues of pricing proportionality are discussed in greater detail in the following chapter.

Average Daily Price (EUR)	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
Shortest term vignette <sup>17</sup>	0.79	0.71	1.00	1.25	0.43	0.70	2.14
Longest term vignette <sup>18</sup>	0.21	0.09	0.13	0.38	0.08	0.10	0.26
Ratio between shortest and longest product	3.8	7.7	7.8	3.3	5.6	7.0	8.2

**Table 5-4: Average Daily Prices for Short Term vs. Long Term Vignettes**

As the table above shows, the average daily price for a short term product varies from 0.70 EUR per day (Slovakia) to 2.14 EUR per day (Slovenia); the average daily price for the annual vignette is universally much lower and ranges from 0.08 EUR per day (Romania) to 0.38 EUR per day (Hungary). It is reasonable that the average daily price for annual products should be lower than for short term products, as users of short-term vignettes are likely to make greater use of the vignette network (even crossing the country) on a daily basis compared with a user with an annual vignette.

<sup>13</sup> This is a typical length of journey to travel across the country; the route will involve roads on the vignette scheme but may not be exclusively vignette charged roads. Further details on routes and methodology are provided in Annex D.

<sup>14</sup> Assumes the country is transited two-ways (i.e. there and back) within a 9 day period (equivalent to a week's holiday with both weekends).

<sup>15</sup> Source: Member States' response to Booz & Company Questionnaire

<sup>16</sup> For example, the average daily price of the shortest period vignette for Austria is 0.79 EUR (i.e. 7.90 EUR divided by 10 days); the average daily price of the shortest period vignette for Bulgaria is 0.71 EUR (i.e. 5 EUR divided by 7 days); the average daily price of the longest period vignette for Austria is 0.21 EUR (76.20 EUR divided by 365 days) etc. These figures are useful to consider in conjunction with the actual price schedules.

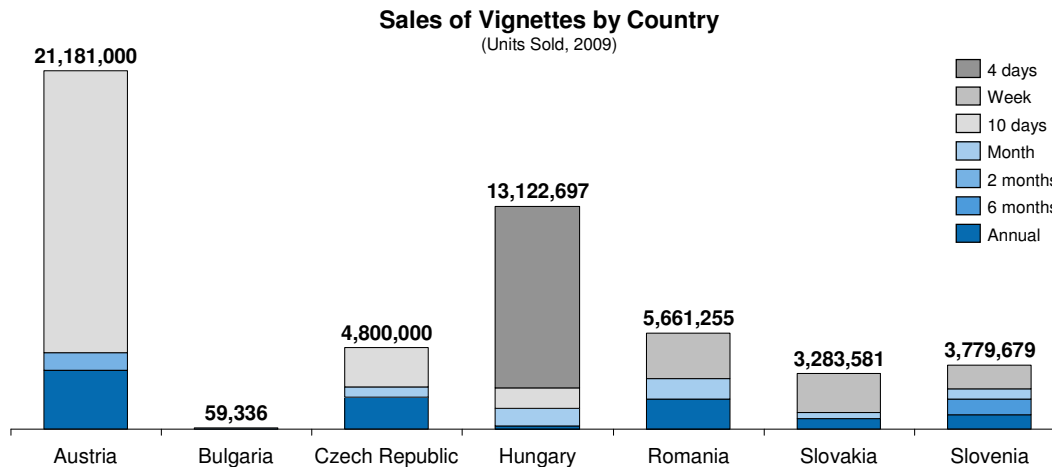
<sup>17</sup> Duration varies from 4 days to 10 days depending on country

<sup>18</sup> For all States studied, the longest term vignette was of a year's duration

Further information and analysis of pricing schedules is provided in the penultimate section of this chapter.

### 5.2.3 Vignette Sales and Revenues

Considering the sales of vignettes, for many countries the majority of vignettes purchased are for the shortest period possible. This is illustrated in the graph below. This pattern is particularly pronounced in Austria and Hungary. It is also worth noting that Hungary has one of the lowest rates of annual vignette sales, which probably reflects the relative cheapness of the shorter period passes, and the limited extent of the vignette network (and the alternative routes available).



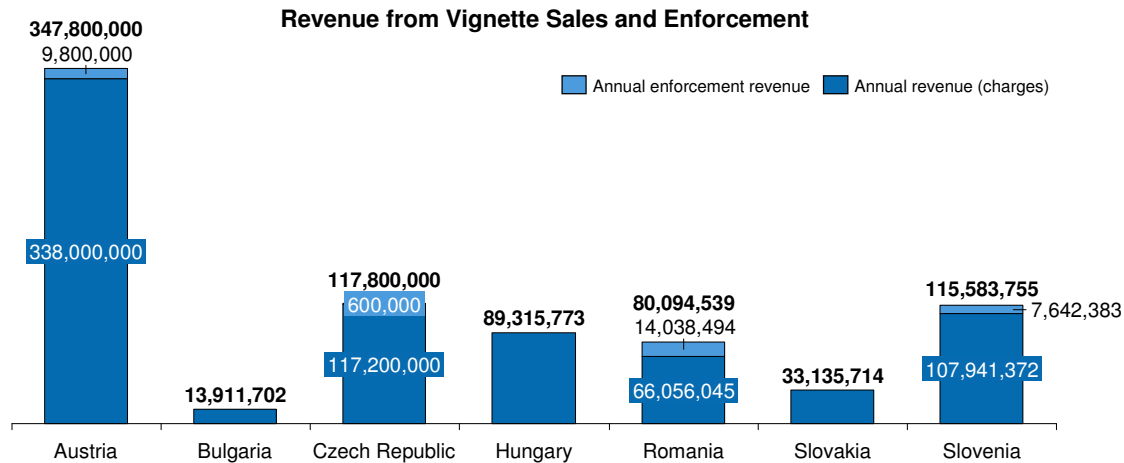
Source: Questionnaire response; Booz & Company research and analysis

Figure 5-1: Sales of Vignettes by Country (2009)<sup>19</sup>

In terms of revenue produced by the vignette system, it is clear that a significant sum of money is generated by the sale of vignettes. Austria does particularly well in this regard, reflecting its high rate of car ownership and usage, and its location as a transit point in central Europe. However, it is clear that the large amount of revenue reflects the large volume of sales, rather than high prices.

In most of the surveyed Member States, enforcement of the vignette system falls under the responsibility of a dedicated highway police force or the national police. As Figure 5-2 below shows, revenue from enforcement makes up a small percentage of total revenue, generally less than ten percent, with the notable exception of Romania where enforcement revenue is almost 20% of total revenue.

<sup>19</sup> Source: Member States' response to Booz & Company Questionnaire

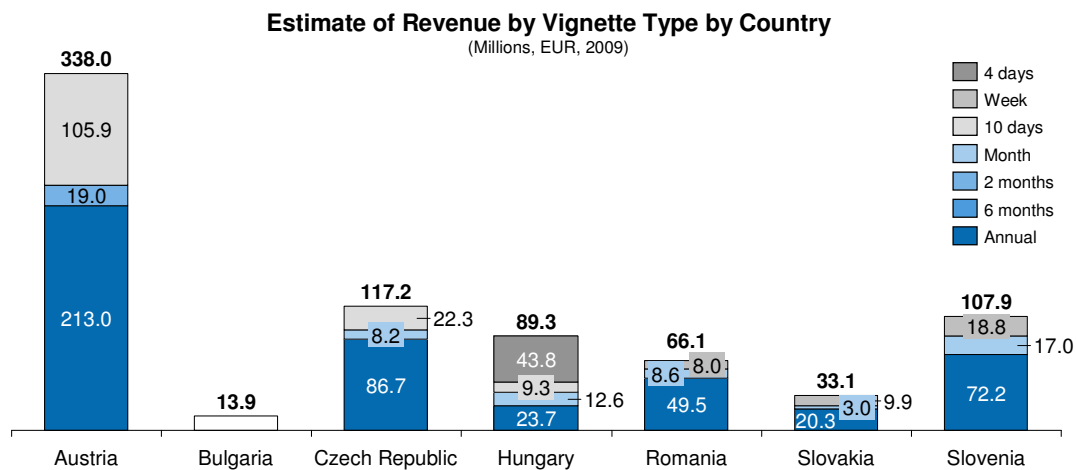


Source: Questionnaire response

Notes: Figures for enforcement revenue are not available for Bulgaria, Hungary and Slovakia

Figure 5-2: Revenue by Country (2009)

Figure 5-3 below provides an estimate of vignette revenue by vignette type, based on the information supplied on the number of vignettes sold, price of vignettes, and total revenue.



Source: Questionnaire response; Booz & Company research and analysis

Notes: Revenue by vignette type was calculated by multiplying vignettes sold by vignette price, and then adjusting the figures to fit the total revenue figures reported. For most countries, this entailed a reduction by 3-20%, and this difference is probably accounted for by sales tax or other transaction costs.

In the case of Bulgaria, there was poor fit between estimated and reported revenue so no break-down is given.

Figure 5-3: Estimated Revenue by Vignette Type

As the graph above shows, with the exception of Hungary (and possibly Bulgaria<sup>20</sup>), the majority of revenue produced for all countries considered is from sales of annual vignettes, which account for around 60-75% of total revenue. This would be expected to reflect the likely pattern that nationals of those countries will be more likely to buy annual vignettes assuming they use the vignette network regularly. Hungary, which is estimated to derive less than 30% of its revenue from annual passes, and in contrast gains almost 50% of revenue

<sup>20</sup> Information on Bulgaria was insufficient to assess this aspect

from its four-day vignettes, has a comparatively flat cost structure, as detailed above, and comparatively low sales of annual vignettes that could account for this difference. In Hungary it is likely that motorists buy vignettes for periods when they need to use the vignette network, rather than pre-pay for access over a year.

Only Bulgaria and Hungary provided information on revenue earned by nationals buying vignettes compared with non-nationals. This is examined in their subsections below.

#### 5.2.4 *Operating Costs of Vignette Scheme*

The information provided on the cost of operating vignette systems was too diverse to give any firm indication of how costs vary from country to country. Unless the basis for these costs are more clearly and transparently understood, it is difficult to know how matters such as overheads and common costs (which may be shared between private vignettes and other charges) are allocated and for judgments to be made as to the most and least efficient operations.

Operating costs are comprised of fixed costs and variable costs, with fixed costs typically made up of management costs, system maintenance costs, signage/information costs and back office costs. Variable costs are dependent on volume and on the methods customers use when interacting with the scheme. Key factors that affect variable operating costs include:

- Payment outlets used (sales at retail premises have a higher cost than online sales);
- Payment options used (cheques and cash transactions cost substantially more than online banking transfers);
- Product distribution/technology (electronic vignettes cost substantially less than paper-based vignettes);
- Complexity of product range and exemptions (greater complexity increases the cost of servicing customers);
- Number of languages service is offered in (call centres and web-based customer services will cost more if multiple languages are to be offered); and,
- Volume (as high volumes can produce net savings).

Enforcement costs are a separate factor, as these are a function of user behaviour and are particularly labour intensive. Enforcement can be “self funding” as fines usually recover revenue significantly above the cost of enforcement.

Austria and Slovakia provided the lowest operating cost estimates (as a percentage of revenue) of 1 million EUR<sup>21</sup> and 187,000 EUR respectively, which equates to less than 1% of vignette revenue in both instances. However, whilst other countries gave higher cost estimates, it is possible that these estimates primarily reflect a broader definition of cost. For instance, Romania provided information that allowed us to estimate 4.5 million EUR in cost (over 6% of revenue), but this comprised the cost of producing the vignette (at approximately 0.7 EUR per unit) and the commission given to the distributor. Slovenia estimated a similar “administrative cost” of 5.99% of revenue, or approximately 6.5 million

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<sup>21</sup> Excluding enforcement costs.

EUR. The Czech Republic and Hungary both had significantly higher cost estimates, at 12 million EUR and 10 million EUR respectively, in both cases equating to over 10% of revenue; both these figures included cost of production and cost of sales commission, and in the case of Hungary, this cost also includes cost of enforcement.

Operating costs will vary by country due to a number of factors such as cost of labour, organisational structure, and the frequency and manner with which users interact with the scheme (i.e. making phone calls to raise queries rather than using the website). The proportion of network users who are regular users (and hold an annual vignette) will have a significant impact on operating costs since regular users tend to interact with the scheme less frequently and more efficiently, reducing the administrative burden. Since vignette schemes are set up and operated in many different ways, it is difficult to compare operating costs without more detailed breakdowns of all of the cost components.

Previous assessments of operating costs of international road user charging schemes have shown that average cost per transaction (i.e. total operating costs divided by total vignette sales) tends to vary between 0.06 EUR and 3.50 EUR (2010 prices) depending on the level of scheme and sales automation, labour costs, inclusion/exclusion of enforcement costs and the proportion of regular users. Figure 5-4 below provides the average operating cost per transaction for six of the vignette systems and shows that each of them falls within the expected range, based on data collected for other vignette systems, road tolling schemes and vehicle licensing schemes. The operating costs of vignette schemes that we have information for are highlighted. It was not possible to calculate an average cost per transaction for Bulgaria because information was not supplied.

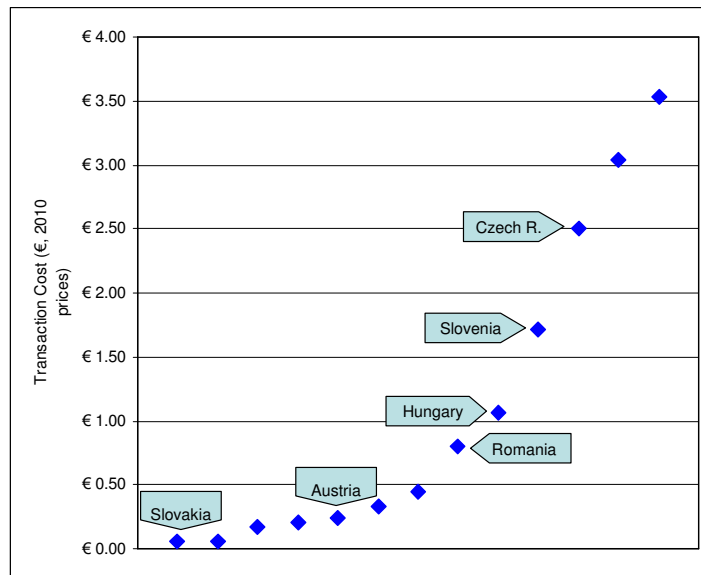


Figure 5-4: Range of Operating Costs per Transaction for Charging Schemes<sup>22</sup>

The range of operating costs per transaction is considerable and without more detailed disaggregation of cost data for the vignette schemes, it is difficult to determine the basis for these variations. For example, it seems unusual for the Czech Republic and Slovakia to have

<sup>22</sup> The points in this figure represent transaction costs for a range of road charging schemes, including vignettes, tolls, road pricing and vehicle licence fees, which Booz & Company has sourced on a confidential basis. The data has been normalised for 2010 prices.

such different costs when the schemes and economies are reasonably similar, indicating that the basis for defining costs is likely to be different between those states. However, based on the information provided, it does not appear that any of the vignette schemes are operating disproportionately inefficiently. In some cases, enforcement costs are included and others they are excluded, since enforcement is not always carried out by the agency that operates the vignette system and is often treated within general traffic enforcement costs. It is also difficult to say whether vignettes generally are lower or higher cost to operate compared to individual or network tolling schemes, because the range of factors which are relevant is quite complicated.

Some key conclusions can be drawn about costs generally within road charging schemes. Electronic-based schemes that have a high proportion of transactions undertaken online or by SMS tend to have a lower overall cost than those that are dominated by cash-based transactions. A key factor in keeping costs low is to minimise the number of queries to retail premises or call centres, so it is critical that information provided is clear and schemes are easy to understand and not unnecessarily complex. Competitive supply of retail outlets can also enable system operators to negotiate lower cost fees for handling transactions.

### 5.3 AUSTRIA

Austria	
Population	8.4 million
GDP per capita (EUR)	34,000
Cars per 1000 inhabitants	507
Scope of vignette scheme	Motorways and expressways
Size of road network covered	2,170 km
Typical transit length <sup>23</sup>	250 km
Minimum cost of vignette, EUR / (period of validity)	7.90 / (10 days)

Source: Eurostat, BMVIT Austria, Booz & Company analysis

**Table 5-5: Austria - Summary**

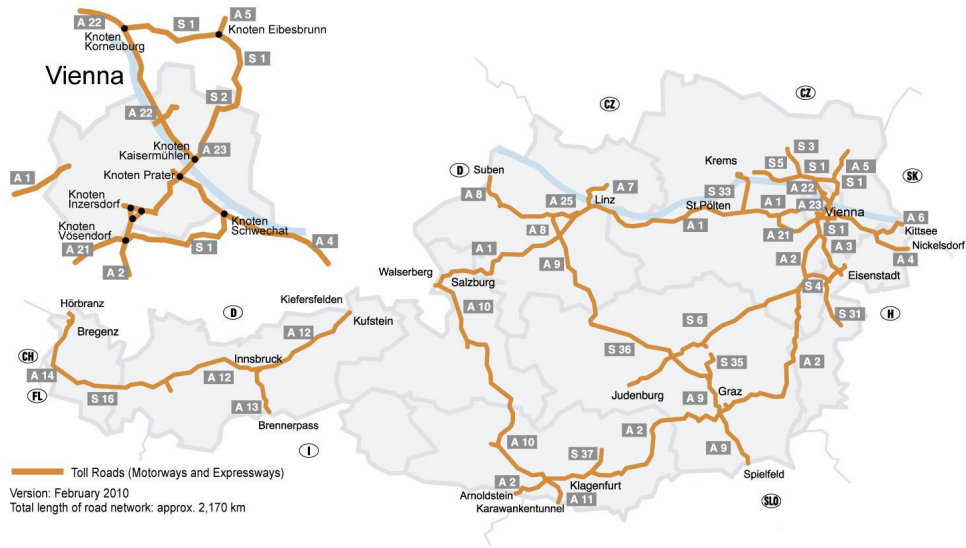
#### 5.3.1 Policy: Purpose and Scope of Scheme

Implemented in 1997, the vignette scheme was designed for the creation of revenues for planning, construction, maintenance, operation and refinancing of motorways and expressways. Today it is managed by ASFINAG, the state owned company that owns and manages the Austrian motorway and expressway network.

The vignette scheme covers all motorways and expressways including the “KorridorVignette” – a 23km stretch of the A14 motorway in Vorarlberg between the German border and the Hohenems junction (see map below). In addition, there are also “special toll routes” (approximately 141km), mainly consisting of tunnels and bridges, which are not covered by the vignette scheme (although the purchase of a vignette does entitle road users to a discount on these special toll routes). The focus of this report’s analysis is the main vignette system.

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<sup>23</sup> This is a typical length of journey to travel across the country; the route will involve roads on the vignette scheme but may not be exclusively vignettted roads.



**Figure 5-5: Map of Roads covered by Vignette System in Austria**

All revenues derived from the vignette scheme are fully earmarked for expenditure on motorways and expressways managed by ASFINAG.

The vignette did not replace other vehicle charges, which include, in Austria, fuel tax, annual vehicle tax, registration tax and tolls on certain sections of the motorway crossing the Alps. Vehicles used for emergency services, military vehicles, vehicles used by diplomats, public security forces, tax authorities, prison services, and foreign security forces, are all exempt from the vignette charge. In addition, disabled people are entitled to free vignettes; 42,000 of these free vignettes were issued in 2009.

### 5.3.2 Price of Vignettes

The price of vignettes is informed by ASFINAG’s forecast infrastructure costs and an analysis of “willingness to pay”, but is ultimately a political decision. The charges are reviewed on an annual basis and revised in line with the consumer price index (CPI).

There are different prices for motorcycles, at approximately half the price of a car vignette. The price schedule for cars is given below, with the equivalent charges per day for each vignette type.

Time Period	Charge	Equivalent Per day
Annual	€ 76.20	€ 0.21
2 months	€ 22.90	€ 0.38
10 days	€ 7.90	€ 0.79

**Table 5-6: Austria – Charge Schedule (Cars)**

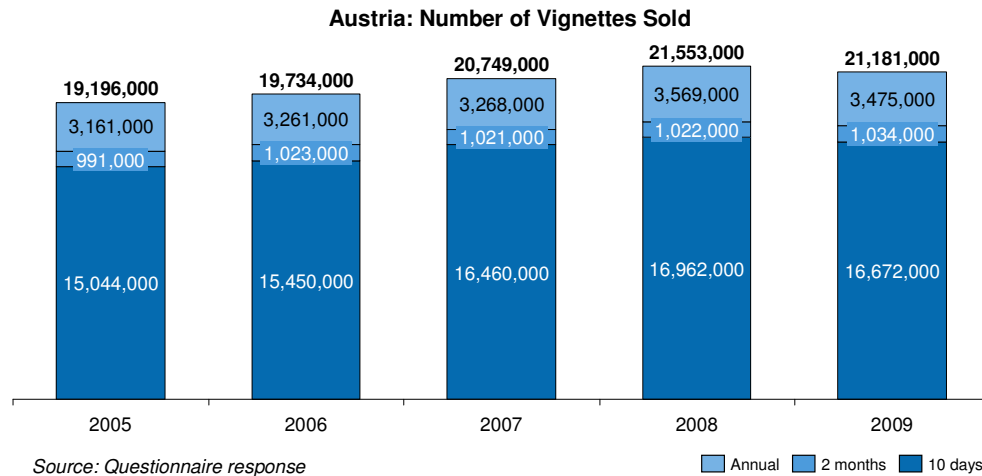
The minimum period a vignette can be purchased for is 10 days at a cost to the user of 7.90 EUR. As the table above shows, the average cost per day decreases markedly with the duration of the vignette.



### 5.3.3 Vignette Sales, Revenues and Costs

The vignette costs approximately 1 EUR to produce, but “vignettes for one year have higher production costs because of advanced security character”<sup>24</sup>. This reflects enforcement issues related to counterfeit vignettes for those of higher value.

As the graph below illustrates, the vast majority of vignettes sold (almost 80%) are for the shortest validity period of ten days. This indicates high demand for short term visits and transit trips in Austria by foreign motorists, but also some resident motorists who only use the motorway network for occasional trips.



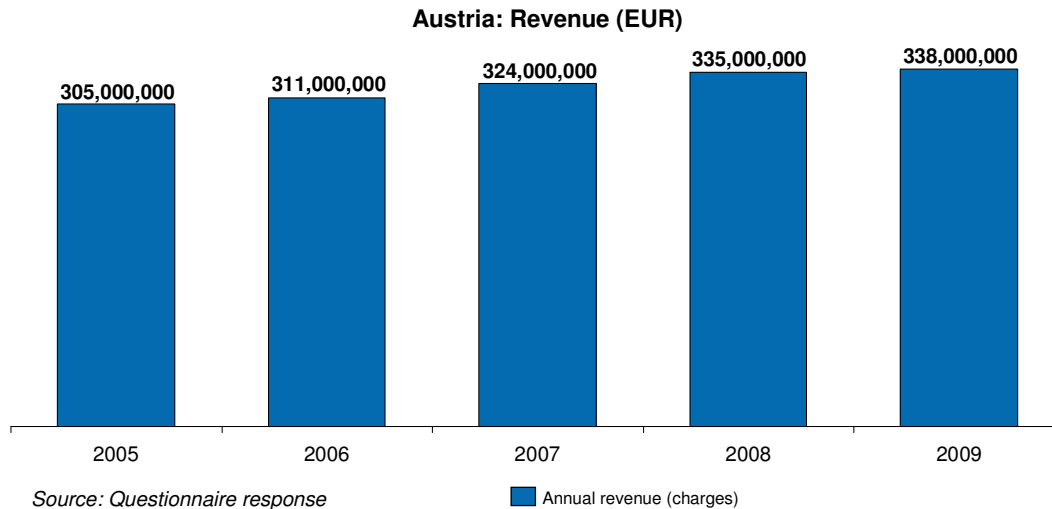
**Figure 5-6: Vignettes Sold by Type**

The total number of vignettes sold has shown a modest increase of 2.5% CAGR<sup>25</sup> over the five year period considered, although the most recent year, 2009, showed a slight decrease in vignettes sold.

The revenue collected from the sale of vignettes is substantial, and stood at 338 million EUR in 2009.

<sup>24</sup> Response to questionnaire: Infrastructure and External Costs, Tolls, Transport and Environment; Ministry of Transport, Innovation and Technologie, Austria.

<sup>25</sup> Compound Annual Growth Rate



**Figure 5-7: Austria – Revenue**

Austria was unable to provide a breakdown of vignette sales and vignette revenues by foreign users compared to domestic users.

The annual operating costs of the vignette system are estimated at 1 million EUR (excluding enforcement costs). This is the second lowest among Member States surveyed<sup>26</sup>.

#### **5.3.4 User Convenience: Access and Information**

Vignettes can be purchased directly from ASFINAG<sup>27</sup> and through sales partners – over 10,000 points of sales are operated in Austria and abroad, including petrol stations, motorway service stations, tobacconists and automobile clubs. A wide range of payment methods are accepted.

Information on the vignette system is promoted on TV, radio, newspapers, and information leaflets in 12 languages at points of sale. Border crossings have large information boards in the languages of the border countries and in English.

#### **5.3.5 Compliance and Enforcement**

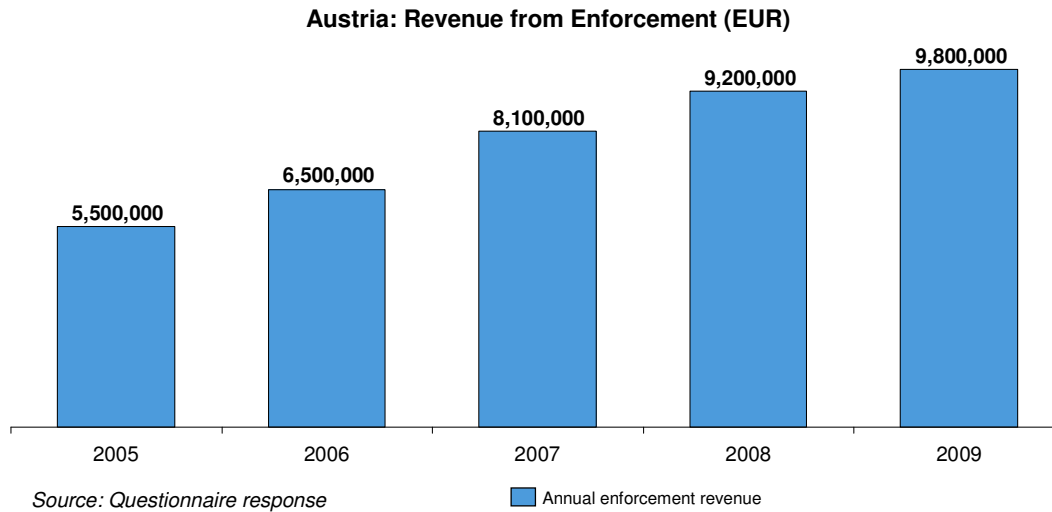
In the event of a violation (e.g. no valid vignette sticker), a substitute fee of 120 EUR is charged to be paid on the spot; failure to pay the substitute fee leads to administrative proceeding with penalties between 300 and 3000 EUR. Payment can be made using cash, credit or debit cards. Spot checks indicate that around 1-2% of vehicles do not comply with the scheme.

The revenue generated through penalty charges is a small percentage of the revenue produced by vignette sales: in 2009, 9.8 million EUR of revenue was generated in penalty charges compared with 338 million EUR generated through sales of vignettes. However, enforcement income has increased substantially over the last five years, with a compound

<sup>26</sup> However, it is difficult to draw conclusions from this information as the breakdown of what is included in these costs is unknown.

<sup>27</sup> ASFINAG (Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft) is the motorway concessionaire which collects charges on all tolled sections of motorways and expressways in Austria.

annual growth rate of 15.5%, while the revenue due to sales has grown by only 2.2% per annum over the same period.



**Figure 5-8: Austria - Enforcement Revenue**

The operating cost of enforcement is estimated at circa 4 million EUR per year, equivalent to just under 40% of the enforcement revenue generated.

### 5.3.6 *Impact of the Vignette System*

The Ministry of Transport reported no impact on traffic volumes from introducing the vignette system, aside from a marginal shift to uncharged roads immediately after the introduction of the scheme in 1997.

### 5.3.7 *Future Plans*

Austria plans to continue the system and is looking to continually optimise it in terms of technical, organisational and user-related issues.

## 5.4 BULGARIA

Bulgaria	
<i>Population</i>	7.6 million
<i>GDP per capita (EUR)</i>	4,500
<i>Cars per 1000 inhabitants (2006)</i>	328
<i>Scope of vignette scheme</i>	All national (state) roads
<i>Size of road network covered</i>	19,400 km <sup>28</sup>
<i>Typical transit length</i>	500 km
<i>Minimum cost of vignette, EUR / (period of validity)</i>	5 / (week)

Source: Eurostat, MTITC Bulgaria, Booz & Company analysis

**Table 5-7: Bulgaria - Summary**

### 5.4.1 Policy: Purpose and Scope of Scheme

The vignette system was introduced for all private vehicles in January 2005 (having been initiated in April 2004 for HGVs and passenger vehicles with more than 8 seats). The purpose given was to raise funds for the maintenance of the road network. Fuel tax and vehicle registration charges also exist. All national roads are included in the scheme, and all road users, with the exception of disabled motorists, are charged.

### 5.4.2 Price of Vignettes

The price of vignettes is set by political decision, and is influenced by the annual road maintenance budget. The charges are reviewed annually. The price schedule is given below.

Time Period	Charge	Equivalent Per day
<i>Annual</i>	€ 34.00	€ 0.09
<i>Month</i>	€ 13.00	€ 0.43
<i>Week</i>	€ 5.00	€ 0.71

**Table 5-8: Bulgaria - Vignette Charge Schedule**

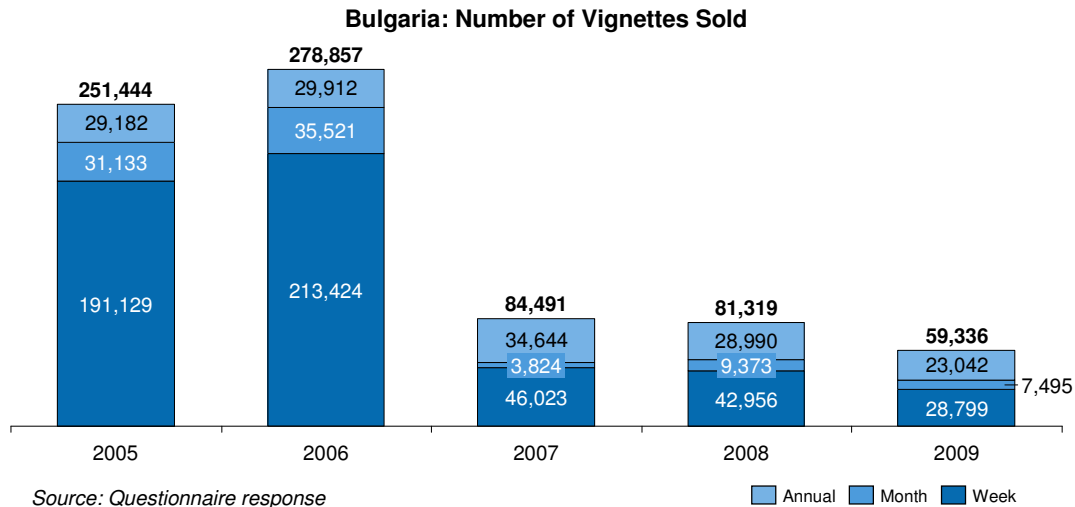
As with other countries, the price per day declines steeply as the vignette time period increases.

Details on the historical charge schedule for vignettes are provided in Table 7.

### 5.4.3 Vignette Sales, Revenues and Costs

The graph below gives the number of vignettes sold by vignette type in the past five years, showing a sharp decline in the sale of vignettes in the last three years.

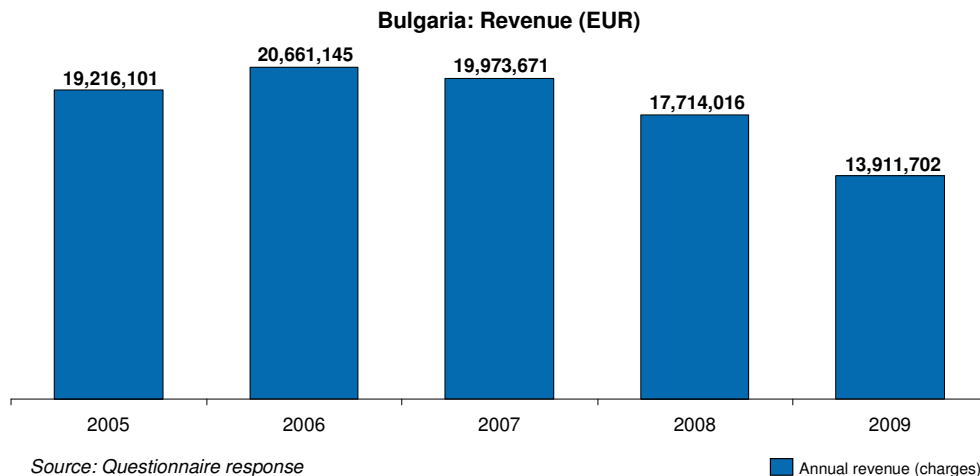
<sup>28</sup> Source: Eurostat. Bulgaria did not provide a figure



**Figure 5-9: Bulgaria - Vignettes Sold by Type**

The number of vignettes sold has shown a steep decline, particularly in 2007 where the number of vignettes purchased reduced to a third of what they had been in 2006. However, if the number of vignette-days<sup>29</sup> purchased are considered, the decline is less pronounced. Although there is not necessarily a correlation between vignettes purchased and amount of usage, the total number of days sold increased between 2006 and 2007, as sales for annual vignettes increased by nearly 16%. The total number of annual passes did not significantly decline until 2009.

This overall pattern of decline in recent years is echoed in the revenues collected, but it is notable that the reduction in revenue is less steep compared with that observed for total vignettes sold. The change in total revenue collected over the years considered is more in line with the number of vignette-days purchased, which, as stated above, did not decline significantly until 2009, since the number of annual passes sold did not experience as great a decline as the number of weekly and monthly passes sold.



**Figure 5-10: Bulgaria - Revenue**

<sup>29</sup> Calculated as: number of vignettes multiplied by days of validity

In order to understand these patterns, it is helpful to look at the schedule of prices over the same time period.

Year	Weekly		Monthly		Annual	
	Bulgarians	Foreign Users	Bulgarians	Foreign Users	Bulgarians	Foreign Users
2005	€ 2	€ 4	€ 5	€ 10	€ 28	€ 59
2006	€ 2	€ 4	€ 6	€ 9	€ 30	€ 51
2007	€ 5	€ 5	€ 13	€ 13	€ 34	€ 34
2008/09	€ 5	€ 5	€ 13	€ 13	€ 34	€ 34

**Table 5-9: Bulgaria - Vignette Charge Schedule 2005-2009**

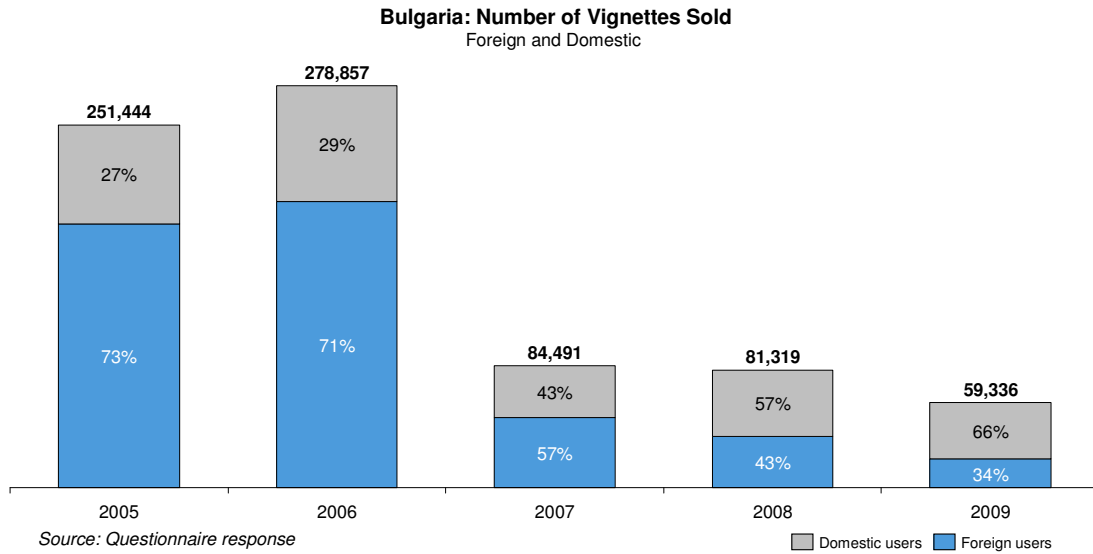
In 2007, the price for weekly and monthly vignettes more than doubled for Bulgarians, corresponding with Bulgaria's entry into the European Union (as Bulgaria was required to apply the non-discrimination principle). Previously, in 2005 and 2006, foreign users were charged substantially higher rates, although this discrepancy was in part obscured by the fact that foreign users paid in Euros and Bulgarians in their national currency, Levas. In 2007 a substantial increase in prices for Bulgarians, alongside a decrease in prices for annual vignettes for foreign users, brought the fees into parity. The new pricing schedule meant that where previously an annual vignette had cost the same as 5 monthly passes or 15 weekly passes, an annual vignette was now equivalent in price to just 3 monthly passes or 7 weekly passes. This change in price structure is likely to have fuelled the switch from weekly and monthly to annual vignettes for domestic users, which has therefore reduced the total number of vignettes purchased. However, this is insufficient to explain the whole impact, and another reason for the reduction in sales is the strong reduction in the number of foreign users, as the next section explores.

An attempt was made to reconcile the revenue figures with the sales and price figures; unfortunately, they did not appear to be consistent. Further investigation would be required to understand this more fully.

No information on vignette operating costs was provided.

#### **5.4.3.1 Sales of Vignettes to Foreign and Domestic Users**

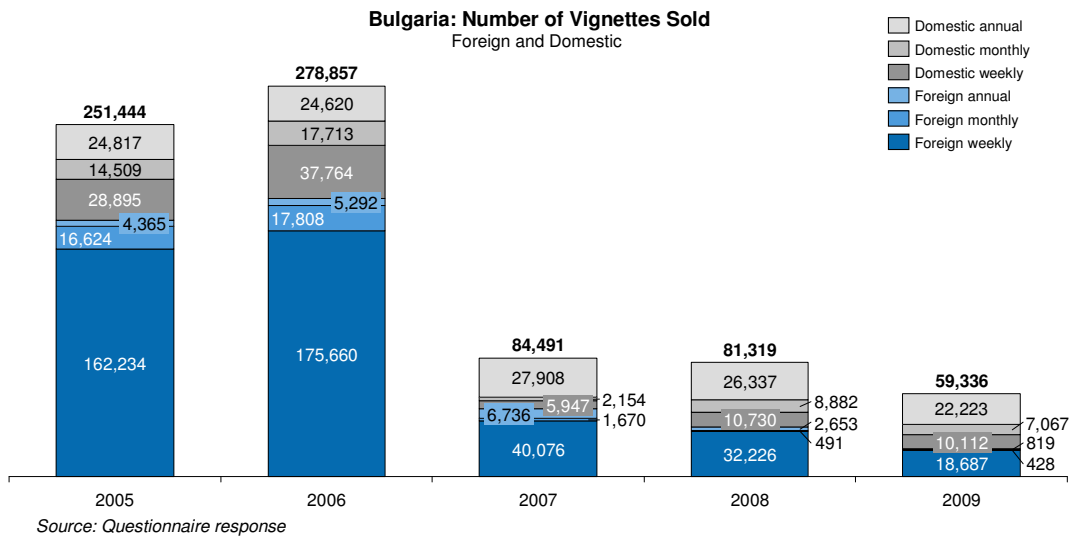
As shown in the section above, the absolute number of sales of vignettes has significantly reduced over the past three years. This decline in the number of vignettes sold was twice as steep for vignettes sold to foreign users compared with those sold to domestic users, which indicates higher elasticity of demand for foreign users compared to domestic (who are more likely to have transferred purchases to less frequent buying of annual vignettes). One possible reason for this is that the higher price could encourage some transit traffic to use alternative routes, such as the E75 highway via Macedonia and Serbia. The graph below gives the total number of vignettes sold to foreign and domestic users.



**Figure 5-11: Bulgaria - Vignette Sales, Foreign and Domestic Users**

As the graph above illustrates, not only did the total number of vignettes sold to foreign users decrease substantially, but the proportion of vignettes that were bought by foreign users decreased from 73% in 2005 to only 34% in 2009.

Looking at vignettes sold by type, the graph below gives the full breakdown over the five year period considered.

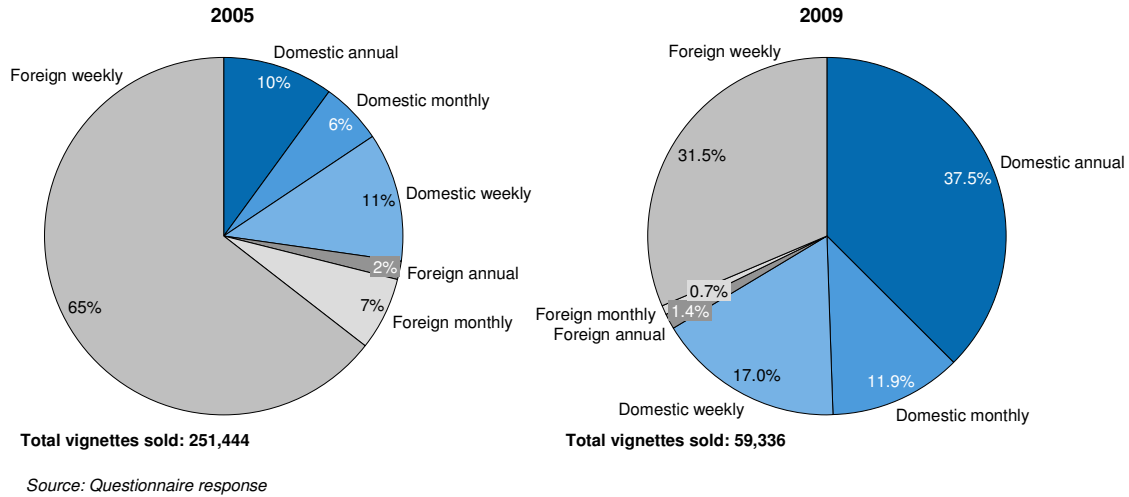


**Figure 5-12: Bulgaria - Vignette Sales, Foreign and Domestic Users, Full Breakdown**

As noted in the previous section, the number of annual passes sold increased in 2007, and this was the case for both domestic and foreign users. It is interesting that so many foreign users bought annual passes in 2007, with a total of 6,736 annual passes purchased by foreign road users in that year, since it is assumed that foreign users would only undertake transit or short trips relatively infrequently.

The underlying shift from foreign users to Bulgarian users in terms of vignette sales is clearly shown in the graphs below, as is the large increase in the sale of annual passes by Bulgarians, which probably reflects the change in the pricing schedule explored in the previous section.

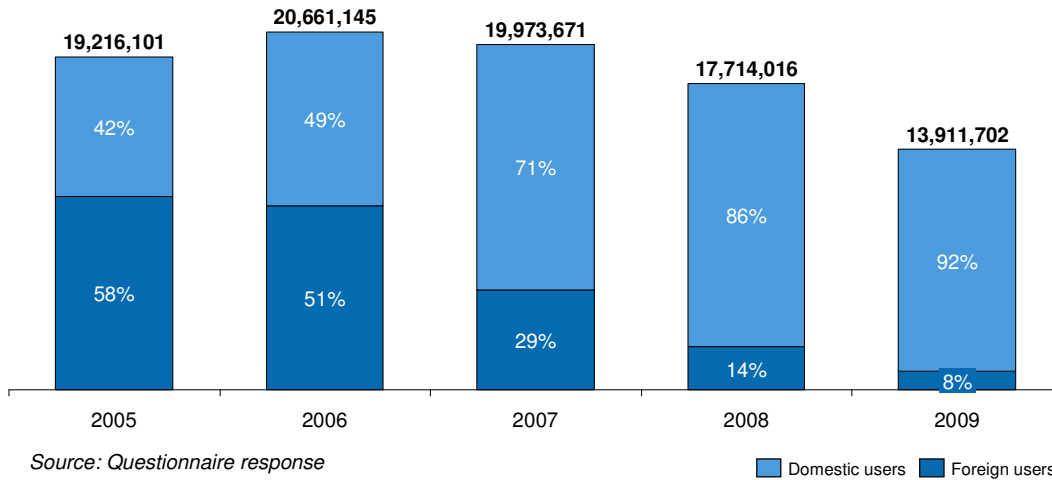
**Bulgaria - Distribution of Vignette Sales**



**Figure 5-13: Bulgaria - Vignette Sales, Foreign and Domestic Users, 2005 & 2009**

Finally, the graph below considers the revenue provided by foreign and domestic users.

**Bulgaria: Revenue (EUR)**



**Figure 5-14: Bulgaria – Revenue by Domestic vs. Foreign Users**

As illustrated in the graph, whereas foreign users used to provide the majority of the vignette revenue (in 2005 and 2006) they now only contribute less than 10% of the total revenue. The difference between the percentage of vignettes sold to foreign users (34% in 2009) and revenue generated by foreign users (8% in the same year) is due to the fact that the overwhelming majority of foreign users purchase vignettes for the minimum period only – 94% of foreign users purchase weekly vignettes.



#### **5.4.4**      *User Convenience: Access and Information*

The vignettes can be purchased, in both Euros and Bulgarian Levas, in shops, petrol stations and in Customs at the borders. Information on the vignette system is provided in Bulgarian and English only.

#### **5.4.5**      *Compliance and Enforcement*

Enforcement comes under the jurisdiction of the road police.

No information was received relating to the level of fines, violation rates or the revenue derived from enforcement.

#### **5.4.6**      *Impact of the Vignette System*

The increase in vignette prices in 2007 appears to have significantly reduced the number of vignettes sold in that year. While there has been a decline in all sections of the market, sales of the weekly and monthly vignettes have decreased far more rapidly than those of the annual vignettes, and the use of vignettes by foreign road users has decreased more than by Bulgarians. However, further research is required to understand the reason behind this dramatic decline in vignette sales and to discern the extent to which the changes in the vignette system have influenced demand. There is no evidence that has been supplied that would indicate sales reductions have also matched reductions in traffic volumes on the same scale. One explanation could be the change in purchase patterns to annual vignettes, which would not be reflected in traffic volumes. Another could be an increased violation rate, but as no information has been supplied on enforcement, this is only speculative. Clearly, there are questions which remain unanswered as to why revenue has not exhibited the same decline as sales of vignette over the past few years.

#### **5.4.7**      *Future Plans*

Bulgaria plans to develop a system of electronic toll charging to replace the current vignette system.

## 5.5 THE CZECH REPUBLIC

The Czech Republic	
Population	10.5 million
GDP per capita (EUR)	13,100
Cars per 1000 inhabitants (2006)	399
Scope of vignette scheme	Motorways and highways only
Size of road network covered	1087 km
Typical transit length	450 km
Minimum cost of vignette, EUR / (period of validity)	10 / (10 days)

Source: Eurostat, MDCR Czech Republic, Booz & Company analysis

**Table 5-10: The Czech Republic - Summary**

### 5.5.1 Policy: Purpose and Scope of Scheme

The vignette system was introduced for the purpose of generating income for the State Transport Infrastructure Fund that is used, inter alia, for the construction of new roads and the maintenance of the current road network. However, the revenue generated is not directly hypothecated to the Fund. The vignette system did not replace any other charges and, in addition to the vignette, vehicle owners are charged fuel tax and obligatory insurance.

The vignette scheme covers motorways and highways. Exemptions are issued for disabled people. Motorcycles do not require a vignette.

### 5.5.2 Price of Vignettes

The level of charges is set by Government, informed by the cost of newly opened motorways and related costs of road infrastructure, inflation, and the length of time since the last price change. Charges are reviewed approximately every two years.

Time Period	Charge	Equivalent Per day
Annual	€ 47.00	€ 0.13
Month	€ 14.00	€ 0.46
10 days	€ 10.00	€ 1.00

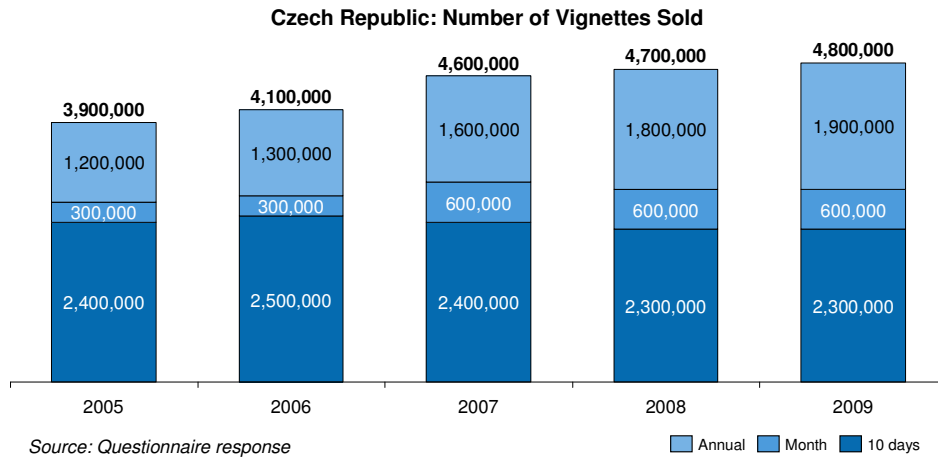
**Table 5-11: The Czech Republic - Charge Schedule**

The price schedule in the table above provides charges for 2010. As with other countries, the equivalent daily rate decreases significantly as the duration of the vignette increases.

### 5.5.3 Vignette Sales, Revenues and Costs

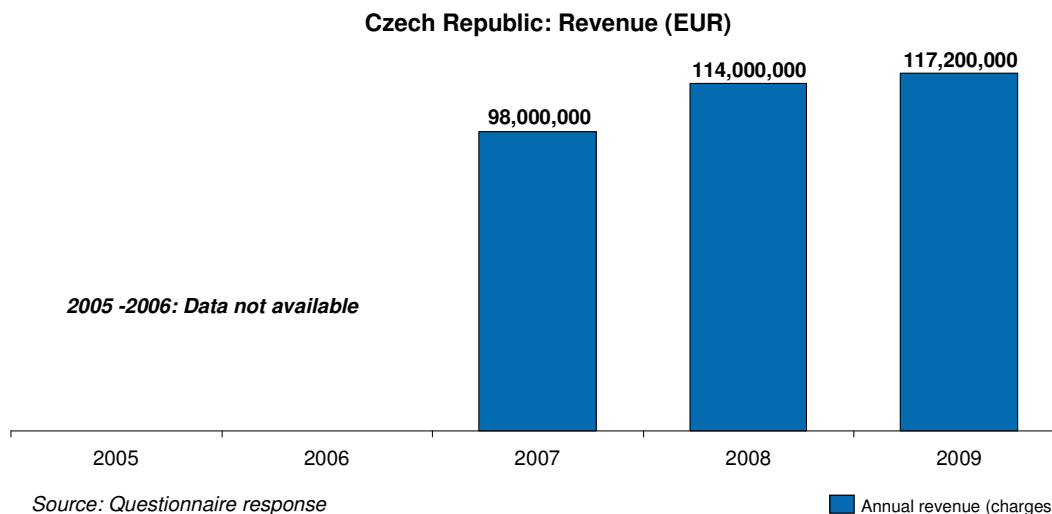
Figure 5-15 below shows the quantity of vignettes sold over the past five years, showing a steady increase in sales, equivalent to 5% increase per year (CAGR). In particular, the

number of annual passes has increased considerably, possibly reflecting an increase in the level of national vehicle ownership.



**Figure 5-15: The Czech Republic - Vignettes Sold by Type**

The revenue from vignette sales is given in Figure 5-16 below. Revenue has grown by over 9% annually between 2007-2009.



**Figure 5-16: The Czech Republic - Revenue**

The Czech Republic was unable to provide a breakdown of vignette sales and vignette revenues by foreign users compared to domestic users.

Operating costs of the vignette system are estimated at 12 million EUR per year, including sales commission and the printing of the vignettes themselves. This is equivalent to approximately 10% of revenue. This was the highest of any of the vignette systems surveyed<sup>30</sup>.

<sup>30</sup> However, it is difficult to draw conclusions from this information as the breakdown of what is included in these costs is unknown.

#### 5.5.4 *User Convenience: Access and Information*

The vignettes can be bought at post offices, petrol stations, shops and border crossings, and paid for in cash or by credit card. Information leaflets on the vignette scheme are made available at sales points and are printed in four languages. There is information on the vignette system on the Ministry and State Fund website, as well as on the official Czech Tourism website.

#### 5.5.5 *Compliance and Enforcement*

The penalty for non-compliance consists of an on-the-spot penalty (not to be paid instantly) of up to 200 EUR, with an administrative procedure that can award fines of up to 4000 EUR if the initial fine is not paid. Fines can be paid in cash, by credit card or through internet banking.

Enforcement comes under the jurisdiction of the Police (Ministry of Interior) and Customs Authorities (Ministry of Finance); enforcement revenue was estimated at 600,000 EUR in 2009, but operating cost data for enforcement was not made available.

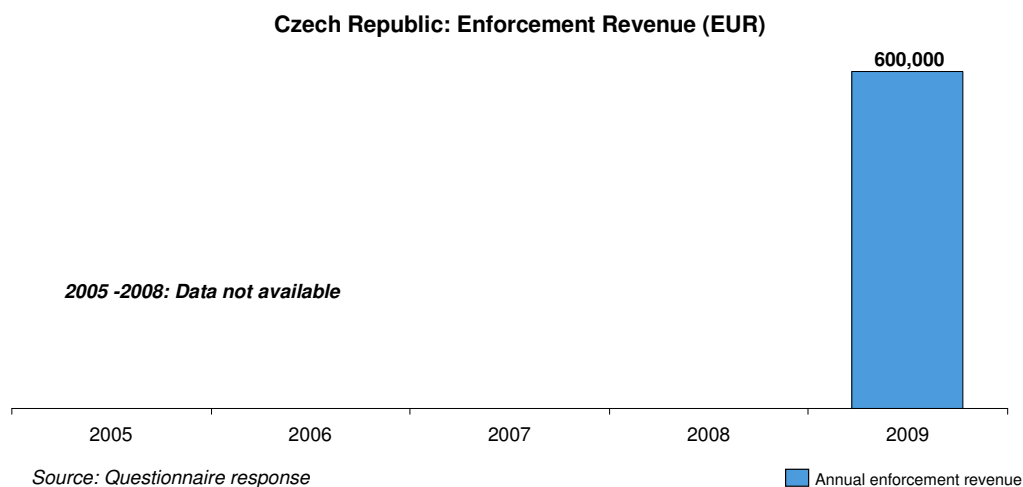


Figure 5-17: Czech Republic – Enforcement Revenue

#### 5.5.6 *Impact of the Vignette System*

The Department of Roads, Ministry of Transport, noted that the introduction of the vignette system provided “not insignificant” income to the State Fund, and that the roads for which the vignette system operated were “less congested, safer, and beneficial” for both the operating costs of cars and for the environment. It is presumed that this arose from a modest reduction in vehicle traffic, but there is insufficient information to determine this with more certainty.

#### 5.5.7 *Future Plans*

Czech Republic has no firm future plans for the vignette system, but, like other countries, it is considering replacing the vignette system with electronic distance based toll charging.

## 5.6 HUNGARY

Hungary	
Population	10 million
GDP per capita (EUR)	9,300
Cars per 1000 inhabitants (2006)	293
Scope of vignette scheme	Motorways only
Size of road network covered	555 km
Typical transit length	400 km
Minimum cost of vignette, EUR (period of validity)	4.30 or 5.70 <sup>31</sup> / (4 days)

Source: Eurostat, Coordination Centre for Transport Development, Hungary, Booz & Company analysis

**Table 5-12: Hungary - Summary**

### 5.6.1 Policy: Purpose and Scope of Scheme

The vignette system was introduced in 1998 for the purpose of funding the operation, maintenance and reconstruction costs of the charged road network. The system was updated in 2008 with the e-vignette system replacing the former paper-based system.

The e-vignette income provides almost two-thirds of the Road Budget, which exists to fund investments, operation, maintenance and reconstruction of the overall national public road network (i.e. not merely the sections of motorway covered by the vignette scheme). The vignette system replaced the former mileage-based manual toll gate system in operation on some motorways. Other motoring charges include excise duty, fuel tax, vehicle tax and registration tax.

### 5.6.2 Price of Vignettes

Vignette prices are decided politically, taking into account affordability and the limit for HGV charging set out in the Eurovignette Directive. Although the Eurovignette Directive does not apply to private vehicles, for Hungary it is effectively used to set an upper limit to the tariffs charged, so that private cars are not charged more than HGVs. The vignette charges are reviewed annually and take into account the EUR/HUF exchange rate, but do not consider the cost of road infrastructure (beyond the indirect reflection of this as revenue is sought for the Road Budget).

The Hungarian vignette system is the only one of the systems examined where there is seasonal variation in the charges; the 4 day vignette costs 5.70 EUR during the peak summer months (May – September) and 4.30 EUR at all other times. This appears to be intended to help manage demand because of summer congestion, although this surcharge does not apply to other vignettes sold at that time.

<sup>31</sup> Dependent on season

Time Period	Charge	Equivalent Per day
Annual	€ 137.80	€ 0.38
Month	€ 15.50	€ 0.51
10 days	€ 9.40	€ 0.94
4 days	€ 4.30 - € 5.70	€ 1.08 - € 1.43

Table 5-13: Hungary - Charge Schedule

### 5.6.1 Vignette Sales, Revenues and Costs

The number of vignettes sold has consistently increased year-on-year over the last five years.

Hungary has a very low sales rate of annual passes. The vast majority of vignettes sold (over 80% in 2009) were for 4 days validity, with less than 2% of vignettes sold being annual vignettes. This is in significant contrast to other countries surveyed (in both Bulgaria and the Czech Republic annual vignettes accounted for around 40% of sales) and may reflect the fact that the equivalent price per day does not diminish as significantly for vignettes of longer duration as is the case in other countries. Annual vignettes in Hungary do not therefore offer the same comparative value for money (as compared to shorter term vignettes) as in the other countries. Furthermore, the cost of an annual vignette pass in Hungary is the highest of all the seven countries considered, even though Hungary is by no means the richest country considered<sup>32</sup>, which may suggest that the price is simply too high for the national market.

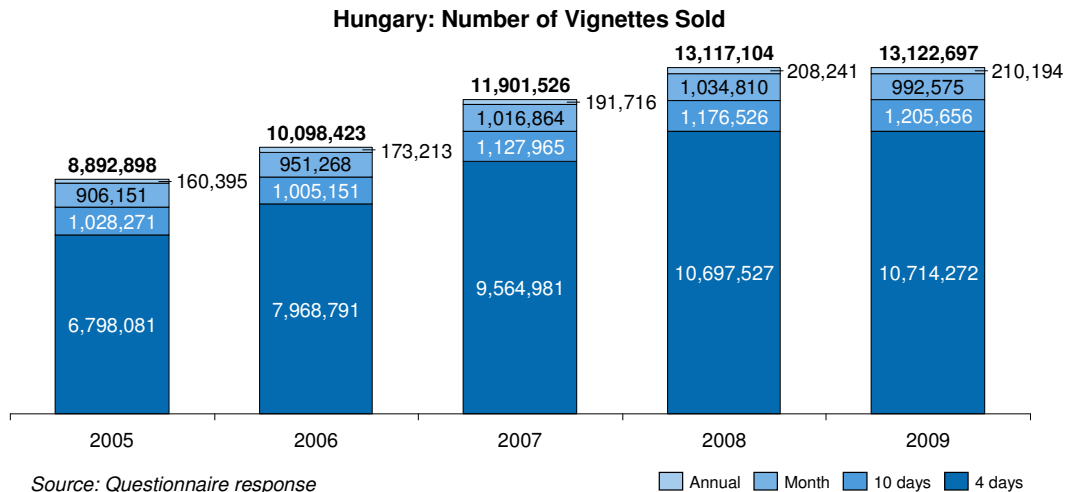
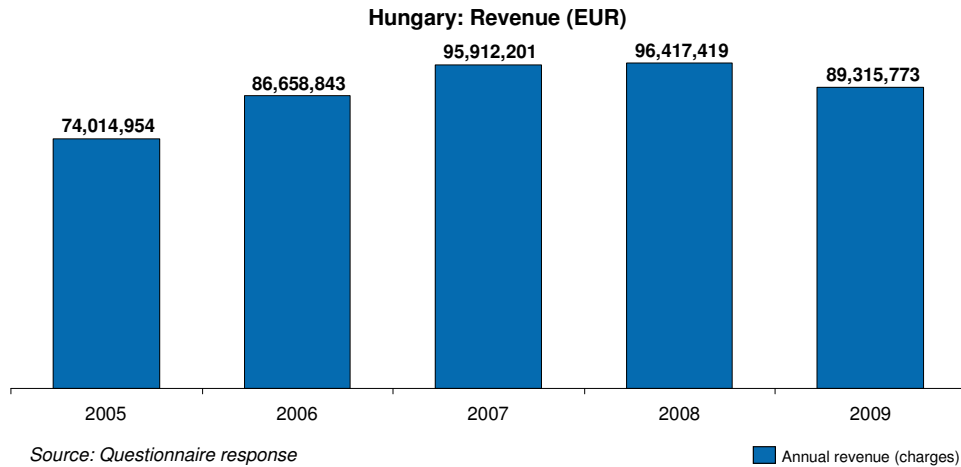


Figure 5-18: Hungary - Vignettes Sold by Type

Annual revenue has decreased in the most recent year, despite a small increase in the number of vignettes sold.

<sup>32</sup> On a measure of GDP per capita (Purchasing Power Parity basis) Hungary is below Austria, Slovenia and Slovakia source IMF World Economic Outlook Database, October 2010.

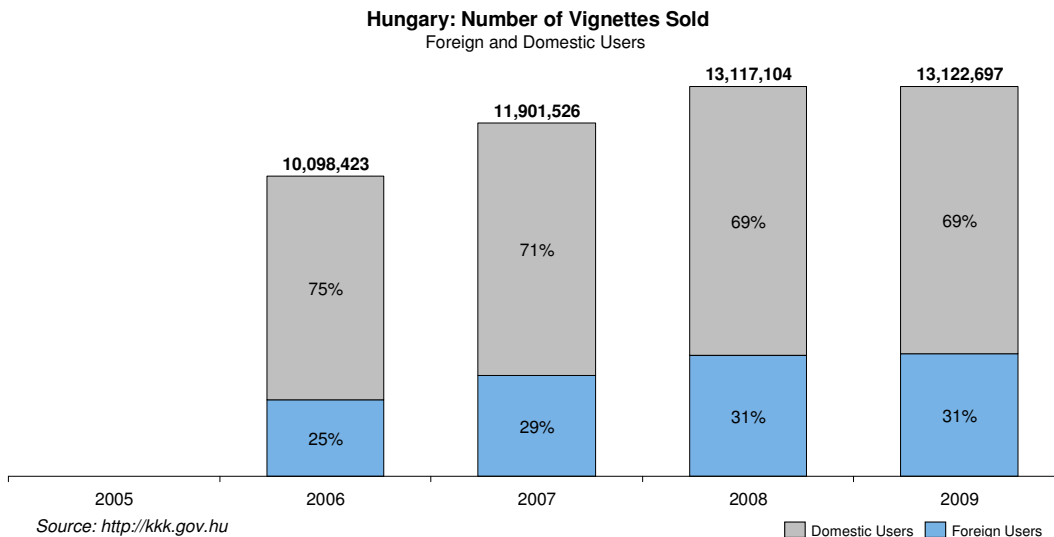


**Figure 5-19: Hungary - Revenue**

The Hungarian Toll Strategy Bureau estimated that the cost of operating the vignette system is 11.5% of total revenue, including the cost of enforcement. No further breakdown was given. Given the e-vignette is also used to charge heavy vehicles, it is unclear whether these costs only apply to the private vehicle component or are across the board.

#### 5.6.1.1 Sales of Vignettes to Foreign and Domestic Users

In addition to the information given above, Hungary also collects figures on the nationality of vignette users, i.e. whether they are foreign or domestic. Figure 5-20 below gives the breakdown of the number of vignettes sold to foreign and domestic users, and illustrates that foreign users account for 25-31% of total units sold, and their proportion of vignette sales has risen over the last four years.



**Figure 5-20: Hungary - Vignette Sales, Foreign and Domestic Users**

The type of vignette bought by foreign users is likely to result in a greater number of sales than a national user would make, i.e. a foreign driver passing through Hungary several times a year may buy several 4-day vignettes over the course of that year, whereas a

Hungarian resident would be better incentivised to buy only one annual vignette. The full breakdown of vignette sales by type is given in Figure 5-21.

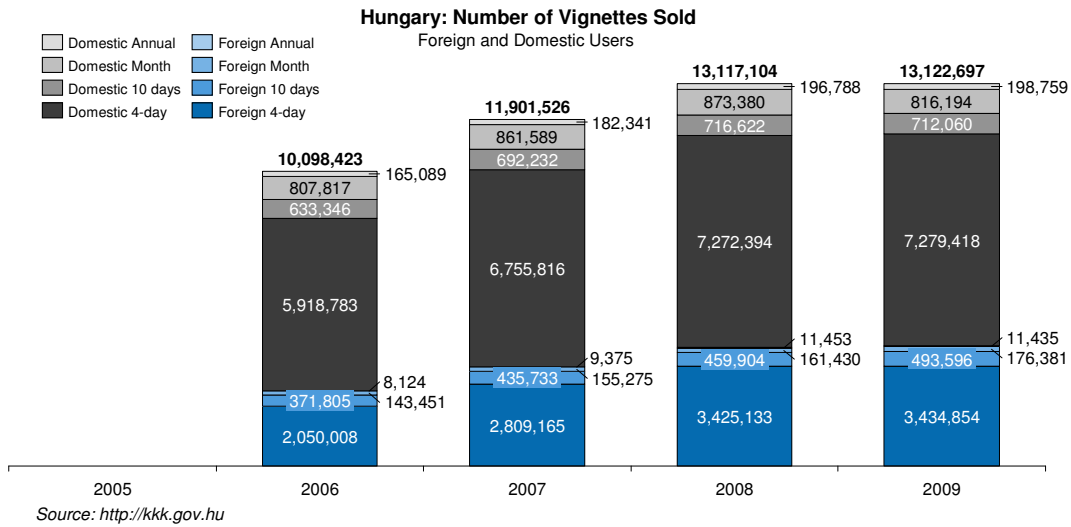


Figure 5-21: Hungary - Vignette Sales, Foreign and Domestic Users, Full Breakdown

Domestic users constitute the majority of vignette purchasers, and 4 day passes are the most popular type of vignette for foreign and domestic users alike. In 2009, over 80% of users (foreign and domestic) bought 4 day vignettes. This buying pattern probably reflects the relatively flat pricing schedule of vignettes in Hungary, where there is less saving to be made by buying vignettes of longer duration than there is in other countries. However, the high rate of sales of low-duration vignettes may also signal that a reasonable proportion of Hungarian motorists do not regularly use the roads on which the vignette system applies.

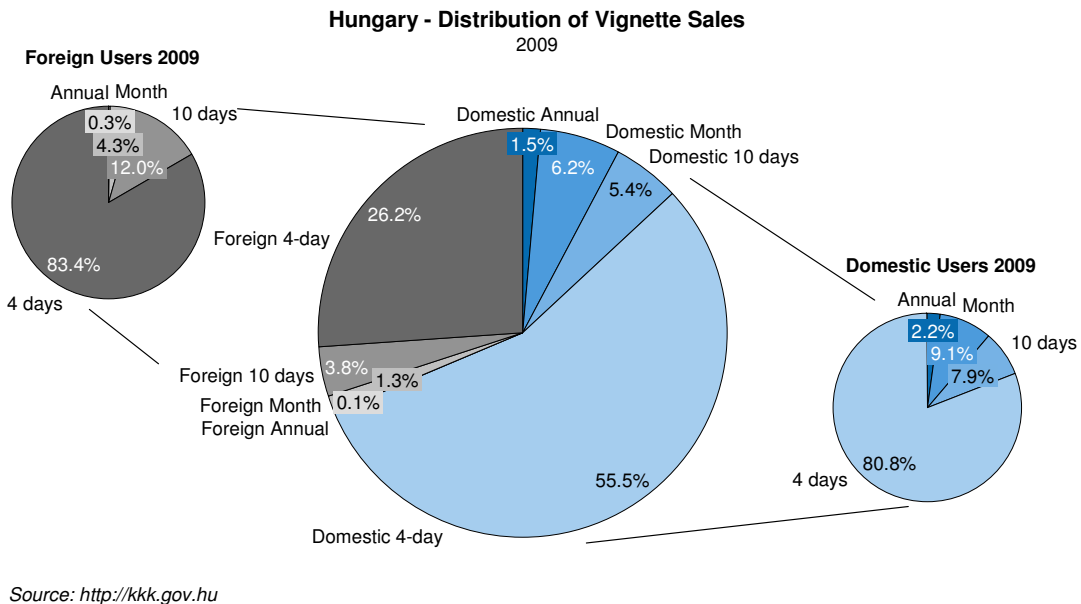


Figure 5-22: Hungary - Vignette Sales, Foreign and Domestic Users 2009



### 5.6.2 *User Convenience: Access and Information*

A motorist can purchase e-vignettes at customer service offices operated by the motorway company itself; through approximately 2,200 retailing points, including petrol stations and newspaper stands, and over the internet or through select SMS service providers. Payment may be made in cash or by credit card. It is a key advantage of the e-vignette is that it can be sold in advance by phone or online, rather than require motorists to have a specific trip to buy a sticker.

Information leaflets on the vignette system are available at all physical retailing points in 16 languages, and are also downloadable from the motorway website ([www.motorway.hu](http://www.motorway.hu)). There are also informational road signs at all inward border crossings, and road signs at entry interchanges. In motorway rest areas there are informational signboards in four languages (Hungarian, English and the two languages of the countries the road leads to). In addition, information on the vignette system is also provided in some tourism brochures.

### 5.6.3 *Compliance and Enforcement*

In order to enforce compliance, Hungary uses fixed free-flow ANPR<sup>33</sup> gantries and mobile detection cars, using a process of cross-checking the e-vignette purchase against the Hungarian motor vehicle register, and identifying foreign number plates that are non-compliant. Penalties for non-compliance are given in multiples of the 10 day vignette rate, equivalent to 57 EUR if paid within 15 days, and 237 EUR if paid after that. This fine can be paid in cash, by credit card, cheque or bank transfer.

Average violation rate on the charged network is estimated at 2-3%.

### 5.6.4 *Impact of the Vignette System*

No significant impact on traffic levels was detected when the vignette system opened.

### 5.6.5 *Future Plans*

Hungary plans to replace the e-vignette system with an electronic distance based toll system.

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<sup>33</sup> *Automatic Number Plate Recognition*

## 5.7 ROMANIA

Romania	
<i>Population</i>	21.5 million
<i>GDP per capita (EUR, 2005)</i>	5,800
<i>Cars per 1000 inhabitants (2006)</i>	167
<i>Scope of vignette scheme</i>	Motorways and national roads
<i>Size of road network covered</i>	16,000km
<i>Typical transit length</i>	700 km
<i>Minimum cost of vignette, EUR / (period of validity)</i>	3 / (week)

*Source: Eurostat, Ministry of Transport, Romania; Booz & Company analysis*

**Table 5-14: Romania - Summary**

### 5.7.1 Policy: Purpose and Scope of Scheme

The Romanian vignette system, the “Roviniete”, was introduced on 1 January 2008 with the aim of raising funds to improve existing infrastructure under the control of the Romanian National Company of Motorways and National Roads (RNCMNR). It covers all motorways and national roads under control of the RNCMNR, but excludes county and communal roads (some 63,000km) that are managed by County and Local Councils. The revenues from vignette sales are hypothecated for the RNCMNR budget.

Other costs to motorists include a registration tax, annual tax, fuel tax and taxes for crossing bridges over the Danube. Additionally, some counties have introduced road user taxes and city transit taxes. No information was provided on these local vignette systems.

Exemptions to the vignette charge are available for vehicles owned by the Ministry of National Defense, the Ministry of Administration, ambulance services, emergency service, RNCMNR, public transport services, and historical vehicles (that is, vehicles which have been out of production for more than 30 years yet retain the original body and engine; certification is required).

### 5.7.2 Price of Vignettes

The price of vignettes is determined by political decision. The charge schedule is set out below. This schedule is reviewed on an annual basis.

Time Period	Charge	Equivalent Per day
Annual	€ 28.00	€ 0.08
90 days <sup>34</sup>	€ 13.00	€ 0.14
Month	€ 7.00	€ 0.23
Week	€ 3.00	€ 0.43

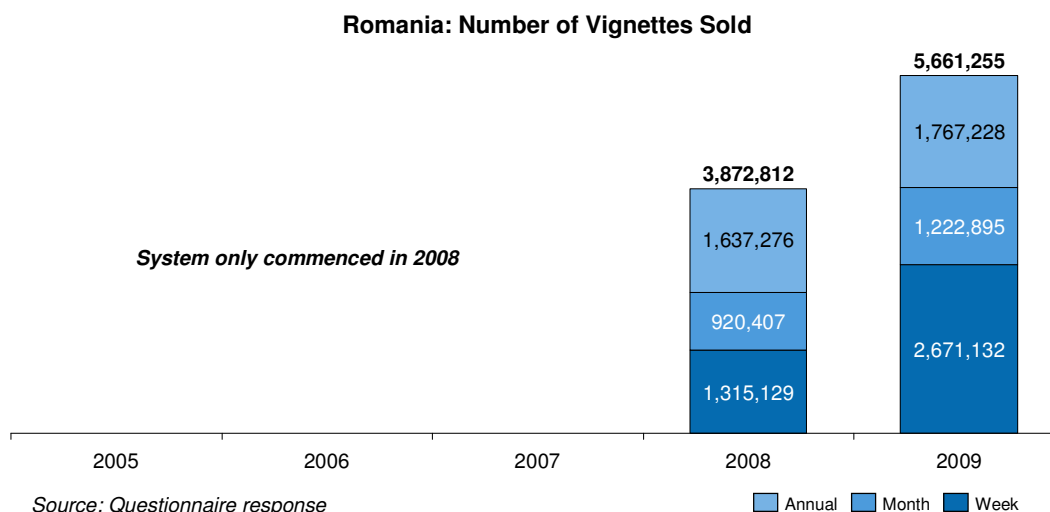
**Table 5-15: Romania - Charge Schedule**

Romania has the cheapest vignette system of the countries considered, both in terms of the absolute minimum price paid (3 EUR) and in terms of the equivalent daily rate (0.08 EUR per day for the annual vignette).

However, Romania also has one of the lowest rates of GDP per capita of the Member States surveyed and the lowest rate of car ownership of all the countries with vignette systems. It is likely that the vignette pricing schedule reflects this relatively low ability to pay, as well as lower labour costs to operate and maintain the vignette and the road network.

### 5.7.3 Vignette Sales, Revenues and Costs

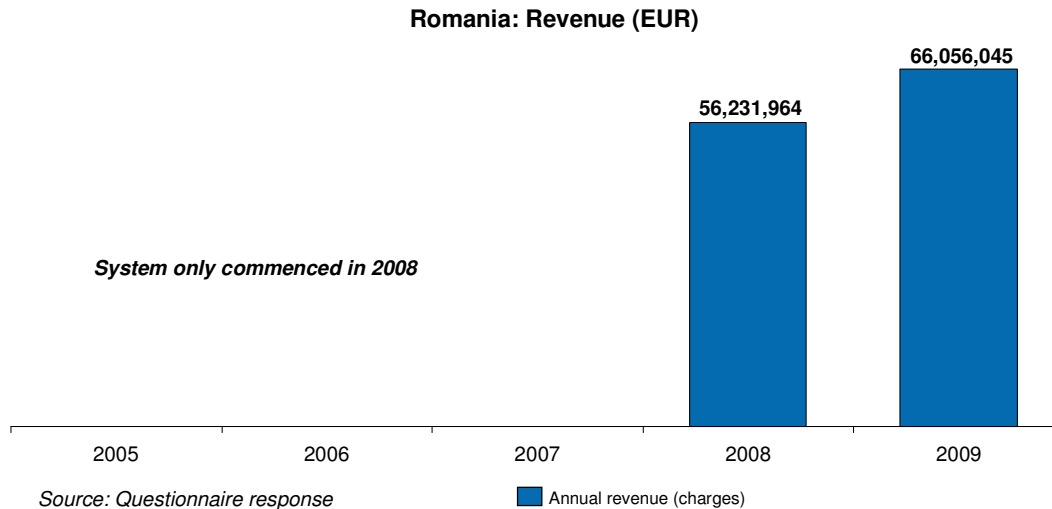
The graph below shows the number of vignettes sold in 2008, when the system began, and 2009. Sales of all durations of vignette increased significantly over that time, with weekly vignettes doubling in number from 2008 to 2009.



**Figure 5-23: Romania - Vignettes Sold by Type**

Annual revenue has increased by 17% over the two years the system has been in place.

<sup>34</sup> 90 day pass to be introduced October 2010



**Figure 5-24: Romania - Revenue**

Despite having the lowest prices, Romania generates more revenue from vignette sales than Bulgaria and Slovakia, due to having a larger quantity of sales.

Romania was unable to provide a breakdown of vignette sales and vignette revenues by foreign users compared to domestic users. However, since Romania has recently switched to an electronic system (October 2010) this information may be more readily available in future.

Operating costs for the vignette system were estimated at 0.70 EUR per vignette plus a sales commission granted to the distributor of between 3-5% of the vignette purchase price. Our analysis suggests that the total operating costs, including sales commission but excluding enforcement costs, are approximately 4.5 million EUR, equivalent to 6.8% of the revenue collected.

#### 5.7.4 *User Convenience: Access and Information*

Vignettes can be bought in petrol stations and other licensed distributors using cash or credit cards. Electronic vignettes were introduced on 1 October 2010 and it has been possible to buy them over the internet since then. The new system uses number plate recognition in place of the standard vignette stickers. Since vignettes are now electronic, this enables foreign motorists to buy vignettes outside Romania (in advance of travel) and information on the vignette system is available in Romanian and English on the RNCMNR website, and displayed at all access points into the country.

In addition, several counties have adopted their own road user taxes<sup>35</sup>, and some cities also have a transit tax<sup>36</sup>, which can be a cause of confusion to both nationals and foreign. We understand that these schemes are currently under investigation by the European Commission to determine their compliance with the Eurovignette Directive.

<sup>35</sup> For example, road user taxes have been introduced in Constanta by the Constanta Local County Decision 223/13.08.2008, in Tulcea by the Tulcea Local County Decision 147/2009 and in Giurgiu by the Giurgiu Local County Decision 244/2009.

<sup>36</sup> For example, Cluj Napoca, Timisoara and Targu Mures.

### 5.7.5 Compliance and Enforcement

Failure to purchase a vignette is punishable by a fine and, in addition, a compensation fee equivalent to using the road network for 1 year is charged, i.e. 28 EUR. The value of the fine itself was not specified.

In Romania, 40% of registered vehicles do not have vignettes and it is estimated that a large percentage of these, around 35-40%, use the vignettted road system and are therefore in contravention of the law. This equates to a non-compliance rate for domestic users of around 15%<sup>37</sup>, which is high compared with most other surveyed countries. The non-compliance rate of foreign vehicles is unknown.

It is therefore unsurprising that the revenue generated by enforcement is comparatively large, at 14 million EUR in 2009, and is equivalent to 20% of revenue from vignette sales. In other Member States enforcement revenue is equivalent to a maximum of 7% of the size of vignette sales revenue. This would indicate that there is some success in detecting violators, but that fine levels may be too low relative to vignette prices for them to be a sufficient deterrent. Further investigation would be needed to understand the dynamics around violation rates, compliance, enforcement and revenue in Romania.

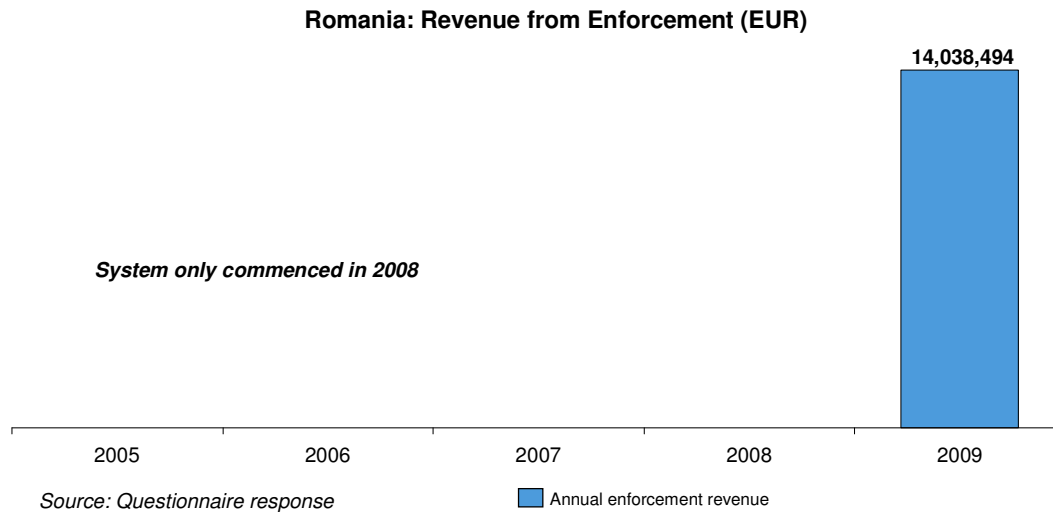


Figure 5-25: Romania - Enforcement Revenue

### 5.7.6 Impact of the Vignette System

No reduction in road traffic was observed when the system opened in 2008.

### 5.7.7 Future Plans

The electronic system was introduced in October 2010. This monitors the presence of vignettes at fixed points by linking vignette purchases to vehicle number plates. This is predicted to increase the number of vignettes sales and reduce the number of violators.

<sup>37</sup> I.e. 37.5% \* 40% = 15%

## 5.8 THE SLOVAK REPUBLIC

The Slovak Republic	
Population	5.4 million
GDP per capita (EUR)	11,700
Cars per 100 inhabitants (2006)	247
Scope of vignette scheme	Motorways and Highways only
Size of road network covered	467 km
Typical transit length	300 km
Minimum cost of vignette, EUR/ (period of validity)	4.90 / (week)

Source: Eurostat, Ministry of Transport, Posts and Telecommunications, The Slovak Republic, Booz & Company analysis

**Table 5-16: The Slovak Republic - Summary**

### 5.8.1 Policy: Purpose and Scope of Scheme

The vignette system that covers all highways and motorways in the Slovak Republic (also known as Slovakia) was established to provide funds for construction and maintenance of highways and motorways. According to the Ministry of Transport, Posts and Telecommunications, the revenue derived from the vignette system is used for covering the expenses of maintaining road infrastructure and for the construction of new roads. However, the revenue is not hypothecated for this purpose.

Exemptions exist for vehicles of the Ministry of Interior; the Ministry of Defence; the armed forces or civil corps of the commissioning states when fulfilling their duties; the rescue forces; the administrator of roads; the Railway Police; the Corps of Prison and Judicial Guard; disabled people; foreign diplomats; customs administration and historical vehicles.

The vignette charges did not replace any other taxes. Motorists in the Slovak Republic also pay a vehicle tax and fuel tax.

### 5.8.2 Price of Vignettes

The price of the vignette is based upon “economic analysis and political decision”. These charges are reviewed on an annual basis.

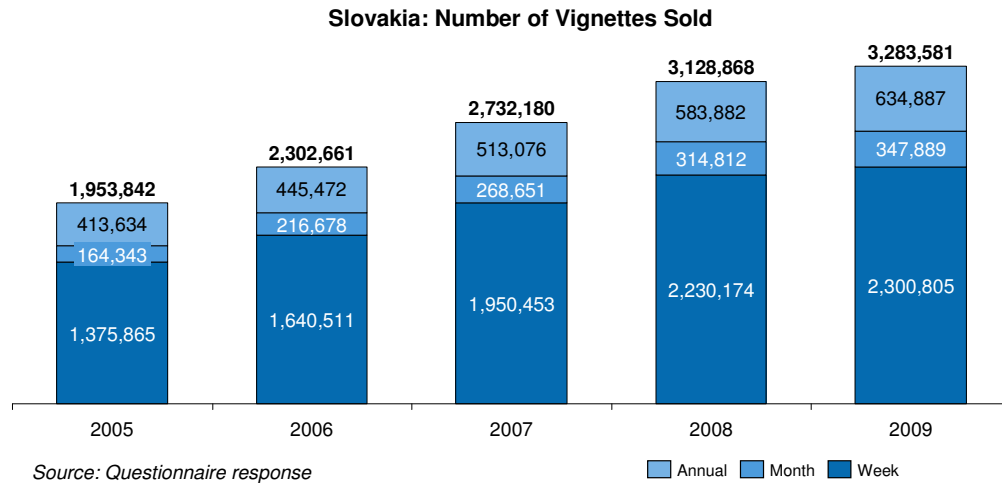
The charge schedule is given below.

Time Period	Charge	Equivalent Per day
Annual	€ 36.50	€ 0.10
Month	€ 9.90	€ 0.33
Week	€ 4.90	€ 0.70

**Table 5-17: The Slovak Republic - Charge Schedule**

### 5.8.3 Vignette Sales, Revenues and Costs

In line with many other countries, the vast majority (70%) of vignettes sold in the Slovak Republic are for the shortest time period available (one week). The graph below gives vignette sales by duration for the last five years.

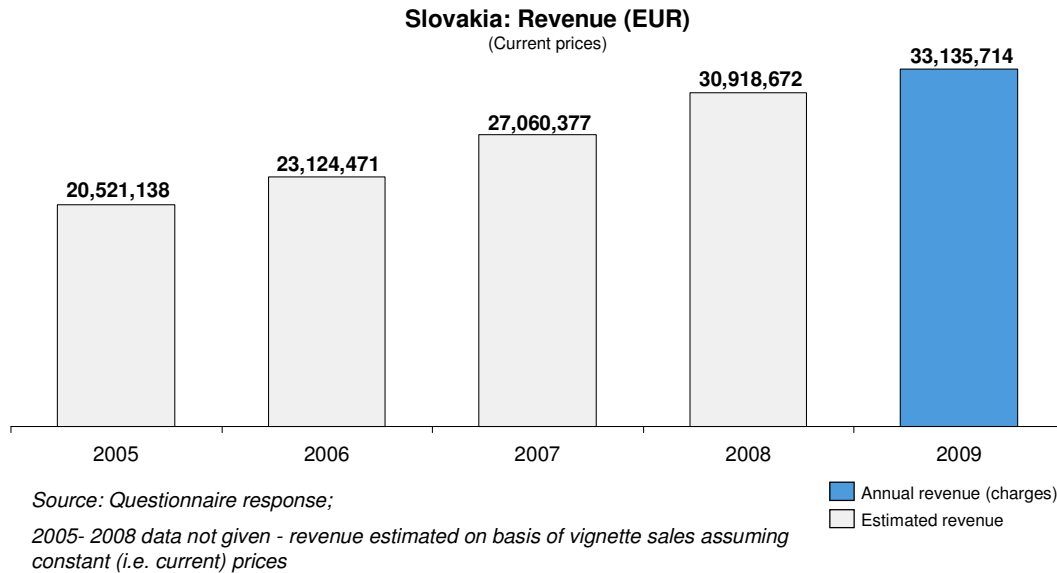


**Figure 5-26: The Slovak Republic - Vignettes Sold by Type**

The growth in sales of vignettes over the time considered is impressive, with sales of all types of vignettes increasing by at least a 10% compound annual growth rate. The total sale of vignettes increased by over 14% per annum in the time period considered.

Figures for revenue from vignette charges were given for the most recent year only. An estimate of previous years' revenue is calculated based upon the sales figures of vignettes, and shown in Figure 5-27 below<sup>38</sup>.

<sup>38</sup> Historical price schedule information was also unavailable, thus the estimated revenue figures are calculated based on current prices, with the assumption that prices increased in line with inflation. Therefore, the estimated revenue figures are accurate only in so far as vignette prices have increased in line with inflation, and should be used with caution.



**Figure 5-27: The Slovak Republic – Revenue**

The Slovak Republic was unable to provide a breakdown of vignette sales and vignette revenues by foreign users compared to domestic users.

Annual operating costs for the vignette system, excluding enforcement costs, are estimated at 186,960 EUR + VAT, which equates to less than 1% of the revenue generated. This is by far the lowest operating cost of any system surveyed, being 25% lower per transaction than the second lowest (Austria). However, without a more comprehensive definition of such costs, it is unclear what is included to make a reasonable comparison.

#### 5.8.4 *User Convenience: Access and Information*

The vignettes can be purchased at border crossings, from service stations and post offices using cash or credit cards. Information on the system is provided in leaflets which are available at every point of sale, printed in both English and Slovak, and is also available on the National Motorway Company website (Narodna dialnicna spolocnost (NDS), [www.ndsas.sk](http://www.ndsas.sk).) Motorists are also reminded of the obligation to buy vignettes by large road signs at every border crossing.

#### 5.8.5 *Compliance and Enforcement*

In the case of non-compliance, an on-the-spot fine of up to 99 EUR may be charged; if the person is unable to pay it immediately, the police may retain the motorist’s driving licence until the fine is paid. If offenders fail to pay the fine they risk incurring an administrative proceeding that could result in a fine of up to 495 EUR. This fine may be paid in cash, by cheque, credit card or bank transfer.

#### 5.8.6 *Impact of the Vignette System*

The vignette system appears to have had virtually no effect on the growth of traffic in the Slovak Republic given the steady increase in vignette sales over the time period considered.



### 5.8.7 *Future Plans*

The Slovak Republic divulged no firm future plans, except that its system would be in accordance with the “EU concept”. However, the price of all types of vignettes is set to increase by approximately 40% from 1<sup>st</sup> January 2011.

Slovakia introduced an electronic distance based road user charging scheme for heavy vehicles on motorways on 1 January 2010. This may also influence future developments for private vehicle tolling in Slovakia.

## 5.9 SLOVENIA

Slovenia	
Population	2.0 million
GDP per capita (EUR)	17,300
Cars per 100 inhabitants (2006)	488
Scope of vignette scheme	Motorways and expressways
Size of road network covered	592.2 km
Typical transit length	200 km
Minimum cost of vignette, EUR / (period of validity)	15 / (week)

Source: Eurostat, Ministry of Transport, Slovenia, Booz & Company analysis

**Table 5-18: Slovenia - Summary**

### 5.9.1 Policy: Purpose and Scope of Scheme

The vignette system was introduced in Slovenia on 1 July 2008, replacing a manual toll system. The vignette system covers all motorways and expressways managed by the Motorway Company of the Republic of Slovenia (DARS d.d.), and is applicable to motorbikes, cars and vans. The purpose of the vignette system is to raise revenue to fund the maintenance of road infrastructure, to cover network operating costs, and to pay off loans taken out for the construction of the motorways. The revenue appears to be hypothecated for these purposes.

In addition, other motoring charges in Slovenia include: annual vehicle tax, registration tax and fuel tax.

### 5.9.2 Price of Vignettes

The price of the vignette is determined as a political decision informed by forecasts of the revenue required for financing, operating and maintaining the motorways. The structure of charges is based on expected revenue. It was deemed by the government that the vignette charges had to be lower than the former toll charges that were replaced. The charge schedule is set out below. Prices are reviewed on an annual basis.

Time Period	Charge	Equivalent Per day
Annual	€ 95.00	€ 0.26
Month	€ 30.00	€ 0.99
Week	€ 15.00	€ 2.14

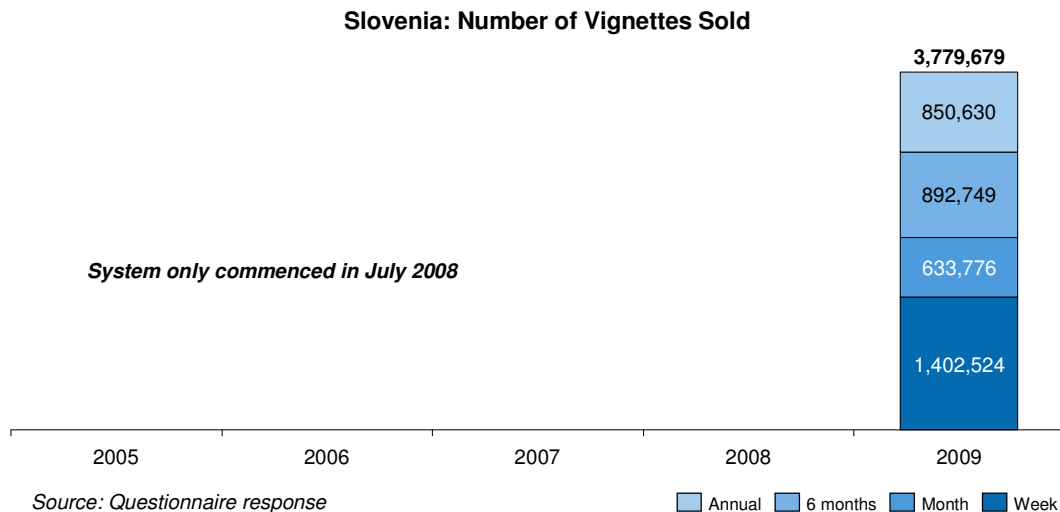
**Table 5-19: Slovenia - Charge Schedule for Cars & Vans**

At 15 EUR for a weekly pass, Slovenia has the highest minimum charge as well as the highest equivalent daily rate (2.14 EUR for the weekly vignette) of all the Member States considered in this study. The difference between the equivalent daily rate for the weekly

pass and that for the annual pass is also the greatest of all the countries considered, with the daily rate for the weekly pass standing at 8.2 times the equivalent daily rate for the annual pass. Given the annual vignette can be valid for up to 14 months<sup>39</sup>, this ratio is even higher. However, the Czech, Bulgarian and Romanian vignettes come close to this, with their daily rate for the minimum period being 7 times or more their equivalent daily rate for the annual pass.

### 5.9.3 Vignette Sales, Revenues and Costs

Data on number of vignettes sold was provided for 2009 only.



**Figure 5-28: Slovenia - Vignettes Sold by Type**

The number of vignettes sold is evenly spread across the different types of vignette, though weekly vignettes are the most popular and accounted for 37% of sales in 2009. Weekly vignettes were only introduced on 1 July 2009, when 6 monthly vignettes were abolished (except for motorcycles). These changes in available vignette types occurred after the European Commission had initiated an infringement procedure in October 2008 which required Slovenia to start offering short time vignettes in addition to the annual and six month vignettes which were, at that time, all that was available. This infringement procedure was launched explicitly to stop what the Commission said was “discriminatory treatment of occasional users on Slovenian toll roads”. The proceedings against Slovenia were formally drawn to a close in January 2010 in view of the introduction of weekly and monthly vignettes on 1 July 2009.

Revenue from sales was 107.9 million EUR in 2009. 2010 looks set to exceed this as it already stands at 94.8 million EUR (to 31 July 2010) indicating full year sales perhaps closer to 150 million EUR. This suggests that the change in vignette product types has encouraged demand by reducing the cost of transiting Slovenia.

<sup>39</sup> <http://www.slovenia.info/?faq=199&lng=2>.

### Slovenia: Revenue (EUR)

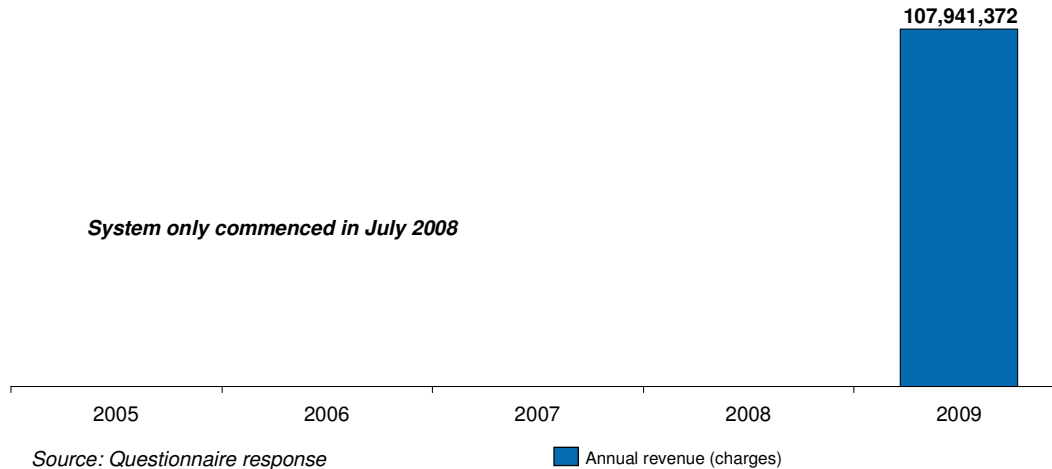


Figure 5-29: Slovenia - Revenue

Slovenia was unable to provide a breakdown of vignette sales and vignette revenues by foreign users compared to domestic users.

The operating cost of the vignette system, including costs of printing, distribution and provision, was 6.5 million EUR in 2009, equivalent to 6% of revenue.

#### 5.9.4 User Convenience: Access and Information

Information on the vignette system is promoted via internet, car touring clubs, printed media and leaflets on the borders. Signs are provided advertising the requirement for vignettes from 50 km before the Slovene national borders (although anecdotal evidence indicates the signs are only available in Slovene<sup>40</sup>). At sales points, printed information is provided in five languages, while on the internet, information is given in Slovene and English. Particular effort is made to inform foreign users, and information is available via EU car touring clubs, as well as via the internet and brochures, the Slovenian tourist board, and Slovenian embassies in Europe and Israel.

#### 5.9.5 Compliance and Enforcement

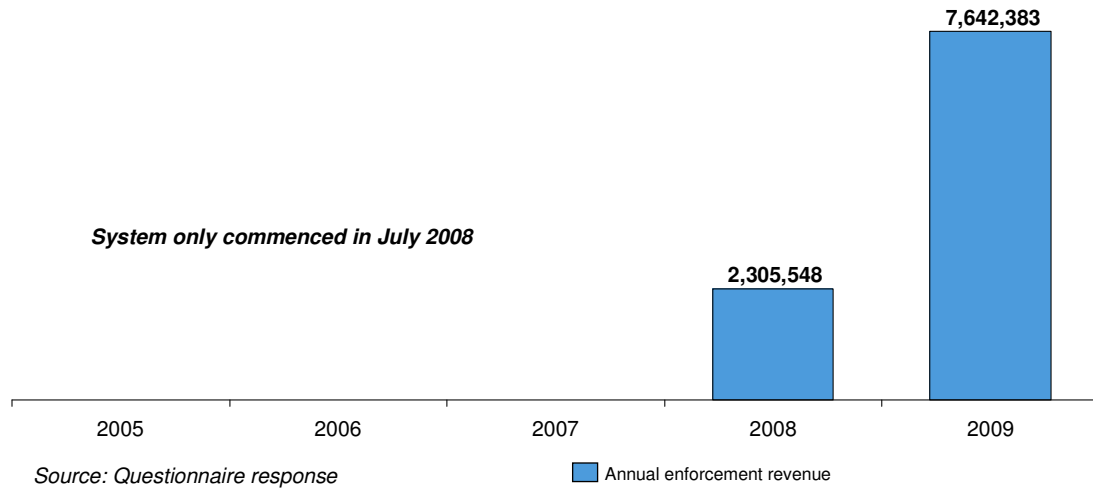
Spot-checking of vignette stickers by the Police is used to enforce the system. In the event of a non-valid vignette, the driver is subject to an on-the-spot fine of 150 EUR. If the driver fails to pay within 8 days, the fine rises to 300 EUR. There is anecdotal evidence that enforcement in Slovenia includes confiscation of identification documents (e.g. driving licence or passport)<sup>41</sup>.

The estimated violation rate is 3%.

<sup>40</sup> [http://wikitravel.org/en/Slovenia#By\\_car](http://wikitravel.org/en/Slovenia#By_car).

<sup>41</sup> This is even alluded to on the Slovenian vignette official website where it is stated "If toll supervisors of DARS d.d. seized your documents, we will verify payment to our account before returning them; we will then pass the documents to the embassy of your country." at [https://www.dars.si/Dokumenti/Toll/Methods\\_of\\_payment/Vehicles\\_up\\_to\\_35\\_t/Vignette/How\\_to\\_pay\\_the\\_fine\\_501.aspx](https://www.dars.si/Dokumenti/Toll/Methods_of_payment/Vehicles_up_to_35_t/Vignette/How_to_pay_the_fine_501.aspx)

### Slovenia: Revenue from Enforcement (EUR)



**Figure 5-30: Slovenia – Enforcement Revenue**

The cost of enforcement is estimated at 3.5 million EUR – equivalent to almost half the revenue generated by enforcement.

#### 5.9.6 *Impact of the Vignette System*

Positive effects of the vignette system are cited by the Slovene Ministry of Transport, including an increase in traffic safety and reduced congestion, and consequently reduced emissions. This is partly as a result of the closure of manual toll booths for private vehicles.

#### 5.9.7 *Future Plans*

Slovenia plans to replace the current vignette system with free-flow kilometre-based road charging.

## 5.10 PRICING SCHEDULES IN THE SEVEN STATES

This section focuses on pricing since it is perhaps the single most important consideration from a user perspective.

The graph and table below gives the full price schedule for each country.

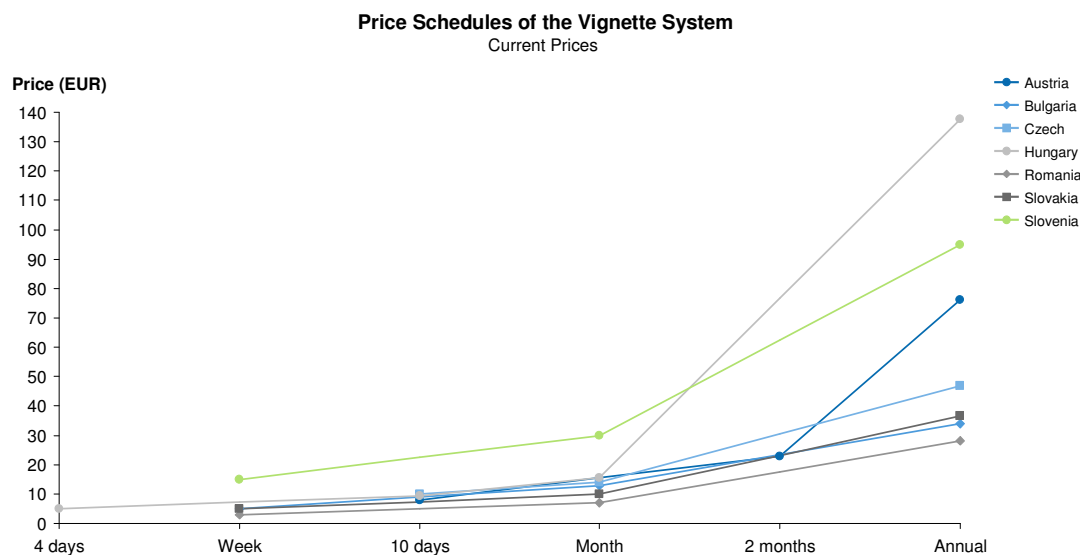


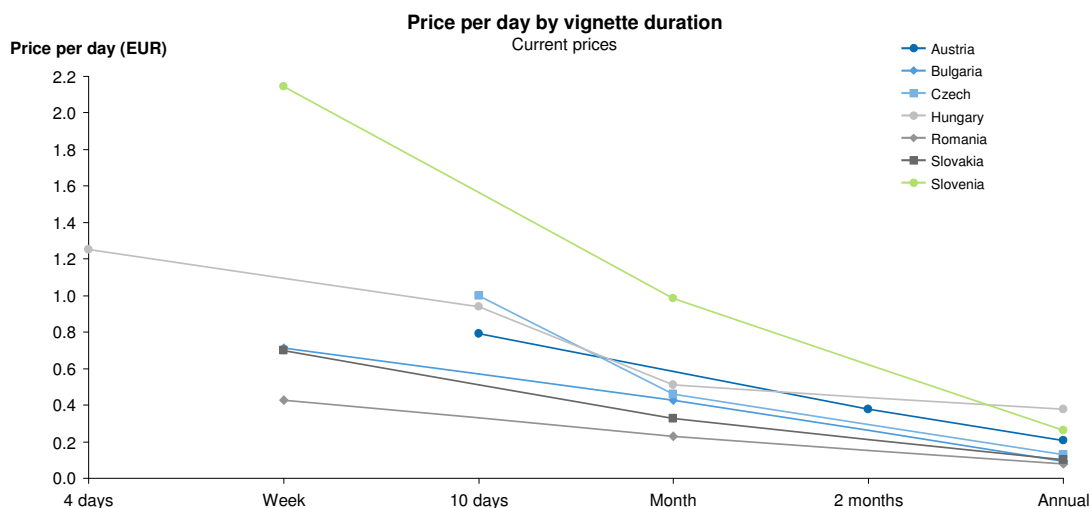
Figure 5-31: Price Schedules of the Seven Vignette Systems (EUR)<sup>43</sup>

As the graph illustrates, Slovenia's pricing is the highest for weekly and monthly vignettes, and second only to Hungary for annual vignettes. Slovakia, Bulgaria and Romania offer some of the lowest prices across the board.

Considering the pricing on a daily basis as seen in Figure 5-32 below (equivalent price per day), Slovenia comes out as by far the highest priced on a weekly and monthly basis.

<sup>42</sup> Average of 4.30 and 5.70 across 12 months (varies according to season)

<sup>43</sup> Source: Member States' response to Booz & Company Questionnaire



Average Daily Price by Vignette Duration	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
4 days				1.25			
Week		0.71			0.43	0.70	2.14
10 days	0.79		1.00	0.94			
Month		0.43	0.46	0.51	0.23	0.33	0.99
2 months	0.38						
Annual	0.21	0.09	0.13	0.38	0.08	0.10	0.26

Source: Member States' Response to questionnaire; Booz & Company analysis

**Figure 5-32: Equivalent Price per Day of the Seven Vignette Systems<sup>44</sup>**

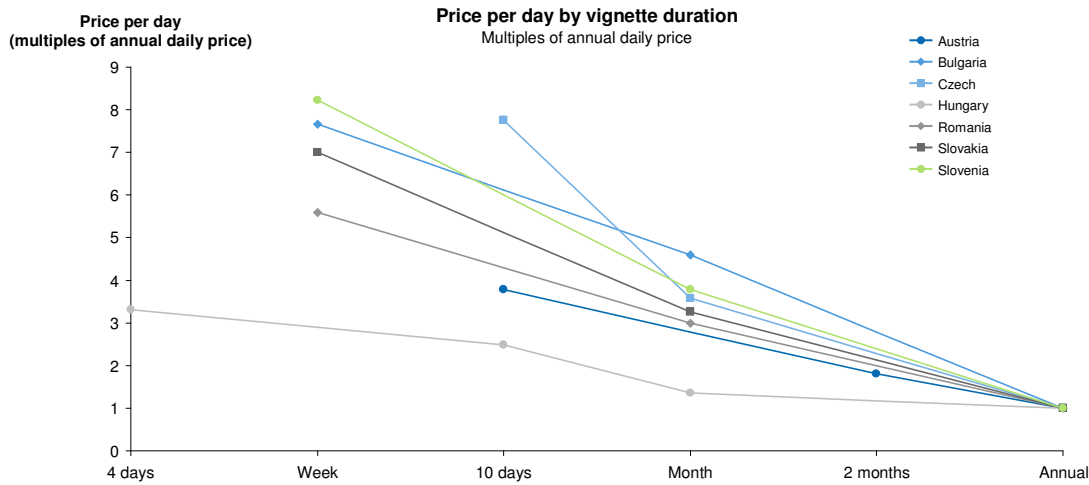
Figure 5-32 illustrates that prices converge as the duration of the vignette increases. The absolute difference in the daily rate between the most expensive and the cheapest weekly vignette is significantly greater than the price differentials across the annual vignettes (a difference of 1.70 EUR compared with 0.30 EUR). However, if relative difference is considered, the most expensive vignette is approximately five times more expensive than the cheapest vignette for both weekly and annual vignettes.

The gradient of the curve in the graph above provides an indication of the relative price of short term vignettes to longer term vignettes. The steeper the curve, the more expensive a short period vignette is relative to a vignette covering a longer period. Hence the charge structure for Slovenia is most expensive for short-term users, whilst the Hungarian charge structure, which is comparatively flat, is the least expensive for short-term users compared with the price paid by long-term users. It is also notable that the price per day for the 10 day vignette for the Czech Republic is significantly higher than the price per day for the monthly vignette.

The graph below shows vignette price schedules in multiples of the equivalent daily price of the annual vignette. This is relevant since foreign users tend to predominantly buy short-term vignettes, and annual passes are going to be bought by domestic users for the most

<sup>44</sup> Note: Average daily price is calculated by taking the price of the vignette and dividing by the number of days validity, e.g. for Austria, the price per day for a 10 day vignette is 0.79 EUR (7.90EUR/10 days) while the price per day for an annual vignette is 0.21 EUR (76.20EUR/365 days).

part. It is therefore an effective assessment of whether a system shows signs of discriminating against foreign users.<sup>45</sup>



Sources: Questionnaire responses; Booz & Company analysis

Ratio of Average Daily Price for each Vignette Type compared to Annual Price	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
4 days				3.3			
Week		7.7			5.6	7.0	8.2
10 days	3.8		7.8	2.5			
Month		4.6	3.6	1.3	3.0	3.3	3.8
2 months	1.8						
Annual	1	1	1	1	1	1	1

Figure 5-33: Ratios of Short Term Prices to Annual Prices of the Seven Vignette Systems

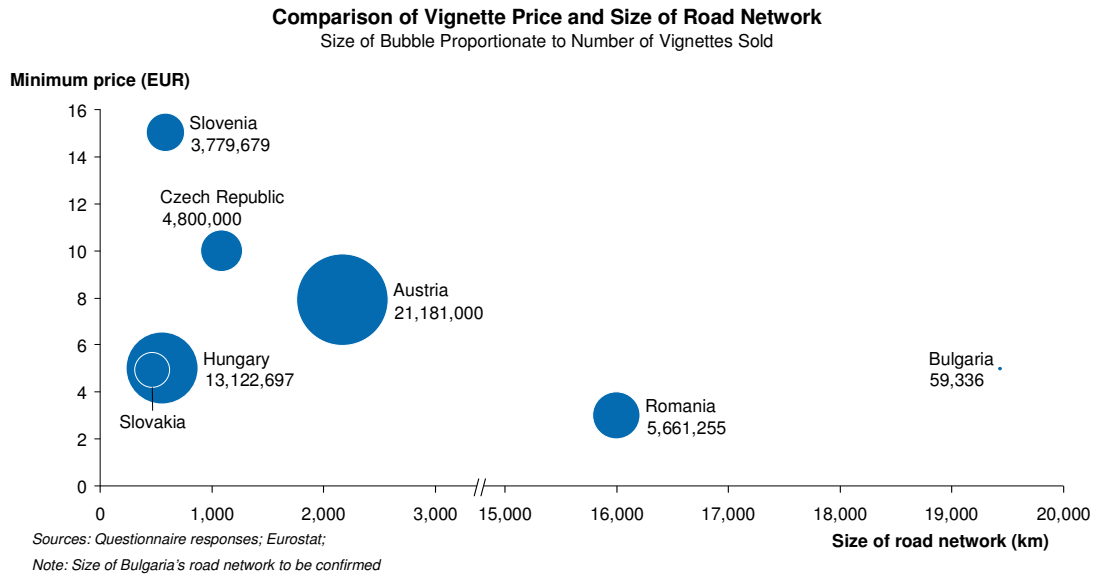
The price schedule that has the least variation across vignette products is Hungary's, where the daily rate for the minimum period pass is only just over three times the daily rate for the annual pass. In contrast, Slovenia has the greatest variation in price, with the minimum daily rate equating to over eight times the daily rate for an annual pass. In all cases it would be expected that a portion of the cost of each vignette is a charge for the administrative cost of selling the vignette. As was seen in Figure 5-4, the range for total costs divided by transaction could be between €0.06 and €2.50, so that the prices of short term products are proportionately more about administrative costs than the prices of longer term products.

As seen previously, the size of the road network covered by the vignette system varies greatly, and it is worth considering if there is a relationship between price of vignette and the number of kilometres of road it allows the user to access. The graph below compares the minimum price charged with the size of the road network covered by the vignette system. The results are surprising and show that if a relationship exists at all, the relationship

<sup>45</sup> The average daily rate of an annual pass is calculated by taking the price of an annual pass and dividing it by the number of days in a year (i.e. 365). Similarly, the daily rate of a weekly pass is calculated by taking the price of the weekly pass and dividing by the number of days in a week (i.e. 7). These daily rates can then be compared to give an indication of the savings gained by purchasing vignette passes of a longer duration. For example, Austria's average daily rate for an annual pass is 0.21 EUR, while its average daily rate for a ten day pass is 0.79, thus the daily rate for the minimum period pass is almost four times the daily rate for an annual pass (0.79 / 0.21 = 3.8 times).



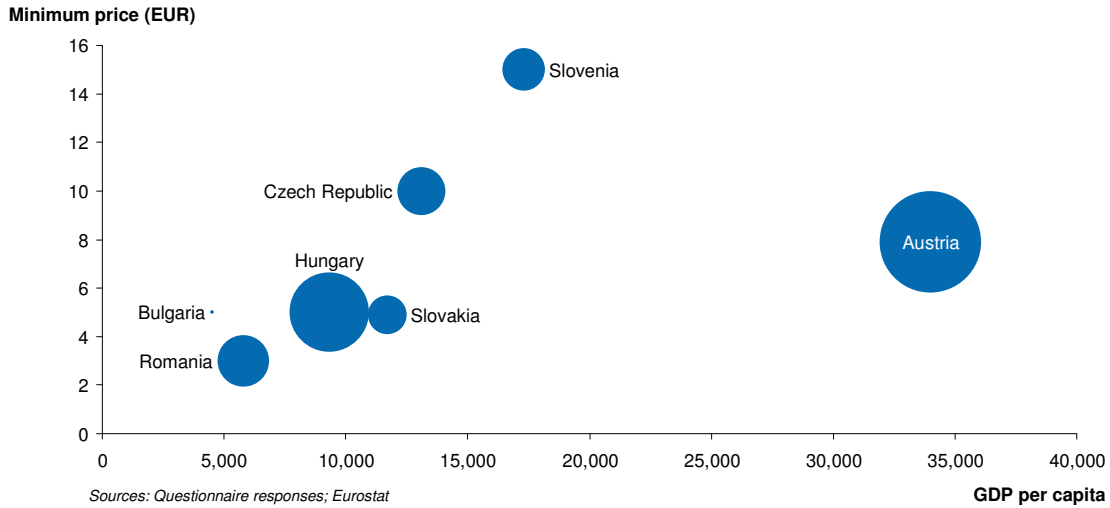
between size of the road network and minimum price of a vignette is negative. In particular, it is notable that Romania and Bulgaria have the largest charged networks and amongst the cheapest prices. It could be considered that there is quite a high “value for money” in terms of length of network accessible for vignettes in Romania and Bulgaria compared to Slovenia’s shorter network and charges significantly higher than those of all other surveyed Member States. However, it is noted that much of the network charged in both Bulgaria and Romania is not to motorway standard.



**Figure 5-34: Comparison of Vignette Price and Size of Road Network**

Figure 5-35 below illustrates that there is a positive relationship between GDP per capita and minimum price, indicating that prices are, to some extent, set based on the national population’s ability to pay. Under this measure, the Austrian system appears comparatively good value for money, again Slovenia appears to be a particular outlier compared to other Member States by this measure.

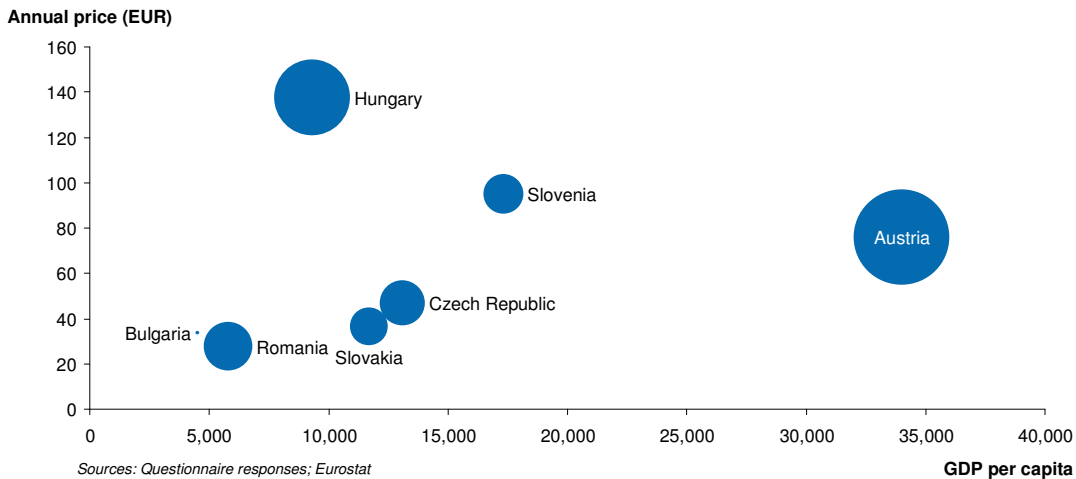
**Comparison of Price, GDP per capita, Number of Vignettes Sold**



**Figure 5-35: Comparison of Minimum Vignette Price and GDP**

However, this pattern is less clear if the same information is considered on the basis of the cost of the annual vignette, partly due to Hungary’s expensive annual vignette. Most schemes surveyed have a loose correlation to GDP per capita, but both Slovenia and Hungary have proportionately more expensive annual vignettes.

**Comparison of Price, GDP per capita, Number of Vignettes Sold**



**Figure 5-36: Comparison of Annual Vignette Price and GDP**

Overall, Slovenia has the most expensive vignette, having the most expensive short term and second most expensive annual vignette products. Bulgaria and Romania have the cheapest, but this reflects significantly lower GDP per capita. Others do not appear to be significantly out of alignment based on GDP per capita, network length and general quality.

	Austria	Bulgaria	Czech R.	Hungary	Romania	Slovakia	Slovenia
2009 Revenue (exc. Enforcement) (€ Mn)	338	13.9	117.2	89.3	66.1	33.1	107.9
Size of vignette road network (km) 2010	2,170	19,400	1,087	555	16,000	467	592
<b>Revenue per km of network charged (€)</b>	<b>115,760</b>	<b>717</b>	<b>107,820</b>	<b>160,929</b>	<b>4,129</b>	<b>70,954</b>	<b>182,333</b>
Numbers of vignettes sold 2009 (millions)	21.18	0.06	4.8	13.12	5.66	3.28	3.78
<b>Revenue per vignette sold (€)</b>	<b>16</b>	<b>n.a.<sup>46</sup></b>	<b>24</b>	<b>7</b>	<b>12</b>	<b>10</b>	<b>29</b>
Highest priced vignette product (€)	76.20	34.00	47.00	137.80	28.00	36.50	95.00

**Table 5-20: Vignette revenue per km and per vignette charged**

Table 5-20 compares the revenue of the vignette systems surveyed against the length of the networks charged and the numbers of vignettes sold. Slovenia generates the highest revenue per km of charged network, at 13% higher than the second highest, Hungary. By contrast, Bulgaria generates only €717 per charged km. The lower revenue in Bulgaria and Romania partly reflects the larger networks charged and the lower traffic densities across such large networks. The average revenue generated per km across the seven Member States surveyed is €97,520, although if Bulgaria and Romania are excluded it would be €135,559. These values can be applied to benchmark the vignette systems of this study with other road charging schemes. Of particular interest is the ratio of revenue generated by a private vehicle vignette to revenue from an HGV vignette. For example, the Austrian HGV tolling scheme generates significantly more revenue than the private vehicles vignette, at €425,242 per km<sup>47</sup>. This is consistent with the far higher cost that HGVs impose on road infrastructure and indicates that a reasonable ratio exists between light vehicle charges and heavy vehicle charges in Austria. Further assessment of proportionality based on cost recovery would require additional data and a more detailed assessment of costs in other Member States.

The table also compares revenue per vignette sold. Hungary has the lowest revenue per vignette sold, reflecting the relatively low sales of annual vignettes and the attractiveness of the shorter term 4 day vignette. This is interesting given Hungary has the second highest revenue per km charged, indicating a high number of sales for a relatively small network, so revenue is made from the sheer quantity of vignettes sold rather than high charges.

Slovenia had the highest revenue per vignette sold, at over four times that of Hungary's. However, the Czech Republic revenue per vignette sold was the highest ratio of revenue compared to the highest priced product (€24 per vignette sold is 52% of the value of the €47 annual product). The average (excluding Bulgaria) is €16, with the Czech Republic 50% higher at €24 and Slovenia 81% higher at €29. It is notable that Slovenia has the highest revenue per vignettes sold and highest revenue per km charged.

<sup>46</sup> Bulgaria's revenue and sales figures are inconsistent and therefore unsuitable for comparative analysis.

<sup>47</sup> Source: Based on data from ASFINAG Annual Report 2009.

## 5.11 OVERVIEW OF INTERNATIONAL TRAFFIC

In each of the seven Member States assessed, the vignette system for private vehicles applies to either the motorway network only, or to the motorway and highway network only, with the exception of Bulgaria and Romania. A larger proportion of traffic on those major roads is likely to include foreign trips, as these are the networks that connect countries to each other. However, nationals of those countries undertake the vast majority of passenger vehicle trips in the surveyed Member States.

In order to assess the proportion of international traffic within each of the seven Member States with vignette systems for private vehicles, TRANS-TOOL model was used. TRANS-TOOL<sup>48</sup> is a multi-modal European transport network model that has been developed by the European Commission. The model's base data provides origin-destination flow data (O-D data) for journeys made by air, rail and car between allocated "zones" within Europe. This typically splits a country into 20-50 sub-regions. The base year of the data is 2005<sup>49</sup>.

Domestic trip data and international trip data (trips where the destination is within the country of interest, but the origin is another country) was extracted from the dataset for each of the seven relevant countries. For the purpose of our study, only international trips with a destination in the country of interest but an origin in another country were included. It is assumed that these are trips made by foreign motorists. In addition, an assessment was made of which trips were likely to transit through a country of interest, (i.e. the origin and destination of the trip are in different countries, but the most logical route would be to transit the country of interest). International trips and transit trips were combined to make up total foreign trips.

A detailed description of the methodology applied to extract values from TRANS-TOOL is provided in the Appendix.

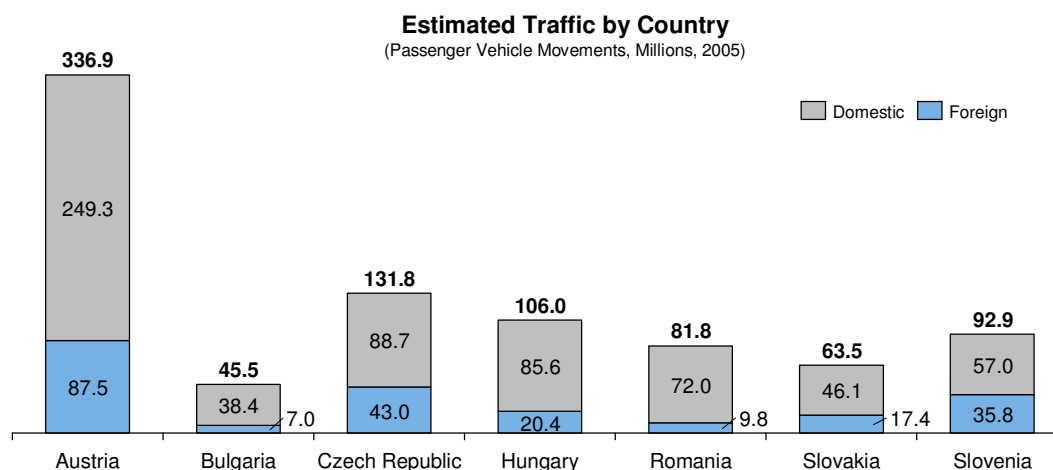
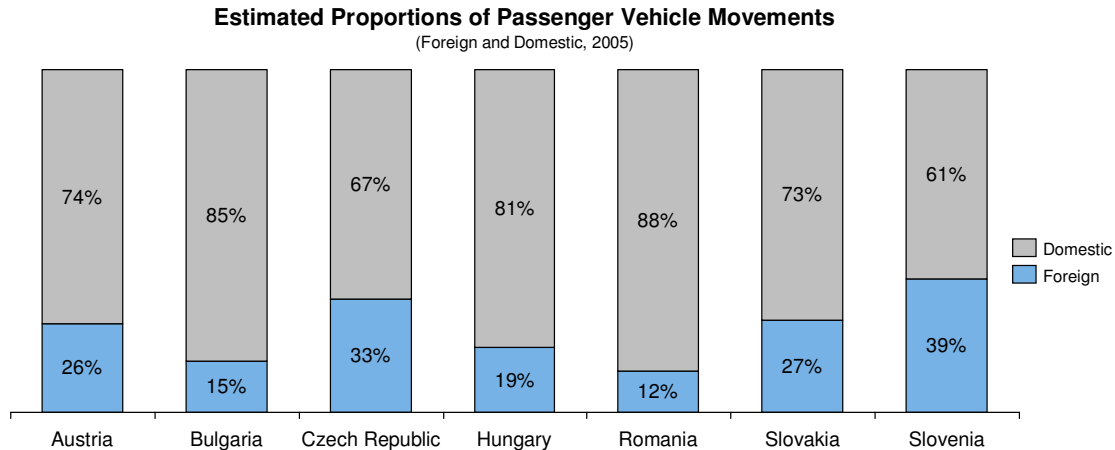


Figure 5-37: Domestic and Foreign Trips of the Seven Member States

<sup>48</sup> "Tools for TRansport forecasting ANd Scenario testing

<sup>49</sup> This is the most recent version available; work on a new model with updated base matrices will begin in January 2011

Figure 5-37 shows the total estimated vehicle movements, as extracted from TRANS-TOOL. It must be noted that these movements include only those trips that start and end in different zones, since the assumption is made that inter-zone trips will be undertaken on local roads that are not covered by the vignette. Figure 5-38 illustrates the proportion of trips that are undertaken by foreign vehicles. The data extracted has been validated against the data provided by Member States, and was found to be reasonably consistent.



**Figure 5-38: Proportion of Foreign Trips within the Seven Member States**

It is difficult to link these figures directly to vignette sales since they represent numbers of journeys whereas vignette sales represent purchases of the right to make journeys on networks over a set period of time. However, they do provide an indication of the proportion of foreign users, and some indication of how this varies between the Member States. Slovenia would appear to be the Member State surveyed with the highest proportion of visitor and transit traffic, whereas Romania is the lowest. This would appear to be in alignment with data received on vignette sales and reflect the networks and geographies of the countries surveyed. This indicates that the pricing and operation of the Slovenian vignette will have a proportionately higher impact on nationals from other EU Member States than the vignettes of Romania and Bulgaria.

## 6. EVALUATION OF VIGNETTE SYSTEMS

### 6.1 STRENGTHS AND WEAKNESSES OF VIGNETTE SYSTEMS

The primary strengths of vignette systems can be summarised as follows:

1. Recovery of network costs: Vignette systems can generate net revenue that can be applied to recover the long run capital expenditure on road infrastructure. Vignette prices can be set to allow users to make a contribution towards the long run capital and operating costs of the road network. This can be a more secure and efficient<sup>50</sup> source of revenue than to seek funding from general taxation;
2. Encouragement of better network utilisation: Vignettes can be used to encourage more efficient behaviour by ensuring drivers do not treat roads as a “free” public good. Vignettes may also be used to incentivise drivers to use roads at particular time periods (e.g. seasonal charges to reflect higher network demand);
3. Charging foreign drivers for their road use: Both domestic and foreign users of a road network are required to pay a vignette. By contrast, fuel taxes might not be paid by foreign users if they fill their fuel tanks before entering a country and foreign motorists are not liable for annual ownership fees;
4. Ability to reflect environmental costs: Vignette rates may be set to meet environmental objectives such as reducing emissions. This may be achieved by encouraging use of lower emission vehicles through differential vignette rates;
5. Low operating costs: Compared with tolling or full road user charging systems, vignettes are a relatively low cost and simple method of directly charging for road use;
6. Easy to understand: As they are essentially time-based licences, vignettes are simple for motorists to understand (i.e. a vignette is permission to use a network within a certain time period). This makes it easier to introduce vignettes and to promote compliance from motorists; and,
7. Potential for development: The administrative and operational systems needed for vignette systems can be a “first step” towards more comprehensive tolling or road user charging schemes that can better address issues such as congestion. This has already been seen in the transition of some countries from the Eurovignette for heavy vehicles to electronic road tolling (e.g. Austria, Czech Republic, Germany and Slovakia).

The primary weaknesses of a vignette system are:

1. Inconvenience for users: The purchase of a vignette involves a cost in terms of the time required to make the transaction, particularly where paper or sticker vignettes are used;
2. Inability to directly reflect usage: Vignettes do not reflect actual usage of networks by vehicles and are limited in their ability to vary charges by route or time of day to reflect demand. Neither the distance travelled, nor time spent on charged routes is reflected in vignettes. As a result, road use will vary considerably amongst purchasers of the same

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<sup>50</sup> In terms of allocative efficiency

vignette. Heavy users of the network may pay the same charge as low users (over a similar time period), raising questions of fairness and equity, and limiting the scope of vignettes to reflect congestion and environmental costs;

3. Revenue growth is not directly proportionate to growth in traffic: Since vignettes are fixed charges for access to the road network, they do not generate additional revenue when motorists drive more frequently. As such, whilst vignette revenue might grow due to the number of vehicles, it will not reflect the need for extra expenditure (e.g. for capacity) based on the usage of those vehicles, so may be insufficient to meet the long run capital requirements in the absence of regular increases in prices; and,
4. High enforcement costs: Enforcement of the vignette requires manual intervention by enforcement officers. This is costly in terms of time for motorists and in terms of administration and staff time for the system. In addition, the inconsistent approach may incentivise evasion depending on drivers' perceptions of the likelihood of being stopped. Electronic vignette systems are more efficient.
5. Encourage use of local roads: In the case of vignettes applied only to motorways and highways, vignettes impose a high fixed cost for accessing motorway networks. This may mean shorter trips in some cases are diverted to local routes, which may be less efficient and create greater issues of pollution and congestion

## 6.2 ASSESSMENT OF VIGNETTE SYSTEMS

Each of the vignette systems in the EU operates in a slightly different way with variations in vignette charge rate structures, validity periods, and the determination of rates, as well as sales, information and enforcement procedures. To undertake a robust assessment of the various vignette systems, criteria should be applied based on considering issues such as:

- The economic principles behind road user charging for light vehicles (recovery of capital and operating costs of infrastructure and impact of environmental externalities);
- Administrative costs of vignette mechanisms;
- Extent to which such mechanisms are complementary to, and contribute to, European Transport Policy objectives, especially around mobility, economic efficiency and environmental sustainability;
- The extent to which other charging mechanisms (e.g. ownership taxes and fuel taxes) might offset any "discount" for long period users of vignettes; and,
- Existing EC Directives on heavy vehicle charging and whether the principles and policies within those are applicable to light vehicles.

## 6.3 OBJECTIVE CRITERIA FOR ASSESSMENT

### 6.3.1 *Introduction*

The vignette systems of the seven EU Member States that are the subject of this study have been assessed according to the key principles of the Treaty and the most relevant objectives of the European Transport Policy. The criteria developed provide a qualitative assessment

as to how well the vignette schemes satisfy those principles and objectives. The assessment that has been undertaken is indicative only, based on publicly available information and information provided by Member States in response to specific questions. The aim of this assessment is to identify where further investigation might be required.

### **6.3.2 Assessment of Non-Discrimination and Proportionality**

All vignette systems should be consistent with the principles of “non-discrimination” and “proportionality”. As described in Section 3 of this report, non-discrimination reflects the core principle that all EU citizens should be treated in a similar manner, and proportionality primarily means that prices should broadly reflect usage and the value derived by users, and that enforcement procedures and penalties should be proportionate to what is necessary. Objective criteria to assess compliance with these principles have been created so that an initial assessment can be made as to how successfully a Member State has implemented those principles within its vignette scheme. The criteria developed are not intended to form a quantitative assessment, but to provide an indication as to whether more detailed investigation might be justified.

#### ***a) Non-Discrimination: Nationals vs. Non-Nationals***

It is a core principle of membership of the European Union that Member States must not discriminate against EU citizens from other Member States, as this would hinder the free movement of people and goods across the EU. As such, it is unlikely that any Member State would do this explicitly. However, there is considerable potential for vignettes to be structured, sold and publicised in ways that could treat non-nationals of a Member State less favourably than nationals, and effectively resulting in discrimination.

The key methods by which vignette systems could treat non-nationals less favourably than nationals are:

- Setting charges that are disproportionately high for short term users of the network;
- Failure to provide sufficient information in languages other than the national language;
- Failure to provide adequate payment options, particularly for vignettes operated by countries with their own national currency; and
- Application of enforcement measures in inconsistent and non-transparent ways.

#### ***b) Proportionality & Price***

A key condition for proportionality is to ensure that vignette prices are set according to the relative levels of usage of motorists. As such, the prices should represent a form of proxy for usage charges based on the average amount of road use over the period of different vignettes. Whilst longer period vignettes reflect greater usage, it is not a linear relationship. Short term vignettes are likely to be used for more hours on average per day than longer term vignettes since they are more likely to be purchased for specific trips.

The application of proportionality to enforcement is also important, and enforcement procedures should be proportionate to the “harm done”. The penalties for violations should also be proportionate to the harm done and to the cost of operating the enforcement procedure. A fine should act as a deterrent to potential violators, but should not be greater than for other moving vehicle offences. In particular, “on demand” fines, when the motorist is expected to pay up instantly, often in cash, and is not given the option of paying within a



set time period, is viewed as disproportionate<sup>51</sup>. Stronger measures, such as confiscating drivers' licences until fines are paid, could also be seen as disproportionate when a violation does not constitute a safety issue.

By purchasing a vignette, motorists are effectively buying a service so it is fair to assess the proportionate value obtained from a vignette in terms of the accessible network and the service received throughout the vignette sales process. The value from the network accessed can be crudely measured by the length of the network covered and by a general assessment of the quality of that network. For quality of service, factors such as the availability of information about the vignette (in all relevant languages), adequacy of signage and the range of payment outlets and options are all relevant.

Finally, a vignette system, as a tool to recover costs, should reflect a fair and transparent cost allocation methodology in which costs are recovered from road users according to the proportion to which they benefit, on average, from the infrastructure and according to a fair distribution of the administrative costs they impose and the infrastructure costs they impose through wear and tear<sup>52</sup>. This is consistent with the "user pays" principle.

### *c) Objective Criteria*

The objective criteria for assessing non-discrimination and proportionality of vignette systems need to balance sufficient detail and information to demonstrate consistency with those principles, with the need for the criteria to be measurable and to be relatively quick and simple to apply. Each of the criteria should be answered with a "yes" or "no" to avoid any ambiguity as to whether or not a Member State is consistent with the principles of non-discrimination and proportionality. In each instance, a "yes" response indicates compliance with the principles. The core purpose of these objective criteria is to determine whether the short-term vignettes have been set at an optimum level where short-term or occasional users are charged only for their proportional share of road infrastructure costs, plus any reasonable administration costs. The proportion of administration costs allocated to occasional users could be higher to account for providing information and answering queries, since occasional users are more likely to need greater individual attention compared to regular users.

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<sup>51</sup> There may also be a possibility of "discrimination" here as this sort of procedure is likely to inconvenience non-nationals more than nationals.

<sup>52</sup> The key dimensions to cost recovery are:

Reflecting the costs for the road network subject to the vignette only (not cross-subsidising roads that are not subject to the vignette);

Charging the costs attributable to the vehicle categories subject to the vignette (so that light vehicles are not charged more than their share of fixed and marginal long run capital costs and operating costs);

Ensuring that the proportion of cost-recovery is transparent (meaning that if it is a policy decision to only recover 50% of attributable infrastructure costs, then it is clear that a vignette is set to recover just those costs);

Setting vignette prices by time series in proportion to the relative amount of usage of different categories of users; and, Setting vignette prices by time series taking into account relative administration and transaction costs.

Objective criteria for the assessment of non-discrimination are set out in Table 6-1 below:

**Table 6-1: Criteria for the Assessment of Non-Discrimination**

Type of criteria	
<b>Economic</b>	Are vignette products available that meet the needs of short term users, including transit users?
<b>Social</b>	Are vignettes available on an equal basis and price to nationals and non nationals?
	Is information on vignettes available outside the relevant Member State in sufficient languages for all motorists to understand what is required of them?
	Is signage on entering Member States explicit and clear for non-national motorists to understand how to comply?
	Are compliance requirements and enforcement penalties transparent and applied in a non-discriminatory and consistent manner?
<b>Technical</b>	Are vignette retail outlets available near all border crossing points on roads subject to the vignette, and are they open for sufficient hours to allow convenient purchase of a vignette?
	Do payment options exist that include credit cards, debit cards, and options to pay in cash using currencies that are not only used in the country concerned?

Objective criteria for testing the application of the principle of proportionality are in Table 6-2 below:

**Table 6-2: Criteria for the Assessment of Proportionality**

Type of criteria	
<b>Economic</b>	Does the price schedule for different durations of vignettes reflect variations in average usage?
	Do users get value for money for what they pay?
	Is an appropriate methodology applied to allocate infrastructure costs and administrative costs according to vignette product (i.e. short term, long term)?
<b>Social</b>	Are the enforcement procedures and practices proportionate to the "harm done"? E.g. Does enforcement result in "on demand" cash fines without the option to pay within a fixed time period?
	Are the penalties for vignette violations proportionate to lost revenue, costs and a reasonable deterrent factor?

#### *d) Assessment of Existing Schemes using Identified Criteria*

Based on the information supplied by surveys of EU Member States and publicly available material, the criteria listed above have been applied to the vignette schemes. Not all of the questions above have been able to be answered by these means. The assessment has been undertaken largely qualitatively and compares the relative strengths of applicability of the non-discrimination and proportionality principles by the surveyed Member States. This assessment is not considered to be an absolute assessment as to compliance with the Treaty, but an indication to guide where progress could be made to improve the quality of alignment to the principles of non-discrimination and proportionality.

**Table 6-3: Austria: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Austria's shortest vignette product is 10 days, which is not suitable for most short trip or transit users (e.g. weekend trips).
	Social	Austria claims to have reasonable standards of signage and information for motorists at the borders and within the country, including information in all relevant languages.
	Technical	Purchase options appear to be diverse, including options to purchase vignettes outside Austria's borders.
	<b>Conclusion</b>	Austria achieves reasonable standards of non-discrimination in relation to social and technical criteria, but poorly in terms of economic criteria. This could improve if it had a vignette product better suited to transit and short trips.
<b>Proportionality</b>	Economic	Austria is understood to use a transparent methodology to inform the setting of vignette prices.  The average daily cost of the 10 day vignette is 3.8 times higher than the average daily cost of the annual vignette. This is likely to be a proportionate reflection of relative road use and administration costs of different vignette purchasers.  Austria appears to offer a high standard of service both in terms of network and sales of vignettes.
	Social	The enforcement of vignettes in Austria is undertaken by 'on the spot' payment of 120 EUR, to be paid immediately. While credit or debit card as well as cash can be used to pay this fine, it does not appear to be proportionate to demand instant payment of a fine for a vignette.
	<b>Conclusion</b>	Austria achieves a reasonable standard of proportionality across vignette types, but it would be preferable if there were greater transparency as to the basis of the allocation of charges across vignette product types. It would also be preferable if instant fines were not required to be paid "on the spot".

Austria is considered to be reasonably compliant with the principles of non-discrimination and proportionality; its only weaknesses are the lack of availability of a shorter term vignette and the presence of instant payment fines. To meet best practice, Austria would be expected to have a vignette product that is better suited to short and transit trips, and options to pay fines within a set period rather than instantly.

**Table 6-4: Bulgaria: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Bulgaria's shortest vignette product is 1 week, which is unlikely to be suitable for many short trip or transit users (e.g. weekend trips).
	Social	Bulgaria claims to have information at border crossings in only Bulgarian and English, which may not meet the needs of some motorists from Romania and Greece (bordering EU Member States). Online information is only available in Bulgarian.
	Technical	Payment options appear to be limited to border crossings with payment in Euros and Bulgarian Levas (not the Romanian Leu).
	<b>Conclusion</b>	Bulgaria does not achieve high standards of non-discrimination in relation to social, technical and economic criteria. This could be improved if it had a vignette product better suited to transit and short trips, greater effort is taken to provide information in Romanian and Greek, and for payment to be accepted in Romanian Leu and/or with credit and debit cards.
<b>Proportionality</b>	Economic	The average daily cost of the 1 week vignette is almost 8 times higher than the average daily cost of the annual vignette. This is unlikely to be a proportionate reflection of relative road use of the different vignette type purchasers. Bulgaria's vignettes offer access to an extensive network, although most of that is not to motorway standard. Quality of service in vignette sales does not reflect the cost paid as information is not provided in neighbouring EU Member States languages nor can vignettes be bought in all neighbouring state's currencies.
	Social	No information was provided about enforcement, so no assessment could be made about proportionality of enforcement.
	<b>Conclusion</b>	It appears unlikely that Bulgaria's proportionality across vignette types (particularly between 1 week and annual products) could be justified. Greater transparency as to the basis of the allocation of charges across vignette product types would allow this to be determined more definitively. Greater transparency about enforcement procedures and fines would enable a more complete assessment to be made of proportionality.

Bulgaria does not achieve high standards of compliance with the principles of non-discrimination and proportionality. To better meet criteria of non-discrimination, it should have vignette products better suited to transit and short trips, improve information for Romanian and Greek motorists and provide a wider range of payment options than cash by two currencies. To better meet criteria of proportionality, Bulgaria should review its vignette price schedule with a transparent cost allocation methodology, and review its enforcement procedures and penalties to ensure their appropriateness.

**Table 6-5: Czech Republic: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	The Czech Republic's shortest vignette product is 10 days, which is not suitable for most short trip or transit users (e.g. weekend trips).
	Social	The Czech Republic claims to provide information at border crossings (and on the website) in all neighbouring Member State languages.
	Technical	Payment options are available at a wide range of outlets near borders including options to pay by credit and debit cards.
	<b>Conclusion</b>	The Czech Republic achieves reasonable standards of non-discrimination in relation to social and technical criteria, but not so well in terms of economic criteria. This could improve if it had a vignette product better suited to transit and short trips.
<b>Proportionality</b>	Economic	The average daily cost of the 10 day vignette is approximately 8 times higher than the average daily cost of the annual vignette. This is highly unlikely to be a proportionate reflection of relative road use of the different vignette type purchasers. The proportionality issue is also reflected in the relative price of the 10 day vignette compared to 1 month. The quality of network provided and customer service is reasonable, but not exceptional for the price paid.
	Social	The enforcement of vignettes in the Czech Republic is undertaken by on the spot fines, which would not appear to be disproportionate. The level of fines appears to be proportionately high (20x the price of the cheapest vignette).
	<b>Conclusion</b>	It appears unlikely that the Czech Republic's proportionality across vignette types could be justified. Greater transparency as to the basis of the allocation of charges across vignette product types would allow economic proportionality to be determined more definitively and enforcement penalties should be reconsidered for proportionality.

The Czech Republic achieves reasonable standards of compliance with the principles of non-discrimination and proportionality. To better meet criteria of non-discrimination, it should have vignette products better suited to transit and short trips. To better meet criteria of proportionality, the Czech Republic should review its vignette price schedule with a transparent cost allocation methodology and the relative level of fines compared to vignette prices.

**Table 6-6: Hungary: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Hungary's shortest vignette product is 4 days, which is likely to be suitable for many short trip users (e.g. weekend visits), but less so for some transit users. A summer surcharge is applied to the four day vignette only and this could be seen as discriminating against non-national users since they are more likely to purchase the four day product.
	Social	Hungary claims to provide information at border crossings (and on the website) in three major languages, but not in Romanian, Slovak or Slovene.
	Technical	Payment options are available at a wide range of outlets near borders including options to pay by credit and debit cards. There is also an option to purchase online or by phone in advance.
	<b>Conclusion</b>	Hungary achieves reasonable standards of non-discrimination in relation to economic, social and technical criteria, but could improve by providing information in the languages of all bordering EU Member States. It would be desirable to have vignette products for periods of less than 4 days for transit users. It should also apply the summer surcharge to all vignette products except the annual or abolish the surcharge.
<b>Proportionality</b>	Economic	The average daily cost of the 4 day vignette is approximately 3-4 times higher (depending on season) than the average daily cost of the annual vignette. This does not appear to be a disproportionate reflection of relative road use of the different vignette type purchasers. The standard of service (by network and customer service) offered is high, as is the network quality, although the extent of the network able to be accessed is low compared to other Member States.
	Social	Enforcement procedures in Hungary are undertaken using a mix of measures that appear proportionate. Fine levels are not disproportionate to the harm done, being relatively low compared to some other Member States.
	<b>Conclusion</b>	Hungary achieves a reasonable standard of proportionality across vignette types, but it would be preferable if there could be greater transparency as to the basis of the allocation of charges across vignette product types.

Hungary achieves reasonable standards of compliance with the principles of non-discrimination and proportionality. To better meet criteria of non-discrimination, it should provide information in the languages of all bordering EU Member States, to have a product that particularly caters for transit traffic and for the summer surcharge to apply to all vignette products (except annual). To better meet criteria of proportionality, it would be preferable if there were greater transparency as to the basis for the allocation of charges across vignette types.

**Table 6-7: Romania: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Romania's shortest vignette product is 1 week, which is unlikely to be suitable for many short trip or transit users (e.g. weekend visits).  Romania also has some localised vignettes operated by municipalities. No information was provided on these vignettes.
	Social	It is unclear to what standard Romania provides information at border crossings and in what languages. However, its website provides information in Romanian, Bulgarian, German, English and Turkish (but not Greek or Hungarian).  A significant proportion of revenue from the Romanian system arises from enforcement. It is unclear whether this revenue is disproportionately collected from foreign motorists. If so, it could give cause for concern as to whether adequate information on compliance is provided at the borders.
	Technical	Romania has recently launched an electronic vignette system allowing prepaid online and telephone purchases of vignettes in advance of travel by credit or debit card.
	<b>Conclusion</b>	Romania's national vignette appears to achieve reasonable standards of non-discrimination in relation to technical criteria through its website, although it is unclear as to whether it meets such standards in relation to signage at border crossings (and payment options at retail outlets).  This could improve if it had a vignette product better suited to transit and short trips, and if there could be confidence about the standards of signage and information available in neighbouring Member State languages (Hungarian and Bulgarian) at border crossings. It is also unknown whether Romania extracts disproportionate amounts of fines from foreign violators compared to domestic violators, given the high rate of non-compliance among Romanian nationals.  It is also unknown as to whether local vignettes operated in some Romanian municipalities are operated in a way that could be seen to be non-discriminatory to non-nationals.
<b>Proportionality</b>	Economic	The average daily cost of the 1 week vignette is over 5 times higher than the average daily cost of the annual vignette. This is unlikely to be a proportionate reflection of relative road use of the different vignette type purchasers. Romania's vignettes offer access to an extensive network, although most of that is not to motorway standard. Quality of service in vignette sales has recently improved with the introduction of electronic vignettes with new payment options.
	Social	Enforcement procedures for Romanian vignettes are unclear, as there is extensive non-compliance particularly by Romanian nationals. Fines levied are proportionately low relative to the offence (50% below that of the next lowest Member State), which may explain non-compliance levels. Romania receives 20% of its total revenue from enforcement, which would appear to be disproportionately high.
	<b>Conclusion</b>	It appears unlikely that Romania's proportionality across vignette types could be justified. Greater transparency as to the basis of the allocation of charges across vignette product types could allow this to

		<p>be determined more definitively. Romania's fine levels are low, but the proportion of revenue received from fines is high compared to other Member States. This would indicate that emphasis is placed not on promoting compliance with the vignette, but on catching violators (with the low fines not acting as a deterrent).</p>
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Romania achieves moderate standards of compliance with the principle of non-discrimination, and poor standard of compliance with the principle of proportionality. To better meet criteria of non-discrimination, it should have vignette products better suited to transit and short trips, and better standards of information provided in Hungarian and Bulgarian. It should also ensure that local vignettes are provided to a standard that ensures non-discriminatory treatment of non-Romanian motorists. To better meet criteria of proportionality, Romania should review its vignette price schedule with a transparent cost allocation methodology, and review its enforcement procedures and penalties to ensure enforcement is consistently targeted towards both national and non-national violators.



**Table 6-8: Slovakia: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Slovakia's shortest vignette product is 1 week, which is unlikely to be suitable for most short trip or transit users (e.g. weekend visits).
	Social	Slovakia claims it provides information at border crossings (and on the website) is provided in Slovak and English. It is unclear whether information is also available in other bordering Member State languages (Polish, German, Czech, Hungarian). Enforcement includes confiscation of drivers' licences if fines are not paid on the spot. Such a procedure can risk exploitation of foreign motorists who are less likely to understand the requirements.
	Technical	Payment options are available at a range of outlets near borders including options to pay by credit and debit cards.
	<b>Conclusion</b>	Slovakia does not achieve high standards of non-discrimination in relation to economic, social and technical criteria. This could improve if it had a vignette product better suited to transit and short trips, ensured it provided information at borders in all relevant languages and reconsidered its approach to enforcement that includes spot fines and confiscation of drivers' licences.
<b>Proportionality</b>	Economic	The average daily cost of the 1 week vignette is approximately 7 times higher than the average daily cost of the annual vignette. This is highly unlikely to be a proportionate reflection of relative road use of the different vignette type purchasers. The standard and extent of network available is modest and standards of service adequate for the price paid.
	Social	Procedures for enforcement appear to be disproportionate, as they include on the spot fines to be paid on demand, with failure to pay including confiscation of driving licences. The fine itself is proportionately high – up to 20x the cheapest vignette price (99 EUR), and the secondary penalty for failure to pay on demand is 495 EUR.
	<b>Conclusion</b>	It appears unlikely that Slovakia's proportionality across vignette types could be justified, particularly because the proximity of Bratislava to two borders indicates many short trips will be for a short distance within Slovakia. Greater transparency as to the basis of the allocation of charges across vignette product types would allow this to be determined more definitively. Slovakia's procedures for enforcement are not proportionate to the offence concerned, and would be improved if on demand fines were abolished.

Slovakia does not achieve high standard of compliance with the principles of non-discrimination and proportionality. To better meet criteria of non-discrimination, it should have vignette products better suited to transit and short trips, provide information in all relevant EU Member State languages and abolish the confiscation of drivers' licences for non-instant payment of fines. To better meet criteria of proportionality, Slovakia should review its vignette price schedule with a transparent cost allocation methodology, and review its enforcement procedures and penalties to ensure their appropriateness.

**Table 6-9: Slovenia: Assessment of Non-Discrimination and Proportionality**

Principles	Type of Criteria	Assessment
<b>Non-discrimination</b>	Economic	Slovenia's shortest vignette product is 1 week, which is unlikely to be suitable for most short trip or transit users (e.g. weekend visits).
	Social	Slovenia claims to provide information at border crossings in five languages and to a high standard, although its website only provides information in Slovene and English.
	Technical	Payment options are available at a range of outlets at borders and in neighbouring countries including options to pay by credit and debit card.
	<b>Conclusion</b>	Slovenia appears to achieve high standards on technical criteria, reasonable standards on social criteria, but not on economic criteria. This could improve if it had a vignette product better suited to transit and short trips.
<b>Proportionality</b>	Economic	The average daily cost of the 1 week vignette is approximately 8 times higher than the average daily cost of the annual vignette. This is highly unlikely to be a proportionate reflection of relative road use of the different vignette type purchasers. The extent of network able to be accessed is reasonable, although not extensive for the price. Service standards are reportedly adequate.
	Social	The fine for non-compliance with the vignette system is relatively high at 300 EUR; However, this is reduced to 150 EUR if paid within 8 days, which brings it into line with other countries considered. Revenue figures for enforcement suggest that 150 EUR fines are the norm. However, the practice of confiscating identity documents of violators (to be returned at the embassies of nationals) is highly disproportionate to the harm done.
	<b>Conclusion</b>	It appears unlikely that Slovenia's proportionality across vignette types could be justified, particularly because the travel time for many transit trips across Slovenia will be around 2 hours. Greater transparency as to the basis of the allocation of charges across vignette product types would allow this to be determined more definitively. However, the most disproportionate feature of the Slovenian vignette is the practice of confiscating identity documents of motorists who do not have vignettes. This practice should cease to be part of the enforcement process of the vignette system.

Slovenia achieves moderate standards of compliance with the principle of non-discrimination, but poor standards of compliance with proportionality. To better meet criteria of non-discrimination, it should have vignette products better suited to transit and short trips. To better meet criteria of proportionality, Slovenia should review its vignette price schedule with a transparent cost allocation methodology, and revise its enforcement procedures and penalties to abolish confiscation of identity documents as part of its procedures.

### *e) Conclusions on Non-Discrimination and Proportionality*

The evaluation of non-discrimination and proportionality undertaken here has been primarily based on information supplied by Member States. More detailed investigation and surveys could indicate variations to the results indicated.

No EU Member State achieves high standards of compliance with both the non-discrimination and proportionality principles according to the criteria set out in Tables 18 and 19. However, it is important to note that greater transparency behind the calculations used to establish vignette prices might result in better certainty about the basis of rates, which could better justify the proportionality between different vignette prices by time.

#### *Non-Discrimination*

The best performing Member States on non-discrimination by social and technical criteria appear to be Austria and the Czech Republic, both of which have a wide range of information and payment options for foreign motorists, yet both have the longest short term vignette periods (10 days) of the countries surveyed. This does not meet the needs of short trip or transit users (which are more likely to be foreign motorists) well. Hungary has the best product for such users in the form of the 4 day vignette, with the added convenience of the electronic vignette enabling purchase online in advance of travel, although it is noted that the 4 day product is the only one subject to a summer “surcharge” apparently intended to help manage congestion. Hungary achieves standards almost as good as Austria and the Czech Republic, except that the summer surcharge should be applicable to all products valid only during that period.

Of notable concern is the low level of compliance with the Romanian vignette by Romanian motorists, yet high levels of enforcement revenue. This could indicate enforcement being targeted specifically at foreign motorists, when non-compliance among Romanian motorists is particularly high. It is important that enforcement procedures and practices are directed to monitor all groups of motorists. Objective information on the standards of signage and information for all motorists was not available, but standards of information vary considerably. This could be seen as being discriminatory when signage or information is not provided in the national language of a bordering Member State when approaching that of another Member State that has a vignette.<sup>53</sup>

In conclusion, the key measures Member States could take to improve compliance with non-discrimination are:

- Establish vignette products that better suit travel patterns of short term visitors and transit users;
- Ensure adequate warning signage is provided in the languages of border Member States as a minimum;
- Ensure a diverse range of payment outlets and options are available for either major credit and debit cards, or the currencies of all bordering Member States, with preference

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<sup>53</sup> No objective survey was undertaken of signage approaching vignette charged networks. Such a survey would enable a broader assessment of the standards of signage applied by Member States in terms of location, ease of understanding and language.

to the ability to pre-purchase vignettes, or purchase from vending machines conveniently located;

- Ensure enforcement procedures are applied fairly across national and non-national motorists according to non-compliance rates.

### *Proportionality*

The EU Member States that currently achieve the best standards of proportionality are Austria and Hungary with reasonable proportionality between vignette product prices (if measured by likely road usage) and reasonable proportionality applied to enforcement procedures and practices, although the network accessible by the Hungarian vignette is relatively low in length terms. The poorest performing Member States on proportionality are Slovenia, Slovakia and the Czech Republics, all of which have short term vignette products at an average daily price between 7 and 8 times higher than the corresponding annual product.

It is difficult to envisage how either administrative costs or any cost allocation methodology based on average usage might justify such a wide variation, with the logical conclusion that this discriminates against those buying the shortest term vignettes (which may be more likely to be foreign motorists). The Bulgarian and Romanian short term products at 6 and 5 times the daily cost of the corresponding annual products are only marginally better. However, it is important to note that transparent data on the cost allocation methodologies used to set vignettes was not available for this study, and information on administrative costs was incomplete, so that there may be some justification for these variations that has not been made available, although it would have to indicate very high levels of relative usage by short term vignette users and very high administrative costs for such users.

Proportionality of enforcement procedures and penalties would appear to be good in Austria and Hungary. Austria's penalty is to pay the liable vignette upfront or face a fine to be paid at a future date (although that is rather high at 15x the minimum vignette price). Hungary presents motorists with fines to pay at a future date, which are 10x, the minimum vignette prices. By contrast, both the Czech Republic and Slovakia charge fines that are 20x the price of the minimum vignette, in addition Slovakia imposes instant payment fines (as does Slovenia) that require payment on demand. This procedure appears to be disproportionate for the harm done, as it would be more appropriate to treat vignettes as with parking fines or fines issued by speed cameras. Information about Romanian enforcement procedures was poor, and non-existent for Bulgaria, raising doubts about the proportionality of processes for both countries. Although in both cases the existence of manned border control with other EU Member States provides ready enforcement for foreign traffic, it is unclear the extent to which national traffic is subject to similar levels of enforcement. Slovenia has the greatest issue with proportionality, as the practice of confiscating violators' identification documents is difficult to justify given that the harm done is simply failure to pay a vignette. This is likely to also be discriminatory, as it will be of less concern to Slovenian nationals (who have no language barrier and can more readily pay the fine to recover the documents), and may be particularly confusing or distressing for EU citizens being required to visit embassies at Ljubljana to recover the documents after the fine has been paid.

In conclusion, the key measures Member States could take to improve compliance with proportionality are:

- Determine vignette prices based on a transparent cost-allocation methodology that relates price to average road usage by purchasers of different vignette products;
- Ensure penalty levels are related to minimum vignette prices at ratios not exceeding that of other traffic offences (e.g. parking fines); and
- Ensure enforcement procedures do not include confiscation of identification documentation or other measures that may be considered excessive and unnecessary elsewhere.

### **6.3.3      *Criteria for Assessment of the Relevance of Vignette Systems against European Transport Policy Objectives***

#### ***a) European Transport Policy Objectives***

The focus of the European Transport Policy (ETP) is on ensuring transport is economically, socially and environmentally sustainable in Europe. Sustainability is, in part, promoted by encouraging greater integration of networks and services. It can also be supported by using the latest technology to improve efficiency and safety, and to reduce the net environmental impacts of transport use.

The key policy objectives that effective road charging policies (such as vignettes) can support include:

- Enhancing economic competitiveness; and
- Protecting the environment.

In addition, vignette systems should also take into account user requirements, since the ETP states that users should be central to transport policy.

Vignette systems are capable of enhancing economic competitiveness by charging road users for accessing a road network to ensure the price they pay is more reflective of the cost they impose. Whilst not as flexible and effective as road user charging, a vignette can still provide a time-based reflection of infrastructure costs, and can charge for some externalities. As such vignettes can be seen as a “second best” alternative to road user charging. The development of new technologies now allows for vignettes to be bought and held by electronic means. This provides greater flexibility for vignette schemes to vary (i.e. by day, season or trans-border), and increases the payment options available. This can enhance the experience for users and by allowing for more precise charging periods to be set, can enable vignettes to be better targeted based on price (e.g. charging differently by season, specific day or vehicle type).

Such pricing can influence behaviour. For national motorists it effectively increases the cost of owning a motor vehicle, since a vignette is likely to be seen as a fixed charge that is unavoidable for motorists wishing to use national highways. This may have a minor effect on overall vehicle ownership levels, and consequently on traffic levels. For foreign motorists, it will increase the cost of driving to a particular country compared to other

options (e.g. mode, destination or transit route options). If vignette charges reflect costs, they can result in improved allocation of resources by reducing cross subsidies from other sources of revenue into the funding of roads.

The key ways that vignettes can contribute to environmental objectives are by:

- Increasing costs of private motoring relative to more environmentally friendly modes of transport; and,
- Incentivising usage and ownership of more environmentally friendly vehicles.

By increasing the cost of private motoring, the relative cost of alternative modes of travel (e.g. bus or rail) will be reduced. Since these modes are generally considered to have a lower environmental impact per person (or per kilometre) compared to a single occupancy private car, this can have a positive impact on overall net emissions by helping encourage a switch from car use to other modes.

There is potential for vignette systems to charge lower rates for lower emission cars compared to higher emission cars. For residents of countries with vignettes, this could incentivise purchases of more environmentally friendly vehicles, since annual vignettes will be seen as a fixed cost of car ownership in many countries. For foreign users of vignettes, variable pricing is unlikely to have much impact on purchasing habits, unless particularly punitive charges are imposed for higher emission vehicles. The likely change in behaviour will be mode shift, or change in route or destination, which might reduce congestion, but would also reduce economic activity in the country concerned.

Over a longer period, the use of differentiated charges for vignettes across multiple countries could encourage a faster shift of vehicle fleets to more environmentally friendly vehicles, although the effects will be dependent on the extent of the price differential. Whilst the “Eurovignette Directive” allows environmental differentials for HGV charges up to a maximum specified in Annex II<sup>54</sup>, for private vehicles there is no Directive to limit such charges. Therefore, vignette charges can be set that actually correspond to measurable factors such as CO<sub>2</sub> or particulate emissions.

It is important to recognise the limitations that vignette schemes have in charging for environmental externalities. Some of the factors that influence the impact of externalities are location and time, which means that some externalities cannot be well priced with a time based flat charge. A vehicle travelling in a rural area at off peak times creates significantly fewer pollutants than a vehicle in an urban area at peak times (when congestion exacerbates emissions per vehicle kilometre). Vignettes are not well suited to allocating cost across these different user groups.

Vignettes could vary charges by days of the week (e.g. treating weekdays differently from weekends). Hungary already varies the price of its short term vignette by season. This can broadly reflect underlying levels of demand across the network, however it will not reflect congestion over short time periods by location<sup>55</sup>.

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<sup>54</sup> Annex II specifies maximum rates for annual vignettes for HGVs according to configuration and Euro class. This allows vignette rates to vary more than 100% between the least polluting and the most polluting HGVs.

<sup>55</sup> The use of electronic technology for charging facilitates congestion charging but it has been assumed that this type of charging is not a “vignette” and is not therefore relevant to this study

Noise, as an externality, is more difficult to equitably monetise for the purposes of charging. Objective measures of noise are not solely dependent on vehicles, but also on road surfaces and surrounding environment, and it is therefore difficult to change behaviour related to noise simply by charging for that noise. Noise based charges do not currently exist and are not considered further since noise cannot be fairly reflected using vignettes.

**b) Objective Criteria**

Objective criteria for the assessment of vignette systems against the EU Transport Policy are set out in Table 6-10 below:

**Table 6-10: Criteria for the Assessment of ETP Objectives**

Type of Criteria	
<b>Economic</b>	Does the scheme have clearly stated objectives that are aligned with the ETP objectives of efficient infrastructure pricing and protecting the environment? Does the scheme have a robust and transparent methodology for the calculation of infrastructure and external cost that is applied in setting the vignette charges?
<b>Social</b>	Does pricing incentivise the use of more environmentally friendly vehicles? Does the scheme have potential to offer a cross-border interoperable vignette product?
<b>Technical</b>	Is the scheme technology based? Does the scheme have transparent enforcement procedures that are fairly applied across all road user classes?

**c) Assessment of Existing Schemes using Identified Criteria**

Based on the information supplied by surveys of EU Member States and publicly available material, the criteria listed above have been applied to the vignette schemes. Not all of the questions above have been able to be answered by these means. The assessment has been undertaken qualitatively and compares the relative strengths of applicability of the ETP principles by the Member States. This assessment is not considered to be an absolute assessment as to compliance with the ETP, but an indication to guide where progress could be made to improve the quality of alignment to the EU Transport Policy.

All Member States with private car vignettes are consistent with European Transport Policy, but none of them have vignette systems that target the environmental performance of vehicles. Only Hungary and Romania have technologically sophisticated systems, and these systems are suitable for interoperability across Member States. None of the Member States charge differentially on vignette routes, except Austria’s specific “Korridorvignette” which reflects significantly higher infrastructure costs.

A summary assessment by Member State is provided in the tables below.

**Table 6-11: Austria: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to recover infrastructure costs, and vignette charges are set to reflect those costs. Externalities are not included.
Social	Austria's vignette system does not incentivise use of lower emission vehicles.  Austria's vignette system does not include particular capability to include a cross-border product, but the existence of the KorridorVignette is intended to provide a convenient alternative to purchasing the national vignette for a single route.
Technical	Austria's vignette system is sticker-based and includes a wide range of payment options. Enforcement procedures appear transparent and consistent.
<b>Conclusion</b>	Austria's vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives.

**Table 6-12: Bulgaria: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to raise revenue for road maintenance expenditure, and vignette charges are set to achieve budgetary targets. Externalities are not included.
Social	Bulgaria's vignette does not incentivise use of lower emission vehicles.  Bulgaria's vignette system does not include particular capability to include a cross-border product.
Technical	Bulgaria's vignette system is sticker-based, with relatively limited purchase options. No information was provided on enforcement procedures.
<b>Conclusion</b>	Bulgaria's vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives and there is no transparency as to its enforcement procedures.

**Table 6-13: Czech Republic: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to raise revenue for the infrastructure fund, and vignette charges are set to reflect infrastructure costs. Externalities are not included.
Social	The Czech vignette does not incentivise use of lower emission vehicles.  The Czech vignette system does not include particular capability to include a cross-border product
Technical	The Czech vignette system is sticker-based and includes a wide range of payment options.  The Czech vignette enforcement procedures include on the spot fines, which creates risks of unequal treatment of violators.
<b>Conclusion</b>	The Czech vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives, and has enforcement procedures that may risk unequal treatment.



**Table 6-14: Hungary: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to provide funds for road maintenance and capital expenditure, and vignette charges are set to achieve budgetary targets. Externalities are not included, but there is a higher charge for the 4 day vignette over summer, in order to reflect congestion costs.
Social	Hungary's vignette does not incentivise use of lower emission vehicles.  Hungary's vignette system could be adapted to incorporate a cross-border vignette product.
Technical	Hungary's vignette system is electronic, with a wide range of payment options. Enforcement procedures appear transparent and consistent.
<b>Conclusion</b>	Hungary's vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives.

**Table 6-15: Romania: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to raise revenue for the road budget. The basis for setting vignette charges is unclear. Externalities are not included.
Social	Romania's vignette does not incentivise use of lower emission vehicles.  Romania's vignette system could be adapted to incorporate a cross-border vignette product, and its website already includes the option to purchase a Hungarian e-vignette along with a Romanian e-vignette.
Technical	Romania's vignette system is electronic, with a wide range of payment options.  Romania's vignette system has comparatively high levels of non-compliance and high levels of enforcement revenue, raising concerns about unequal treatment of violators.
<b>Conclusion</b>	Romania's vignette system is consistent with European Transport Policy, but has enforcement outcomes that raise concerns about fair treatment of users and does not go as far as it could to promote environmental objectives.

**Table 6-16: Slovak Republic: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to raise revenue for the road budget, and vignette charges are set to reflect “economic analysis”. Externalities are not included.
Social	Slovakia’s vignette does not incentivise use of lower emission vehicles.  Slovakia’s vignette system does not include particular capability to include a cross-border product.
Technical	Slovakia’s vignette system is sticker-based and includes a range of retail payment options.  The Slovak vignette enforcement procedures include on the spot fines, which creates risks of unequal treatment of violators.
<b>Conclusion</b>	Slovakia’s vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives and has enforcement procedures that may risk unequal treatment.

**Table 6-17: Slovenia: Assessment of ETP Objectives**

Type of criteria	Assessment
Economic	The purpose of the vignette system is to raise revenue for maintenance and construction of the motorway network, and vignette charges are set to reflect expected expenditure. Externalities are not included.
Social	Slovenia’s vignette does not incentivise use of lower emission vehicles.  Slovenia’s vignette system does not include particular capability to include a cross-border product
Technical	Slovenia’s vignette system is sticker-based. No information was provided about the range of purchase options.  Slovenia’s vignette enforcement procedures include on the spot fines, which creates risks of unequal treatment of violators.
<b>Conclusion</b>	Slovenia’s vignette system is consistent with European Transport Policy, but does not go as far as it could to promote environmental objectives and has enforcement procedures that may risk unequal treatment.

***d) Conclusions on European Transport Policy consistency***

All vignette systems assessed in this study are generally consistent with European Transport Policy, but none of them could be said to be applying European Transport Policy to the extent possible within the reasonable expectations of a vignette system for private vehicles. Of the Member States assessed, Austria and Hungary come closest to having best practice, but neither has adopted the “polluter pays” principle in setting private vehicle vignettes in that all cars pay the same, regardless of environmental impact.

Overall, the key ways in which Member States could make improvements are:

- Better transparency between the setting of vignette prices and their relationship to infrastructure and externality costs;
- Consideration of products that incentivise the use of lower emission vehicles and discourage use of higher emission vehicles;
- Consideration of products for cross-border use of vignettes;
- Removal of instant payment fines as part of enforcement procedures, and improved transparency on enforcement practices.

All of the vignette systems are claimed to have prices set to recover infrastructure costs or raise revenue for infrastructure investment, although transparency as to the basis for setting prices is relatively low. For better consistency with European Transport Policy objectives, vignettes should be set with some reference to transparent analysis as to infrastructure costs (and if desired, externality costs) so that users can see a direct relationship between costs and prices (although it is unnecessary to limit prices to those costs). If any Member States have not undertaken adequate cost calculations to inform such charges, it is likely to cost at least 500,000 euro to undertake such a study.

None of the vignette systems include any measures to give discounts to lower emitting vehicles or to charge more for vehicles that emit greater levels of pollution. This may be because all Member States also have fuel taxes, which can be said to be a proxy for vehicle emissions (particularly CO<sub>2</sub>) in that the higher polluting vehicles tend to pay more through increased fuel consumption. However, as has been seen with HGV vignettes and tolling, there is potential for variations on prices, based on emissions ratings, to encourage a shift towards less polluting vehicles over time. Member States should be encouraged to consider implementing such an approach. Private vignettes that vary by Euro engine rating (for example) would require implementation of systems to extend the price schedules for vignette products and to verify the purchase of the correct vignette for particular vehicle types. For some Member States this may involve ensuring motor vehicle registries contain information about such ratings, and for sales outlets to have access to such information for national registries and also foreign ones. The costs of implementing this may be substantial, with such systems likely to cost between 2 and 10 million euro to introduce, with ongoing operating costs over at least 10-15% of that.

None of the vignette systems surveyed included any cross-border products for convenience to users, although the KorridorVignette in Austria is noted as being specifically designed to avoid motorists having to purchase the national vignette. It is expected the Hungarian and Romanian systems may have the best capability for cross border vignettes given they are now electronic based vignettes, and the Romanian vignette website already has a link to allow for purchase of Hungarian vignettes conveniently after purchasing a Romanian vignette. For cross-border vignettes to be implemented, systems would need to be in place to enable communication of data about vignette validity between countries. The costs of such system implementation would be similar to that of having a sophisticated environmentally based vignette operation, depending on the number of countries involved.

Austria, the Czech Republic, Romania and Slovakia have enforcement based on “on demand” fines, which include requirements to pay instant fines. This risks unfair treatment

of some categories of users, particularly foreign users<sup>56</sup>. Bulgaria's enforcement procedures are not transparent, which means it is not possible to assess their consistency with European Transport Policy.

## 6.4 CONCLUSIONS

Overall, while improvements have been made over the last few years, none of the vignette systems surveyed can be said to fully adopt "best practice". All have room for improvement. Of the Member States assessed, the best performing overall would appear to be Austria and Hungary. Slovenia, overall, is considered the most in need of reform. Bulgaria and the Slovak Republic also have serious issues with proportionality, with short term vignette charges much higher proportionately than annual vignettes. In addition, Bulgaria's enforcement processes require further investigation to determine whether they are compliant with all relevant principles and policies.

Whilst some individual Member States have issues specific to them, there are a range of key issues that are shared across several of them:

- **Lack of products well suited to transit users:** Some Member States offer minimum period products for a period of 10 days, compared to best practice within the States considered, which is 4 days. It appears unreasonable to expect motorists to purchase access for periods that are many times longer than what is needed for transit trips, given all surveyed Member States can be transited in less than 1 day;
- **Poor price proportionality between the shortest and longest period vignettes:** Some Member States have an average daily price for short term products that is eight times higher than the equivalent daily price for annual products, which would appear to be difficult to justify proportionately, and can be seen as a form of discrimination against short-term users (including foreign motorists);
- **Lack of effective signage and information in all relevant languages:** Some Member States do not provide signage or information in the languages of all bordering neighbour states which risks being considered discriminatory if motorists from those states are unable to reasonably understand the requirement to purchase a vignette;
- **Disproportionate enforcement procedures and practices:** Some Member States adopt disproportionate procedures to enforce vignettes, which particularly affect foreign motorists. The requirement to pay fines "on the spot" or face confiscation of passports or driving licences until fines are paid, appears draconian; and
- **Lack of application of environmental factors:** No Member States apply differential charges according to the emissions categories of vehicles charged. Whilst not contrary to EU law or policy, it would appear to be a conservative approach compared to that used for charging HGVs.

A summary of the assessment contained in Section 6.3 is in Table 6-18. The rankings are only comparative between the Member States assessed, and do not offer any absolute rating. Rather they are for illustrative purposes only. Heavier weighting has been put on economic

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<sup>56</sup> This issue is further discussed in the evaluation of vignette systems for proportionality.





criteria than on social and technical criteria, given the importance of price in assessing vignette systems.

**Table 6-18: Summary Assessment of Vignette Systems<sup>57</sup>**

	Economic	Social	Technical	Overall	Key Points
Austria					Product not well suited to transit users Generally models best practice
Bulgaria			? <sup>58</sup>		Poor price proportionality Product not well suited to transit users Lack of information in all relevant languages Unknown enforcement procedures
Czech Republic					Product not well suited to transit users Poor price proportionality
Hungary					Poor price proportionality (for summer surcharge only) Lack of information in all relevant languages Product adequate for transit users Good range of purchase methods available Electronic vignette system allows for a range of purchase methods and advance purchase
Romania					Poor price proportionality Product not well suited to transit users Lack of information in all relevant languages Poor transparency for local vignettes Electronic vignette system allows for a range of purchase methods and advance purchase
Slovakia					Poor price proportionality Product not well suited to transit users Lack of information in all relevant languages Disproportionate enforcement procedures
Slovenia					Product not well suited to transit users Poor price proportionality Lack of information in all relevant languages Disproportionate enforcement procedures

<sup>57</sup> Key provided overleaf

<sup>58</sup> No information was provided on enforcement, so no rating has been made.

- Key:*
-  Does not meet EC requirements and principles
  -  Partially meets EC requirements and principles
  -  Generally meets EC requirements and principles
  -  Fully meets EC requirements and principles

## 7. RECOMMENDATIONS FOR AN OPTIMUM VIGNETTE SYSTEM

### 7.1 INTRODUCTION

Recommendations for an optimum structure of vignette system have been set out using our professional judgment and experience. The recommendations are based on the requirements of the Treaty and the ETP, and draw on best practices observed in the existing vignette systems applied in the seven EU Member States. In designing an optimum system, the aim has been to set out broad principles to be adhered to, rather than designing an overly prescriptive system that might not be appropriate for every Member State.

Whilst none of the Member States surveyed could be said to have adopted best practices across the board, the two Member States that appear closest are Austria and Hungary. Austria achieves reasonable standards of non-discrimination and proportionality overall. Hungary also does so, with the added advantage of the e-vignette system adding convenience for motorists. It is noted that Romania's introduction of a similar system occurred during the period of this study, which appears to also create advantages from a user perspective (although Romania still achieves lower standards overall for proportionality and non-discrimination compared to Hungary). All vignette systems surveyed could be better assessed if there was more transparency as to the basis for the vignette rate calculations, and this is particularly relevant when the stated purpose of the scheme is recovery of infrastructure costs.

### 7.2 USER REQUIREMENTS

As outlined in Chapter 4, the key dimensions of a vignette system from a user perspective are:

- Price (as this can affect whether or not to drive at all);
- Compliance and Enforcement (understanding how to comply with the requirement to have a vignette, and an enforcement procedure that is fair and reasonable);
- Convenience (ease by which compliance can be undertaken); and
- Transnational compatibility (ability to use vignettes across more than one country).

Vignette systems should also offer a wide range of time options to meet user requirements.

#### 7.2.1 *Price*

Setting aside the obvious point that users will, generally speaking, prefer vignettes to be as cheap as possible, the key consideration for users is value for money.

Users are more likely to accept the price of a vignette if:

- The road network they access is to a high standard, well maintained and adequately policed, as reflected in an absence of reckless driving behaviour. Expenditure on roads should be evident; and,
- The vignette products suit the travel period of the motorist.

Ideally, motorists should see the vignette not as an imposition, but as a reasonable payment for use of a well-maintained network. An appearance of good maintenance can be exhibited by a safe, smooth road surface and high quality signage and lighting. In short, the road network should appear to be of a reasonable standard to reflect that motorists are directly paying for use of that road.

Beyond the requirement of value for money, a key requirement is that vignette products meet the needs of motorists. In this respect there should be vignette periods available that meet a wide range of trip periods, and it should be possible to combine such products to meet typical periods of continual use.

The vignette systems considered have annual, monthly and ten day or weekly (seven day) products. Given that all EU Member States can be transited within a single day, an optimum vignette system would also offer single day vignettes to cover simple transit trips. This would correspond with the single day product available under the HGV Eurovignette. A day product would provide the flexibility for motorists to buy multiple single day vignettes according to need. It would also ensure that the EU principles of proportionality and “user pays” are supported by allowing road users to purchase vignettes that reflect usage. The ability to buy vignettes that match days of usage would ensure the best alignment with user pays that a vignette scheme could have without becoming a road toll scheme. Longer term products should be designed to match the typical time periods over which visitors might want to drive on the vignette network. For example, if surveys show that visitors tend to make trips for 8 calendar days (e.g. Saturday to Saturday), the host country should offer a product that accommodates them, rather than a weekly vignette which covers only 7 calendar days and does not meet their requirements.

The inclusion of a day vignette could also negate the most common criticism of vignette systems whereby motorists are required to purchase products for significantly longer periods of time than the period for which they will use the network, since those transiting a country could purchase day vignettes for their outbound and return journeys, rather than having to buy a week vignette or two week vignettes for one transit trip<sup>59</sup>.

It is recognised that the inclusion of a day vignette would have an impact on operating costs since it would result in some drivers purchasing multiple day passes instead of a longer term product, and this may require them to interact with the system on more than one occasion (although some drivers would purchase multiple day vignettes in one transaction).

The provision of a day vignette pass would also affect revenue, as some users who had previously been forced to buy a week or 10 day product would be able to select a cheaper day product. This may mean an increase in prices is required if the revenue gained is to remain constant: there is nothing inherently wrong with this outcome, if one group of users are paying less than previously it is natural that another group of users may have to pay more if the total monies collected is to remain constant. However, the provision of a day vignette could also induce demand by attracting drivers for whom the longer term products are too expensive or inefficient for their needs (e.g. making day trips from neighbouring States a more attractive proposition). Individual Member States would need to undertake

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<sup>59</sup> It is conceivable that a Member State could choose to offer an even shorter vignette product (e.g. for an hour) but it is likely that this would lead to the purchase of multiple products for one transit trip and may therefore increase administrative costs significantly.



demand forecasting to determine the net effect on revenues of introducing such a product and consider potential revisions to their price schedule in view of the impact on revenue.

The average operating cost associated with a daily vignette would inevitably be proportionately higher than for those vignette products that cover a longer period since the cost of issuing a daily vignette, in general, does not vary compared to the cost of issuing a weekly or monthly vignette. These operating costs should be included in the price of the vignette and will result in the daily vignette being the least competitive product in terms of price per day. However, it will still offer the lowest price for anyone transiting the country in a single day and will therefore be the preferred product for those visitors. Visitors who intend to use the vignette network for longer than one day can choose to buy multiple day vignettes or to purchase a longer term product, depending on which is most cost effective for them. It is likely that the price of the day vignette will act as a benchmark for visitors and they will view the longer term products as offering far better value compared with the day product.

An optimum vignette system will allocate prices to each of the products according to the expected road use of the various user groups plus the estimated administrative cost for each product<sup>60</sup>. Member States with vignette systems that have higher administration costs may find it challenging to set single day vignette prices substantially cheaper than current products, but this will still mean the products meet the needs of users who only wish to use a network for one day. A day vignette will need to be priced at a level that covers the administrative costs associated with it and still generates revenue, and it will therefore be set at a level above the average operating cost (as calculated in Figure 7-1). There would appear to be no reason that the inclusion of a daily vignette should necessarily lead to an increase in prices for longer term products. Further guidance on setting vignette prices is provided later in Chapter 7.3.

No specific ratios are recommended for the price structure of the various products, since prescriptive ratios will remove the ability of the Member State to set prices that reflect actual road use, in accordance with the European Transport Policy. It is more important that Member States are transparent in setting prices and Member States should be able to demonstrate that both the products and the prices have been set to reflect expected road use (and therefore cost to the infrastructure).

From an economic efficiency point of view, the key limitation of vignettes is that they charge for days of access, rather than actual usage. While there may be merit in seasonal vignettes or vignettes that are geographically specific, the benefits that these may generate in terms of management of demand will always be limited compared with any form of tolling. As such, it is important to note that the optimum form of charging for private vehicles in terms of European Transport Policy objectives will be distance-based charging which varies according to time of day, location and vehicle type so that the costs of road use, and externalities, can be appropriately targeted. An optimum vignette system cannot accurately vary charges by time or location so cannot appropriately reflect congestion costs. A vignette is not an appropriate tool for accurately targeting congestion where and when it occurs. It is therefore recommended that Hungary abolish the seasonal variation in its 4 day product if it only justified on the basis of management of congestion.

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<sup>60</sup> Most of the costs of a transaction are fixed rather than variable, and costs will not therefore vary significantly across the various vignette products. Exceptions to this include sales commission which is often a percentage of the price.

## 7.2.2 Compliance and Enforcement

It is a reasonable expectation of motorists that they are supplied with sufficient information of the requirement to buy a vignette in advance of accessing the network. The first source of such information should be in tourist publicity material and on easily accessible websites. These should explain the requirement (in at least the languages of neighbouring countries and other main European languages) with information about options on how to purchase the relevant vignette.

Signage should also be provided in advance of the chargeable network. The signage should ideally be in the language of the bordering Member State as well as in the national language. Compliance could also be facilitated by providing signage in a standardised format across Member States, including an internationally recognisable symbol to indicate the presence of a vignette charged route.

Signage should also indicate the price, means of payment and directions to the nearest retail outlet for purchase. In short, no reasonable motorist should enter a vignette charged route without having been forewarned of the need to buy a vignette. This should be part of an overall compliance policy that focuses on encouraging motorists to purchase vignettes, rather than on catching and fining violators of the system.

Information at retail outlets or at self-serve kiosks should indicate:

- Which types of vehicles are liable to purchase a vignette;
- The roads on which motorists require vignettes;
- Vignette product options and prices;
- How to purchase vignettes;
- How to seek further information; and
- Penalties for non-compliance.

All signage should state clearly how many calendar days each vignette product is valid for, to avoid any confusion over the definition of a week or a month. Where a vignette sticker is supplied, the expiry date of the vignette should be stated on that sticker to ensure that the user knows exactly which days it is valid for.

If there are roads within the Member State that are not covered by the vignette system, it should be possible to exit a network in advance of a vignette charged route to travel on alternative routes, although there is no expectation that such routes should be to a comparable standard to the vignette charged route.

The approach to enforcement should be transparent and fair. Information about penalties, appeals processes and means to pay penalties should be clearly presented. Motorists receiving penalties should have a reasonable period over which to pay that penalty, and should be given information about options to pay and how to appeal the penalty if it is considered to be mistaken or unreasonable. Penalties should not be required to be paid on the spot, since this risks corruption and intimidation of motorists, particularly of foreign

motorists who may be less able to communicate with enforcement officers<sup>61</sup>. In addition, enforcement should be focused on locations where non-compliance is relatively high, not simply on border locations, so that both nationals and foreigners are treated equally.

### 7.2.3 *Convenience*

Motorists should have a wide range of options available to pay for a vignette. These options can be defined by the following dimensions:

- Type of outlet;
- Locations of outlets;
- Opening hours of outlets; and
- Payment options.

In general, the greater the range of these options, the more convenient the scheme will be for a wider range of motorists. However, decisions on which payment options exist will be affected by a reasonable trade-off between cost and convenience. An optimum vignette system will locate retail and kiosk outlets near to the roads that are charged, near all border crossings and within neighbouring countries. Most retail outlets would be accessible every day for 24 hours a day. Widely used debit and credit cards would be acceptable, as well as cash in the national currency and neighbouring country currency

There is a significant convenience associated with motorists being able to pre-pay for a vignette before starting a trip. This avoids the need to divert a trip via a retail outlet before entering a vignette charged route. In addition, options to purchase by phone or online (without the need to enter a retail outlet) offer added convenience because there are no limits by location or opening hours for purchase. This requires the use of electronic vignettes where a vignette is linked to the number plate of the motorist's vehicle so that no sticker is required to prove compliance. This approach offers higher levels of convenience and flexibility and would be a feature of an optimum vignette system.

### 7.2.4 *Transnational compatibility*

For motorists transiting more than one country with a vignette system, there would be added convenience in having a vignette product that covers multiple countries. The Eurovignette for HGVs offers this level of interoperability since it is a standard product across five EU Member States. A similar product for private vehicles could be particularly convenient for international motorists, particularly between pairs of countries with high volumes of foreign traffic.

There are a number of challenges associated with the introduction of a vignette to cover multiple Member States, including the requirement for countries to agree on a consistent pricing structure and to determine an approach for distributing revenue equitably, since the roads in some Member States will inevitably be used more heavily than others. In Member States with the Eurovignette for HGVs, a vignette for national roads only is not available. It

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<sup>61</sup> *There is a wider problem with collecting fines for traffic offences from non-Nationals, however this doesn't justify the inclusion of discriminatory practices in vignette schemes. The EC has proposed a Directive for cross-border enforcement but it is yet to be accepted into Community Law.*

is unlikely that this would be acceptable for private vehicles, since drivers of private vehicles are more likely to remain within State borders, and thus, should a transnational vignette become available, it is important that a national product continues to be offered as well.

Overall, the administrative costs and compromises may not be justified by the benefits of a transnational product, since private vehicles generally cross international borders less frequently than HGVs, and it is not therefore included in our recommendations for an optimum vignette. However, the EC could act as facilitator in the event that two or more Member States wish to explore options for a transnational vignette. Romania has recently included a link to the Hungarian vignette system's website on its own website and this could be a first step to offering a more comprehensive service to drivers who wish to transit other Member States.

### 7.3 COST ALLOCATION AND RECOVERY

#### 7.3.1 *Cost Recovery Approach*

Whilst there is no legal requirement for Member States to base their vignette charges on road infrastructure costs, in the interest of transparency and equity an optimum vignette system would set charges based on the transparent recovery of the following stated costs:

- Road infrastructure costs (actual and/or forecast); and,
- Costs of administration and operation of the vignette system.

Setting vignette charges that reflect actual or forecast expenditure ensures that the primary purpose of the vignette is cost recovery, and that the vignette system is therefore consistent with the ETP principle of "user pays".

There is no legal requirement for Member States to directly link their vignette for private vehicles to actual expenditure<sup>62</sup> and Member States are therefore entitled to collect additional revenue by charging at a rate that exceeds total infrastructure costs allocated to these vehicles. The additional revenue could be to reflect externalities or as a simple financial surplus used to fund other areas of government expenditure. However, the optimum vignette system would provide a transparent explanation of the amount of any surplus revenue forecast for collection. The provision of this information would provide the European Commission with confidence that charges are proportionate and non-discriminatory.

The presence of HGV charging in some of the Member States acts as a requirement for those Member States to build and maintain a detailed model of road infrastructure costs (including a register of road infrastructure assets) on which the charges are based. These models will typically calculate total long run capital and operating costs and then use assumptions to identify the proportion of those costs that can be apportioned to HGVs. Where such a model exists, application of the same process and the same values to the calculation of road costs imposed by private vehicles would be efficient. Therefore in theory a register of total road infrastructure expenditure can be allocated between those that are attributable to HGVs and those attributable to private vehicles. This ensures that costs are

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<sup>62</sup> There is also no such requirement for the Eurovignette to be linked to expenditure.

recovered in an equitable manner and provides a solid basis for the setting of vignette charges.

Administrative costs includes fixed costs that should be allocated equally across vignette products and variable costs that should be allocated according to the profile of each vignette product. Whilst there will be some standard administrative costs that apply to every vignette purchase, the average buyer of a short term vignette may use payment outlets and payment options that have a higher cost than those used by buyers of long term vignettes (e.g. payment by cash via a retail outlet compared to automatic payment by direct debit). In addition, it may be fair to allocate costs of customer service (e.g. call centre query and retail premises time) to those groups of customers that make a higher proportion of queries who, once again, are likely to be the less regular users who purchase shorter period vignettes.

Cost allocation should be done transparently in all cases, and in the absence of transparent data to differentiate administrative costs by vignette type, it is fairer to allocate such costs on a flat basis across user types.

Figure 7-1 illustrates how the various costs can be allocated by user group/vignette type when setting prices. Administrative costs are allocated based on the cost each group impose on the system, and infrastructure costs are allocated based on average use of the system. These are added together to determine the total cost allocated to each vignette type, and a surplus can then be included, so long as it is allocated in proportion to the total cost. The price of each vignette product is equal to the average cost imposed by that user group plus a surplus.

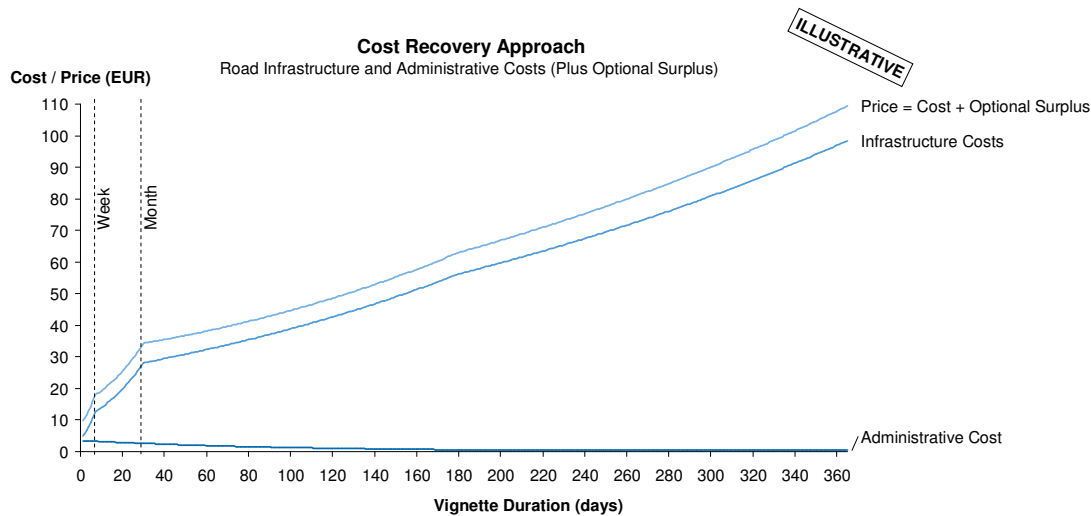


Figure 7-1: Cost Recovery Approach

To be consistent with the EC principle of “the polluter pays”, charges could be varied by vehicle emission class to incentivise the use of vehicles with lower emissions. The EC has a legal framework for vehicle emissions standards, and identifies vehicles as being in “EURO classes” from Euro 1 (the highest emissions) to Euro 5 (the lowest emissions). The Eurovignette for the charging of HGVs allows for differentiation of charges according to these categories, and the inclusion of EURO classes in the charging of private vehicles would be consistent with this. An optimum vignette system would vary charges by EURO emission class, to be consistent with the European Transport Policy’s environmental

objectives and with “the polluter pays” principle, however such variation should not be mandatory. The variable price structure could be based on the average price identified by following the cost recovery approach outlined in this chapter, or it could include a monetised cost of environmental externalities where the necessary data is available.

It is acknowledged that variation by EURO class would increase the administrative burden on users since they would need to research what class their vehicle falls into and quote this information when purchasing any vignette product. Sophisticated systems that determine EURO class based on vehicle make and model are available, but these would increase scheme costs and that cost would be passed onto users.

Vignette prices could also be varied by season, to account for the different levels of demand across the year and the external costs of associated congestion at peak times. As described in chapter 5, Hungary is the only Member State to vary charges by season currently, by charging a higher price for the shortest term vignette over the summer months. Varying vignette prices by season can be justified if the higher price is shown to result in reduced congestion, however a tolling system is a better approach than a vignette if congestion reduction is an objective. The vignette is too blunt a product to effectively target congestion at the times and places that it occurs. For example, the most congested periods are likely to be a few peak weekends during the summer months and the vignette products on offer do not coincide with weekends. Congestion is also likely to occur along key routes, rather than on the whole vignette network, and the vignette is too blunt to target specific routes. To be consistent with the principle of non-discrimination, any seasonal variation should be reflected across all vignette products, rather than just the product which is most often purchased by foreign road users. Seasonal variation is not therefore included as a recommendation for the optimum vignette.

### **7.3.2 Revenue Allocation**

In an optimum vignette system, charges would be reviewed on an annual basis, and set on the basis of a revenue projection for the subsequent year. The revenue projection will be made up of total forecast long run capital and operating costs plus any additional revenue the Member State seeks to collect.

The setting of proportionate and fair charge rates is the most complex of all processes undertaken when setting up an optimum vignette system. To ensure that vignette charges meet the European Treaty’s principle of being “proportionate”, road users should be charged only for the proportion of costs they impose on the road network. Member States might choose to retrieve revenue that exceeds total cost, but the total amount of revenue collected should be allocated amongst road users in a manner that is proportionate to a share of the long run capital and operating costs attributable to users. As user groups are distinguished by time series of vignette products, the allocation needs to reflect the utility that the road users extract from the road network over that time period.

There are several options for setting the vignette differentials. It is possible to treat vignettes as simple access charges to the network, where a flat charge on a per day basis would be most appropriate. This would mean that an annual vignette would be 365 times the price of a daily vignette, before administrative costs are allocated. There is an economic argument that justifies fixed access charges for roads based on the fact that the majority of road related capital costs do not vary according to usage, particular for private cars. However, this approach would be contrary to European Transport Policy since it would impose high

barriers to car ownership, but low costs on actual car use when the key costs of private car use arise from externalities (congestion and pollution) caused by marginal road use. Distributing costs on a fixed time basis would not therefore be optimal and would not be consistent with the European Transport Policy which supports a “users pays” and “polluter pays” approach to the pricing of road use, so lends itself to charging users on the basis of consumption of road space rather than access to road space. Consumption of road space is better measured by distance travelled. Although vignette systems differ from road user charging systems, approximations of average usage over certain time periods can be applied when setting the charges. The use of distance as a basis for setting charges in a proportionate manner is consistent with the Eurovignette Directive for HGV charging. The Directive has the requirement that “Maximum monthly and weekly rates are in proportion to the duration of the use made of the infrastructure”<sup>63</sup>. This indicates that proportionality between vignette rates should be driven by levels of expected infrastructure use by motorists.

The benefit of using a distance-based approach to revenue allocation is that the vignette is priced to reflect forecast road use, rather than reflecting the period of time over which a user has access to the road. For example, if a driver was to purchase a one day vignette, it is possible to say with almost 100% certainty that the driver will use the roads on that day. A driver who purchases an annual vignette will almost certainly use the road network over the course of that year, and will use the network far more than the day vignette user, but it would be unreasonable to assume that road use will be 365 times heavier than the single day user since an annual vignette user’s travel patterns will inevitably vary across the year. Basic principles can be applied to define user groups, for example:

- Transit Users (neither the origin or destination are in the Member State);
- Visitors/Occasional Users (visitors to the Member State for business or leisure, and nationals who only use the vignette network occasionally); and,
- Regular Users (nationals who use the network regularly, and non-nationals who use the network regularly for business or leisure).

Once a Member State has defined its core user groups, the optimum vignette would apply forecasts of average distance travelled by user group to determine the proportion of cost that should be allocated to that user group. The vignette products should be designed to meet the requirements of the various user groups, and then prices should be set based on average distance travelled within that group. For example, in most Member States a transit user will only use the network for one day for the trip and one day on the return. They will therefore purchase the vignette that offers the shortest time period. A regular user would purchase an annual pass for convenience, and foreign visitors or national users who only use the network occasionally would purchase either week, fortnight or month products, depending on their travel patterns and the products on offer.

Ideally a Member State would have a transport model that simulated trip lengths by user type to provide annual forecasts of average distance travelled. Member States who apply HGV charging are most likely to operate this type of model already, so the relevant data can be extracted. Other Member States may have detailed journey data for their own residents,

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<sup>63</sup> Caps for annual rates and daily rates are specified in Annex II of the Eurovignette Directive

based on surveys or models. This approach ensures a better reflection of actual road use and is therefore more consistent with the principle of proportionality.

The calculation of an “optimum vignette” charge structure can be achieved by undertaking the seven steps set out below.

### *Calculating the “Optimum Vignette” Charge Structure*

#### *Step 1: Set revenue target*

The annual revenue target should be set based on a forecast of road infrastructure capital and operating costs, and a forecast of annual operating and administrative costs from operating the vignette system. Additional forecast revenue can be based upon calculations of external costs if such costs are to be reflected, and a surplus can be added to these costs to increase the revenue target if the Member State deems that a greater level of revenue is required. Robust and traceable calculations should be applied when setting the level of the surplus.

#### *Step 2: Forecast annual traffic in vehicle kilometres*

All Member States should base vignette rates on forecasts of annual vehicle kilometres on the charged network. This allows costs to be allocated according to estimated road usage which is consistent with the principles of the Treaty and with the European Transport Policy. This approach is also consistent with that applied to HGVs under the Eurovignette Directive.

Traffic forecasts should be robust, based on past trends and estimates of economic growth and vehicle fleet growth.

#### *Step 3: Divide revenue target by traffic forecast to obtain average cost per vehicle kilometre*

Dividing the revenue target by the forecast annual traffic on the vignette network provides an average cost per vehicle kilometre. This is an important measure since it sets a benchmark price for each vehicle kilometre travelled on the vignette network.

#### *Step 4: Extract annual vehicle kilometres for each user group*

An optimum vignette system will forecast annual traffic kilometres at a user group level, to determine the relative usage of each group. The user groups should be aligned to each of the vignette types by time series so that the vignette price can be calculated based on the forecast usage of that particular group.

In the absence of a detailed model of trip lengths and frequency, it should be possible to estimate the average annual vehicle kilometres undertaken by its national residents on the vignette network, based on surveys. Some countries take odometer readings as part of the annual process of vehicle registration, and these can be applied to estimate average distance travelled within the Member State. Where a forecast model by user group is unavailable, Member States should be able to estimate the proportion of national residents that use the highway network frequently and will therefore purchase an annual vignette. The average cost per kilometre can be applied to the average vehicle kilometres of frequent users to obtain a price for the annual vignette. Average distance for all other vignette types (monthly, weekly, daily etc) is estimated using a bottom-up approach based on average time spent on the charged road network multiplied by average speed.



**Step 5: Multiply cost per kilometre by annual vehicle kilometres to obtain revenue targets for each vignette type**

Applying the average cost per kilometre to the forecast average vehicle kilometres of each user group will provide an overall revenue target for each user group. These revenue targets reflect the proportion of costs allocated to each of the user groups, ensuring that the optimum vignette meets the proportionality principle of the EC Treaty.

**Step 6: Divide revenue targets by sales forecasts to obtain vignette charge structure**

An optimum vignette charge structure should be derived from the revenue targets and sales forecasts of each user group. Dividing the total revenue by the forecast number of vignettes sold within each group will provide a vignette charge level that reflects the anticipated level of usage associated with that vignette.

**Step 7: Add administrative cost of operating the vignette system, on a per transaction basis**

The final step in establishing the vignette charge structure is to allocate the administrative costs of the vignette system across the vignette products. Administrative costs will include a share of fixed costs and the per transaction operating costs associated with selling the vignette. These transaction costs may vary by type of vignette, based on the payment options and outlets used (e.g. online transactions are cheaper to manage than retail outlets). Costs should be disaggregated and allocated fairly and transparently by vignette type.

A worked example is provided below to illustrate how a Member State should allocate revenue to set charge rates in an optimal manner.

<b>Setting Charge Structure by Revenue Allocation</b>
1. Set revenue target based on road infrastructure costs. A surplus can be included if required
<i>Revenue Target = €400,000,000</i>
2. Forecast annual traffic in vehicle kilometres
<i>Annual Traffic (forecast) = 50,000,000,000km</i>
3. Divide revenue target by total forecast vehicle kilometres to obtain an average “cost per kilometre”
<i>Cost/km = €400M / 50,000M km = €0.008</i>
4. Extract the annual vehicle kilometres of each user group from the traffic forecast
<i>Regular users = 36,750M km</i> <i>Occasional users = 2,650M km</i> <i>Visitors = 5,300M km</i> <i>Transit users = 5,300M km</i>
5. Multiply the cost per kilometre by the annual vehicle kilometres to calculate the total amount of revenue required from each user group
<i>Regular users: 36,750M km x €0.008 = €294M</i> <i>Occasional users: 2,650M km x €0.008 = €21.2M</i> <i>Visitors: 5,300M km x €0.008 = €42.4M</i> <i>Transit users: 5,300M km x €0.008 = €42.4M</i>
6. Divide each user group’s revenue target by the number of vignettes forecast to be purchased by that group to obtain an appropriate price for that user group’s access to the network

<i>Annual vignette: €294M / 3.5M = €84/vignette</i> <i>Monthly vignette: €21.2M / 1.1M = €19.27/vignette</i> <i>Weekly vignette: €42.4M / 6.4M = €6.63/vignette</i> <i>Daily vignette: €42.4M / 11M = €3.85/vignette</i>
7. Add administrative cost of operating the vignette system, on a per transaction basis
<i>Annual vignette: €84 + €1.70 = €85.70/vignette</i> <i>Monthly vignette: €19.27+ €1.70 =€20.97/vignette</i> <i>Weekly vignette: €6.63 +€1.70 = €8.33/vignette</i> <i>Daily vignette: €3.85 + €1.70 = €5.55/vignette</i>

The vignette charges can be validated by dividing the forecast vehicle kilometres by the estimated number of vignettes sold in each user group, to obtain an estimate of the average number of kilometres undertaken by each user. Surveys or traffic monitoring can be undertaken to test these values against actual road use. Any identified differences can be incorporated into periodic reviews of the vignette charges.

A worked example of the validation process is set out below.

<b>Validating Vignette Charge Structure</b>
8. Divide average annual vehicle kilometres by forecast or actual vignette sales for each user group to obtain average vehicle kilometres per user
<i>Annual users: 36,750M km / 3.5M = 10,500km</i> <i>Monthly users: 2,650M km / 1.1M = 2,409km</i> <i>Weekly users: 5,300M km / 6.4M = 828km</i> <i>Daily users: 5,300M km / 11M = 482km</i>

The revenue derived should be assessed against the revenue target on a periodic basis. Under an optimum vignette system, this process of review and adjustment would take place at least every 3 years. In some instances it may be appropriate to “over adjust” to compensate for any significant revenue gains or losses in the preceding period. Since the number of vignette sales can never be forecast 100% accurately it is expected that revenue would vary from the target and variations within 10% would be considered reasonable

#### 7.4 ENFORCEMENT

As with any enforcement regime, it is critical than vignette systems be supported by robust and fair enforcement rules and procedures. The key underlying principle of any enforcement regime should be that users perceive there is a lower risk and cost in purchasing a vignette compared to the risk and cost of being caught evading it<sup>64</sup>. The measure of a successful enforcement policy will not be in the recovery of high levels of revenue from penalties, but the maintenance of low evasion rates. Key to enforcement of traffic offences across borders, especially between countries that have eliminated border checks, is to co-ordinate and co-operate in ensuring fines can be enforced in different Member States.

<sup>64</sup> The cost of compliance (the total cost, including time, for purchasing a vignette) should be seen as lower than the savings from non-compliance plus cost of penalties multiplied by the risk of being caught.

The design of an enforcement policy should be based on best practice and principles that can be applied to the conditions of a Member State. These principles include:

- Emphasis on promotion of compliance;
- Transparency of penalties and procedures;
- Deterrence;
- Non-discrimination; and
- Proportionality

#### **7.4.1 Promoting Compliance**

The optimum enforcement policy should not be focused on apprehending violators, but on promoting understanding of the system to encourage user compliance. Application of such a principle would see high standards of information provision to motorists, both in terms of clarity of information and diversity of information outlets. Violations due to ignorance or mistake should be minimised. Signage should be clear, concise, in relevant languages and explain clearly where and how motorists can purchase vignettes.

When a vignette system is to be introduced the priority should be on informing motorists, rather than penalising them for not understanding the scheme.

Part of a compliance-oriented approach to enforcement would be to give enforcement officers the discretion to direct motorists to buy a vignette immediately to avoid a penalty, if it is genuinely believed that a mistake was made. This can help to ensure that efforts on enforcement are focussed on motorists that are deliberately, or repeatedly, evading the vignette.

#### **7.4.2 Transparency**

A key feature of an effective and fair enforcement policy is transparency. The laws and regulations defining the vignette, violations, penalties and procedures should be published, with key provisions summarised for motorists to clearly understand. This should also include procedures for complaints and appeals, in the event that a motorist believes a penalty has been unfairly applied.

Procedures to pay penalties should be clear and easy to follow, and under an optimum vignette system fines will not be payable to the enforcing officers. On the spot fines provide opportunities for corruption, either preferentially or discriminatorily, and should not be mandated.

#### **7.4.3 Deterrence**

Effective deterrence is about taking steps to ensure motorists believe there is sufficient risk of being caught for evasion of the vignette system, with sufficiently punitive penalties to deter a reasonable motorist from choosing to evade the vignette. Deterrence is promoted by signage which clarifies that the vignette is enforced by a specific agency and states the penalties of being caught. Enforcement processes should also be highly visible, such as checkpoints, cameras and signage warning of checkpoints. It is preferable that motorists do not develop perceptions that certain locations or times periods are without enforcement,

thereby encouraging them to drive at such times without vignettes. This visibility of enforcement is in itself a key element in encouraging compliance, even if the actual enforcement activity is low.

Another key component of deterrence is the provision of confidence that any fines or penalties will be enforced not only in the country where they are issued, but also in the motorist's home country. Member States applying vignettes are likely to be concerned that penalty notices may not deter motorists if the penalty cannot be enforced outside the country concerned. The same issue exists for other traffic offences, including parking fines and a co-ordinated response to this has been developed with the "SPARKS Network" initiative. This enables national agencies to co-ordinate across borders to collect fines. Extending this to cover vignette enforcement across Member States could effectively improve the deterrence of vignette evasion. The EC could help facilitate this further and encourage Member States to exchange data and

#### **7.4.4      *Non-Discrimination***

The optimum vignette system will ensure the application of non-discrimination with an enforcement strategy that does not specifically target foreign motorists.

Enforcement strategies are expected to target particular locations and times where and when it is known that a higher proportion of motorists evade a vignette system. This is reasonable and understandable. However, it is important that in doing this, the enforcement effort does not target foreign motorists per se, but focuses effort based upon objective data (e.g. violation rates).

In addition, procedures for appealing any penalty notice should not, for the first stage, require an appellant to appear in person since this penalises foreign motorists on transit trips. The system should allow an appeal to be made in writing.

#### **7.4.5      *Proportionality***

Penalties should be proportionate and should reflect a combination of what is essentially civil "harm" (lost revenue and cost of enforcement) with a punitive element to deter repeat behaviour. The punitive element should be proportionate to other traffic offences. Penalties for first time offenders should not generally include significant infringements on personal liberties, such as confiscation of vehicles or confiscation of driver licences, unless there are exceptional cases (e.g. court orders have been issued to recover high levels of debt).

An optimum enforcement system would maintain records of offending vehicles, so that warnings and penalties could be applied appropriately. For example, a first time offender who honestly appears to be unaware of the requirement could be issued a warning and requested to purchase a vignette as soon as possible. A repeat violator might reasonably face vehicle impoundment if there are significant debts arising from multiple violations.

## ANNEX A: USING TRANS-TOOLS TO ANALYSE INTERNATIONAL TRIP DATA

Domestic and foreign traffic data was extracted from TRANS-TOOLS (“Tools for TRansport forecasting ANd Scenario testing”), which is a multi-modal European transport network model that has been developed by the European Commission.

Passenger transport data is segmented across 4 travel modes:

1. Air;
2. Rail;
3. Car Passengers (excluding driver); and
4. Passenger Vehicles (driver only; no passengers).

The model’s base data provides origin-destination flow data (O-D data) for each of these groups between all zones within Europe, which are defined to NUTS 3 level (Nomenclature of Units for Territorial Statistics 3); the most granular level. This typically splits a country into 20-50 sub-regions. The base year of this data is 2005.

In order to reveal both domestic and foreign traffic data the following data was required for extraction:

1. *Domestic* traffic within each country;
2. International traffic *originating* or *destined* our countries of interest; and
3. International traffic *transiting* through our countries of interest.

Data for the first two of these datasets were readily available from the TRANS-TOOL data files. However data for international transit traffic was not readily available and required additional calculation. For all calculations data on Passenger Vehicles only was used since the focus of the study is on private vehicle traffic flows.

### **Step 1: Determining Domestic Traffic for each country of interest:**

Domestic travel data in the TRANS-TOOLS model includes all types of journeys made by the population including journeys such as travel to work or shopping, and any other local journey. These journeys are not of interest to this study as they are not likely to make use of major highway routes on which the vignette system is applicable.

To overcome this, domestic journeys have been defined as the journeys which take place between any of the sub-zones (NUTS3 level) within each country, and excludes all journeys which occur within a sub-zone, since these are less likely to utilise the network on which the vignette applies. The major assumption here is that all inter-zonal trips utilise some portion of the vignette charged road network.

### **Step 2: Determining International Traffic originating or destined for each country of interest:**

The TRANS-TOOLS data was aggregated into an O-D matrix at country level which provided the data required. Any journey which originated in, or was destined for the country of interest was included in these figures. The assumption behind this approach is that any journey to or from another Member State will use the major road system.

### **Step 3: Determining Transiting traffic for each country of interest:**

Transiting data was calculated by making a number of high level assumptions for each O-D pair in the matrix about the proportion of flows travelling through each of the analysed countries. For example, for Austria:

1. Czech Republic-Slovenia: 100% transit through Austria
2. Germany-Romania: 50% transit through Austria
3. Latvia-Poland: 0% transit through Austria

Over 800 of these assumptions have been made for each of the countries of interest, and the assumptions were specified as either 100%, 50%, or 0%. These assumptions were then multiplied by the full flow data to determine the number of transit flows. Once again, this approach assumes that any vehicle transiting through these countries will make use of the major road network.

**Additional notes:**

The O-D flow data in TRANS-TOOLS is specified as a return journey. In order to report on actual traffic data, these figures have been multiplied by 2 to represent the number of single traffic flows on each road network.

Sensitivity analysis was carried out on the assumptions used in Step 3 in order to measure by how much the transit share of traffic flows fluctuated with changes in these assumptions. Little variation was observed in these tests. Tests included changing all 100% assumptions to 80% and then 50%, and then separately changing all 50% assumptions to 30%.

## **ANNEX B: TAXES, VIGNETTES AND TOLLS**

Directive 1999/62/EC refers to the charging of heavy goods vehicles (HGVs). Whilst it does not cover the charging of private vehicles, the definitions and principles are generally applicable to all forms of road charging in Europe.

A toll is defined in Directive 1999/62/EC (Article 2(b)) as “a specified amount payable for a vehicle travelling a given distance on the infrastructures referred to in Article 7(1); the amount shall be based on the distance travelled and the type of vehicle”.

A vignette defined in Directive 1999/62/EC as a “user charge” in Article 2(c) as “a specified amount payment of which confers the right for a vehicle to use for a given period the infrastructures referred to in Article 7(1)”.

European Court of Justice cases ECJ C-276/97 and C-462/05 confirmed that tolls are not taxes, but rather charges for services.

## ANNEX C: DRAFT QUESTIONS FOR CONSULTATION

Should Member States be required to offer a daily vignette for private vehicles as well as other products?

Should a methodology be established or recommended by the European Commission for the setting of proportionality between vignette products (differentiated by time periods)? If so, what should be the basis for that methodology?

Should Member States be transparent about cost allocation methodologies to establish vignette prices, including infrastructure and externality cost calculations?

Should there be minimum criteria for payment options and outlets for private vignette systems?

Should there be standardised signage for vignettes (with specific symbols), so that motorists across the EU understand when and where vignettes are charged and directions to where they can be purchased?

Should signage and information for vignettes be at least in the languages of the Member States of the country establishing the vignette?

Should the European Commission help facilitate enforcement of vignette systems across Member States? If so, how?

Should the European Commission facilitate trans-national vignette products for private vehicles to allow motorists to travel across borders with single vignettes? If so, how?

Should private vehicle vignettes include variations to prices based on Euro engine classifications to encourage use of lower emission vehicles?

Should electronic vignettes be encouraged as a way to ease purchases of vignette products (with the provision of prepay options that do not require stickers)?

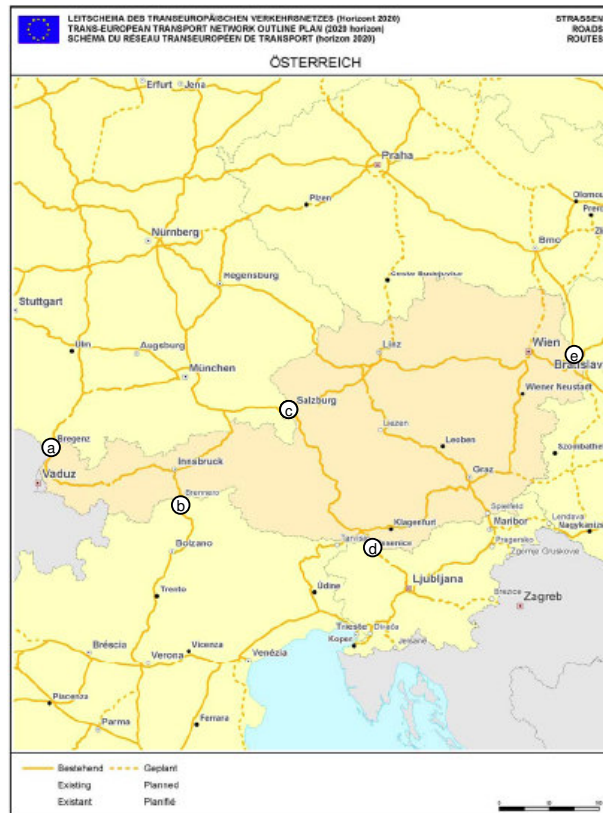
Should enforcement procedures for vignettes exclude instant payment fines and confiscation of identity documents until fines are paid?



## ANNEX D: TRANSIT DISTANCES

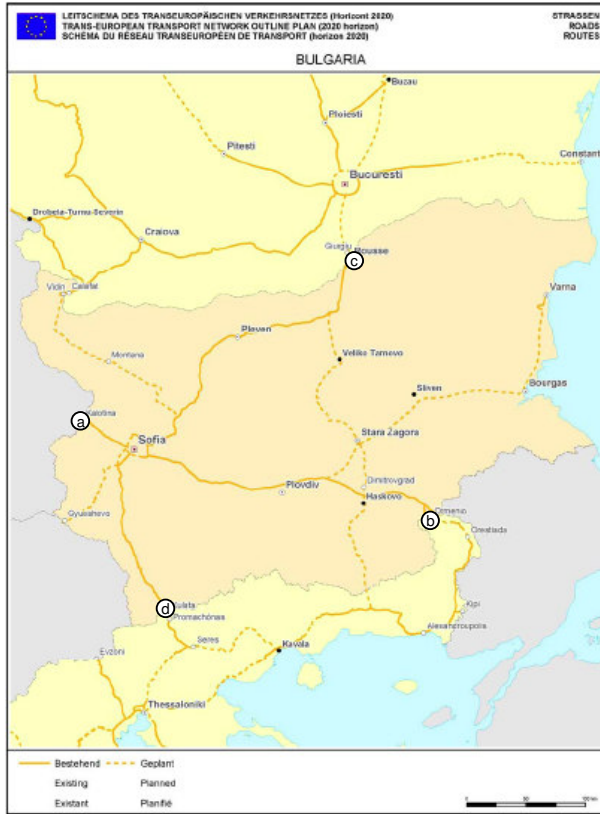
In order to provide an indication of typical transit distances, at least two routes traversing the country were considered for each Member State. Broadly speaking, at least one route was chosen to be north-south, and one to be east-west, though the actual choice of route depended on the road network and an assessment of the routes most likely to be travelled. The result was then averaged across all the route considered and rounded to the nearest 50km, in view of the fact that the result is indicative only, and naturally would vary depending on the routes chosen.

The graphs and tables below show the routes and the distances for each country. Where possible, the routes were chosen to be on the vignette road system, though in some cases it is likely that at least some part of the journey may be on non-vignette roads. The maps are taken from European Commission literature on the development of the trans-European transport network. The distances are calculated with the aid of the internet-based road mapping utility GoogleMaps. The results are intended to provide indicative values only; further investigation on road-traffic movements and transit routes would be required to form a definitive answer.



Origin	Destination	Distance (km)
Hörbranz, nr Germany (a)	Passo del Brennero, Italy (b)	230
Salzburg, nr Germany (c)	Jessenice, Slovenia (d)	220
Salzburg, nr Germany (c)	Bratislava, Slovakia (e)	380
Average (to nearest 50km)		300

**Table 0-1: Austria – Transit Distances**



Origin	Destination	Distance (km)
<i>Kalotina, Dragoman, nr Central Serbia (a)</i>	<i>Soilengrad, nr Greece/Turkey (b)</i>	370
<i>Giurgiu, Romania (c)</i>	<i>Petrich, nr Greece (d)</i>	500
<i>Average (to nearest 50km)</i>		450

**Table 0-2: Bulgaria – Transit Distances**



Origin	Destination	Distance (km)
<i>Altenberg, Germany (a)</i>	<i>Kúty, Slovakia (b)</i>	380
<i>Waidhaus, Germany (c)</i>	<i>Kúty, Slovakia (b)</i>	440
<i>Waidhaus, Germany (c)</i>	<i>Cieszyn, Poland (d)</i>	570
<i>Average (to nearest 50km)</i>		450

**Table 0-3: Czech Republic – Transit Distances**



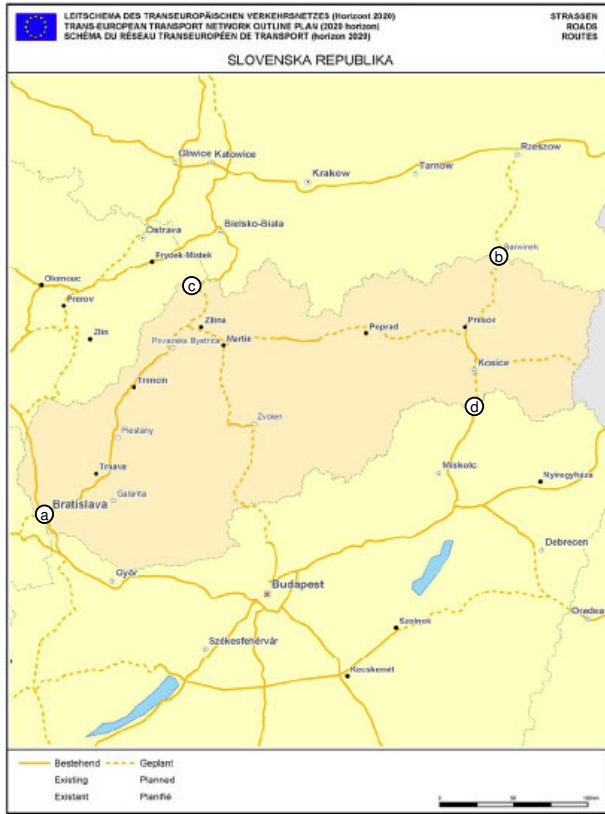
Origin	Destination	Distance (km)
Nickelsdorf, Austria (a)	Szeged, nr Serbia/Romania (b)	Nickelsdorf, Austria (a)
Kosice, Slovakia (c)	Nagykanizsa, nr Croatia (d)	Kosice, Slovakia (c)
	Average (to nearest 50km)	400

Table 0-4: Hungary - Transit Distances



Origin	Destination	Distance (km)
<i>Oradea, nr Hungary (a)</i>	<i>Ruse, Bulgaria (b)</i>	640
<i>Albita, nr Moldova (c)</i>	<i>Nădlac, Arad, nr Hungary (d)</i>	780
<i>Average (to nearest 50km)</i>		700

**Table 0-5: Romania - Transit Distances**



Origin	Destination	Distance (km)
<i>Bratislava, nr Austria</i>	<i>Ożenna, Poland</i>	500
<i>Velké Karlovice-Uzgrůň, Czech Republic</i>	<i>Hidasnémeti, Hungary</i>	320
	<i>Average (to nearest 50km)</i>	400

**Table 0-6: Slovak Republic – Transit Distances**



Origin	Destination	Distance (km)
<i>Trieste, Italy (a)</i>	<i>Bregana, Croatia (b)</i>	200
<i>Rosenbach, Austria (c)</i>	<i>Rupa, Matulji, Croatia (d)</i>	170
	<i>Average (to nearest 50km)</i>	200

**Table 0-7: Slovenia – Transit Distances**