Heavy Vehicle Tolling in Germany

State and Local Policy Program
Hubert Humphrey Institute for Public Affairs
University of Minnesota

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Heavy Vehicle Tolling in Germany:

Performance, Outcomes and Lessons Learned for Future Pricing Efforts in Minnesota and the U.S.

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INTRODUCTION

Purpose of Report

The purpose of this report is to describe the German "Heavy Goods Vehicle (HGV)" tolling system, including the rationale for its implementation, achievement of system objectives, outcomes and political issues surrounding the project. Ultimately, this report attempts to draw conclusions and make inferences from lessons learned and their applicability to pricing efforts in Minnesota and the United States. This report also describes an alternative multi-country road charge system called Euro-Vignette, and Berlin's Low Emission Zone environmental charge and restrictions.

The visit to the German HGV toll system was organized by the State and Local Policy Program (SLPP) of the University of Minnesota's Humphrey Institute of Public Affairs. The Humphrey Institute has played a primary role in the areas of research, outreach, education and evaluation of pricing and innovative financing initiatives, both in Minnesota and nationwide. SLPP selected Germany for this visit because: (1) it considers the German HGV tolling system to be at the cutting-edge of large-scale, distance-based tolling for the purpose of infrastructure investment funding, and because of its use of incentives to reduce vehicle emissions, especially as they relate to greenhouse gases (GHG); and (2) because the HGV system could be used as a possible model for Minnesota and the United States in the future. It is anticipated that the next Surface Transportation Authorization Bill will likely include a mileage-based implementation demonstration project. The Humphrey Institute hopes that this visit and report will result in a better understanding of the challenges and successes of the German system and its possible relevance to the US.

The agenda for the visit, including meetings with relevant organizations and their representatives, and a list of US delegation members, are included in the Appendix to this report. Many thanks go to Dr. Eng. Andreas Kossak for his invaluable assistance in securing meetings with key people. His knowledge of the German tolling system, in his role of permanent advisor to the German High Commission on "Financing the Federal Transportation Infrastructure", helped the US delegation to better understand the process leading to system implementation, including related political issues.

Background on Pricing

Unpriced commodities, such as the current transportation system capacity, are viewed by users as being "free" and lead to excessive use. In the case of roads, this unconstrained demand results in high levels of congestion and delays and an associated reduction in safety and air quality. The concept of pricing as a means to limit peak period or seasonal demand is widely used by the airline industry, transit operators and utility companies, to name a few, and the public understands and accepts this.

Pricing of transportation facilities is seen as the most effective method for managing system capacity and for funding highway infrastructure and transit services. Pricing is used to manage demand on congested roads by charging for peak-period use, while charging less for off-peak period use. Pricing can be done dynamically—where the price charged varies with current, real-time level of demand or congestion—so as to maintain free-flow traffic conditions.

Pricing is also seen as an alternative to fuel taxes, which is currently the primary funding source for construction and improvement of the nation's transportation infrastructure. There are three important concerns with continuing to use fuel taxes as the main source of transportation funding. The first is that fuel taxes, as a fixed cents-per-gallon charge, have not kept up with inflation. In Minnesota, the gas tax, which had not been increased since 1988, was finally increased in 2008, twenty years later. Second, continued increase in vehicle fuel efficiency and growth in the number of alternative-fuel vehicles further and substantially diminishes fuel tax collections. The third concern is that fuel taxes are an indirect charge, not directly related in most people's minds to the amount of travel they make nor to the congestion costs they impose on others.

The key to the success of pricing as a means of reducing demand while generating revenues is that pricing, as a direct charge, is clearly related to the time of travel as well as the amount of travel. Users can appreciate immediately that roadway capacity is not free, which causes many to adjust their travel patterns to avoid the charges. Road pricing rations scarce highway resources by discouraging demand and encouraging competition in use of facilities and services.

GENERAL DESCRIPTION OF THE HGV TOLLING SYSTEM

The German Heavy Goods Vehicle tolling, introduced on January 1, 2005, is a satellite-based, electronic system covering the entire national motorway (Autobahn) network (12,500 kilometers or 7,768 miles). Tolls are assessed to all heavy commercial vehicles over 12 tons (26,400 pounds) gross vehicle weight, based on distance traveled, number of axles and emission class. A public-private partnership (PPP) was formed between the Ministry of Transport, Building and Housing), who was responsible for contracting and system regulation; the Federal Office for Goods Transport (BAG), responsible for enforcement; and Toll Collect, a private-sector joint venture made up of Daimler-Chrysler Financial Services, Deutsche Telecom and Cofiroute. Specifics of the implementation contract between the Ministry of Transport and Toll Collect are not publicly available due to confidentiality agreements that protect sensitive details related to Toll Collect technology and business model.

Background

The rationale for truck charges was based on several factors. First, recognition of the substantial infrastructure costs imposed by heavy trucks on federal motorways, estimated at 3.4 billion Euros per year of internal costs per year ($4.4 billion), equivalent to 15 Euro cents per vehicle-km ($0.32 per vehicle-mile)[1]. The cost-allocation method used to estimate the impact of trucks on infrastructure damage was done under the direction of the European Commission. Second, was the fact that 35 percent of truck-kilometers on Germany's motorways were made by foreign-registered vehicles that impose infrastructure costs without contributing directly to system construction, maintenance and reconstruction. Third, many foreign trucks did not comply with European Union emission standards and therefore had a competitive advantage over German-registered trucks. The final factor was that fuel taxes had been raised eight times since 1991, resulting in a doubling of taxes on gasoline and diesel fuel. (Currently, fuel taxes are approximately half of the price per gallon of fuel.)

The idea of a distance-based charge was conceived in 1989. Studies were conducted subsequently, and in 1995, based on the recommendations of the German High Commission (Paellman Commission) on Financing of Federal Transport Infrastructure, the federal government decided to introduce distance-based tolls. Initial opposition turned into acceptance because tolling of all heavy goods vehicles was considered fairer for German trucks vis-à-vis foreign trucks; tolling also served environmental interests, and more revenues would be available for transportation infrastructure improvements. The decision to implement tolls was strongly supported by a coalition of the ruling Christian Democratic Party and the Green Party ("Red-Green" Coalition).

The imposition of tolls on domestic and foreign trucks by the German government had to be authorized by the European Commission before implementation could occur. The Commission ensures that the scheme does not discriminate nor place foreign trucks at a competitive disadvantage. For example, an attempt to rebate fuel tax payments worth 600 million Euros ($787 million) to the German trucking industry was rejected by the European Commission as being de facto discrimination.

Toll Collect was commissioned by the Federal Republic of Germany to develop the toll system, which Toll Collect also operates, under the direction of the Federal Ministry of Transport.

Objectives

The objectives of HGV tolling in Germany, implemented in 2005, were as follows:

- Introduce a national mileage-based infrastructure charging system for heavy tucks, applying the "user-pays" principle.

  The "user-pays" principle was intended to make a direct connection between road use and charging users for the impact their use caused, thus initiating a shift from traditional tax-financing of transportation infrastructure to user-financing.

[1] Based on the mid-August 2006 exchange rate of $1.30 per Euro.

- Secure funding for upgrade and maintenance of the transportation infrastructure.

  Unlike the US, where federal fuel taxes go into the Federal Highway Trust Fund, in Germany fuel taxes become part of the "general fund", which is used to fund federal programs, including transportation infrastructure. The HGV toll revenues, however, are allocated (earmarked) exclusively to funding road, rail and waterway transportation infrastructure. This earmarking of HGV toll revenues was intended to complement the federal budget allocation to transportation, and help close the 2-billion Euro annual funding gap for roads, 1.5 billion for rail and 0.25 billion for inland waterways (year 2000 estimates). Importantly, the expectation of closing or eliminating the road infrastructure funding gap was instrumental in securing support of the HGV tolling scheme by the trucking and logistics community.

- Provide incentives to shift freight truck traffic to rail and waterways.

  As part of the HGV tolling implementation, it was decided that 50 percent of the toll revenues would go to finance the federal motorway infrastructure; the other 50 percent would go to cross-subsidize other freight modes (38 percent to rail and 12 percent to waterways). This decision by the red-green coalition, which was intended to effect a better modal balance, was made despite violating the "user-pays" principle, and resulted in a reversal from initial stakeholder support to opposition for expansion of road tolling.

- Promote environmental interests and more efficient deployment of heavy goods vehicles.

  The decision to implement HGV tolls was strongly supported, and influenced, by a coalition of the ruling (at the time) Christian Democratic Party and the Green Party, who supported the provision of incentives through lower tolls for lower emission vehicles (Euro Class III to VI) and higher tolls for highest emission level vehicles (Euro Class I and II).

- Promote innovative tolling technologies.

  The HGV tolling system was envisioned to use electronic toll collection at free-flow speeds (no gates), automatically taking into account the type of road traveled, the distance traveled, number of axles, and level of emissions.

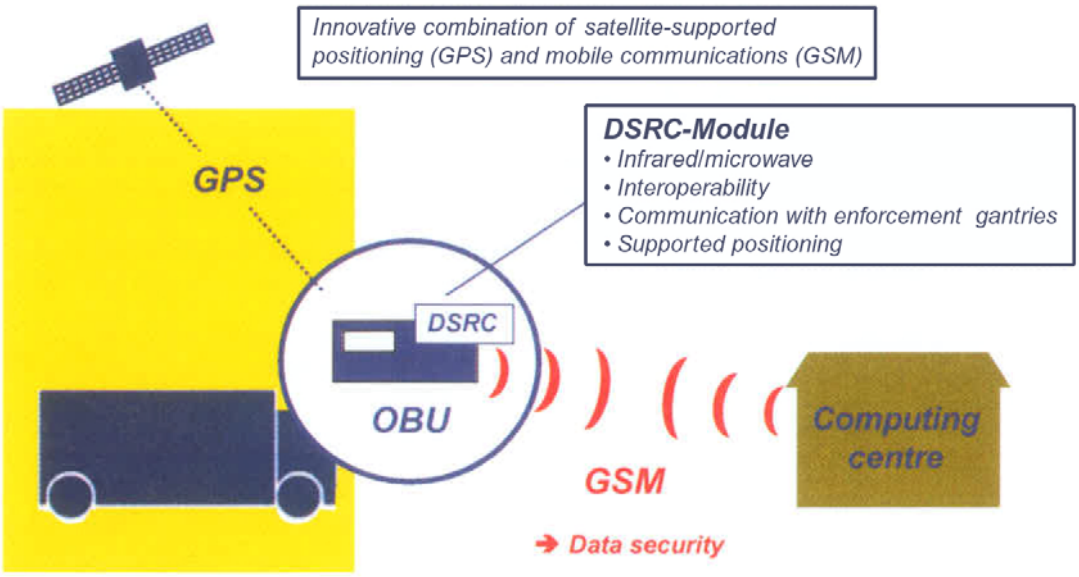
System Facts

Date Started:	January 1, 2005
Vehicle Applicability:	Heavy Trucks 12 tons and above gross vehicle weight (26,400 pounds)
System Applicability:	12,500 km (7,768 miles) of Federal Motorways (Autobahn) system and three segments of Second Class Federal Highways
Total Vehicles Tolled:	1.5 million (35% foreign)
Vehicle-Miles Tolled:	22.7 billion Km (14.1 billion miles) per year

Cost Imposed by Trucks:[2]	15 Euro cents per km (approx. 37.6 US cents per mile)
Average Toll Charged	13.5 Euro cents per km (approx. 33.9 US cents per mile)
Range of Toll Rates:	9 – 14 Euro cents per km (approx. 22.6 to 35.1 US cents per mile)
Toll Rate Factors:	Number of axles (up to 3 and 4 or more) Emission Class (Class I, highest rate, through Class VI, lowest)
Pricing per Axle Group:	10 – 14.5 Euro cents per km (25.1 – 36.4 US cents per mile)
Pricing per Emission Class:	9 – 14 Euro cents per km (22.6 – 35.1 US cents per mile) (50% premium for older, "dirtier" trucks vs. newer, cleaner trucks)
Annual Gross Revenues:	2005: 2.86B Euros; 2006: 3.08B Euros; 2007: 3.40B Euros (approximately $4.46B, $4.80B and $5.30B, respectively)
Distribution of Revenues:	50% Roads; 38% Rail; 12% Waterways
System Annual Cost:	Estimated at 15 – 20 percent of revenues
OBU Cost:	500 Euros initially ($650); 200 – 250 Euros currently
OBU Installation Cost:	60 to 70 Euros ($94 – $109), installed by private market

Automatic Tolling System (Automatic Log-On: 90% of Transactions)

- USGPS-Based Vehicle Location
- On-Board Computer (OBU)—Not mandatory
- Data Transmission: Mobile Communications Network (GSM)
- Dedicated Short Range Communications (DSRC – 5.8 GHz)
- Toll Collect Data Processing System



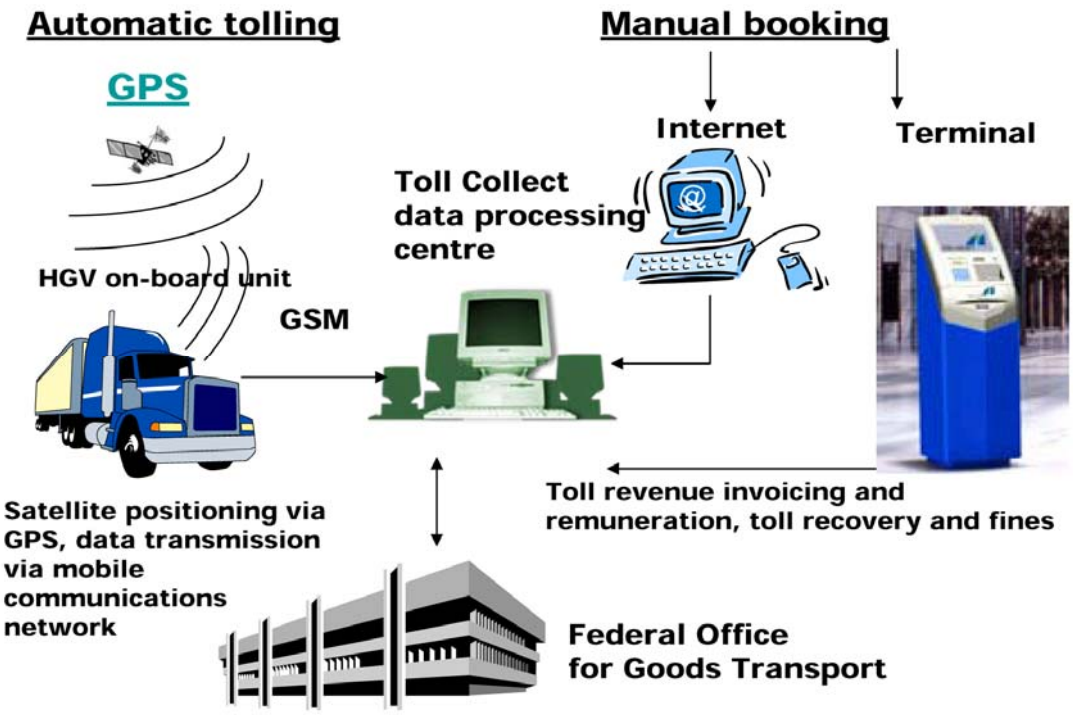
[2] Based on the August 2008 exchange rate of $1.56 per Euro.

Manual Booking (Manual Log-On: 10% of Transactions)

- Internet or Terminal (3,000 units)
- Toll Collect data processing center
- Toll Revenue Invoicing, Remuneration, Recovery and Fines

Enforcement Approach: Spot Checks

1. Automatic, using 300 gantries, backed by video and Optical Character Recognition (OCR)
2. Stationary, at parking areas following up on automatic check (150 locations near gantries)
3. Mobile, using enforcement vehicle fleet on Autobahn (280 vehicles)
4. On premises of freight shippers



Violations

- Fine for intentional violations: 400 Euros ($624)
- Fine for unintentional violations: 200 Euros ($312)
- Maximum Fine: 20,000 Euros ($31,200)
- Responsibility for fines: 50 percent to driver; 50 percent to shipper

SYSTEM OUTCOMES AND POLITICAL ISSUES

The German HGV tolling system, now in its fourth year of operation, has largely achieved the objectives it set out to accomplish. System implementation outcomes as well as related technical and political issues are described next.

User-Pays Principle

The user-pays principle has been successfully implemented within the constraints of policy decisions made at the time of implementation. Specifically, HGVs are paying for their use of the road, but only 50 percent of the toll charges are being reinvested in roadway infrastructure. This policy was not agreed-to by haulers and logistics companies. Furthermore, the level of road funding from the general fund has been cut substantially, leading to a continued underfunding of roadway infrastructure needs. The reduction in appropriations for road infrastructure, which has been blamed on the growth of social programs, has further eroded the initial support by haulers and logistics companies.

System Operations

From an operations perspective, the German tolling system has been quite successful. System performance has exceeded expectations in terms of the reliability and accuracy of toll charges, the ability of enforcement to minimize violations, continuity of operations, reliability of the technology, and system flexibility and adaptability.

Revenues

The anticipated toll revenue, estimated at Euro 3 billion (approximately $3.9 billon in 2006 dollars) was exceeded during the second year of operations (2006), with a revenue of Euro 3.08 billion ($4.8 billion). In 2007 revenue grew to Euro 3.4 billion ($5.3 billion).

Mode Shift

Achieving the objective of shifting freight truck traffic to rail and waterways through the use of truck toll revenue cross-subsidization (38 percent of revenues to rail and 12 percent to waterways) has not been clearly demonstrated since no formal studies have been completed. While initial data shows that the number of containers shipped by rail has increased by about 7 percent, a formal study is needed to determine if this is due to normal growth in rail freight or to a mode shift from trucks.

Environment Effects

Environmental interests have benefited from several HGV toll-related effects. First, older, "dirtier" trucks pay a toll rate, which is 50 percent higher than newer, cleaner trucks. As a result, between the years 2004 (pre-toll) and 2006, the proportion of cleaner trucks (Euro Class III to Class VI) has increased from 50 percent to 64 percent, while the proportion of "dirtier" trucks (Euro Class I and II) has decreased from 50 percent to 36 percent. Secondly, if it is demonstrated that there has been a shift from trucks to rail and waterways, it follows that the amount of greenhouse gas emissions will have been reduced proportionately. Finally, the effect of charging the full toll whether the truck is loaded or empty has been to reduce the number of empty truck trips by 20 percent, thus increasing truck operation efficiency. Firms are using freight exchange marketplaces on the Internet to acquire loads, since they are unable to charge their customers for empty trips.

Technological Innovation

The German HGV tolling approach has successfully demonstrated that distance-based tolling can be implemented at a national level, using innovative technology: Satellite-based (GPS), mobile communications (GSM), on-board computers (OBUs), Dedicated Short-Range Communications (DSRC), license plate character recognition (OCR), as well as the internet and terminals. This national HGV toll system is able to accommodate 35 percent of foreign through trucks and vehicle-miles seamlessly.

Tolls have been successfully charged, with a reliability of 99.7 percent, and enforcement-aided technology has been able to keep toll violations below 2 percent.

The system is flexible and expandable: road segments can be added, time-of-day toll rates can be implemented, and differentiation by road type can be introduced, all without having to deploy any costly roadside infrastructure. Changes to the computer program and to the corresponding instructions to the on-board units are all that is needed.

Implementation Delays

The success of the toll system has been achieved despite delays in the initial schedule, which called for an 11-month implementation period but experienced a two-year delay. Many blame the delay on an unreasonable schedule, especially given the project's magnitude, complexity and advancement of state-of-the-art technology. Toll Collect, who signed on to deliver the project on this schedule, also underestimated the complexity of the technology and systems requirements. On the basis of the initial implementation schedule, in 2003 Germany pulled out, prematurely, from the six-country, sticker-based, road-charging system called Euro-Vignette, from which it was receiving 500 million Euros per year ($650 million). The delay that led to Toll Collect opening in 2005 resulted in a loss of federal toll collection, estimated at 2.5 billion Euros per year ($3.5 billion). Haulers were able to use the Autobahn charge-free during this period. A German government's pending claim against Toll Collect to recover lost revenues has created a great deal of tension between the public- and private-sector partners.

LESSONS LEARNED

The German HGV tolling approach has largely succeeded in achieving its stated objectives. A brief review of steps leading to system development, deployment and operations, and outcomes, provide some useful lessons for future pricing efforts in Minnesota and the United States.

1. A clear and strong rationale is needed to create support among affected stakeholders for any proposed pricing scheme. The fact that the 35 percent foreign heavy goods vehicles using the Autobahn would have to pay their fair share under the HGV tolling scheme was instrumental in securing support. Furthermore, the fact that all HGVs were charged a predictable and documental toll meant that toll charges could be passed on to consumers, ultimately. Prior to implementation, it was estimated that toll charges would result in an increase of 0.15 percent in the price of consumer goods; however, there has been no documented increases in consumer prices as a result of tolling charges.

2. A clear statement of objectives, subscribed to by stakeholders, interest groups and political parties, is key to securing broad support and necessary for guiding system development and measuring outcomes:

   - In the case of the German system, "user pays" was agreed to be a fair principle, as part of a shift from tax-financing to user-financing of the transportation infrastructure.

   - Earmarking toll revenues for transportation infrastructure, rather than commingling these with general funds, meant that users would pay but also receive the benefits through increased funding levels. This was particularly attractive to truckers and haulers since projection of toll revenues indicated that the anticipated funding gap could be eliminated over time by this means.

   - Cross-subsidy of rail and inland waterway infrastructure using HGV toll revenues, while violating the "user-pays" principle, served the federal objective of achieving a better freight modal balance. This cross-subsidy decision was made solely by the red-green coalition.

   - The ability of HGV tolling to promote environmental interest was key to generating political support through a coalition of the leading Christian Democratic Party and the Green Party. Oldest, dirtiest vehicles pay as much as 50 percent higher tools than newer, cleaner ones. Tolling trucks and cross-subsidizing rail and waterways with toll revenues were expected to effect a shift from trucks to these other freight modes. Tolling empty trucks was done to improve truck operation efficiency. The German experience suggests that, given the worldwide concerns with GHG and global warming, future pricing schemes would do well to include a strong environmental benefit to broaden its support.

   - The objective to promote innovative tolling technology has been successfully achieved. Germany's HGV tolling system, now in its fourth year of operation, is generally considered foundational for future large-scale tolling systems: Satellite-based, use of mobile and dedicated short-range communications, and vehicle on-board computers. The system is interoperable with other European microwave-based tolling systems and has DSRC compatibility.

3. Ensuring adherence to principles that secure pre-implementation agreements. While most of the parties involved in crafting the compromises required for successful system implementation have adhered to agreed-to conditions, unexpected actions by the federal government has resulted in a substantial reduction of the amount of federal budget allocated to roadway infrastructure. These actions have created a great deal of consternation on the part of toll-paying HGV users, who have seen their hope of reducing or eliminating the road-infrastructure funding gap largely disappear. This situation has had the effect of jeopardizing the support of haulers and logistics companies for any expansion of the tolling system.

4. A realistic implementation schedule has to consider the magnitude and complexity of the system as well as the time required to develop and integrate complex technologies. There is no question that the German HGV tolling system is the largest in magnitude (national coverage), complexity (applicable to all domestic and foreign trucks), having multi-factor toll rate application (distance-based, specific road type, number of axles, emission level), and technologically innovative in its integration of GPS, GSM, OBUs and DSRC, to name just the key elements. In addition, certain system requirements add greater complexity: The system had to accommodate both automatic and manual logon, with the latter providing a one-hundred percent backup, and toll violations had to be kept at or below 5 percent, which required multiple enforcement approaches, each of which required technology development and support. Given all these factors, the decision on what is a realistic implementation schedule needs to be given a great deal of consideration at the outset. This applies to the government as well as to the private sector system developer.

5. The impact of system requirements and specifications on system implementation and operation costs need to be considered early in the process, and adequate trade-offs need to be made at that time. This is a concern because, at present, 15 to 20 percent of revenues are spent on debt repayment, depreciation, profit, enforcement and maintenance, and operations (25 to 40 percent initially). The following examples serve to illustrate how requirements affect costs. The requirement was to have a built-in redundancy between the automatic and manual logon systems. The manual logon is used for only 10 percent of all transactions, but represents one-third of operations cost. This has been the case since shortly after operations began, so the question is: Is there a more cost- effective method that can be used as a back-up for the automatic logon, or should the system rely solely on automatic logon? If these questions cannot be answered before system operations begin, then contingencies should be put in place to make an objective decision once the necessary evidence becomes available.

   The second example is enforcement. The requirement is that 10 percent of all truck trips be verified in order to achieve a violation rate of no more than 5 percent. A substantial amount of resources have been devoted to achieve this requirement: 300 gantries have been installed, each equipped with video cameras, license plate readers with infrared cameras, optical character recognition, and DSRC communications; at half of these gantry locations, there are stationary parking areas where enforcement personnel can check vehicles flagged by means of communications received from the gantries; there are about 280 mobile enforcement vehicles equipped with electronic equipment necessary to verify compliance; finally, enforcement personnel have access to shippers' premises where they can verify toll payments against manifests. It is important to note that the current violation rate is 1.7 percent, which is substantially below the 5 percent requirement. Given the high cost of implementing this substantial level of enforcement, is the low violation rate requirement reasonable and cost-effective? Since enforcement is random, is it necessary to monitor 10 percent of trips, or would 5 percent suffice, since the important factor is the randomness and the substantial fines. The main question is, however: What is the most cost-effective level of enforcement vis-à-vis loss of revenues through violations?

6. Concerns about privacy have to be addressed. In general, the trucking industry, which has been using advanced technology to track trucks for the past two decades, does not generally have the same level of concerns as individual auto drivers do. Nevertheless, the issue of data protection and security has been addressed by the HGV tolling system. A comprehensive data protection and security system has been implemented to protect system access—registration, route booking or payment—against unauthorized access or data tampering. Data gathering is limited to what is legally approved for purposes of toll collection. Data communications are protected using an encryption system developed for that purpose. No voice telephone communications with the OBUs is possible, since the system makes use of modified SIM cards, designed exclusively for data communications.

Summary of Lessons Learned

- Worldwide implementation and trials of pricing schemes, especially Germany's distance-based system, have amply demonstrated that technical solutions are available for large-scale, complex pricing implementation systems—technology is no longer an impediment to implementation.

- Future pricing systems in Minnesota and the US need to build coalitions around common-good principles and objectives.

- Key principles that should be considered include: users pay as well as benefit from the payment, and polluters-pay.

- Political expediency should not be allowed to interfere with agreed-upon principles and objectives. Such actions have the effect of eroding stakeholder support for future system expansion.

- System requirements drive capital and operating costs, and should be carefully evaluated in terms of their cost-effectiveness and ability to achieve system objectives. Complexity can always be added later.

- Success should be measured based on pre-established system performance expectations and outcomes.

- Privacy concerns related to data protection and security need to be fully addressed as part of system design and implementation, and should be developed within a policy framework.

ADDITIONAL PRICING-RELATED TOPICS

Aside from the HGV tolling investigation, the US delegation discussed two additional charge-related topics. The first was the Euro-Vignette approach to user charges. The second was an environmental charge in Berlin's Low Emission Zone (LEZ). These are described next.

Euro-Vignette: An Alternative Approach to Road User Charges

Euro-Vignette is a sticker-based road-user charge system for trucks 12 tons (26,400 pounds) or heavier and entitles vehicles to access pre-established areas during a specific period of time. The amount of road-ser charge can vary based on emission level, time of travel, number of axles and specific traffic regulations. It can apply to HGVs as well as cars. Fees for the Vignette range from 797 Euros per vehicle per year to 2,233 Euros for the most polluting vehicles. Vignettes are also available with a validity of one month, one week or one day. Revenues are used for highway construction, maintenance and operations.

Euro-Vignette was gradually introduced in six European countries starting in 1995: Sweden, Denmark, Belgium, the Netherlands, Luxemburg and Germany. Germany pulled out of Euro-Vignette in 2003, in anticipation of implementing its own Heavy Goods Vehicle satellite- and distance-based tolling system, finally implemented in 2005. National Vignettes have since been introduced in Bulgaria, Hungary, Poland, Rumania, Slovakia and Turkey. On October 2008, Euro-Vignette will go electronic and will be known as e-Vignette. Charges will increase by 8 percent once the system goes electronic.

Multiple methods are available for acquiring e-Vignettes: Personal computer, service provider, Internet, GSM mobile communications, point-of-sale or through a call center. Enforcement is conducted using hand-held mobile units. The license plate number is entered into the mobile terminal and the system verifies if the vehicle is in the database and has a valid vignette. If the vehicle is in violation, a substitute vignette is issued on the spot and the appropriate penalty is applied. No additional roadside equipment or controls are necessary.

Advantages of the Euro-Vignette charging system are that it can be implemented relatively easily; the risk of manipulation, theft or forgery is low; no driver or vehicle data is kept, except for license plate number, emission class and other charge-related data; enforcement technology cost is low; and the system can be easily expanded to cover additional vehicle types (for example, starting in 2012, e-Vignette will apply to trucks over 3.5 tons (7,700 pounds).

It should be noted that, aside from the German HGV tolling system, there are other open-tolling applications, including the Swiss system, which has been operating since 2001. It came about as a result of the Alpine Protection Article ballot initiative, which set HGV growth limits in the Swiss constitution and required a shift of freight to rail.

Berlin's Low Emission Zone

The Berlin Low Emission Zone (LEZ), also known as the Environmental Zone, refers to the densely built-up area inside Berlin's suburban rail ring (88 square kilometers or 34 square miles) where only vehicles that meet certain emission standards are allowed to operate. Vehicles with particularly high emissions are not allowed.

The LEZ was implemented in January 2008 as a result of a European Union Air Quality Directive that sets target air quality standards and attainment periods. The State Department for Health, Environment and Consumer Protection is responsible for regulation and implementation. The City of Berlin is responsible for monitoring.

The objective of the LEZ is to reduce emissions of fine dust (PM10 particulate matter) and nitrogen dioxide (NO2), whose allowable limits were already being exceeded on major streets. Regulations apply at all times, and vehicles must purchase a colored windshield sticker that allows them to operate indefinitely within the zone. Stickers are sold at many organizations and at about 800 authorized garages. The price is 5 Euros ($7.80) and covers production and administrative costs. Vehicles without a valid sticker are fined 40 Euros ($62). Cars registered in Germany are eligible for a tax subsidy of 330 Euros ($515) for retrofitting older diesel passenger cars with particulate filters.

Stage 1 implementation, which began on January 1, 2008, requires vehicles to meet the requirements of Pollutant Class 2 of the recently-adopted national vehicle pollution designation scheme. Thus, only vehicles with red, yellow and green stickers are allowed in the LEZ. There are four pollutant designations:

- **Group 1**: No stickers are issued for Euro 2 or worse emission class diesel vehicles or to gasoline-powered cars without a three-way catalytic converter.
- **Group 2**: Red stickers are issued for Euro 2 or Euro 1 diesel-powered cars, if equipped with a particle filter. Diesel vehicles older than 1997 are banned.
- **Group 3**: Yellow stickers are issued for Euro 3 or Euro 2 diesel-powered cars, if equipped with a particle filter. Diesel vehicles older than 2001 are banned.
- **Group 4**: Green stickers are issued for Euro 4 or Euro 3 diesel-powered vehicles, if equipped with a particle filter, or for Euro 1 gasoline-powered cars, if equipped with a regulated catalytic converter or better. Diesel vehicles older than 2006 are banned.

The predicted impact of the LEZ scheme on residents within the zone is a reduction of PM10 exposure for 9,700 residents on streets exceeding the PM10 limits (by 2010), and of NO2 exposure for about 1,900 residents on roads exceeding the annual limit value for NO2 (by 2010).

APPENDICES

1. Berlin Visit Agenda
2. US Delegation

UNIVERSITY OF MINNESOTA

Twin Cities Campus

State and Local Policy Program

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University of Minnesota Research Delegation Tour of German Toll Collect System and Berlin Environmental Zone

August 16-22, 2008

Contact: *Lee W. Munnich, Jr., Senior Fellow, Hubert Humphrey Institute of Public Affairs, University of Minnesota, 157 Humphrey Center, 301-19th Ave. S., Minneapolis, MN 55455, (612) 625-7357, lmunnich@umn.edu*

Saturday, August 16, 2008

Leave for Berlin, Germany

Sunday, August 17

Arrive Hotel Berlin, Lützowplatz 17, Berlin, Germany http://www.hotel-berlin.de/default-en.html

Monday, August 18

Location:	**City of Berlin** / Department of Health, Environmental and Consumer Protection
	Brückenstraße 6 (room 9.023)
3—5 p.m.	**Berlin "Environmental Zone"**
	Presentation: Bernd Lehming; division head (Environment)
	Dr. Friedemann Kirn, division head (Transportation)
	Discussion

Tuesday, August 19

Location:	**Toll Collect GmbH**
	Linkstraße 4
	German DOT + Toll Collect
9:30 a.m.	Welcome
9:40 – 10:10 a.m.	Presentation DOT: Edith Buss, Assistant Head of Division A 24 Financial and Competition Policy, Trade and industry
	>Political and financial aspects of the German tolling system
	Discussion
10:10 – 11:30 a.m.	Presentation Toll Collect: Martin Rickmann (Head of Communication)
	Discussion
11:30 – 1 p.m.	Live tour Toll Collect System

Location:	**Hotel Berlin, meeting room (Berlin Sydney)** **Automatic Number Plate Recognition** **Euro-Vignette / electronic Vignette**
3 – 5 p.m.	Presentation: Dr. Norbert Stein (President Vitronic) Frans Vandepoele (General director AGES – Operator of the Euro-Vignette) Discussion
7 p.m.	Dinner – Prenzlauer Berg District

Wednesday, August 20

Location:	**Verkehrsinfrastrukturfinanzierungsgesellschaft mbH (VIFG)** Federal Transportation infrastructure Financing Company Georgenstraße 25 (Railway Station Friedrichstrasse) **Political and Financial Briefing and Discussion** **> German DOT:** Antje Geese, Head of Division A 21 Infrastructure Financing Policy Issues **> VIFG:** Karl-Heinz Schmid, Chief Executive Officer (CEO) Torsten-R. Böger, Chief Operating Office (COO) **> Politics:** Dr. Peter Fischer, Former Secretary of Transportation – Federal State Lower Saxony / President National Initiative, Pro-Mobility ("National Champion"); Stefan Gerwens (Managing Director of Pro-Mobility) **> Trucking Industry:** Danida Henze (head of Berlin's Office of the German Trucking and Logistics Association)
9:30 a.m.	Welcome
9:40 – 10:45 a.m.	Presentations and Statements
10:45 – 11:45 a.m.	Discussion

Location:	**Reichstag**
12 – 1 p.m.	Special Reichstag visitor program – for delegation and spouses

Location:	**Airport Tempelhof** **VMT – technology / Berline Traffic Management Center**
4 – 5:30 p.m.	Presentation / Demonstration: Robert Sykora (Director of Traffic Solutions Siemens AG)

Thursday, August 21

8 a.m. – 10 a.m. Debriefing by delegation – Hotel Berlin

Friday, August 22

Return to U.S.

August 15, 2008

US Delegation

Lee W. Munnich, Jr., Senior Fellow and Director
State and Local Policy Program
Hubert Humphrey Institute of Public Affairs
University of Minnesota

Jim Kolb, Staff Director
Subcommittee on Highways and Transit
Committee on Transportation and Infrastructure
US House of Representatives (chaired by Congressman Peter DeFazio of Oregon)

Michael Replogle
Transportation Director—Environmental Defense Fund (non-profit organization)
President—Institute for Transportation and Development Policy (non-profit group)

Barbara Rohde, Research Fellow
State and Local Policy Program
Hubert Humphrey Institute of Public Affairs
University of Minnesota

Adeel Lari, Director of Innovative Transportation Finance
State and Local Policy Program
Hubert Humphrey Institute of Public Affairs
University of Minnesota

Kenneth Buckeye, Program Manager of Value Pricing
Office of Investment Management
Minnesota Department of Transportation

Ferrol O. Robinson, Senior Principal and Senior Advisor
SRF Consulting Group, Inc.

David Montebello, Vice President
SRF Consulting Group, Inc.

German Counterpart

Dr. Eng. Andreas Kossak
Andreas Kossak Research and Consulting