

Sebastian Seck 2005:

Entwicklung eines Mautsystems für die A46 in Wuppertal

Abstract

Toll roads have a long history in all parts of the world. This thesis gives an outline of common tolling systems and their advantages and disadvantages. Examples from all over the world show how advanced electronic toll systems work. As one of the first completely electronic highways, the 407 ETR in Toronto, Canada, opened in 1997. The history of the highway, its technical specifications and financing are examined and analysed.

In Germany, however, the tolling of roads is just starting to become a method of financing road construction. The introduction of a satellite based tolling system for heavy vehicles in January 2005 was the first step in a new direction. But besides this, there are other means of private investment in the road sector. Since 1994, the Highway Construction Private Financing Law (FStrPrivFinG) regulates the legal requirements for the application of the operator model in federal highway construction. According to this law, construction, maintenance, operation and financing are transferred to the private sector. For refinancing, the operator is granted the right to charge toll fees. Because of conditions in the European framework this operator model is limited to new construction of bridges, tunnels and mountain passes along the routes of federal freeways and multiple lane divided federal highways. In addition to the Highway Construction Private Financing Law, a second operator model was created for the extension of existing highways. This so called "A-Modell" transfers the construction of new lanes (highway extension) and the maintenance of all lanes to a private investor. For refinancing, the tolls collected from the heavy trucks using this part of the highway, are transferred to the operator.

The objective of this thesis is to develop a tolling system for the freeway A 46 in the greater Wuppertal area. To achieve this, the conversion of the 407 ETR model to German law standards and operator models is analysed. Necessary changes to the Highway Construction Private Financing Law are described. Based on these facts, a new electronic tolling system for the freeway A 46 is developed. The system is similar to the 407 ETR. Some changes are made to the video system and to other specifications. A very delicate subject is the treatment of information technology. According to German laws, data taken from users has to be highly protected. Other features are added to the freeway, such as the temporary release of the side lane to traffic in peak hours. Highly frequented interchanges are equipped with signals. This makes it easier for entering traffic to access the highway.

Finally, the chances of realisation are estimated with the help of a cost analysis. During this process, two different licensing methods are discussed. Toll rates are developed for both models.