

IMPLEMENTATION OF INTEROPERABLE FEE COLLECTION IN THE NORDIC REGION

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ABSTRACT

This paper describes the work on regional interoperability for Road User Charges that has been agreed between Nordic Road Authorities and toll operators.

The new Svinesund Bridge on the border between Norway and Sweden will open in June 2005. The Bridge is located on the E6 between Oslo and Gothenburg with large amount of traffic crossing the new bridge. Many of the users are already equipped with on-board units from existing toll operators / issuers. It has therefore been decided that the toll operator at the Svinesund Bridge will accept on-board units from all major toll operators in the Nordic countries as payment means.

Norway introduced interoperability between their toll operators at the beginning of 2004. The Norwegian Public Roads Administration, the Swedish National Roads Administration, and the operators of the Great Bælt Bridge and the Øresund Bridge have now signed an agreement to implement interoperable toll collection systems to coincide with the opening of the Svinesund Bridge. This project is called NORITS and will secure interoperability not only between the Nordic countries but also with toll collection systems in the rest of Europe.

1 INTRODUCTION

Some milestones in the history of Electronic Fee Collection (EFC) in the Nordic countries:

- 1987: The world's first EFC-system put into operation in Ålesund, Norway (2.4 GHz). The system includes non-stop EFC-lanes without barriers.
- 1990: The Oslo Toll ring implemented (850 MHz – Changed to 5.8 “AutoPASS” in 2002). The system includes non-stop EFC-lanes without barriers.
- 1998: The Great Belt Bridge opened. The toll collection system includes a total of 22 lanes of which 4 are dedicated EFC lanes (5.8 GHz). All lanes are barrier operated
- 1998 - 2003: The AutoPASS specification being developed and implemented in Norway
- 2000: The Øresund Bridge opened. The toll collection system includes a total of 22 lanes of which 4 are dedicated EFC lanes (5.8 GHz). All lanes are barrier operated
- 2003 - 2004: The Great Belt and Øresund joined the PISTA-project (Norwegian Public Roads Administration - NPRA and the Swedish National Roads Administration - SNRA later became observers)
- 2004: National interoperability implemented in Norway including more than 20 operators
- 2004: Fully automated toll stations introduced in Bergen and Tønsberg (Norway)



Figure 1: Examples of toll stations in Norway

At the beginning of 2004 there was approximately 1.000.000 On Board Units (OBUs) in operation in Norway and 250.000 at the Storebælt and Øresund Bridges. An additional 500.000 OBUs is estimated for the Stockholm toll ring planned to open in June 2005.

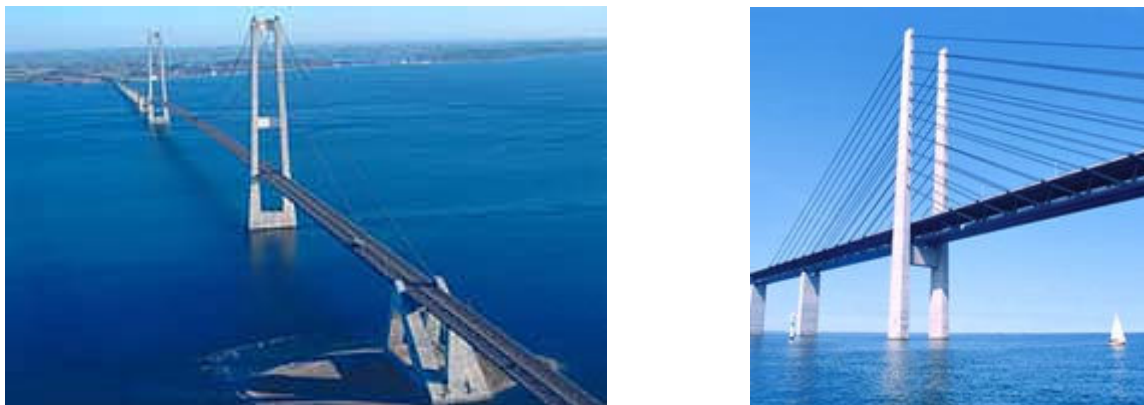


Figure 2: The Great Belt and Øresund Bridges

2 THE SVINESUND BRIDGE TOLL COLLECTION SYSTEM

The new Svinesund Bridge will open in June 2005 on the 100 year anniversary of the dissolution of the union between Norway and Sweden.

The bridge is a part of the corridor (E6) from Oslo via Gothenburg to Copenhagen. The corridor is the main entry point to Norway for both commercial and private road transport. The bridge and connecting roads will be 100 % financed by road user charges.

The annual daily traffic is estimated to reach approximately 16.500 in the opening year. 12 % of this number is heavy goods vehicles. 83 % of private cars are Norwegians. A large percentage of these travellers take advantage of the lower prices on consumer goods on the Swedish side of the border.

The heavy goods vehicles are distributed as follows:

- | | | | |
|--------------|------|-----------|------|
| • Norwegian: | 35 % | • Danish: | 15 % |
| • Swedish: | 35 % | • Other: | 15 % |



Figure 3: The Svinesund Bridge during construction

A large number of the Heavy Goods Vehicles (HGVs) already use other toll stations in Norway, Denmark and Sweden. These, as well as many private Norwegian vehicles are already equipped with OBU.

The basic toll fees (without discount) will be:

Vehicles < 3500 kg = SEK 20

Vehicles > 3500 kg = SEK 100

This means that 40 % of the income is generated by HGV.

The following principles have been adopted for the Svinesund Bridge toll system:

- The Svinesund Bridge is located in a rural area with few local customers and will therefore not issue it's own OBUs
- The operator of the bridge will accept OBUs from any other Nordic issuer as payment means. These include:
 - AutoPASS (Norway)
 - BroBizz (Øresund and Storebælt Bridges)
 - PISTA (Stockholm and new OBUs at Storebælt and Øresund etc.)
- There will be no barriers in the EFC-lanes. Enforcement will be based upon video registration.
- All cars with an approved OBU will receive a 10 % discount compared to cash payment
- Frequent users may obtain an additional discount by registering their OBU-number with the operator (no name or address needed) on the internet
- Data exchange and clearing between the operator and OBU issuers will be based on CESARE II

In august 2004 a contract was awarded to supply the Road side equipment for the 4 toll stations. A contract for the development of a toll administration system will be signed in December

3 THE NORITS PROJECT

The principles adopted for the Svinesund Bridge made it a perfect platform for the Nordic road authorities and toll operators to develop a regional interoperable toll collection system. The NORITS project was initiated. (NORdic Interoperable Tolling System)

An agreement was signed early 2004 between SNRA, NPRA, Sund & Bælt Holding and Øresundsbrokonsortiet. Norvegfinans also signed the agreement on behalf of all Norwegian toll operators and the Finnish Ministry of Transport joined the project as an observer.

NPRA was given the management of the project based upon the experience from the Norwegian interoperability project implemented and put into operation early 2004.

Phase 1 of the NORITS project included the following 4 working groups with participants from all partners:

1. Functionality
2. Legal and institutional issues
3. Technical issues
4. Market requirements and consequences

Phase 1 has confirmed the feasibility of Nordic interoperability within the framework of European standardisation and harmonisation. Phase 2 is on-going and is defining the detailed aspects of technical, procedural and contractual interoperability.

4 THE NORITS SERVICE

The following points describe how NORITS is intended to work:

- NORITS will be an additional service to all present and new users in Nordic toll systems, allowing the use of their OBU as payment means at all NORITS toll stations, paying through their local issuer
- Customers will automatically get the NORITS service but may ask the issuer to cancel the additional service described above.
- It is the responsibility of each operator to classify vehicles and determine the price to be charged
- There will be no NORITS-“products”. The NORITS user should automatically be given the best product available
- The user should be able to raise questions and complain about the NORITS service to the issuer of his OBU. He/she may also ask questions or complain about prices or fines to the relevant operator.
- Validation of the OBU will be based upon the distribution of black lists from NORITS issuers.
- NORITS will, in its final form, be based upon the principle “one vehicle – one OBU”
- NORITS will, with regards to data exchange and clearing between issuers and operators, be based on CESARE II
- Operators, who are a part of NORITS, will accept OBUs issued in Norway (AutoPASS) and at Øresund and Great Belt (BroBizz and PISTA) as payment means. NORITS will also accept OBUs according to the new Swedish EFC-specification (which is compatible to the PISTA specification)
- The objective is that NORITS should be implemented at the same time as the new Svinesund Bridge is opened in June 2005 and as a minimum include the corridor: Oslo, E6 Østfold, Svinesund, Øresund and the Great Belt.
- The development of NORITS will be done in accordance with the EU Directive on EFC.
- Due to the short time before implementation, some elements of the solution may be preliminary or limited in functionality during the first period of operation.

5 CHALLENGES TO OVERCOME

The working groups have found the project feasible. However a number of points related to legal and institutional issues, customer relations, procedures and technology that need clarification before implementation have been identified. The main points are:

- A common security concept
- Principles for classification
- Introducing the principle “one vehicle – one OBU” in systems where this doesn’t apply today
- Definition of new clauses in the user agreement
- Responsibility for payment and claims management between user, issuer and operator
- Value added tax

- Local legislation in Sweden does not permit the collection of toll fees on existing roads. The same amount however, may be collected as tax. This means different procedures concerning discounts and vat.
- Confirming the technical interoperability between AutoPASS, BroBizz and PISTA OBUs and road side equipment

		On Board Units		
		AutoPASS	BroBizz	PISTA
Road Side Equipment	AutoPASS	-	X	X
	BroBizz	X	-	X
	PISTA	X	X	-

- Harmonisation of customer relation procedures
- As long as better discounts may be achieved by a contract directly with other operators than through NORITS, it seems impossible to avoid one user having several contracts.
- The investments and operational costs of NORITS are not yet clear. The question of “issuer’s administration fee” is also open.
- There is a need for increased credit time for users with low tariff “home”-tolls when he is using high tariff toll systems. (His balance at the local issuer will be emptied when passing one or two high tariff toll stations)
- How are relations between issuers and credit card companies handled when credit cards are used for paying transactions registered via OBUs?
- Competition between operators may be influenced by traffic data exchanged in the NORITS system based on the CESARE model
- How do we administer the NORITS-service after the project phase?
- Are there common services that can be included in the NORITS operation to increase efficiency, improve customer relations or handle relations to 3rd parties?
- There is a need for a well planned and extensive information campaign before introducing NORITS

6 CONCLUSION

Interoperability will be implemented between existing and future payment systems for tolling (EFC) in the Nordic region

Commercial operation is planned to start June 2005 when the new Svinesund Bridge between Norway and Sweden opens and will include as a minimum the corridor Oslo, E6 Østfold, the Svinesund Bridge, the Øresund Bridge and the Great Belt Bridge.

Phase one of the project has been finalised including the following results:

- The feasibility of NORITS has been confirmed
- The basic functionality of NORITS has been defined
- Critical factors that needs to be solved before implementation has been identified

Phase 2 of the project is currently in progress including the development of requirement specifications, agreements between the actors, planning of information and finding solutions to the critical topics identified in phase 1.