



The Environmental Management System at the Municipal Bus Company in Uppsala, Sweden

1 The Municipal Bus Company

Public Transport in Uppsala

Public transport in and around Uppsala, today the fourth largest city in Sweden with about 180,000 inhabitants, started in 1906 with tram traffic. Buses appeared in 1923, but trams dominated the scene until 1953, when they were replaced with buses. Gamla Uppsala Buss AB, is the company running municipal transport in the city. It is owned by Uppsala Municipality and its business agency Uppsala City AB. It is one of Sweden's largest municipally owned bus companies. Its premises are located in central Uppsala, and include offices, workshop buildings, garages, and parking for the company's buses.

Since 1996, Gamla Uppsala Buss AB, is the entrepreneur for and operator of public bus transportation within the Uppsala area. However, it is the responsible local government agency (the purchaser) that determines routes, timetables, ticket prices, vehicle disposition, the interior and exterior design (green), etc. The company operates 166 buses, of which 46 are biogas fuelled. The number of staff is about 485 of whom 405 are bus drivers. The economic turnover 2003 was 210 million SEK (~22 million Euro).

Background for the EMS and Certification

Environmental problems have reached such large proportions that it is unlikely that the next generation will be able to live in the same way as we do. New patterns that are ecologically sustain-

able and economically robust must be developed. We must begin to examine our sphere of activity and actively work towards conserving, recycling and reusing whatever materials we can.

In the mid-1990s, the public transport sector experienced a change. Responsibility for transportation services was divided between a purchaser (the responsible government agency) and an executor. This in turn led to greater competition and more explicit purchase requirements. Purchasers began, amongst other things, to place greater demands on the entrepreneurs' environmental work, and there was an expectation that this would increase in the future.

In light of these circumstances, the management of Gamla Uppsala Buss decided that the company would implement an environmental management system, and that the ambition would be to achieve ISO 14001 certification. Aside from the pure environmental benefit and the gained competitive advantage, they realized that an environmental management system could lead to greater efficiency within the entire operation.

The company's owner (Uppsala Municipality) was also positive towards implementation of an environmental management system as it was in line with the municipality's own environmental work, e.g., with Agenda 21. An important part of this was the simultaneous efforts by the city to establish a biogas production plant in Uppsala. It was based on fermentation of organic waste, mostly from the slaughterhouse (Swedish Meat, Inc.), one of the large industries in the city.



Gamla Uppsala Buss AB

Number of vehicles 2003/2004:
166, of which 46 are biogas fuelled.
Owner: Uppsala City, Inc., and Uppsala Municipality.
Turnover 2003: about 210 million SEK (~22 million Euro).

Activities

Gamla Uppsala Buss AB (GUB), established already in 1906 as Uppsala Trams, is since 1996 the entrepreneur for and operator of public bus transportation within the Uppsala area. The transportation services include:

- Routes within the Uppsala area. The company carries out 100% of Uppsala's public transportation.
- Transportation services for old and disabled persons. GUB carries out most of such transportation within the municipality.
- School and special school transportation.
- Book bus services.
- Contract transportation services for schools and other customers within Uppsala Municipality.

Organisation

Number of staff is 485 of whom 405 are bus drivers. The support functions needed for the company's daily operation include:

Personnel Department: Hiring of employees, education, wages, insurance and ID cards.

Transportation Department: Daily bus transports, traffic management, staff management, ticket sales and planning of services.

Technical Department: Service, maintenance, repairs and acquisition of buses. Property administration.

Financial Department: Economic transactions and financial reports.

The work began in the beginning of 1997 and eventually resulted in certification according to SS-EN ISO 14001:1996 in October 1998.

2 Implementing the EMS

Environmental Review and Training

The first step was to train key personnel in environmental management systems with the help of an external consultant. In conjunction with this, an environmental review was carried out, where a rough check was made of the company's environmental performance.

Some initial information about implementation of an environmental management system and what in general it would mean was given to all staff. Shortly thereafter, basic environmental training for both bus drivers and other staff began.

The next step was to carry out an environmental audit, where the activities within the company that have an environmental impact were identified. The environmental audit presented a description of improvement possibilities and goal areas. In addition routines were identified that would have to be implemented in order to meet the requirements of the ISO 14001 standard.

The management of Gamla Uppsala Buss decided to divide responsibility for their environmental work according to the division of responsibility already in place. The Technical Manager was appointed Environmental Coordinator and Management Representative on environmental issues. He was thereby given overall responsibility for work on the environmental management system. To assist him, he had an environmental coordinator and a group of staff referred to as the environmental group.

Otherwise, each department within the company was responsible for carrying out the environmental work according to the plans, and every individual employee was responsible for their part of the environmental work.

The environmental group consisted of staff from different parts of the operation, including the management group, and their task was to work out policies and routines for the environmental work. When the group was formed, the members received more extensive training in certain important areas.

One of the first tasks was to work out an environmental policy for Gamla Uppsala Buss. The policy is based on the environmental audit, and is the foundation of the company's environmental work.

Audits and Certifications

The environmental group used the established practices in the company, both documented and undocumented, as the start-



Figure 4.1 The garage of Gamla Uppsala Buss AB.

ing point for working out the different routines. Later, during implementation of the system, this was one of the strengths, as staff was familiar with several of the practices/routines. As well, the practices/routines dealing with quality and work environment were included in the environmental management system. Thus, an integrated system was established. The governing documents (policies and practices/routines) were collected in a binder, the so-called Golden Binder.

Using the environmental audit as a basis, the important environmental aspects were identified, and based on these and the environmental policy; environmental goals were formulated, both long-term and short-term.

Work to implement the system in the company then followed. The management and environmental group worked on information for bus drivers and other staff. Nine staff members were chosen and trained as internal auditors.

In autumn 1998, the certification audit was carried out by SEMKO-DEKRA Certification Inc., and Gamla Uppsala Buss received ISO 14001 certification on October 28, 1998. Since then, follow-up audits have been carried out every six months to analyse and evaluate the work on continual improvement.



Environmental Policy

The Environmental Policy, established in March 1998 has three basic components. These states that Gamla Uppsala Buss, GUB, will:

- In all its operations, continually strive to minimise negative effects on the environment.
- Offer environmentally friendly public transportation.
- Inform customers, clients and staff about environmentally friendly public transportation.

GUB will achieve this by:

- Efficient use of materials, energy and other resources consumed in all operations.
- Viewing active environmental work as a means of competing and a condition for long-term survival in the market.
- Working on preventative initiatives with regards to emissions, waste and other environmental disturbances.
- Training all staff members so that they can participate in the company's environmental work; proposals for measures to improve environmental performance will be actively encouraged and examined.
- Placing demands on our suppliers to introduce and maintain an acceptable environmental standard.
- Actively and positively taking part in experimental activity that our employer wants to carry out in order to reduce the environmental impact of public transit.
- Informing our employer and other interested parties about our commitments and our results in the environmental area, e.g., in the annual report.
- Regarding environmental laws and regulations as a minimum requirement in our environmental work and adapting the environmental management system so that it meets ISO 14001 requirements.

Environmental Goals

The environmental policy was made operational by the formulation of goals. The environmental goals that the company

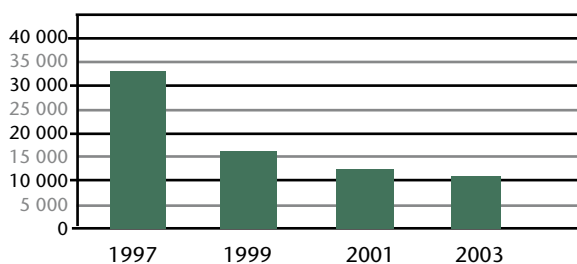


Figure 4.2 Glycol Consumption in GUB (litres/year).

has chosen to work with are based on the activities within the operation that have the greatest environmental impact:

Goal 1: We will reduce emissions of dangerous substances and particles.

Goal 2: We will, through continual training and our own commitment, as well as through cooperation with customers, authorities, the branch and suppliers, actively work to prevent and minimise environmental impact.

The overall goals are broken down into detailed goals, which are measured and subject to continuous follow-up. Every detailed goal has an action programme where the background, purpose, schedule, responsibility and follow-up are clarified.

Detailed goal 1.1:

We will reduce the fuel consumption of our buses.

Detailed goal 1.2:

We will reduce the number of changes of buses during traffic.

Detailed goal 1.3:

We will reduce the number of tire changes due to side damage.

Detailed goal 1.4:

We will implement a water purification system for the vehicle wash water.

Detailed goal 2.1:

We will create internal and external networks for an improved exchange of experiences and improvement possibilities.

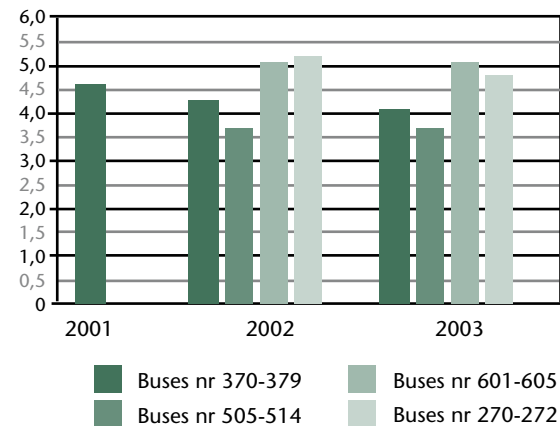


Figure 4.3 Average consumption of diesel fuel (litres/10km) for buses 370-379 all year, July-December for the other groups of buses.

Practices – an Organisation for Implementing the Policies

It has been important for the company management to have a vital environmental management system where descriptions from the governing documents are actually applied in the operation. It was realised from the beginning that in order to achieve this, staff had to be involved in development of the environmental work. Therefore, work groups were established that consisted of staff, which represented different parts of the operation. These groups have a more formal responsibility for the company's environmental work and are, together with the company management, responsible for development of the work.

- Environmental group
- Chemicals group
- Internal auditors

The work group method has been very successful and facilitated implementation of the environmental management system. The staff members that make up the groups have acted as ambassadors within the operation for the environmental work and have been able to describe the background to implemented routines for other staff members. In this way, an increased understanding of the environmental work and for everyone's responsibility has been achieved within the organisation.

3 Results of the Environmental Work 1999–2004 Practical Improvements

The following points are some of the improvements that the environmental management system of Gamla Uppsala Buss has led to:

- All staff members have taken a basic environmental training course. This course is now included in the introductory training of new employees.
- A thorough management system with regard to both the environment and the working environment, as well as quality to some degree.
- A functioning deviation reporting with cause analysis and corrective measures.
- Environmental evaluation is carried out for the chemicals used in the operation, and as a result, several products have been replaced with more environmentally friendly alternatives.
- Stocktaking and cataloguing of the chemical products in the operation, as well as safe storage of the products.
- Training of all drivers in "heavy eco driving" (HED, economic driving) was carried out in 2002. HED is now in-

cluded in the company's internal basic training for newly employed drivers. In cooperation with Anders af Wählberg, Dept. of Psychology, Uppsala University, a study of the effects of HED training was done by a follow-up of the fuel consumption of five GUB buses. The effects of a number of other parameters were included in the study. This project took place during the period 2001-01-07 to 2004-06-30 and is documented in several research reports (see References).

- Mounting digital gauges (Econen) for direct reporting of fuel consumption on about 30 buses. This gives drivers direct feedback on how fuel efficient their driving is.
- Separation of waste for recycling was implemented in all parts of the operation in 2001.
- Reduced glycol consumption; a reduction of 68% during 1997-2003 (see Figure 4.2).
- Reduced diesel consumption in certain groups of buses (HED training began in the year 2002), (see Figure 4.3).
- Increased number of kilometres driven using biogas fuel (the year 2001=21% biogas, the year 2003=23% biogas).
- Adaptation of the bus washing detergent dosage to prevailing weather conditions.
- Some water reuse implemented in the washing hall, which contributed to reduced consumption of fresh water.
- Increased emergency preparedness regarding leakage and spills from machines and vehicles.
- Improved environmental performance of the vehicle fleet through purchase of buses with a higher environmental rating, which contributes to reduced carbon dioxide emissions (see Figure 4.4).
- Increased awareness of environmental responsibility and environmental work among all the staff.

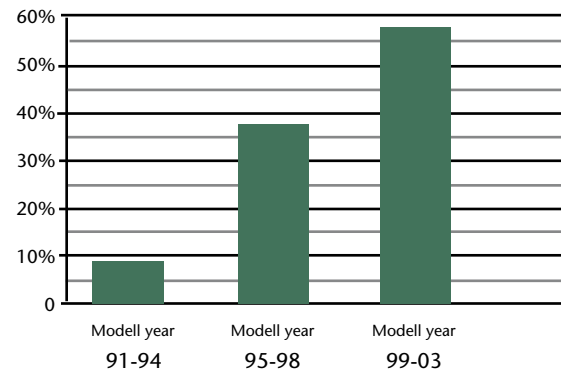


Figure 4.4 Environmental rating of the GUB vehicle fleet.

Contacts

Company

Gamla Uppsala Buss AB
Kungsängsgatan 6
Box 167, 751 04 Uppsala, Sweden
Tel: +46-18-727 38 00
Fax: +46-18-14 77 74
<http://www.gub.se>

Author

Eva Pettersson, *Management system coordinator*
Tel: +46-18-727 38 15
eva.pettersson@gub.se

References

af Wåhlberg, A. E. (2002). *Att mäta effekter av utbildning i sparsam körning* (Measuring the effect of training on economical driving). VIT Transportforum 2002, Linköping.

af Wåhlberg, A. E. (2002). *Fuel efficient driving training – state of the art and quantification of effects*. E141 Proceedings of Soric'02.
http://www.psyk.uu.se/hemsidor/busdriver/af_Wahlberg_Fuel_efficient_driving_training.pdf

af Wåhlberg, A. E. (2004). Sammanfattning av resultaten från projektet *Sparsam körning – longitudinella effekter av utbildning och information via displayenhet* (A summary in Swedish, of results from the economical driving project – longitudinal effects of training and information via display unit).
http://www.psyk.uu.se/hemsidor/busdriver/af_Wahlberg_Slutrapport_sparsam_korning.pdf