

Final Report

A Project on

**the first steps of the build-up of a
Modern Air Quality Management System**

including
development of organisation and practical work,
basic theoretical and practical training,
and transfer of methodology and technology.

in

Tallinn, Estonia

**A co-operation
between**

**Environmental Department
Tallinn City Government
Tallinn, Estonia**



<http://www.tallinn.ee/keskkonnaamet>

**and Conexor Sensus AB
Bromma
Sweden**



<http://www.conexor.com>

Financed by



<http://www.sida.se>

Doss: EST 1101 (Former BITS project)

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Appendixes:

Appendix 1: Monthly report for Ambient Air Quality March 1999 (in Estonian).
Environmental Department, Tallinn City Government, March 1999.

Appendix 2: Final report from Mapping of Air Pollution Levels in Tallinn. Measurement campaigns
with diffusive samplers.
IVL, Sweden. January 1999.

Appendix 3: Report on “Gaasikatlamajade mõju Mustamäe linnaosa õhu seisundile” (in Estonian).
Environmental Impact Assessment Study (EIA) of proposed ideas to change heating mode from
central heating system to local boiler houses in Mustamäe district, Tallinn.
Environmental Department, Tallinn City Government, 1997.

1 SUMMARY

BITS (transferred into Sida) allocated SEK 5,422,000:- in October 1994 to accomplish a Project on the first steps of the build-up of a Modern Air Quality Management System including development of organisation and practical work, basic theoretical and practical training, and transfer of methodology and technology in Tallinn, Estonia.

The formal Project Partners have been

- The Environmental Department (ENVTallinn), Tallinn City Government (formerly Environmental Board, Tallinn Municipality); and
- Conexor Sensus AB, Bromma.

The Project has been based on the twin city relationship between the City of Tallinn and the City of Göteborg in the field of Environmental Protection.

The accomplished activities have been build up around the computerised Air Quality Management System, the Airviro System. The features of the Airviro System are, in summary, to handle collection of ambient air quality data, to analyse and report data; to store emission data from point, area and line source in a database; and carry to out dispersion modelling.

The training of the ENVTallinn staff and the Air Quality Group (consisting of persons from other agencies with interest in Air Quality Management issues) and the experience transfer have been focusing on

- the general capacity building of the ENVTallinn staff and the Air Quality Group in technical as well as organisational and legislative matters related to Air Quality Management.
- the handling of ambient air quality data to provide accurate and regular reports to the general public, the media etc.; and
- the support to decision-makers in terms of ambient air quality reports, “what-if scenarios” for planning purposes (also called Environmental Impact Assessment, EIA), and general expertise in the area of Air Quality Management;

The ENVTallinn is currently actively involved in all types of city and traffic planning activities providing more or less advanced input, reports, EIAs etc.

The ENVTallinn and the Air Quality Group have been visiting Sweden several times. Different agencies dealing with Air Quality Management have been visited for study purposes and more formal training. Several Swedish organisations and experts have visited Tallinn in order to provide a wide range of expertise and experience.

The objectives in the Agreement have been met with full measure. In addition to the activities in the Agreement, the Information Technology (IT) era has also influenced the Project in such a way that the ENVTallinn now provides part of the Air Quality Management Information via Internet.

The Project will continue into a second phase, which has just started. The objectives of the second phase are, in summary, to deepen the general knowledge and skills at the ENVTallinn and to focus on the dissemination of Air Quality Management information the different kind of users using IT.

2 REPORTS

2.1 This Final Report

This Final Report summarises the Project progress from the start in October 1994 until the transition into its second phase by the end of 1998.

This Report will focus on the practical results of the different activities in relation to the objectives outlined in the Agreement. The Report is therefore kept relatively short, since the appendixes clearly show the type of work that is now being carried out based on the Project implementation.

2.2 Previous Interim Reports

Three Interim Reports have been produced:

Interim Report No. 1: 12 January 1995
Interim Report No. 2: 28 November 1995
Interim Report No. 3: 22 July 1996

The detailed progress of the different activities, the practical results, and the budget follow-up has been continuously reported in the Interim Reports. This means that this Final Report will not focus on too many details, since they are reported earlier. However, some details will be covered for the period after the last Interim Report.

3 GENERAL PROGRESS

3.1 The beginning

The progress of the Project has in general been very good. The ENVTallinn quickly adapted to the activities in the Project and made use of the technical functions, knowledge skills, and experience transfer. The organisation was adjusted to handle the Air Quality Management Project by appointing a person, the Application Manager, to be directly responsible for the practical work besides the formal Project Manager. The Air Quality Group was established with participants from not only the ENVTallinn, but also from other agencies and organisations dealing directly or indirectly with Air Quality Management issues.

The interest from other organisations dealing with, or related to, Air Quality Management could initially be partly categorised as a wait-and-see policy, but over the last two years the ENVTallinn has been intensively involved in traffic and city planning work. The interest from traffic and city planners have been focusing on the practical effects on ambient air quality of different actions taken, so called "what-if studies".

In addition, the Project has provided the ENVTallinn with a tool to carry out the routine tasks like monitoring ambient air quality and meteorological data, and regular reporting.

3.2 The second phase

Already in the Agreement and the initial discussions with Sida (former BITS), ENVTallinn indicated the interest for a long-term co-operation with Sweden in the area of Air Quality Management. Consequently, the ENVTallinn requested financial support from Sida for a second phase of the Project in September 1996. For different reasons, Sida's formal decision to finance a second phase of the Project was not made until 23 June 1998, i.e. almost two years after the formal request.

In the meantime, the Project suffered from the lack of knowledge about the continued work. The Project Management could not decide on any strategic aims and directions for the work during the latter period of the first phase, since a positive decision from Sida would direct the remaining part of the first phase in one direction, a negative decision in another direction. This meant that the intensity in the co-operation was reduced from early 1997 until June 1998.

Luckily, the ENVTallinn had by late 1996 achieved such a level of competence and skills, that part of the development work could be accomplished without too much support from Sweden.

Once the positive decision was made in June 1998, the intensity of the Project work has increased again.

4 WORK AND RESULTS RELATED TO THE PROJECT OBJECTIVES

4.1 Objectives listed in the Agreement

In paragraph 3.3 in the Agreement, one can find the estimated outputs after the completion of the Project.

The different items are listed below and commented on.

4.2 Review of the current organisational and administrative situation

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have reviewed the current organisational and administrative situation in the area of Air Quality Management. The practical use of current legislation will also be reviewed. A basic summary of the advantages and disadvantages of the current situation will reported.”

The development and changes of the laws and regulations as well as the organisational framework in the area of environmental protection have been significant and rapid in Estonia over the last years. There is no formal study carried out as a part of the Project. However, the ENVTallinn has continuously adapted to, and partly been leading, the practical changes of the formal framework governing the environmental protection work on the local (city) level as well as on the central (government) level.

Today, the ENVTallinn is an active player in the daily Tallinn City Government work.

4.3 First phase of the work to build up an Emission Database (EDB)

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have finalised the first phase of the work to build up an Emission Database (EDB) with as high data quality as possible. A long term strategy for updating and maintenance of the EDB should be defined. The content in the EDB should also be able to export to other Estonian organisations that could make use of the information in their respective work in the field of Air Quality Management.”

The Airviro System installed at the ENVTallinn today includes a comprehensive Emission Database. The EDB is used for two main purposes:

The first purpose is to estimate the total emissions from all major air pollution sources in Tallinn. The EDB is continuously updated by direct measurements as well as via requested information from industries, boiler plants etc. Traffic counting is also an active and important way of estimating and updating the emission information for vehicles.

The second purpose is to use the EDB as input for dispersion simulations. By simulating the emissions - and the estimated emissions in the future - and feeding the estimates into the dispersion modelling function in the Airviro System, it is possible to carry out “what-if scenarios” on ambient air quality.

4.4 Ambient air quality situation

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have carried out basic analyses concerning the air pollution situation in the TMA with the aid of the above-mentioned traffic and industrial emission information as well as the installed - basic - ambient air quality measurement equipment.”

The ENVTallinn utilises 3 fixed monitoring stations in the Tallinn area. These stations produce hourly values, which are later used for regular follow-up and reporting. (Please refer to Appendix 1 for an example of a Monthly Report for March 1999.)

The costs for servicing and maintaining these monitoring stations are significant, and are borne by the ENVTallinn.

The Project has undertaken an extensive study of the ambient air quality in the Tallinn area by using so called “passive sampler technique”. The study covers the period from April 1996 to January 1998. This study was not only the first comprehensive study of the ambient air quality situation in Tallinn using the passive sampler technique, but actually the first time ever this technique was used in Estonia. Since the study also covers a large geographic area, the information gives a good view of the air pollution situation also in areas where one normally does not place monitoring equipment.

The possibilities to introduce the technique on a broader scale in Estonia are currently being studied.

The final report from the study has recently been presented and the interest has been very high. The final report is currently being translated into Estonian to allow for a wider distribution and use.

The final report from the study is found in Appendix 2.

4.5 Determine the air pollution consequences using simulation methods

Quotes from the Agreement:

“After the Project is completed, the ENVTallinn should be able to basically determine the air pollution consequences of industrial establishments, traffic routing and planning, city planning, etc. and also to analyse the consequences of corrective measures using simulation methods.”

“After the Project is completed, the ENVTallinn should be able to use the Air Quality Management System to produce basic simulation studies for different scenarios.”

“After the Project is completed, the ENVTallinn should be able to produce reports on the environmental impact (in terms of ambient air quality) of certain planned activities and actions and be able to present the reports to decision-makers in a professional way.”

This part of the Project has turned out to be one of the most demanded ones. Many City Government departments ask for different kinds of Environmental Impact Assessment Studies (EIA) for complex planning tasks (roads, industry establishments, residential area planning etc). Private companies ask for studies what impact an individual stack would have since this kind of EIA studies is required for certain establishments.

The ENVTallinn is practically working as a consultant carrying out EIA studies. This means also that the knowledge of the ENVTallinn's skills and capabilities is being widely spread.

A listing of some of the studies is found below:

1. Northern bypass road (to reduce traffic flow in central part of Tallinn);
2. Reconstruction of Vabaduse road;
3. Environmental part of Tallinn general plan;
4. EIA of proposed idea to change heating mode from central heating system to local boiler houses in Mustamäe district; and
5. Evaluation of air quality at Kose area.

In addition to these examples of major studies, there are lots of small studies for different companies.

The Airviro System functions for the EDB and dispersion modelling are used for this work. The report (in Estonian) found in Appendix 3 is an example of a typical study report.

4.6 Understanding of the scientific background and requirements needed

Quotes from the Agreement:

“After the Project is completed, the ENVTallinn should understand the scientific background and requirements needed to feed an advanced Air Quality Management System with accurate input data, such as meteorological data.”

“After the Project is completed, the ENVTallinn should understand the quality requirements for all types of data used in the Air Quality Management System, such as ambient air quality data, emission data etc.”

This issue has been a natural part of the development of the Project. Without such understanding it would not be possible to carry out the kind of work the ENVTallinn is doing today.

4.7 The integrated approach to air quality problems

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have defined and started to develop the integrated approach to the complicated air quality problem to deal with real time pollution data from the autonomous monitoring network and with emission databases for all types of sources in the same Air Quality Management System.”

The Airviro System is today the technical backbone of all Air Quality Management work in Tallinn City Government. The co-operation between the ENVTallinn and other departments dealing with Air Quality Management issues is depending on the good handling of monitoring and emission data in combination with dispersion modelling.

The current installation of the Airviro System is being enhanced to handle other features like Internet presentation systems for real-time information and on-line access to ambient air quality data and regular reports.

These functions will be expanded and implemented in the second phase of the Project.

4.8 Start co-operation with other Estonian organisations in the area of Air Quality Management

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have started a co-operation with other Estonian organisations that also work in the area of Air Quality Management. This also includes the possibilities to export and import data and other types of information to/from the other organisations.”

The current routine work at the ENVTallinn includes intensive and regular contacts with different kinds of organisations dealing directly and indirectly with Air Quality Management issues. The ENVTallinn has become the centre for such issues in Tallinn.

The following listing includes some of the organisations with which an intensive co-operation is carried out:

- Tallinn City Government, City Planning Department;
- Tallinn City Government, Transport Department;
- Estonian Environmental Research Laboratory;
- Institute of Chemical Physics and Biophysics; and
- Stratum IB.

4.9 Continued development of the Air Quality Management skills.

Quote from the Agreement:

“After the Project is completed, the ENVTallinn should have defined and specified how a continued development of the Air Quality Management skills should be handled. This could also include an inquiry to BITS for continued financial support.”

The current plans for the future are summarised in the request to Sida for the second phase. The objectives are repeated below. It should be noted how well the current plans fit into the initial plans and objective outlined in 1994, more that five years ago. The current plans are a prolongation of the initial ones with the added experience from the first phase of the Air Quality Management Project.

The following Project Objectives are specific, measurable, achievable, relevant and time bound. However, there are a lot more objectives that will be reached, but they are of such kind that they can be measured against the more general objective criteria above.

1. Establish an Ambient Air Quality Monitoring Network, which provides data from existing and possible enhancements of the monitoring network to the Central Computerised Air Quality Information System (the Airviro System). The Airviro System was installed as a part of the first phase.
2. Enhance the functions of the Central Computerised Air Quality Information System (the Airviro System) to also be able to handle Heavy Gas Modelling and accomplish relevant training.
3. Produce regular Ambient Air Quality Monitoring reports.
4. Produce Environmental Impact Assessment Studies (EIA) on demand or on the Environmental Department's own initiative regarding infrastructural projects and activities in Tallinn.
5. Develop the co-operation between the ENVTallinn and the City Planning Department in terms of Environmental Impact Assessment Studies.
6. Establish an Internet Based Air Quality Information System, which will provide information from the Ambient Air Quality Monitoring Network and also about the content and results of Air Quality Management Project.
7. Establish a basic co-operation between the political decision-making levels in Tallinn and Göteborg in terms of regular meetings and exchange of experience.

4.10 Additional outcome of the Project

The development in the IT sector has been most intensive during the course of the Project since October 1994. The ENVTallinn has during the last two three years been developing and testing different IT functions to disseminate Air Quality Management information to different types of users like the media, the general public, decision-makers etc.

ENVTallinn currently has a Local Area Network (LAN) with several computers attached. During a period of time, real-time ambient air quality information was displayed in a shop window at the central square in Tallinn city centre via the LAN. The ENVTallinn started early to provide Air Quality Management on the Internet via its own homepage. That information is currently a part of the Tallinn City Information System and is subject to changes as phase 2 of the Project includes some activities in the field (item 6 in the previous chapter).

5 REPORTING

Different reports were to be provided according to the Agreement paragraph 4.4.2.

The three Interim Reports have been mentioned above in paragraph 2.2.

Interim Report No. 1: 12 January 1995

Interim Report No. 2: 28 November 1995

Interim Report No. 3: 22 July 1996

Seven Project Progress Reports have been issued for internal use within the Project group of participants.

Several reports and other types of information were provided to Sida during the period pending the final decision about the financing of the second phase.

Sida consultants have been visiting ENVTallinn at several occasions. The Project has not received any formal comments or feedback from these visits.

ENVTallinn has more or less frequently and formally reported about the activities to different decision-makers and other people with interest in the development of the Project.

6 BUDGET

The graph below shows the spending of the budget.

The formal budget allocation from BITS/Sida was SEK 5,422,000:-. The Project budget target was SEK 5,419,000:- which is also the finally invoiced amount.

The spending was intense from the beginning of the Project since the installation, commissioning and basic training for the technical platform, the Airviro System, was accomplished. Once the installation was completed, the spending was rather evenly distributed over time, which indicates a continuous co-operation according to plan.

It is obvious that the Project was more or less idling in terms of co-operation with Sweden during the period of time, January 1997 -- June 1998, pending the final decision from Sida about the financing of the second phase.

SEK (*1000)												
Invoice period	9409	9411	9412	9502	9504	9506	9508	9510	9512	9602	9604	9606
Invoiced amount		821.334	1336.699	218.132	144.571	112.176	72.787	305.692	187.24	224.787	433.194	338.963
Total amount	0	821	2158	2376	2521	2633	2706	3011	3199	3423	3857	4196
Total budget	5419	5419	5419	5419	5419	5420	5419	5419	5419	5419	5419	5419
Remaining budget	5419	4598	3261	3043	2898	2787	2713	2408	2220	1996	1562	1223
SEK (*1000)												
Invoice period	9608	9610	9612	9702	9704	9706	Pending	9806	9808	9810	9812	
Invoiced amount	157.078	281.426	154.257	90.9	13.4	31.361		97.021	32.268	179.938	185.776	
Total amount	4353	4634	4788	4879	4893	4924	4924	5021	5053	5233	5419	
Total budget	5419	5419	5419	5419	5419	5419	5419	5419	5419	5419	5419	
Remaining budget	1066	785	631	540	526	495		398	365.714	185.776	0.000	

