DEAF ACCESS 112

ADAPTATION OF SERVICES OF EMERGENCY CALL NUMBER 112 TO THE DEAF

FEASIBILITY STUDY

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1. CONTENTS

This report introduces the Feasibility Study on adaptation of the services of the emergency call number 112 (hereinafter – number 112) for the deaf, which was prepared during implementation of the project "Possibilities of adaptation of emergency call number 112 for the deaf: Experience of Lithuania and Norway (Deaf Access 112) ". The project is financed by the concerted support of financial mechanism of the Republic of Lithuania and Norway.

Overall goal of the introduced project is to warrant the possibility of the hearing-impaired and/or speech-impaired people in Lithuania to call the emergency services by single emergency number 112. Herewith the project contributes to increase and ensure the accessibility of public services and well-timed professional assistance and help (from fire fighters-rescuers, police officers, medical staff) for the disabled people in Lithuania.

Key project's objectives are:

1. To find the advanced technological solution enabling:

- The hearing-impaired and (or) speech-impaired person to call the emergency services by number 112 using the acceptable opportunities in convenient way,

- To accept the emergency call incoming from the hearing-impaired and (or) speech-impaired person to the Emergency Response Centre (hereinafter referred to as ERC) promptly and appropriately respond to it , i.e. to ascertain the emergency case of the caller, determine his/her location and to dispatch the required emergency services to the emergency location;

2. To structure the organisational system ensuring effective mutual two-way communication between the disabled person calling for emergency assistance and ERC operator/emergency services' staff.

This Feasibility Study is prepared according to these documents: Public Enterprise Central Project Management Agency "Methodology of Investment Projects Preparation in Public Sector", the European Commission "Guide to Cost-Benefit Analysis of Investment Projects", also basing on perennial experience of Public Enterprise Economic Research Centre on preparation of feasibility studies.

Preparation of the Feasibility Study was based on the data selected and presented by the Department of Statistics of the Government of the Republic of Lithuania (hereinafter referred to as Statistics Lithuania), the Lithuanian Association of the Deaf and ERC , also there were used other publicly available information sources. In March-April of 2010 the inquiry of the hearing-impaired and (or) speech-impaired persons in form of the questionnaire was performed in order to identify their needs related with the call of the emergency assistance services.

Representatives from different national establishments and organisations, related with the intended project, participated in preparation of this Feasibility study: namely, the Lithuanian Association of the Deaf and its subsidiary organisations, ERC, Department of the Affairs of the Disabled, national mobile communications operators (OMNITEL UAB, BITE LIETUVA UAB, TELE2 UAB), also foreign experts – the staff of the Norwegian National Centre on Emergency Communication in Health (KoKom), who have accumulated the experience of different countries related with the emergency assistance call services adapted for the disabled.

The separate issues of preparation of the Feasibility Study were discussed during official meetings (22 April 2010 and 29 June 2010) with representatives of liable state institutions (Ministry of the Interior Affairs, Communications Regulatory Authority, Department of the Affairs of the Disabled, Ministry of Health, Ministry of Social Security and Labour, Information Society Development Committee under the Ministry of Transport and Communications and others).

Feasibility study includes these fundamental aspects:

(1) Analysis of accessibility of the emergency call services for the deaf in Lithuania and foreign countries;

(2) Identification, description and assessment of technical alternatives of provision of the emergency services to the deaf according to the selected criteria (including financial);

(3) Selection and detailed description of optimal alternative;

(4) Preparation of the detailed project plan and definition of organisational structure of project implementation.

The basic conclusions and recommendations of this Feasibility Study are presented in Chapter 7 "CONCLUSIONS AND RECOMMENDATIONS".

3. DESCRIPTION OF ORGANISATION

Preparation of the Feasibility Study presented in this document was initiated by the Public Enterprise Vilnius Rehabilitation Centre of the Deaf (thereinafter – VRCD). VRCD, being authorized by the Lithuanian Association of the Deaf (more details in Chapter 4.1.4) and implementing its own goals and tasks, aims to represent the interests of the deaf in Lithuania concerning the accessibility of emergency response services by emergency call number 112. Hereinafter, the short description of this organisation is given below.

3.1. SHORT PRESENTATION OF PUBLIC ENTERPRISE VILNIUS REHABILITATION CENTRE OF THE DEAF

Public enterprise Vilnius Rehabilitation Centre of the Deaf was established in 2000. VRCD's founder is the Lithuanian Association of the Deaf (thereinafter - LAD). Till 2000 VRCD was a territorial subdivision of the LAD for Vilnius County. The institution as a subdivision of Lithuanian Association of the Deaf has already existed for 50 years.

According to the recent status Public enterprise Vilnius Rehabilitation Centre of the Deaf is an independent, voluntary, non-profit organization, acting in the field of rehabilitation of the deaf and publicly providing services of this field for inhabitants of Vilnius County. VRCD's office is situated in Vilnius, Kazimiero street 3. Presently 27 staff members are employed in the centre.

VRCD is one of six rehabilitation centres of the deaf (one of them is national, five others – regional) functioning in Lithuania.

VRCD maintains the close relations with LAD, the aforesaid rehabilitation centres of the deaf, the centres for sign language interpreters, the education establishments for the deaf, other organisations for the disabled people in Lithuania and abroad, also state establishments whose activities are directly related with the affairs of the disabled people.

3.2. TASKS AND ACTIVITIES OF PUBLIC ENTERPRISE VILNIUS REHABILITATION CENTRE OF THE DEAF

The key VRCD's objective is rehabilitation and integration of the deaf.

The main VRCD's fields of activities are as follows:

- Information, consultation;

- Arrangement/organizing of informal occupation;

- Job search services, assistance in employment;

- Organisation of artistic activities;

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- Organisation of recreating and entertaining activities;

- Social-cultural activities.

The main VRCD's tasks are:

- To assist in activities of the primary LAD organisations, organize the provision of cultural, educational, medical, social and vocational rehabilitation services for the persons with hearing disabilities, to care about their jobs creation, occupation and employment, to help them to integrate into the community, to cooperate with the municipal institutions, social care and educational establishments dealing with problems of the deaf;

- To execute public programs of medical, social and vocational rehabilitation and social integration;

- To establish conditions for the community and the deaf to communicate in sign language and thus allowing them to obtain information and education;

- To provide services of sign language interpretation;

- To inform the deaf about benefits being provided to the people with hearing disabilities and to help them to obtain necessary legal information;

- To keep a record of the deaf living in Vilnius County;

- To assist children, suffering from hearing disabilities, as well as their parents and care takers in implementing the right of these children to seek for education, knowledge and profession;

- To prepare programs for occupation of the deaf people together with the labour centre, to organize teaching of trades and professions and to help the deaf to find a job;

- With a help of public and social institutions of municipalities to organize custody and support for elderly, disabled and lonely members of Lithuanian Association of the Deaf;

- To provide the persons, suffering from hearing disabilities, with compensatory technique.

4. ANALYSIS OF SITUATION ENVIRONMENT

This part of the Feasibility Study is committed to explore the situation of the access of emergency services of emergency response centre by call number 112 to the deaf in Lithuania and to review the experience of foreign countries and their implemented projects in this field.

In respect of the situation in Lithuania these main issues are explored and analyzed:

- Legal basis: fundamental adopted legal acts, which include provisions on emergency assistance services using single emergency call number 112, access of emergency services for the disabled inhabitants, including the hearing impaired and/or speech impaired persons;

- Demographical and social situation: circumstances and factors, having a significant influence for the communication of the deaf;

- Needs of the people with hearing and/or speech disabilities for the emergency response and assistance services: existing problems and results of research of these needs;

- Role of the organisations representing the interests of the deaf: activities of leading organisations in initiation on purpose to solve the problems of access of emergency services for the deaf; structure of these organisations from the viewpoint of territorial and functional coverage.

In regard to the foreign experience these issues are reviewed:

- Experience of different countries on provision of emergency services to the people with hearing and (or) speech disabilities;

- Currently underway of the international project REACH 112 that is implemented in the European Union in order to increase the accessibility of emergency call number 112 for the EU citizens, firstly the ones with disabilities; project's objectives, principles, pilots and targets of researches.

4.1. ACCESSIBILITY OF EMERGENCY NUMBER 112 FOR THE DEAF IN LITHUANIA

4.1.1. REVIEW OF LEGAL BASIS

Already in the eighth decade of the last century the talks on necessity to introduce the single emergency call number in the entire Europe were initiated. The separate call numbers of the dispatcher offices of the police, fire brigades' and urgent medical help started to unite in the emergency call response centres where the advanced information technologies were

launched in order to assure the prompter response to the requests of emergency assistance from the persons.

Having regard to the Decision of the Council of the European Communities of 29 July 1991 on the introduction of a single European emergency call number (91/396/EEC), the Member States of the European Union were obligated to ensure that the single European emergency call number 112 would be introduced in public telephone networks as well as in future digital networks of integrated services and public mobile services, which could be introduced in parallel to the existing national emergency call number, by 31 December 1996 at the latest.

Later the provisions, related with the assurance of functioning of emergency call number 112, were transferred to the Universal Service Directive or formally Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services, where Article 26 regulated the single European emergency call number 112:

„Article 26.

Single European emergency call number

1. Member States shall ensure that, in addition to any other national emergency call numbers specified by the national regulatory authorities, all end-users of publicly available telephone services, including users of public pay telephones, are able to call the emergency services free of charge, by using the single European emergency call number "112".

2. Member States shall ensure that calls to the single European emergency call number "112" are appropriately answered and handled in a manner best suited to the national organisation of emergency systems and within the technological possibilities of the networks.

3. Member States shall ensure that undertakings which operate public telephone networks make caller location information available to authorities handling emergencies, to the extent technically feasible, for all calls to the single European emergency call number "112".

4. Member States shall ensure that citizens are adequately informed about the existence and use of the single European emergency call number "112".„

Part 1 of Article 7 of the Universal Service Directive regulates that Member States should, where appropriate, take specific measures for the disabled end-users in order to ensure access to and affordability of publicly available telephone services, equivalent to that enjoyed by other end-users, determining the obligation of the EU Member States to ensure that disabled end-users could also take advantage of the choice of undertakings and service providers available to the majority of end-users. This obligation shall include also the obligation to ensure the accessibility of emergency call number 112 for the disabled.

Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 on the rights of the citizens, amending the Universal Service Directive 2002/22/EC, established the new edition of Article 26:

„Article 26.

Emergency services and the single European emergency call number

1. Member States shall ensure that all end-users of the service referred to in paragraph 2, including users of public pay telephones, are able to call the emergency services free of charge and without having to use any means of payment, by using the single European emergency call number 112 and any national emergency call number specified by Member States.

2. Member States, in consultation with national regulatory authorities, emergency services and providers, shall ensure that undertakings providing end-users with an electronic communications service for originating national calls to a number or numbers in a national telephone numbering plan provide access to emergency services.

3. Member States shall ensure that calls to the single European emergency call number 112 are appropriately answered and handled in the manner best suited to the national organisation of emergency systems. Such calls shall be answered and handled at least as expeditiously and effectively as calls to the national emergency number or numbers, where these continue to be in use.

*4. Member States shall ensure that **access for disabled end-users to emergency services is equivalent to that enjoyed by other end-users**. **Measures** taken to ensure that disabled end-users are able to access emergency services whilst travelling in other Member States **shall be based to the greatest extent possible on European standards or specifications** published in accordance with the provisions of Article 17 of Directive2002/21/EC (Framework Directive), and they shall not prevent Member States from adopting additional requirements in order to pursue the objectives set out in this Article.*

5. Member States shall ensure that undertakings concerned make caller location information available free of charge to the authority handling emergency calls as soon as the call reaches that authority. This shall apply to all calls to the single European emergency call number 112. Member States may extend this obligation to cover calls to national emergency numbers. Competent regulatory authorities shall lay down criteria for the accuracy and reliability of the caller location information provided.

6. Member States shall ensure that citizens are adequately informed about the existence and use of the single European emergency call number 112, in particular through initiatives specifically targeting persons travelling between Member States.

7. In order to ensure effective access to 112 services in the Member States, the Commission, having consulted BEREC, may adopt technical implementing measures. However, these technical implementing measures shall be adopted without prejudice to, and shall have no impact on, the organisation of emergency services, which remains of the exclusive competence of Member States.

*   Those measures, designed to amend non-essential elements of this Directive by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 37(2). ".*

Member States shall adopt and notify not later than 25 May 2011 the laws and other legislative and administrative acts necessary to observe the requirements of the Directive on the rights of citizens. The requirements of Directive 2009/136/EC on the rights of citizens are not just yet transposed into national legislation.

In order to implement the provisions of the Universal Service Directive, the appropriate legal basis was started to be formed in Lithuania. Below there follow the fundamental

documents intended to ensure the accessibility of emergency call number 112 for the disabled persons.

In September 2002 the Strategy on Establishment of Emergency Response Centre and Introduction of a Single Emergency Call Number 112 was formulated that was approved by Decree No. 1500 the Government of the Republic of Lithuania of 25 September 2002 on the approval of the Strategy on Establishment of Emergency Response Centre and Introduction of a Single Emergency Call Number 112 and its Implementation Plan (Official Journal „Valstybes zinios", 2002, No. 95-4114). The implementation plan of this strategy also included the measure (among other measures) to prepare the program of community information about a single emergency call number 112 and its adaptation in order to be accessed by the disabled persons, to approve the program by the Decree of Minister of the Interior.

In April 2004 the Law No. IX-2135 on Electronic Communications of the Republic of Lithuania (Official Journal „Valstybes zinios", 2004, No. 69-2382) was adopted, where the public telephone communications services are defined as „services available to the society, designed to send and receive the national and international calls, also to ensure the access to the emergency services using the respective number or numbers indicated in the National Telephone Communications Numbering Plan. These services also include the assistance services from the service provider such as information services about subscribers, public pay telephone services, services that are provided under special conditions, **provision of special measures to the disabled users or users with special social needs** and (or) not geographical services".

Following the Strategy on Establishment of Emergency Response Centre (hereinafter – ERC) and Introduction of a Single Emergency Call Number 112 there was prepared the Program of Informing the Society about Emergency Call Number 112 and its Adaptation to the Disabled, this Program was approved by the Decree of the Minister of the Interior of the Republic of Lithuania of 9 December 2004 on the approval of Program of Informing the Society about Emergency Call Number 112 and its Adaptation to the Disabled No. IV-412 (Official Journal „Valstybes zinios", 2004, No. 180-6678).

This Program states that „Till now there were applied no special organisational or technical solutions enabling to settle the conditions for assurance of the access of emergency call number 112 or short numbers for the disabled depending on nature and difficulty/challenge of their disability. In case of necessity not all the disabled persons can communicate with the operators handling the emergency calls and express their requests for emergency assistance in a form suitable for them. This problem is especially important for the disabled persons having the certain disabilities (e.g. speech, hearing, speech and hearing, or movement disorders)". Considering that the Program provided to capacitate the conditions for Emergency Response Centre to receive the requests for emergency assistance, expressed by image or text and sent by public mobile network. The measures of this Program had to be implemented till the end of year of 2008; however the funds were not budgeted for this objective, thus the measures remained unrealised.

On 3 September 2008 by the Decree No. 866 of the Government of the Republic of Lithuania the Program on Infrastructure Development of Emergency Services of Call

Number 112" was approved (Program's amendments were approved by the Decree No. 1313 of the Government of the Republic of Lithuania of 7 October, 2009), aiming to create the infrastructure allowing to ensure that the emergency assistance would be timely provided to the inhabitants in the entire territory of the Republic of Lithuania, that the emergency calls would be duly responded and the requests of emergency assistance would be properly reacted upon.

The responsible executors of this Program are: Fire and Rescue Department under the Ministry of the Interior of the Republic of Lithuania, Ministry of the Interior of the Republic of Lithuania, and Ministry of Health of the Republic of Lithuania. The nominative coordinator of implementation of the Program is the Ministry of the Interior of the Republic of Lithuania, and participation of the local municipalities in implementation of the Program is highly recommended. One of the measures of implementation of the Program is Measure 3.1 "To expand the functionality of the software „ELS/GOEFIS (**G**eographic **E**mergency **O**peration **F**orces **I**nformation **S**ystem)" (to increase the capacities of the software in order to enable its use in the entire territory of Lithuania, adapt the software capacitating the reception of emergency requests from the disabled persons, etc.)", the responsible institution for execution of this measure is the Fire and Rescue Department under the Ministry of the Interior of the Republic of Lithuania The implementation of the measure is intended during 2008-2013, the preliminary sum for its implementation is approximately 20.6 mill. Litas (LTL) (more details about the Program see Chapter 5.3).

4.1.2. ANALYSIS OF THE DEMOGRAPHIC AND SOCIAL SITUATION OF THE DEAF COMMUNITY

4.1.2.1. *Demographic situation*

Basing on the data collected by LAD[1], in Lithuania there live about 40 thous. persons (or 1.2 % of all the population of the country) with significant hearing (speech) disorders – deaf or hard of hearing people, i.e. persons, whose degree of hearing failure hinders a satisfactory communication in a verbal (oral) speaking form. Among them the percentage of deaf persons is about 20 %.

In Lithuania in 2008 there lived about 8.3 thousand of deaf inhabitants: 7.4 thousand adults and 897 children under 15 years. In comparison with data of the Population and Housing Census of Lithuania of 2001, in 2008 the number of the deaf was less by 360 persons. During the period of 2001-2008 the population in Lithuania decreased by 3.5 %, meanwhile the number of the deaf decreased by 4.2 %. This decrease was influenced by ambiguous tendencies. On one hand, the number of the deaf people decreased because of the negative tendencies (common to all the inhabitants in the country): increase of emigration, decrease of birth rate and etc. On other hand, number decreased because of the

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1 In Lithuania there are no databases, which would be systematically collected on national level and available publicly, on the demographic and social statistics about people with hearing/speaking disorders. The only open information source is the Lithuanian Association of the Deaf, which compiles the data about the deaf on its own initiative.

positive factors, e.g. more frequent cases of application of cochlear implants (prosthesis of the auditory nerve reproducing the hearing).

Diagram No. 1. Number of the deaf persons according to the counties in 2008
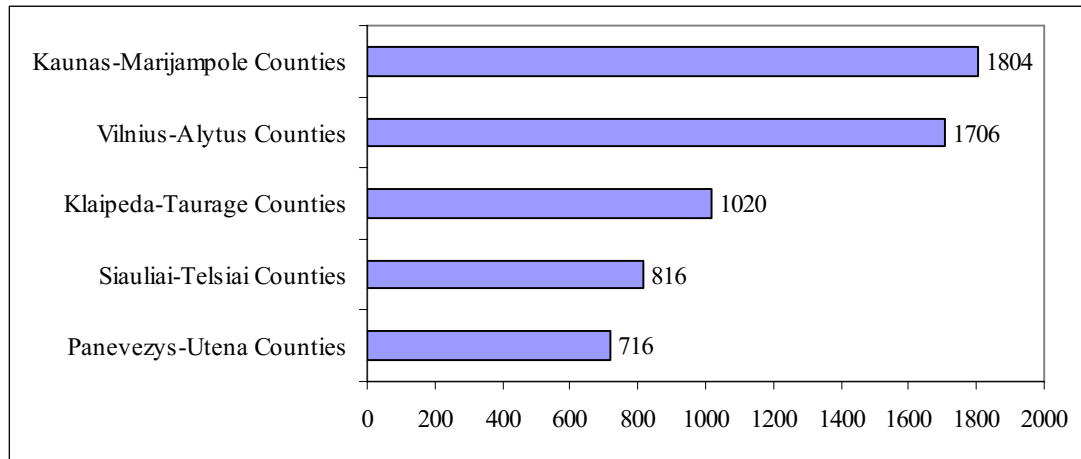
Source: LAD.

In 2008 in the survey performed by the LAD there were obtained demographic and social data of 6062 deaf people[2]. These data indicate that in territorial respect the most of the deaf persons live in the territory served by the LAD Kaunas territorial board (Kaunas and Marijampole Counties) , and the least – in the territory served by Panevezys territorial board (Panevezys and Utena Counties)[3] (see Diagram No. 1). Almost 65 % of the deaf people live in cities, about 35 % - in rural localities.

According to the age groups the structure of number of the deaf people is as follows: under 3 years old – 0.4 %; from 3 to 7 years old – 1.6 %; from 7 to 16 years old – 9.6 %; from 16 to 30 years old – 18.5 %.; from 30 to 60 years old – 33.7 %.; over 60 years old – 36.1 %.

4.1.2.2. Social situation

In respect of the social situation of the deaf it should be noted that the hearing disorders have significant negative consequences in all the fields of lives of the people having these disorders, i.e. on their education, occupation and, generally, on quality of life.

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2 Herein and hereafter in this Chapter there are presented statistical data on the deaf Lithuanian inhabitants, that was collected by the LAD performing the survey of its members, education and training institutions for the deaf, establishments providing their services to the deaf, other establishments and organisations, whose activities are related with the affairs of the deaf. The collected detailed statistical data does not cover all the deaf persons (about 75 %), however these data is sufficiently representative and presentable in decisions on different aspects of demographic and social situation of the deaf.

3 The territorial boards (TB) of the LAD perform their activities in the greatest Lithuanian cities each combining 2 counties according to the territorial principle: Vilnius TB – Vilnius County and Alytus County, Kaunas TB – Kaunas County and Marijampole County, Panevezys TB - Panevezys County and Utena County, Siauliai TB – Siauliai County and Telsiai County, Klaipeda TB - Klaipeda County and Taurage County.

Education

In Lithuania, as in other countries too, general education level of the deaf people is not high. This situation is determined by the fact that only after the special conditions – the deaf person learns to understand the words in oral language – are satisfied; it is possible to start to teach the deaf person to write and to read. The researches demonstrate that the deaf are loaded down with 3-6 times heavier learning burden than the healthy persons. It is confirmed by a low number of the deaf who graduated from the higher schools or studied in the higher establishments. The analogous situation prevails in Lithuania too, there are only 104 graduates from the higher education establishments (only 2 % of the number of the deaf older than 15 years); in comparison 19 % of the Lithuanian population of the same age have the higher education (graduated from the higher schools). Currently 32 deaf young people study in the higher schools, it makes slightly more than 5 students per 1 thousand of the deaf persons, and meanwhile this coefficient is more than 60 students per 1 thousand of all the population in Lithuania.

Low education level of the deaf people is displayed by the fact that in Lithuania among the deaf persons older than 15 years the majority is without education, having lower education than basic education (about 40 %) or having the basic education (34 %) (see Diagram No. 2). For example, about 12 % of all the population older than 15 years have the primary education and 14 % have the basic education.

In turn, this situation determines the more scarce possibilities for the deaf to be employed, also restrain the communication possibilities, firstly – communicating in written form. It should be noted that the written language of many deaf people, who are deaf from their birth or lost their hearing in early childhood, is characterized by poor grammar, while writing they apply the syntax rules of the sign language that are not known to the hearing people who have not encountered the sign language before.

Thus, while solving the problem of accessibility of the emergency assistance for the deaf, it would be important to train the employees of the 112-service in order to enable them to understand the particularities of the written language used by the deaf and to instruct the deaf people in order to make them aware how SMS message with help request should be written correctly and sent properly to the 112-service.

Diagram No. 2. The deaf according to the education in 2008 (percentage of the number of the deaf older than 15 years)

Finished the high schools 2%

Finished the colleges 3%

Finished the vocational schools 3%

Have lower than basic education or have no education 40%

Finished the secondary schools 18%

Finished the basic schools 34%
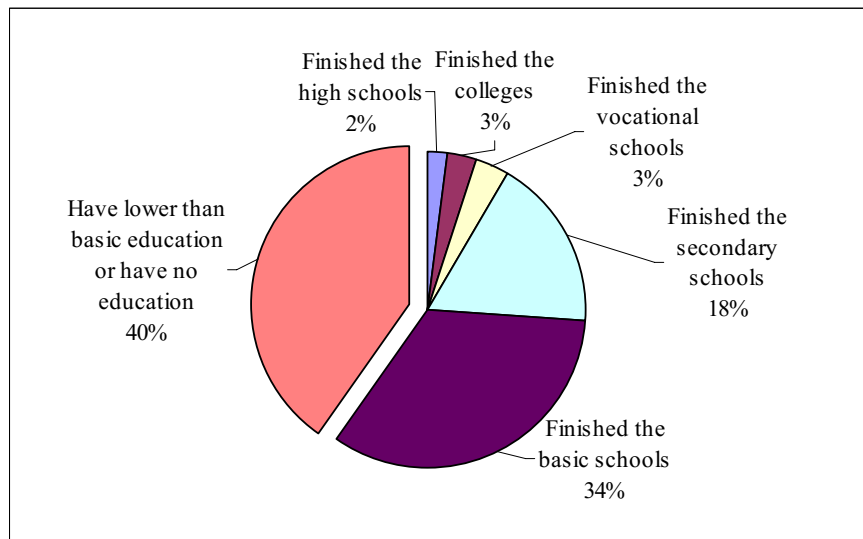
Source: LAD.

Employment/occupation

Basing on the data of the LAD, the number of employed deaf people is only about 1.2 thousand. After comparison of this number with the number of the deaf people of working age (about 3.2 thousand) it is possible to state that general level of employment of the deaf people is not more than 35 %, and it makes almost two times less occupation factor than the overall factor in the country (in 2008 the occupation factor in Lithuania was 64.3 %).

Adaptation of Information Environment

One of the most important contributors, which influence the life's quality of the deaf people and their social activity, is accessibility of information and communication possibilities.

The National Program of the Social Integration of the Persons with Disabilities into the Society of 2003-2012, adopted by Decree No. 850 of the Government of the Republic of Lithuania of 7 June 2002 (Official Journal „Valstybes zinios", 2002, No. 57-2335), includes almost all the most important fields, where the rights of the disabled shall be ensured as ratified in the United Nations Convention on the Rights of Persons with Disabilities, the Program states that „during last decade the society was informed about problems of persons with disabilities, but adaptation of information environment for these persons was neglected". It should be noted that accessibility of environment, also of information environment, for the persons with disabilities was mentioned as one of the most problematic areas of integration of the disabled. In the Programme it is indicated that in the area of information environment it is necessary to adapt the public elements of information environment for the persons with disabilities and to ensure their possibility to use the information; involve the persons with disabilities to the execution of programs of

development of information society; to implement the conception of adaptation of information environment for the persons with disabilities; create and adapt the special supporting equipment for the persons with disabilities; provide them with this equipment; adapt the information systems and data for their needs; to invite and motivate the mass media to provide the information for the persons with disabilities in accessible way. The implementation plan of the measures of this Program includes the intended respective measures to implement these tasks, also the measures to improve the information environment of the deaf persons (measures related with use of sign language, provision of interpreting services, training of interpreters, adaptation of information and communication services and etc.).

While implementing these measures many positive results were achieved, but in respect of many essential aspects the information environment is still insufficiently adapted for the persons with disabilities, also with hearing/speaking disabilities. This statement is defined in the National Programme of the Social Integration of the Persons with Disabilities of 2010-2012 (i.e. new edition of the National Programme of the Social Integration of the Persons with Disabilities of 2003-2012, approved by Decree No. 227 of the Government of the Republic of Lithuania of 7 March 2010 (Official Journal „Valstybes zinios", 2002, No. 57-2335), describing the present situation in the area of information environment. It states that despite of appearing more and more technical possibilities for the deaf to receive the information via new technologies, they still experience the information isolation. As an example, the current situation is depicted, when many television broadcastings in many countries are transmitted with „hidden subtitles" that can be switched on using teletext, and in Lithuania only one news broadcasting program is interpreted to the sign language, only some cultural and educational programs prepared on the national television channel are suggested with interpretation to the sign language when the program is shown repeatedly. In the National Programme it is also noted that the persons with seeing or hearing disabilities, also with significant movement and self-service disorders, frequently do not receive the proper services from the services' providers of public and private sectors.

Presently, the areas, which are vital for the communication of the deaf, are not yet satisfactorily developed: interpretation services of sign language, provision of the deaf persons with the technical communication measures.

The Programme of Use of Lithuanian Sign Language and Provision of Interpreters' Services of 2005-2008, that was prepared in context of implementation of the National Programme of the Social Integration of the Persons with Disabilities of 2003-2012, incorporated the striving provision that in 2008 one Lithuanian sign language interpreter would provide his/her services in average for 70 deaf persons. Currently, in average even 88 deaf persons are served by one sign language interpreter. It should be noted that the lack of interpreters is one of the major problems of all the centres of the sign language interpreters[4].

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[4] At most this problem is related with the fact, that the work payment of 60-80 % interpreters from sign language centers is still significantly less in comparison with the work payment of employees from budget education and social security institutions, and it does not make person's living. Then in frequen cases the intepreters search for another job or work additionally otherwhere. In that situation many sign language centers' managers look for the hearing persons familiar with basics of sign language in their regions, managers employ them, delegate them to the different qualification trainings and prepare the professional specialists for their centers.

Even the centres in the greatest cities as Vilnius and Kaunas suffer the lack of interpreters, and in other centres (or in the Governors' Administrations of the Counties) this problem is especially topical[5]. This situation decides the huge work load for the sign language interpreters and weaker possibilities of the deaf to use the interpretation services: there is lack of interpretation services in higher schools and colleges; because of the lack of the interpreters the deaf persons frequently have no possibilities to satisfy their important needs, e.g. timely manage their affairs in governmental and other institutions, and etc.

Adequate and sufficient provision of the deaf persons with modern communication measures is one of most important conditions of technical format in order to solve their remote communication enhancement and improvement. In this respect the great significance is attributed to the program of provision of the inhabitants with the technical assistance measures, executed by the Ministry of Social Security and Labour, implemented by providing the persons with disabilities with technical aid measures (TAM) and repairing them. The execution of these functions is delegated to the Centre of Technical Aid for the Disabled (CTAD) under the Ministry of Social Security and Labour.

During 2007-2009 the CTAD's compensation sums, intended for the persons with hearing disabilities to purchase TAM, amounted to 135.2 thous. Litas. 39 % of this sum consisted of compensations to 181 persons to purchase the mobile communication phones (with vibration function), another part – for 27 persons to purchase the FM listening system. This is a detectable and sensible support, but inadequate, both from viewpoint of appointed funds' size and the assortment of compensated technical aid measures in order to satisfy the needs of all the deaf persons.

4.1.3. PROBLEMS AND NEEDS OF HEARING-IMPAIRED AND (OR) SPEAKING-IMPAIRED PERSONS RELATED WITH ACCESS OF EMERGENCY SERVICES

4.1.3.1. Review of problems related with emergency calls

One of the burning problems of adaptation of information environment to the deaf persons is a problem of access of emergency assistance by telephone number 112. According to the statements from the deaf community and its representatives from related organisations, the deaf persons have as yet no possibilities to call independently the emergency services by number 112. Because of the nature and particularities of their disability they can limitedly use the mobile communication measures - most frequently they use the SMS function in their mobile phone, but the information system in the Emergency Response Centre is not adjusted to receive the help requests in a mode of short messages. It should be noted that this problem is met not only by the deaf persons, but also by hard of hearing persons, also the persons having speech disabilities.

The deaf person, stranded in a seriously dangerous situation, is able to call the emergency help only through the mediation of the hearing persons:

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[5] This situation is dictated by the fact that students, who study the speciality of sign language interpreter in Vilnius College of Higher Education under non-university study programme, perform their internship frequently in Vilnius or Kaunas and stay to work there because of the material reasons, refusing to make for elsewhere.

- asking nearby hearing person to call the emergency services (in this case it is the most complicated situation, as the hearing persons do not understand the sign language, and the deaf person must explain what has happened and what kind of help he needs);

- Or by using the communication measures (by video, text) asking the familiar hearing persons (if there are no hearing persons nearby), that they would call the emergency services (in this case most frequently they send the short message).

In case of need of assistance of communicative nature, also of emergency assistance, the deaf persons very often appeal to the familiar sign language interpreter. Despite of the huge work load, besides the ordinarily provided services, the majority of the sign language interpreters benevolently provide the additional (private) communicative assistance too, they help to call the emergency services: police, urgent medical help or any other emergency assistance for the deaf persons they serve customarily.

In this case it should be noted that in most frequent cases the sign language interpreters communicate with the deaf persons very closely (in many cases the interpreters are the persons having the deaf relatives), thus many interpreters share their private telephone number with the familiar deaf persons in order to make themselves available at any time. The interpreters do help only with inducement of goodwill and benevolence as these services (provided during unworking hours) are unpaid. From this point of view the LAD's attitude is that all the services of sign language interpreters shall be paid. There is the demand that the official working hours of the interpreters (from 8 a.m. to 5 p.m.) during the working days would be extended to the twenty-four-hours regime including the week-ends (establishing the additional tenures of duty interpreters working during unworking hours and week-ends). In this case the access of communicative assistance would be increased at least partly in cases of various situations, also the dangerous ones (notwithstanding the fact that the mediators will be needed).

Willing to have any real possibility by necessity to call the emergency services, the persons with hearing or speaking disabilities arrange themselves the individual prevention measures, e. g. some of them prepare the short message (with their name, surname, address) in their mobile phone and agree in advance with the familiar hearing persons (sometimes with the staff of the emergency services too), that in case of emergency they will send this SMS and wait for the emergency assistance. However, these measures are only fragmentary, because of many different circumstances they are not always efficient, and they do not provide the guarantee that the deaf person will receive the emergency assistance promptly in case of disaster or any dangerous situation.

In generalisation, it could be written, that at present the transmission of requests of emergency assistance from the person with hearing or speaking disabilities to the emergency departments depends only on his/her environment – the hearing family members, relatives and neighbours, familiar people (from the science, work and community establishments), sign language interpreter, and often it depends on the benevolence of the by passers found themselves in the location of the accident.

4.1.3.2. Results of Survey „Deaf Access 112"

During months of March-April of 2010 there was carried on the survey by questionnaires of the persons having hearing and (or) speaking disabilities in order to clarify:

- Present situation due to the accessibility of emergency services for the persons with hearing or speaking disabilities, i.e. what circumstances and problems are met by these persons when they collide with the situation with a need to call the emergency services;

- Opinion of these persons, what measures and ways are the most acceptable to them in order to call the emergency services.

Characteristics of Respondents

283 persons took part in the survey: 276 persons with hearing disabilities, among them 177 deaf persons (63 % of all respondents participating in the survey) and 99 hard of hearing persons (35 %), also 4 persons with speaking disabilities (1 %) and 3 healthy persons (1 %).

Structure of respondents according to the sex, age and occupation is as follows:

- 40 % male (116 persons), 59 % female (167 persons);

- from 16 to 25 years old – 20 % (57 persons), 26–35 years old – 22 % (64 persons), 36–45 years old – 18 % (51 persons), 46–60 years old - 26 % (73 persons), above 60 years old - 13 % (38 persons);

- unemployed persons (the jobless) – 28 % (80 persons), employed – 45 % (128 persons), studying (schoolchildren/students) – 14 % (41 persons), retired persons (the old age pensioners) – 12 % (34 persons).

With the regard that call of emergency services is directly related with the technical communication measures, the respondents were asked a question in the survey questionnaire, what technical measures they currently use (a respondent could select all the listed technical measures). The replies indicate that the most popular communication measure is a mobile phone, the most rarely used measure – a wire phone (the results of all the replies is presented in Diagram No. 3).

Diagram No. 3. Use of technical measures (percentage of replies from the total number of respondents)
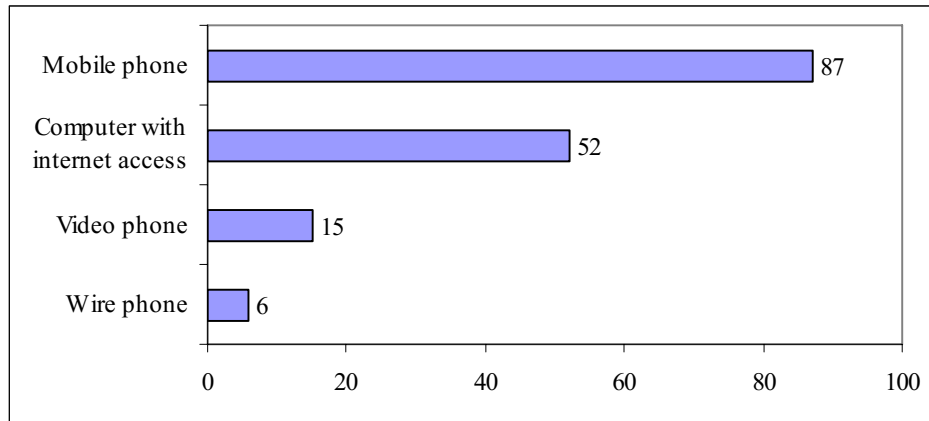
Present Situation and Problems to Call the Emergency Services

Survey results indicate[6], that persons with hearing/speaking disabilities are aware of the emergency call number 112 in Lithuania and the degree of awareness is not very low: about 18 % of the respondents (50 persons from 282 respondents) answered that they knew nothing about call number 112, other persons knew (43 %) or heard/read about it but they did not know how the system functions (39 %).

Majority of respondents - 72 % (201 persons from 278 respondents of the question on the access of emergency call number 112) replied that an emergency service by call number 112 is not available and accessible for them. This situation was directly reflected in results of the replies to the question if a respondent can independently call the emergency services by phone: only 23 % of respondents can phone independently (63 persons from 277 respondents to this question), and 77 % (214 persons) replied that they can not call themselves.

Responding to the question who helps (could or would help) to call the emergency services, the respondents most frequently mentioned the relatives (41 % or 114 persons from 279 respondents), more rare – neighbours (32 %), other persons (19 %), the most rare case – passer-by on street (8 %).

Many respondents - 39 % (109 persons from 280 respondents), after being asked about private experience in regard of dangerous situation, answered that they were in dangerous

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6 There is a need to note that not all the respondents answered all the questions of the questionnaire. Thus representation of results of replies in percentage considers the number of respondents giving the reply to the specific question.

situations when they needed the emergency police, fire fighters' or immediate medical assistance.

According to the character of dangerous situation the most frequent cases were assault, contusion, thievery or robbery. 30 respondents experienced these situations. Almost the same number of respondents (29) met with the dangerous car accidents. In 25 cases the respondents found themselves in the situations, when they suffered the traumas, burns or heavy injuries. One (1) respondent even ended up with the fire situation. In other 53 cases the respondents met dangerous situations of other character.

Caught in the toils of dangerous situation, 68 % of respondents (96 persons of 141 respondents to this question) tried to call the emergency services. In most frequent cases (if only the possibility was) they appealed to the speaking and hearing persons who were nearby to call the emergency services. Such cases were indicated by 64 respondents. Almost less by half there were cases (34), when in dangerous situations the deaf persons asked for help by sending the short messages by mobile phone to the hearing persons and described the situation at a critical juncture and requested to call the emergency services. There were just few cases (12), when the respondents tried to call the emergency service, firstly calling by videophone to the hearing and speaking familiar person and explaining to him/her the situation in sign language. 30 respondents replied that they called for the help also in other ways.

The respondents, who suffered the dangerous situation and sought the emergency assistance, replied how long it took for them to explain the situation about the needed immediate help, and the replies distributed as follows:

- 36 % respondents (49 persons of 137 respondents) indicated, that explanation took from 2 to 7 minutes;

- 23 % – 7-15 minutes;

- 16 % – 1-2 minutes;

- 12 % – 15-30 minutes;

- 9 % – more than 30 minutes;

- 4 % – about 1 minute.

Greater part of respondents – 62 % (84 persons of 135 respondents) – thought that emergency assistance was provided too slowly. More than one fifth of the respondents – 27 % (37 persons of 135 respondents) – pointed out, that the assistance that was provided to them was not the one they required.

Opinion of Respondents on Potential Ways and Measures to Call Emergency Services

Comparatively many respondents – 84 % (231 persons of 276 respondents) do not know how the deaf persons can call for the emergency services in the European Union member-states. Almost 90 % of respondents (249 persons of 277 respondents) positively answer the

question; if they do agree with the statement that emergency services shall be accessible by the deaf persons by a single emergency number 112.

More than half of the respondents - 63 % (174 persons of 277 respondents) – would agree that the separate (special) number would be established to call the emergency services for the deaf persons. 9 % of respondents think that there is no need to create the new emergency number. Other respondents do not have any opinion on this issue (they do not know).

One of the possibilities to call the emergency services by call number 112 for the persons with the hearing/speaking disabilities is related with the subscription or pre-registration (supplying the data of address, telephone number and etc.) of these persons. The respondents were asked whether they agreed that these data would be registered in the Emergency Response Centre (ERC). More than half (56 % or 156 persons of 281 respondents) would agree that these data (address, telephone number) would be registered in the ERC in order to receive the immediate emergency assistance, 16 % of respondents would not agree, the rest part of respondents (28 %) did not know whether they would agree.

The opinion of the respondents due to the form of communication – direct or with assistance of a mediator – calling the emergency services by emergency number 112 was as follows:

- 73 % (202 persons of 277 respondents) would choose the possibility to contact directly the operator of 112-service;

- 18 % would contact the 112-service through the mediation of hearing and speaking interpreter;

- 9 % respondents indicated no their specific opinion on this issue.

While responding to the question, what way (using what measure) the respondents would like to call the emergency services, the majority indicated that they would choose the possibility to send the short message (SMS) from mobile phone (all the results of the replies are presented in Diagram No. 4)[7].

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[7] A respondent could select all the presented alternatives:

- send SMS message by mobile phone: in Diagram 4 – „SMS messaging";
- video call by mobile phone (in sign language): in Diagram 4 – "Video Call";
- through the mediation of duty interpreter: in Diagram 4 – "Through the interpreter";
- by special codes (when each situation would be given a code): in Diagram 4 – „Special Codes";
- by special equipment to call the emergency help: in Diagram 4 – „Special Equipment";
- by internet (send a message by e-mail): in Diagram 4 – „Electronic mail";
- communicating in "Real-time text" mode: in Diagram 4 – „Real time text";
- other way: in Diagram 4 – „Other ways".

In opinion of majority of the respondents the call of emergency services (by a short message, by call) shall be costless: 77 % respondents (216 persons of 279 respondents) think so. 13 % of respondents would agree to pay for this service, another 10 % have no own opinion on this issue.

Diagram No. 4. Measure (way), how the respondents would prefer to call the emergency services (% of replies of all the respondents)
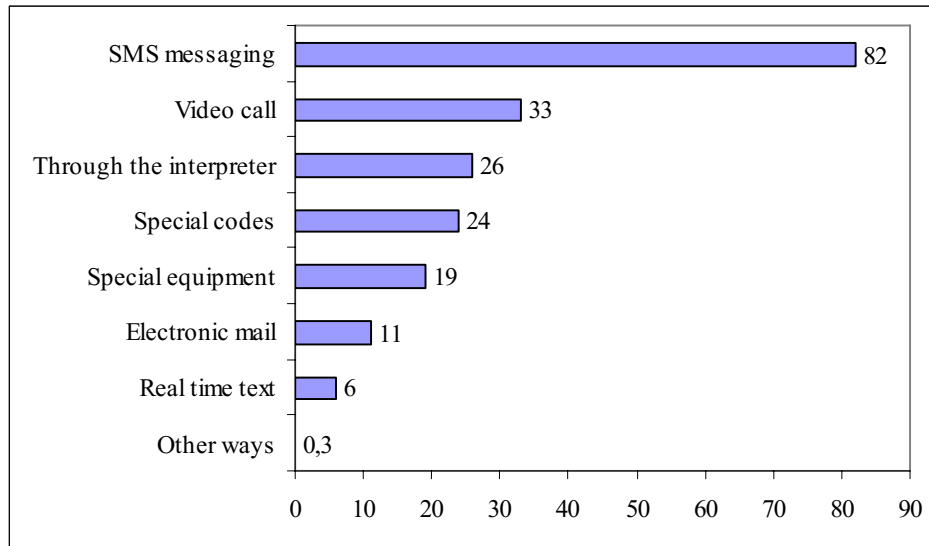
The respondents were asked to indicate how many minutes, in their opinion, the conversation with operator would take from the first moment of the emergency call (short message), the replies spread as follows (in decreasing order):

- 40 % (109 persons of 276 respondents) – 2-7 minutes;

- 23 % (64 persons) – 1-2 minutes;

- 23 % (62 persons) – 7-15 minutes;

- 9 % (25 persons) – less than 1 minute;

- 5 % (15 persons) – 15-30 minutes.

The question what the operators should know and should learn in order to accept the emergency signal (call, short message) was answered by majority of the respondents – 74 % (208 persons of 281 respondents) – that the operators should understand the particularities of the language written by the deaf persons. 23 % respondents noted that the operators should learn the sign language. 2 % respondents indicated that the operators should possess other competences too.

Majority of respondents - 74 % (210 persons of 282 respondents) – had the opinion that it would be required that the operator of emergency service 112 would give the guidance how to deal with and behave in the specific dangerous situation. 20 % thought that it was

not necessary. In opinion of 6 % respondents this guidance would be required only sometimes.

Summation

Summarizing the results of the performed survey the important statements can be distinguished that are as follows:

- there were comparatively many cases (39 % respondents) when the persons with hearing and (or) speaking disabilities were in need of emergency services (39 % of all the population of Lithuania having significant hearing and (or) speaking disabilities over age of 15 years old (i.e. about 35 thous. persons), it makes approximately 13-14 thous. cases);

- majority (90 % respondents) would prefer to have the possibility to call the emergency services by number 112 (90 %, about 32 thous. persons);

- 82 % would prefer to call the emergency services by a short text message (correspondingly about 29 thous. persons);

- More than half of respondents (56 %) would agree, that their data e. g. address, telephone number would be registered in the ERC in order to receive the emergency assistance (correspondingly about 20 thous. persons).

4.1.4. ANALYSIS OF THE ROLE OF ORGANISATIONS REPRESENTING THE INTERESTS OF THE DEAF

The Lithuanian Association of the Deaf (LAD) is the topmost organisation that represents the interests of the deaf on international and national level, protects their concerns, and provides universal assistance and miscellaneous services in the country.

The main objectives of the Lithuanian Association of the Deaf are:

- To organize the deaf living in Lithuania, to assist the state and community morally and materially compensate their physical and spiritual disabilities;

- To represent its members and protect their occupational, economical, social and employment rights and related legal interests, provide the necessary assistance;

- To support education, health care, employment and culture level of the deaf;

- To care about the occupational activities of the LAD's members and to solve the issues of vocational rehabilitation;

- To assist the national organisations, establishments and companies to employ and rehabilitate the deaf persons.

The LAD is a member of the World Federation of the Deaf (WFD) and the European Union of the Deaf (EUD), by the medium of these international organisations the LAD represents the deaf of Lithuania on the international level. The LAD has permanent and lasting relations with many other national associations of the deaf (of Latvia, Belarus, Ireland, Germany and etc.). On the national level the LAD maintains the close relations with other national organisations of the disabled; the LAD is one of the founders and board members of the Lithuanian Forum of the Disabled. Under this umbrella organisation the LAD represents the interests of the deaf on the national level emphasizing the problems of the deaf persons and their needs in the general context of the problems and needs of the disabled. Solving the national social integration issues of the deaf the LAD also actively cooperates with state, governmental and municipality institutions and establishments.

Institution, that is a mediator of direct LAD's representation of the deaf community interests in the state structure, is the Board of the Affairs of the Disabled at the Ministry of the Social Security and Labour (hereinafter – the Board) [8], where one of 14 board members is delegated by the Lithuanian Association of the Deaf. The main objective of the Board is to examine the most important social integration issues of the disabled and to assist the Minister of Social Security and Labour and other Ministers to implement the policy of the social integration of the disabled, meeting the needs of the disabled.

One of the most important LAD's tasks participating in the activities of the Board is to publicize the national problems of the deaf community, whose demand the political solution, initiate and stimulate the processes of settlement of these problems.

Achieving to solve the problem of the deaf access number 112 during last years the LAD initiated the discussion on this issue in the meetings of the Board, also discussions and considerations in the meetings organised by the Department of the Affairs of the Disabled under the Ministry of Social Security and Labour[9] and the LAD itself with responsible representatives of respective state institutions (Ministry of the Interior, Ministry of Social Security and Labour, the Communications Regulatory Authority, ERC, Information Society Development Committee under the Ministry of Transport and Communications and etc.).

These considerations and discussions have influenced the following proceedings in the Parliament of the Republic of Lithuania (Seimas), where the problem of access of the emergency services 112 for the deaf was started to be discussed, e. g. this problem was

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[8] The Board of the Affairs of the Disabled under the Ministry of Social Security and Labour is a collegial institution, constituted on voluntary basis following the principles of equality and partnership of the representatives from the state institutions and associations of the disabled. The Board consists of 14 members: 7 members are delegated by the associations of the disabled (Lithuanian Association of the Blind and Visually Impaired, Lithuanian Association of the Deaf, The Society for the Physically Disabled of Lithuania, The Lithuanian Union of Persons with Disabilities, Lithuanian Welfare Society for People with Intellectual Disability "Viltis", Lithuanian Paralympic Committee) and 7 representatives are delegated by the ministries (Ministry of Social Security and Labour, Ministry of Health, Ministry of Education and Science, Ministry of Environment, Ministry of Transport and Communications, Ministry of the Interior and Ministry of Economy).

[9] The Department of the Affairs of the Disabled under the Ministry of Social Security and Labour (hereinafter – the Department) is a public legal entity, which founder's functions are executed by Ministry of Social Security and Labour. The Department coordinates and executes the National Programme of Social Integration of Persons with Disabilities, implements other measures of implementation of policy of social integration of the disabled. One of the functions of the Department of the Affairs of the Disabled is technical service for the Board of the Affairs of the Disabled.

investigated in the Government Hour that took place in Seimas on 11 February of 2010, also in the meeting of Seimas Committee on Audit on 24 March.

While solving the topical introduction issues of the communication services, the emergency services too, for the deaf the important significance here is possessed by the LAD, its territorial structure of the established organizations and establishments providing the communication services for the deaf, or in other words, territorial coverage of its network.

In its structure the LAD has 5 territorial boards and 38 primary organisations. The territorial boards in the biggest cities of Lithuania perform their activities each uniting 2 counties according to the territorial principle. Each territorial board unites the primary organisations established in its territory. Majority of primary organisations are entities without legal status[10], only executing the functions of the LAD's representation in the region.

In every region, supervised by the LAD's territorial board, the rehabilitation centre of the deaf performs its activities, i.e. in Lithuania there are five regional rehabilitation centres of the deaf – in Vilnius, Kaunas, Klaipeda, Siauliai and Panevezys. The founder of all these centres and also of the National Centre of the Deaf is the LAD. In fact, these centres function as LAD's territorial subdivisions, although they are public establishments, having independent legal entity status. Every of the regional centres is headed by a Director, who is the Chairman elected by the Territorial Board. In the regional rehabilitation centres of the deaf there are employed in total about 100 employees, in the National Centre – 19 employees.

The activities of these organisations include different fields: information and consultation, representation, assistance in job search and employment, psychological aid to the deaf and their family members, training of social and independent life skills, provision of compensatory technique, organisation of cultural and artistic activities of the deaf, education and training of sport capacities and etc.

The import establishment from the viewpoint of establishments involved in the LAD's system and established by the LAD, providing the communication services, is a Public Establishment Surdology Centre, executing the sign language research, its training and other activities of qualification and improvement of sign language interpreters.

In this attitude the activities of the sign language interpreters' centres closely concern the establishments of the LAD's system.

The interpretation services of sign language are provided by seven sign language interpreters' centres[11] in the counties (of Vilnius, Kaunas, Klaipeda, Panevezys, Siauliai,

10 Seven primary organisations of the deaf have the registered statutes and status of legal entities.

11 Presently the sign language interpreters' centres are budget establishments, those founders are the Governors' Administrations of Counties. However, the counties are to be reformed starting from the middle of year of 2010, so it is planned that some sign language interpreters' centres of the counties (of Vilnius, Kaunas, Klaipeda, Siauliai, Panevezys) will be transferred to the responsibility of the Ministry of Social Security and Labour, some centres (of Marijampole and Alytus) will be completely abolished, establishing new distanced work places in the territory of these counties, which would belong to the sign language interpreters' centres of Kaunas or Vilnius. At the moment there are no final decision, what institutions will have to care about the transffered sign language interpreters' staff currently present at the Governors' Administrations of Utena, Taurage and Telsiai Counties.

Alytus and Marijampole), and in three counties (of Utena, Taurage and Telsiai) the sign language interpreters work in the Governor's Administration of County. In pursuance to move the interpretation services of sign language in closer to the consumers/clients, the interpretation centres of sign language of the counties established their divisions in the districts of the counties. Most frequently in the districts there is employed one interpreter, who is also the LAD's consultant, representing the deaf in different establishments and organisations under the necessity. In major cities the deaf can appeal for help both to the rehabilitation centre and to the sign language interpreters' centre.

Adequately, the developed territorial structure of the LAD, its divisions and establishments founded by the LAD, also other establishments providing the communication services to the deaf, underlies the favourable supplementary background to implement the national projects of development of communication services for the deaf or introduction of new services, among which the introduction of emergency services by number 112 for the deaf is also included.

4.2. SERVICE OF EMERGENCY CALL FOR THE DEAF IN FOREIGN COUNTRIES

4.2.1. REVIEW OF EXPERIENCES OF DIFFERENT COUNTRIES

Currently in some European countries (Iceland, the United Kingdom, Sweden, Finland, Denmark and etc.) and other countries (e. g. Canada, Australia, the USA) the national emergency systems are already functioning or are in the introduction phase, those allow for the persons with hearing and (or) speaking disabilities to call the emergency services independently. These systems are different: they use different communication schemes, base on different technologies and their combinations, are created by different organisational structures and etc. The review of experience of some countries in this field is presented below.

4.2.1.1. Iceland (SMS 112)

Presently in Iceland there is introduced the single call number 112 for emergency services, which combine the police control rooms, fire brigades, coastguard service and ambulance service. The calls from all over the country by number 112 are routed to the 112-centre in Reykjavik. In addition to "traditional" services, the 112- centre also accepts the calls like non-urgent requests (without emergency) for assistance by the police, child protection agency and etc.

In cooperation with the national deaf and hard of hearing association, the 112 call centre has implemented the information system, allowing the inhabitants to contact the 112 centre by sending SMS messages. The implementation of this system was initiated in May of 2005; the system was launched in April of 2006. Before the launching of information system, there was introduced the possibility to send by number 112 the short message to the separate receiver located in the 112 call centre, however now the SMS are received using the same information system, which is used to receive the help calls.

Introduction of this system in Iceland was not complicated because of these reasons:

- Although the introduction of this system demanded participation of mobile communication operators, but, as in the country there was **only one** 112 call centre, the mobile communication operators had no need to make the reformations due to the possibility to direct the SMS messages to different local centres;

- On principle, the system functioning on the base of SMS messages has been already known by the operators at the 112-centre, as they used the SMS communication system between emergency operation forces (SMS messaging in interdependent communication of the Icelandic emergency forces has been in use since 1999), thus there was no need of much time, organisational and other resources to train the operators of the 112-centre;

- There was no need to create the new legal base for functioning of this system, only some amendments were incorporated in applicable legislation.

Some major aspects of functioning of emergency call system by SMS message are as follows:

- Iceland has no requirement that the persons calling the emergency services by SMS message would be registered in advance (no prescription);

- In need of emergency services the sender just writes a short message (or selects the one written in advance) and send it by number 112;

- messages asking for emergency services, received from the inhabitants, are not automatically confirmed. The sender gets the confirmation by message-response from the 112 call centre where it is written that his/her message was received and the emergency services are arranged;

- if the 112 call centre receives the emergency message, the operator hears a sound (tone), different one than in case of ordinary (voice) call, the operator's computer desktop shows the information about the received message;

- sending the short message (SMS), there is no facility to determine the geographical location of the sender/caller, thus the operator of the 112-centre, who accepted the message, determines the location in any of two possible ways: communicating with the caller or asking the caller (if there is a possibility) to make a voice call (in this case the call made from the wire (land-line) or wireless (mobile) phone will not automatically be routed to the same operator, as it would be in case of communication between the operator and the caller by short messages. Thus, all operators will be notified that a „silent" call is expected aiming to identify the location information of the caller);

- SMS messages that are sent by call number 112 are free for inhabitants;

- The short messages (SMS-calls) to 112-centre are not defined as emergency calls, like voice calls to 112-centre are. This implies that the short message does not

have a priority in the mobile communication operator's network. A system of priority of emergency short messages in the network for incoming SMS was considered too expensive to implement at the time. The absence of the priority in the network might lead to problems if the network is overloaded at the time of the incident. However, the management of the Icelandic 112-centre has not had any reports on cases where failure of transmission has been a problem.

- As the SMS to 112 is not technically considered an emergency call, it is not possible to send a message to 112-centre from a phone without a SIM-card or from a phone with an invalid SIM.

The total number of emergency calls received in 2008 was 257 597. Of these, 0.5 % was made via SMS.

4.2.1.2. Sweden (SMS 112)

In Sweden the organisation SOS Alarm is responsible for the emergency services by call number 112, which provides these services on the agreement with the Government of the country. By the right of ownership 50 % SOS Alarm belongs to the Government of Sweden and 50 % – to the Boards of Counties.

Among ways how it is possible to call the emergency services in Sweden[12], there is a possibility to call the emergency service by SMS message. The system of call the emergency services by SMS message in Sweden is based on subscription (pre-registration). The user has to register and sign a contract that he/she has been informed about the system, its shortcomings (limitation of capacity). The purpose of subscription is to ensure that the user is well informed and to avoid abuse of the system. For the meantime the handling time to the received SMS message is rather long – about 14 minutes.

4.2.1.3. The United Kingdom (SMS 999 / 112)

Considering the fact, that possibility of the persons with hearing and speaking disorders, as in general of all the inhabitants, to communicate via SMS messages became very important in their communication, during the last several years the United Kingdom has implemented several regional schemes enabling to send the SMS messages to the local emergency centres (most frequently – the police) using a short code of 5 digits or long number of 11 digits.

Without any doubts, the introduction of this service improved the situation of inhabitants to reach the emergency centre, especially for the persons with hearing and speech disabilities. However from the viewpoint of all the geographical territory of the country and correspondingly from the viewpoint of the inhabitants it meant the fragmentation of

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[12] In Sweden there are different ways to call the emergency services by call number 112: by fixed line phones, cell phones (even in those cases when the phone has no SIM card or the credit is over), SMS messages, PSTN (Public Switched Telephone Network) text telephones, satellite phones (addressing the special number, through which the connection with 112 ensues). In Sweden it is also possible to direct to the 112 service via any relay services.

provision of these services. Negative aspect was that level of different introduced regional schemes sharply differed. Some regional schemes had no possibilities to provide the essential information in order to render the emergency services, i.e. identification data of the caller or determination of caller's location.

Thus in 2009 in the United Kingdom there was started a pilot project introducing the system for the service, intended to the persons with hearing and (or) speaking disabilities, allowing nation-wide to call the emergency services (police, urgent medical aid, fire fighters' and coast rescue services) by emergency call number 999 by sending SMS messages. This project is financed by the large-scale telecommunication companies, emergency centres and the Royal National Institute for Deaf People (RNID).

The service to call the emergency centre by SMS message has not changed the service to call the emergencies by voice call by number 999 or text phone by number 18000, as it was introduced as the supplementary service. There should be denoted that all signals (calls and messages) by number 112 are automatically directed to call-handlers of 999-service, as both numbers are based on the same infrastructure, neither of them takes priority over another.

General scheme of reception and reacting to the SMS message is as follows:

- SMS message, sent by emergency telephone number 999 (or 112), is received by the call-handlers of the 999-service using the Text Relay 18000-service;

- Employee of the Text Relay Service reads over the message to a consultant (call-handler) of the 999-service;

- Consultant of the 999-service can ask to specify the information about the emergency case (accident) or to pass straight the message text to the specialist emergency service (police, ambulance, fire and rescue or coastguard). In both cases the response of the 999-service handler and further contact with a sender follows through the 18000-service. The sender receives the replies in a form of messages. The first reply to the sender (request of more detailed information or confirmation that the emergency assistance service was dispatched) reaches him in average in 2 minutes.

Some important aspects of organisation, arrangement and functioning of emergency services system by SMS message:

- In order to call the emergency services by using SMS messages, the user must get a subscription (advanced registration) of his/her mobile phone number in the 999-service (registration is possible on the internet webpage *www. emergencysms.org.uk* or send a word „register" by SMS message to the number 999 and thereafter the imperative registration procedures shall be performed). Otherwise, the received SMS message shall not be routed to the emergency services (in case the SMS message was received from the unregistered sender (unregistered mobile phone number), then the sender will receive only the reply with the information how to register his/her mobile phone number, no other emergency measures will be assumed and arranged). If the registered user

changed his/her mobile phone number or mobile network operator, the user shall newly register.

- The service is provided only in the territory of the country: the SMS messages, which are sent to the number 999 from abroad, may be not transmitted to the 999-service, and in case they reach 999-service, they may be rejected.

- The SMS messages, which are sent to the number 999, have the same priority as the voice calls to this number.

- The SMS messages, which are sent to the number 999, are free of charge, but they may be not routed to the emergency service, when the phone has no credits.

- The intensive campaign is carried on through different media sources in order to announce the information widely, massively and continually, what the conditions of call to the emergency services by SMS message are, what the particular actions (steps) taken by the user shall be to call the emergency services by SMS message, including the recommendations on what format of a message shall be used to call the emergency assistance. It is recommended in the message:

  1) firstly, to indicate what emergency assistance is needed (e. g., „ambulance", „police", „fire and rescue");

  2) shortly describe what has happened (e. g., „assault", „trauma", „heart attack", „car accident" and etc.);

  3) point the place of the happened emergency case (city, street) and, if possible, to name the objects located nearby (e. g., „over the bridge", „near the post office", „close to the shop" and etc.);

- The location of message sender is automatically determined, but the 999-service can ask the sender to clarify and give details on the accident location.

- In order to call the emergency services it is recommended to send the SMS message only in a case when it is no other choice, because the call of emergency services by SMS message takes longer than the call by voice to the number 999 or by text phone to contact to the number 18000.

If the results of this pilot project are estimated positively, the call system of emergency services by SMS message will be introduced as a constant service until the end of 2010 year.

4.2.1.4. Canada (call + SMS 911)

During the period from July of 2009 to January of 2010 the Working Group of the United Monitoring Committee of the Canadian Radio-television and Telecommunications Commission (CRTC), working in the field of the emergency services (Emergency Services Working Group, ESWG) prepared the research, which analysed the accessibility of

emergency services provided by the emergency telephone number 911 for the persons with hearing and (or) speaking disabilities, using different forms of text messaging, including the short messages (SMS), instant messaging (IM), real time text (RTT) and relay services (TTY and IP Relay). In the research there were assessed the advantages, shortages and limitations of these technologies.

It was determined that the different text sending forms (direct services and relay services), used for the persons with hearing and (or) speaking disorders to contact the service 9-1-1, are not sufficiently rational because of the following main reasons and causes:

- In SMS, IM, RTT and IP Relay cases, the automatic text directing to the required territorial emergency control centres or automatic transfer of information of the sender's location to the required emergency control centre is not ascertained;

- Using IM and RTT, there is no automatic presentation of sender's identification data, e.g. telephone number (as it is by sending SMS message).

- ESWG noted that nowadays developing 9-1-1 standards and technologies in long term perspective would enable the users to contact the emergency services using multiple methods of text messaging to the 9-1-1 service. Introduction of these possibilities will depend on the development level of new generation of the IP networks and 9-1-1 platforms.

Thus in order to solve the issue already during the closest period, the aforesaid working group suggested the potential solution combining the SMS message and „silent call" from wireless communication measures - *„SMS T9-1-1 via silent wireless voice call"* (hereinafter „SMS+silent voice call").

Using the combination „SMS+silent voice call" the principal sequence of the calling the emergency services would be as follows:

- Potential users – persons with hearing/speaking disabilities are registered in advances (system of subscription);

- In case of emergency, the user calls by mobile phone (by voice call) to the emergency service by number 9-1-1;

- In the 9-1-1 emergency centre the information on the caller's location and its contact data are automatically received, as it is in case of all calls to the 9-1-1 service, but this call is immediately identified as one received from a person with hearing/speaking disability. The call-handler in this case sends the answer to the caller by SMS message enabling the communication with this person by SMS messages.

This solution allows to route automatically the call received by number 911 to the relevant 9-1-1 emergency centre, to receive automatically the contact data of the caller, also information on the caller's location, to use the existing network infrastructure, it all goes to decrease the time needed for implementation of the solution.

However, the ESWG notes that the combined solution „SMS+silent voice call" does not allow for the user to initiate the contact with the 911-service writing directly or using other text messaging methods. Moreover, this solution will demand to change the executable call handling procedures of the emergency services. Thus ESWG suggested to perform more detailed technical survey of the solution „SMS+silent voice call" from the viewpoint of every earlier mentioned activity determined during primary research (e. g. determination of the most efficient method except „silent call"; establishment and description of registration procedures of potential users and their registration template; preparation of detailed technical specification of the service; identification of the special requirements for the training of the call-handlers (operators) of the emergency services and etc.).

These explorations would last from 12 to 18 months, i.e. they would be finished at the latest in the end of 2011.

4.2.1.5. Norway (1412)

In Norway there function three numbers for the main emergencies: number 110 for the fire and rescue, 112 – police and 113 – ambulance services[13]. In case of need, every emergency service can connect the caller with any other service.

The hearing-impaired persons as users of the fixed network telephony in Norway have the special emergency number 1412 and special interpretation number 149. The provider of these services, having over 3000 users in all the country, is former state-run telecommunications company TELENOR. The calls by these numbers are answered by the call-handlers of the centre of this company, located in the city of Mosjøen in the north of Norway, who clarify the callers' need in assistance and inform the respective emergency services.

Two months ago the 113-centre of the region of Førde launched the project „SMS 113", which provides the possibility for the deaf inhabitants in the region to call the emergency services in case of an emergency. The attention should be paid that despite the service is called as „SMS 113", in order to use the service the standard SMS message must be sent by eight-digits number, not by number „113". The 113-center has purchased the separate mobile telephony in order to accept the SMS messages. Information on this service and eight-digit number is shared only in the deaf community in order to avoid the number abuse. To date during two months of project execution no SMS with help request was received.

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[13] The activities of the emergency medical assistance centers, reacting and responding to the emergency calls by emergency medical assistance number 113, are coordinated and assisted by the Norwegian national institution KoKom (National Centre on Emergency Communication in Health). This organisation is a partner of the Project „Adaptation of Services of Emergency Call Number 112 to the Deaf: Experience of Lithuania and Norway" (Deaf Access 112), its staff participated in the role of consultants in the preparation of the feasibility study presented in this document.

4.2.2. REVIEW OF THE REACH 112 PROJECT

Presently in all 27 states-members of the European Union it is implemented the free emergency telephone number 112 that is suitable to call from all the public telephone communication networks. In many of these countries number 112 is not thus far accessible for the disabled persons, having speech, hearing and other disorders, impeding the independent and immediate call of the emergency services.

The European Disability Forum described this situation as discrimination of the disabled people and demanded that the accessibility of the number 112 and any other applicable numbers of the national emergency services would be not less for the disabled people than it is for any other people; that disabled persons in need to call the emergency services would be able to use their customary communication measures of daily use.

Solution of this problem is a purpose of the project „REACH112" - *Responding to All Citizens needing Help* – which execution was started on the 1st of July in 2009 and would have to be finished on the 30th of June in 2012.

The main objective of the REACH112 project is to implement an accessible new mode of a distance communication in text, voice and video, enabling the disabled persons to use the emergency services independently. This solution with a live real-time text conversation, with sign language, with lip-reading, with voice or with any simultaneous combination of these modes described by the concept of *Total Conversation* [14], will be of benefit for all. This communication service will be integrated into existing telecommunications platforms and emergency centres structures.

Total budget of the REACH112 project is 8.80 million euros, with 50% EC funding EC **(4.40 million euros)**. The REACH112 project is partially funded under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Programme by the European Community. The project is implemented by Consortium of Partners – 22 European organisations and institutions, among them there are users' organisations and international telecommunications companies (e. g. , *Nokia, Siemens, and Vodafone*).

Presently in the framework of REACH112 project there are executed the pilot projects of 12 months duration in 5 EU member-states (or parts of the countries) – Sweden, the United Kingdom, the Netherlands, France and Galicia Region of Spain.

During the execution time of the pilot projects the disabled users will be able to communicate at a distance with each other and directly with the emergency services. IP (Internet Protocol) devices will be provided in their homes, workplaces and on the move, connecting the users simultaneously in video, voice and text. Users will be able to connect between countries and different service providers, on mobile and fixed IP networks. The service will be integrated with existing telecommunication platforms and emergency service

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[14] *Total Conversation* means a standardised concept (a conceptual solution), where an user can use video, text and speech (voice) at the same time in a call for the distance communication. This concept can be seen as an extension of the videophone concept by consistent addition of the real-time text medium. *Total Conversation* fits people with disabilities too, especially the deaf, hearing impaired, deafened and speech-impaired persons have especially great usage of *Total Conversation* because of its opportunity to allow any mix of sign language, lip-reading, speech and typing that suits the participants in each call.

frameworks. The users will also connect through a third-party service (relay) with voice telephone users. Additionally, a protocol for the exchange of information between emergency services will be made available so that relevant data can be transferred to the most appropriate emergency service. In every of the mentioned pilot projects it is investigated, how solutions of Total Conversation function using different technologies and technical equipment, various communication network transmission and call handling schemes, organisational structures.

In France the Total Conversation solutions are introduced in order the inhabitants could communicate using voice, text or sign language. Basing on the analysis of the particularities of the communication of the persons, who presently have no opportunity to contact the emergency services independently (i.e. persons with hearing and (or) speaking or any other disabilities), every signal is received and handled on the national level: by deaf operator of the 112-service if signal was received in sign language and text or by hearing operator of the 112-service if signal was received in text and voice mode. Every operator using the present interpretation service (communication mediator) will transfer the received information to the local emergency services.

In the Netherlands in the national IP platform of the 112-centre (located in Driebergen) there is introduced the technology that enables the inhabitants directly to connect with and communicate with the operators of the 112-centre using real-time text (RTT) mode, and after the communication is renewed with local emergency control centre.

In Galicia region of Spain there goes the introduction of technologies allowing the inhabitants directly to communicate with regional 112-service in real-time text (RTT) mode. Also they have possibility to transfer their video after connection with the National Relay Centre, which in its turn directs the information to the 112-service. During project there will be also performed some trials of video in sign language and use of possibilities of its interpretation, voice and real-time text (RTT) in the 112-service and the National Relay Centre.

In Sweden in the emergency control centre „SOS Alarm" there were installed two Total Conversation terminals, which enable the signal-accepting operator to see both text and video information, also to use the external relay services interpreting the sign language in which video was received to voice language. Transmitting text or video, telephone number 112 is directly accessible. After the signal is received the relay transmission service activates automatically. In case the signal with help request comes from region, which is served by the emergency control service that does not participate in the pilot project, SOS Alarm centre contacts each other by voice mode and dispatch the needed forces to an emergency location.

In the United Kingdom the Total Conversation solutions are examined by the persons having speaking and (or) hearing disorders using fixed and mobile communication devices. The pilot project is executed on two levels: national and local. On national level the users are connected with national emergency services through the relay centre, where the operators perform the interpretation from sign language or transform real-time text (RTT) to voice and conversely. On local level the Total Conversation terminals are additionally installed in several regional emergency centres (of immediate ambulance, police, fire) of the United Kingdom. It enables directly contact their operators. The users registered in the regions

served by these centres are directly connected with sign language operators through 112-service.

It is estimated that REACH112 project will therefore become a blueprint for the extension of IP-based communications, Total Conversation and emergency services in the EU. It will guide the improvements of communication between all citizens - in particular those with disabilities - as well as the accessibility and call handling of all EU emergency services.

The Emergency Response Centre (hereinafter – ERC) is a Lithuanian establishment, which main task is to ensure the answer to the emergency calls to the single emergency call number 112 and to react to the emergency cases. Presently the ERC activities cover not all the territory of Lithuania, but it is foreseen to expand its activities in the entire of Lithuania. Thus the tactical issues and solutions, related with access of emergency call number 112 for all the inhabitants, including the persons with hearing and (or) speech disability, are inevitably concerned by the ERC activities and their expansion. It is essential to emphasize that the success of access of emergency call number 112 by the deaf persons depends on contribution of other state and governmental establishments too: Department of the Affairs of the Disabled at the Ministry of the Social Security and Labour (in clarification and identification of the needs of the deaf persons, financing of the special services and (or) measures designed for the deaf), the Ministry of Transport and Communications (in the implementation of national strategy and policy on the electronic communications), The Communications Regulatory Authority (in assurance of the protection of rights and legal interests of the users of the electronic communications) and etc.

The aspects that are related with the ERC role and functions in the chain of provision of the emergency services are discussed in the below presented chapters of this part.

5.1. DESCRIPTION OF ESTABLISHMENT

The ERC is a public legal entity, budgetary establishment, established on 2 October 2003, and since 1 July 2006 the ERC is a statutory body of the Fire and Rescue Department under the Ministry of the Interior.

The main ERC task is to administrate and handle the emergency calls to the single emergency call number 112 that is used for reporting any offence ongoing, planned or committed, any risk to life, health or safety, the environment, material, non-material or other values and, if necessary, for calling the appropriate emergency services.

The main functions of the Emergency Response Centre are as follows:

- To answer emergency calls to the number 112,

- take and assess the requests for emergency assistance, determine what emergency assistance the callers need (police, fire and rescue brigades, emergency medical service;

- in case of a need, provide emergency assistance (advice, explanations, instructions, etc) by phone until the arrival of emergency services;

- inform the appropriate emergency services about the need of emergency assistance at the place of the emergency, i.e. prepare the emergency reports and transmit them to emergency services,

- increase public awareness on the number 112, its purpose and use, related features and future alterations, also giving explanations how and in what cases should or should not this number be used.

The present ERC structure was approved by the Decree No. 1-222 of 18 July 2008 of the Director of the Fire and Rescue Department under the Ministry of the Interior „On the Approval of the Statutes of the Emergency Response Centre and its Structure" (Official Journal, 2008 No. 86-3445). According to it the new divisions in Alytus, Klaipeda and Siauliai were established, former division of the Service was renamed to Vilnius division. ERC structure is depicted in Picture No. 1.

On data available on June 2010, the ERC had 222 staff: 201 staff – for calls administration and handling, 21 – ERC administration. The assigned tasks and functions are performed by the ERC operators, officers, who have been specially trained to handle emergency calls and who possess appropriate qualifications.

The ERC accepts and handles emergency calls 24 hours a day and 7 days a week.

Picture No. 1. ERC structure
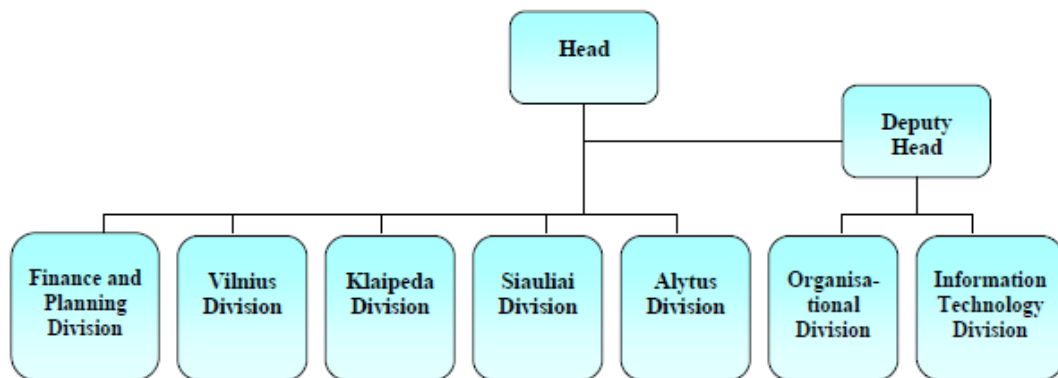
Source: ERC

5.2.   REVIEW OF ACTIVITIES OF ESTABLISHMENT

5.2.1.   CALL ADMINISTRATION AND HANDLING

On 1 September 2004 the ERC started to administrate the emergency calls received by number 112 in Vilnius city and in part of Vilnius district (about 10%). In this territory in 2005 the ERC started to administrate the emergency calls received by short police numbers (02, 022 and 102) and short fire and rescue numbers (01, 011 and 101).

On 1 December 2008 the new ERC regional divisions, established by the Decree of the Director of the Fire and Rescue Department, gradually started to intercept the administration of emergency calls received by number 112 from the territorial police departments, also of emergency calls, received by numbers 01, 101, 011 from the fire and

rescue departments. Thus, besides the administration of the emergency calls, the regional ERC divisions also implement the control functions of fire and rescue forces.

Basing on the data of March 2010, the regional ERC divisions administrated the emergency calls in 29 Municipalities (in which territory there live about 69 % of all the population of Lithuania).

5.2.2. DETERMINATION OF CALLER'S LOCATION

ERC was assigned to implement the requirement to determine the location of the person, calling to the emergency services, in the fixed and mobile communication networks, as it is regulated by provisions of the Universal Service Directive and Law on Electronic Communications.

Implementing this requirement, on 4 December 2006 the ERC concluded the „Agreement on Cooperation Introducing Technical Opportunities in Public Mobile Telephone Communications Networks in order to Provide the Data to the ERC on the Location Determination of Callers to the Emergency Number 112" with mobile communication companies acting in Lithuania (BITE LIETUVA UAB, OMNITEL UAB, TELE2 UAB), prepared the comprehensive technical requirements of provision of location determination data to the ERC. According to these technical requirements the aforesaid companies designed and implemented the technical location determination solutions in their networks in mid-year of 2008. Since 1 September 2008 the mobile communication companies started a constant provision of the data to the ERC on callers' location on real-time basis.

Firstly, the location determination was possible only for inhabitants in Vilnius city and Vilnius district, but in 2009 the ERC concluded the contracts with fixed communication company (TEO LT AB) and mobile communication companies (Omnitel UAB, TELE2 UAB, BITE LIETUVA UAB), which were obligated to provide to the ERC all the data of location determination of the telephone communication subscribers and (or) recipients of services, calling by the number 112, in all the territory of Lithuania.

The acceptance of location determination data is integrally assured in the ERC information system used in the ERC activities in territory of Vilnius city and Vilnius district. The coordinates of the caller's location determination are automatically represented in the digital map. These data are also available for the emergency services (police and ambulance services) that use the resources of ERC information system.

5.2.3. PROCESSES OF CALL HANDLING AND DATA OPERATION

In the process of emergency call handling and data operation the ERC functions as a link in the chain of reception, assessment and transfer of the information on an emergency to the appropriate emergency services and provision of assistance until the emergency services

arrive to an emergency location. The ERC also expeditiously manage the fire and rescue forces. The ERC accomplishes these functions:

- Reception of emergency calls by telephone number 112, short numbers of the police commissariats, fire and rescue departments (FRD) and immediate medical assistance (ambulance) services;

- Determination of call's type (request for emergency assistance or non-emergency assistance, call in urgent need to be directed to the emergency services, fraud call and etc.) and filtering;

- Determination of caller's request type and identification of caller's location;

- In case of possibility, provision of assistance by phone to the caller (recommendations, advices and etc.) without transfer of message of immediate assistance needed to the emergency services;

- Registration of main information on a emergency case (documentation using ERCIS);

- Connection of additional information from databases to the information on a emergency case;

- Classification of the request for emergency assistance and its direction to one or several emergency services (e.g. in case of traffic accident, the request is directed straightly to all emergencies: to the police, ambulance and fire and rescue services);

- Connection of the caller with respective officers of the emergency services (if the need persists);

- Preparation of message on needed emergency assistance and its transfer to the emergency services;

- Dispatch of the emergency assistance brigades (crews) to the emergency location;

- Information to the caller on the arranged measures (on caller's request);

- Monitoring of location of emergency assistance brigades (crews);

- Recording and control of conversation and information on conversation (caller's telephone number, precise time, duration of conversation);

- Collection, systematization and presentation of statistical data on emergency cases;

- Supervision and monitoring of assistance provision status.

In 2009 the average time of response of the call was 4.9 s, it means that it is shorter by 2.2 s in comparison with 2008 (it was 7.1 s). The improvement of this factor was influenced by optimisation of number of officers in shifts and introduction of peak load shift.

In 2009 the average number of calls per month was 483 439, daily it was received 16 115 calls. In average, during peak time, the greatest number of received calls per hour was 165 calls in Vilnius (in Vilnius Division), the least number – 14 calls - in Marijampole (in Alytus Division). It should be noted that only about 20% of all the calls are related with direct requests of emergency assistance. The rest part of all the calls are repetitive calls, malicious calls, "unanswered" calls (very short calls, calls of the defective facsimile devices).

5.3. REVIEW OF EXPANSION OF ESTABLISHMENT AND ITS SERVICES

In order to improve the quality of administration of the emergency services by call number 112, the Program of the Development of the Infrastructure of Services of Single Emergency Call Number 112 prepared by the ERC and approved by the Decree No. 866 of 3 September 2008 of the Government of the Republic of Lithuania (Official Journal, 2008, No. 105-4025), the Program was amended by the Decree No. 1313 of 7 October 2009 of the Government of the Republic of Lithuania.

In this Program it was supposed to implement the measures until the year of 2012, which will ensure the reliable functioning of the Emergency Response Centre countrywide, the immediate response to the requests of emergency assistance by call number 112 and other telephone numbers, prompt and accurate provision of the needed urgent assistance, the decrease of number of malevolent and hoax calls. The Programme also intends to assure that the location determination data and eCalls sent from the vehicles in traffic accidents, which are also sent by emergency call number 112 and other emergency numbers, would be properly accepted and handled. The execution of programme measures will capacitate to implement the obligations and pledges assumed together with the membership in the EU and other EU initiatives.

As it was mentioned in Chapter 2.1.1, one of the measures included in the Program it is „To expand the functionality of the software „Els/Geofis" (to increase the capacities of this equipment, enabling to use them in the entire territory of Lithuania, adapting it for the accepting of requests of emergency assistance from the disabled and etc.). While implementing this measure, the functioning of the databases and sub-systems of the ERC information systems (hereinafter – ERCIS) is updated (modernized), combining the present functionality of the ERCIS databases and sub-systems and functionality of newly created databases and additional functions of sub-systems.

The existing ERCIS information structure consists of databases of ERCIS sub-systems and there accumulated data: information of calls with requests of emergency assistance (including the data on location of the person reporting on the need of emergency assistance), information of the resources of the emergency assistance services (crews), geographical information system data and etc., also the functional structures of ERCIS sub-systems

(functions and information handling processes of these sub-systems): of operation, data handling and administration of databases.

The newly created databases involve the information on emergency messages (SMS) and information on the eCall integrated in the vehicles. From the functional point of view, these additional operational functions of the sub-systems include aspects how to accept the emergency messages (SMS), to accept the information by eCall integrated in the vehicle, to transcribe automatically the information of requests of emergency assistance and the received SMS messages, automatically record the information of the eCalls received from the equipment installed in the vehicles.

In order to accelerate the provision of the ERC divisions with the necessary technical equipment (hardware) and software, in the beginning of 2010 there was prepared the project „Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the Emergency Calls, Manage the Emergency Operation Forces" was prepared. The project was included into the list of state significance projects. On 20 January 2010 the project application was furnished to the Central Project Management Agency, and on 4 May 2010 the finance and administration agreement was signed for implementation of this project by these agreement parties: Information Society Development Committee under the Government of the Republic of Lithuania, the Central Project Management Agency (as an implementing institution) and Fire and Rescue Department under the Ministry of Interior (as a project executor). Under this agreement the project will be financed by funds of the European Regional Development Fund (ERDF) and the budget of the Republic of Lithuania.

The projected implementation duration is 30 months. **The expected main result of this project is development and modernisation of electronic service, expanding its functional coverage from Vilnius city and Vilnius district to the entire territory of the Republic of Lithuania.**

The ERCIS modernisation implemented during project will ensure the efficient execution of these functions of the electronic service:

- Reception of requests of emergency assistance (voice calls and SMS messages) and their distribution to the ERC operators;

- Registration (recording) of emergency conversation (between the ERC operator and the caller) in order to exercise the quality control or to specify/correct information in demand;

- Registration of information of request of emergency assistance in the agreed template, ensuring the collection of all the necessary information to the united solid database;

- Determination and registration of the caller's location using the databases of the fixed telephone (landline) numbers and technologies of caller's location determination and depiction in the GSM (Global Standard for Mobile Communications) networks using GIS (Geographical Information System);

- Detalisation and specification of request of the emergency assistance and its classification using the structured context questionnaire ;

- In order to ensure the preservation of health or life, decrease the possibility for upraise of subsequent losses and etc., using the structured context questionnaires and additional context information proposed automatically according to the category of an emergency, i. e. recommended or necessary actions until the emergency services arrive to the emergency location;

- Automatic assignment of the emergency services and suggestion of the responding emergency brigades, crews, units according to the emergency information and availability status of emergency brigades, crews and units;

- Transfer of all the needed information on need of emergency assistance to the responding emergency services using the ERCIS measures immediately after the request for emergency assistance is registered;

- Operational management of the emergency response units – their assignment according to the request of emergency assistance, list of available emergency response units, detailed information on the technical parameters of the units (e. g. the achievable height of the fire escape ladders present on the vehicle, other available special measures and etc.), their status and etc.;

- Operative transfer of all the needed information on the need of emergency assistance to the responding emergency units by GPRS (General Packet Radio Service) or TETRA (TErrestrial Trunked RAdio) communication measures;

- Efficient monitoring of location and status (dispatched, arrived, ready and etc.) of the responding emergency units by GPS, GIS measures and transfer of information by GPRS or TETRA communication measures;

- Coordination of actions of responding emergency service units according to the information of status and location of the units by TETRA or GPRS communication measures;

- Automatic registration of the actions, related with the request of emergency assistance, and control. The events with the delayed dispatch, departure and arrival times and etc. become accentuated to the ERCIS operators;

- Automatic transfer of information on traffic accidents to the traffic management systems;

- Automatic transfer of information on coherent emergencies to the police information system for the subsequent handling and processing.

After the implementation of the project the electronic service will enable:

- To register the emergency request by single emergency telephone number 112 from any location of the country, when the immediate need of fire and rescue, police or ambulance emergency response and service appears, to provide all the needed information on the needed emergency assistance;

- To receive the qualified and prompt references on further actions, capacitating to preserve the health or life, or to decrease the possibility to upraise of the greater losses;

- To transfer automatically the information of the location of the caller, capacitating to ensure the prompter arrival of the emergency services;

- To ensure that during registration of the request of emergency assistance by telephone communication, information on need of the emergency services will be transferred in a prompt mode to all the necessary emergency services, thus the caller will not need to repeat the same information to different emergency services and waste time, avoiding the fragmentation of the information and ensuring the necessary level of information particularities (especially these aspects are topical in case of a complex emergency);

- To ensure the possible presentation of the emergency request by SMS message, if the caller has no ability to talk, i.e. he/she does not want to attract the attention of the criminals, he/she is disabled or etc.

5.4. PRESENT SITUATION ON INTRODUCTION OF ACCESS OF THE EMERGENCY SERVICES FOR THE DISABLED

Presently the technical and organisational basis possessed by the ERC has no possibilities to ensure the reception of the SMS messages with the requests of emergency assistance from the people with hearing and (or) speaking disabilities and appropriate response and reaction.

As it was denoted in Chapter 5.3, the implementation time of the project "Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the Emergency Calls, Manage the Emergency Operation Forces" is 30 months, i. e. the project will be finished in the end of 2012 – beginning of 2013. Thus, the submission of the SMS message with request of emergency assistance will be guaranteed only after 2.5 years. On the other side, it is a solution of more general profile, that is not adapted especially for the needs of persons with hearing and speaking disabilities, this solution does not embrace all the particularities of the provision of the service to call the emergency assistance for these persons.

ERC actively cooperates with other institutions searching for the most acceptable solutions of this problem, considering the planned organisational development, needs and demands of the Lithuanian deaf community and advanced technological tendencies.

The most important ERC's aspects that must be considered selecting the appropriate technological solution (related with provision of services to the persons with hearing and (or) speaking disabilities) and organising the implementation of this solution, are as follows:

- The calls to emergency services by text shall be accessible only to the people having the urgent need to access the emergency services. The restriction of accessibility is necessary in order to avoid the great quantity of hoax messages that are not requests for emergency services, thus ensuring the prompter reaction and response to the genuine requests. As the present experience indicates, only 20 % of all the calls received in ERC are related with factual dangerous situations in the provision of emergency assistance by voice calls.

- The technical solution shall enable the ERC to maintain the proper quality level of the provided services (i.e. to determine the caller's location, to provide the assistance (advices, guidance) to the caller in real time and etc.). The expedition is one of the most important quality criteria of the services provided by the ERC.

- In case of any technological solution there must be implemented the trainings of the ERC staff to work and communicate with the deaf persons;

- The campaign raising the awareness of the deaf persons on the access of the emergency services by number 112 shall be periodically executed.

It is vital to emphasize that the ERC is only one link in all the chain of provision of emergency services. Thus, the possibility to provide the emergency services for the disabled and its quality will greatly depend on other links too: starting from (1) the victim itself (awareness of the principle of provision of the emergency assistance, ability to contact and communicate and etc.); (2) possibilities provided by the measures via which the caller accesses the ERC, (3) possibilities provided by the communication operators' network, also (4) operation of the emergency services (ambulance, police, fire and rescue).

6. OPPORTUNITIES OF IMPROVEMENT OF ACCESS OF NUMBER 112 FOR THE DEAF

The following part of the Study is dedicated to the analysis of opportunities to improve and to increase the access of the emergency services by number 112 for the deaf, also to the search and selection of the most suitable solution (the best solution) and the detailed planning of its implementation.

6.1. PROJECT DESCRIPTION

6.1.1. PROJECT OBJECTIVES

In this document the presented project „Adaptation of emergency services of emergency response telephone number 112 to the deaf" [15] seeks to ensure the opportunity to call the emergency services by telephone number 112 for the deaf and other persons having significant hearing and (or) speaking disorders[16] in Lithuania.

Concurrently the project contributes to the improvement of access of public services and accessibility of timely and professional assistance (of fire ad rescue, police, and ambulance operation forces) for the disabled people in Lithuania.

The main objectives of the Project are:

1. to find the progressive technological solution enabling:

- the person with hearing and (or) speaking disability to call the emergency assistance by number 112 in the most acceptable way to him or her;

- to receive the request of the person with hearing and (or) speaking disability by the ERC in a expedient regime, properly to react and respond to it, i.e. clarify the profile of the emergency case of the caller, to determine his/her location and to dispatch the necessary emergency services to the determined location;

2. to structure the organisational system ensuring the efficient mutual (bilateral) communication between the callers and ERC staff/emergency operation forces.

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[15] In the Agremeent No. TES-2NOR-02-048/7-2 of 29 March 2010 signed between the Public Enterprise Vilnius Rehabilitation Centre of the Deaf and Public Enterprise Economic Research Centre this project is titled as "Adaptation of the emergency telephone number 112 to the deaf".

[16] The Public Enterprise Vilnius Rehabilitation Centre of the Deaf represents the interests of the deaf community, and in this project the aforesaid enterprise is interested in the implementation of the deafs' right to access the emergency services by telephone number 112. However, considering the common topic and similarity of its solutions, the project (despite of its specific title) is devoted to the larger target group – the persons with significant hearing and (or) speaking disabilities.

6.1.2.   IDEA OF THE PROJECT

In 2009 the project, devoted to the implementation of the rights of the deaf persons to access the emergency services by emergency telephone number 112, was initiated by the Public Enterprise Vilnius Rehabilitation Centre of the Deaf together with partners, submitting the project application to finance the preparation of the study and organizing of other related activities (business trips, discussions with the groups of interest, dissemination and publicising) according to the Norwegian financial mechanism (more details in Chapter 6.1.3 „Pre-Project Activities"). In 2010 the financing was received.

The provisions of the EU and national legislation settle the requirements related with the accessibility and its security of the emergency services by emergency telephone number 112 for the disabled people. However, in Lithuania the attention paid to these regulations is not satisfactory already for several years. Here, as also in other European countries, the greater hopes and expectations are interconnected with the project REACH112 that is presently under the implementation, which would have to present the united and at most efficient solution for all the EU countries due to assurance of the access of the emergency services for the disabled persons. However, in estimation opinions of the experts the expected solution in Lithuania could be implemented only after 7 years in the best scenario or even later. Considering these perspectives, it was decided that it was necessary to find the quicker solution, which model became the research object of this feasibility study.

6.1.3.   PRE-PROJECT ACTIVITIES

Presently these pre-project activities are being performed or already performed:

1. Preparation of Project Application and Financing. Public Enterprise Vilnius Rehabilitation Centre of the Deaf together with partners, namely: the Emergency Response Centre (ERC), the Lithuanian Association of the Deaf, Public Enterprise National Rehabilitation Centre of the Deaf, Norwegian National Centre on Emergency Communication in Health (KoKom), prepared the project application (title: „Possibilities of the Adaptation of Emergency Call Number 112 to the Needs of the Deaf: Experience of Lithuania and Norway" (Deaf Access 112)) to receive the financing. In 2010 this project received the collective support of the Lithuanian and Norwegian financial mechanism according to the subsidizing scheme „Transfer of Experience and Strengthening of Cooperation among Local, Regional and Euro-regional Partners in Lithuania and Norway". The following activities are implemented by the funds of the aforesaid support finances:

2. Organisation of the business trip of the Lithuanian project partners and staff members of other related organisations in Norway. Business trip, organised on 17-20 April 2010, aimed to introduce the Norwegian experience in adaptation of the emergency call services to the deaf.

3. Preparation of Feasibility Study (of this document). The objective of the Feasibility Study is to perform the review of secondary sources and to identify the needs of the deaf using the questionnaires, also to analyse the technical solutions and formulate the conclusions and recommendations on the adaptation of the emergency number 112 to the deaf.

4. Organizing of round-table discussions with responsible Lithuanian institutions and Norwegian partners. This activity was devoted to discuss the project presented in this Feasibility Study and its implementation with the national governmental institutions and representatives of the deaf community. The first discussion took place on 29 June 2010, the second one will planned in the middle of September, 2010.

5. Implementation of Information and Awareness campaign. The result of this activity aims to inform the deaf community and general public about the achieved results in search of solutions, how to adapt the call of emergency services to the deaf.

6.2.   TECHNICAL ALTERNATIVES

6.2.1.   IDENTIFICATION AND DESCRIPTION OF THE ALTERNATIVES

Basing on the collected information and its analysis, also experience of the foreign countries, during the discussions the project working group has distinguished seven (7) alternatives of the adaptation of the emergency telephone number 112 to the deaf. All the alternatives are related with use of mobile phones. The short description of these alternatives is presented below.

6.2.1.1.   „Standard SMS" – the first alternative (1)

This alternative allows conditioning the possibility to send the standard short messages (SMS) by the emergency phone number 112, which would be received by the ERC operator, who would communicate with the person requesting the emergency assistance via SMS messaging. „Standard SMS" has no priority in the network, the ERC does not receive the determination on caller's location, the reception of the messages is not automatically confirmed.

6.2.1.2.   „Advanced SMS" – the second alternative (2)

This alternative allows conditioning the possibility to send the short messages (SMS) by the emergency phone number 112, which would be received by the ERC operator, who would communicate with the person requesting the emergency assistance via SMS messaging. However, the difference between „Standard SMS" and „Advanced SMS" is that the mobile communication operators' network gives the priority to the latter SMS messages, sent by emergency phone number 112, over other messages and calls, also together with the SMS messages' text there are transferred the information of location to the ERC, the confirmations of reception of these messages are automatically provided, i.e. messages with requests of emergency assistance are excluded from all other SMS messages (analogously the voice calls by emergency number 112 have the priority in the network over other calls or commercial calls).

6.2.1.3. „SMS through interpreter" – the third alternative(3)

In this case the SMS message with request of emergency assistance is sent by ordinary mobile (long) number, which is specially dedicated to the sign language interpreter, who collects all the information on emergency and calls the number 112 and accesses the emergency services via voice call.

6.2.1.4. „Subscription + „silent" call + SMS messaging" – the fourth alternative (4)

In this case the deaf in need to use the emergency call number 112 should provide the information on their telephone number, address, name and surname, type of their disability to the respective responsible organisation, which creates (and updates) the database of the deaf persons and provides to (synchronizes with) the Emergency Response Centre.

The call of the emergency services is performed according to the settled scheme:

1) The deaf person, who finds himself/herself in the extreme situation, calls the ERC using „silent call" mode - i.e. he/she calls the number 112 and sometime after he/she hangs up the phone/ends up the call;

2) According to the caller's telephone number the ERC information system (ERCIS) identifies that the caller is a deaf person, and automatically signals to the ERC operator (dedicated call-handler);

3) The ERC operator, knowing that the deaf person calls, communicates with him/her by standard SMS messages, i.e. asks the information on situation, location, and other important circumstances.

6.2.1.5. „Dedicated real time text application" – the fifth alternative(5)

In order to implement the solution's alternative with the „dedicated real-time text", all the deaf persons are provided with the smart phones, where the emergency real time text application is installed. The analogous program is installed at the workplaces of the ERC operators, thus the possibility is provided to communicate between the caller and operator by text messages in real time.

6.2.1.6. „Video call" – the sixth alternative (6)

In order to implement this solution's alternative, all the deaf persons are provided with the phones adequate to make the video calls. In the extreme situation the deaf calls to the ERC by telephone number 112 and starts the video conversation. The ERC accepts the video call and communicates with the caller in sign language.

6.2.1.7. „Text transfer during voice call (SAT technology)" – the seventh alternative (7)

There exists the technical opportunity during the voice call to realize the text dialog with the subscriber of the mobile phone. This possibility is base don the SIM Application Toolkit technology (also named as SIM Toolkit, SAT, STK and etc.). Basing on the data received from mobile network operators, this technology is supported by almost all the phones used in Lithuania, also by particular SIM cards.

Using this technology, the request of emergency assistance would be performed by following steps:

1) the deaf person, who tackles the extreme situation, calls the ERC, i.e. the emergency phone number 112;

2) The ERC information system identifies the caller as a person with disability and directs the call to the appropriate ERC operator and informs him;

3) The ERC operator receives the information from database and initiates the further conversation via text SAT application.

6.2.2. ASSESSMENT OF ALTERNATIVES ACCORDING TO THE SELECTED CRITERIA

6.2.2.1. Objective of Analysis

The objective of the primary selection of the alternatives is to assess (estimate) all seven described alternatives according to their conformability to the project implementation strategy.

The project implementation strategy is defined considering these factors:

1) Project objectives – to find and to introduce the progressive technological solution, create and implement the organisational structure which would ensure and guarantee the proper execution of the selected solution (see Chapter 6.1.1 „Project Objectives");

2) Collegial solution of the project initiators (Public Enterprise Vilnius Rehabilitation Centre of the Deaf and the Emergency Response Centre) on the implementation of the interim solution solving the access of the emergency services for the deaf persons until the full and complete implementation of the project REACH112 solutions in Lithuania (see Chapter 6.1.2 „Project idea" and Chapter 2.2.2. „Review of REACH 112 project");

3) The project implemented by the Fire and Rescue Department under the Ministry of the Interior and the Emergency Response Centre titled as "Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the Emergency Calls, Manage the Emergency Operation Forces" (see Chapter 5 „Emergency Response Centre in Lithuania"/5.3. „Development review of organisation and its services").

Thus, the objective of analysis of alternatives is formulated as follows: *to select the progressive technological solution and the required organisational structure for its implementation, considering the EU project REACH112 and ERC project on infrastructural development.*

6.2.2.2. Stages of Assessment

The assessment of the alternatives and their selection was performed in two stages:

1) <u>Qualitative analysis of alternatives and their functional potentials.</u> During the qualitative analysis the alternatives were analysed according to their conformity to the strategy of implementation of the adaptation of the emergency call of the emergency services for the deaf (as described in the definition of the analysis objective), considering what functional potentials were created for the deaf with the implementation of these alternatives (use of emergency call) and for the ERC operators (to serve the system), also qualitatively assessed the possibilities, costs and time for implementation of these alternatives. Using the qualitative analysis methodology, two technical alternatives out of seven identified alternatives were selected for successive analysis.

2) <u>Financial analysis.</u> Two alternatives, selected on the first stage, are analysed from the financial viewpoint, identifying costs of introduction and maintenance of the technical and organisational solutions, also the cost for the target group of users. The optimal project implementation alternative is selected considering results of both qualitative and financial analysis.

6.2.2.3. Qualitative Analysis

6.2.2.3.1. Assessment Criteria

In selection of the criteria for the analysis, which would make an assessment base for the alternatives, there were followed the functional parameters of handling and service of the voice calls of the information system presently used by the ERC. The objective of the assessment is to select the alternative, closest to the presently operated system by its functional and qualitative criteria. In the ideal situation the functional and qualitative level of the emergency services of emergency call number 112 for the deaf should not be lower than the level of the voice calls.

Table No. 1. Qualitative criteria of assessment of alternatives

1. Price for user	8. Limitation of subscribers
2. Mobility	9. Implementation time
3. Information on determination of location	10. Price of solution
4. Confirmation of the call reception	11. Technical possibilities
5. Communication in real time	12. Acceptability of solution to users
6. Priority in network	13. Organisational complexity
7. No inhibition of telephone number display	

The table above presents thirteen (13) qualitative assessment criteria, according to which the identified alternatives are estimated. Some of criteria are related with functional potentials of the system, other – with complexity of system introduction and price of total implementation. The financial criteria may have the attributed specific quantitative values,

but on this stage of assessment all the criteria are estimated only on qualitative base. The detailed explanation of every criterion follows below.

1. Price for user

According to the Universal Services Directive, the emergency call by telephone number 112 shall be free of charge. The present calls by emergency number 112 are free. In order to make these calls the equipment of general character (phones) are used. The selected alternative must guarantee the analogous conditions to the users sending the emergency messages.

2. Mobility

The person in need of emergency assistance shall have the possibility to request for emergency assistance without reference of his/her location. It means that the emergency assistance shall be available and accessible via mobile telephony as it functions now. It does not restrict the possibilities and demand to provide the emergency assistance using the wire phones (presently existing possibility in case of voice calls) and other communication measures.

3. Information on determination of location

Together with the request for emergency assistance, the ERC must receive the information on location of the caller (person calling for the emergency services).

4. Confirmation of call reception

The person who called for emergency services must be sure at once that his/her request reached the ERC and it will be reacted upon. Also the ERC operator must receive the confirmation that the sent question or guidance advice reached the caller. This function is especially vital in order to secure the efficient communication in case of disaster.

5. Communication in real time

As all the requests for emergency assistance most frequently are especially urgent and immediate, it is important to guarantee the possibility of communication in real time (or close to real time) as it is secured by telephone communication via voice call. The real time telephone communication by text or by video rejects the need to have a separate confirmation of the call reception.

6. Priority in network

The emergency services shall be constantly accessible. The priority in network means that in case of network overload the call by number 112 terminates all other conversations and uses the liberated network resources. Thus the emergency assistance is accessible even in case of great overload in the communication operators' network.

7. No inhibition of telephone number display

In all cases of requests of emergency assistance the ERC must receive the caller's telephone number (independently from the services applied by the operator). It is necessary because of the need both of ERC operators and emergency operation forces to communicate with the caller.

8. Limitation of subscribers

The emergency service by the telephone number 112 adapted to the need of the deaf is dedicated to the specific target group. This target group is not so large comparing with the total number of Lithuanian population. This criterion describes whether the service would be available only to the target group or to all the callers for emergency assistance. The ERC would give the priority to the limitation of subscribers, i.e. provision of services only to the defined target group, as this alternative would decrease the resources needed for the service implementation.

9. Implementation Time

Implementation time is the possibly needed time that implementation of the solution would take (it is calculated from the moment of preparation of this Feasibility Study to the beginning of service operation). Obviously, the solution that is possible to be implemented during the shorter implementation time is more attractive alternative (especially under the assumption that the effectual legal acts demand the accessibility of services of number 112 for the disabled).

10. Price of solution

Price of the solution is a qualitative (orientation) assessment of the complete price of the solution implementation. Price of complete installation includes hardware and software (including update of the equipment at the mobile network operators), training costs of ERC operators, constant costs of service administration, also the price for the users (training of the users, communication costs and etc.). In this stage the price of the solution is assessed qualitatively but very approximately. The detailed assessment of the solution price is accomplished in the stage of financial assessment of the alternatives.

11. Technical possibilities

The identified technical alternatives obviously differ in their technical progressiveness, which determines the time span how long the certain technical solution will be possible to be used. It is evident that the solution of higher advancement would be possible to be used for longer time, whereas the simpler and cheaper solution may be applied for intermediate period.

12. Acceptability of solution to users

One of the main criteria is the acceptability of the solution to the target group of the users – to the deaf. In March-April of 2010 the poll survey "Accessibility of 112-service for the deaf" in form of questionnaire of the people with hearing and (or) speaking disabilities was performed, during which the opinion from the people was selected in order to clarify the most acceptable ways and measures to call the emergency services. The quantitative value is used to rate a criterion – value of the share of respondents (in percents) who would like to call the emergency assistance in the given way. The detailed survey results are described in Chapter 4.1.3.2. "Results of the Survey „Deaf Access 112" of this Study.

13. Organisational complexity

Organisational complexity is a complex quantitative criterion, describing complexity of introduction of the solution (depending on the number of involved institutions and

organisations, number of legislation documents to be amended or prepared, demand of coordination of the actions), from other hand – complexity of administration of the solution (depending on the number of organisations in the emergency response chain, application of the progressive information technologies and etc.). Obviously the most attractive alternative is a simple solution, but from other side – a simple solution often can suggest only scanty functional possibilities.

6.2.2.3.2. Analysis and Assessment

Analysis is performed in order to assess all seven identified alternatives (see 6.2.1 „Identification and Description of the Alternatives") in regard to qualitative criteria explained above. The objective of the analysis is to propose the optimal alternatives that would be farther investigated quantifiably (in stage of financial analysis).

„Standard SMS"

In order to introduce the call system of the emergency assistance accessible for the deaf by the standard SMS message there should be circumstanced the possibility for ERC employees to receive the SMS messages with requests for emergency assistance. In the simplest variant, the ERC would have to use the dedicated mobile phone which would accept the SMS messages directly or the messages sent by 112-number would be directed to the dedicated mobile phone, used for ERC operator to communicate with the caller by the text messages. The ERC operators, responding to the messages by the dedicated mobile phone, would have to be trained to know the particularities of the written language of the deaf. Alternatively, reception and sending of SMS messages could be integrated to the ERC information system, where the conditions would be formed for the ERC operators to send and to receive the SMS messages not directly using telephone, but using computer, integrating the SMS conversations to the information system of calls handling used by the ERC.

The deaf persons would be informed by the employees of the Lithuanian Association of the Deaf and related organisations about the possibility to call the emergency assistance by telephone and trained how properly to do that (what number to call, what information to provide and etc.). As the messages sent to the ERC would not be differentiated in the network, the sending persons would have to pay the tariffs settled by the operators, and compensation of price of these messages would be hardly implemented from technical point of view.

Advantages

Short messaging by mobile phone is one of main communication ways among the deaf. Almost all the deaf persons have mobile phones, thus the users would have no need for supplementary equipment. Besides, the deaf are used to communicate by SMS messages, thus it would a natural way to call the emergency assistance (partly coincident with the voice call used by the enabled people). The appropriateness of access of the emergency assistance by text messages for the deaf persons was identified during the polling interview by questionnaires.

Other positive aspect is a conditional simplicity of installation of this technical solution (correspondingly, its price) and speed of implementation, especially if the simplest alternative was chosen then just the dedicated mobile phone would be assigned to the ERC.

<u>Disadvantages</u>

This alternative would ensure the lowest number of functional possibilities comparing with present voice call system: the ERC would not be able to receive the location determination information, the confirmation of the call reception would not be proceeded, the messages would have no priority in the network, the inhibition service of display of the subscriber would be valid, if the inhibition service was ordered by the subscriber. The dedicated mobile phone would not circumstance the possibility for the ERC to record the actions of the operator and to save records' history in order to ensure the service quality control.

Likely, the accepting and sending of the short messages with requests of emergency assistance using the dedicated mobile phone would be inefficient for the ERC operators because of user's interface, which is conditioned by small mobile phone screen and keyboard, limited navigation possibilities. Functionally the user's interface used by the ERC operator essentially would be different from the interface used for voice calls – in three computer displays there are together proposed the context information, fields of databases of registration of emergency calls, location determination information and etc. Undoubtedly, that this interface would condition the lower quality of emergency calls handling in comparison with the handling of voice calls.

Other disadvantage would be organisational inefficiency of this solution, which is conditioned by the need, that the messages would be immediately reacted upon, and by the circumstances, that the ERC operator, accepting the emergency messages, would be specially trained for this job. In one shift there should work at least two operators able to use the language of the deaf, that in case of need, they could intercept the dedicated telephone. If the processes of accepting and sending of the short messages was not integrated into the ERC information system, then the dedicated telephone would have to be portable in order to carry among operators' work places. Besides, the communication by SMS is fairly not operative – one conversation can continue for about 10 minutes (this disadvantage is typical for all solutions based on SMS messages).

Basing on the statistics of the calls served by ERC, only 20% of the calls received by ERC centre are the true (objective) calls for emergency assistance, meanwhile a majority share of the calls are the fraud calls or calls of wrong destination (objectless). Although only deaf persons and social workers working with them, also members of the Lithuanian Association of the Deaf, have to be informed about the dedicated telephone number, but the possibility exists that the share of true calls for emergency assistance in total flow of messages will reach the present structure of statistics of voice calls for emergency services. Thus, the solution of dedicated mobile phone number would become totally inefficient.

Basing on the estimation of experts, the standard SMS alternative is the simplest and easiest solution to implement, but it provides too less functional possibilities in order to handle the emergency calls properly and efficiently.

„Advanced SMS"

Essentially, „Advanced SMS" differs from „Standard SMS" that in case of technical alternative of advanced short message the mobile communication network operators would distinguish the messages sent by 112 number from all other SMS messages and these messages would be treated according to other requirements (analogous to the voice calls by emergency call number 112): the messages would have a priority in the network, the call reception would be confirmed, the service to hide the telephone number would not be applied.

<u>Advantages</u>

Principally, this technical alternative approaches the voice call for emergency assistance as much as it is possible in case of short message services, i.e. the messages with requests for emergency assistance can be free of charge (technically possible, but the Law on Electronic Communications shall need some amendments), together with the message there can be also sent the information on location determination and confirmation of received message. This method to call the emergency services, analogously as the standard SMS, is the most acceptable way for the deaf to call the emergencies.

Alternative foresees that that the short messages with request for emergency assistance would be handled only in case the person sending the emergency message is registered in the database of the deaf. Thus the limitation of the subscribers would be performed in order to ensure the minimal ERC resources for handling of SMS messages.

<u>Disadvantages</u>

The main disadvantage of the alternative is a relative technical complexity, conditioned by necessary technical modifications in all the equipment operated in the mobile communication operators' networks. This would influence the great price of the entire solution[17].

Basing on preliminary estimations, the introduction of this alternative can demand amendments of two laws (Law on Electronic Communications and Law on Emergency Response Centre). Due to the need to amend these laws and, likely, the corresponding sub-laws, the implementation time of the project would be prolonged to 2 years. If the solution of price compensation of all messages sent to 112-centre was agreed, then the implementation time additionally would take more due to the need to prepare the compensation procedures and to plan the state budget funds for compensation of these costs. The necessity to create the database of the deaf would also demand the additional financial and institutional resources.

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[17] In order to assess the suitability of the alternative more accurately, the queries were sent to all mobile network operators operating in Lithuania about the technical possibilities and price of introduction of this solution. From the replies received from mobile network operators it became clear that the solution „Advanced SMS" is impossible to introduce without essential modifications in the mobile network infrastructure, which would be nonstandard and very expensive (see Annexes of this Feasibility Study, Chapter 10.4. „Correspondence and offers"). The prices of these modifications are not possible to present without the precise functional requirements.

As it was mentioned above, the alternative of the advanced short messages provides wide functional possibilities, close to voice-call, thus it could be estimated as a very attractive alternative in this aspect. However , the suitability of the alternative is greatly decreased by its disadvantages: long implementation time, expected high installation price and intense technical complexity. Due to the mentioned reasons, the working group of preparation of this Feasibility Study has the opinion that „Advanced SMS" technical alternative is not suitable and optimal for organisation of access of the emergency services for the deaf.

„SMS through interpreter"

Essentially, the alternative "SMS through interpreter" would regulate and validate the present situation of access of emergency assistance for the deaf. According to the data received from the answers of questionnaires of the polling survey, in case of dangerous situation the deaf persons (respondents of the questionnaire) used most often to ask the hearing and speaking persons who were present nearby for the assistance to call the emergencies. In other case (when the hearing and speaking persons were not present at or near emergency location) the assistance was asked by sending the messages to the hearing persons. The deaf often address to their familiar sign language interpreter who communicates with the deaf rather closely and friendly. However, the interpreters act on voluntary basis, as their work is not paid after work hours. In order to guarantee the access of the emergency assistance around-the-clock, the duty interpreters shall be organised, and the deaf shall be informed about telephone numbers they could call in order to receive the emergency assistance 24 hours. Principally, this new organisation would try to repeat the ERC functions, but it would be designed only for the needs of the deaf and would serve as a mediator between the caller and the ERC operator.

Obviously, if the alternative "SMS through the interpreter" was selected among others, the most efficient way would be an arrangement of interpreters' duties in the scope of ERC activities in the ERC premises. In this case, this alternative becomes identical to other alternatives based on short messages. If the decision was to use the services of external interpreters, the functional possibilities of this system would be minimal (ERC would receive no location determination information, calls would not be confirmed, the end-user's (caller's) messages would have no priority in the network), besides, the additional mediation would decrease the communication speed and information accuracy that are so important in case of extreme situations.

Because of the described reasons the alternative „SMS through the interpreter" shall be considered as an unqualified solution for access of the emergency services by the deaf. It should be noted that the results of questionnaire revealed that 73% of respondents would prefer to have a possibility of direct communication with 112-service operator and only 18% - through hearing and speaking mediator (interpreter).

„Subscription + „silent" call + SMS messaging"

This alternative is a complex solution achieving to use the convenience of SMS messaging and its availability to the deaf, from other hand – to „bypass" the complexity of prioritized SMS introduction and costs, using the present infrastructure of mobile communication networks and ERCIS technologies with relatively minor improvements (database of the deaf).

The principal scheme of the provision of emergency service to the deaf according to this alternative is presented in the picture below.

Picture No. 2. Principal Scheme of Service Provision
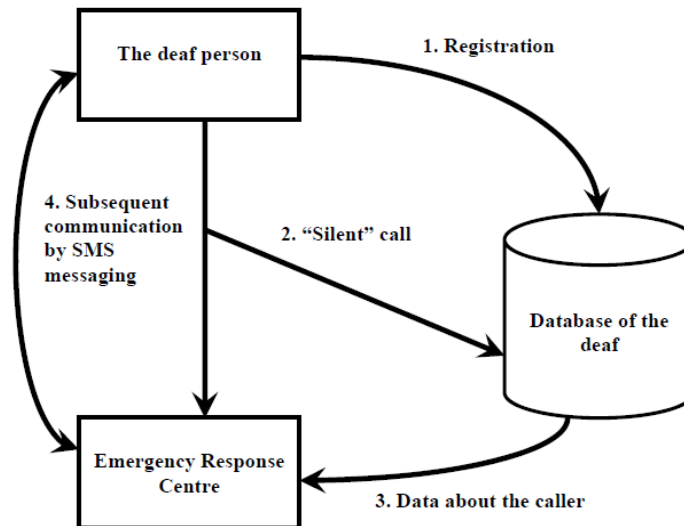
The deaf person, willing by necessity to use this model of call of the emergency services, would have to register himself/herself in the database of the deaf, presenting his/her data (name, surname, telephone number(s), type of disability, address). The database would be incorporated into the ERC information system and its constant renewal/update would be also guaranteed. In necessity, the deaf would call by telephone number 112 making a „silent" call, i.e. he would call, he would be connected, after some time the call would be suspended. Model of "silent" call would enable to use the present infrastructure of the mobile communication networks, i.e. would allow in real time to receive the information on location of caller and telephone number from the mobile communication operators, also the call would be prioritized in the network. During the call according to the telephone number the caller would be identified as a "deaf" in the ERCIS data base, this information immediately would appear on the screen of computerized work place of the ERC operator. The subsequent communication (with asked questions, clarified information and etc.) between the ERC operator and the caller would be performed in SMS messaging mode.

<u>Advantages</u>

In comparison with "Standard SMS" alternative (based on simplest SMS regime), this alternative provides the possibility for the ERC operators to receive the location determination information and in real time to confirm the reception of the emergency message (i.e. to suspend the call and immediately send the SMS message to the deaf person that his/her call was received). Analogously to other alternatives based on SMS messages, this alternative is also convenient for users to use, besides, the service to hide the telephone number of "the silent call" would not be applied, and the number of subscribers, whom the communication by SMS messages would be ensured, would be limited according to the number of persons registered in the database of the deaf.

Due to the integrity of this solution, its implementation would demand no additional or supplementary services from mobile communication network operators and need less amendment in national legislation. Thus, basing on the preliminary assessment, this alternative would cost less than the alternative "Advanced SMS" and implementation time would be, believably, shorter.

Disadvantages

The main disadvantage of this alternative is a need to create the database of the deaf. The persons with no registration in the database or with changed telephone numbers (and with no updated information in the database) could not use the emergency telephone number in case of necessity as the system will not identify their call as the call of the deaf person for emergency assistance. Besides, the creation of the database would demand additional financial resources for introduction and constant operation and maintenance of the alternative, so from the organisational point of view this alternative would be rather complicated.

Other disadvantages are that the subsequent communication by SMS messages (after the „silent" call) would be performed by standard messages, which have no guarantee of real time communication, no priority in the network, so in case of network overload the further clarification of emergency situation details would be impossible.

From the viewpoint of functional potentials, this alternative markedly overtakes "Standard SMS" and approaches to the "Advanced SMS". In order to assess the suitability of this alternative, the financial analysis should be additionally performed.

„Dedicated real time text solution"

Advantages

"Dedicated real time text solution" would not be based on SMS messages, as the earlier alternatives were. Technically this solution would be almost identical to the present service by the voice call – solution would be free of charge, the ERC would receive the location information, the communication would proceed in real time, thus the calls of emergency assistance would be respectively confirmed, the limitation of the subscribers for this service could be applied according to the choice (could be created the database of the deaf).

Disadvantages

The main disadvantage of the alternative is that in order to introduce the system a lot of time and great investments can be needed. The fundamental investments would be devoted for purchase of smart phones for all the deaf, creation of conversation application and its installation in their smart phone, because without them the emergency services will not be possible to reach, also the modifications in mobile communication operators' networks could take place. Correspondingly, the deaf persons would have to learn to use not only the emergency call system, but also how to use the smart phones. Responding to the questionnaire, only 6% of the deaf pointed out that they would choose the real time text solution. The solution would not enable to use the number 112, because the service would function by data transfer regime, i.e. mobile internet regime thus other identification forms shall be used (e. g. similar to "Skype" chat).

"Dedicated real time text" technical solution is very progressive from the technical point of view, thus the implementation of this solution could be considered as a constant or long term solution. However, the solution would require changing the communication measures used by the users, and it is a great disadvantage. Thus the implementation of this solution would be complicated and expensive. In opinion of the work group of this project the dedicated real time text alternative is unsuitable and further will not be analysed.

„Video call"

Technical alternative of the "video call" is analogous to the communication regime by real time text in all aspects, except the way of communication – the deaf could communicate in sign language using the video phone.

<u>Advantages</u>

Analogously to the RTT solution, this alternative would be familiar to voice call – it would ensure the location determination information, real time communication and confirmation of the received notice. The additional advantage would be that the deaf, who know sign language, could communicate with ERC operator in the most natural and most information providing language of signs

<u>Disadvantages</u>

Although all the alternatives demand that the deaf would be communicated by the specially trained operators, this alternative would demand to have the interpreters knowing the sign language. Learning of sign language used by the deaf would demand significantly more resources and time than the training of written text language used by the deaf (necessary to know for the ERC operators in case of alternatives based on SMS messages). On other hand, this alternative would not be acceptable to the deaf who do not know the sign language. It should be also noted that other alternatives discussed in this Feasibility Study would allow to serve the greater target group – the persons with all the hearing and speaking disorders not only the deaf persons as it would be in case of this alternative.

Other disadvantages of the alternative are analogous to the RTT solution – it would be necessity for all the deaf to purchase the videophones and to learn to use them if they want to be able to contact the emergency services according to the chosen alternative. In order to handle the video calls the ERCIS would need some modifications, which shall be assessed in the additional technical analysis.

In questionnaires only one third of the respondents answered that they would prefer to have possibility to call the emergency assistance using video call.

In opinion of working group of the project the alternative of „video call" is too complicated and inefficient, thus it will not analysed further on.

„Text transfer during voice call (SAT technology)"

This technical alternative is possible to consider as an interim solution between the fifth alternative "Dedicated real time text" solution and the fourth alternative of "subscription+silent call +SMS messaging" (see above). Although the scheme of provision

of the emergency service is very similar to the fourth alternative, the technical possibilities and potential is closer to the fifth alternative (i.e. RTT solution).

The principal scheme of service provision according to the alternative with SAT technology is depicted below.

Picture No. 3. Principal Scheme of Service Provision
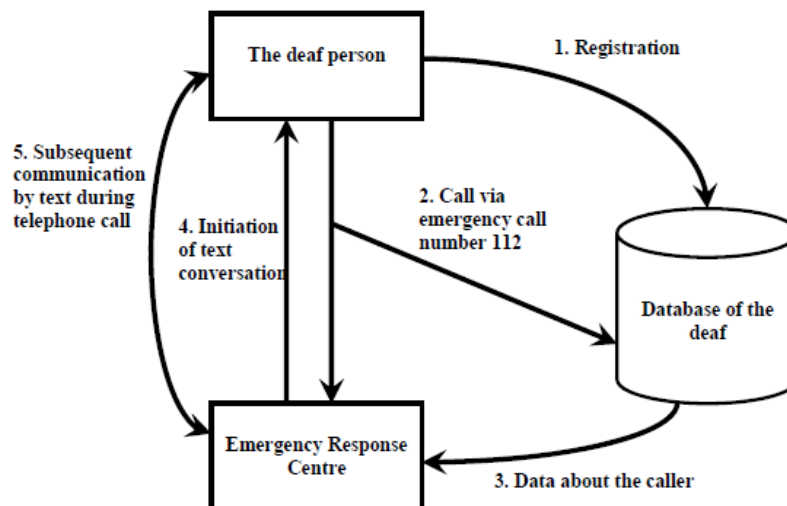
The deaf person, willing by necessity to use the emergency call service, would have to register in advance the personal data in the database of the deaf (see Chapter 6.3.1. "Database of the deaf"). In necessity of immediate emergency service attendance, the deaf would call the emergency telephone number 112. According to the database of the deaf the ERCIS would identify the caller as a person with disability and would direct the call to the computerized work place of the respective ERC operator. The ERC operator would send the query and would start the conversation after positive reply.

The essential particularity of this technical alternative is SIM application toolkit (SAT) technology, which is applied in order to create the possibility to execute the close to RTT regime the text conversation and control the sequence of the conversation. The principal technical scheme of text conversation between the ERC operators and mobile phone subscribers is depicted in the picture below.

Picture No. 4. Principal scheme of the SAT technology
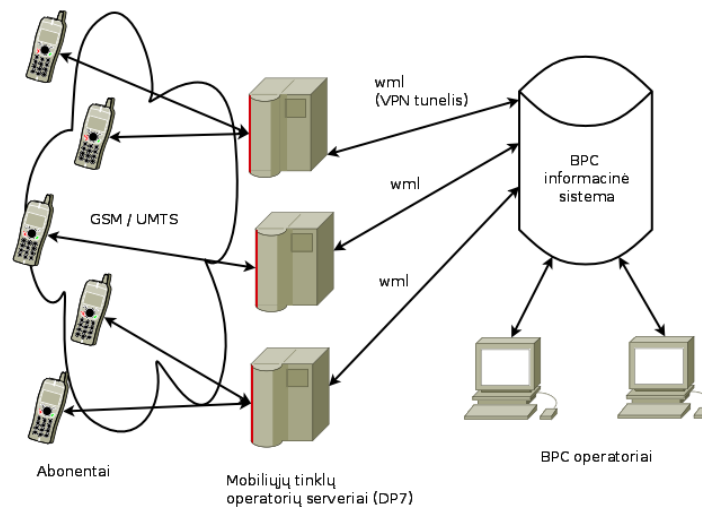
Translation:	abonentai	**subsribers**
	mobiliųjų tinklų operatorių serveriai	**mobile networks operators' servers**
	VPN tunelis	**VPN tunnell**
	BPC operatoriai	**ERC operators**
	BPC informacinė sistema	**ERC information system**

Using the SAT technology, the party initiating the conversation (in this case – the ERC operator) would have the possibility to send the query directly to the subscriber's mobile phone, on principle modelling a dialogue. Technically, it is done sending HTML "post" queries (in wireless mark-up language, WML) to the SIM card of the mobile phone and receiving the answers of the same type. Thus, the dialogue depends on the sent code that in turn depends on choice and programming of the serve provider. For example, the dialogue could proceed as follows:

1) The query "Do you want to communicate by text?" is sent to the mobile phone and the variants of possible answers "Yes/No" are chosen by navigation keys of the mobile phone;

2) If the deaf person chooses "Yes", then on the phone screen the information is displayed that the ERC operator needs to know in order to respond to the emergency call properly (e.g. the type of extreme situation, emergency location, other information); information can be received allowing to input text freely or consecutively presenting the questions (according to the ready questionnaire form) ;

3) If ERC operator receives the text (as a reply to the question) from the user of the mobile phone, the ERCIS can be programmed automatically inform that the notice was received.

Advantages

The solution based on the SAT technology, analogously to the "Dedicated real time text" solution, would not apply the SMS messages. With regard to technical and functional possibilities, this solution is approximated to the dedicated RTT and voice conversation – this alternative would be free of charge for the users , the ERC operator would receive the

information on location determination, communication in close to real time regime, information on reception of the notices, also the possibilities to hide the telephone number would be not applied (as in case of an ordinary call). The limitation of the subscribers would be executed on the base of the valid database of the deaf. This alternative would allow the emergency messages to have a priority in the network.

Disadvantages

Disadvantages of the alternative are related with that its implementation demand completely new technology – i. e. SAT Application Toolkit, base don text communication (see explanation above). Although this technology exists and functions, its operation needs the supplementary module (information transfer to and reception from mobile networks operators' DP7 servers) to be installed in the presently available ERC infrastructure and the code of text dialogue to be programmed. Besides, although a part of the deaf use the mobile phones having SIM cards with SAT technology, but in order to guarantee the complete service accessibility it could be needed to replace the SIM cards that the persons registered in the database have by the new ones (or to create the efficient mechanism how to check all their cards). Due to non-standard programming works, the implementation of this alternative would need a phase of system testing and adjustment (more complicated than testing and adjustment of other alternatives).

In the questionnaires there was no question whether the deaf would consider it convenient to use this specific service, thus it is complicated to assess the opinion of the final users. However, this solution is close to the dedicated real time text solution, and this solution was chosen only by 6 % of respondents. From other hand, the respondents considered the ordinary communication by SMS messages as the best solution, because they lack the knowledge on other solutions. Considering the advantages, the automatically initiated text conversation, during which the questions of ERC operator are to be answered, can be more advanced than SMS messaging. However, in order to know the exact opinion of the end users, there should be provided a possibility to test this service. If this alternative was chosen, the testing by end-users would be executed during the phase of system testing and adjustment.

As it was mentioned earlier, text communication based on SAT technology would be similar to real time text communication, i.e. advanced and progressive solution, which can be considered to be constant, not temporary measure. It is less believable that solutions of the REACH112 project would suggest more advanced or better alternatives, and the introduction of only inessential changes and modifications is economically inefficient. Thus, in case this alternative was chosen, then the solutions of REACH project would be rejected in advance or their introduction would be postponed for long period.

In opinion of working group of preparation of this Feasibility Study, despite of the constant base of the SAT technical alternative, it is rather attractive by its technological freshness, thus this alternative deserves a further investigation.

6.2.2.3.3. Conclusions of qualitative assessment

Guided by the qualitative analysis of seven identified alternatives, as described above, the working group of the project adopted the solution to reject five alternatives: the first

alternative „Standard SMS", the second alternative „Advanced SMS", the third alternative „SMS through the interpreter", the fifth alternative „Dedicated real time text solution" and the sixth alternative „Video call". The work group decided that two alternatives – the fourth alternative "Subscription+"silent" call+SMS messaging" and the seventh alternative "Text transfer during voice call (SAT technology)" – have to be investigated on quantitative base calculating and assessing financial-economical factors.

Table No. 2 presents the summary of the qualitative analysis of the alternatives. All seven alternatives are assessed according to thirteen criteria which were described above (see 6.2.2.3.1. "Assessment Criteria").

The basic arguments to reject the first and the third alternatives were that they do not satisfy the necessary quality level of the service, i.e. the ERC does not receive the information of location determination, confirmation of call reception, the telephone number of the caller for emergency services (the values of 3, 4, 5 and 6th criterion are not satisfied, in case of the first alternative – also 7 and 8 the criterion is not satisfied). The communication mode suggested by the third alternative is less acceptable for the deaf. The main arguments to reject the fifth and seventh alternatives was too low level of solution's acceptability for the end-users, i.e. for the deaf, also the solution price is believed to be high. The reason of rejection of the second alternative is technical complexity of the solution implementation and also very high costs.

The main arguments influencing the selection of the fourth and seventh alternative were as follows: sufficiently clear and decided procedure of technical implementation, no demand of essential technological modifications (as in the cases of the fifth and seventh alternatives), moderate period of introduction of the alternatives and conformity to principal quality level required for this type of services. It should be admitted that neither the fourth nor seventh alternative does not satisfy all the required functional requirements, but in opinion of the working group of this Feasibility study, these alternatives do meet the minimal quality requirements.

In working group's estimation, the fourth and seventh alternatives the best meet the analysis objective: *to select the progressive technological solution and the required organisational structure for its implementation, considering the EU project REACH112 and ERC project on infrastructural development.* The detailed assessment of integration of these technical alternatives to the ERC information system is performed by financial analysis of these alternatives (see Chapter 6.2.2.4 "Financial analysis").

Table No. 2. Consolidated Table of Quantitative Assessment of the Alternatives

Alternative	1	2	3	4	5	6	7	8
Assessment Criteria	Standard SMS	Advanced SMS	SMS through the interpreter	Subscription + „silent" call + messaging	Dedicated real time text solution	Video call	Text transfer during voice call (SAT technology)	Voice call
1 Price for user	Standard price of the network operator, applied to all SMS	Free of charge or standard price	Standard price of the network operator, applied to all SMS	Free of charge	Free of charge	Free of charge	Free of charge	Free of charge
2 Mobility	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication	Application of GSM mobile communication and fixed phone communication
3 Information on determination of location	No	Yes	No	Yes	Yes	Yes	Yes	Yes
4 Confirmation of the call reception	No	Yes	No	Yes	Yes	Yes	Yes	Yes
5 Communication in real time	No	No	No	No	Yes	Yes	Yes	Yes
6 Priority in network	No	Yes	No	No	Yes	Yes	Yes	Yes
7 No inhibition of telephone number display	No	Yes	Yes (?)	Yes	Yes	Yes	Yes	Yes
8 Limitation of subscribers	No	Yes	Yes *	Yes	Yes	Yes	Yes	No
9 Implementation time	to 1 year	from 2 to 4 years	to 1 year	From 1 to 2 years	about 2 years	about 2 years	to 1 year	not applied
10 Price of solution	Very low	High	Low	Moderate	High	High	Moderate	High
11 Technical possibilities	Temporary simple solution	Permanent solution, no technical possibilities	Temporary solution, used now	Temporary solution, all technical possibilities exist	Permanent solution, the possibilities are to be checked	Permanent solution, the possibilities are to be checked	Permanent solution, the technical possibilities exist	Permanent solution, used now
12 Acceptability of solution to users	82%	82%	26%	82%	6%	33%	6% (?)	not applied

6.2.2.4. Financial analysis

6.2.2.4.1. Methodology

Discounted cash flow (DCF) analysis is used as a method to value the alternatives financially. Methodologically, a full costs-benefits analysis demands to estimate all the financial and social-economical costs and benefits related with the implementation of the alternative. However, in this Feasibility Study only the financial costs of the alternatives are evaluated because of these reasons:

1. neither of the alternatives does not generate the financial benefits;

2. both qualified alternatives generate both economic and social benefits – the more handy and practical access of the emergency call number for the deaf conditions prompter and better assistance in case of emergency, and respectively, lower number of cases of injuries, deaths or property damage and (or) their extent;

3. Although the economical and social benefits of access of the emergency services can be theoretically estimated on the quantitative basis, in the context of this study this estimation would have no meaning as both alternatives would generate very similar social-economical benefits. The analysis aims to select one optimal alternative of two possible alternatives, any factors characteristic to both alternatives have no impact on their comparison results.

Estimation of costs flow is based on the costs incurred because of the alternative implementation in every period of planned time, with reference to the assumptions related with technical solutions (see part of the Chapter 6.2.2.4.2. "Assumptions").

Present value of cash flow of every alternative is estimated discounting the cash flow. The alternative with lower present value of costs is considered to be financially feasible.

6.2.2.4.2. Assumptions

Forecast period

The forecast period is 10 years. The selection of such a period is related with the fact that selection of one of the alternatives is partly related with implementation of the solutions of the REACH112 project in Lithuania, which, in estimation of experts, could be implemented only after 7 years or later. Estimation of detailed implementation and constant costs of solutions of project REACH112 project without knowing whether this project will be implemented at all, is not purposeful in scope of this Feasibility Study.

Assumptions of prices

The detailed assumptions of the prices used in the calculations are presented in the Annexes of this Feasibility study, also see Chapter 10.3 "Assumptions of Financial Calculation".

Assumptions of reinvestments

As the amortisation (depreciation) period of immaterial property planned to procure in the framework of this project is shorter than the predicted period (10 years), the reinvestments are included into the financial calculations reaching 10 % of project implementation investments transacted per year.

The assumption is made that the reinvestments will be started after three years from the project finishing date.

Beginning and finishing dates of investments

The assumption is made that the project's investments will be started in the beginning of 2011 and will continue till the end of 2012. The assumptions of beginning and finishing dates of investments are determined mainly by the process of infrastructure development project implemented by the ERC and striving to combine the adaptation of emergency call number 112 for the needs of the deaf with the activities of the ERC (more details in Chapter 6.4 „Plan of Implementation").

Discount rate

The discount rate equal to 5% is used for discount of investments costs flow. This discount rate conforms to the discount rate recommended by the European Union[18].

6.2.2.4.3.   Costs of Alternatives

In the tables below there are presented calculations of costs of both alternatives for every year of the predicted period.

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[18] European Commision. Directorate General Regional Policy. (2008). Guide to Cost-Benefit analysis of investment projects. Internet address: http://ec.europa.eu/regional_policy/sources/docgener/guides/cost/guide2008_en.pdf

**Table No. 3. Costs (in thousand Litas) of the fourth alternative
"Subscription+"silent" call+SMS messaging"**

Project year	Total	0	1	2	3	4	5	6	7	8	9	10
Calendar year		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Infrastructure of communication by text	523	0	255	252	2	2	52	52	52	52	52	52
Adaptation of the ERC information system	500		250	250								
Training of the ERC staff	23		5	2	2	2	2	2	2	2	2	2
Re-investments							50	50	50	50	50	50
Infrastructure of the database of the deaf persons	128	22	92	40	22	22	22	22	22	22	22	22
Programming of database and safe internet access	70		70									
Training of the LAD staff	18			18								
Administration of the database	40	22	22	22	22	22	22	22	22	22	22	22
Re-investments							7	7	7	7	7	7
End users	246	0	0	0	64	26	26	26	26	26	26	26
Campaign on primary information	63				63							
Campaign of constant information	175					25	25	25	25	25	25	25
Price of SMS message	8				1	1	1	1	1	1	1	1
Total	**1.403**	**22**	**347**	**292**	**88**	**50**	**100**	**100**	**100**	**100**	**100**	**100**

Table No. 4. Costs (in thousand Litas) of the seventh alternative "Text transfer during voice call (SAT technology)"

Project year	Total	0	1	2	3	4	5	6	7	8	9	10
Calendar year		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Infrastructure of communication by text	727	60	255	252	20	20	70	70	70	70	70	70
Adaptation of the ERC information system	500		250	250								
Training of the ERC staff	23		5	2	2	2	2	2	2	2	2	2
Programming of the text dialogue (WML)	60	60										
Service charge	144				18	18	18	18	18	18	18	18
Reinvestments							50	50	50	50	50	50
Infrastructure of the database of the deaf	128	22.4	92.4	40.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4
Programming of database and safe internet access	70		70									
Training of the LAD staff	18			18								
Administration of the database	40	22	22	22	22	22	22	22	22	22	22	22
Reinvestments							7	7	7	7	7	7
End users	310	0	0	36	99	25	25	25	25	25	25	25
Campaign on primary information	63				63							
Campaign of constant information	175					25	25	25	25	25	25	25
Change of SIM cards	72			36	36							
Total	**1.671**	**82**	**347**	**328**	**141**	**67**	**117**	**117**	**117**	**117**	**117**	**117**

From the financial point of view, the alternatives differ by four articles:

(1) Programming of text dialogue (WML code), necessary only for SAT technology application (the seventh alternative) – 60 thous. Litas (LTL);

(2)   Service charge for the mobile communication network operators for the use of SAT technology (necessary only for the seventh alternative) – 144 thous. LTL per predicted period;

(3)   Price of replacement of SIM cards of all the registered (subscribed) users, incurred only in case of SAT technology application (the seventh alternative) – 72 thous. LTL;

(4)   Price of SMS messages, incurred only in case of the fourth alternative "Subscription+"silent" call+SMS messaging" - 8 thous. LTL.

Total financial costs of the seventh technical alternative "Text transfer during voice call (SAT technology)" during period of 2010-2020 exceed the financial costs of the fourth technical alternative "Subscription+"silent" call+SMS messaging" by 268 thous. Litas.

In estimation of organisers of this Feasibility Study, the financial difference of two alternatives is only small-scale, if considering the conservative assumptions of the calculations: the real price of programming of text dialogue and charges of the service depend on the results of negotiation with the mobile network operators. It is believable that costs of SIM cards will be significantly lower than it is assumed in the conservative assumptions (see Chapter 10.3 „Assumptions of Financial Calculations").

6.2.2.4.4.   Assessment

According to the methodology the assessment is performed discounting the costs of every alternative of the project (applying 5% discount rate). Besides, the assessment of discounted costs of the fourth alternative "Subscription+"silent" call+SMS messaging" considered that this alternative would be applied on temporal basis – i.e. until the implementation of solutions of REACH112 project.

The discounted costs calculations for the alternatives are presented in tables below.

Table No. 5. The discounted costs of the fourth alternative
"Subscription + "silent" call + SMS messaging" in thousand Litas

Project year		0	1	2	3	4	5	6	7	8	9	10
Calendar year	Total	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Project costs	1.403	22	347	292	88	50	100	100	100	100	100	100
Discount rate		5%										
Present value of discounted costs		**1.101**										

Table No. 6. The discounted costs of the seventh alternative
"Text Transfer during voice call (SAT technology)" in thousand Litas

Project year	Total	0	1	2	3	4	5	6	7	8	9	10
Calendar year		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Project costs	1.671	82	347	328	141	67	117	117	117	117	117	117
Discount rate		5%										
Present value of discounted costs		**1.313**										

Table No. 7. The discounted costs of the fourth alternative
„Subscription + „Silent" call + SMS messaging" in thousand Litas
after assessment of temporality of this alternative

Project year	Total	0	1	2	3	4	5	6	7	8	9	10
Calendar year		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Project costs	1.403	22	347	292	88	50	100	100	100	100	100	100
Costs of project Reach112 (approximate)										82	347	328
Total costs of alternative		22	347	292	88	50	100	100	100	183	448	429
Discount rate		5%										
Present value of discounted costs		**1.559**										

The financial calculations indicate that the least cost technical alternative depends on the answer whether the fourth alternative is considered to be a temporary or permanent alternative, and the question is if it will be still the objective to implement the solution of REACH112 project when the solution will be prepared (after some 7 years)[19] in case of already implemented this technical alternative.

If the fourth alternative after 7 years was replaced by another solution suggested by the REACH112 project, then it would be financially optimal to implement the seventh alternative „Text transfer during voice call (SAT technology)". But if the solution of REACH112 project was neglected, then the fourth alternative „Subscription+"silent" call+SMS messaging" would be a cheapest solution.

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[19] Meanwhile, as it was mentioned earlier, the seventh alternative due to its provided broad functional possibilities is considered as an advanced, progressive and long term solution.

Table No. 8. Results of financial assessment of the alternatives *

Net present value of the costs of alternatives	thousand Litas
(4th alternative) Subscription + „silent" call + SMS messaging	1.101
(7th alternative) Text transfer during voice call (SAT technology)	**1.313**
(4th alternative) Subscription + „silent" call + SMS messaging (evaluating the temporality of this alternative)	**1.559**

*The least present value of the costs indicates the economically optimal alternative.

The authors of this Feasibility Study, basing on the results of discussions of the working group, assume the assumption that the fourth alternative „Subscription+"silent" call+SMS messaging" is temporary, i.e. this alternative would be replaced by the solution of the REACH112 project.

6.2.3. SELECTION OF OPTIMAL ALTERNATIVE OF PROJECT IMPLEMENTATION

In order to select the optimal alternative of the adaptation of emergency call number 112 for the needs of the deaf there are compared both results of (qualitative and financial) assessment. The assessment aims to select one optimal alternative out of two potential alternatives, thus the assessment is influenced only by those criteria that differ for alternatives (see table below).

Table No. 9. Comparison of two investigated alternatives

Alternative	4	7
Assessment Criteria	Subsription + „silent" call + SMS messaging	Text transfer during voice call (SAT technology)
5 Communication in real time	No	Yes
6 Priority in network	No	Yes
10 Present value of costs of the solution, thous. LTL	1.559	1.313
11 Technical possibilities	Temporary solution, all technical possibilities exist	Permanent solution, technical possibilities exist
12 Acceptibility of the solution to the end-users	82%	6% (?)

Thus, the seventh alternative is more attractive than the fourth alternative, because:

(1)   It provides the possibility to communicate in real time (or close to real time);

(2)   Messages can have the priority in the network (this issue shall be solved separately as the technology does not guarantee it automatically);

(3)   Present value of alternative costs is lower if the temporality of the fourth alternative is assessed.

Meantime, the fourth alternative is more attractive than the seventh alternative, as the absolute majority of the deaf would prefer the communication by SMS messages. The real time text communication would be chosen only by 6% of respondents. In opinion of the organisers of this Feasibility study, these results were influenced by the fact that communication by SMS messages presently is a main communication measure among the deaf using the private mobile phones, and communication based on the RTT and (or) SAT technology is not widely known thus these applications are unattractive. In opinion of the working group, the SAT technology potentially is significantly more practical and convenient than ordinary SMS messages (automatic initiation of the conversation-dialogue, template of questions and replies), thus it should be tested to clarify its attractiveness for the deaf.

After estimation of all the criteria, it is considered that the **optimal project implementation technical alternative is the seventh alternative „Text transfer during voice call (SAT technology)".** During implementation of this alternative there should be paid a deep attention for the creation of handy text dialogue and its testing. It is highly recommended in the earliest phase of the project implementation to create the prototype of the text dialogue and on its base additionally evaluate the desirability of the deaf persons to use these technologies.

6.3.   DETAILED DESCRIPTION OF THE SELECTED ALTERNATIVE

The selected technical alternative of the adaptation of emergency call number 112 for the deaf can be resolved into three components corresponding to these project activity groups: (1) the database of the deaf, (2) infrastructure of text communication and (3) information campaign. The detailed descriptions of the database of the deaf and information campaign are presented below. The comprehensive presentation of the infrastructure of text communication was given earlier, in Chapter 6.2.2.3.2. „Analysis and Assessment" / „Text Transfer during Voice Call (SAT technology)".

6.3.1.   DATABASE OF THE DEAF

In order to implement the technical alternative it is necessary to create the database of the deaf, where would be saved and updated all the data of the persons with hearing and speaking disabilities who expressed their will to be registered in this database and to use the emergency telephone number dedicated for the deaf and who agreed to provide these data about themselves:

1) Mobile phone number (or numbers), which are used by the deaf. This information is necessary in order the ERCIS would automatically identify the caller according to the subscriber's number and would denote that the caller is a person with disability, then would route the call to the ERC operator to handle, who is instructed how to communicate with the deaf.

2) <u>Person's name and surname.</u> During the ordinary/conventional voice call, the ERC operators inquire about the caller's name and surname. Due to the more complicated particularity of the communication mode with persons having hearing and (or) speaking disabilities it is necessary to interconnect the mobile phone number with the name and surname of the deaf in order to shorten the communication time by SMS messaging and to permit the ERC operator to address the person's guardian or responsible social workers.

3) <u>Type of Disability.</u> This information is necessary in order to know how to communicate with the person, also it is required by the emergency services if their attendance in emergency situation is called by the emergency request of this person.

4) <u>Home address.</u> According to the data of determination of subscriber's location received from mobile communication network operator, the geographical location of the caller can be determined in accuracy from 100 m to 1 km (depending on the core network density). Thus, having the information on home address and approximate information of determination of caller's location, the ERC operator could properly inform the emergency services.

5) <u>Notes</u> – indications of the second disability; names, surnames and contact telephone numbers of the responsible social workers. The data are not obligatory but they increase the service quality and could be included into the database.

The data collection template is annexed in the Annexes of this Feasibility Study (see Chapter 10.2 „Database of the Deaf (Template)").

6.3.1.1. Present situation

During the preparation of this Feasibility study, the Lithuanian Association of the Deaf (LAD) and Department of the Affairs of the Disabled (DAD) started to perform the preparatory works of creation of the database of the deaf and collection of the necessary data. The scheme of data collection and storage was prepared, the data collection templates and forms of consent to use the personal data were formulated, the executors (organisations and persons) were appointed, and the documents were filled and furnished to the State Data Protection Inspectorate.

The present scheme of data collection and storage is presented in Picture No. 5, given below. According to the planned scheme of implementation of data collection as it was planned during the preparation time of this Feasibility Study, four parties would take part in the creation of the database of the deaf:

(1) <u>Organisations directly working with the deaf</u> – LAD public establishments and organisations, centres of sign language interpreters (see Annexes, Table No. 12). These organisations work directly with target group of the project – the deaf, thus they are responsible for the physical collection of the data and signing of the consents' templates that allow to use the private data for the emergency services

(as it is regulated according to the Law on Legal Protection of Private Data), also the transference of the collected data to input into the database.

(2)   Public Enterprise Centre of Surdology. In this enterprise one job place is intended for administration of the database of the deaf and coordination of data collection. This staff member will coordinate the actions of all the related organisations. Besides, according to the present data collection scheme, the employee of Centre of Surdology will receive by e-mail all the data from LAD organisations and, after positive check of the conformity of the received data to the requirements of the template, will input them into the database maintained and protected by the Department of the Affairs of the Disabled.

(3)   Department of the Affairs of the Disabled under the Ministry of Social Security and Labour. Department was chosen as an organisation providing the material resources to protect the database (part of resources of server of Department's data). The measures available at the Department of the Affairs of the Disabled (computer hardware and software, physical protection measures and etc.) meet the requirements of the Law on Legal Protection of Personal Data and do not demand extra works and measures.

(4)   ERC is an end-user of the formed database of the deaf. Usually during the ordinary call via emergency number 112, the ERC receives the caller's telephone number. During the call of the deaf person, the ERCIS will identify the call according to the input data of the database of the deaf and correspondingly will apply the proper measures.

Due to the strict ERCIS security and protection requirements it is planned that the database of the deaf will not be automatically (directly) synchronised with the ERC information system. The present data collected scheme predicates that the database administrator (employee of Public Enterprise Centre of Surdology) periodically will send the updates of the database to the ERC responsible person, who safely and properly will input the data into the ERC information system.

Picture No. 5. Present Scheme of Data Collection and Storage *
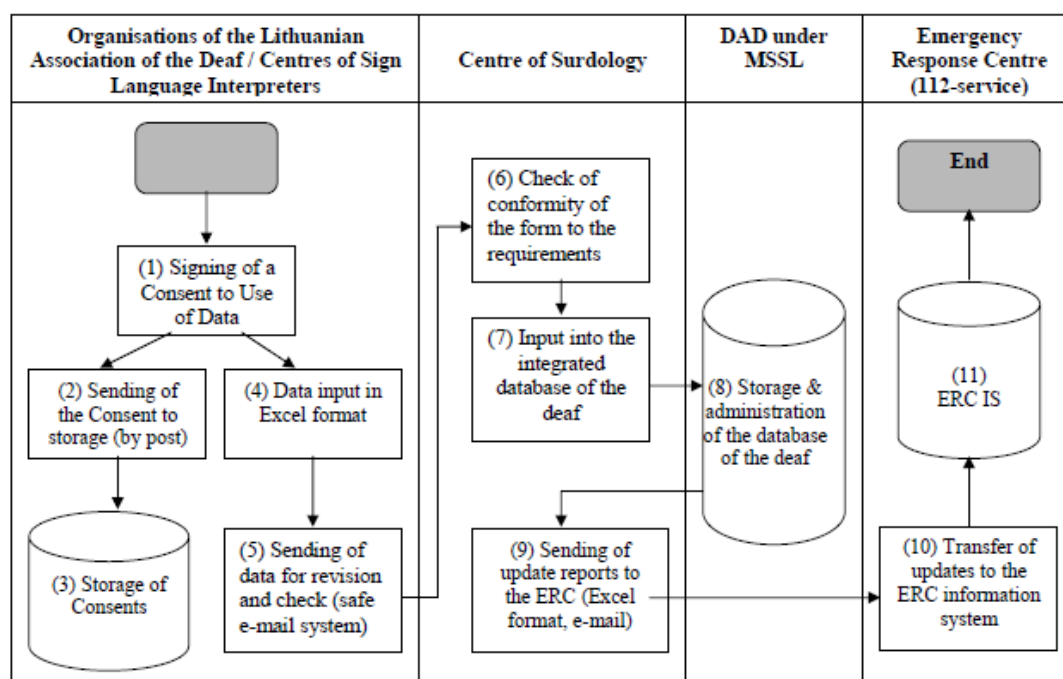
*Remark: it is planned to implement during the nearest time (in the short run).
DAD under MSSL = Department of the Affairs of the Disabled under the Ministry of Social Security and Labour
ERC IS = Emergency Response Centre information system

In opinion of the organisers of this Feasibility study, the present data collection and storage scheme, which during the preparation of the Feasibility Study it was planned to implement as quick as possible, is not optimal because of the following reasons:

(1)   Data input in Excel. The employees of the LAD organisations and centres of sign language interpreters collected the data from the deaf and they were input to the electronic media based on Microsoft Excel , because all the computers of these organisations have Microsoft Office programme package and users are used to work with it. The disadvantage of this method is possible mistakes of data input (the input data can not be automatically checked), also the security guarantee in case of many users and different installations is very inefficient (it would be applied the coding of Excel media and protection by passwords).

(2)   Data check and double input of the same data. The employees of the LAD organisations and centres of sign language interpreters would send the input data to the employee of the Public Enterprise Centre of Surdology (who would be administrator of the database), who also check the correspondence of the data to the template requirements and input them into the database available only in the Department of the Affairs of the Disabled. The double data input and check is inefficient and it increases the probability of human mistakes (especially in huge amount of data handling).

(3)   Data sending by electronic mail. In order to guarantee the safety of data sending by e-mail the sent messages would be coded by special programmes that could be

pay programmes. Besides, evaluating the quantity of the data users (at least 21 organisations collecting the data, see Annexes, Table 12), there should be needed the great resources for system introduction and administration, also for training of the system users.

In opinion of the organisers of this Feasibility study, the present scheme of data collection could be used only on temporary basis in order to clarify and itemize the technical aspects of data collection, storage and synchronization, also to prepare the functional requirements for the automatic system of data collection and storage, which would differ technologically from the present scheme. However, even the temporary use of this system gives many doubts on security level and additional works required for safety guarantee (see details above).

The Feasibility Study suggests the automatic scheme of data collection, storage and protection, its characteristics and complexion of administration are presented in the next Chapter.

6.3.1.2. *Proposed mechanism of data collection, storage and administration*

According to the proposed scheme (see below, Picture No. 6) these three parties would take an active part in processes of the database creation, storage and usage:

(1)   Organisations, directly working with the deaf – LAD public establishments and organisations, centres of the sign language interpreters (see Annexes, Table No. 12). Analogously to the present data collection scheme, these organisations directly would contact the deaf, gather the consent to use of data forms and send them to the regional organisations to save and input the data of the deaf to the database. It is suggested that every employee of LAD organisation and centre of the sign language interpreters working with the deaf would have the right to be authorized and connect to the database via safe internet access.

(2)   Department of the Affairs of the Disabled under the Ministry of Social Security and Labour. Department would provide the computer resources (corresponding to the requirements of the Law on Legal Protection of Personal Data) to save/maintain and service the data base and safe internet access.

(3)   Emergency Response Centre. Synchronization of the ERC information system and database of the deaf would be proceeding semi-automatically. The database of the deaf would be programmed automatically to send the updates of the database in format indicated by the ERC using the safe (coded) electronic mail, because according to the ERCIS security and safety policy the direct synchronization of the ERCIS and database of the deaf is impossible.

Picture No. 6. Proposed scheme of data collection and storage
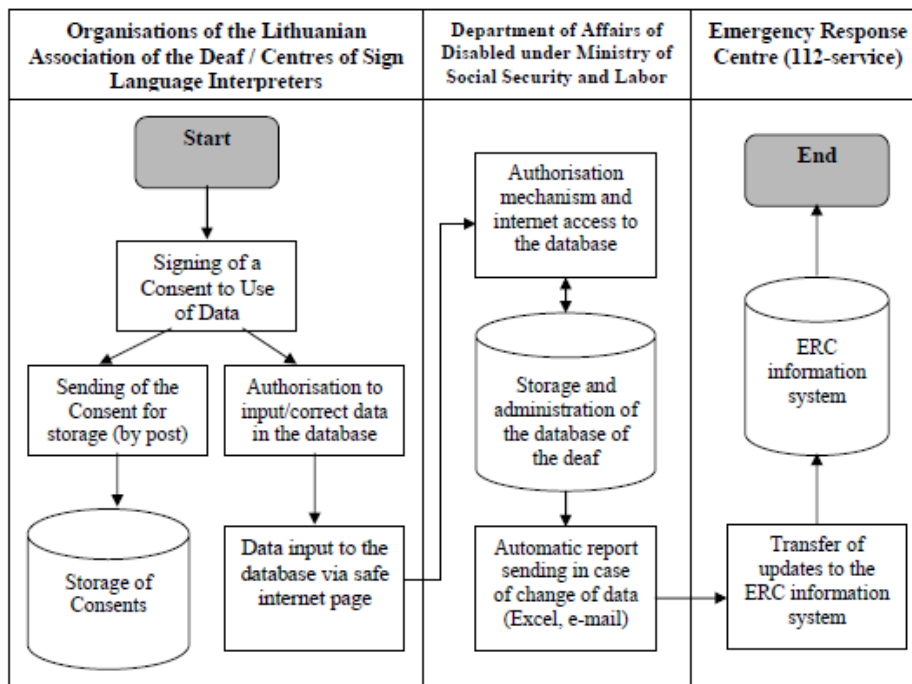
The base of suggested scheme of data collection and storage would be direct safe internet access to the database of the deaf and application of modern systems of databases management for database programming. The introduction of these information technologies would solve the disadvantages of the present scheme:

(1)   The data would be inputted directly to the database via safe coded internet channel that would be created automatically in connection with the database. In order to connect the distant users (employees of the LAD organisations and centres of the sign language interpreters) to the database it would be used a standard internet browser. This method would solve the technical and organisational problems, related with the security of Excel files and electronic mail messages.

(2)   The proper programming of database would allow the automatic checking of conformity of the input data to the requirements of the template (e. g. "RSM Vilnius" instead of "Vilnius city") and duplication of the input data with the present data. In this case the database administrator (employee of the Public Enterprise Centre of Surdology) would not need to check the data, thus the efficiency would increase significantly, and probability for human mistakes would decrease markedly.

The preliminary functional requirements of access and administration of the database may be found in the Annexes (see Table 8 "Functional requirements for the database of the deaf and its access (Working document)*").

6.3.2. INFORMATION CAMPAIGN

The database of the deaf is necessary to implement the selected optimal technical alternative, because the emergency call number could be used only by the persons who would register in advance (get subscription) in the database and would provide their data. Moreover, in case of change of data (especially, of telephone number), the database will have to be updated. Registration and data provision will be voluntary, i.e. the deaf will be entitled to reject to provide their data, but herewith they will also reject the right to use the emergency call services without intermediaries.

Thus, as it was already emphasized in the earlier chapters of this Feasibility Study, the information campaign should accompany the implementation of technical solution of emergency call service. The campaign shall consist of two elements: "initial information campaign" dedicated to inform about the introduction of the new service to call the emergency telephone number for the deaf and "constant information", annually organized campaign dedicated to remind about the possibilities and conditions to use this service for the deaf.

Considering the fact that all the potential group of the users of this service, i. e. 40 thousand persons with hearing and (or) speaking disabilities (more details see Chapter 4.1.2. "Analysis of Demographic and Social Situation of the Deaf Community"), will be difficult to reach directly (exception is the deaf persons who are the members of the deaf organisations) because of group's versatility (degree of severeness of disability, lifestyle and etc.), thus it is advisable to perform the information through the intermediaries – 1) establishments and organisations, which care about the needs of these persons and provide them special services, 2) the general public, i.e. increase the awareness about the service in-between the hearing community, that they could inform their relatives, neighbours or familiar persons.

The suggested information campaign consists of: 1) creation of basic communication elements and 2) external communication.

The suggested basic communication elements consist of:

(1) <u>Internet website</u>. It is recommended to create a new separate website for newly introduced service. The main works include the registration of website's address, creation of structure, preparation of information, creation and placement of the web banner (online advertising form) in webpages of the information partners. In the website all the most important information would be presented in a clear and accurate form about the emergency call service via telephone number 112 for the persons with hearing disabilities (about the possibilities, particularities of use, necessary to provide the data, method of data use and etc.). Website's address would be indicated on all the visual or distribution material created during information campaign. Alternative of this solution could be use of present internet website (of ERC, DAD, LAD or www.sos112.lt), but it would be less attractive for the user with regard to information access. In case of need, there could be discussion on possibility besides the internet website to have social profile in Facebook (social network website).

(2) <u>Information video</u>. A video of 2-3 minutes, presenting the most important steps of call to emergency services, would permit to provide information both to persons with hearing disabilities and hearing persons in order the provided information would be easily understandable and easy to remember. The main disadvantage of this element is related with rather high price of its production. Otherwise, it is compensated by broad possibilities of use of this element. Video could be shown on TV in certain periodicity , also uploaded to the website, demonstrated in the presentations or trainings organized during information campaign in order to get introduced a new service of emergency call.

(3) <u>Booklet</u> It is suggested to prepare and to add the most essential information into the booklets of 2-4 pages. The main works are preparation of information, printing of booklets and their distribution through the establishments and organisations, felt concerned about the needs of the deaf, providing the services to the deaf, also in presentations or trainings organised during information campaign. During the first year the edition could be 8 000 copies, then every later year – it would be enough 500 units.

(4) <u>Souvenirs.</u> It is suggested to produce small stickers to put on the mobile phone devices, where information with emergency call number and other vital information would be provided (start edition: 5000 units, annual addition – 100 units per year).

(5) <u>Information poster for outdoor advertising.</u> In order to reach as great as possible awareness of the people during the initial information campaign, it is suggested to prepare and to use the postering material (about 40 posters) for 2 weeks duration in appropriate spaces of the greatest cities of Lithuania, e.g. in the bus shelters, city light columns, standard billboards or advertising walls, evaluating nearby public infrastructural objects , people traffic flows and etc. Usually these advertising billboards present the information posters in average for a month and it is related with great expenses. In case of social advertising (if poster's project announces no commercial sponsors), then the outdoor advertising companies apply the discounts (about 90%) for the rent price of the advertising billboards.

The external communication consists of these actions:

(1) <u>Making useful contacts and their maintenance with the mass media (press and television)</u>. In the beginning of the information campaign and later this action would consist of: preparation and distribution of 2 (two) press releases , organisation of 1 (one) article in the press (newspaper and etc.), organisation of 1 (one) TV reportage in the news broadcasting programme, organisation of broadcasting of the prepared information video. As all the project is social, it is recommended to make a useful contact with the mass media, maintain them in order to avoid the contracting articles or broadcasts, other expenses related with the advertising activities.

(2) <u>Initiation and implementation of united/collective social action with mobile network operators.</u> It is suggested to involve all the mobile communication network operators to the information campaign in order they would inform the users of their services in most acceptable way on introduction of new service (e. g. to send an informative message by SMS messaging to all users or to present the new information with the sent invoices for the provided services), and they could send the message-reminder about the conditions of this

service to all the users who were later registered to use the emergency call service for the disabled persons.

(3) Organisation of the presentations. It is suggested to organize 2 (two) information presentations during the annual events of the Lithuanian Association of the Deaf that would be dedicated to present the emergency call service and to discuss it with the LAD members.

(4) Organisation of the training for the deaf. In order not only to introduce, but also to assist in registration, explain personally to the deaf the conditions of emergency call services, it is recommended to organize annually in average 5 trainings. They could be organized separately or during the events of the deaf community.

Considering the necessary specific knowledge and time expenditures, the first two actions need professional public relations agency, and organisation of presentations and trainings for the persons with hearing disabilities could be purposeful to be assigned to implement for the deaf organisations (as it was mentioned earlier in Lithuania there well developed LAD network functions together with LAD's divisions, LAD established institutions and other establishments providing the communication service for the deaf).

The budget for the information campaign, prepared according to the presented suggestions (commercial offers) (if there were implemented all the suggested components) is presented in the Annex of the Feasibility Study (see Chapter 10.3 "Assumptions of the Financial Calculations").

6.4. PLAN OF IMPLEMENTATION

6.4.1. HARMONIZATION OF THE DEAF ACCESS OF EMERGENCY NUMBER 112 AND DEVELOPMENT OF THE EMERGENCY RESPONSE CENTRE

Presently, the administration of the emergency calls by telephone number 112, using the modern information system, enabling to determine the caller's telephone number and caller's location, using integrated computerized workplaces of the ERC operators, is executed only in Vilnius city and Vilnius district. In December 2008 there were established the ERC territorial subdivisions, which started their activities in the territory of municipalities of counties' centres and gradually they intercept the administration of emergency calls from police, fire and rescue stations.

By Decree of the Government of the Republic of Lithuania of 3 September 2008 the Programme of Infrastructure Development of ERC Services Provided by a Single Emergency Call Number 112 was approved, which besides many other aspects also foresaw the gradual transfer of all the responding and handling operations of the emergency calls, functions of the operative forces (except the police) management in all Lithuania to the ERC centre.

According to the mentioned Programme, in May of 2010 the Emergency Response Centre started to implement project „Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the

Emergency Calls, Manage the Emergency Operation Forces", financed from the EU structural funds. The project budget is 20 mill. Litas. According to this project there will be introduced two regional ERC divisions: in Vilnius (to serve the East of Lithuania) and Klaipeda (to serve the West of Lithuania). All the necessary equipment for administration and handling of the emergency calls will be purchased and installed. It is planned, that in both regional divisions there will work about 360 operators. The planned duration of project implementation – 30 months, i. e. ERC regional centres will start their activities in the mid-year of 2012 – in the beginning of 2013. Correspondingly, the present ERC call administration centre will function only until the mid-year of 2012.

It is obvious that the text communication infrastructure adapted to the needs of the deaf, which was planned in this Feasibility Study, would have to be coordinated with the new infrastructure implemented during ERC development project. Meanwhile, creation of interim technical solutions for 2 years period would be economically infeasible and too complicated from the organisational and technical points of view.

Thus, the project implementation schedule was formed considering the circumstances that the new infrastructure of ERC regional divisions will start functioning not sooner than mid-year of 2012. The possibilities, provided to the deaf persons to use the emergency call service via 112-centre earlier than the implementation of infrastructure of both regional ERC divisions is finished, could be discussed in the earliest procedures of project implementation considering all the technical and management aspects.

6.4.2. SCHEDULE OF PROJECT ACTIVITIES

All the project activities are divided into 4 groups (pre-project works, text communication infrastructure, database of the deaf and information campaign):

(1) Activity group „Pre-Project Works" includes the works, necessary to guarantee the project financing. The potential project financing sources are EU structural funds and state budget. Project implementation plan schedules that the specific detection of financing possibilities, documents preparation and financing sources approval will take to 9 months (from 3rd quarter of 2010 to 1st quarter of 2011). In this case the project activities implementation could be started to implement not earlier than the 1st quarter of 2011.

(2) Activity group "Text communication infrastructure" includes:

   a. Preparation of detailed functional requirements for the adaptation of ERC information system and text dialogue (Activity 2.1.) – 2nd quarter of 2011.

   b. Adaptation of ERC information system – introduction of possibility of real time text communication in the ERC computerized work places, installation of data channels between ERC and mobile network operators' servers, testing works (Activity 2.2). It is emphasized that the duration of these works will be conditioned by present development project executed by the ERC, financed by EU structural funds (see above Chapter 6.4.1 "Adaptation of Emergency Number 112 for the Deaf and Coordination with ERC's Development"), thus they will take time from the middle of 2011 to the end of 2012.

c. Programming and testing of text dialogue (Activities 2.3., 2.4. and 2.5). There activities would have to start immediately after the preparation of functional requirements (2.1), but it is desirable that the initial testing of text dialogue based on SAT technology would be performed in a very beginning of the project. During the initial testing there would be learned the attitude of the deaf to the appropriate communication mode – i.e. acceptability of the alternative to the users. This information is important formulating the functional requirements for the system. Project schedule predicates that the initial testing would be implemented in the 4th quarter of 2010, meanwhile the final programming works and final testing – from 3rd quarter of 2011 to 1st quarter of 2012.

d. Training of the ERC staff (Activity 2.6) – 4th quarter of 2012.

In this case the text communication services by emergency phone number 112 to the deaf in the entire territory of Lithuania would be started to be provided from the beginning of 2013.

(3) Activity group "Database of the Deaf" includes:

a. Preparation and harmonization of functional requirements, settled for the database management system and safe internet access (Activity 3.1.) – 2nd quarter of 2011,

b. Selection of suppliers and programming works (Activity 3.2.) – 3rd quarter of 2011,

c. Testing of the database (Activity 3.3.) – from 3rd quarter of 2011 to 4th quarter of 2011;

d. Training of employees of organisations of the Lithuanian Association of the Deaf how to use the database and internet access (Activity 3.4.) – 1st quarter of 2012.

In this case, the database of the deaf and its access would be available for operation only in the 2nd quarter of 2012. However, the database of the deaf (in the framework and scope of this project) has implication only when the infrastructure of communication by text will be implemented. Besides, it would be purposeful to coordinate the data collection from the deaf persons with the replacement of the SIM cards together with the information of the services, thus the database of the deaf is advisable to be formed only after implementation of all the project.

(4) Group of Activities "Initial Information Campaign" includes:

a. Creation and production of basic elements (website, information video, booklets (brochures), souvenirs, information posters) (Activity 4.1.) – from the 1st quarter of 2012 to the 3rd quarter of 2012.

b. Actions of external communication (relations with mass media, actions with mobile networks operators, presentations, trainings) (Activity 4.2.) – from the 4th quarter of 2012 to the 1st quarter of 2013.

Table No. 10. Preliminary Time Schedule of Execution of Project Activities

| Years	2010				2011				2012				2013			
Quarters	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1. Pre-Project works			█	█	█											
2. Infrastructure of communication in text				█	█	█	█	█	█	█	█	█				
2.1. Preparation of detailed functional requirements						▒										
2.2. Adaptation of ERC information system							▒	▒	▒	▒	▒	▒				
2.3. Primary testing of text dialogue				▒												
2.4. Programming of text dialogue							▒									
2.5. Testing of text dialogue								▒	▒							
2.6. Training of ERC staff												▒				
Start of operation of the service (in all Lithuania)													▒			
3. Database of the Deaf						█	█	█	█							
3.1. Preparation and coordination of functional requirements						▒										
3.2. Selection of suppliers and programming works							▒									
3.3. Testing of the database of the deaf							▒	▒								
3.4. Training of LAD staff									▒							
Potential start of data collection										▒						
4. Initial information campaign									█	█	█	█				
4.1. Creating of basic campaign elements									▒	▒	▒					
4.2. External communication												▒	▒			

6.5. ORGANISATIONAL STRUCTURE OF PROJECT IMPLEMENTATION

The purpose of organisational structure of project implementation is to guarantee the proper organisation of project works and activities from both viewpoints of technological and, most important, managerial aspects. In opinion of the organizers of this Feasibility Study, the main objective of project leader is to assure that two main groups of activities of the project – ERC information system modernisation and creation of the database of the deaf – would be properly coordinated and harmonized without any dissociation.

It is suggested that the project implementation would have the proper organisational structure (working group), which would embrace the employees of three organisations – the

ERC, LAD and DAD under the Ministry of Social Security and Labour (see Diagram below).

Scheme No. 1. Proposed organisational structure
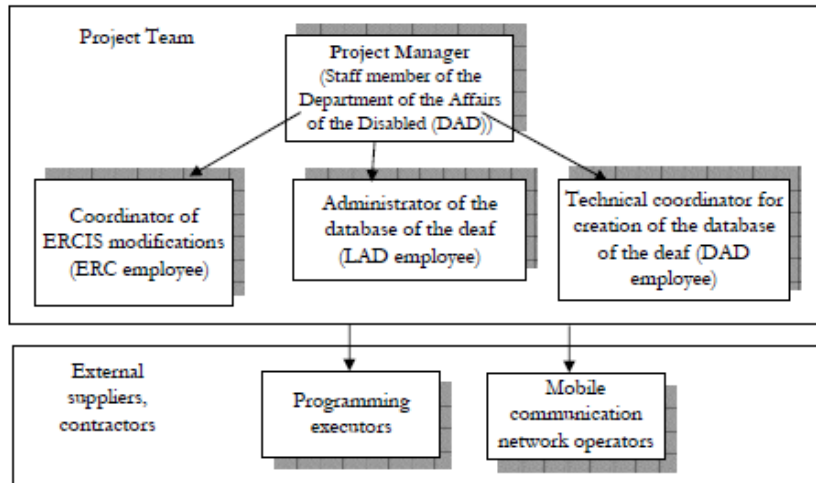
6.6. CONTINUITY OF THE PROJECT

The project continuity is apprehensible and considered as the efficient operation of the infrastructure, created during the adaptation project of the emergency call number 112 for the deaf, after the accomplishment of the system introduction works. The project execution costs include permanent costs (inevitable costs on constant basis) incurred after the full project implementation (see Chapter 6.2.2.4.3. "Costs of Alternatives"):

(1) Reinvestments to the ERCIS;

(2) Service charges (fees) to the operators of the mobile communication networks;

(3) Costs of regular training of the ERC staff;

(4) Administration costs of the database;

(5) Reinvestments to the infrastructure of the database;

(6) Constant information campaign for the users.

According to the financial calculations of the costs of the technical alternatives performed in the Feasibility Study, the total project execution costs can reach from 60 to 120 thous. Litas annually. Minimisation of these costs (as much as possible without impairment to the system functionality and its safety) is a main task of assurance of the project continuity. Thus, in order to assure the project continuity these factors shall be considered :

(1) During the project implementation there shall be achieved that modern system based on up-to-date information technologies and high automation level would be created, thus demanding minimal operational and financial costs in order to use it properly and efficiently. This factor is mainly related with the creation of the database of the deaf and its service and maintenance;

(2)   Guarantee of the data safety. Project foresees the use of private data that are to be properly protected with regard to requirements under the Law on Legal Protection of Personal Data (again, this aspect is more related with the database of the deaf). It is important not only to create the modern and safe information infrastructure of data collection, storage and administration, but also to maintain and guarantee its constant protection and safety. It is necessary to appoint the executors of the maintenance and supervision of the information system (also from the viewpoint of safety).

- The Lithuanian legislation forms a legal base to provide the emergency services by emergency call number 112 to the disabled people. Notwithstanding, the provision of these services is not yet secured for the persons with hearing and (or) speaking disabilities. The Emergency Response Centre (ERC) provides the emergency services by emergency call number 112 only to the callers requesting the emergency attendance by voice calls from mobile or fixed (land-line) phones.

- In Lithuania there live about 40 thousand persons with severe hearing and (or) speaking disorders – the deaf and hard of hearing persons, i.e. persons whose hearing degree does not allow them to communicate in the speaking mode. About 35 thousand persons are older than 15 years. The results of the polling survey "Deaf access 112", performed in the framework of preparation of this Feasibility Study, indicate that majority of persons having hearing and (or) speaking disorders would like to have the possibility to call the emergency services by a single emergency call number 112 (in expert estimations this number of persons would reach more than 32 thousand).

- The demand of persons having hearing and (or) speaking disabilities to have the possibility to call the emergency assistance independently, without external mediation, is partly increased by the under-developed information environment of these persons, especially insufficient and inadequate accessibility of the sign language interpretation services.

- Thanks to the initiatives of the organisations representing the needs of the deaf, firstly the Lithuanian Association of the Deaf (LAD), recently the introduction of the emergency call services via telephone number 112 for the persons with hearing and (or) speaking disabilities is actively discussed in the state institutions, also in the Parliament of the Republic of Lithuania (Seimas). In all the discussions the representatives of participating institutions acknowledge the problem's topicality, relevance and urgency to introduce the aforesaid service as soon as possible.

- Experience of different foreign countries in provision of emergency services to the deaf shows that presently SMS message is a dominant mode to accept the emergency notices from the deaf and to respond in the emergency operation centres. Frequently other modes are also used, or even their combinations. The organisational aspects of services of emergency operation for the deaf differ by the country; one of the different aspects is necessary or not necessary pre-registration (subscription). Presently executable EU project REACH112 is intended to introduce the new solution of remote communication by text, voice and video enabling the disabled persons independently use the emergency call services. However, this project is still in the preparation process, presently the pilot researches only take place, their results will be presented only in the mid-year of 2012. The solutions, based on these received results, will be possible to implement in Lithuania only after 7 years (in expert estimation).

- The results of the polling survey "Deaf Access 112" indicate that 82% respondents (28-29 thousand persons, living in Lithuania with the hearing and (or) speaking disabilities) would prefer to call the emergency assistance via SMS message. However, the ERC has no yet technical possibilities to guarantee the acceptance, reception and sending of the emergency notices by SMS messaging system.

- The ERC implements the project „Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the Emergency Calls, Manage the Emergency Operation Forces", which intends the expansion, development and modernisation of the electronic services increasing the scope of their operation from Vilnius city and Vilnius district to the entire territory of the Republic of Lithuania. The project envisages the solution related with reception of the SMS message in the ERC facilities, but this solution is more of general profile, it does not include the particularities needed for the emergency call services for the persons with hearing and (or) speaking disabilities. Thus the ERC actively cooperates with other institutions and searches for optimal solution of this problem.

- Basing on the information collected during the preparation of this Feasibility Study, 7 technical alternatives for the adaptation of emergency call services for the deaf could be distinguished:

(1)   "Standard SMS",

(2)   "Advanced SMS",

(3)   "SMS through the interpreter",

(4)   "Subscription + "silent" call+ SMS messaging",

(5)   "Dedicated real time text" application,

(6)   "Video call",

(7)   "Text transfer during the voice call (SAT technology)".

- Quantitative assessment of technical alternatives and their functional possibilities, performed on the base of 13 (thirteen) selected criteria, indicated that two technical alternatives No. 4 "Subscription+"silent" call+ SMS messaging" and No. 7 "Text transfer during voice call (SAT technology)" are the closest ones to the project implementation strategy presented in this document. The main arguments, deciding the selection of these two alternatives, were as follows: sufficiently clear procedure of technical implementation, no demand of essential technological amendments/modifications, medium time term required for implementation of these alternatives and principal conformity to the necessary level of service quality. There should be noted that neither the fourth (No. 4) alternative nor the seventh (No. 7) alternative completely comply with all the

required functional requirements, on the other side, they both satisfy the minimal quality standards.

- The financial assessment of the technical alternatives, selected in the qualitative estimation stage, was performed using methodology of discounted cash flows. **The financial calculations indicated that after consideration of assumption that the 4th technical alternative „Subscription + „silent" call + SMS messaging" is temporary, i. e. after 7 years this alternative would be changed by another alternative, REACH112 project solution, and meanwhile the 7th technical alternative „Text transfer during voice call (SAT technology)" is a long-term solution (unalterable, not changed by new REACH112 project solution), then the 7th alternative is more economically feasible (i. e. more cost-effective, least-cost) than the 4th alternative.**

- After final estimation of qualitative and financial assessment results, it was determined that **optimal technical alternative of the project execution is No. 7 (the seventh alternative) „Text transfer during voice call (SAT technology)".** The seventh alternative is more attractive than the fourth alternative, because (a) it provides the possibility to communicate between the caller and ERC employee in real time regime (or close to it), (b) it has opportunity to give priority for emergency messages in the mobile network; (c) the present value of alternative's costs is less when the temporality of the fourth alternative is considered. This alternative is less attractive only if comparing the solutions' acceptability to the users, but its acceptability is considered to be low because of the low knowledge and low prevalence of this technology.

- As the acceptability of the solution for the users is one of the most important criteria of alternatives' assessment, the disadvantage of the optimal (No. 7) technical alternative "Text transfer during voice call (SAT technology)" related with the acceptability issue, shall be minimized by preparation of very convenient format of text dialogue for the deaf (template of initiation of automatic conversation and format of questions-replies and etc.), i.e. it is advisable to created the text dialogue prototype in the earliest alternative's implementation stage, to test it in the deaf community and improve it according to the wishes and requests from the deaf community.

- As in case of optimal alternative, the introduction of the emergency call services via single emergency number 112 for the persons with hearing and (or) speaking disabilities is based on text communication infrastructure, the determination of organisational issues of introduction of this services shall consider several aspects. The written language of the deaf in most cases is not well understood by the hearing persons. It would be important to train the 112-service staff in order they would comprehend the particularities of the written language of the deaf. The issue of the same importance would be organisation of trainings and seminars for the deaf persons in order to inform them how to write a proper emergency message and send it to 112-service. In this respect the favourable circumstances are related with well-developed structure of the LAD and its

divisions, other organisations founded by the LAD and establishments providing the direct services (of communication) to the deaf, this territorial network enables to organise the training seminars widely and expeditiously, also to perform the public awareness and information campaign necessary to guarantee the proper implementation process.

- The proposed infrastructure implementation of the seventh (No. 7) technical alternative "Text transfer during voice call (SAT technology)" shall be coordinated, harmonized and executed in concordance with the early mentioned ERC infrastructure development project. Creation and implementation of the separate, interim technical solutions for only 2 year period (until the ERC will finish the implementation of its infrastructure project in the end of 2012) would be economically infeasible, technically complicated and organisationally confusing. The possibilities, provided for the deaf to use the emergency services via single emergency call number 112 based on the seventh (No. 7) alternative "Text transfer during voice call (SAT technology)" earlier than the projected ERC infrastructure installation is finished, shall be discussed separately in the sequence of project implementation, considering all technical and managerial aspects of the project.

- The project implementation duration is 33 months from the 3rd quarter of 2010 to the 1st quarter of 2013. The implementation of the project would include these groups of different activities: (a) pre-project works intended to ensure the project financing, (b) introduction of infrastructure of communication by text, (c) creation of the database of the deaf and (d) implementation of initial information campaign.

- In order to guarantee the fluent project implementation it is advisable to create the proper organisational structure (working group), which would include the staff from three organisations – the ERC, Lithuanian Association of the Deaf and the Department of the Affairs of the Disabled under the Ministry of Social Security and Labour.

- It is assessed that the total price of the adaptation of emergency services via single emergency number 112, after selection of the seventh technical alternative "Text transfer during voice call (SAT technology)", would reach 1.67 mill. Litas for 10 years period. It should be noted that the indicated price is only preliminary. The exact and precise price would have to be estimated after itemizing of technical and functional requirements related with the project execution after selection of the service providers and negotiation with the mobile communication network operators.

8. ABBREVIATIONS USED IN TEXT

ERC – Emergency Response Centre

RERC - Regional Emergency Response Centres

ERCIS – ERC Information System

DAD – Department of the Affairs of the Disabled under the Ministry of Social Security and Labour

MSSL – Ministry of Social Security and Labour

IP – Internet protocol

IM – Instant Messaging

LAD – Lithuanian Association of the Deaf

FRD – Fire and Rescue Department under the Ministry of Interior

RTT – Real Time Text

SMS – Short Message Service

CTAD – Centre of Technical Aid for The Disabled under Ministry of Social Security and Labour

TAM – Technical Aid Measures

TTY – Tele TYpewriter

VRCD – Vilnius Rehabilitation Centre for the Deaf

TB - Territorial Board (of the LAD)

Legislation

COUNCIL DECISION OF THE EUROPEAN COMMUNITIES of 29 July 1991 on the introduction of a single European emergency call number (91/396/EEC).

DIRECTIVE 2002/22/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

Law on Emergency Response Centre of the Republic of Lithuania No. IX-2246 (Official journal „Valstybes zinios", 2004, No. 90-3306). *Official translation to English 2 May 2006.*

Law on Electronic Communications of the Republic of Lithuania No. IX-2135 (Official journal „Valstybes zinios", 2004, No. 69-2382). *Official translation to English 15 April 2004.*

Decree No. 850 of the Government of the Republic of Lithuania of 7 June 2002 on approval of National Programme of Social Integration of Persons with Disabilities 2003-2012 (Official journal „Valstybes zinios", 2002, No. 57-2335). *Only in Lithuanian.*

Decree No. 1500 of the Government of the Republic of Lithuania of 25 September 2002 on approval of strategy and its implementation plan of the establishment of the emergency response centre and introduction of the single emergency call number 112 (Official journal „Valstybes zinios", 2002, No. 95-4114). *Only in Lithuanian.*

Decree No. 896 of the Government of the Republic of Lithuania of 17 August 2005 on approval of Programme of Lithuanian sign language use and provision of interpretation services 2005–2008 (Official journal „Valstybes zinios", 2005, No. 101-3745). *Only in Lithuanian.*

Decree No. 1426 of the Government of the Republic of Lithuania of 23 December 2005 on approval of Statutes and Composition of the Board of the Affairs of the Disabled under the Ministry of Social Security and Labour" (Official journal „Valstybes zinios", 2005, No. 152-5603). *Only in Lithuanian.*

Decree No. 866 of the Government of the Republic of Lithuania of 3 September 2008 on approval of programme of development of infrastructure of emergency services of single emergency call number 112 (Official journal „Valstybes zinios", 2008, No. 105-4025). *Only in Lithuanian.*

Decree No. 550 of the Government of the Republic of Lithuania of 3 June 2009 on approval of programme of use of Lithuanian sign language and provision of interpretation services 2009-2012 (Official journal „Valstybes zinios", 2009, Nr. 70-2844). *Only in Lithuanian.*

Decree No. 1313 of the Government of the Republic of Lithuania of 7 October 2009 on amendment of the Decree No. 866 of the Government of the Republic of Lithuania of 3

September 2008 on amendment of the approval of programme of development of infrastructure of emergency services of single emergency call number 112 (Official journal „Valstybes zinios", 2009, No. 126-5428). *Only in Lithuanian.*

Decree No. 227 of the Government of the Republic of Lithuania of 3 March 2010 on amendment of Decree No. 850 of the Government of the Republic of Lithuania of 7 June 2002 on approval of National Programme of Social Integration of Persons with Disabilities 2003-2012 (Official journal „Valstybes zinios", 2010, No. 29-1345). *Only in Lithuanian.*

Decree No. IV-412 of the Minister of Interior of the Republic of Lithuania of 9 December 2004 on approval of the Programme of Public Information about the single emergency call number 112 and its adaptation to the disabled (Official journal „Valstybes zinios", 2004, No. 180-6678). *Only in Lithuanian.*

Decree No.1-222 of the Director of the Fire and Rescue Department under the Ministry of Interior of the Republic of Lithuania of 18 July 2008 on approval of the Statutes and Structure of the Emergency Response Centre (Official journal „Valstybes zinios", 2008, No. 86-3445). *Only in Lithuanian.*

Statistical databases

Statistics (tables by topics): Population and social statistics < http://www.stat.gov.lt/ lt/ pages/view/?id =1110>: Date of access: 4 May 2010

Statistics (tables by topics): Regional statistics < http://www.stat.gov.lt /lt/ pages/ view/?id= 1112 >: Date of access: 4 May 2010

Methodologies

European Commission. Directorate General Regional Policy. (2008). Guide to Cost-Benefit Analysis of Investment Projects. Website:
http://ec.europa.eu/regional_policy/sources/docgener/guides/cost/guide2008_en.pdf

Methodology of Investment Projects Preparation in Public Sector. Public Enterprise Central Project Management Agency. Vilnius, 2004.

Other sources

Investment project: „Provision of Regional Divisions of Emergency Response Centre by Specialized Hardware and Software in order to Respond and Handle the Emergency Calls, Manage the Emergency Operation Forces". Fire and Rescue Department under the Ministry of the Interior of the Republic of Lithuania, Vilnius, 2010.

ERC Activities Report 2008 <www.ERC112.lt/download.php?file_id=154> : Date of access: 21 April 2010.

ERC Activities Report 2009 < www.ERC112.lt/download.php?file_id=165>: Date of access: 21 April 2010.

REACH112 REsponding to All Citizens Needing Help: Deliverable Report (D2.1, v.1.1) / RNID and others, 18/02/2010.

SMS in Emergency < http://www.emergencysms.org.uk> : Date of access: 8 April 2010.

SMS in Emergency Communication: Report /KoKom, Bergen, November 2009.

Text Messaging to 9-1-1 (T9-1-1) Service: Report to the CRTC (Number ESRE0051) / Emergency Services Working Group (ESWG), January 21, 2010.

Trials begin on Emergency SMS system <http://www.ofcom.org.uk/consumer/2009/09/trials-begin-on-emergency-sms-system/> : Date of access: 8 April 2010.

Centre of Technical Aid for the Disabled. Activities Report 2009/ Centre of Technical Aid for the Disabled (CTAD) under the Ministry of Social Security and Labour, 5 February 2010.

10.1. QUESTIONNAIRE ON THE ACCESS OF EMERGENCY SERVICES 112 TO THE DEAF

Translation from Lithuanian

1. Respondent' s Data

1.1. Sex:
☐ Male
☐ Female

1.2. Age:
☐ from 16 to 25
☐ from 26 to 35
☐ from 36 to 45
☐ from 46 to 60
☐ above 60

1.3 Disability
☐ deaf (communicating by sign language)
☐ hard of hearing (speaking Lithuanian language)
☐ having speaking disorders
☐ deaf-blind

1.4 Occupation
☐ unemployed
☐ employed
☐ schoolpupil/student
☐ retired_____

1.5. Living location
City/municipality/district/rural location _____

1.6. What technical measures do You usually use?
☐ Mobile phone
☐ Video phone
☐ Computer with internet access
☐ Wire phone

2. Analysis of situation:

2.1. Do you know about single emergency telephone number 112?
☐ Yes, I know
☐ No, I do not know
☐ I heard something but I do not know how it functions

2.2. In your opinion, are the emergency services presently accessible for you by emergency telephone number 112?
☐ Yes
☐ No
☐ Other (fill in) _____

2.3. Have you found yourself in dangerous situation when you needed to call the immediate police, fire and rescue or ambulance assistance?
☐ Yes
☐ No *(if no, go to question 2.13.)*

2.4. What situation have you found yourself in:
☐ The location (premise), where you was present, was on fire
☐ You met with a car accident
☐ You was attacked, contused, robbed, riffled
☐ You suffered trauma, burn, serious injury
☐ Other (fill in)...

2.5. Did you attempt to call the emergency services being in this dangerous situation?
☐ Yes
☐ No

2.6. How did you call the emergency services?
☐ I asked a hearing and speaking person who was beside to do so
☐ I asked a hearing and speaking person whom I sent a SMS message explaining the situation
☐ I asked a hearing and speaking person whom I called by video phone and explained the situation using sign language
☐ I called the emergency services in other way (fill in)

_____

2.7. How long did it take to explain what you needed the emergency assistance?
☐ less than 1 minute
☐ from 1 to 2 minutes
☐ from 2 to 7 minutes
☐ from 7 to 15 minutes
☐ from 15 to 30 minutes
☐ more than 30 minutes

2.8. Did the contacted person understood at once that you needed the emergency assistance?
☐ Yes
☐ No

2.9. How many times did you have to specify the information (explain the situation once again)?
☐ 1 time
☐ 2 times
☐ 3 times
☐ 4 times
☐ 5 times
☐ 6 and more times

2.10. Do you think that the emergency assistance was provided to you too lately?
☐ Yes
☐ No

2.11. Was the emergency service provided to you in a way you needed?
☐ Yes
☐ No

2.12. Do you think that the emergency assistance was not provided properly because you are deaf?
☐ Yes
☐ No

2.13. Can you call the emergency services independently (without external help) by phone?
☐ Yes
☐ No
☐ Other (fill in) _____

2.14. Who helps (would help) you to call the emergency services?
☐ Relatives
☐ Neighbours
☐ Bypassers
☐ Other (fill in) _____

3. Expectations

3.1. Do you know how the deaf persons can call the emergency services in the European Union member-states?
☐ Yes (please comment) _____
☐ No

3.2. Do you agree that the call of emergency services shall be accessible for the deaf by emergency telephone number 112?
☐ Yes
☐ No

3.3. Would you agree that the deaf would have the specially for them created new emergency telephone number?
☐ Yes
☐ No
☐ I don't know

3.4. Would you agree to register your private data (address, telephone) in the Emergency Response Centre in order to receive the emergency assistance (with subscription of the emergency services)?
☐ Yes
☐ No
☐ I don't know

3.5. Would you agree to pay for the call of the emergency services (pay for a SMS message, call)?
☐ Yes
☐ No, emergency call shall be free of charge
☐ I don't know

3.6. The deaf should have the possibility to call the emergency assistance by emergency number 112:
☐ directly (without mediator) contacting the 112-service operator
☐ indirectly, i.e. with mediation of a hearing and speaking mediator (interpreter)
☐ I have no opinion

3.7. How would you like to call the emergency services (which way of calling would be the most acceptable for you)?
☐ by mobile phone sending a SMS message by number 112
☐ by mobile phone sending a video call (in sign language)
☐ by special device to call the emergencies
☐ by internet (sending a message via e-mail)
☐ by communication in text using real time regime
☐ through the duty interpreter
☐ by special codes (every situation would be coded)
☐ other (propose your solution)
_____

3.8. How much time, in your opinion, would the conversation with the 112-service operator take from the moment of the first call (message)?
☐ less than 1 minute
☐ from 1 to 2 minutes
☐ from 2 to 7 minutes
☐ from 7 to 15 minutes
☐ from 15 to 30 minutes

3.9. What capacities should the operators, accepting the emergency calls, have?
☐ They should know the sign language
☐ They should learn the particuliarities of the written language of the deaf
☐ Other (fill in) _____

3.10. Would it be necessary, in your opinion, for the 112-service operator to provide the guidance advices how to behave in the particular dangerous situation?

☐ Yes, it would be necessary
☐ The advices are not necessary
☐ Sometimes (write the particular cases)_____

Your comments
_____
_____

_____

We thank you for your answers.

10.2. DATABASE OF THE DEAF (TEMPLATE)

Table No. 11. Format of Data Collection (Template)

	Telephone number	Municipality	City, village, town, steading, railway station	Ward	Street1, alley (a.), avenue (av.), square (sq.), highway (h.)	Street2, alley (a.), avenue (av.), square (sq.), highway (h.)	Building No. 1	Building No. 2	Apartment No.	Name	Surname	Disability	Notes (second disability, other remarks)
	LIST OF DATA AND TELEHONE NUMBERS FOR THE												
	ADAPTATION OF THE EMERGENCY CALL NUMBER 112 FOR THE DEAF												
1.	37069801010	Vilnius city municipality	Vilnius	Naujininkai ward	Kaminkelio		2		4	Name	Surname	Deaf	
2.	37069801010	Vilnius district municipality	Rieses village	Avizieniai ward	Ezero		5			Name	Surname	Hard of hearing	
3.	37069801010	Vilnius district municipality	Sumskas town	Kalveliai ward	Sodo		4A			Name	Surname	Deaf	
4.	37069801010	Vilnius city municipality	Vilnius	Naujamiestis ward	Kauno		37		8	Name	Surname	Deaf	

- Source: Public Enterprise Surdology Centre (Ieva Cereskaite, senior specialist).

Picture No. 7. Consent to Use of Data (Template)*

Translation from Lithuanian

Consent to Use of Personal Data of the Natural Persons, willing to be included into the database of the Emergency Response Centre, where their personal data will be used in order to provide the emergency services via single emergency call number 112

_____
(Name, Surname of the Natural Person)

To: Centre of Surdology
            St. Kazimiero street 3, Vilnius

CONSENT TO USE OF PERSONAL DATA OF THE NATURAL PERSON

__day_____month____20___year

I do acknowledge that before I have filled the template of this Consent, I had been acquainted with the procedures of collection, accumulation, storage and use as defined in the Law of Legal Protection of Personal Data (Official Journal "Valstybes zinios", 2008, No. 22-804) in order to provide the emergency services via single emergency call number 112 to the disabled (the deaf).

I, _____, do agree that my private data: telephone number, municipality, settlement (city, town, village), ward, street, building number or apartment number, name, surname, type of disability, notes would be collected by the organizations authorized by Public Enterprise Centre of Surdology basing on the provisions of the Law of Legal Protection of Personal Data (Official Journal "Valstybes zinios", 2008, No. 22-804) and they would be managed and accumulated in the Public Enterprise Centre of Surdology, located in St. Kazimiero street No. 3 in Vilnius.

I do agree that my saved personal data would be incorporated into the information base of the Emergency Response Centre, and the Emergency Response Centre would use my data indicated in this Consent in order to ensure the emergency services provided to me via single emergency call number 112.

I do agree that following the procedures determined under the legislation of the Republic of Lithuania, the Emergency Response Centre would transfer my personal data accumulated in the Public Enterprise Centre of Surdology to the third parties having the legal interests and providing the emergency assistance services via emergency call number 112.

I am familiar that:

1. I have the right to get acquainted with my private date collected, accumulated and managed by the Public Enterprise Centre of Surdology, to ask to supplement, specify my presented private data or to rectify wrong, lacking precision and particularity my private data, ask to prohibit their use.
2. I have the right to give no consent that my personal data would be used in provision of emergency services via single emergency call number 112, and presenting legally based objections not to agree that my data would be managed due to legal interests of data managers or third parties, whom these my private data are transferred.

(Signature)   (Name, Surname)

* Source: Public Enterprise Surdology Centre (Ieva Cereskaite, senior specialist).

Table No. 12. Organisations that will be involved in data collection *

Centres of the Sign Language Interpreters
1. Vilnius County Sign Language Interpreters Centre
2. Kaunas County Sign Language Interpreters Centre
3. Klaipeda County Sign Language Interpreters Centre
4. Panevezys County Sign Language Interpreters Centre
5. Siauliai County Sign Language Interpreters Centre
6. Marijampole County Sign Language Interpreters Centre
7. Alytus County Sign Language Interpreters Centre

Public establishments and organisations of the Lithuanian Association of the Deaf (LAD)
8. Public Enterprise National Rehabilitation Centre of the Deaf
9. Public Enterprise Vilnius Rehabilitation Centre of the Deaf
10. Alytus primary organisation of Vilnius Territorial Board (TB) of the LAD
11. Public Enterprise Kaunas Rehabilitation Centre of the Deaf
12. Kedainiai primary organisation of Kaunas TB of the LAD
13. Public Enterprise Klaipeda Rehabilitation Centre of the Deaf
14. Marijampole primary organisation of Kaunas TB of the LAD
15. Mazeikiai District Union of the Deaf
16. Public Enterprise Panevezys Rehabilitation Centre of the Deaf
17. Public Enterprise Siauliai Rehabilitation Centre of the Deaf
18. Telsiai Society of the Deaf „Tyla" („Silence")
19. Utena primary organisation of Panevezys TB of the LAD
20. Vilkaviskis primary organisation of Kaunas TB of the LAD
21. Lithuanian Association of Families with Deaf and Hearing Impaired Children „Pagava"

*Source: Public Enterprise Surdology Centre (Ieva Cereskaite, senior specialist).

Picture No. 8. Functional requirements of the database of the deaf and its access (Working document) *

Principal architecture of the system
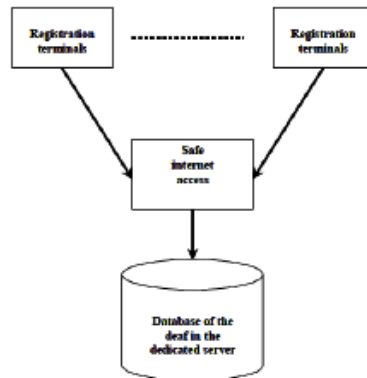
Database

One record (about one person) will have 10 fields (cells). The number of target persons is about 40 thousand people. Thus, initially the number of records will not exceed 40 thousand. Evaluating the change and update of the records, after some time the number of records may reach 100-150 thousand.

The database would be created using MySQL DMVS and Linux server in the data centre or in other organisation operating the server.

Registration by internet

Essential question – how to achieve that all the persons with disabilities would deliver their data, their records (telephone numbers and etc.) would be included in the database, and the data would be updated in case of any change (cases of telephone number change, loss of the telephone device, etc.). It would be wished that only persons with disabilities would register into the database (and also would change their data), so it would be necessary to ensure a proper authorization mechanism.

In our opinion, this issue could be solved in the best way if there would be assured the registration via internet and authorization by mobile phones.

We think about this scheme:

- The disabled person registers himself/herself, he/she enters his/her telephone number, and the password is sent to him/her, person with this password registers in the database. In this way it would be guaranteed that the persons register with their own mobile phones and these phones are functioning.
- Additionally the registration of social workers would be used; they would also participate in the process of data input. These social workers will have the names of the end users (in advance these names would be attached and saved in the database), after the login by the name of this user to the database, the password will be sent to the mobile phone the one inputted into the database and they authorize with;
- In order to update the data again the telephone number will be used and also e.g. name and surname. After inspection of conformity of the telephone number, name and surname with the records in the database, the temporary password is sent to the phone, which the person authorizes with and can update/change the recorded data in the database;
- Data input format will be sufficiently simple (mostly 10 cells: mobile telephone number, person's name, surname, type of disability, residence address, names, surnames and telephone numbers of the social workers and guardians), but the conformity of the inputted data will have to be checked according to the requirements (e.g. "Vilnius c.", not "Vilnius" or "Vilnius city"). Also the duplication of the records in the database would be inspected (i.e. there will be no possibility for two similar telephone numbers, if the address is already existing in the data base, the additional remarks will be needed to input for clarification);

Data transmission to the ERC

It is planned that the database itself (computer) would be present in the data centre, and data will be sent (e.g. by coded e-mail in special format) to the computer of the ERC operator (as ERC desires no direct synchronization under safety considerations). This e-mail will have to be sent automatically only when the new or changed record appears in the database.

*Note: Working document would be used for preliminary estimation of price of creation of database and its access, if there were used the services from the commercial suppliers (see Chapter 10.3).

10.3. ASSUMPTIONS OF FINANCIAL CALCULATIONS

The project costs and their assumptions are divided into three groups according to the target of the costs: (1) infrastructure of communication in text, (2) infrastructure of the database of the deaf, and (3) end-users. Below there are itemized the costs of both project technical alternatives.

Below the assumptions of financial analysis of investigated technical alternatives are presented, in every case it is indicated where they are applied for. In majority of cases the assessment of financial assumptions demanded respective assumptions of technical solutions, which will be adapted during system implementation process. In this case the authors of this Feasibility Study referred on the assumptions based on the opinions and expert evaluations of working group members, project partners, third parties and their own estimations in order to evaluate the costs of technical alternatives as accurately as possible. The fact was ignored that the presented assumptions may significantly vary in process of project implementation and preparation of explicit functional requirements for the implementation works.

Infrastructure of communication in text

The infrastructure of text communication is defined as all technical and organisational solutions necessary to ensure the conversations (communications) in text between the deaf persons and ERC operators.

ERC IS adaptation (re-adjustment)

Estimating the costs of ERC IS adaptation (re-adjustment) it is planned that infrastructure of text communication will be integrated with infrastructure of voice communication, i.e. the text communication will use the same computerized workplaces of the respective ERC operators. Presently, the ERC infrastructure modernisation and development project, executed by Fire and Rescue Department under the Ministry of Interior and the ERC, does not suppose the ERC IS adaptation (re-adjustment) in order to enable the text communication (in the new functional ERC IS requirements there is foreseen only the possibility to accept the SMS messages). Thus, the ERC IS adaptation for the needs of the deaf (communication in text) will include these works:

(1) Creation of real time text communication interface, dedicated to use in the ERC IS work places (similar to real time chat interface), which would enable the ERC operator to see all the tile of the developing conversation (i.e. the asked operator's questions and caller's answers) in the separate information system window;

(2) Composition of infrastructure of data interchange with the mobile network operators (coordination of data interchange protocols, conformable programming of the ERC IS, installation of the physical connection);

(3) Creation of infrastructure of storage of all the text dialogues (conversations) in the ERCIS database , analogous to the storage of all voice calls;

Table No. 13. ERC IS adaptation (re-adjustment) costs

Title	Costs, LTL	Basis
ERCIS adaptation (re-adjustment)	500.000	ERC expert assessment

Sources:
Tadas Maroščikas, ERC Deputy Head
Saulius Petrauskas, Senior Specialist of ERC Information Technologies Division
Contact data: http://www.bpc112.lt/index/lt/kontaktai

In the financial assessment of the alternatives the assumption, that the ERC IS adaptation (re-adjustment) costs of both investigated alternatives will be analogous, was leading.

<u>ERC staff training</u>

Due to particularities of communication with the persons having hearing and (or) speaking disabilities (as the deaf persons use the specific grammar of the written language related with the sign language), the ERC operators, who will communicate with the deaf, shall be respectively instructed and trained.

It was projected that after implementation of ERC infrastructure development project and establishment of two Regional Emergency Response Centres (RERC) in Vilnius and Kaunas, 4 (four) instructed (on communication with the deaf) operators will work in one shift (i.e. at one time, contemporaneously), i.e. 2 (two) workplaces in every RERC. It was assessed that in order to guarantee the continuous, uninterrupted service (24 hours per day, 7 days per week, without day-off during national holidays), in average the 5 (five) shifts are required. Thus, 20 (twenty) operators shall be trained in order to handle and response the deaf calls properly.

Table No. 14. ERC staff training costs

Title	Value	Basis
Preparation of material, LTL	1.000	LAD expert assessment
Courses (lecturer, equipment), LTL	2.000	
Number of courses (first years)	2	
Number of courses (later years)	1	
Total (first years), LTL	**5.000**	
Total (later years), LTL	**2.000**	

Sources:
Svetlana Litvinaitė, LAD project coordinator
Contact data: http://www.lkd.lt/id-asociacija_lietuvos_kurciuju_draugija.html

It is emphasized that due to the low number of the deaf persons in Lithuania, these operators will handle the ordinary calls too, but in case of necessity all the calls from the deaf persons and text dialogues with the request for emergency assistance will be directed to these operators. Because of this reason, the remuneration costs of these trained ERC operators are not included into the costs of implementation and execution of this project.

These costs are equal for both alternatives.

Programming of text dialogue

These costs will incur only in case of selection of the seventh technical alternative (No. 7) "Text transfer during voice call (SAT technology)". In this case, the communication is initiated during voice call and is performed when the SIM card interprets the WML queries, routed by SMS messaging service (safe OTA data traffic channel). Using the interfaces of the ERC information system and mobile network operators' servers, the WML queries would be sent from workplaces of ERC operators, as it was depicted earlier (see Picture No. 4 "Principal scheme of SAT technology").

WML queries shall be prepared in advances (programmed WML code) according to the format and requirements of the required text dialogue developed between the deaf and the ERC operator.

Table No. 15. Assumptions of programming costs of text dialogue

Title	Value	Basis
Programming of WML code for one operator, LTL	20.000	Omnitel UAB commercial offer
Number of operators	3	
Total	**60.000**	
Sources:		
Commercial offer No. 6400-1729 of 2 July 2010 of OMNITEL UAB (see Annexes)		
Ramūnas Šablinskas, Chief Specialist of Representation Group of OMNITEL UAB		

Service Charge

Likely, that text messaging services will be charged by the mobile network operators applying the fixed monthly fee. As the service is non-standard, the procedure of charge settlement may be determined only in negotiation with the mobile network operators. The assumptions, used in the financial assessment, are based only on single discussion with one mobile network operator (its one staff member), thus they are very preliminary and interim.

Table 16. Assumptions of SAT service charge

Title	Value	Basis
Monthly charge of the service, LTL	500	Working discussion
Number of operators	3	
Total annually, LTL	**18.000**	

Sources:
Discussion with Ramūnas Šablinskas, Chief Specialist of Representation Group of OMNITEL UAB

Infrastructure of the database of the deaf

The assumptions of the infrastructure costs of database of the deaf are assessed on the base of scheme proposed by the authors of this Feasibility Study (see 6.3.1.2. "Proposed mechanism of data collection, storage and administration"). The infrastructure of the database of the deaf does not depend on the selected technical alternative, i.e. the assumptions of these costs are the same for both alternatives: for the fourth alternative (No. 4) "Subscription+"Silent" call+SMS messaging" and the seventh alternative (No. 7) "Text transfer during voice call (SAT technology)".

Programming of the database and safe internet access

These costs include the programming of the database in the server possessed by the DAD under MSSL and creation and installation of the safe internet webpage (including the mechanism of the users' authorization). The preliminary functional requirements for the database and safe internet access could be found in the earlier Chapters (see Picture No. 8 "Functional requirements of the database of the deaf and its access (Working Document)").

Table No. 17. Costs of the database infrastructure

Title	Value	Basis
Works costs, LTL	70.000	Preliminary offer of potential supplier

Sources:
Commercial Offer of 2 August 2010 of NET FREQUENCY UAB, Director Darius Lebedzinskas (see Annexes)

Training of staff of the LAD organisations

It was estimated that the staff of the LAD organisations will collect the data from the deaf persons and input the collected data into the database. In total 21 LAD organisations will be entitled to manage the data process (see Table No. 12 „Organisations involved in the data collection").

Estimated, that in the beginning of the project the training seminar of 2-3 days will be organised for the LAD staff members, which could be repeated according to the demand.

Also the instructions (of authorization, data input, etc.) will be prepared for proper system use, they will be available on the LAD's webpage.

Table No. 18. Costs of training of LAD staff

Title	Value	Basis
Preparation of seminar material, LTL	2.000	LAD and Economic Research Centre expert assessment
Lecturers remuneration	2.000	
Equipment, other costs	5.000	
Total, LTL	**9.000**	

Administration

During the preparation of this Feasibility Study one duty staff of Public Enterprise Centre of Surdology was appointed in order to coordinate the creation and use of the database of the deaf, collection of data and its input. In estimation of the organisers of the Feasibility Study, despite of the selected data collection mechanism, the coordinators' duty will be necessary in all cases.

Table 19. Administration costs of data collection

Title	Costs, LTL	Basis
Work remuneration of duty employee per year (including taxes)	22.000	LAD data
Costs of workplaces	400	
Total, annually, LTL	**22.400**	

Sources:
Svetlana Litvinaitė, LAD project coordinator
Contact data: http://www.lkd.lt/id-asociacija_lietuvos_kurciuju_draugija.html

End users

The assumptions of the costs, related with the end-users (the deaf persons), are the same for both technical alternatives. It is emphasized that the costs, related with the end users, do not mean that the deaf persons will have to cover them themselves – in many cases the financing of these costs will be a charge burden for the project executors (LAD, ERC).

Initial information campaign

Table below presents the assumptions of costs of initial information campaign. The details of the proposed actions of initial information campaign are presented in Chapter 6.3.2. "Information campaign".

Table No. 20. Assumptions of costs of initial information campaign

Title and clarification of the measure	Quantity	Price, LTL	Basis
Creation of basic communication elements			
Creation of internet webpage and related works	1 unit	2.500	(1)
Creation of information video	1 unit	20.000	(1)
Development, printing and distribution of the booklets	8000 units	12.500	(1)
Development and production of the souvenirs	5000 units	2.500	(3)
Creation of information poster for outdoor advertising	1 unit	500	(1)
Manufacture of information poster for outdoor advertising	43 units	1.075	(2)
Rent of advertising panes for outdoor advertising	2 weeks	2.189	(2)
External communication			
Relations with mass media	4 months	12.000	(1)
Preparation and distribution of two (2) press releases			
Organisation of article in the press			
Organisation of the reportage in TV news broadcasting programme			
Organisation of information video broadcasting			
Mutual social action with the mobile network operators	2 months	6.000	(1)
Presentations	2 units	1.200	(3)
Seminars for people with hearing disabilities	5 units	3.000	(3)
	Total:	**63.464**	

* Basis of assumptions of prices (see Annexes)
(1) Preliminary commercial offer from "KOMUNIKACIJA IR KONSULTANTAI UAB"
(2) Commercial offer of outdoor advertising from "JCDecaux LIETUVA UAB"
(3) Expert estimation of the organisers of the Feasibility Study and Working Group

Constant information campaign

Table below presents the assumptions of costs of constant information campaign. The details of the proposed information actions are presented in the Chapter 6.3.2. "Information campaign").

Table No. 21. Assumptions of costs of constant information campaign

Title and clarification of the measure	Quantity	Price, LTL	Basis
Creation of basic communication elements			
Update of internet webpage	1 unit	2.000	(3)
Printing of the booklets	500 units	500	(1)
Production of souvenirs	100 units	50	(3)
External communication			
Relations with mass media	4 months	12.000	(1)
Preparation and distribution of two (2) press releases			
Organisation of article in the press			
Organisation of the reportage in TV news broadcasting programme			
Organisation of information video broadcasting			
Mutual social action with the mobile network operators	2 months	6.000	(1)
Presentations	2 units	1.200	(3)
Seminars for people with hearing disabilities	5 units	3.000	(3)
	Total:	**24.750**	

* Basis of assumptions of prices (see Annexes)
(1) Preliminary commercial offer from "KOMUNIKACIJA IR KONSULTANTAI UAB"
(2) Commercial offer of outdoor advertising from "JCDecaux LIETUVA UAB"
(3) Expert estimation of the organisers of the Feasibility Study and Working Group

<u>Training of users</u>

The persons, registered in the database of the deaf (persons with subscription), i. e. persons willing to use the emergency services via single emergency telephone number using text, will be trained to use the system properly. It is projected that the representatives of the LAD organisations will organise the training seminars for the users during the constant work with the deaf using the material, prepared in the framework of the information campaign, thus the additional costs for this activity are not predictive.

<u>Replacement of the SIM cards</u>

In case of the seventh technical alternative (No. 7) "Text transfer during voice call (SAT technology)", it is estimated that all SIM cards of the mobile phones of the persons registered in the database will be changed by new ones in order to guarantee the operation of the SAT technology.

It should be emphasized that this assumption is very conservative, because, in opinion of mobile network operators, majority of the SIM cards available in the market do support the SAT technology. After technical check of the SIM cards of mobile phones hold by the subscribers, the costs would decrease significantly.

Table 22. Costs of replacement of the SIM cards

Title	Value	Basis
Number of users	9.000	Data of mobile
Average card price*, LTL	8	network operators
Total, annually, LTL	**72.000**	

Sources:
Service centres of mobile network operators (telephone conversations)
*SIM card prices: Omnitel UAB - 19 LTL, BITE and TELE2 - 1 LTL

Remark: Average card price is estimated considering the number of subscribers in the mobile network in Lithuania.

New SIM cards would be ordered by internet or phone during the registration of the deaf person to the database of the deaf.

<u>Price of SMS message</u>

The communication by text according to the fourth alternative (No. 4) „Subscription+"silent" call+SMS messaging" would be operated by sending the ordinary SMS messages that are fee-paying. Technically, the operators could enable the subscribers to send the SMS messages to 112-service for free, but the particular conditions shall be negotiated with every operator separately; also it could be projected that the message price will be compensated by their receivers (ERC). Basing on the conservative assumptions it is foreseen that SMS messages will be fee-paying and these costs are included into the project costs.

Table 23. Assumptions of the costs of the SMS messages

Title	Value	Basis
Number of calls from the deaf	1.000	Data of mobile network operators
Number of SMS messages via one conversation	10	
Average SMS message price, LTL	0,1	
Total, annually, LTL	**1.000**	

Sources:
Commercial offers of mobile network operators (see Annexes)

Picture No. 9. Preliminary offer of prices of the creation of the database and its access *

Translation from Lithuanian

Viktoras Veitas

From: Darius Lebedzinskas
Sent: 2 August 2010, 13:28
To: Viktoras Veitas
Subject: Deaf Access 112

Good day,
It is enough information for preliminary assessment. The realization is possible in several ways using different solutions, we will be engaged on that for a sum of 70 thousand without VAT.
We would use open source code programming languages and tools.

Respectfully,

Darius Lebedzinskas
NET FREQUENCY
Director
+370 37 793515
+370 612 03560
www.nfq.lt

On 28 07 2010 at 16:20 Viktoras Veitas wrote:

Good day,
Following our discussion on phone yesterday, I am sending the short description of the functional requirements of the access of the database of the deaf.
I would be interested if this description is enough to determine the preliminary price of this system (programming) and how long the programming works could take.
Please contact me if any obscurities appear or if there is a lack of any data.

Thank you,

VIktoras Veitas
Economic Research Centre
T. Vrublevskio g. 4, 01100 Vilnius
www.erc.lt
Mob. +370 686 26339
Skype:vveitas

*Remark: This offer was used for the purposes of the financial assessment of the technical alternatives. See Picture No. 8 for the preliminary description of functional requirements of the access to the database of the deaf.

Table No. 24. Letter from OMNITEL UAB (1st page)

Translation from Lithuanian

OMNITEL UAB

State budget enterprise
EMERGENCY RESPONSE CENTRE
Svitrigailos 18, Vilnius
E-mail: bpc112@vrm.lt

02 07 2010 No. 6400-1729
to 07 06 2010 No. 41D-448

DUE TO FEASIBILITY STUDY "POSSIBILITIES OF THE ADAPTATION OF THE EMERGENCY CALL NUMBER 112 FOR THE DEAF: EXPERIENCE OF LITHUANIA AND NORWAY ("DEAF ACCESS 112")

We present our answers to Your questions delivered in the letter No. 41D-448 dated on 07 06 2010:
1. Due to the special services for the deaf. Presently our enterprise provides several services that the deaf (among other users) can use for reciprocal communication:
   a. SMS messaging service;
   b. Video call service (video telephony and IP telephony);
   c. Instant messaging service (this service is supported by smart phones).
2. Due to free SMS messages to 112-service. Yes, this technical possibility exists, but the different subscribers would not be distinguished, free service would be valid for all OMNITEL's subscribers. The commercial conditions would be necessary to specify by individual contract, preliminary price of one SMS to ERC would cost 0,09 LTL.
3. Due to the "Advanced SMS" model:
   a. Presently prioritized SMS trafficking is impossible;
   b. Confirmation about SMS delivery is a standard SMS function, it would also operate with the SMS messaging to 112-service;
   c. Location determination is possible to realize, but this service (provided by partners) is fee-paying (accurate price is unknown as it is contractual);
   d. Number prohibition for SMS messages is not applied;
   e. Inhibition for unregistered users to send the SMS to 112-service is impossible, but it is possible to generate error notices, when the message is sent by a sender that is not registered in the system. There is a technical possibility not to tax the error notices.

Technical project implementation would involve these additional works:
- connection/configuration fee of short number: 2100 LTL,
- integration fee for the project: 1260,50 LTL.

The support of the short number is taxed by monthly charge of 420,17 LTL. More information see http://www.omnitel.lt/partneriams

Below we present comments on the possibilities to provide the services for the deaf corresponding to their needs.

Table No. 25. Letter from OMNITEL UAB (2nd page)

Translation from Lithuanian

Comment on advance registration (subscription) of the deaf persons.
Our experience of production of services shows that the advance registration is too high barrier for the potential service users. It is possible to believe that only part of potential users will register themselves, and in case of necessity they will have no phone which data they presented to the system (they will desire to use the service from another phone). Our recommendations would be – according to the possibilities to apply no active registration, and in case of need it would be better use "the blacklist" method, when the undisciplined users (after their identification) would loose their possibility to use the provided services for a while (for indicated time term).

Comment on the SMS messaging as a main communication channel.
In our opinion SMS message is not the most convenient communication channel in case of emergency. If there are possibilities, we propose to analyse other solution ways, we present some of them:

1. Video call
It is a standard service (in limits of 3G communication zone, this zone covers 80% of the Lithuanian population, about 20% of the Lithuanian territory), that is supported by majority of mobile phones. It is possible to realize technically that during video call the user would see the text on display, that would be inputted by the ERC operator in his/her system. Also it is technically feasible that user would write the text in real time, which may be seen both by the user and by the ERC operator. Our partners – enterprise INFOSPALVOS has potentiality to manufacture these installations (www.infospalvos.lt).

2. Text transmission during voice call.
It is a technical possibility allowing during telephone conversation to realize the text dialogue with a user: in his/her telephone display (on screen) the text dialogue is formulated where it is seen what the ERC operator wants to say (e.g. ERC operator's question) and there is a possibility to communicate by voice or to select the answer by telephone keyboard. Technology is called SIM Toolkit (STK). It is supported by all (95%) used telephones in Lithuania and all (95%) of OMNITEL SIM cards (possibility to formulate the dialogue depends on the SIM card). The realization of this system would cost about 20000 LTL (depending on the needs).

Functioning of the system: person calls by mobile phone to the 112-service, ERC operator responds to the call. If the user does not speak/keeps silence or introduces as a deaf person, the operator send the dialogue to the mobile phone: "If you want to communicate by text, select YES", the user selects "YES" and receives the text input cell, where he/she can write the emergency problem, if the user can speak but can not hear, then the user can perform a dialogue by voice, but the ERC operators will answer by text.

3. Text dialogue.
There is a technical possibility to create the internet webpage (WAP or simplified HTML), which would allow to communicate with the ERC in text dialogue mode. Almost all the phones available in the market support the data transmission and have WAP and HTML browsers. The user himself/herself would have to launch the browser, or the browser could be launched from ERC location (this solution will operate by OMNITEL SIM cards similarly as in the case No.2).

Respectfully,
OMNITEL representation group
Chief Specialist   (signature)   Ramunas Sablinskas
                                       (signed by electronic signature)

Phone: +370 698 63289
R.Sablinskas@omnitel.net

Table No. 26. Official letter from BITE LIETUVA UAB

Translation from Lithuanian

BITE LIETUVA UAB

To:
Emergency Response Centre   29 06 2010 No. 4011-21
Head of the Service   to 07 06 2010 No. 41D-488
Arturas Kedavicius
Svitrigailos street 18
LT-03223 Vilnius

DUE TO FEASIBILITY STUDY "POSSIBILITIES OF THE ADAPTATION OF THE EMERGENCY CALL NUMBER 112 FOR THE DEAF: EXPERIENCE OF LITHUANIA AND NORWAY ("DEAF ACCESS 112")

We present our answers to Your questions delivered in the letter No. 41D-448 dated on 07 06 2010:

1) BITE LIETUVA UAB does not provide any special services to the deaf persons.
2) BITE LIETUVA UAB could enable the conditions for the persons with disability to send the free SMS messages to the 112-service.
3)
   a) SMS message sent by number 112 would have no priority in respect to other SMS messages;
   b) The confirmation about reception of the message would be possible to send to the deaf person or other person with disability;
   c) Principally, SMS message could be send to the ERC together with the location determination information, but this requires greater analysis of possibilities and investments;
   d) There is no possibility that SMS 112 message would have no applied number display inhibition;
   e) There is no possibility that SMS 112 message could be sent only by those subscribers who can not call number 112 by ordinary voice mode.

Head of Network Development   (signature)   Dalius Radis

P. Stonys phone +370 699 23348

Table No. 27. Official letter from TELE2 UAB

Translation from Lithuanian

TELE2 UAB

To:
Emergency Response Centre   16 07 2010 No. SD-9916
Svitrigailos street 18, LT-03223 Vilnius   to 07 06 2010 No. 41D-488
                                                              Vilnius

DUE TO FEASIBILITY STUDY "POSSIBILITIES OF THE ADAPTATION OF THE EMERGENCY CALL NUMBER 112 FOR THE DEAF: EXPERIENCE OF LITHUANIA AND NORWAY ("DEAF ACCESS 112")

Responding to Your letter No. 41D-448 dated on 07 06 2010 we notify that TELE2 UAB provides no special services to the deaf.

Investigating possible alternatives of the solution of the adaptation of emergency number 112 to the deaf, we could propose to discuss two alternatives of this adaptation:

- TELE2 UAB designs the conditions to connect to TELE2 UAB SMS Service Centre using SMPP (short message peer to peer protocol) as with any of the provider of any other services. Then the ERC integrates it into its general system.
- Short number 112 is allocated for ERC SMS Service Centre converting it to the long number. On its side the ERC installs the ordinary terminal, which can be integrated or not integrated into the ERC system. In this case the person with disability sends the SMS by short number 112, but he/she will receive the answer from long number. This variant can be used as interim.

Respectfully   (signature)   Vitalij Zareckij
Head of Regulation and Permissions

Vitalij Zareckij, phone: 2366330, fax: 2366302, vitalij.zareckij@tele2.com

TELE2 UAB
Sporto street 7A, LT-09200 Vilnius
Phone: +370 5 236 6300
Fax: +370 5 236 6302
Enterprise code 111471645, VAT payer's code LT114716417
AB SEB Vilniaus bankas, account No. LT417044060001223597, bank code 70440
AB bankas SWEDBANK, account No. LT137300010000173743, bank code 73000

Table No. 28. Proposal of KOMUNIKACIJA IR KONSULTANTAI UAB

Translation from Lithuanian

3 August 2010, Vilnius

ORIENTATION PRICES
for planned information campaign
dedicated to present the emergency assistance call service for the deaf

Responding to Your query, we are sending the orientation prices for your requested services.

Services	Price, LTL (without VAT)
1. Services of relations with mass media (duration – 4 months) include: Preparation and distribution of 2 (two) press releases Organisation of the article in the press Organisation of the reportage in the TV news broadcasting programme Organisation of information video broadcasting on TV	12000
2. Organisation of joint social action with mobile network operators (2 months)	6000
3. Creation of internet webpage	2500
4. Updating of internet webpage	2000
5. Creation of information video (2-3 minutes)	20000
6. Creation, printing and distribution of booklets of 2-4 pages (8000 units)	12500
7. Creation and production of stickers for the mobile phones (5000 units)	2500
8. Creation of information poster (model) for outdoor advertising	500

Respectfully,   (seal)
Andrius Kasparavičius

Contacts:
KOMUNIKACIJA IR KONSULTANTAI UAB
Pamenkalnio street 5-9, Vilnius
Mobile + 370 698 17740

Table No. 29. Commercial offer of outdoor advertising

JCDecaux LIETUVA UAB
Seimyniskiu street 1A, 7th floor
LT-09310 Vilnius 5, Lithuania
Phone; +370 5 2730 917
Fax: +370 5 2730 916
www.jcdecaux.lt

JCDecaux
Outdoor advertising campaign calculation

Client	Project for the Deaf
Campaign	Without commercial sponsors
Time period	2 weeks
Date	
Litas/1 EUR exchange rate	3,4528

City	Population	Total number of advertising planes	Weeks		Weekly planes		Official price of unit, Lt	Official price, total in Lt	Discount %	unit price, netto, Lt	JCDecaux Lietuva offer, Lt	JCDecaux Lietuva offer, EUR
			34	35	Quantity	Split of cities						
Bus shelters and city lights (6S)												
Vilnius	542.287	962	15	15	30	39%	360.00	10 800.00	92%	28.80	864.00	250.23
Kaunas	378.943	492	9	9	18	24%	360.00	6 480.00	92%	28.80	518.40	150.14
Klaipeda	192.954	262	6	6	12	16%	360.00	4 320.00	92%	28.80	345.60	100.09
Siauliai	133.883	143	5	5	10	13%	360.00	3 600.00	92%	28.80	288.00	83.41
Panevezys	119.749	191	3	3	6	8%	360.00	2 160.00	92%	28.80	172.80	
Rent			38	38	76			27 360.00			2188.80	633.92
Additional discount, %											1075.00	311.34
Postering, 43 units											3263.80	945.26
Total 6S campaign							Total rent				2188.80	633.92
							Total postering				1075.00	945.26

Offer prepared by:
Sales Manager Oksana Lekaunikiene
mobile phone +370 680 36561
e-mail:oksana.lekaunikiene@jcdecaux.lt

Campain Awareness Reseach		
Total Campaign	3263.80	945.26
Total Campaign, 21%VAT	3949.20	1143.77

Notes:
Outdoor advertising is weekly.