Further Development and Practical Application of Market-Based Land Mass Appraisal On-Line System for Land Taxation

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Abstract

Multiple Criteria Value Model was developed. Analysis of criteria system being used by Lithuanian State Enterprise Centre of Registers for mass valuation of land was performed. Proposal and description of new additional criteria (device-based data about pollution, noise, indoor microclimates and allergens causing allergy in buildings) allowing more precise mass valuation of land was fulfilled. A new method of complex determination of the weight of the criteria for mass valuation of land taking into account their quantitative and qualitative characteristics was developed. Pilot development of pollution and noise digital maps was accomplished. Formalized presentation of the digital maps shows how changes in the pollution and noise cause corresponding changes in the mass valuation of land. Partial integration of Market-based Land Mass Appraisal On-line System (LMAS-LT) for Land Taxation and Lithuanian State Enterprise Centre of Registers mass valuation of land sub-systems and digital maps has been performed. Development testing database for land taxation in selected Lithuanian region was accomplished. In order to test the usefulness of the LMAS-LT more than 100 listings have been collected. The LMAS-LT was tested for areas that could be improved, e.g. process, interface, navigation, multiple criteria evaluations and mass valuation of land. Some proposals for further implementation of the LMAS-LT in Lithuania have been presented.

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Introduction

A computerized mass valuation, integrating the information of the cadastre, register, and market database into a single system, was implemented in Lithuania in 2002–2003. It provides a possibility to evaluate the real property in the entire territory of the country based on single principles, within the defined time, and using updated market data. It also allows periodical reevaluation of property, taking into account market developments. The results were integrated with GIS and, therefore, provide a possibility for public access to the value maps and receiving the mass appraisal results through the Internet.

The Centre of Registers has developed mass valuation models for buildings and has prepared value maps. ORACLE Discover, standart statistical software, and GIS software were use in this process. In cases in which the specialists failed to adopt standard software for certain jobs, they tried to search for their own solutions (GIS and merging valuation results with the real property register data) to have full automation of the valuation system and the implementation of basic Automated Valauation Model and Computer Assisted mass Appraisal (CAMA) principles.

The mass valuation in Lithuania is performed in the conditions of the limited amount of market data. Therefore, while making the analysis of sales data in such a situation it is necessary to invoke all possible tools including GIS which offers versatile opportunities for the presentation, grouping and analysis of information about real property.

Labor expenditure and quality of the results depend very much on the reliability of data. Statistical methods and graphical measures are used for checking and revision. The experience of property valuers as specialists and the knowledge of real property market within the territory being valued are also very important. After the elimination of the disputed transactions, a specification of the land valuation model is worked out, that is factors and characteristics affecting market prices, as well as their relationship, are determined. The impact of property location and time factor on the transaction prices is analyzed in this phase.

Mass valuation of land based on market principles in Lithuania started in 2002, four valuations were performed. Market values (mass appraisal) are used for provision of social support, estimation of property inheritance tax, fee for registration of land parcels, sale of state owned land and lease of state owned land. Normative values of land are used for tax purposes by the Resolution of the Government, 1999.

Mass valuation of buildings based on market principles started in 2005. The legal basis for mass valuation is the Law on Immovable Property Tax, 2005. The values are used for buildings taxation. Administrative responsibility for valuation is assigned to the State Enterprise Centre of Registers.

The development of a system for mass valuation of real property in Lithuania where a computerised cadastre and register as well as storage of transaction data in the common database served as a base, also methods taken over from the developed countries, particularly from the USA, was a successive process with applying new technologies, improving valuation procedure and obtaining more accurate values.

However the four-year practice of land mass appraisal and first buildings mass appraisal, performed in 2005 revealed some shortcomings of the system. The mass valuation is performed in the conditions of the limited amount of market data. Therefore, while making the analysis of sales data in such a situation it is necessary to invoke all possible tools and to explore all opportunities for the presentation, grouping and analysis of information about real property.

At working out and translating to reality of real estate tax system, a problem arises how to rationally employ the available informational and institutional potential and how to reach that land and buildings tax administration was effective and entailed small costs. Solution of these problems will be assisted as well by the project "Further Development And Practical Application Of Market-Based Land Mass Appraisal On-Line System For Land Taxation" The present Fellowship application is focused on the further development of previous project "Market-based Land Mass Appraisal On-line System for Land Taxation" and it's practical implementation.

In order to improve this system, Market-based Land Mass Appraisal On-line System for Land Taxation in Lithuania was developed during the Lincoln Institute of Land Policy Fellowship_ 2006. Following the intermediate objectives of the project during the period of project implementation the the comparative analysis of the software and intelligent automation applications for land taxation in developed countries and in Lithuania was performed. The recommendations as how to improve the efficiency levels for Web-based land taxation system for Lithuania, multiple criteria decision making method for market-based land valuation for taxation purposes and testing database were developed.

The present work was focused on the further development Market-based Land Mass Appraisal On-line System for Land Taxation in Lithuania and it's practical implementation. It included:

- Analysis of criteria system being used by theState Enterprise Centre of Registers (LSECR) for mass valuation of land and buildings.
- Proposal and description of new additional criteria (device-based data about pollution, noise, indoor microclimates and allergens) allowing more precise mass valuation of land.
- A new method of complex determination of the weight of the criteria for mass valuation taking into account their quantitative and qualitative characteristics will be developed.
- Pilot development of pollution and noise digital maps. The pollution and noise digital maps will allow more precise mass valuation of land.
- Partial integration of Market-based Land Mass Appraisal On-line System for Land Taxation (LMAS-LT) and LSECR mass valuation of land sub-systems and digital maps.

- Development testing database for land taxation in selected Lithuanian region.
- Testing of the developed Integrated Syste and the preparation of proposals for further implementation of the Integrated System in Lithuania.

PART I. Multiple Criteria Value Model, Air and Noise Pollution Digital Maps, Scenic Values, Indoor Microclimate and Allergens allowing more Precise Mass Valuation of Land

1. Multiple Criteria Value Model

We use a multiple criteria value model developed by us (see Fig. 2) to compare measured air and noise pollution level, scenic and greenery values, indoor microclimate and allergens, and subjective expectations of residents as predictors of flats mass valuation values in Zirmunai and Antakalnis district, Vilnius. Research's study object is present in Figure 1.

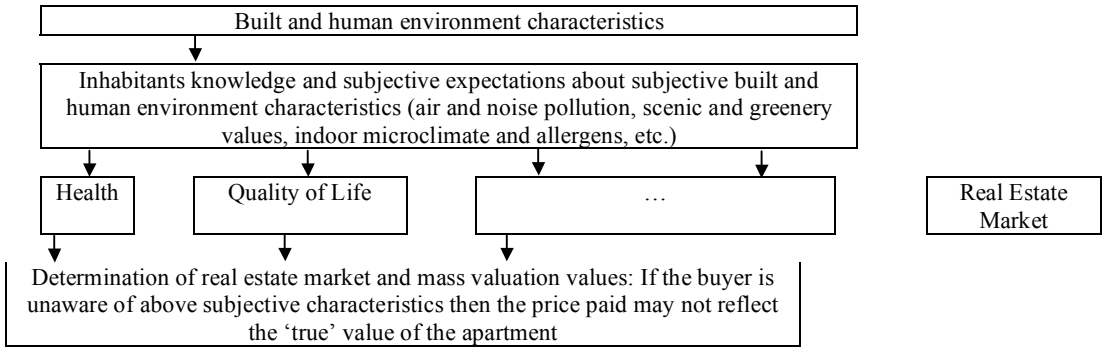

Fig. 1. Research's study object

1.1. Effect of Air and Noise Pollution, Scenic Values and Inhabitants Subjective Expectations on Pollution on Real Estate Values

Theoretical and empirical studies of the effect of air and noise pollution, voltage power lines, indoor microclimate and allergens, scenic values and inhabitants subjective expectations on pollution on urban real estate values have raised the following questions:

- How would one predict the change in real estate market and mass valuation values resulting from a change in the air and noise pollution, scenic values and inhabitant subjective expectations on pollution, etc.?
- If there is an improvement in the air and noise pollution, scenic values and transformation of inhabitant subjective expectations on pollution, does the change in real estate market and mass valuation values correspond to willingness to pay?
- What can be learned about the demand for clean environment, healthy indoor microclimate, quality of life, scenic values and it relations with real estate market and mass valuation values?

The questions have arisen in studies which predict the change in real estate and mass valuation values that would result from public improvements such as pollution abatement. The interest in these predictions is due in part to the frequently made assumption that real estate market value changes represent willingness to pay. What is the relationship between the change in real estate market values and willingness to pay for the pollution reduction? The change in real estate market values corresponds to the total willingness to pay on behalf of all parties.

If transactions in the apartment market reflect the interaction of informed buyers and sellers, then the price that the apartment was sold for is the sum of the prices the buyer is willing to pay for each built and human environment characteristic. It is this notion that motivates built and human environment researchers to study real estate values. If residents consider the local built and human environment as a component of the apartment they purchase, then information on the flat and its sales price allows researchers to analyze the price that residents would be willing to pay for better quality of life (less air and noise pollution, voltage power lines, better indoor microclimate and scenic values, etc.). As example, we shortly analyze the influence of indoor microclimate for health of people and related financial burden.

Harmful construction materials and products, too high/low indoor temperature, humidity, lighting, air quality (CO_2, tobacco smoke, small and large dust and particles in the air, microorganisms, etc.), noise, allergens, harmful gases, etc. can endanger health. They can cause various health problems. Dust in the premises can harm people allergic to dust. Too low relative indoor air humidity can case serious problems of nasal cavity to some people. Air humidity can have indirect effect on human health, including mould on internal building surfaces and products and increased amount of household dust. Air humidity must be regulated by maintaining rational heating level, ventilating premises, humidifying or drying indoor air and the air supplied to the premises. Thus improvement of indoor microclimate can help to improve human life quality, to increase productivity, to reduce morbidity and health care expenditures, to increase life expectancy.

Quality of Life Report of the European Construction Technology Platform (2005) specifies that the total annual financial burden due to lung diseases in Europe is 102 billion euros. Therefore, it is necessary to develop construction products (floors, partitions, wall trimming, ceiling materials, paints, varnishes, etc.) that would not emit pollutants to indoor air and to improve air quality (fewer carpets, ventilation and cleaning of premises, etc.). It is estimated that 15-30 % of *housing* in Europe suffer from moisture and mould. Only in recent years the link between the indoor fungi and allergic reactions and respiratory diseases has become widely known. About 20 % of European citizens are allergic to mites and fungi, and domination of asthma and allergy in residential buildings increases constantly. One of seven children in Europe has asthma, and children in Western Europe experience rates 10-fold than those in Eastern Europe (Quality of Life Report, 2005).

Only 20 % of the existing offices can be called healthy, thus 80 % offices are open for improvement of employee productivity by 1-6 %. Human productivity can be increased by reducing the sick building syndrome, i.e. by reducing the incidence of allergy and asthma and improving work conditions. In case indoor environment becomes healthier and more comfortable for work, EU15 would save (Quality of Life Report, 2005):

- 3-6 billion euros annually by reducing allergies and asthma (based on 8-25 % reduction of medical costs);
- 15-45 billion euros annually by reducing the symptoms of sick building syndrome (based on 20-50 % reduction and 2 % productivity improvement);
- 30-240 billion euros per year because productivity would increase by improving work conditions (if employee productivity increases by 0.5-5 %).

Healthy and comfortable indoor environment and microclimate improve productivity and GDP, reduce health care expenditures and guarantee quality of life. It can be achieved by integrated analysis of social, environmental and economic issues which reflect daily, immediate and long-term problems of and opportunities for people.

Researchers are interested in multiple criteria studies involving ecological environment for several reasons. The first is that such studies reveal how much real estate values decline due to the environmental pollution; this leads to an estimate of how much compensation would be required for residents who experience the external pollution. This also provides a measure of the damages that residents suffer from the polluted externality. The second reason to estimate the price of an environmental pollution is to be able to estimate the demand function for the ecological environment. Knowing the demand allows researchers to estimate the benefits from a reduction of the pollution.

In order to estimate how much residents are willing to pay for a non-polluted environment, there are two categories of approaches. Researchers generally prefer to use what are called revealed preference models. Multiple criteria is a revealed preference approach that uses real estate values to measure the price people are willing to pay for non-polluted environment, such as improved air quality and decrease noise. The concept is based on the idea from Griliches (1971) and Rosen (1974) that many characteristics affecting quality of life are considered when buying an apartment, and that consumers' preferences regarding the characteristics will be represented in the price that they are willing to pay for the apartment. Such characteristics can include the air quality, distance from street, etc. For example, a consumer may be willing to pay a higher price for an apartment that is located farther away from a street than for an otherwise identical apartment that is located next to a street. Multiple criteria analysis can be used to measure the consumer's willingness to pay for an apartment given changes in the distance from the street, holding all other characteristics of the apartment constant. When they purchase an apartment, they consider the utility they obtain from the characteristics of the apartment and its location.

Multiple criteria analysis can be used to obtain the knowledge about the resident's willingness to pay for the human and built environment characteristics. If the prices adjust relatively quickly the calculated criteria values and weights should still reveal buyers' and sellers' preferences.

All the characteristics of the human and built environment need to be known by the buyer so that the prices of the characteristics are summed into the sales price of the apartment. If the buyer is unaware of a characteristics then the price paid may not reflect the 'true' value of the apartment. In the case of some characteristics, such as the number of rooms, it is reasonable to believe that both the buyer and the seller have the same information. In the case of an air

and noise pollution, it is possible that the buyer does not know of the existence of the externality so the values and weights of criteria under analysis may be incorrect. Again, the extent of the buyer's information is an empirical question.

The independent variables of greatest interest for our purposes are those that measure the air and noise pollution, indoor microclimate, scenic values and inhabitants subjective expectations on pollution. It is important that the variable measures the above aspects in a way that best represents how the buyer thinks about the (dis)amenity. In some cases this can be quite straightforward. For example, when considering NO_2, it seems most likely that residents consider how far the apartment is from the street. Thus, a simple measure of distance is a reasonable way to capture the amenity. However, with other types of pollution, it can be more complicated. Air quality is one such example: How do residents think about air quality? Are they concerned with parts per million of certain types of pollutants (e.g. nitrous oxides) or are they more concerned with overall totals of all criteria pollutants? Are they focused on health impacts or on visibility? Do they care only if the pollutants exceed some threshold, or do they care about the actual level of the pollutant?

An apartment hold can be compensated for living in an area with negative (positive) externalities by receiving lower (higher) apartment prices. Thus, it is important to model both impacts in order to correctly calculate the marginal price of the externality. Researchers also struggle over what variables to include in the multiple criteria analysis. In particular, how best can we measure pollution. In theory, we want to include the measure that apartment buyers observe and that they are most concerned about. In some instances the measure seems clear (e.g. distance to a busy street) but in other cases it is not (e.g. air pollution). Do residents care about a single pollutant, or are they more aware of the overall level of all pollutants? Do they think about the past levels of pollution, the current levels, or do they attempt to forecast pollution over the time they plan on owning the apartment? To answer these questions it is likely that economists will need to work with researchers from other disciplines such as psychology, ecologists, ethics, etc. At this point in time, we can only hope that our scientific measures of pollution will approximate the measures that residents focus on when buying an apartment. Our survey questions concerned pollution in Zirmunai and Antakalnis district, but the answers may not reflect any knowledge about that topic. If not, they may nonetheless assist in predicting flats market and mass valuation values but would reflect the impact of misperception rather than insight into pollution.

1.2. Multiple Criteria Value Model

In order to study the combined effects of air and noise pollution, scenic values and inhabitants subjective expectations on pollution variables on the real estate values in the study area, the need arose for an integrated criterion. This integrated criterion is calculated by methods developed by authors:

- A method of complex determination of the weight of the criteria taking into account their quantitative and qualitative characteristics.
- A method of multiple criteria complex proportional valuation of the real estate.
- A method of defining the utility and market value of a real estate.
  Above methods frame the essence of the Multiple Criteria Value Model (see Fig. 2).

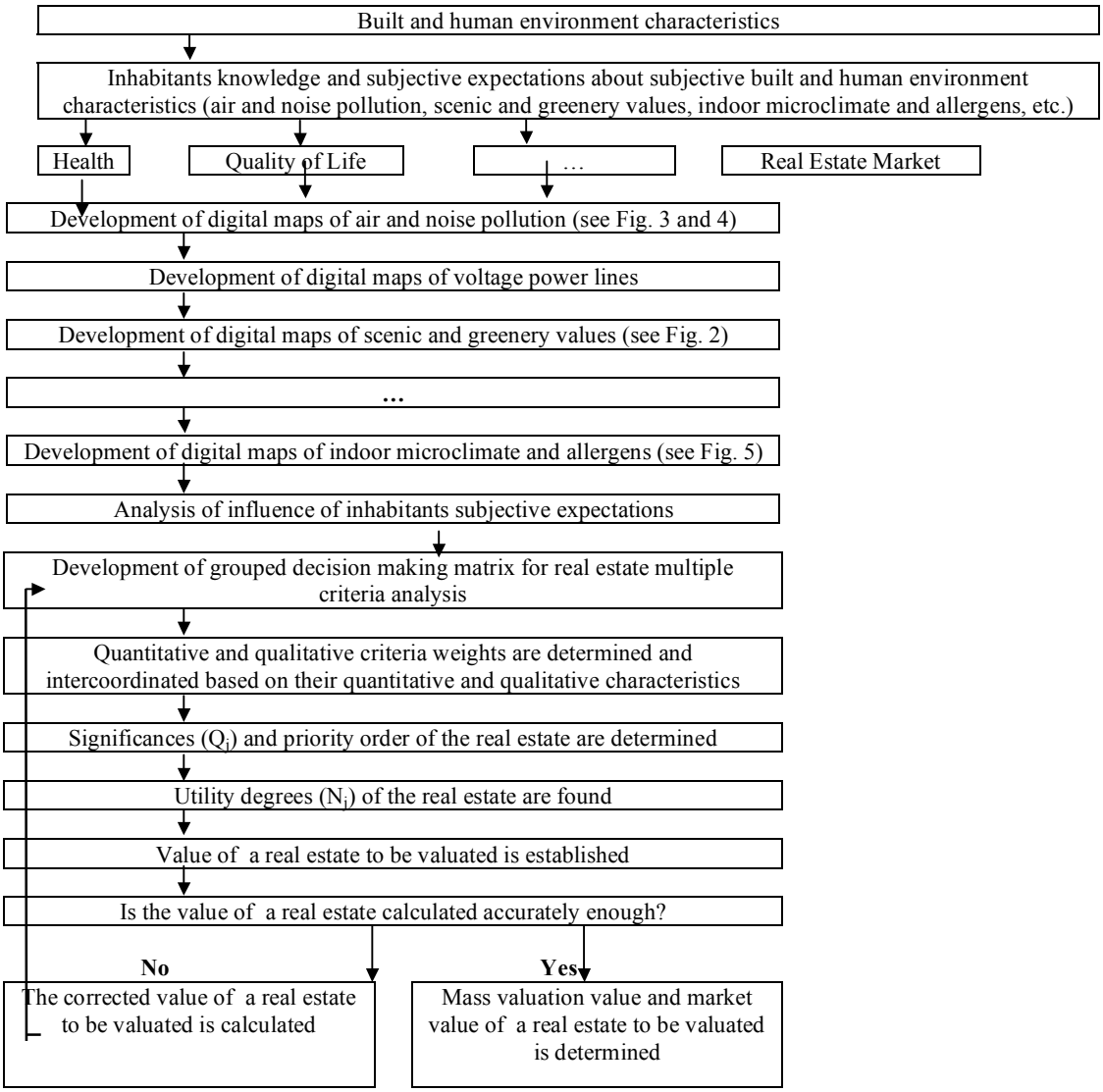

Fig. 2. Multiple Criteria Value Model

Significance Q_j of real estate a_j indicates satisfaction degree of demands and goals pursued by the interested parties - the greater is the Q_j the higher is the efficiency of the real estate. In this case, the significance Q_{max} of the most rational real estate will always be the highest. The significances of all remaining real estate are lower as compared with the most rational one. This means that total demands and goals of interested parties will be satisfied to a smaller extent than it would be in case of the best real estate.

The degree of real estate utility is directly associated with quantitative and conceptual information related to it. If one real estate is characterized by the best comfortability, aesthetics, price indices, while the other shows better maintenance and indoor microclimate characteristics, both having obtained the same significance values as a result of multiple criteria valuation, this means that their utility degree is also the same. With the increase (decrease) of the significance of a real estate analyzed, its degree of utility also increases (decreases). The degree of real estate utility is determined by comparing the real estate analysed with the most efficient real estate. In this case, all the utility degree values related to

the real estate analyzed will be ranged from 0% to 100%. This will facilitate visual assessment of real estate efficiency.

The degree of utility N_j of real estate a_j indicates the level of satisfying the needs of the parties interested in the real estate. The more goals are achieved and the more important they are, the higher is the degree of the real estate utility. Since clients are mostly interested in how much more efficient particular real estate are than the others (which ones can better satisfy their needs), then it is more advisable to use the concept of real estate utility rather than significance when choosing the most efficient solution.

A degree of real estate utility reflects the extent to which the goals pursued by the interested parties are attained. Therefore, it may be used as a basis for determining real estate market value. The more objectives are attained and the more significant they are the higher will be real estate degree of utility and its market value.

Thus, having determined in such a way the ratio of degree of utility and market value of real estate, one can see what complex effect can be obtained by investing money into anyone of the real estate. There is a complete clarity where it pays better to invest the money and what is the efficiency degree of the investment.

According to this method the real estate utility degree and the market value of a real estate being estimated are directly proportional to the system of the criteria adequately describing them and the values and significances of these criteria.

A method of multiple criteria complex proportional valuation of the real estate and a method of defining the utility and market value of a real estate were presented in the last year final report. A method of complex determination of the weight of the criteria taking into account their quantitative and qualitative characteristics is follows.

1.3. A method of complex determination of the significances of the criteria taking into account their quantitative and qualitative characteristics

1.3.1.Why do the expert methods not suffice for the determination of criteria significance?

In order to select the best real estate, it is necessary, having formed the grouped decision making matrix to perform the multiple criteria analysis of the real estate. This is done by comparing criteria numerical values and significances and analyzing the conceptual information of the investigated real estate. The life cycle of an investigated real estate can be described only on the basis of a criteria system comprising many criteria with different meanings and dimensions. Such variety of criteria makes it difficult to compare the real estate directly. One of the major tasks in solving the above problem is to determine the weights of the criteria. It is most commonly done by means of expert methods.

Having determined the weights of criteria by expert methods, we learn how much one of the criteria is more significant than another one. However, having determined by these methods

the weights of quantitative criteria (cost of plot and building, maintenance costs, etc.), we do not find out everything we need. For instance, values of quantitative criteria in this case are not fully evaluated. It can be seen from the following hypothetical example.

Let us assume that a customer intended to choose the best version out of 4 alternative real estate available according to 3 criteria (the most significant goals pursued by him: real estate cost X_1, general comfortability level of the building X_2 and reference fuel required for building heating X_3) (see Table 1). For this purpose, the multiple criteria analysis methods were employed. At first, the values of criteria were set. Then, using expert methods, the weights of criteria were calculated. It has been established that the quantity of reference fuel needed for the heating of the building is 1,62 times more significant over the general comfortability level of the building, etc. As it is, at this point started all the difficulties. For instance, it turned out that four equally priced real estate have equal levels of general comfortability, however, different quantities of reference fuel are needed for the heating of these buildings.

Table 1. The dependence of quantitative criteria weight on their values

Criteria	Measuring units	Numerical values of criteria of real estate under investigation			
		1	2	3	4
1. Real estate cost, X_1	1000 Lt	200	200	200	200
2. General comfortability level of the building, X_2	Points	0,78	0,78	0,78	0,78
3. Reference fuel required for building heating, X_3	Tons per year	3,7	4,7	5,8	6,8

The 1st version of comparison (3,7+4,7):2=4,2 t

The 2nd version of comparison (5,8+6,8):2=6,3 t

The 3rd version of comparison (3,7+4,7+5,8+6,8):4=5,25 t

It is quite evident that if we compare all these real estate (at first, the first and the second real estate (the first version of comparison), then the third and the fourth real estate (the second version of comparison), and, finally all the four real estate (the third version of comparison)), we shall see that all the three versions of comparison will have different significances of X_3. This is so because, at the same price of the real estate and equal levels of general comfortability, different quantities of reference fuel needed for the heating of buildings are used in different versions of comparison. Hence, heating costs in all the buildings are different. In the first version of comparison, heating of a building requires at average x_{31}=(3,7+4,7):2=4,2 tons, in the second - x_{32}=(5,8+6,8):2=6,3 tons, in the third - x_{33}=(3,7+4,7+5,8+6,8):4=5,25 tons of reference fuel per year. Therefore, the significance of X_3 in all three versions of comparison should be different: the significance of this criterion in

version two should be 1.5 times (x_{32}:x_{31}=6,3:4,2=1,5) greater than in version one and 1.18 times (x_{32}:x_{33}=6,3:5,25=1,18) greater than in version three (see Table 1). In the given case, however, it has been established by means of expert methods that the quantity of reference fuel required for the heating of a building is 1.62 times more significant over the general level of its comfortability, i.e. the significance of both criteria must be constant in all versions of comparison. As it has been shown by the above example, with the change of values of quantitative criteria (in this case - the quantity of reference fuel required for building heating), their significance is changing as well. Therefore a method should be developed enabling realistic and accurate assessment of these quantitative changes. It is also necessary to make compatible the significances of quantitative and qualitative criteria taking into account their values.

Further on follows the description of a new method of complex determination of the significances of the criteria taking into account their quantitative and qualitative characteristics

1.3.2. A method of complex determination of the significances of the criteria taking into account their quantitative and qualitative characteristics

When performing multiple criteria assessment of real estate it is necessary to normalize the values of criteria describing the real estate and then to weight them. This creates a possibility to compare the values of criteria with different measuring units and to determine the most efficient alternatives. The weighting of criteria is performed by the multiplication of their normalized values and their significances. Therefore, the significances of all criteria must be coordinated among themselves, taking into consideration their quantitative and qualitative characteristics. The significances of quantitative criteria can be exactly coordinated among themselves if the values of quantitative criteria are expressed through an equivalent monetary unit (stages 1-4). Having performed strict mutual coordination of quantitative criteria significances, the same is done with the significances of qualitative criteria (stages 5-7). In this case all the significances of qualitative and quantitative criteria are coordinated exactly at the same time.

Having determined the system of criteria describing the alternatives and calculated numerical values and initial weights of criteria and having presented them in the form of grouped decision making matrix, the user should calculate the actual weights of criteria. The values of criteria must be calculated for the whole real estate. The calculation of the criteria significances is carried out in seven stages. In the stages 1-4 the significances of quantitative criteria are identified whereas in the stages 5-7 the significances of qualitative criteria are identified.

Stage 1. The determination of the sum of values for every quantitative criterion:

$$S_i = \sum_{j=1}^{n} x_{ij}\ ,\ i=\overline{1,t}\ ;\ j=\overline{1,n}\ ; \qquad (1)$$

where x_{ij} - the value of the i-th criterion in the j-th alternative of a solution; t - the number of quantitative criteria; n - the number of the alternatives compared.

Stage 2. The total monetary expression of every quantitative criterion describing the investigated real estate is obtained by:

$$P_i = S_i \cdot p_i,\ i=\overline{1,t}; \qquad (2)$$

where p_i - initial significance of the i criteria. p_i should be measured in such a way as, being multiplied by a quantitative criterion value, an equivalent monetary expression could be obtained.

According to their effect on the efficiency of the real estate in time the quantitative criteria may be divided into:

- short-term factors affecting the real estate for a certain period of time only;
- long-term factors affecting the real estate throughout its life cycle.

The initial significance of long-term criteria, like resources needed for the maintenance, environment protection, etc. is dependent on the repayment time of the real estate as well as on the valuation in money terms of a measure unit of a criterion:

$$p_i = e \cdot f_i; \qquad (3)$$

where e - repayment time of a real estate; f_i - monetary valuation of a measure unit of the i criterion.

The initial significance of a single criteria comprising valuation of the cost of plot, etc. equals the measure unit of a criterion in money terms:

$$p_i = f_i. \qquad (4)$$

The physical meaning of the initial significance of a quantitative criterion consists in the fact that multiplying it by the value of a quantitative criterion its monetary expression calculated over the whole period of repayment of the real estate (equivalent to former natural expression) is obtained.

Stage 3. The overall quantitative criteria magnitude sum expressed in money terms is determined:

$$V = \sum_{i=1}^{t} P_i,\ i=\overline{1,t}. \qquad (5)$$

Stage 4. The quantitative criteria significances describing the real estate which can be expressed in money terms are determined as follows:

$$q_i = \frac{P_i}{V},\ i=\overline{1,t}. \qquad (6)$$

If the above method is applied in calculation of significances, the total sum of significances quantitative criteria is always equal to 1:

$$\sum_{i=1}^{t} q_i = 1. \qquad (7)$$

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This allows us to check if the quantitative criteria significances are calculated correctly. The qualitative criteria significances pertaining to the life cycle of a building are determined in stages 5-

Stage 5. In order to achieve full coordination between the significances of quantitative and qualitative criteria, a compared standard value (*E*) is set. It is equal to the sum of any selected significances of quantitative criteria. One of the main requirements for this compared standard value is that according to utility it should be easily comparable with all qualitative criteria. This compared standard value, for instance, could be:

- real estate cost;
- maintenance costs, etc.

In this case, the significances of all qualitative criteria are determined by the comparison of their utility with the significance of the compared standard value. E is determined according to the following formula:

$$E = \sum_{z=1}^{g} q_z ; \qquad (8)$$

where g is the number of quantitative criteria included into the compared standard; q_z is the significance of z quantitative criterion included into the compared standard.

Stage 6. The initial significances v_i of qualitative criteria are determined by expert methods comparing their relative significance to the significance E of the selected compared standard. In this case, relative significances of qualitative criteria should be expressed in per cent. For instance, if the expert methods revealed that the sound insulation properties of a building made up 6.2% of the utility of the compared standard (for example, of the cost of a building), the significance of the sound insulation properties v=6,2%.

Stage 7. The significances of qualitative criteria are determined as follows:

$$q_i = \frac{v_i \cdot E}{100}, \; i=t+1,\ldots, m. \qquad (9)$$

The above method allows to determine weights of criteria which are maximally interrelated and depend on qualitative and quantitative characteristics of all criteria.

2. Mass Valuation and Quality of Life

2.1. Quality of Life

Mass value depends from Quality of Life. The Quality of life of a population is an important concern in economics, political, medicine, social, construction and other science. There is not the single definition of what comes under the concept Quality of Life:

- The level of enjoyment and fulfillment derived by humans from the life they live within their local economic, cultural, social, and environmental conditions. The Jacksonville Community Council defines quality of life as the "feeling of wellbeing, fulfillment, or satisfaction resulting from factors in the external environments." Quality of life, in this sense, is most directly measured using subjective indicators. ... [1]
- The degree to which intellectual, spiritual, economical, social and health pursuits are achieved and maintained [2].
- Refers to the level of comfort, enjoyment, and ability to pursue daily activities of living [3].
- Value assigned to duration of life as modified by the impairments, functional status and social opportunities that are influenced by disease, injury, treatment or social and political policy [4].
- Degree to which a person enjoys the important possibilities of his/her life [5].
- An single's overall sense of well-being. In medical studies, quality of life is measured using various standardized questionnaires to rate such factors as pain, treatment side-effects, mood, energy level, family and social interactions, sexual function, ability to work, and ability to keep up with routine daily activities [6].
- A measure of the standard of living which considers non - financial factors [7].
- The term used to describe an single's satisfaction with his or her life and general sense of well-being. It is often measured as physical, psychological and social well-being [8].
- Refers to the patient's ability to take pleasure in normal daily activities [9].
- The well-being or quality of life of a population is an important concern in economics and political science. There are many components to well-being. A large part is standard of living, the amount of money and access to goods and services that a person has; these numbers are fairly easily measured. Others like freedom, happiness, art, environmental health, and innovation are far harder to measure. ... [10]

European Construction Technology Platform (Quality of Life – Towards a Sustainable Built Environment, 2005) describes the Quality of Life as totality of:

- Reducing Environmental Impacts.
- Mitigating Natural and Man–Made Hazards.
- Improving the Indoor Environment for All.
- More Attractive Work Places.

Standards for the Quality of life include a very wide spectrum of standards.

2.2. Built Environment Standards and Environmental Health in Lithuania

In Lithuania (2003) results of various investigations of indoor environment hygiene conditions carried out by regional public health centres showed that most frequently allowable standards were exceeded for lighting (55%), microclimate (28%), noise (14%); more rarely - for vibration (2%) and non-ionising radiation (1%). Most frequently noise (61%) and microclimate (37%) made the indoor environment quality worse in dwellings. Investigations of indoor environment in health care institutions showed that most frequently allowable standards were exceeded for microclimate (60%) and lighting (36%). In children and adolescent educational institutions the main issue was lighting (in 73% of investigated cases) – one of the main reasons for sight disorders. Main factors having negative impact on indoor environment at food enterprises and did not corresponding with allowable standards were noise (37%) and lighting (32%). Noise was not corresponding with allowable standards most frequently in industrial enterprises (43%) too.

The biggest number of investigations of air chemical pollution exceeding hygiene standards was registered at industrial enterprises (76%), the smallest – at health care institutions (1%). In dwellings and food enterprises chemical pollution exceeded standards for 12% and 11%, respectively.

Microbiological contamination of air was the highest in health care institutions and exceeded allowable standards in 4.7% of investigated points. Investigations of microbiological contamination in distilled water were carried out only in health care institutions, and exceeded allowable standards in 6.25% of investigated points.

The main source of fresh drinking water in Lithuania is underground (ground and pressure) water. About 2/3 of Lithuania inhabitants are using water from centralized water supply systems, and about 1/3 (mostly inhabitants in rural and sub-urban territories) are using water from dug shaft wells. In 2003, chemical contamination in 23295 shaft wells and 2836 single bores was investigated. In 16.3% of shaft wells and 15.8% of single bores did not correspond with hygiene requirements. Most frequently the investigated drinking water of shaft wells did not correspond with the standards for the following parameters: nitrates (43.1%), turbidity (13.7%) and colour (4.9%). Most frequently the following parameters investigated in single bores did not correspond with hygiene standards: iron (45.6%), ammonium (25%), turbidity (37.8%), colour (16.6%). Microbiological contamination of raw water in shaft wells (9943) and single bores (2928) were also investigated. 26.1% of investigated shaft wells and 5.8% of single bores did not correspond with standards. Most frequently the standards in shaft wells were exceeded for coliform bacteria (30.5%), heat resistant coliform bacteria (27%) and enterococcus (23.3%). Microbiological contamination in single bores was lower than in shaft wells, only enterococcus exceeded standards in 11.7% of investigations.

In 2003 public health centres have received from inhabitants 972 requests and complaints, 49% of which were confirmed. Majority of confirmed complaints were related to environmental pollution (36%), other reasons – 19%, insufficient surveillance of territories and buildings – 17%, economic – commercial activities – 11%, neighbours – 10%, construction – 7%.

Results of hygiene assessment of working places in Lithuania showed that about 20 – 30 percent of employees were exposed to professional risk for health.

In 2003 hygiene assessment of working places was carried out in 590 enterprises and 6880 working places in different fields of activities. Analysis of data of hygiene assessment of working places revealed that 88% of employees in Lithuania were working at normal working conditions; 11% - at hazardous and 1% - at very hazardous working conditions. Analysing data according to the different activity fields, the major part of working places with hazardous working conditions were determined in non-metal fiber production – 51%; wood and wood products production – 25%. In 2003 in Lithuania 200805 employees were exposed to professional risks. According to investigations, the main professional risk factors were: physical factors – 58% of employees exposed to risk factors (in production and transport – 60%; other fields of activities – 53%); chemical factors – 18% (in production and transport – 21%; other fields of activities – 14%); ergonomic factors – 20% (in production and transport – 17%; other fields of activities – 25%); biological factors – 4% (in production and transport – 2%, other fields of activities – 8%).

People are also exposed to various sources of ionising radiation. These sources are of natural and artificial nature. Besides, different sources of radiation have different input in radiation dose. Information about radiation sources and radiation doses is important to define which radiation safety measures are required. This helps to optimise radiation safety – ensure that radiation doses and number of exposed people being as small as possible with reasonable measures used and taking into account social and economic conditions in the country. According to the data and calculations of Radiation Safety Centre the total annual effective dose of all radiation sources is 2.63 mSv for inhabitants and 4.24 mSv for employees working with the sources of ionising radiation.

2.3. Standards for Air Pollutant Concentrations and Estimated Populations at Risk

Certain groups of patients such as asthmatics, atopic patients, patients with emphysema and bronchitis, heart and stroke patients, diabetes, pregnant women, the elderly and children as especially sensitive to the health effects of outdoor air toxicants. It is estimated that about 20% of the US population suffers from asthma, emphysema, bronchitis, diabetes or cardiovascular disease and is thus especially susceptible to outdoor air pollution (American Lung Association, 2005). Outdoor air quality plays an important role in human health. Air pollution causes large increases in medical expenses, morbidity and is estimated to cause about 800,000 annual premature deaths worldwide (Cohen et al., 2005). Above and other problems are related with built environment air pollution, premises microclimate, health effects, real estate market value, etc. Estimated Populations at Risk from Short-Term Particle Pollution in US is presented in Table 1. Estimated health effects of air pollution in from 2000 to 2020 are presented in Table 2.

Table 2: Estimated Populations at Risk from Short-Term Particle Pollution (24-Hour PM2.5) in US (Estimated Populations at Risk, 2005)

	Report Year	Adult Asthma	Pediatric Asthma	Chronic Bronchitis	Emphy-sema	CV Disease	Diabetes
Grade A (0.0)	2004	1,098,109	427,013	677,090	238,588	4,417,584	(1)
	2005	1,265,970	486,791	721,673	275,701	6,069,486	1,214,415
Grade B (0.3-0.9)	2004	2,091,803	777,232	1,234,260	429,795	7,998,682	(1)
	2005	2,177,008	850,022	1,165,895	421,841	9,554,840	1,899,681
Grade C (1.0-2.0)	2004	2,494,275	941,891	1,500,267	514,544	9,635,256	(1)
	2005	2,241,512	849,957	1,181,534	419,786	9,612,249	1,905,198
Grade D (2.1-3.2)	2004	1,341,788	496,552	783,391	263,649	4,966,969	(1)
	2005	1,711,703	622,929	873,476	312,009	7,131,044	1,413,876
Grade F (3.3+)	2004	4,468,378	1,766,912	2,649,823	888,281	16,729,853	(1)
	2005	4,606,903	1,679,638	2,254,726	801,992	18,325,151	3,627,483
National Population in Counties with PM2.5 Monitors	2004	11,731,287	4,497,507	6,985,770	2,383,863	44,661,067	(1)
	2005	13,606,631	5,060,978	7,032,822	2,540,957	50,692,770	11,444,651

Table 2: Estimated health effects of air pollution in from 2000 to 2020 (Commission staff working paper, 2005)

Effect	**Unit**	**2000**	**Baseline 2020**
Chronic and acute mortality			
PM Chronic mortality	Thousands life years lost	3,619	2,467
PM Chronic mortality	*Premature deaths*	*347,900*	*271,600*
PM Infant mortality	*Premature deaths*	680	350
Ozone acute mortality	*Premature deaths*	21400	20800
PM morbidity effects			
Chronic bronchitis	Cases	163,800	128,100
Respiratory hospital admissions	Cases	62,000	42,300
Cardiac hospital admissions	Cases	38,300	26,100
Restricted activity days (RADs)	Million days	347.7	222.0
Respiratory medication Use (children)	Million days	4.2	2.0
Respiratory medication Use (adults)	Million days	27.7	20.9
LRS (including cough) among children	Million days	192.8	88.9
LRS among adults with chronic symptoms	Million days	285.3	207.6
Ozone morbidity effects			

Respiratory hospital admissions	Cases	14000	20100
Respiratory medication Use (Children)	Million days	21.4	12.9
Respiratory medication Use (Adults)	Million days	8.8	8.2
Minor Restricted Activity Days (MRADs)	Million days	53.9	42.4
Cough and lower respiratory symptoms (LRS) (children)	Million days	108.1	65.3

Standard is a measure of environmental quality. It may be a simple numerical standard (eg pollutant concentration >10ppm), areaspecific (eg the pH must be within ± 1 units of the average background level), or more complex (eg species diversity index >10). A standard is a quantifiable characteristic of the environment that provides a surrogate for the environmental values that are to be protected. It is a necessary but not always sufficient indicator against which measured environmental quality can be assessed.

A number of countries and organizations have developed standards for concentrations of common pollutants in outdoor air. Table 3 lists recent outdoor air standards for the six "priority pollutants" (PM_{10}/$PM_{2.5}$, O_3, CO, NO_2, SO_2, Pb) for the USA EPA, Japan, Germany and the World Health Organization (WHO).

Table 3. Recent standards for outdoor air concentrations of common "Criteria" outdoor air pollutants

Country	Particulates in ug/m^3	Ozone in ug/m^3	Carbon monoxide in mg/ m^3	Sulfur dioxide in mg/m^3	Nitrogen dioxide in mg/m^3	Lead in ug/m^3
United States EPA	PM_{10}	1 h 240	1 h 40	Daily 0.365	Annual 0.1	3 month
	Annual 50		8 h 10	Annual 0.08		Mean 1.5
	Daily 150-					
	$PM_{2.5}$					
	Annual 15					
	Daily 65					
Japan	PM_{10}	1 h 120	8 h 22.8	Daily 0.26	Daily 0.04–0.06	*
	Annual 200			Annual 0.11		
	Daily 100					
Germany	PM_{10}	*	1 h 30	Daily 0.40	Daily 0.3	*
	Annual 100			Annual 0.14	Annual 0.1	
	Daily 200					
WHO—World Health Org.	Total soluble particulates (TSP)	1 h 200	1 h 30	Daily 0.20	1 h 0.190 to 0.320	*
	Annual 60–90		8 h 10	Annual 0.09		
	Daily 150–230					

*Pollutant levels without an ambient standard yet.

[US Environmental Protection Agency (EPA), 1982, US Environmental Protection Agency (EPA), 1987, US Environmental Protection Agency (EPA), 1997 and US Environmental Protection Agency (EPA), 2000, Environmental Management Centre (2006), World Bank (1995)]

Levels of priority air pollutants often exceed these limits in many parts of the world, especially in large cities of developing countries. For example, it was estimated in 2004 that 18% of the world's urban areas (cities with a population of over 100,000) have ambient air containing an annual mean of over 100 ug/m^3 PM_{10} or more than twice the US EPA limit (Cohen et al., 2005). It should be noted that adverse health effects have been documented at levels well below these official US EPA standards. In addition, these standards ignore the synergistic effects of combinations of toxic air pollutants. Please also note that many pollutants such as organic solvents, pesticides, mercury, dioxins and bioaerosols do not have official outdoor air standards. A total of 189 such pollutants have been defined as "air toxics" by the US Clean Air Act of 1990 (Suh et al., 2004).

3. Case Study: Air and Noise Pollution Digital Maps, Scenic Values, Indoor Microclimate and Allergens allowing more Precise Mass Valuation of Land

Antakalnis and Zirmunai area of Vilnius (Lithuanian capital) alongside the river (see Fig. 2) have been chosen in order to analyze impact of air and noise pollution, scenic values, indoor microclimate and allergens on real estate supply price, market value and mass appraisal value. It has been selected due to the fact that the apartment houses located in it were built approximately in the same period (1960-1970).

Fig. 3. Subset of the research's study area

One of the purpose of the case study is to examine how real estate market and mass valuation values vary in Zirmunai and Antakalnis district subject to:

- air and noise pollution,
- voltage power lines,
- scenic and greenery values,
- indoor microclimate and allergens,
- influence of inhabitants subjective expectations.

On the basis received research results authors will propose more precise mass valuation of the land. The authors emphasize that each of the factors have a different weight in influencing the real estate values. The dependant variable in the study is the assessed real estate value of the residential properties within our defined study area. The dataset was obtained in three parts, one from the Lithuanian State Enterprise Centre of Registers, the other part from Vilnius' real estate broker companies and the final part of data was obtain by project participants. These parcel datasets were then merged to form a full subset of the research's study area. That dataset, however, represented the entirety of real estate parcels within the study area where the study calls for only residential properties.

3.1. Zirmunai (Antakalnis) Street Proximity: air and noise pollution

The main variable examined in this study is a real estate's proximity to streets. Streets are typically thought of has adding noise or air pollution to an area, or in general, being unattractive and unappealing to live near. This is supported in the literature by Espey and Lopez (2000) who studied the effects of airport noise pollution on apartments prices and found that those with higher noise levels sold for roughly $2,400 less than those in quieter areas. The concept behind using street proximity variable is that those apartments that are closer to busy streets would suffer in value because taking up residence near busy streets is generally considered less than desirable.

Digital maps of air (the zones of concentration of carbon monoxide, particle pollution, nitrogen oxides monoxide and sulfur dioxide) and noise pollution in the research's study area respectively are presented in Figure 3 and 4.

a) b)

c) d)

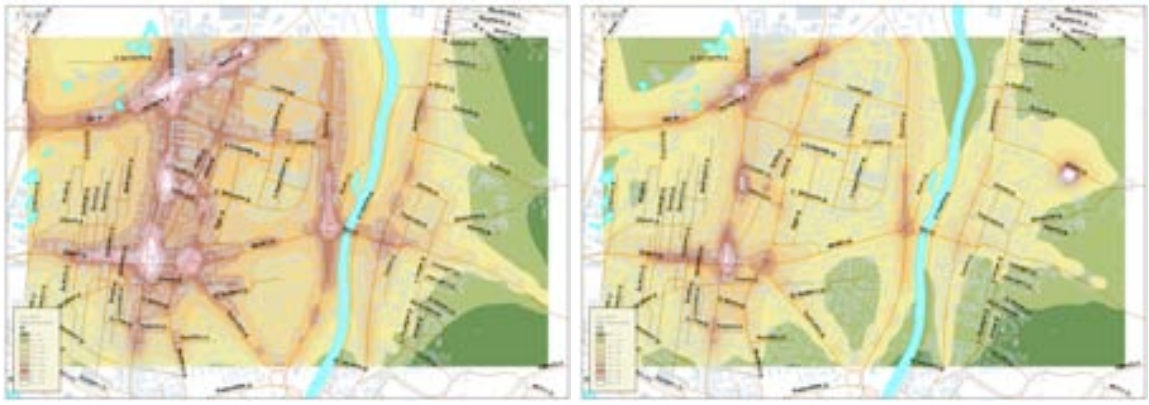


Fig. 4. Digital maps of the concentration of carbon monoxide CO (a), particle pollution (b), nitrogen monoxide NO (c) and sulfur dioxide SO_2 (d)

Fig. 5. Digital map of the noise level in the research's study area

The following main factors determine changing amount of air and noise pollution in in the research's study area: the distance from Zirmunai (Antakalnis) street to the river and the number of buildings and their arrangement in the analyzed sections. The bigger the distance from the river to Zirmunai (Antakalnis) street, the bigger decrease of the amount of pollutants is noticed. Number and arrangement of houses has a similar effect. Both above-mentioned factors determine spreading of pollutants within an area, i.e. when residential buildings are closer to each other the amount of pollutants decreases faster away from Zirmunai (Antakalnis) street. However, wind and the speed of air movement among houses have a considerably important role in this case. If buildings are not very densely arranged, then the air moves faster among them, thus pollutants are carried from the street at a larger distance. The role of the arrangement of buildings is also vital: if buildings are parallel to Zirmunai (Antakalnis) street and quite close to each other, the chances are bigger that such arrangement of buildings will act as a barrier to further movement of pollutants, and buildings perpendicular to the street will stop less pollutants.

3.2. Voltage power lines

Some high voltage power lines are located in Zirmunai area. Influence of power lines on real estate values is seen in a study by Delaney and Timmons (1992) that concludes that areas near high voltage power lines are found to, on average, have a market value of about 10% less than comparable properties that are farther away.

3.3. Scenic Neris River and Greenery Value

Previous studies have shown that properties with at least a partial view of lake, river or ocean tend to be valued higher than those without. Benson et al. (1998) compared real estate values in Washington state and found that even the poorest ocean-views added 8% to the market price of a home. Similarly, Seiler et al. (2001) found that residential properties with a lake view had significantly higher values than those without one. Additionally, numerous other studies have also shown results that proximity to bodies of water will increase real estate values (Darling, 1973; Gillard, 1981 for example). As important as it is, it is also difficult to quantify scenic Neris river and greenery value in a measurable number because it is based heavily in opinion and inherently subjective. With this in mind, a visual inspection of the entire study area was decided to be the most effective way to objectively quantify each area. The variable was measured on a scale from one to ten, ten being the best looking areas. During this survey, the authors took into consideration the general length of the view and the overall attractiveness of the area, all the while keeping in mind the question of whether an average person might find this place scenic. Attributes such as limited view (whether man-made or natural) would detract from a score where in contrast attributes such as greenery, unobstructed views of the Neris river, and areas with more open space nearby would tend to score higher. Research suggests that the influence of the Neris river on higher overall real estate values may end to the boundaries of the 100 metres from the river.

Cars produce Volatile organic compounds (VOCs). VOCs are hydrocarbon compounds that exist in the ambient air, often have an odor, and contribute to the formation of smog. VOCs themselves may be toxic. A high background level of VOCs in Zirmunai and Antakalnis district arises from natural sources. In particular, trees release isoprene, a naturally occurring substance that contributes to pollution production. In Zirmunai and Antakalnis district, has estimated that biggest part of total VOCs are naturally occurring, rather than man-made, with the main producers being trees. Nevertheless, scientific understanding of the emission of natural VOCs and their effects is far from complete. For example, trees also may play a positive role in reducing pollution, with some evidence suggesting that they can remove pollution, sulfur dioxide, particulate, and nitrogen dioxide pollution from the air. Automobile emissions combined with the natural background VOCs might explain some of the odorous emissions that apparently arise in this part of the district under analysis.

3.4. Indoor microclimate and allergens

We measure internal microclimate parameters (illumination, volume flow, air velocity, air temperature, relative humidity, dew point temperature, vibration impulse amplitudes (see Fig. 5)) and house allergens, e.g. house dust mites, dermatophagoides pteronysinus allergen, etc. Let us analyze the internal volume flow and relative humidity as an example. Insufficient

speed of the internal volume flow determines the lack of oxygen. As a result, internal hygiene conditions are worse, flowers wither and people feel unwell and their productivity decreases. Dry air in premises causes nasal mucous to dry and creates discomfort, thus productivity and good moods decrease. The discomfort may be removed by pipetting oil into the nose. Quite a few people encounter this problem. Other microclimate parameters may be described in a similar way.

The concentration of house dust mites (%) strongly depends on the temperature of premises and humidity. When air temperature in premises is 20-25 Cº, the concentration of house dust mites is 100%. When the temperature is lower (by 10 degrees) the concentration of house dust mites decreases by 40%. When humidity in premises is 60-70%, the concentration of house dust mites is 80%. When humidity is 50%, the concentration of dust mites decreases four times and makes up 20%. It is clear that allergic people feel bad due to temperature and humidity fluctuations in premises, i.e. when the concentration of house dust mites increases. Mites cause allergic reactions and make people feel worse.

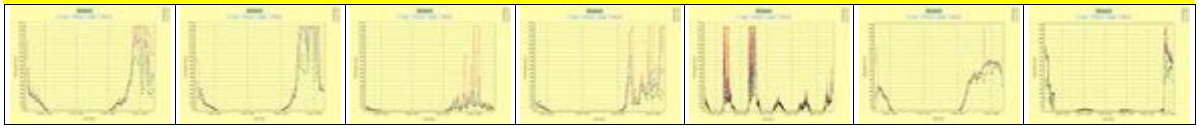
Table 4. Influence of room temperature to premises dust mite Dermatophagoides pteronyssinus survival

Temperature (Cº)	Percentages of live mites
20-25	100
10- 15	60
0-10	25
- 10-0	8
-15	0

Table 5. Relative humidity and mite survival

Relative humidity in %	Percentages of live mites
75 - 80	100
60-70	80
50	20
40	0

Illumination



The vertical axis of the diagram shows Illumination in the premises (lux). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

Volume Flow

The vertical axis of the diagram shows volume flow in the premises (m^3/h). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

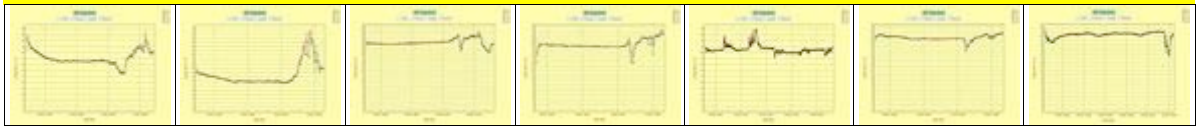
Relative Humidity

The vertical axis of the diagram shows relative humidity in the premises (%). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

Air Velocity

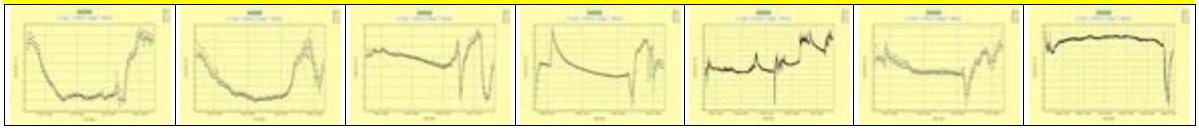
The vertical axis of the diagram shows air velocity in the premises (m/s). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

Air Temperature



The vertical axis of the diagram shows air temperature in the premises (^0C). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

Dew Point

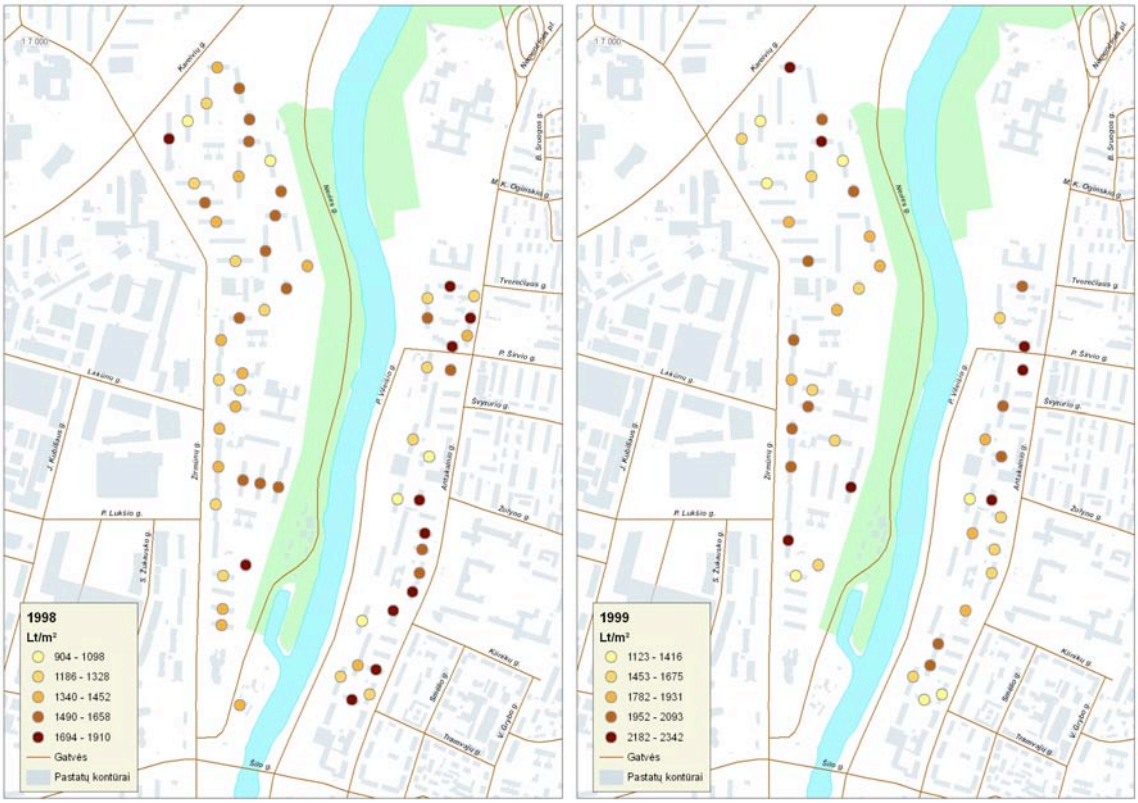


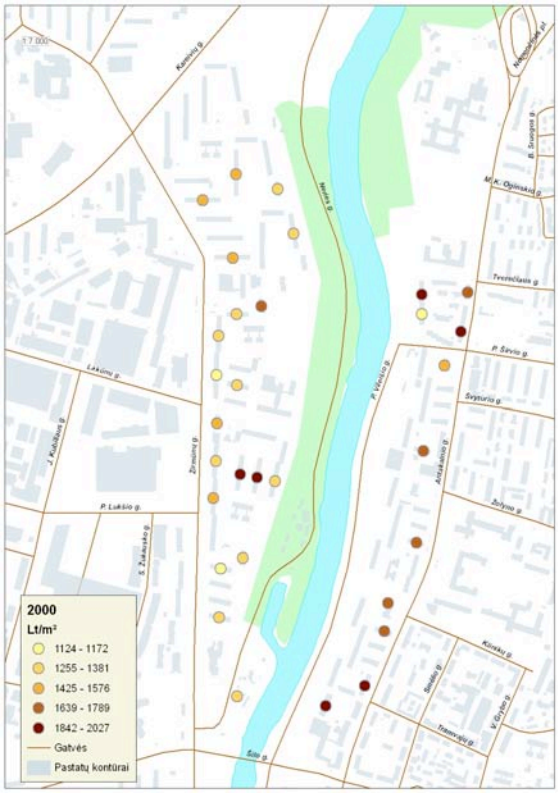
The vertical axis of the diagram shows dew point temperature in the premises (^0C). The horizontal axis shows time interval of the research. Maximum values are red, minimum values are green and average values are blue.

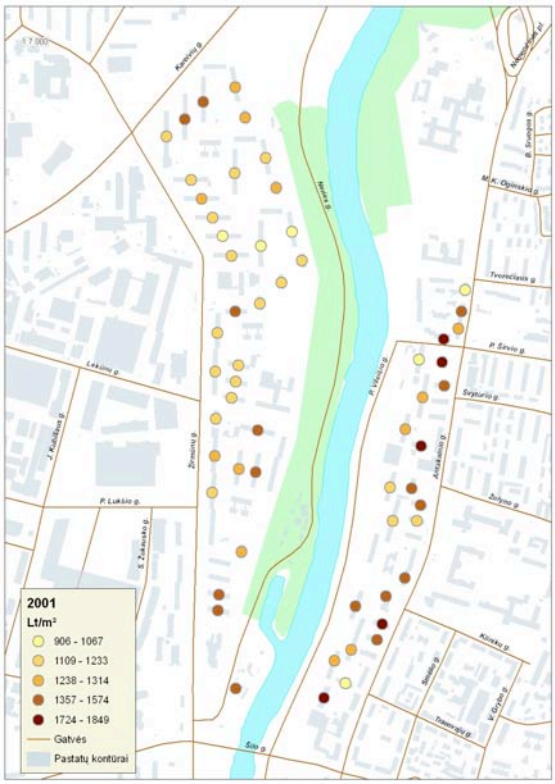
Fig.6. Indoor microclimate data in the research's study area

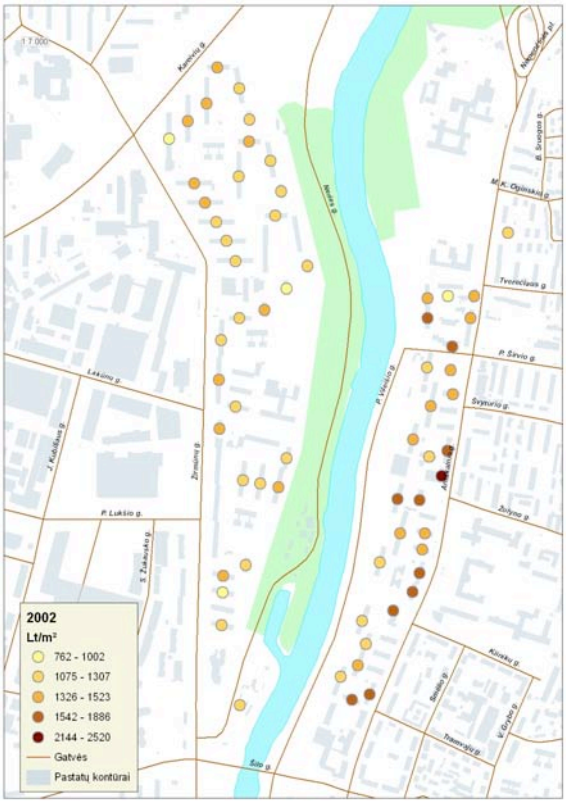
3.5. Influence of inhabitants subjective expectations

Even though we find evidence that singles are knowledgeable about air and noise pollution levels, we also find that subjective expectations and measured air and noise pollution levels have different effects on housing values (see Figures 3, 4 and 6). The subjective expectations about air and noise pollution were obtained from surveys. A higher subjective knowing of air and noise pollution significantly reduces flats values as we expected, we are left with a puzzle. Residents believe that pollution is greater near Zirmunai and Antakalnis street, and this belief apparently is not reflected in flats values. The absent of correlation between measured pollution and flats values also suggests (see Figures 3, 4 and 6), that residents are not fully informed about air and noise pollution influence on their health. Nevertheless, residents appear to be a knowledgeable about the relationships between the relative levels of pollution in different neighborhoods and weather conditions. The opinion that houses near Zirmunai and Antakalnis streets are more polluted is most likely due to the presence of busy Zirmunai and Antakalnis streets and related crossroads.




2000
Lt/m²
1124 - 1172
1255 - 1381
1425 - 1576
1639 - 1789
1842 - 2027
Gatvės
Pastatų kontūrai


2001
Lt/m²
906 - 1067
1109 - 1233
1238 - 1314
1357 - 1574
1724 - 1849
Gatvės
Pastatų kontūrai


2002
Lt/m²
762 - 1002
1075 - 1307
1326 - 1523
1542 - 1886
2144 - 2520
Gatvės
Pastatų kontūrai

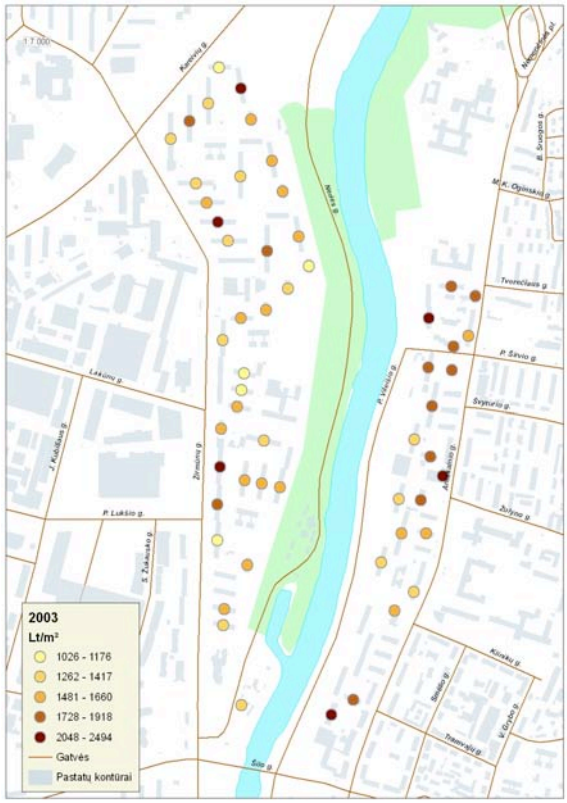

2003
Lt/m²
1026 - 1176
1262 - 1417
1481 - 1660
1728 - 1918
2048 - 2494
Gatvės
Pastatų kontūrai

Fig. 7**.** The wide variety of real estate values along the Neris river and Zirmunai and Antakalnis streets (1998 – 2006 years, prices are Lt/sq.m., Litas = 3,4528 Euro)

The overall trend persist, however, it seems to be less regular. A possible explanation of this may be an over-estimation of the distance at which the busy street actually influences real estate values. A positive effect on pollution levels may arise actions that might be taken to reduce pollution, such as measures to reduce traffic congestion.

In order to measure inhabitants subjective expectations on the effect of the busy Zirmunai (Antakalnis) street proximity on the apartments an survey was performed. According to survey, inhabitants living in Zirmunai district according to the impact of air and noise pollution considered three district blocks from Zirmunai street to Neris river. The physical distance from Zirmunai street to Neris river is varied from 60 to 300 metres. According the survey, this was divided into three categories, the closest (0-60 metres) to Zirmunai street getting the highest value of air and noise pollution, the middle (60 - 180 metres), and closest to Neris river (0-120 metres) getting the smallest values of air and noise pollution.

In order to measure the effect of the air and noise pollution from Antakalnis street on the apartments, the impact of a single street area was considered by inhabitants two district blocks from Antakalnis street to Neris river. The physical distance from Antakalnis street to Neris river is varied from 135 to 150 metres. This was divided by inhabitants into two categories, the closest (0-75 metres) to Antakalnis street getting the highest value of air and noise pollution, and closest to Neris river (0-75 metres) getting the smallest values of air and noise pollution.

3.6. Pollution effect on the inhabitants health

On the purpose to evaluate effect on the health made by pollutant there was estimated Air Quality Index (AQI) and made the map of pollution impact on human health using methodology of U.S. Environment Protection Agency. This map is made for specific area i.e. the part of Zirmunai and Antakalnis district, surrounded with Antakalnis, Zirmunai, Kareivių, Šilo streets. This index is divided into six categories:

Air Quality Index (AQI) value	Level of health concern	Colors
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for sensitive groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very unhealthy	Purple
301 to 500	Hazardous	Maroon

The map of pollution impact on human health and mentioned methodology enable us to decide what associated health effect might be due to concentration of pollutants and what kind of diseases it might cause. Analyzing the map the most attention is paid to such diseases groups as heart and lung diseases. The pollution impact on human heath is different for single groups of people. In the methodology there are mentioned four main groups, i.e. sensitive groups (people with respiratory, cardiopulmonary and cardiovascular diseases), adults, active

children, older adults. Furthermore there are given the health effects statement for guidance on the Air Quality Index in the methodology:

Air Quality Index (AQI) value	Level of health concern	Health effect statement
0 to 50	Good	There is no effect on health
51 to 100	Moderate	Usually sensitive singles might experience discomfort and respiratory symptoms. Possible aggravation of heart or lung diseases in people with cardiopulmonary diseases and older people.
101 to 150	Unhealthy for sensitive groups	Increasing likelihood of respiratory symptoms and breathing discomfort in active children, adults and people with lung diseases. Also aggravation of heart or lung diseases and premature mortality in people with cardiopulmonary diseases and older adults. People with heart diseases might experience chest pain and tightness.
151 to 200	Unhealthy	Greater likelihood of respiratory symptoms and breathing difficulties in active children and adults and people with lung diseases. Possible aggravation of the heart, cardiovascular symptoms and premature mortality in people with cardopulmonary disease.
201 to 300	Very unhealthy	Increasingly severe symptoms and impaired breathing likely in active children and adults and people with lung diseases, increasing likelihood of respiratory effects in general population. Significant aggravation of heart or lung disease, cardiovascular symptoms and premature mortality in people with cardiopulmonary disease and older people.
301 to 500	Hazardous	Hazardous Severe respiratory effects and impaired breathing likely in active children and adults and people with lung disease. Increasingly severe respiratory effects likely in general population. Serious aggravation of heart and cardiovascular symptoms and premature mortality in people with heart disease. Impairment of strenuous activities in general population.

In the given map (see Fig. 7) there is possible to see that the air quality in the zone of concern is good or moderate. Obviously that near the streets the pollution is bigger and that means that people living in this territory are always on exposure of pollutants. So in this zone sensitive singles might experience discomfort and respiratory symptoms. Also there is possible aggravation of heart or lung diseases in people with cardiopulmonary diseases and older people. Furthermore it is important to mention that calculated Air Quality index near the road in many cases is on the line of the third category “Unhealthy for sensitive groups”.

Making the forecast of the increase of vehicles in Lithuanian roads in the future, the situation of the air quality can even get worse.

Fig. 8. Digital map of Air Quality Index value for the research's study area

4. Congruity between the Purchase/Sale Price of 1 m2 of an Apartment, Inhabitants Subjective Expectations and Quantitative and Qualitative indicators of External Environment

4.1. A Survey of Inhabitants Subjective Expectations

In order to measure inhabitants subjective expectations on the effect of the busy Zirmunai and Antakalnis street proximity on the apartments a survey was performed. According to survey, inhabitants living in Zirmunai district according to the impact of air and noise pollution considered three district blocks from Zirmunai street to Neris river. The physical distance from Zirmunai street to Neris river is varied from 60 to 300 metres. According the survey, this was divided into three categories, the closest (0-60 metres) to Zirmunai street getting the highest value of air and noise pollution, the middle (60 - 180 metres), and closest to Neris river (0-120 metres) getting the smallest values of air and noise pollution.

In order to measure the effect of the air and noise pollution from Antakalnis street on the apartments, the impact of a single street area was considered by inhabitants two district blocks from Antakalnis street to Neris river. The physical distance from Antakalnis street to Neris river is varied from 135 to 150 metres. This was divided by inhabitants into two

categories, the closest (0-75 metres) to Antakalnis street getting the highest value of air and noise pollution, and closest to Neris river (0-75 metres) getting the smallest values of air and noise pollution.
Subjective people's senses are very important in the evaluation of dwelling conditions. Dwelling conditions influence not only physical health of people. Usually the influence on mental health is even greater; however, it is more seldom and more difficult to determine. Subjective evaluation, satisfaction and comfort are important indicators during the process of improving of psychological dwelling conditions, as well as the quality of life and understanding of house value.

Some survey data on the Citizens of Vilnius City and District, who Live and Work in a Risk Environment, 2000; Vilnius City Housing Survey, 2002; and an Integrated Survey on Health, Surroundings and the Quality of Life of Vilnius Citizens, performed in 2005 – 2006 which are related with our research are presented further.

According to the data of the survey performed in the period of 2005-2006 in Vilnius 35.0% and 31.3% of men, 28.6% and 32.5% of women respectively stated to have no problem at all or that the problems are small with regard to the air quality in a flat (dryness, dust, smells and smoke). 26.8% of men and 28.9% of women stated that they face problems related to air quality in a flat; 5.0% of men and 6.9% of women stated large problems; 1.9% of men and 3.1% of women stated that the problems are related to air quality in living surroundings and cause very large problems.

55.6 percent of the respondents during the survey performed in Vilnius stated that dusty air influences their health "very much" and "extremely" and evaluated their health as "good" and "very good". Whereas 38.7 percent of the respondents stated that dusty air does not influence their health "at all" and evaluated their health as "good" and "very good".

It appeared that the respondents, who stated that dusty air has influence on their health (the level of influence ranges from "a little bit" to "extremely") evaluate their health in a better way than the respondents, who stated that dusty air does not influence their health "at all".

15.9 percent of the respondents stated that the air polluted with harmful substances does not have influence on their health status "at all"; however they evaluated their health as "bad"; and only 3.5 percent of the respondents stated that the air polluted with harmful substances influences their health "very much" and "extremely" and evaluated their health as "very bad" $p<0,001$. There were more respondents, who evaluated their health as "bad" among those, who stated that the air polluted with harmful chemical substances "a little bit" and "in average" influences their health (12,4%), than those, who stated that live in an environment, which is "very much" and "extremely" polluted with harmful chemical substances (3,5 percent) $p<0,05$.

Obviously, the real air pollution level depends on the distance between the streets and the Neris river. More information about decreasing solid particles pollution from river Neris in different sections (A-A, B-B, C-C, D-D, E-E) can be found in Figures 9-12.

Fig. 9. Sections where air pollution and noise level have been investigated

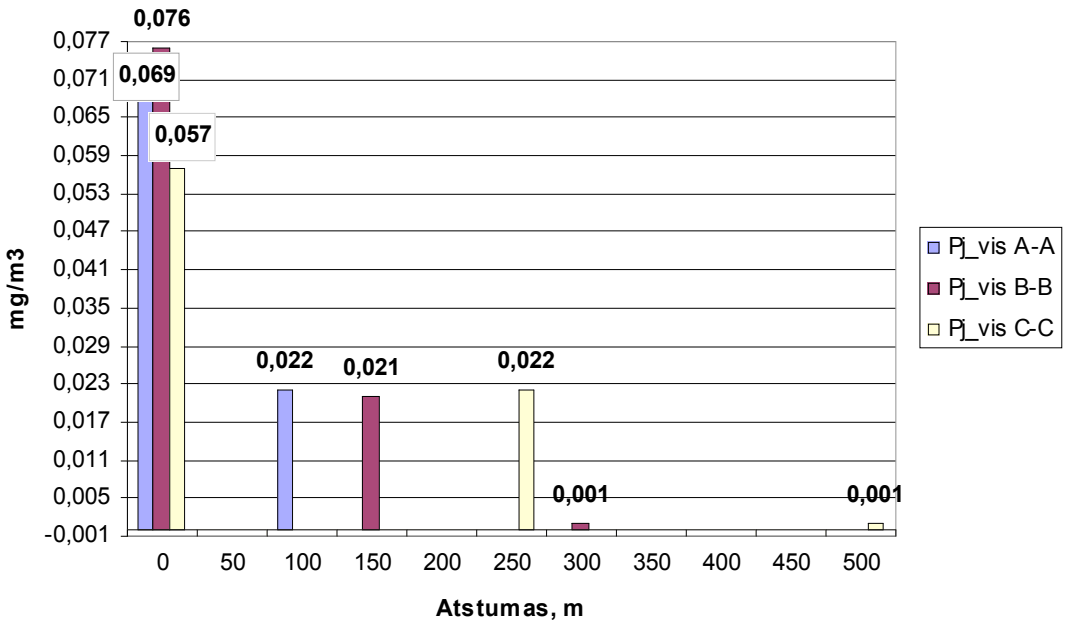


Fig. 10. Decreasing level of concentration of solid particles with increasing distance from the street in Zirmunai borough at cross-sections A–A, B–B and C–C

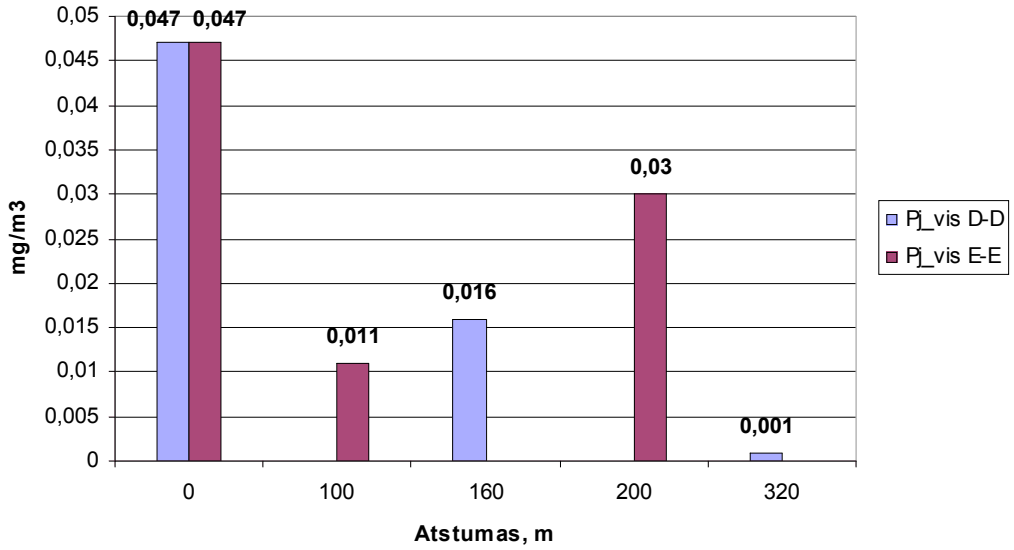


Fig. 11. Decreasing level of concentration of solid particles with increasing distance from the street in Antakalnis borough at cross-sections D–D and E–E

During the survey it was determined that noise is one of the most obvious and the most important problems in the blocks of flats. Even 87.3 percent of residents stated that the noise coming from the outside or neighbouring flats disturbs them (even when the windows are closed). Even 15.7 percent of population state that noise constantly disturbs them. The most common noise source is the noise from neighbouring flats (i.e. talking, music, TV, work, pets, etc.), from the outside (from bars, playgrounds, etc.) and noise of transport. Therefore 66.7 % of population evaluated sound insulation in flats as worse. Most of the population think that bad sound insulation is in indoor walls, windows and ceiling of a flat. 54.2 % of the interviewed residents agree to pay additional sum every month for a possibility to live in a quiet environment.

Quite a lot of residents mentioned noise as the reason for people's sleep disorders or regular sleep disturbance (38.8 %); and people are irritated or being angry because of the noise (43.3 %). Even two thirds of the residents think that they are disturbed by noise due to insufficient sound insulation. People are especially angry about the noise from the neighbouring flats (talking, music, TV, repair works, pets, etc.), noise from traffic and car parking areas.

Three fourth of the residents (74.4%) state that they have problems related to sound insulation. Generally they think that sound insulation of the windows' (42.5 %), the ceiling (41 %), indoor walls of the flat (34.3 %), walls among the flat and other flats or in the staircases (33.2 %), outdoor walls (31.6%) and the floor (30.9%) is bad.

According to the opinion of the respondents they usually have problems because of the noise from neighbouring flats, traffic noise, and the noise from car parking areas.

According to the data of the survey 12,5 % of the respondents stated that the street noise in the living surroundings does not influence their health "at all"; and the same number

indicated that the street noise in the living surroundings influences their health status “very much” and “extremely”, and they evaluated their health as “very bad”.

34,4 % of the respondents stated that street noise prevails in their living surroundings. It appeared that the respondents, evaluating the noise, which prevails in the living surroundings as “a little bit” and “in average” evaluated their own health status worse than the respondents, who state that street noise does not influence their living surroundings “at all”; however, the respondents, who stated that street noise influences their living surroundings as “very much” and “extremely” evaluated their own health status better than those, who stated that street noise does not influence their living surroundings “at all”.

43,7 % of the respondents, according to the survey data, stated that noise does not influence their living surroundings; however, it appeared that the respondents, who indicated that traffic noise in the yards influences their living surroundings “a little bit” and “in average” evaluated their health status worse than those, who stated that traffic noise in the yards does not influence their living surroundings “at all”. However, the respondents, who stated that traffic noise in the yard influences their living surroundings as “very much” and “extremely” evaluated their own health status better than those, who stated that street noise does not influence their living surroundings.

Out of the interviewed people only 5.3% of men and 5.1% of women have very large problems related to noise (neighbours, transport). 10.9% of men and 10.3% of women stated that there are large problems related to noise from the surroundings; 22.5% of men and 26.7% of women indicated that noise from the surroundings causes them average problems; 31.6% and 29.7% of men; 30.1% and 27.8% of women indicated that there are few problems; or there are no problems at all.

Therefore, the solution of the noise problem should be one of the main priorities.

According to the data of the survey performed in Vilnius city 13 % of the respondents complained about bad health status and stated that the noise caused by their neighbours influences their health status “very much” and “extremely”. The respondents, who evaluate the noise caused by their neighbours as “a little bit” and “in average” evaluated their own health status worse than those, who evaluated the noise caused by their neighbours as influencing their health status “very much” or “extremely”.

The real noise level depends on the distance between the streets and the Neris river. More information about decreasing noise from river Neris in different sections (A-A, B-B, C-C, D-D, E-E) can be found in Figures 12 and 13.

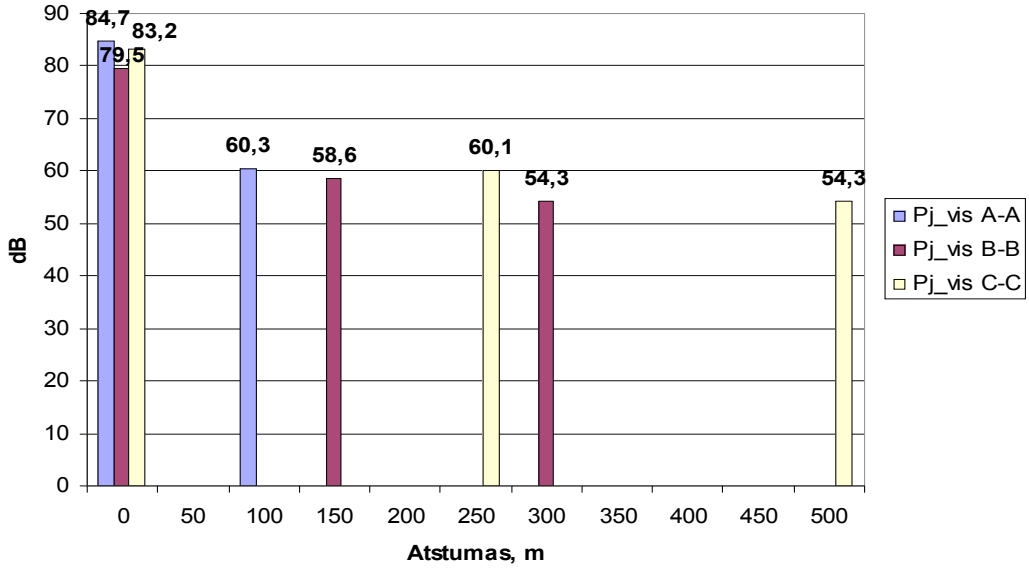


Fig. 12. Decreasing noise level with increasing distance from the street in Zirmunai at sections A–A, B–B and C–C

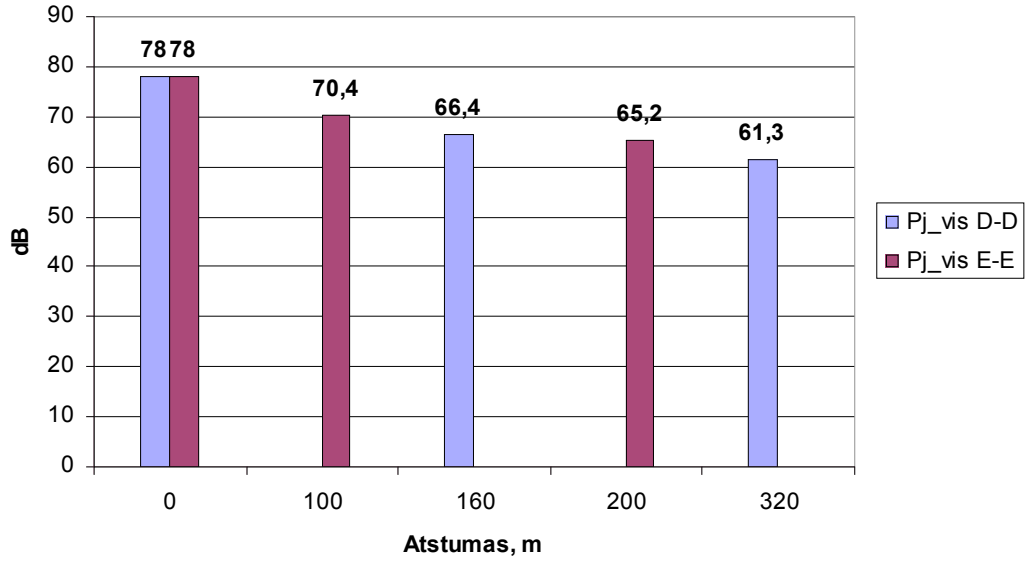


Fig. 13. Decreasing noise level with increasing distance from the street in Antakalnis at sections D–D and E–E

The Lithuanian hygiene standard HN 35:2002 "Marginal Values of Air Pollutant Concentrations in Residential Areas" sets the following allowable norms of pollutants:

- Carbon monoxide (CO): up to 5 mg/m^3. CO concentration exceeds the normative requirements at the crossroads of Šilo street with Antakalnio and Žirmūnų streets (up to 7.15 mg/m^3).
- Volatile organic compounds are emitted from oil products as gases of any composition. Their highest allowable concentration in a residential area is 5 mg/m^3.

Studies have shown that norms are exceeded at the crossroad of Žirmūnų street with Kareivių street and in some parts of Antakalnio street where the traffic is more intense.

- Concentration of airborne solid particles cannot exceed 0.5 mg/m^3. The norms are not exceeded as shown by measurements. Pollutant concentrations are particularly high at crossroads. Pollution by solid particles reaches up to 0.077 mg/m^3 there.
- The allowable concentration of nitrogen dioxide (NO_2) in the air is up to 0.040 mg/m^3. Concentration of nitrogen dioxide exceeds the allowed norm greatly at the crossroad of Antakalnio street with Žolyno street (up to 0.071 mg/m^3). Concentration of NO_2 at crossroads varies from 0.041 to 0.063 mg/m^3.

Experiments have shown that humans perceive a reduction of sound by 10 dB as if the noise level decreases twice. Therefore, we can claim that the noise level decreases up to eight times in the places farthest from the street.

31.1 % of the respondents think that they had health disorders and illnesses, which, in their opinion, may be related to the accommodation itself. Generally the people indicated respiratory disorders and cough (12.3%), headaches (10.0%), coryza (5.5%.) and problems of getting asleep (4.6%). Most of them thought that health disorders or illnesses, related to the conditions of accommodation, may have appeared due to the influence of air quality in a flat (15.1%), noise (9.1%), temperature (8.7%), and air humidity (7.8%) [8].

On the basis of the survey results the conclusion may be that the greatest influence on people's health, in their own opinion, has noise, coming from the outside or from neighbouring flats (when the windows are closed); 15.7 % of the respondents complain that noise disturbs them constantly (87.3 % stated that the surrounding air pollution, noise, dust, microclimate of the premises disturbs them).
The factors of house and living surroundings have a great influence on people's health; and their impact is complex. Even a slight impact on health may turn into a great problem if large groups of people are influenced. Subjective people's senses are very important in the evaluation of dwelling conditions.

Dwelling conditions influence not only physical health of people. Usually the influence on mental health is even greater; however, it is more seldom and more difficult to determine. Subjective evaluation, satisfaction and comfort are important indicators during the process of improving of psychological dwelling conditions, as well as the quality of life and understanding of house value.

64.4 % of the house complained against the air quality in a flat. A lot of respondents mentioned dry air, humidity, dust, smells, insufficient air circulation as the factors of air quality. The residents, which indicated that air quality in a flat is bad, quite bad, and medium, more often were less satisfied with their flat and were subject to relate people's health disorders with the conditions of a flat, compared to those residents, which evaluated air quality in a flat as quite good or good. Air quality is greatly influenced by ventilation system. According to the survey data, mechanical ventilation system was installed in only 20.6 % of flats; however, only half of them thought that it is sufficiently functioning.

Almost half of the residents were not satisfied by the air quality in the house. Most of the residents think that the main reasons for the problems of air quality in premises are dust and other particles (41.9 %), pollution from the outside (38.2 %), dryness (34.9 %), smells (30.2 %), humidity (22.6 %), smoke (22.3 %), insufficient air circulation or "heavy" air (18.6 %); (Picture 6).

Smoking in the premises is also one of inadequate reasons of air quality. It was determined that every fourth person sleeps in smoke-filled rooms. People who sleep in smoky rooms more often complained against chronic diseases or long-term health disorders (blood pressure and heart problems; more often colds in winter) than those, who sleep in non-smoky rooms.

Researches of air quality in premises are evaluated as secondary and this fact sometimes results in fatal outcomes. Insufficient attention is paid to micro-climate of premises and insufficient amount of money is allocated to obtain ventilation systems of good quality. Due to this reason our health suffers. Five decades ago allergy was not spread so much. Today it is difficult to find a person, who does not suffer from allergy or has no close person, who suffers from this cunning disease. It is possible to find a lot of examples, how much we are influenced by air of the premises, which we breathe in average 21 hours per day out of 24.

Ventilation is the main measure in order to reduce pollutants in the air of the premises, which could not be controlled in the places of their discharge. However, ventilation system in premises in many cases is insufficient and non-regulated; and more often evaluated by residents as worse than better; 54,6 % of the respondents evaluate it from 1 to 3 in the evaluation scale of 5 (1-totally dissatisfactory, 5 –totally satisfactory).

38.2% of men and 35.7% of women indicated that ventilation system in their dwelling surroundings in winter, as well as in summer is very good and it does not cause any problems. 27.6% of men and 32.5% of women stated that they have only few problems related to ventilation system; 26.3% of men and 23.8% of women indicated that they have average problems; and 7.2% of men and 6.1% stated to have great problems; and only 0.8% of men and 1.9% of women indicated that ventilation system causes very large problems in winter, as well as in summer.

One of the main complaints of the people living in the blocks of flats was dissatisfaction with temperature comfort. More than a half of all interviewed residents complained against insufficient temperature in a flat in all seasons; and even 73% of people complained about it in autumn and spring. Most of them indicated that it is too hot for them in summer and too cold in winter and intermediary period. Therefore, people are forced to use additional heating appliances. As far as we know, low temperature of the premises increases humidity and falling ill with respiratory diseases. During the survey it was determined that those people who complained against the temperature in a flat during summer and winter seasons evaluated their own health twice as bad as those, who have no problems of temperature in a flat.

One of the main complaints of the people living in panel blocks of flats was dissatisfaction with temperature comfort. Almost one third of the residents (30.4%) were dissatisfied with air temperature in their housing during summer. 92.1 % out of them complain that it is too

hot. More than half of the residents (54.1%) complain against the temperature during the intermediary period; 90.8 % out of them complain that it is too cold. Even 60 % of the residents are dissatisfied by air temperature in their house in winter. The most common reason of dissatisfaction against air temperature is cold (92.0%). 15.4 % of the respondents constantly suffer from temperature discomfort in winter. 19.8 % of the respondents use additional heating appliances in intermediary and winter period.

In autumn of 2005 and in spring of 2006 an integrated survey was performed in Vilnius city on „Health, Surroundings and the Quality of Life of Vilnius City Citizens". The survey was performed in random selection method; the respondents were interviewed by anonymous questionnaire, which consisted of 274 questions. This questionnaire also included questions about the factors of dwelling environment. After the data analysis it appeared that 35.8% men indicated that there are no problems in a flat related to air temperature (in winter, in summer, in autumn, and in spring); 27.7% of women did not complain against the air temperature in a flat as well. 24.5% of men and 35.5% of women indicated that there are few problems related to air temperature in a flat; 24.7% of men and 27.2% of women stated that there are average problems related to air temperature in a flat. Only quite a small part of the interviewed stated that the problems are large and very large; 3.2% and 1.9% of men, 8.5% and 1.1% of women respectively.

As far as we know, low temperature of the premises increases humidity and falling ill with respiratory diseases. During the survey it was determined that those people who complained against the temperature in flats during summer and winter period evaluated their own health twice as bad as those who have no problems related to temperature.

One of the most obvious problems of the people living in panel blocks of flats is draught and insufficient heating insulation. 74.5 % of the analysed households complained against the problems of air circulation, especially in winter, wind blowing through the windows, because windows/door do not close hermetically. More than a half of the interviewed indicated that draught troubles them often and constantly. Quite a large part of the people who complained about air circulation or draught in a flat evaluated their health and satisfaction with the housing worse. The main reason of draughts is non-hermetic windows. The flat analysis has shown that in 73.5 % of the analysed housings windows do not close hermetically.

During the housing examination (the survey of 2002) non-hermetic windows were determined (sometimes even visible gaps) at least in one room in two thirds of the residents, through which wind is blowing; in one fifth of the residents windows are of single glass packet. Even more than a half of residents complained against the problems of air shift or draught in the housing, especially in winter that are caused by non-hermetic windows, doors or their insufficient quality.

Only one fourth of residents state they have no problems related to temperature in a house. People more often evaluate the quality of heating system as worse than better; 54.9 % in the scale of 5 evaluate it from 1 to 3, where 1 means "totally dissatisfactory" and 5 means "totally satisfactory".

In many cases the residents cannot regulate heating systems themselves (more than 80 % of the case). Some residents are forced to use additional heating appliances (27.3 %), which influences larger expenses related to house economy. 28.0 % of them constantly use additional heating appliances.
Two thirds of the residents evaluated heating insulation in the house in the scale of 5 from 1 to 3, where 1 means "totally dissatisfactory" and 5 means "totally satisfactory".

In case of very large problems related to the lighting of the flat due to buildings and trees, which block the windows only 1.1% of women complained against these problems; whereas this problem did not cause a lot of inconveniences for men. 4.8% of men and 5.3% of women stated that there are large problems related to lighting. Average discomfort with regard to insufficient lighting in a flat was felt by 16.7% of men and 17.5% of women. Most of the respondents were those, who indicated that there are no problems related to flat lighting at all or that there are only few of them (respectively 54.6% and 23.9% of men; and 50.6% and 25.4% of women).

According to the data of the survey performed in 2002 almost one third of the residents indicated that sometimes during the daylight on a sunny day they need to turn on the light, because natural lighting in a house is insufficient.

Even 51.7% of the interviewed men and 46.1% women indicated that there are no problems related to humidity of the flat at all; 22.5% of men and 28.9% of women stated that there are few problems; 19.6% of men and 17.5% of women indicated that there are average problems related to humidity in a flat; and 4.0% and 2.1% of men, as well as 5.6% and 1.8% of women respectively indicated that problems related to humidity are large or very large.

4.2. Case Study: Congruity between the Purchase/Sale Price of 1 m2 of an Apartment, Inhabitants Subjective Expectations and Quantitative and Qualitative indicators of External Environment

Even though we find evidence that individuals are knowledgeable about air and noise pollution levels, we also find that subjective expectations and measured air and noise pollution levels have different effects on housing values. A higher subjective knowing of air and noise pollution reduces flats values as we expected. Residents believe that pollution is greater near Zirmunai and Antakalnis street, and this belief apparently is reflected in flats values. The correlation between measured pollution and flats values also suggests, that residents are partly informed about air and noise pollution influence on their health. Residents appear to be a knowledgeable about the relationships between the relative levels of pollution in different neighborhoods and weather conditions. The opinion that houses near Zirmunai and Antakalnis streets are more polluted is most likely due to the presence of busy Zirmunai and Antakalnis streets and related crossroads.

While analysing changes of pollution and noise and their effect on human health, an assumption was made that air pollution and sound can have a certain effect on dwelling prices, i.e. the prices in the houses close to the street should be slightly lower than the prices in the houses close to the river. For this purpose, using Lithuanian web-based real estate databases and periodicals, the offer prices of apartments for sale in the analysed zone for the

summer of 2006 were collected and diagrams of average values were drawn for Zirmunai and Antakalnis boroughs separately (Fig. 14 and 15).

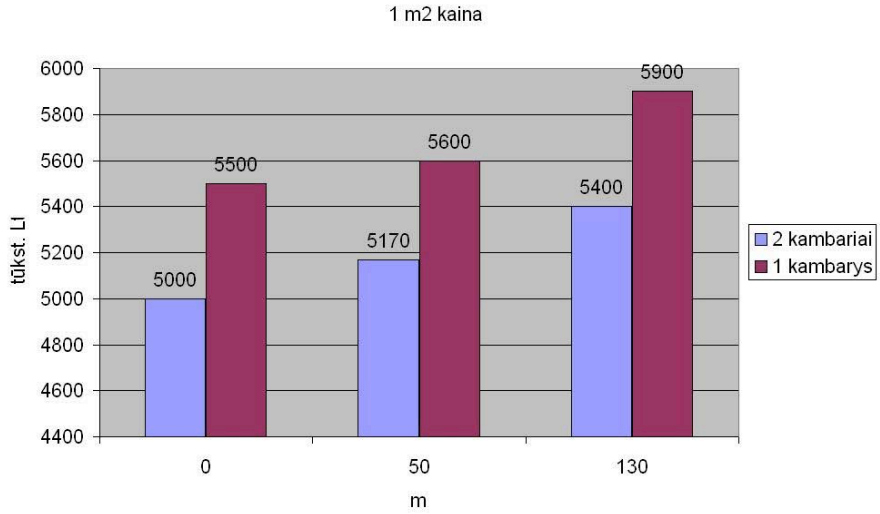


Fig. 14. Increasing price of 1 m^2 of an apartment for sale with increasing distance from the street in Antakalnis in 2006

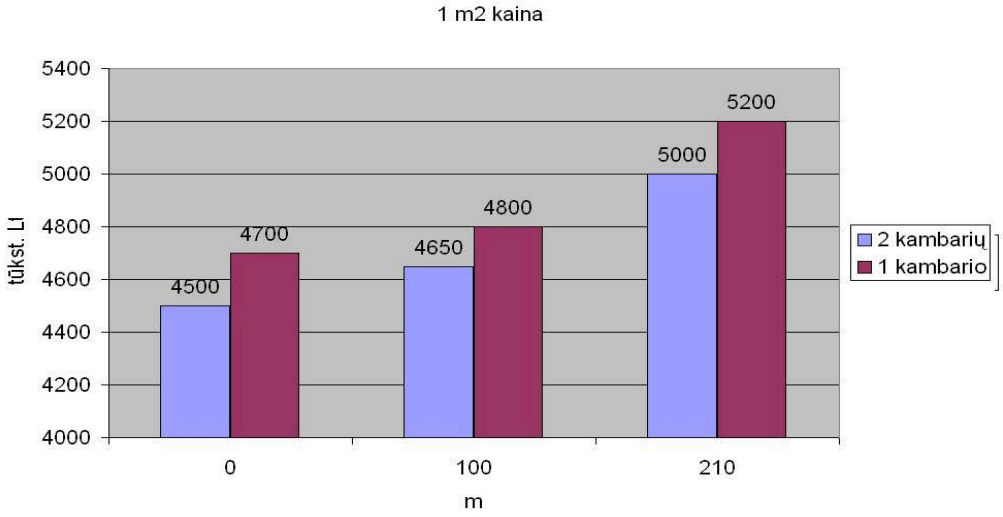


Fig. 15. Increasing price for 1 m^2 of an apartment for sale with increasing distance from the street in Zirmunai in 2006

The histograms show the price of 1 m^2 of an apartment changes with respect to the distance from the street in Zirmunai and Antakalnis boroughs. As the chart shows, the most expensive apartments are closest to the river, since air pollution and noise penetration from the street is lower and the environment is more picturesque. By comparison of the offer prices of the objects close to the street with the offer prices of those close to the river, it was analysed whether people are aware of the effect of pollution and noise and whether they assess the effect adequately when selling or purchasing dwellings. A price variation of about LTL 400–

500 per m^2 was noticed with respect to apartment's location in a house at the river or in a house at the street.

However, the results of this analysis were not sufficient to make valid conclusions. The data on transactions made in the period from 1998 to 2006 and accumulated in the database of by Lithuanian *State Enterprise Centre of Registers* and was used for further analysis of the effect of pollution and noise on dwelling prices. This data was used as a basis for separate digital maps of purchase/sale transactions made from 1998 to 2006 showing the average purchase/sale price of 1 m^2 of an apartment in each house ignoring the extreme values.

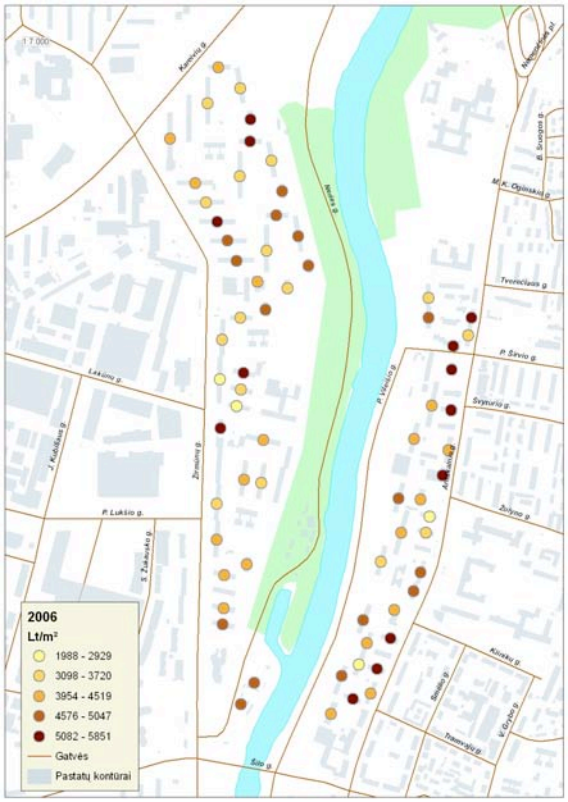


Fig. 16. Digital map of purchase/sale prices of apartments in the analysed area of Zirmunai and Antakalnis in 2006

The digital map of purchase/sale prices of apartments in 2006 (Fig. 16) shows certain discrepancies between the real situation and our assumption that apartments in houses close to the street should cost less and the price should increase with increasing distance from the street and decreasing distance to the river. For example, expert opinion shows that apartments close to the river Neris should cost by 20% more than similar apartments close to Žirmūnų or Antakalnio streets. However, prices in some houses close to the street are especially high, as the digital map shows, and this fact contravenes the assumption; prices of apartments in some houses close to the river are considerably low, analogically. To explain this discrepancy, the analysed area was inspected and a detailed analysis of the available data made (Table 6). The Table 6 analyses the transactions made in 2006 and the possible influence of various quantitative and qualitative environment criteria on the transactions:

- Quantitative criteria:
  1) Year of construction (based on the data from the Centre of Registers – *Lithuanian State Enterprise Centre of Registers*).
  2) Number of floors (based on the data from *Lithuanian State Enterprise Centre of Registers*).
  3) Noise and its digital map.
  4) CO and its digital map.
  5) Solid particles and their digital map.
  6) NO_2 (nitrogen dioxide) and its digital map.
- Qualitative criteria (determined through a detailed inspection of the analysed area):
  7) Aesthetic environment: this criterion assesses aesthetics of the environment, quality of landscaping and green areas. Scored in a 5-point system (see Table 4).
  8) Street: this criterion shows whether a building is close to the street.
  9) Car parking lot: to assess whether there is a small parking lot or it is missing altogether.
  10) Recreation area: to assess whether a developed recreation area is near to the analysed building: playgrounds, basketball fields, benches, etc.
  11) Renovation: whether the building is or is not renovated. Access: scored in a 3-point system (see Table 2).
  12) Lighting: to assess whether remote streets (away from the main street) have lighting.
  13) Construction works: this criterion is used to assess whether new construction works are underway near the building.
  14) Retail park: to assess whether there are retail parks and shops near the building.
  15) Kindergarten, school: to assess whether a school or a kindergarten is near the building.

Table 4. Assessment of an aesthetic environment in points

Points	Description
5	Especially beautiful landscape. Recreation area complying with modern requirements. Houses surrounded by trees. Newly planted lawns or flowerbeds under especially good maintenance near the house.
4	Beautiful environment. Trees are planted. Flowerbeds near the house. Benches in good condition near the house; grass is cut.
3	Maintained environment. Trees and bushes growing around the house. There are benches but not in very good condition and not painted. Flowerbeds are chaotic.
2	Quite messy environment. Flowerbeds are not maintained, grass is not cut. Some benches are almost broken or they are missing. Trees and bushes grow wild.
1	Especially messy environment.

Table 5. Assessment of access in points

Points	Description
3	A very convenient access to the house. You do not have to drive through parking lots of other houses.
2	Convenient. You have to drive through parking lots of several houses but a driveway is available from two sides.
1	Very bad. Access is very complicated; you have to drive through parking lots of several houses. Very small area for a car to turn around at the house.

Table 6. Quantitative and qualitative criteria that define sold apartments and their environment; congruity between the criteria and the purchase/sale prices of apartments (see Fig. 16)

Street	House No.	2006																			Do the analysed criteria correspond to the price?
		Price group (see Fig.8)	Purchase/ sale price of 1 m^2 (LTL)	Quantitative and qualitative criteria which defiNo sold apartments and their environment																	
				Year of construc-tion	Num-ber of floors	Noise (decibels)	CO	Solid partic-les	NO_2	Aes-the-tics, in points	A house close to the street	Car parking lot		Is there a recrea-tional zone?	Is the house reno-vated?	Access (in points)	Do the remote areas have lighting?	Is cons-truction work under way nearby?	Is there a retail park nearby ?	Is there a kindergar-ten or school nearby?	
												Too small or absent	Suffi-cient								
Žirmūnų g.	1A	4	5023	1940	1	66,51–71,23	0–0,38	0,016–0,023	0,019–0,025	5			Yes	Is		3	Yes				Yes
	3	3	4369	1965	5	71-24–80,70	0,39–3,00	0,033–0,051	0,026–0,033	4	Yes		Yes	Is	Yes	3	Yes				Yes
	7	3	4516	1965	5	71,24–80,.70	0,39–3,00	0,033–0,051	0,026–0,033	4	Yes		Yes	Is		3	Yes				Yes
	21	3	4518	1965	5	75,98–80,70	2,14–3,00	0,060–0,067	0,019–0,025	3	Yes	Yes		Is		3					Yes
	23	2	3098	1965	5	75,98–80.70	2,14–3,00	0,060–0,067	0,019–0,025	3	Yes	Yes		Is		3					Yes
	39	1	2819	1965	5	66,51–75,97	1,26–2,13	0,023–0,032	0,026–0,033	1	Yes	Yes				3			Yes	Yes	No
	41	2	3720	1966	5	66,51–75,97	0,83–2,13	0,016–0,032	0,026–0,033	1	Yes	Yes		Is		3				Yes	Yes
	47	1	1987	1965	5	75,98–80,.70	2,14–3,00	0,033–0,041	0,034–0,040	2	Yes	Yes				3				Yes	Yes
	49	2	3182	1965	5	75,98–80,70	1,27–2,13	0,033–0,041	0,034–0,040	2	Yes	Yes				3				Yes	Yes
	51	2	3335	1965	5	66,50–75,97	0,39–1,26	0,016–0,033	0,034–0,040	3	Yes	Yes				3				Yes	Yes
	59	5	4711	1966	9	52,30–57,00	0–0,38	0,007–0,015	0,026–0,033	4			Yes	Is		2	Yes				Yes
	61	5	4821	1966	5	52,30–57,00	0–0,38	0–0,006	0,019–0,025	5			Yes	Is		1	Yes				Yes
	69	5	4658	1966	5	57,01–61,77	0–0,38	0–0,006	0,026–0,033	4		Yes		Is		2	Yes				Yes
	71	5	4662	1967	9	52.30–57,01	0–0,38	0–0,006	0,019–0,025	4		Yes		Is		2	Yes				Yes
	85	2	3178	1966	5	71,24–85,43	3,01–4,75	0,033–0,050	0,034–0,040	3	Yes		Yes			3			Yes		Yes

	87	3	4469	1966	5	75,98–85,43	3,01–4,75	0,033–0,041	0,026–0,033	3	Yes		Yes			3			Yes		Yes
	91	5	5851	1966	5	61,77–66,50	0,39–1,26	0,007–0,015	0,011–0,018	4		Yes		Is		2	Yes			Yes	No
	93	5	5232	1965	9	57,01–61,77	0,39–126	0007–0,015	0,003–0,010	1		Yes		Is		2	Yes			Yes	Yes
	99	3	3999	1967	5	71,24–80,70	1,27–3,00	0,016–0,023	0,003–0,010	2	Yes	Yes				1					Yes
	101	2	3241	1967	5	75,89–80,70	2,14–3,00	0,024–0,032	0,011–0,016	3	Yes	Yes		Is		1					Yes
	105	3	4272	1967	5	80,71–95	3,89–4,75	0,033–0,041	0,019–0,026	2	Yes		Yes			2		Yes	Yes		Yes
Antakalnio g.	60	2	4443	1965	5	71,24–75,97	3,89–4,75	0,051–0,59	0,041–0,048	3	Yes		Yes			3	Yes				Yes
	68	3	4339	1968	9	71,24–75,97	2,14–3,00	0,033–0,041	0,041–0,048	2	Yes		Yes	Is		3			Yes	Yes	No
	78	2	3596	1963	5	7,98–80,70	3,89–4,75	0,042–0,050	0064–0,071	2	Yes	Yes		Is		3					Yes
	80	1	2388	1963	5	75,89–80,70	3,89–4,75	0,042–0,050	0,064–0,071	2	Yes	Yes				3					Yes
	82	3	4409	1967	9	71,24–75,97	2,14–3,00	0,033–0,041	0,056–0,064	1	Yes	Yes				3					Yes
	86	3	4307	1965	5	75,98–80,70	2,14–3,00	0,033–0,041	0,056–0,063	3	Yes		Yes			3			Yes		Yes
	102	3	3503	1965	5	75,98–80,70	3,89–4,75	0,051–0,59	0,049–0,055	2	Yes	Yes				3			Yes	Yes	Yes
P. Vileišio g.	20	3	4155	1967	5	66,51–71,23	3,01–3,88	0,024–0,032	0,026–0,033	4		Yes		Is		3	Yes				No
	21	4	4576	1963	5	57,01–61,78	1,27–2,13	0,016–0,023	0,019–0.025	4		Yes		Is		3	Yes				Yes
	24	4	4619	1963	5	66,50–71,23	0,39–1,26	0,024–0,032	0,019–0,033	5		Yes		Is		2	Yes			Yes	Yes
	27	4	4766	1963	5	61,78–66,50	1,27–2,13	0,015–0,023	0,049–0,055	2		Yes				2					Yes
	32	4	5046	1964	5	61,78–66,50	1,27–2,13	0,015–0,023	0,034–0,040	4	Yes					3			Yes	Yes	Yes

Table 7. Pollution, aesthetics and noisiness of the environment; congruity between the criteria and the purchase/sale prices of apartments

House No.	1998 year							1999 year							2000 year						
	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analysed criteria corres-pond to the price?	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analysed criteria corres-pond to the price?	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	D ar cr co po th pr
1/3															3	1345	64.93-71.04	0.0166-0.023	5	Yes	Y
1A																					
3	3	1313	71,04–77,15	2,14–3,0	1	No	Yes														
9	4	1510	52,7–58,8	0,39–1,26	5	Yes	Yes	3	1270	52,7–58,8	0,39–1,26	5	Yes	Yes							
23	3	1410	77,15–83,27	2,14–3,0	1	No	Yes	3	1438	77,15–83,27	2,14–3,0	1	No	Yes							
47	2	1299	77,15–83,27	2,14–3,0	1	No	Yes	2	1651	77,15–83,27	2,14–3,0	1	No	Yes							
51	4	1080	64,93–71,04	0,39–1,26	2	No	No								2	1255	64,93-71,04	0,39-1,26	2	No	Y
59								3	1870	52,7–58,8	0–0,38	5	Yes	Yes							
61								3	1857	52,7–58,8	0–0,38	5	Yes	Yes							
71	4	1513	52,7–58,8	0–0,38	5	Yes	Yes	4	1952	52,7–58,8	0–0,38	5	Yes	Yes	2	1356	52,7-58,8	0-0,38	5	No	Y
73								4	2049	52,7–58,8	0–0,38	5	Yes	Yes							
99																					

Continuation of Table 7

	2001 year							2002 year						
House No.	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analysed criteria corre-pond to the price?	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analys criteria corres to the price?
1/3	5	1472	64.93–71.04	0.0166–0.023	5	+	Yes	3	1075	64.93–71.04	0.0166–0.023	5	+	Yes
1A	5	1412	64.93–71.04	0.0166–0.023	5	+	Yes							
3								3	1332	71,04–77,15	2,14–3,0	1	–	Yes
9	3	1311	52,7–58,8	0,39–1,26	5	+	No							
23														
47	2	1207	77,15–83,27	2,14–3,0	1	–	Yes							
51														
59	2	1226	52,7–58,8	0–0,38	5	+	Yes	2	1281	52,7–58,8	0–0,38	5	+	Yes
61	1	906	52,7–58,8	0–0,38	3	+	Yes							
71								3	1262	52,7–58,8	0–0,38	5	+	Yes
73	3	1314	52,7–58,8	0–0,38	5	+	Yes							
99								3	1457	58,8–64,9	0,39–1,26	1	–	Yes

Continuation of Table 7

House No.	2004 year							2005 year						
	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analysed criteria corres-pond to the price?	Price group	Purchase/ sale price of 1 m^2 (LTL)	Noise (decibels)	CO	Aesthe-tics, in points	A house close to the street	Do the analysed criteria corres-pond to the price?
1/3								1	1643	64.93–71.04	0.0166–0.023	5	+	Yes
1A								1	3533	64.93–71.04	0.0166–0.023	5	+	Yes
3								4	2331	71,04–77,15	2,14–3,0	1	–	Yes
9	3	2140	52,7–58,8	0,39–1,26	5	+	Yes							
23								3	2010	77,15–83,27	2,14–3,0	1	–	Yes
47	3	2660	77,15–83,27	2,14–3,0	1	–	Yes							
51								1	3027	64,93–71,04	0,39–1,26	2	–	No
59								4	3638	52,7–58,8	0–0,38	5	+	Yes
61	2	1884	52,7–58,8	0–0,38	5	+	Yes							
71	4	2299	52,7–58,8	0–0,38	5	+	Yes	3	2727	52,7–58,8	0–0,38	5	+	Yes
73														
99														

Table 8. Summary analysis of congruity between the purchase/sale price of 1 m^2 of an apartment and the defining quantitative and qualitative indicators of external environment

House No.	It is analysed whether purchase/sale price of 1 m^2 of an apartment is adequate (+) or inadequate (-) to the defining quantitative and qualitative indicators of external environment								
	1998	1999	2000	2001	2002	2003	2004	2005	2006
1/3			+	+	+	+		+	+
1A				+		+		+	+
3	+				-			-	+
9	+	+		-			+		-
23	+	+				-		+	-
47	+	+		+			+		+
51	+		+			+		-	+
59		+		+	+	+		+	+
61		+		+		+	+		+
71	+	+	+		+			+	+
73		+		+		+			+
99					+	+			+
*, %	100	100	100	86	86	86	100	86	82
**, %, price difference	18.5	25.1	15.2	5.5	15.6	18.3	26.2	17.4	28.83

* Shows the percent of analysed purchase/sale prices of apartments which correspond to the defining quantitative and qualitative indicators of external environment (noise, pollution, aesthetics (river, pond, green areas), closeness to the street, etc.)

** Shows the percent of apartments closer to Žirmūnų or Antakalnio streets which had a lower average purchase/sale price of 1 m^2 compared to those closer to the river Neris

The analysis of prices of 1 m^2 of sold apartments and their comparison with quantitative and qualitative criteria, which describe both the building itself and its environment, enables a conclusion that the farther an apartment is from the river, the less it costs. Comparison of purchase/sale prices of objects close to the street and of objects close to the river proved that people are aware of air pollution and noise and make a respective assessment when selling or purchasing a dwelling. This fact is clearly illustrated by the summary in Table 5 which shows that a difference of prices for 1 m^2 is almost up to 27 %; and it is another proof of the loss that a resident can suffer should a new road, a bypass or a similar object be constructed near his/her house.

Thorough analysis of dwelling prices and references to pollution maps can be used as a basis to offer rational measures for urban construction and planning and for designing of the street

network, to develop highway bypasses or highways for incessant traffic, to determine priority development plans for public transport, to arrange buildings in territories under construction rationally and to foresee the best measures in order to reduce environment pollution and noise and, most importantly, to preserve health of many people.

Conclusions

The Multiple Criteria Value Model is proposed in the research. Multiple criteria analysis is a useful tool in assessing the impacts of air and noise, voltage power lines, scenic and greenery values, indoor microclimate and allergens, influence of inhabitant subjective expectations to apartments prices. The assumptions that underlie the proposed Multiple Criteria Value Model - that the apartment market is in equilibrium, that all buyers and sellers know all the characteristics of the apartment and neighborhood, that there is no discrimination in the market, and that the market is not segmented - are not always easily justified in an empirical study. Of particular interest in the case of air and noise pollution, the role of information in the market has not yet been fully tested. Researchers often assume that, due to newspaper articles or other public attention, all buyers are aware of the existence of local air and noise pollution. However, since realtors are often not required to inform residents resident about air and noise pollution, it is up to the buyer to discover air and noise pollution on their own. How diligent buyers are remains an interesting question.

We found unexpected evidence that perceived air and noise pollution differences between neighborhoods not affected flats values. There are small notion that flats prices reflect some negative consequences of air and noise pollution. The novel element of our study is that we examine the relationship between flats prices and subjective resident beliefs about air and noise pollution. Subjective beliefs about air and noise pollution were elicited along with beliefs about possible connections between air and noise pollution and health. We gauge whether survey participants were knowledgeable about the relationships between air and noise pollution episodes and health. We found small evidence that they were. The survey responses were also found to be probabilistically incoherent. After introducing inhabitants about pollution impact on their health, we found that the modified subjective knowledge were even better able to predict the relationship between pollution and real estate market value in future. In addition, the modified subjective knowledge better explained flats values. Our results imply that the objectively measured pollution levels have a different effect on Zirmunai and Antakalnis district flats values than do subjective residents expectations of pollution watch probabilities. It appears paradoxical, however, that residents nevertheless appear to be knowledgeable about some of the determinants of pollution.

Changes in aggregate apartment values the research's study area correspond to willingness to pay. The value placed on the apartments utility (air and noise pollution, etc.) difference usually are not be reflected in market values, and therefore the change in aggregate apartments values may understate or overstate total willingness to pay. The education of residents about air and noise pollution and their adverse effect on their health would change these conclusions in an essential way.

The results of the multiple criteria analysis performed on the relationship between the real estate values and the locational quality value indicate that there is a correlation between good

neighborhood characteristics, scenic amenities, and a higher assessed value of a residential real estate within a Neris river area.

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Part II. The development of real estate tax appeal system

1. Preface

The life of society is usually regulated by some regulations and social rules. It has been known for a long time, that justice is the base of state, and the law – one of the most important means to implement the goals of it. So law is one of particular regulations (rules), which were established or authorized by the state, and regulating these public relations with a purpose to consolidate, to protect and develop social order, system. Compliance with these rules, under the necessity, is guaranteed by compulsory measures of the state.

The purpose of this work is to analyze what that real estate taxing appeal is, when and why it appeared, how it developed and how juridical basis has been improved in this area, also what importance appeals have to society. We will analyze the submission forms of appeals, depending upon in what form the complaint is presented, and what decisions can an appellant expect. We will analyze the order and essentiality of investigation of appeals, what are the opportunities for waiter to protect his or her complaints' requirements, if their complaint is rejected and leaving to obtain the lower instance agreements. Also we will analyze the hierarchy of investigation of complaints and in what priority can the decisions be appealed. In this work we will find out what is the difference between judicial and extrajudicial complaints' investigation facilities and order, which method is more simple and acceptable and both for plaintiff and for defendant. Moreover, we will compare the similarities and differences of Lithuania and foreign countries in this area.

2. The conception of appeal

2.1. What is an appeal?

There is no unanimous definition for appeal. And it hardly would be just, because, first of all, an attitude to how many times we can permit a person to complain the judgment is different in other states. Moreover, different dictionaries in different states give various definitions for appeal: in some states appeal is definable like *law* to apply to superior institution (or superior court in United Kingdom), elsewhere it is definable like procedurally, like court ruling *appeal* to superior institution (in Lithuania) or a method to review court ruling, during the course the case is pending repeatedly by the court of *second* instance within the pale of states complaints prescribed agreements (in Russia, France). The best way to reveal the conception of appeal *procedurally* is to prescribe some unique features, which are common for different types of appeals. Firstly, it is the stage of a civilian process. Secondly, in any case, it is one of the ways to correct mistakes of first instance court, therefore this is one of the ways to control court ruling. Thirdly, this is an action of the second instance reviewing the court ruling of first instance. Fourthly, the law and fact questions are analyzed in appellant process. Fifth, only unenforced court ruling can be judged in appellant order. Sixthly, suspensive effect of appeal is that the enforcement of court ruling is suspended until court ruling of appellant instance stands up. That would be the main appeal features, which enable to reveal its essence.

The dictionary of international words gives a definition of appeal:

Appeal – [Latin *appeliato* – application, complaint] 1. one of the ways to complain about unenforced court ruling in civil or criminal process; 2. a complaint to a superior instance, which has the power to revise a decision (case); 3. request, asking for advice, a call for support, for example, to public opinion.

Since there is no unanimous concept therefore there is unanimous general opinion about the purpose of appeal process. Its conception of purpose most of all depends on in what context of appeal model this aspect is analyzed. Generally – it is a way to correct the mistakes of lower instance of court. In the case of complete appeal, the purpose of process is understood as a repeated hearing of the dispute in higher institution, while limited appeal is a form of control of legitimacy and validity of court ruling. Repeated hearing of a dispute in higher instance with its content is a comprehensive concept which encompass not only perception of appeal as a form of control because it comprises the correction of mistakes of both court and the process parties. But those two conceptions of purpose can‘t be strictly separated because the nature of appeal determine that it is a constituent part of the mechanism of control of court rulings. The Supreme court of Lithuania in one of the case of purpose of appeal indicated that „ The purpose of appeal process – according to the material of the case and not oversteping appellant complaint, to verify the legitimacy and validity of ruling of court which is appealed against (CPK 332), which means to ascertain whether the court has completely determined legally significant facts and whether it has properly applied material rules of law for the regulation of legal relations of a dispute. This means, that process of appeal is a repeated hearing of case in the court of apellant instance within the pale of appeal, on purpose to estimate if the first instance court has correctly solved the case both juridically and factually.“

So we can state that appeal is an action of a superior instance court, initiated by the complaint of lawsuit parties, as well as a stage of civil process, meant to verify the legitimacy and validity of unenforced court rulings according to case material and newly introduced facts, to change or overturn the ruling due to law or factual mistakes made by court.

2.2. Origins and development of appeals

Complaints and appeal allow the society to defend its’ rights in any field and to strive for justice.

We shall start the analysis of appeals from its history and origin. Appeal systems were already known in the ancient Greece and Roman Empire. Appeals were a part of judicial system. In the ancient Greece during appellate procedures after commission of crime, when there was criminal amenability, human rights were defended. In a case of administrative responsibility, there weren’t the procedures of appeal in the courts. In those days appeals were applied that to force the defendant to fulfill obligations. The debtor was summoned by a creditor to the court and the appeal was hearing in it.

In Roman Empire appellant system comprised much bigger field than criminal process, as complaints could be made against fixed taxes and fines.

In Lithuania appeal system developed together with a system of courts. Appeals more interrelate with Appeal Court. We shall shortly review the features of juridical system of the Great Duchy of Lithuania. In the Great Duchy of Lithuania the main person who dealt with a juridical matters was chancellor. At first chancellor was in the council of Grand Duke, which together with a Grand Duke implemented some administrative and legislation functions. Later on, when the council of Lords was settled, chancellor belang to that council. This institution with its forces was compared with a government of contemporary countries.

The chancellor was responsible for governmental papers, which were concerned with in-country and foreign policy. In his hands was Metrics of Lithuania, the grand seal of the Great Duchy of Lithuania, with whom all orders and the assignation papers of officer were confirmed by Grand Duke. The chancellor also edited the papers of state, welcomed deputies from foreign states, confirmed criminal court rulings, which allowed to exile subordinates of Grand Duke and to take from them their honorific. The chancellor was in charge of chartering XVI c. statute-book – statutes of Lithuania. From the middle of XV c. the chancellor was the ranking judge of Chancellor Court. This court heared the property relations of Grand Duke, the complaints of royal peasants, also civil and criminal rulings of the courts of cities which have autonomy.

On the 16th of February of 1918 the council of Lithuania unanimously decided to apply to the governments of Russia, Germany and other states declaring the restoration of Lithuania as an independent, democratic country with capital Vilnius and separating it from all political relations with other countries.

This act became as a base for a development of subsequent Lithuania, and also for a new system of courts of Lithuania. Latter was legitimated by the former and straight away after the law of temporary constitution underlying laws of council of Lithuania in 1918th it was denominated as a temporary courts and its works transaction of Lithuania. The regulations in mentioned law had foreseen three levels of general court system. The lowest instance was compiled of the courts of peace, the second one – district courts, and the highest judicial instance was Supreme Tribunal.

Soon it was noticed that this system of courts has drawbacks. At first there were established just two district courts (Kauno and Marijampolės), the third one (Vilniaus) was established in 1920 but didn‘t start to work. The Supreme Tribunal as a cassation instance court was set up in 1921 for a lawsuits, which were analyzed by the courts of peace. At the same time Supreme Tribunal was as an appellant instance for lawsuits, which were analyzed by the first instance district courts. Therefore, lawsuits for a felony and complicated civil complaints could be analyzed in two court instances, while cases of less importance were analyzed by the third instances.

In 1933 July 11 the law of new Courts system, which is rated as a high-level enactment with its form and content was passed. These regulations of mentioned law became as a base compiling the court law of 1992.

In 1933 the law of Court system determened the fourth levels system of general courts: district courts, environs courts, Apellant chamber and Supreme Tribunal. So the most important story of this law was the establishment of Appellant chamber.

2.3. The essence and meaning of appeal

Both - people who participate in cases, and the court, which analyzes these cases can't be sheltered from error of judgment or its enactment. Lawless and baseless court ruling can be determined by some objective and subjective reasons: wrongly indicated factual circumstances, spurious evidences by witnesses, spurious written evidentiary material, not unanimous practice of courts, also not experienced judge or even dishonesty. Declaring that court ruling is improper, for participants of process, who disagree with court ruling, must be given an opportunity to appeal against judge's decision. The significance of appeal law is emphasized at international level: In the recommendation No R(95)5 "For establishment and working refinement of Appellant system and procedures in civil and commercial cases" of committee of European Council Minister is indicated that for states must be given opportunity to appeal against the ruling of first instance court, whereas a law to appeal against ruling in criminal cases is certified at the highest international level. In the seventh protocol of European human rights and main liberty protection convention, which was enacted in 1984, in the second paragraph is emphasized, that every person, who was convicted for a crime, has a right to require, that the higher judicial instance reconsider his judgment or penalty. It is necessary to admit, that international documents in some occasions allow abridging appeal law both in civil and criminal cases. In criminal cases these restrictions are able in easier circumstances of crime, while in civil cases the main criteria, which allow restricting an opportunity to make an appellant complaint against is contestable sum. The main purpose of these restrictions is abridgment of litigation term, appellant instance courts protection from unessential cases and economical considerations. But in all cases the restrictions of appeal law must be clearly solidified in law.

A principle of Government dismemberment (5th paragraph of Constitution) and the principle of courts and judges independence prohibit both for other national government packs and natural person, legal entity to audit the legitimacy and validity of court ruling. The legitimacy of court ruling can be determined by the court of appellant instance by established order of process. Therefore in many countries, also in Lithuania, instance court system sacred to lower packs control of court rulings exist. In our country the cases are analyzed by district courts, while Lithuania appellant court is the only court, which analyzes cases for district court rulings, decisions and requisition.

The Court ruling of first instance can be improper for wrongly determined factual circumstances of case and wrongly executed judicial valuation of these circumstances. The breach of rule of law of process of first instance court can determine illegitimacy of court ruling. Allowing that first instance court can be wrong both for the statement and valuation of factual circumstances, and in the sphere of law norms fitting, it is necessary to permit for participants of process to initiate the control of first instance made breaches. Consequently, appellant instance court can check the court ruling of first instance both factually and judicially as distinct from cassation court, which checks appealed court rulings or decisions in aspect of law fitting.

There is no unanimous opinion about the bound of appellant process: it is disagreed if appellant process should mean analyzing case anew (*de novo*) or should be realized as court ruling verification (*revisio prioris instantiae*). From the answer to this question depends if an appeal causes devolution effect – a shift of trial to second instance court. Making a complaint against, court ruling standing up is suspended – it is called suspension appeal effect. It is also suspended its implementation.

After reconstruction on independence there were a lot of reforms made in our country. In civil process from absolute appeal system it was switched gradually to partial appeal model, which was established on January 1st, 2003, which inured in civil process code, it is limited *ius novorum* an opportunity of submission in appellant instance court (clause CPK 314), appellant instance court analyze case in bounds of appellant complaint. (Clause CPK 320).

2.4. Forms of appeals

Appeal as a process has some different levels, depending upon, which instance can correct presumable mistakes of states. As a result, given a wrong court ruling, participants of process can appeal court rulings initially for the first instance and if ruling doesn't meet this judgment of this instance rulings can be appealed by higher instance, and if appellant disagree with this decision of this instance he can appeal to highest instance, which can determine if the first and the second instance decision is legitimate.

Consequently, the system of appeals has some forms and they proceed one after another and are connected. We will analyze the priority of these forms in this chapter.

2.4.1. Internal complaints (appeals)

Internal complaints are such complaints, which get into organization, of which actions are complaining and directly for those staff employees, who prosecute these actions. This means, that they can be the first to tackle the problem. The next stage can be unofficial complaint in that case if failed to ascertain problem.

2.4.2. Unofficial complaints (appeals)

Unofficial complaints are such complaints, which are told in words when you come to organization, also by phone, writing an e-mail and etc. It is expected, that such complaints will be solved quickly, invoking competent employees of organizations and not wasting much time. If essentiality of issue is not solved by unofficial complaint, then it can be in written form, which has judicial power and procedure – official complaint.

2.4.3. Official complaints (appeals)

Official complaints are analyzed in accordance with requirements of laws and standard certificates of the Republic of Lithuania. The Executive Branch must guarantee an order and mechanism of enactment of official complaints, to modify the bounds of responsibility, to consecrate officers, who accepted, deliberated and solved such complaints. Official complaints can be analyzed not in judicial or judicial order.

Not in the courts appeals (or complaints) give for person an opportunity to reach that his or her rights to good service and good products (in service), to a proper valuation (for example: valuation of exams) were not infringed. A person applying to appropriate institution can strive for justice and audition.

2.5 Application of appeals

2.5.1. Disquisition of complaints (appeals) in extrajudicial order

2.5.1.1. Disquisition of complaints (appeals) in extrajudicial order in Lithuania

This order regulate disquisition of company work inaction of natural person and legal entity. Complaints are analyzed under the government of Republic of Lithuania. Often in company complaints are analyzed in no legal order. For ruling is formulated a committee of some persons, which analyzes this complaint and give their decision. In such process a waiter – legal entity, natural person or a group of natural persons giving a complaint participate. In this instance complaint is written allocution of waiter. In this complaint must be indicated main data and other information, which will be discussed hereafter. It is intended an order of acceptance of complaints and terms. Complaints can be posted by mail or delivered personally. The committee declares admission address, time and telephone numbers of waiters. Complaints are registered in special journal. When force majeur appear, attendant must warn person about changes of admission conditions. Official complaints must to meet these requirements:

A name of committee, to which the complaint is given; a name, surname of writer and correct address, to which writer would like to get an answer, also telephone number (legal entity – name, its residence address, telephone number, responsible person name, surname and post);

concrete appellant action or inaction, act or decision, its date of enactment;

the name, address of company, whose actions or enactment is complained;

the requirements of writer, circumstances, in which writer predicate on his/her requirement and documents, which confirm it;

confirmation of writer, that court didn't enact the ruling for actions or enactment;

attached list of documents;

Place and date of composing complaint.

It is also attached complaining act or decision. Moreover, it is attached document, which confirm delivery of writer requirements or contradictions for appellant company and received answer or its copies. Complaint must be written regularly and legible in national language and must be signed by its representative. Documents connected with complaint are attached to complaint.

When representative of waiter apply to Committee, procuration should be attached to complaint. Without noted documents in complaint should be waiters' representative name, surname, address, telephone number or representative legal entity name, its address of residence, telephone number, responsible person name, surname, and position.

Committee analyzes complaints following the laws and standardized enactments of the Republic of Lithuania. Complaints, which do not meet the requirements, are not analyzed and waiter is informed about drawbacks of complaint. Committee commits it for competent

institution and informs waiter. Complaints, in which there is no information about waiter, are not registered and analyzed. Committee has the right to require, that waiter specified an essence of complaint or may ask to give additional documents or information and estimate the term for those documents or information to introduce. The acceptance of the complaint for waiter may be confirmed verbally, prescribing registration date and number of received document, or in writing, prescribing registered date, number, civil servant name, surname, official telephone number of second copy of complaint. It is forbidden to send on complaints to analyze for companies or employees, whose actions are complained for committees. Civil servant does not have rights to analyze waiters' complaint, if there are any reasons, which are prescribed in the law of public administration of the Republic of Lithuania. Complaints of waiters, who repeatedly apply with questions, which have been replied, are not analyzed. If the number of complaints from the same area or for the activities of the same company increases, the committee performs a research, prepare offers for likely arrangement of means of prevention, review the provisions of law, may apply to other institutions of state with a request to perform more comprehensive research, and may give offers for the arrangement of development of law. For each complaint a new case is started. Started cases are transferred for the chairperson of committee immediately. The chairperson of committee analyzes and solves those issues: does committee has a competence to analyze complaint; does the complaint meet the requirements; who has to be in meeting; when and where the complaint must be analyzed. The chairperson of committee assigns for adequate department of committee to examine complaint and propose it to analyze for meeting of committee. Committee has a right to:

require documents, information, which are concerned with an issue of meeting from company which is complained about;

Get a verbal and in writing explanations for a matter of dispute of responsible employees. Complaints must be analyzed and decisions accepted during provided period of laws. The period of complaint is started to count from the day when committee got complaint, if complaint meets the requirements. If not all documents are delivered, the period is counted from the day when documents were submitted.

About results of written complaint research must be reported in writing for waiter. The decision must be reasoned by provisions of law, also indicated were and when they were notified. The complaint is analyzed if it is accepted the decision of all issues in complaint by a competence of committee. Decision must be formalized in the form of committee. In this form must be noticed a date of decision, number of complaint, which is replied to, date and number, address, short heading of decision, the letter of civil servant, who prepared a project of decision, name, surname and telephone number. The information for waiter must be explicit in decision.

A waiter, who disagree with a decision of committee, also if did not receive it during the indicated period, has a right to appeal against the committee decision or actions in order of administrative cases of the Republic of Lithuania.

2.5.1.2. Hearing of complaints (appeals) outside the court in other countries

According to the methods of submission and continent it is accentuated if it is unofficial or official complaints. Court hearings proceed according to these types.

Unofficial revise may be implemented by mail, arriving personally or by telephone, it usually decides waiter. Unofficial consultation is oriented to elimination of disagreements with waiter for issues and as many as possible to reduce a number of official appeals. A privy, who decided to appeal, must know a procedure of reclamation, while appealed side must manage to motivate his position according to requirements of laws, rules and methodology.

The second level of analyzing complaints is official appeal. Official appeal might be submitted in several levels. First instance, to which the owner of real estate may apply, is appellant committee. Process for submitting complaints for appellant committee is much more advanced than informal revise and takes much more time. According to particularity of complaints, it might be needed to bring additional documents or give information, which helped to analyze an appeal better. Committee might ask additional information and ask of valuation of independent expert for acceptance of court ruling. For example, if it is a complaint for taxable value then for that information may belong: copies of value maps, photographs of object, information about object and information about comparative objects, which takes place not far from analyzed object or single estimation.

Instance, which analyzes that kind of issues, may be both court, which takes the last decision for separate real estate object value or size of coefficient. Particular problems, for example like law and fact, an explanation of legitimate acts, application of privilege, and appeal against appellant committee or court ruling might be analyzed in the Supreme Court.

Consequently, all system of submitting appeals has several levels and they function one after each other and are relative. These are main stages of this process. But every country acting by main principles of this system create their procedures.

2.5.2 Essence of appellant process

Starting to speak about presumptions of appellant process reforms, firstly we should answer to main question – how should be estimated an appeal in administrative process: like retrial (*novum judicium*) or like a legitimacy control of court ruling (*revisio prioris instantie*)? According to how the essential issue is answered, there must be instituted provisions, which regulate appellant process. In general, we may state, that in a court ruling of appellant instance court is under examination, factual circumstances of lawsuit are examined newly in that case, if appellant litigate a suitability of their investigation. A submission of new evidentiary material in appellant instance court is restricted whereas there is a need to add case material, the case may be returned for repeated hearing for first instance court.

It is quite difficult to define appeal as repeated court hearing for various reasons. Firstly, in many countries models of entrenched appeals may be attributed to composite models, which combine both limited and unlimited features of appeal. For example, clause 305 of administrative law of Latvia, which entrenches unlimited appeal in administrative process

may determine, that appellant instance court may not investigate the facts, which were estimated in first instance court, if states does not dispute them. Clause 130 of administrative law code of Germany anticipates an opportunity to return case to appellant instance court for a repeated hearing, if new facts or evidentiary material emerge. Both mentioned exceptions are features, which are appropriate for limited appeal. Secondly, for active process of court role, it can not be equalized conception of limited appeal in civil and administrative processes. In civil process duty of averment usually belongs to states and court may choose evidence only in cases, which are indicated in law, whereas in administrative process both an opportunity and duty *ex oficio* to explain the circumstances of case is consolidated. First instance court ruling, which was enacted ignoring evidentiary material of state of civil process, which latter had to submit, so it can be considered legitimate, while court ruling of administrative court, which does not conform to state rapport, will not be reputed legitimate and must be eliminated in the appellant instance court. Interdiction of new submission of evidentiary material in appellant instance court in administrative process is not so clear. However, even considering to singularity of administrative process it can be proposed that limited and unlimited appeal must be distinguished by several features: differences of trial in appellant instance court from the process in first instance court and ability to return case to analyze for first instance court when there is not enough case material.

It is hard to attribute appellant process regulation ABTĮ to some of classical appeal models just for ABTĮ 136 provision clause, which eliminate one of main principles of appellant process – *tantum devolutum quantum apellatum*. Such comprehensive court authority of appellant instance by its nature is closer to unlimited appeal because the court of appellant instance is obliged in all cases to take a case once more repeatedly. ABTĮ 138 clause, which estimate an order of trial in appellant instant court is closer to limited appeal, because in first instance court investigated evidentiary material by this clause can be examined if the court them certified, that it is necessary, besides, in this clause is entrenched a restriction of new evidentiary material submission for appellant instance court. For limited appeal is closer ABTĮ 141 clause, which estimates eligibility to return case to analyze it, again if to ascertain circumstances of case, is needed to collect many new evidence. Indecisiveness of legislator for the nature of appellant process determines some contradictions of the norms and reduces an effectiveness of appellant process, that's why preparing new code of Lithuania administrative process is needed to decide for a conception of essence of appellant process.

Differently than in civil process of Europe countries, in which entrenches model of limited appeal analyzing the laws of administrative process it can be envisaged a dominance of model of unlimited appeal. This factor obviously must be explained that model of unlimited appeal traditionally is accepted to be more beneficial determining material truth. It is proposed that appellant process, during which cases are reviewed and thoroughly verified both legally and factually strengthens the defense of appellant's rights. [6] Estimating allocation of particular model of appeal in Lithuania administrative process it should not be forgotten that Lithuania higher administrative court is not an interjacent, but the last link of judicial control in administrative cases and that one of main task of court is to form solid practice of administrative court. Consolidating classical model of unlimited appeal in administrative process of Lithuania, Lithuania higher administrative court should duplicate functions of first instance administrative court system, especially most of time dedicate to repeated research of factual circumstances of lawsuit. That would prejudice implementation

of solid court practice forming functions. Furthermore, forbidding returning the case to analyze repeatedly for Lithuania higher administrative court, by necessity to complement a material of case, there would be an opportunity of risk that analysis of many administrative cases would transferred to the second instance court and Lithuania administrative court *de facto* became as first instance court. Considering to this, we would assume that for Lithuania administrative process known as conception of *revisio prioris instantiae*, together are not denied some peculiarities, which are coherent with an appellant process specification of submission of new evidentiary material. This position is consolidated by the fact, that in some Europe countries (for example: Poland, Czechia) in administrative process is decided to reject for appeal confining by first and cassation instance of court.

2.5.3 Application of principles of appellant process in administrative process

There are four principles of appellant process mentioned in theory: interdict for court to overreach of appeal (*tantum devolutum quantum appellatum*), interdict to decree, which is not beneficial for appellant than court ruling (*non reformation in peius*), interdict of submission on new restrictions in appellant process and interdict of submission of new evidentiary material [7, p. 277 – 284]. Traversing regulation of ABTĮ, we may come to conclusion that from mentioned principles in administrative process it is definetely entrenched just an interdict of new requirements (ABTĮ 130 clause 5 d.). In third part of clause 138 in ABTĮ it can be penetrated some principle aspects of new evidentiary material submission. A clause 136 of ABTĮ declare that appellant instance court is not binded by limits of appeal, about interdict to enact not favouring decision in this law is also not mentioned, so we can draw a conclusion that *tantum devolutum quantum appellatum* and *non reformatio in peius* principles are not applied in administrative process.

An existance of principle of interdict of submission of new evidentiary material in appellant instance court and its largeness depends on chosen model of appellant process, apportionment for states of weight of averment and from chosen conception in trial, so it could be a theme of single paragraph. It will be enough to say that interdict of submission of new evidentiary material nowise binds the court, which analyzes lawsuit, therefore consolidating an active role of court in administrative process and its duty ex officio while clarifying a circumstances of case, this principle would became unadaptable practically, and conversaly, the more duty is transfered for the issue of states, the more actuall become an interdict of submission of new evidentiary material in appellant instance court. It is understandable that for administrative format of process an interdict of submission of new evidentiary material in appelant instance court can not be absolute. On the other hand, a submission of new evidence should be regulated in a way that process motiveless would not be transfered to the court of appelant instance, especially considering to the functions of Lithuania higher administrative court and ascribed obligation to form solid practice of administrative courts. Therefore, some restrictions of submission of new evidentiary material, in pursuance of prevention obvious abuse procedural rights of states. According to decision of organizers of administrative process code concerning limits of court activity in administrative process, it is possible to choose one of two alternatives: to determine that new evidence, which had to be submitted in the court of first instance are examined in appellant process only if there are enough reason for the submission of evidence to first instance court or to refuse the limitation of submission of new evidence to appellant court entrenching procedural sanctions (fines or refusal to award legal costs) for parties for obvious abuse of procedural rights.

The first opportunity, which is related ot assumption, that in some cases an administrative court is exempt from duty *ex ifficio* to clarify the circumstances of lawsuit and some of these circumstances can be rated as not proven, while the second opportunity gives a posibility for court to punish parties for noncompliance of procedural duties, but from duty to clarify real situation even if there is an indefensible passivity of parties.

The principle, which forbid to submitt new requirements in appellant instance court, as it was mentioned, in ABTĮ is entrenched and it does not create new problems in practice. It would be better to analyze an opportunity of existance of principles *tantum devolutum quantum* and *non reformatio in peius* in administrative process.

Principles *tantum devolutum quantum* and *non reformatio in peius* in studies of law of civil process are usually based on the principles of dispozition and rivalry [ex.: 9, p.181]. Considering to circumstances of preparation of ABTĮ, obviously, refusing fixation of these principles in ABTĮ, following by provision, that cases are assigned to the competence of administrative courts, differently than in other civil cases , they are not disposal, that is why mentioned principles in administrative cases should not be applied. Was a good choice made? Even in the right of criminal process interdicts to overstep the limits of appellant complaint and aggravate a position of appellant are applied for appellant instance court [10, p. 256-263]. Is it right to maintain that principles of disposition and rivalry in administrative process are not applied?

It is not mentioned directly about the principles of disposition and rivalry in ABTĮ. In the recommendations of Europe Council minister committee can be penetrated an attitude, that the principle of rivalry should exist in administrative process, which means that administrative process should be a process of litigation [11]. It is natural, because the model of process of litigation is the only possible model, which guarantees a role of impartial institution, which analyzes litigation. On the other hand, this conclusion should not be made absolute – the model of litigation does not signify the passivity of the court, which hears the case, otherwise than in civil process, in administrative process laws of many countries it is clearly entrenched a duty of administrative court to clarify the circumstances of case. For example, 8 part of Sweden administrative process act claims, that court must assure, that the circumstances of case will be properly examined according to the nature of analyzed case. If there is a need court may indicate to parties, how the material of the case should be complemented, the court may refuse to accept the material, which has been transferred. Clause 86 of law of administrative process of Germany establishes that court analyzes facts of case *ex officio* and is not bound by statements of parties and evidence, which have been submitted by them. In the second part of clause 103 of law of administrative process of Latvia is stated, that court *ex officio* determine a circumstances of case and estimate them, while in the fourth chapter of this law does not mention neither disposition nor rivalry. But in clause 14 – 1 of this law entrenched principle of procedural justice requires, that court making a ruling would comply with requirements of impartiality principle and give opportunities for participants of process to state their attitudes and give justifying evidence.

How should those provisions be estimated? Probably, the relation between principle of rivalry and court activity should be seen as a sensible balance. Statement, which declares that a court can not act as an impartial institution of dispute hearing, if given demand, its'

substantiation and limits are not clear, can certainly be applied in administrative process. Therefore, firstly declarant's responsibility is to indicate the reason why and on what grounds he pleads. Obligation of the defendant (institutions of public administration) is to prove the legitimacy of actions, which means, to reply to the demand of declarant, results from the nature of such institutions and acts, which regulate their work. Furthermore, court has to hear both parties and constitute appropriate possibilities to prove their attitude. The proactiveness and activity of the court does not eliminate the possibilities of parties to strive for a just and, in their opinion, favourable ruling in the process [14, p.28]. Hence, the principle of rivalry undoubtedly exists in the administrative process, but its scope is different in civil cases – administrative court can not dispose of the demand of declarant as not proven by one without taking proper measures for the determination of the circumstances of the case and addition of case material. Quite clearly the relation between rivalry and activity of court reveal collaboration principle of code of Lithuania administrative process, which require, that court in collaboration with persons, which participate in administrative process, moved on measures, which are determined in Code, that in time and with expedition would be collected all evidence, which are needed for examination of administrative dispute, also that the road to delay administrative process was precluded, and would reach, that administrative dispute would be analyzed in short time if it is possible to do it. In this clause it is suggested entrench other important attitude – circumstances, to which the party did not pay an attention. The court its decisions in this circumstances can base on just if it made an opportunity for parties to militate for them. This attitude completely is up to standard of recommendation nr. (2004) 20 part 4 of Minister Committee of Europe council.

Speaking about the principle of disposition in civil process it is often emphasized that this principle is a direct result of analogous principle in material law, it means, that parties, which can freely choose the manner of behaviour, keeping material terms, has the right and in analysis of dispute in court. Really, if we looked at disposition principle only from this position, it would be hard to talk about the existence of principle of disposition in the process of administrative court, where are analyzed disputes, which are native of rapport of regulated public law of subordination. On the other hand, to our minds, it would not be good to identify an aspect of material and procedural disposition principle. The content of procedural disposition principle usually is detectable not through the material and judicial rapport, from which the dispute is native, but from the extent of opportunities of parties to dispose by procedural law. Looking from this point of view, elements of disposition principle can be easy found in administrative process – the declarant has a right to decide by himself to go to law or not, the court does not proceed in its initiative, the participants on case have a right to appeal against decision or its part, declarant has a right to refuse of appeal. So in procedural meaning a principle of disposition reflect not the opportunities for parties easy to dispose by adequate material laws, but a relation between parties and court characterizing the court as impartial institution of dispute examination, to which declarant apply, except some exceptions, which are mentioned in the law, also has a right to refuse of this defence, voluntary to set the limits of defence.

Admittedly, a nature of material judicial rapport, from which the dispute is native, can not have an influence on extent of disposition principle. The extension is an institution of country, which oblige to administer justice, so it is understandable that in these cases, when we are talking about relation between two private person, but not about actions of country

institutions. Moreover, the court is obliged by the principle of defence of weaker parties. Subordinate format of material court rapport, from which administrative disputed arise, determine that one of administrative parties of process usually is weaker party. So the extent of disposition principle in administrative process never is the same like in disposition civil case.

However, even after the recognition, that some requirements of rivalry and disposition principle is not avoidable in administrative process, that does not make a cause to state, that these principles does not exist in administrative process. Talking about appellant process we should acknowledge, that the principles *tantum devolutum quantum appelantum* and *non reformation in peius* should be applied in administrative process too.

At this moment clause 136 of ABTĮ entrenches a provision, which was valid in 1996 – 1999 in civil process of Lithuania; court, which analyzes the case, verifies the legitimacy and validity of both appealed and not appealed parts of court ruling, also the legitimacy and validity of ruling regarding persons, who haven‘t appealed. Such attitude, which entrenches special activity of court and disregard of parties of process, was critisized by scientists of law of Lithuania not once. Sharing these pozitions, which violate limits of civil process regulation of law, we will not mention those arguments again. We will limit ourselves statiting, that this provision of ATBĮ substantially entrenches a duty of court against the will of parties to initiate an analysis of case, disregard this will of parties for the extent of requested judicial defence in these cases, when such „licence“ of court can not be excused by defence of public interest. It is unlikely that such judicial regulation can be acknowledged as justifiable or reconcilable with idea of court like an inpartial institution of court ruling.

On the other hand, borders of disposition principle in administrative process determine that the principle *tantum devolutum quantum appelantum* can not be absolute. It is really opposed that must be given an opportunity, which disregards the limits of appeal in that case, if a defence of public interest requires. According to the fact, that there are no cases of disposition amongst cases, which are heard in order of administrative process, it can be stated that, such demand can arise in any category of analysed cases. Therefore it is thought that, the best way would be to entrench a provision, analogous to the valid one in civil process till 2003, January 1st in the new code of administrative process, that the court of appellant institution analyse the case without overstepping the limits set in appeal, except in cases, when it is required by the public interest. As in civil process, administrative court of appeal instance, disregarding limits of appeal should propose whether there are no absolute grounds on which court ruling of first instance would be invalid.

In the practice of higher administrative court of Lithuania, disregarding the provision of clause 136 of proceeding law of administrative cases, the limits of a case should be followed refusing to estimate court ruling parts, which are not appealed, or restricting to the legitimacy and validity grounds of court ruling which is appealed. Disregarding the passing of this provision with the law, we would presume that it is reasonable practice, which corresponds to the essence of process without overstepping the guarantees of parties.

In the laws of administrative process of foreign countries the principle *tantum devolutum quantum appelantum* is usually clearly entrenched naming its’ possible exceptions. For

example, the chapter 302 of law of administrative process of Latvia refers to the fact that administrative court of appellant instance analyse the case according to appealed complaint and head appellant complaint, and only to the extent which is indicated in these complaints. Almost analogous provision is entrenched in chapter 34 of law of process of Estonia administrative courts – a court of appellant instance analyzes a legitimacy and validity of first instance court ruling only by appeal and replications to it, except in that cases, when it is set norm transgressions of law of process, which are mentioned in chapter 45. Clause 29 of act of process of Sweden administrative court entrenches general prohibition to analyse issues for administrative courts, for which the parties did not applied. This rule is complemented by exception that in special circumstances administrative court may decide about requirements, which were not indicated by parties, if that improve a condition of private party and does not contravene others private interests. In clause 129 of law of process of Germany administrative courts is set that a court ruling of administrative court may be altered only to the extent which is requested by the appellant. Hence what is seen from given examples, the principle *tantum devolutum quantum appelantum* is certainly not considered incompatible with particularity of administrative process.

Principle *non reformation in peius* is closely related both to the principle of disposition and the principle of *tantum devolutum quantum appelantum* and expresses the idea, that the court of appeal cannot ameliorate the condition of a party, which has not applied to the court of appellant instance, for the account of the appellant. Moreover, the existence of this principle in legal literature is soundly associated with the demand to ensure the safety of the party, which is questioning the legitimacy and validity of court ruling in the case, in making the appeal as well as practical possibility to make use of the right of appeal provided by the law. Providing guarantee of legitimacy and validity of additional court rulings to the parties of process, the state has to organise proper legal prerequisites to a person to realistically give the use of this possibility. According to E.M.Muradjan, “party, which estimated possible risk of appeal in that case, if mentioned principle is not entrenched in law, probably will decide not appeal the court ruling even if it is not legal”. It is presumed, that these arguments of itself are admitted as applicable based by principle tantum *devolutum quantum appelantum*, it is does this principle is not valid if it is given a right for a court of appellant instance to overstep the limits of appeal. Such reasonless interpretation could constricted working sphere of this principle and may endanger to the main purpose – to vouch for the safety of process party, which have doubts of legitimacy and validity of court ruling. Consequently principle *non reformation in peius* should be applied and in this case, when it is empowered to overstep the limits of appeal for appellant instance court. It shouldn’t be forgotten, that returning the case to analyze it repeatedly for first instance court should not be considered as an admission of bad court ruling, so such norm could become an outcome for court in these cases, when the court ruling of first instance court can not be left valid.

Conclusion:

1. Formulation of provision of appellant process is directly associated with the fact how legislator understand about the essence and purpose of appellant process – is this repeatedly analysis of case (*novum judicium*), is this a control of legitimacy and validity of first instance court ruling (*revisio prioris instantiae*). According to administrative court system features of Lithuania and to functions, which are implemented by higher administrative

court of Lithuania, for Lithuania administrative process is more proper a conception *revisio prioris instantiae* of appeal.

2. Preparing new code of administrative process of Lithuania should be clearly entrenched validity of principles *non reformatio in peius* and *tantum devolutum quantum appelantum* in administrative process together clearly naming possible exceptions of principles.

An extent of interdict principle of submission of new evidence in appellant instance court depends on conception of court role, which was chosen by legislators of Lithuania administrative process code. According to peculiarities of administrative process, submission of new evidence in appellant instance court should not be absolute, but in code of administrative process should be foreseen provisions, which help to prevent abuse by procedural rights of persons, which participate in case and transfer of examination of case to the appellant instance court.

2.5.4. Limits of taxing dispute and position in administrative process

In this chapter is analyzed relation of taxing dispute between administrative process, it is also estimated a position in this process. Relating process of taxing disputes with administrative process and administration of taxes, it is analyzed collocations, which define this phenomenon; features of judicial process of taxing disputes by comparative analysis are estimated. Comparing opinions of foreign and Lithuania authors and provisions of Lithuania standard acts, it is tried to formulate a concept of *process of taxing disputes*. In this chapter are analyzed types of consolidation of act rulings and separate relations of ruling types with taxpayers. The purpose of this analysis is to determine a relation of taxing disputes and position in administrative process, and to show the limits of this procedural judicial phenomenon.

It is analyzed comparing, relating and summarizing different opinions of law authors, economists, lawyers and politics, provisions of laws, which are valid in Lithuania nowadays, statements of Lithuania and foreign authors' publications, which are related with analyzed issues in chapter.

A sphere of finance is highly meaningful part of worldwide economy. It is well known, that over fifty years there were a lot of alterations of both Lithuania and worldwide economies, that's why a new stage of financial relations started, began to formulate the economics of market, which has the main function to distribute material recourses in that way, that producible goods and offered services would correspond with public needs. A passage to new relations of market is coherent with growing critical phenomenon. One of them is taxing reform. While new public relations are forming it is essential to develop and deepen scientific inquiry in theoretically and utilitarian, practically aspect of sphere of taxing judicial relations, because of late years many actual problems have concentrated.

In Lithuania annually appear many disagreements and disputes between administrator of taxes and taxpayers. In Lithuania in sphere of taxing-judicial relations many vacancy and drawbacks have appeared between legal entities and personal entities, which pay fees, and administrator of taxes. Law norms, which regulate issues of analysis of procedural taxing disputes, are explained and applied differently.

In the view of basis of standard taxes it is essential to name taxing disputes as new taxing judicial phenomenon in Lithuania and specify the terms, which determine this phenomenon examining the relations between administrator of taxes and taxpayers, because many characterized findings are made leading not by authoritative opinion of scientists, but by law acts, which regulate analysis of cases of taxing disputes, practical analysis.

2.5.4.1. Position of taxing disputes process in administrative process

If we want to determine a conception of process of taxing disputes, it is necessary to analyze administrative process, because this process involve not only institute of administrative responsibility, - its base of regulated norms is concentrated in many finances, which are referable to public law, and law acts of taxes. Between lawyers of Poland, Russian Federation, Belgium, Netherlands, Germany is popular opinion that process of taxing disputes is a strain of administrative process. Such attitude, obviously, conditions the fact that administrator of taxes always work limited by some rules [3, p. 745].

According to judicial status of participating subjects in taxing disputes, these disputes can be assigned to financial phenomenon. But by the same phenomenon by subjects, which analyzes taxing disputes, is revealed other – judicial side of taxing disputes.

R.Draco and J.Rider while analyzing England financial law and financial judicial relations, financial law they define as private law, branch in concrete civil law [4, p. 111]. Japan author Hiromitsu Ishi, who analyze regular reforms of taxing system in Japan, thinks differently and says, that financial law and taxing law is better attach to sphere of law [5, p. 271]. In Russian author V. M. Manochinas, J. S. Aduškinas, Z.A. Bačitajevas, France financier P.M. Godme opinion, "financial law – a branch of administrative law, regulating a group of relations of controlling nature – that public judicial relations, which are directly related with finance" [6, p. 16-17, 62]. A.G. Kučerena thinks that "taxing law is a part of financial law, while latter – integrate part of administrative law" [7, p. 23]. G. S. Nelson and D. A. Whitman say, that "financial and taxing spheres as a regulation of public law consist with a sphere of administrative law and is kept as branches of administrative law" [8, p. 359]. In conclusion we may agree with authors, who state, that financial law and taxing law are a part of public and administrative law, while finance law – an integrate part of administrative law. Such view motivates a wider conception of administrative process.

In the analyzed context "administrative" means "an order, which was established by the Executive Branch" [9, p. 2]. Dictionary of administrative law in a broad sense defines administrative process as "unit followed by one factor after another, which are regulated by judicial norms, which vouches the functions of institutions of Executive Branch, accepting and implementing administrative norms. In a proper sense – an administrative – judicial activity of commissioned subjects, which are regulated by law, analyzing administrative – judicial disputes and cases of breaches of administrative law" [10, p. 59]. A great dictionary of law terms and Law encyclopaedia defines an administrative process as "countries' commissioned body activity, solving disputes between different subjects, applying measures of administrative interdict, which are implemented in administrative – procedural form" [12, p. 306].

Russian authors J. M. Kozlov and L. L. Popov refer to the fact, that administrative process in a broad sense – a unit of all factual actions, which is accomplished on purpose of implementing a competence of some subjects. Countries' handed activity itself can be as administrative process. In a proper sense, administrative process is understood as an activity of country commissioned public servant, implementing sanctions of norms of administrative law. In conclusion it can be state, that administrative process – with administrative procedural norms regulate an activity of institutions of the Executive Branch, which analyze administrative cases, which are proceeded in spheres of implementation of public control functions and tasks [13, p. 381-383].

Administrative process means a unit of different types of procedural activity, which is estimated by single cases, which arise in sphere of public control, an order of examination, also submission of decisions of The Executive Branch not in the order of dispute [14]. Administrative process should be understood in a broad sense. It is told about administrative procedural activity, "which is made from preparation of acts of public control regulating laws, regulation of activity control, and proceeding of licences" [15, p. 57], it is that "administrative process establishes administrative procedures" [15, p.115].

A Halfway opinion of scientists is that administrative process must be considered equal with civil, criminal, also with lawmaking processes, it is agreed, that administrative process is a judicial process and has all inherent features, but also is "a type of activity control, which is one of the activity type of executive branch subjects and is implemented by way of administrative procedures." [15, p. 111]. A content of such process would include not only administrative procedural order, by which is held implementing administrative compulsion, but also some administrative procedures, which are appointed to regulate an activity of executive of country, and which are applied to institutions of public administration analyzing complaints and applications, solving disputes between participants of administrative judicial relations.

Taxing disputes – one of the forms of administrative taxes, type of executive and regulative activity, which is realizable implementing administrative procedures, that's way if wanting to accomplish analysis of conception of process of taxing disputes it has to be determined judicial meaning of concept of taxing administration.

In law of public administration "public administration – an executive activity, which is regulated by institutions of country and other autonomies, which is set apart for laws, other law acts, for implementation of decisions of institutions of autonomies, also for administration of public services" .

A law of administration of taxes the administration of taxes defines like "implementation of taxpayer laws and rights and of laws and rights of tax administrator, calculation of taxes and ability to put into practice, exaction and payment, application of calculations of taxes and payment, apportionment of taxes, presentation of information for taxpayers" .

Process of taxing disputes is an activity of public commissioned subjects, which is regulated by administrative procedural norms implementing the law norms of taxing. Realization of law forms of taxing forms and the essence of taxing administration.

According to positions of constituent of taxing disputes as a process of administrative law and taxing administration, and the opinions, which were mentioned and analyzed, statements and law provisions, it is made a conclusion, that a *process of taxing disputes* – an activity, which is regulated by taxing procedural law norms by commissioned institutions, which analyzes the cases of taxing disputes of taxing calculations, payment and exaction, taxing arrears or overpayments, for application and imposition of sanctions for non-compliance with duties or breaches, which appear between taxpayer or his representative and tax administrator in the sphere of tax administration.

2.5.4.2. Limits of process of taxing disputes

One special peculiarity, which is substantial for process, is an alternation of stages. A rhythmical phenomenon is substantial for stages of process of taxing disputes. Stage in philosophical literature is explained as a synonymous of phase, it is characterized like a stage of development of something, like a period, a stage of process of phenomenon, which has its own qualitative peculiarities. Just mechanical alternation of internal parts of structure of process, without qualitative changes, would be absolute nonsense.

Stage like internal structural part of process for its content and extent is the most important and biggest part of process, because it unifies smaller segments – stages. In literature is stated, that stage is a unity or a group of some phenomenon, works, which make a complete cycle in particular period, or a process, which has a concrete beginning and ending.

These stages are regulated by chapter X of law of Tax administration, in which separate parts of process of taxing disputes are named as stages, although single unity of procedural actions compound completed cycle of development in particular period, it means that is has a concrete beginning and ending and separate procedural actions proceed in separate institutions and judicial phenomenon are bigger with its extent than stages. Therefore, multiple parts of process of tax administration law are more expedient to resolve into stages, not into way-station.

“Every process is compiled of four step structure: actions – way-stations – stages – main process” [4, p. 316]. First stage of process of taxing disputes proceeds in level of local tax administrator. Essential condition of process beginning and alternation of stages – official document, whose content is made of information, from which tax administrator actions depends, it means, that a stage of pre-trial tax court ruling starts then, when local tax administrator makes a decision, consolidating verification act, with whom content taxpayer or a person who calculate taxes completely or partially disagree expressing it in writing by complaint.

The beginning of process of taxing dispute is making a complaint of taxpayer for tax administrator.

Judicial base of emergence of taxing dispute is a complaint of taxpayer, not other contradiction in verification act for stated facts.

The construction of decision of disputes starts to work, when complaint is in writing. Until the complaint is stated, it formally does not exist [4, p. 37]. Complaint can be in written form, but if it does not correspond with requirements, which are established in law or it is contravened its procedure of submission and if during the term the drawbacks of complaint are not removed, then there is no taxing dispute.

In summary, what was mentioned, it can be considered, that the emergence of taxing disputes depends on:

- breach examination of taxes law, census of act and its place of affirmation, the decision of tax administrator, it means a complaint of taxpayer;
- Decision of local tax administrator, with who is confirmed an act of examination, which is contradictory for interests of taxpayer. If taxpayer agree with everything, then a dispute does not proceed;
- Submission of written complain of taxpayer, which meets law requirements.

Disagreements of taxpayer must be externalized materially, this means with a document, which has judicial power – written complaint, which was signed by taxpayer.

Following clause 56 of law of Tax administration, taxpayer must appeal to central tax administrator through local tax administrator, of which decision is disputed. Chancellery of local tax administrator must register complaint in that day, when this complaint was written and during 3 workdays sent it to central tax administrator. Formal moment of emergence of taxing dispute is a submission moment of complaint for tax administrator of taxpayer, but factual emergence beginning of taxing disputes should be considered when complaint of taxpayer is registered in chancellery of local tax administrator.

In theory a process of analysis of taxpayer special complaints also is comprised of particular stages, of which the first one – perfection of the fact of reception of written special complaint of taxpayer in appropriate chancellery registry of local tax administrator [24, p. 71]. In this stage should be estimated an order, who and what will analyze complaint, is the content of complaint satisfy the competence of tax administrator, to which this complaint is addressed; verification of complaint, analysis of situation. But according to the law of tax administration, complaint of local tax administrator is registered during 3 workdays and sent it to central tax administrator. This stage of examination of complaint makes a process of taxing disputed more different, because for parties of dispute would be easier if taxpayer applied directly to central tax administrator, which is competitive to analyze dispute.

In second stage of complaint examination central tax administrator review complaint, collect and analyzes information and data, which are needed for impartial decision to decree. At that point it could be invoked specialists, analyzed documents, which has a big importance, performed an overhaul, investigating persons.

The third stage of complaint examination – making a decision during the term, which was entrenched by law, this means that during 30 days from reception of complaint. In this stage central tax administrator makes one of decisions:

- confirms a decision of local tax administrator;

- liquidate a decision of local tax administrator;
- partly confirms or liquidate a decision of local tax administrator;
- commit for local tax administrator to make an additional examination

and to take a new decision;

- absolutely or partly change a decision, which was appealed by taxpayer, of local tax administrator;

The ending of taxing dispute depends on taxpayer, who appealed, and reliable relation with a decision of central tax administrator.

If taxpayer disagree with made decision and during the term appeal to other commissioned institution, taxing dispute continue. But if taxpayer agrees with a decision of central tax administrator or does not have further opportunities of procedure realization, taxing dispute finishes.

Moreover taxing dispute is finished then, when central tax administrator liquidate a decision, which was appealed by taxpayer, of local tax administrator, or partly liquidate that part of made decision, which was appealed by taxpayer. But if a part of tax servant decision is liquidated, for which the tax payer did not appeal, and other part, which was appealed is not liquidated and taxpayer disagree with this decision, then submitting a written form of complaint taxing dispute continues.

The last stage of complaint examination of taxpayer is an implementation of made decision. It manifest as exaction and payment of counted taxes, fines and etc. If taxpayer during the term does not appeal the decision of tax administrator, starts a procedure of exaction and payment of fines, taxes and etc.

When central tax administrator makes a decision, that local tax administrator would accomplished alternate examination and made a new decision, it seems, that it is not clear an object which was appealed and limits of process. This situation regulates the law of Administrative cases proceeding, it is when taxpayer appeal concrete actions of administrator, except tax law and returning, so it is not a taxing, but administrative dispute, which is analyzed by a committee of Administrative dispute or Administrative court.

Taxing disputes are also analyzed by a committee of taxing disputes near the parliament of Republic of Lithuania, District court, Lithuania higher administrative court, that's why for tax payer, who disagree with decision of central tax administrator, a law of Taxing administration empower to apply to Committee, which having a complaint of taxpayer, also makes one of decisions:

- confirm decision of central tax administrator;
- liquidate decision of central tax administrator;
- partly confirm or liquidate decision of tax administrator;
- Absolutely or partly change decision, which is appealed by taxpayer, of tax administrator.

The ending of taxing dispute depends on volition of taxpayer and format of decision of committee.

Thereinafter taxing dispute is analyzed by administrative court of District. In this judicial institution taxing dispute is analyzed by the main principles of lawsuit judicial examination. District administrative court, which analyzed taxing dispute and all material of research, makes a suitable decision. A content of decision and relation with it of taxpayer determine later course of taxing dispute. If District administrative court makes a decision, which is beneficial for taxpayer, then taxing dispute is finished at the moment of enactment of decision.

If taxpayer used his right to appeal against the decision of local tax administrative for all mentioned institutions and are accepted disadvantageous, not renewing his rights or not satisfying decisions, the last instance, which analyzes taxing disputes is Lithuania higher administrative court, - its made decision is ultimate and not appealed. When taxing dispute in this instance is analyzed and appropriate decision is made, the process of taxing dispute is finished independent of format of decision.

In Howard E. Ambras and Richard L. Doernberg opinion, legal entities their actions suspend in liquidation and reorganization way , that's why for taxpayer, who appealed the decision of local tax administration, death, suspending it or reorganizing activity, and if there is no judicial base of implementation of institute of law interception, taxing dispute is closed.

Clause 139 of tax code of Russian Federation indicates, that "taxpayer has a right to refuse of complaint by recalling it" [26]. This right does not let repeatedly for taxpayer allot the same written complaint. The law of Lithuania tax administration should foresee this right and let it use in all stages of complaint examination. David Alexander and Simon Archer, who analyze different countries process of taxing appeals, indicates that "for taxpayer, who made an appeal for a decision of tax administrator, must be given a right in changing circumstances, to reject appeal" [27, p. 1000]. Russian author D. N. Bachrach thinks, that "person, who appealed till acceptation of decision, in written form can reject this appeal. In these cases a person, who recalled appeal, looses his/her right repeatedly to apply to commissioned organ" [12, 150 p.]. In summary accepting for mentioned opinions it can be stated, that for taxpayer in either stage of process of taxing disputes recalling complaint, taxing dispute would end and it lost its right to appeal repeatedly.

Summarizing early mentioned norms of laws, statements and ideas, it is made a conclusion that emergence of taxing disputes determines these causes:

- establishment of breaches of tax laws and its fixation by verification act and consolidation of verification act by decision of local tax administrator, it means, that taxpayer has to have what to appeal in material base;
- Decision of local tax administrator, with which verification act is consolidating, must contradict for interests of taxpayer. If taxpayer agrees with everything, dispute does not continue.
- Written complaint, which meet the requirements, submission of taxpayer.

Contradictions of taxpayer must be expressed materially – with a document, which has a judicial power: in written complaint, which was signed by taxpayer.

The beginning of process of taxing dispute is a submission and registration of written complaint of taxpayer in chancellery of local tax administrator.

The ending of taxing dispute:

- when decision enacted by central tax administrator meet requirements, which were mentioned in complaint of taxpayer, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when decision enacted by committee meet the requirements, which were mentioned in complaint, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when decision enacted by District court meet the requirements, which were mentioned in complaint, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when taxing dispute is analyzed and the decision is enacted by Lithuania higher administrative court;
- when taxpayer die, suspend or reorganize his/her activity and there is no judicial base for implementation of institute of interception of laws;
- for taxpayer recalling his/her complaint;

Finding

In conclusion, remembering all mentioned ideas, different opinions of authors, statements and law norms in this chapter, it can be stated, that finance and taxes – law branch regulation of public spheres coincide with a sphere of regulation of administrative law and in a broad sense considered branches of administrative law. Taxing disputes – one of the forms of implementation of tax administration, a type of executive and regulative activity, realized by accomplishing administrative procedures.

Process of taxing disputes – activity of commissioned institutions, which is regulated by taxing procedural norms of law, and which is accomplished analyzing the cases of taxing disputes, which arise between taxpayer or his/her agent and tax administrator in tax administrating sphere: for counting taxes, payment and exaction, taxing arrears or overpayment, for non-compliance with taxing duties and for application of sanctions.

Every process is made from a structure of four levels: actions – levels – stages – main process. In the law of tax administration constituent parts is precise to dissociate to stages, not the levels.

The beginning of process of taxing dispute is a submission and registration of written complaint of taxpayer in chancellery of local tax administrator.
The ending of taxing dispute:

- when decision enacted by central tax administrator meet requirements, which were mentioned in complaint of taxpayer, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when decision enacted by committee meet the requirements, which were mentioned in complaint, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when decision enacted by District court meet the requirements, which were mentioned in complaint, or not, but taxpayer does not want or can not proceed a procedure of tax administrator denunciation of decision;
- when taxing dispute is analyzed and the decision is enacted by Lithuania higher administrative court;
- when taxpayer die, suspend or reorganize his/her activity and there is no judicial base for implementation of institute of interception of laws;
- for taxpayer recalling his/her complaint;

3. Appeals in single and mass valuation of property

We will analyze a submission of complaints and appeals in two methods of property valuation: in single and mass. We will clarify what is single and mass valuation of property, disadvantages and advantages of these valuations, and how that has an impact on property valuation of taxable value.

3.1. Analysis of data of real estate and determination of market value in single property valuation

Single property valuation property is a way of estimation of value, when concrete value of property is determined according to all single characteristics of this property. Single property valuation can be done by valuer – natural person, who has a qualification certificate of valuer issued by the Institute of Audit and Property Valuation of the Republic of Lithuania,.

According to the base of valuation, valuer is:

1. Independent property valuer is an valuer, who being an owner of non judicial company or real member or working by bases of employment contract in company, which values property, in the name of these companies accomplishes valuation of property with customer;
2. Internal property valuer is an valuer, who accomplishes valuations of property by order of company, office, or organization, with which he/she has work relations, to implement of company internal uses and it direct functions.

3.1.2. Data analysis of real estate market and mass valuation

Establishing new administrative procedures of real estate tax, it should be taken acount of not only to this, that taxing load by opportunities for all taxpayers would be dispensed equally, but also to the fact, that tax would be simple and easy to administrate it. From valuation of value of real estate of market starts an valuation of taxable value. Different data, market price, physical, economical and other characteristics about every object of real estate in

country is needed for that. For collecting so many information and process it, it is used computerized data bases, and for estimation of real estate is applied pattern of mass property valuation. Mass property valuation – such pattern of valuation, when real property value is not determined and by the analysis of pattern of collected information about estimated property is determined limits of values, which comprise of evaluated property value. Data are collected, analyzed and calculations are made by the base of filing. In this way of estimation are evaluated objects of property, which has many similarities. An establishment of system of valuation of mass property is one of measures of effective property valuation system. Mass property valuation from single differentiate by quantitative features: an extent of valuation is bigger, property valuation is specialized by real estate features, it is predicted a time cycle of overestimation and etc. Standard methods of property valuation are pleasing of this:

1. property is evaluated by opportunities equally, not separating several taxes and taxpayers and bypassing likely disputes for partiality of property estimation;
2. it is established general system of valuation;
3. it is not big costs, also, overestimation of property could be accomplished periodically;
4. Information about property value would be given for tax inspection from one institution; therefore it would be guaranteed right administration of this tax.

It is understandable that mass property valuation has some drawbacks too: it is not possible to estimate objective all circumstances, which has an impact on value of real estate, by mathematical formula. As it was mentioned, big amount of real estate objects, which condition correspond with same date, are evaluated by mass valuation.

Method of mass valuation is interesting of the fact, that there is no opportunity to take account of factors of real estate value. That's why compiling models of real estate valuation it is not taken an account of increment or decrement of real estate value for this reasons:

1. Temporal improvement or aggravation of environment;
2. for physical features and form of property;
3. for real estate control form;
4. for using, controlling and disposal of real estate;
5. for layout, style, design, internal decoration and other single features of real estate;
6. for a position of real estate in regard of street, word;
7. For universality of using of real estate, technological equipment, its pollution.

3.1.3 Appellant system in valuation of property

As real estate market quickly enlarges in Lithuania, more and more often appears disagreements between property valuer and client and third interested parties for valuation of property. While about forms of decisions of disputes of property valuation and system is just started to think.

Decision of disputes and exaction of damage is regulated by law of valuation base of business, 1999 may 25th No. VII-1202, in Lithuania. In this case when valuer work in company of property estimation compensation of property damage a company valuer is responsible for veracity of made valuation, of its terms in order of law acts and contract between company and client, also make restitution for client, which appeared for responsibilities, which are not accomplished properly. But the law foresees one additional condition. After making restitution, company, which values property, must have a right of recourse to guilty employees, which has to compensate damage for company in order of work law.

In foreign countries disputes for property valuation is adjudicated in many ways. it depends on complexity of dispute, purpose of property valuation, features of evaluated object and agreement between client and valuer.

For example, in United Kingdom usually is applied such forms for decisions of disputes:
Arbitrage.
Broking;
decision of independent expert;
enactment of final decision;

Judicial processes for wrongly doing professional duties appeal to general national law norms, general regulations of responsibility, civil codes. In West Europe and other countries, which reached an acknowledgement in property estimation, is swimmingly applied an interdict of professional damage compensation.

Interdict of professional damage compensation – is an interdict, with which a specialist, offering professional service, protect himself from judicial responsibility, which appears from negligence, mistakes or facts, which happened by working and reported for insurer in pending interdict contract validity. Complaint for valuation of property is given to that company, in which an valuer works. Then for insurance company is important to get information quickly from company valuer in order to ascertain the nature of made transgression.

In Lithuania the Law of property valuation provides a compulsory insurance of professional activities of valuers, it is that company, which values property, except commissioned institutions of Government or cities board, must insure civil responsibility. Government estimate minimal value of civil responsibility sum according to income of companies, which were received for valuation of property, and a qualification of valuers.

Insurance facts in Lithuania are estimated these:

Insurance event is a peace contract of decision of court, which is confirmed by court ruling, or agreement of insurer in writing, or pretension of which insurer first time was informed in writing during the term of contract or in retrospective term, which was analyzed in insurance contract, and which were declared for damage, which was made by insurer activity coherent with professional activity of third persons, which were accepted by composition.

Moment of accomplishment of activity is that day, when action was or had to be made. If the moment can not be stated, then it is considered, that action was made that day, when for services, which are connected with actions should be paid.

One insurance event is considered to be:

some actions, which started one damage;
some pretensions, which were declared for the same activity;
All pretensions, which were declared for typical mistakes of property and valuation of business.

Property and business valuation mistakes – is a breach of principles of valuation of property value, methods of property valuation, an order of valuation of property, which was established in property and business valuation basis law of the Republic of Lithuania, and procedure of property valuation, which is established in methodology of property valuation of the Republic of Lithuania.

The report of property valuation has judicial power and it is considered to be right until it is undisputed in order of laws. Disputes for property valuation are solved in agreement of parties or in judicial order if other laws do not estimate differently.

Estimating why real estate tax and mass valuation method is special, it can be analyzed the last link of valuation and implementation of real estate tax, this means an appeal system, which starts to proceed after when taxpayer gets taxing announcement or record, in which value is indicated and from which all taxes will be calculated. Initial stage of this system is informing taxpayer about procedure of appeals. When taxing announcement is received it is capacitated to apply to particular offices for appearing uncertainty.

An order of analysis and implementation of submission of appeals is one of parts of quality system of taxes. In this stage mistakes, which are connected with real estate data, are corrected, and mistakes of fixed values. Differently from single valuation, mass valuation gives an opportunity for owners to participate in valuation of real estate values and this happens during the procedure of appeals. Also, influence this fact that real estate owners usually roundly react to increment of taxes of real estate value, while relation with public is very important and necessary.

In taxing announcement, together with needful documents, for taxpayer much information is given. Many taxing offices in little brochures inform taxpayer about valuer duties and order of giving appeal for taxable value. Alternate work places are founded, where qualified staff can give more information about appeals. Also tax valuer has to use new technologies as internet, where all information about appeals, their order of analysis and implementation system would be placed.

There is assigned employees – committee, which analyzes complaints and takes decisions for taxable value. About committee decision is announced to real estate owner in writing. Taxpayer, who disagrees with decision, can appeal decision in court.

Main differences of analyzing appeals start from methods of real estate valuation differences. In single estimation valuation is accomplished where client is a concrete person, also a responsibility and in case of appeals one complaint is receivable. Meanwhile in mass valuation, a cycle of interested is all taxpayers of real estate, so and the number of appeals is much bigger.

4. Valuation of real estate taxable value and appellant system in Lithuania

4.1. Estimation of real estate taxable value

The essence of taxes is that country must collect some monetary resources for its activity, for prosecution of functions. The essence of taxes is characterized by other features. Country accumulates recourses by order of laws by taking taxes from taxpayers under compulsion. Order of tax payment, calculation, exaction and returning, administrating taxes, structures which administrate taxes, tax administrator and taxpayer rights and duties, taxpayer accounting is regulated by tax administrating law, which was established in 1995 June 28th, except chapters VI,VII,VIII and IX, which came into effect from 1996 July 1st. And later changes of it. This law determine main concept and rules, which has to be observed by implementing laws of taxes of the Republic of Lithuania, gives a list of applied taxes in Lithuania, estimates rights and duties of tax administrator, taxpayer rights and duties, order of tax and with it connected exaction of sums and analysis of disputes. If tax law does not determine otherwise then in law of tax are usable conceptions: tax – monetary liability for country of taxpayer that income would be got for functions of country to administer. This liability accomplished in order of laws; Tax law – a law of the republic of Lithuania, which determine tax, levy or other deposits to budget or funds of country; Taxpayer – a person, for who a duty to pay tax is fixed; Tax administrator – an institution responsible for tax administration; Tax administration – an implementation of tax administrator and taxpayer rights and duties, tax calculations, payment and exaction, application of responsibility of inappropriate calculations and payment of taxes, apportionment of tax, giving information for taxpayers. Applying tax laws, all taxpayers are equal. If in national contracts are determined other taxing rules than in tax laws and these contracts are ratified in Republic of Lithuania, then rules of national contracts are applied. By this law taxes are administrated.

An order of taxation is established by particular tax law or on its base taken act of Government of the Republic of Lithuania, or on its bases taken other law act. Tax laws, which were enacted by parliament of the Republic of Lithuania, are implemented also by the government of the Republic of Lithuania, also implementing tax laws, establishing methods and rules, which vouch for tax administration, or helps to do it for Board of Exchequer.

4.2. Taxable value appealing system of real estate

We shortly reviewed what and which taxes are in Lithuania, now we will analyze taxable value appealing system of real estate in Lithuania.

Inuring for new law of real estate property tax, real estate taxable value in Lithuania, on which tax of real estate will depend for upcoming five years, is set by company State Enterprise Centre of Registers ry.

Taxpayer can find out commercial real estate value in State Enterprise Centre of Registers website (www.registrucentras.lt), indicating unique number of real estate.

If taxable value, which was set, does not satisfy, it can be appealed to State Enterprise Centre of Registers for value and application for use of set value of single valuation for calculations of tax.

If there is not paying attention to unofficial complaints or it is not reacted in that way, like a client expect, then to official complaints must be reacted and official letter or answer.

Taxpayers should take attention to that fact if purposes of their real estate, which are indicated in database of State Enterprise Centre of Registers, correspond to factual use of this property, because purpose has an impact on property value. If purposes, which were mentioned in data base, does not correspond factual use of real estate, taxpayers should change these purposes of such property.

Till 2006 January 6th taxpayers could give an appeal for State Enterprise Centre of Registers for taxable value extent and inform, that real estate is used for other purpose than it is registered in register of real estate, and it is began its procedure of change of real estate.

Till 2006 January 6th declarant had to change real estate purpose or bring a copy of application, which was registered in Public territory planning and in subdivision of building inspection.

Industrial, manufacturing, engineering taxable value of real estate purpose will be established in the same way, like till new Real estate tax law validity, it is – in method of reproducible value.

From 2006-01-01 calculating such property tax, it can be used of its old values, which are indicated by State Enterprise Centre of Registers till 2006-01-01 in reference, which are given for property owners, if they are set at the earliest before 5 years.
As I have mentioned, if taxpayer disagree with set value, he can submit application for Public company State Enterprise Centre of Registers and property taxable value can be held as a value, which was estimated during single valuation, but only in that case, when property value, which was established in methods of single and mass valuation, differ more than 20 percent. It should be noted that from 2007 January 1st law adjustment become valid, with which property taxable value will be held as an single valuation, which is made by law of property and business bases, if set values of mass and single methods defer more than 10 percent, while valuation itself fulfil conditions, which are set in law.

It is already analyzed first complaints for tax of real estate. It was wildly reacted to the changes of tax of real estate. Taxpayers, politics, media were dissatisfied of innovations, which were established by law of tax of real estate. This law gave a right for local institutions to change tax tariff from 0.3 to 1 percent. From 60 districts, in 18th taxing percent of real estate was minimized.

Market value, by which taxable value is determined, mostly rose in bigger cities, in Vilnius and Kaunas. In these cities taxable value of some objects raised 2 times and more.

Public company State Enterprise Centre of Registers, which implement valuer duties for valuation of taxable value, attempt to keep by main principles, which are connected with public or submission of information:

- ultimate honesty and clearness;
- With certainty defined limits of competence and responsibility.

After analysis of complaints the results can be summarized. During first term of submission of complaints it was 1617 complaints submitted for more than 2000 real estate objects. Just half of them it was submitted reports of single valuation and they were analyzed. Results can be seen in the table 9.

All submitted complaints	Rejected for a reason, that it wasn't submitted a report of single valuation	Suspended for application of complaint bearer	Results of complaints and valuations	
			Set value was changed	Rejected for wrong report
1617	811	31	458	317

Table 9. Summary analysis of complains.

Main reasons for changing set prices:

- Part of premise is founded in basement;
- Property is in bad condition and/or is unusable;
- Objects, which take a big territory, also objects, which are in private territories;
- Commercial objects in expensive zones, but appears in courtyard; they are without window-cases and/or exit to street.

Reasons why reports were not analyzed:

- Evaluated property of not that purpose, which was indicated in data base of State Enterprise Centre of Registers;
- For property, which was evaluated, other valuation method had to be used;
- It was taken agrarian market value after valuation of market value;
- Mathematical mistakes calculating the value of real estate.

From 317 rejected complaints 3 of them were submitted to analyze for committee of Administrative complaints and 40 appealed to Lithuania administrative court. Prolonging the term of submission of complaints repeatedly were submitted about 200 complaints and more than 100 new complaints. Furthermore, almost for 500 new constructions was made reappraisal.

4.2.1. Analysis of complaints and applications of taxpayers' complaints of real estate not in the court

We will analyze one of potential types of official complaints of taxpayers for valuation of real estate taxable value in mass method, appealing not in the court proceeding.

In 2006 March 30 replacement of law of real estate in the Republic of Lithuania of clauses 10 and 12 was enacted. It determined, that complaints of taxpayers for taxable value of real estate and applications for use of real estate value, which was determined in single method calculating taxable value, are submitted for property valuer during three months from valuation of real estate taxable value. These complaints and applications are analyzed by valuer per two months from reception day of compliant or application and make a decision.

Following this law and clause 8 of real estate tax of the Republic of Lithuania and 2 part of clause 10, also by an order No. v - 244, this was set in 2005 December, of director of State Enterprise Centre of Registers, by "work regulation of committee of complaints of analysis of taxpayers and applications of real estate" company continued analysis of taxpayers complaints and applications in this order:

1. Complaints of taxpayers for set taxable value of real estate for real estate value use, which was set in single method calculating taxable value, it is analyzed early mentioned law act in set order in this case, when by complaint is attached valuation report, which meet requirements of LT law of property and business valuation bases. Received complaints are registered by branch establishment, which accepted complaint or central subdivision of company and transfer for committee of taxpayers' complaints and applications of real estate and not later than during workday from reception day informs an administrator of local taxes of property residence. Answer for bearer about complaint and application analysis results and information for tax administrator and branch, which made a decision, prepare and send committee of complaint and applications analysis for taxpayer.

2. In these cases, when taxpayer does not attach to complaint single report of valuation, complaint by set order is registered in acceptance place, but about it is not needed to inform the committee and administrator of local taxes. Answer is prepared and sent by subdivision of company.

Complaints, in which it is indicated, that data, which were recorded in real estate register, do not correspond to factual data, that's why real estate taxable value is not right, are registered in acceptance place, but about it is not needed to inform the committee and administrator of local taxes. Answer is prepared and sent by subdivision of company.

Regulation of committee work of complaints and applications analysis of real estate taxpayers determine norms of clause 10 of LR law of real estate tax of complaints and applications, an order of committee work.

Committee is made by order of director of State Enterprise Centre of Registers. It implements functions of valuer, which are set in clause 10 of real estate law. Committee in its activity follows by law of real estate tax, by other acts and this regulation. Committee analyzes complaints, which were submitted for real estate value use, which was set by single valuation, calculating taxable value.

Complaint and application for concrete object taxable value of real estate has a right to appeal these persons, who pay a tax of real estate for this object and thinking, that their taxable value of real estate, according to clause 8 of law of real estate, is set wrongly. Complaint and application is appealed company branches or in central seat directly or sending by post. Complaint is written by requirements of form and content of compliant, which are set by law of administrative cases proceeding. To complaint and application is attached extract or copy of complaining taxable value. A report of single valuation, which is attached to complaint and application, should meet the requirements of content and form of valuation report. Complaint and application has to be appealed not later than during the month from estimation day of taxable value of real estate. Acceptation, registration in separate register and protection of complaints and applications are organised by head of company and office of central company. Received complaints and applications for taxable value valuation are registered in submission place and quickly transmitted to committee. Material of complaint or application is sending for committee by e-mail or express mail. About received complaint or application not later than per one workday from acceptance day is informed tax administrator of property residence. This information is submitted for tax administrator by head of branches or assistant manager of director for cadastre and for property valuation. In register of complaints and applications these data are indicated: serial number; data of receipt of complaint or application; declarant name, surname, location; content of complaint; referral date to committee and date of examination; notes about appeal; notes about implementation of decision. Chairperson of committee analyzed and decides, if for committee competence belongs to analyze complaint, if the term of submission of complaint is not overdue. In these cases, when form and content of appealed complaint does not meet the requirements of law, chairperson of committee makes a motivated decision to reject to analyze complaint. Chairperson of committee, when there is no chairperson then commissioned person, that complaint transfer to one member of committee. Member of committee has to do preliminary actions, which are needed for examination of complaint in meeting of committee, to collect all material associated with complaint and refer about complaint in meeting of committee. Committee or a member of committee, to who preliminary works of examination is assigned, has a right to:

1. to request and get from subdivisions of company documents, material and information of analyzed issue;
2. to get documents, material and information of analyzed issue in written form or verbally;
3. to get information of company employee, who prepared report of real estate of mass valuation in written form or verbally;
4. Required material or copies of documents has to be submitted for committee not later than during 3 workdays from receipt of requirements, if a member of committee, who has a commission to analyze complaint and submit it to analyze it in meeting of committee, does not set other term.
5. By necessity members of committee can analyze complaint outright.

Committee is collegial organ. The work of committee is organized and is leaded by a chairperson of committee. Analyzing complaint or application, branches of company helps to committee and can depute participating in meeting of committee, in which this complaint or application will be analyzed. Meetings of committee proceed constantly by sequence of

submission of complaint or application. Meetings are organized and leaded by chairperson of committee. Complaints have to be analyzed and decisions should be taken not later than per 30 days from their receipt. Decisions are made by committee in meetings. Meeting is considered to be judicial, when not less than 3 members of committee participate in it. The meeting is started, when chairperson announce of composition of committee and about participants in meeting. Chairperson announces what complaint is analyzed. After that, announcement of a member is auditioned about complaint. Members of committee have a right to give questions, which are connected with complaint, to give their separate opinion. Committee makes a decision usually by common agreement. When common agreement is not reached, then decision is decreed by voting and then a decision is that, for which voted more than a half of members of committee, who participated in meeting. If votes divide equally, then chairperson vote determine the last decision. In decision of committee must be these data: location of acceptation of decision and date; the name of committee and composition of it; the content of complaint; essence of made decision and motivation; explanation of order of decision appeal and indication of term. Decision of committee is signed by chairperson and members, who participated in enactment of decision. A decision of committee is written and those transcripts are sending to person, who appealed, and for local administrator not later than per one workday from acceptation of decision. About decision the branch of company is informed, which prepared the report of valuation of real estate. Meetings are recorded. In protocol of meeting is written these data: location of meeting and date; name of committee and composition of it; dispute thing; explanations, requests of person who participated in meeting; requests of person who participated in meeting; personal opinion of member on issue; results of voting; information about order of decision and the term of appeal. The protocol is signed by chairperson of committee and secretary. Decision, which was made by committee, can be appealed in order of administrative cases legal proceedings.

4.2.2. Examination of complaints and applications of real estate taxpayers in court

If taxpayer is dissatisfied of committee decision, he can apply to higher instance and appeal against the decision of committee in order of Administrative cases legal proceedings. An order of submission and examination of appeals of taxable value is the same, as in other administrative cases.

5. Valuation of taxable value of real estate and appeal system in foreign countries

Substantially in all Europe countries*, in which real estate tax is applied, and USA real estate base of tax is calculated by its value. But in Different countries estimation of concrete property value has some peculiarities. Examination of complaints has some peculiarities too.

Is it possible to appeal against taxable value, which was set?

Name of country	Yes	No	Not known	
Armenia	*			Taxable value can be appealed to committee of public cadastre, of which the founder is the government of Republic of Armenia; later in court, as it is set in laws
Belgium	*			Firstly complaint is given to the local head of office, where the complaint was evaluated. Complaint is analyzed of a committee of one or three experts, which was founded of taxpayer and head of cadastre. If taxpayer disagrees – expert can be a judge.
Cyprus	*			After valuation of taxable values there is a term of 6 months for giving appeals. When the examination of them is finished, it is considered, that the stage of valuation is finished.
Denmark	*			Taxpayer can apply to local committee of complaints. If he disagrees with decision, then he can apply to Public tribunal of taxes.
Georgia	*			Taxpayer can disagree with estimated taxable value, if there is needful data given to local tax organization. If arguments are reasoned, then government can change the decision for estimation of price.
Ireland	*			First of all taxpayer applies to valuers, if decision dissatisfy – the next step – committee of appeals, then – court (rarely practiced).
Italy	*			The procedure is organized of two levels: in level of province of tax committee and in central level.
Latvia	*			If taxpayer is dissatisfied of established taxable value, then he can give his arguments to regional Public site register. If this decision of instance dissatisfy, then he can appeal to central office.
Netherlands	*			From 1997 complaints are applied to mayor and have to be in written form. Complaint is revised by valuer. Appellant can request, that process would be supervised by government hearer. Decision is accepted in written form. In court of taxes complaints are analyzed confidentially - both sides are auditioned separately. Decision is declared publicly.
Romania	*			Applies to local adviser or to court.
Russian Federation	*			Taxpayer, who received taxing announcement, has a right to require, that his property value would be reviewed. In Russian Federation there were no experience in examination of complaints. When taxable value will be estimated by value of cadastral data, such complaints are available.
Slovakia	*			If taxpayer is dissatisfied of decision of local tax institution, he has a right to appeal to court.
Slovenia			*	Complaints for valuation is not available.
Spain	*			It is complained to the excutive, then—to judicial branches.
Sweden	*			First of all it is apealed to intitution which made valuation. The second level is a court of real estate (branch, which belong to autonomy). The last appeal to administrative court (three levels).

Table 10. Is it possible to appeal against taxable value, which was set?

5.1. Germany

In Germany new provisions of real estate were reformulated since 1997, according to 1995 June 22 Constitutional court ruling of Germany. By this ruling property taxes (in germ. *Vermögenssteuer*) were accepted as contradictory to Constitution, because property of different types was evaluated by different rules and this contravene the principle of human equality. Constitution court of Federal of Germany obligated legislator to prepare new provisions of property valuation till 1996 December 31. In new edited Valuation law is clearly preached down of property valuation by prices of market. Law differentiates an valuation of real estate according to the fact, if real estate is with buildings or not. Blanked property is evaluated by its territory or value of site (in germ. *Bodenrichtweten*). This value of site is determined by experts, according to likely opportunities of site use. Value of buildings is estimated by method of earning some income, as a background taking a price of property rent of last three years, reducing its size by depreciation of property.

Taxpayer can appeal to court if he disagrees with established taxable value.

5.2. Switzerland

Tax system of Switzerland and it size depend on canon. In level of confederation there is no general system of property valuation. In 1993 a law of tax harmonization, in which the term of 8 years, when different tax provisions had to be concerted in canons, and contradictory provisions not to be applied, was enacted [6]. But this law does not envisage any provisions for property valuation or tax of real estate. Taxes of real estate (in germ. *Liegenschaft*) usually is determined by market value of property according to method of used income periodically reappraising on alternate 5 – 15 year. Methods of market value of property are different in canons thus far. Usually it is regarded to market value and average of value, which is estimated by income. Income value is denominated by capitalizing property of rental. Rental sum mostly is determined by compared prices of market. To special circumstances, this sometimes appears while transferring property and which has an impact on property value, is taken no count.

If taxpayer disagrees with set taxable value, he can apply directly to valuers or tax organizer. If dispute cannot be solved – court proceed.

5.3. USA

In USA applied property tax is usually regulated by level of state. This tax partly takes a tax, which is applied in Europe and real estate tax, because in some states personal (or movable) estate is liable for tax, also, installation of machine. But, for example, in state of New York, only real estate is liable for tax. Real estate taxable value is equated to its value of market, but in laws methods of valuation of market value are not elaborated. In this view it is very important explanations of administrative and court institutions. But practice is not the same. Usually market value is determined in three methods: 1) sales comparison or market approach; 2) cost approach and 3) income approach. If property was transferred during some time, its price of transference mostly is considered to be market value and property is not revalued additionally. Rented property is usually estimated by how income it gives. In other

cases all three methods are applied, much attention is given to valuation principles – substitution, it is – how much analogous property can be gathered, opportunities to use property in highest and best use and etc. Disputes of taxpayer and tax administrator are usually solved by bargain and compromise.

Reasons of too big tax valuation can be very various:

- Valuers do valuation looking through concrete property, so estimates property value according to factual transactions of analogous objects;
- Buildings, which are near, having similar features, were priced in lower price.
- In note of real estate taxation could be done a mistake describing characteristics of building;
- Valuation itself can be wrong for mistakes of mathematical calculations.
- Buildings were destroyed by natural disaster or fire and for this reason their value is lower.

Committees, which analyze complaints are impartial and independent, usually they are formed from people, who work in local government.

5.4. Hawaiian examination system of complaints

Every year till March 15th Tax organization send an announcements for taxpayers. In announcements is indicated taxable value of taxable property, also perks. After receive of announcement taxpayer, who checked all information, decides if there are no mistakes for accuracy of data, for value or perks, and if he finds some, he has a right to appeal. Before appealing taxpayer apply to Tax office indicating his problem/question or mistake. Most of problems can be solved in this way. But, if it does not work, then it is appealed to higher institution, and here are suggested three variants:

1. Complaint is appealed to informal verification;
2. Complaint is appeal to court – it will be formal verification;
3. Complaint is analyzed in court applying summary procedure.

If complaint is analyzed by informal verification, then a committee of verification compiles from five persons. There are members of local government, who work part time job and analyze complaints. Taxpayer has to give a complaint, of which form can be found in any tax control office. Complaint must be appealed till April 9th of current years. In complaint must be indicated reasons, why it was appealed, which are reasoned by factual material, which prove the correctness of bearer. Examination of complaints is paid. If the tax is not paid, complaint is not analyzed.

Complaint can be applied to appellant court of taxes, or for committee rejecting a complaint of taxpayer. Complaint must be submitted during 30 days from acceptation of committee ruling. Forms, which are needed for appealing, can be taken in court. It is estimated a tax of 5 percent from difference of property values, but not more like 100 and no less than 5 dollars. When complaint is satisfied – all money are returned. The secretary of court inform about date, time, when and where the court will proceed.

Summary procedure can be applied in the sum of dispute does not exceed 1000 dollars. Tax of appealing – 3 dollars. This procedure has one condition that if complaint was not satisfied taxpayer is out of Hawaiian court.

While registering complaint, reasons of complaint must be indicated. It can be:

1. You disagree with set value, because it does not contravene market value.
2. Inequality while valuation;
3. Perks are not calculated;
4. Methods of valuation were illegal or constructive.

Taxpayer has to submit data about sales of similar buildings or holdings. If real estate was bought – sold, prices of transaction are analyzed, if property was rented – prices of rent are analyzed.

The answer of ending of complaint examination, the committee read outright or after the term, which was set. Written ruling is submitted later.

5.5. Great Britain

In Great Britain two taxes, which are very similar to real estate taxes, are applied: council tax and non domestic tax. More alike in continental Europe to applied real estate tax is council tax, which was enacted since 1993 April 1st in stead of applied poll tax. Real estate is not evaluated singlely, but is classifiable by its value (valuation bonds). Buildings are evaluated in method of income, capitalizing income to property (capital value basis). Determining rent price there is no inflexible rules, but usually it is taken an account of market position, ret prices are compared. Other real estate is evaluated by market value. Valuation is done by commissioned institution (Inland Revenue Valuation Office). Non domestic tax judicial regulation is very complicated, because its origins touch years of 1601, and many provisions of taxation are deduced according to formed precedents of court practice. Taxable property is named as “hereditament”. Tax is evaluated by ratings of valuation (taxable value), which refer to yearly rent price, according to confirmed coefficients of this property. Disagreements between taxpayer and tax administrator are solved by bargain, and if the compromise about property valuation is not found, then valuer decision can be appealed to court institutions (Land Tribunal).

5.6. Denmark

Taxpayer can apply to local valuation office, that he could change real estate value. Complaint must be appealed in written form and in it has to be indicated reasons, why this complaint is appealed. Main reasons of appealing complaint are data mistakes and facts, which can change set value and to which was not taken an account of valuation.

If committee determines, that complaint is legitimate, then set value is changed and about these changes taxpayer is informed. If committee disagrees with complaints, then complaint is appealed to the Board and taxpayer can find out about that, when complaint will be analyzed, also agree upon when Board will come to inspect real estate. After examination of

complaint, Board makes a decision and informs taxpayer. Complaint from controlling Board can be applied to National Tribunal of Taxes. Lodgment of complaint for National Tax Tribunal is paid, this payment can be returned, if decision is taken in behalf of taxpayer.

Number of complaints after valuation of 1988 and reappraisal of 1992 was 100000 (it took a part of 5 percent of all real estate objects. When valuation was started in every year from 1998 a number of complaints decreased to 30000). About 6000 complaints were appealed to controlling Board and about 500 – to Tax tribunal. This increase of number of complaints is connected with annual reappraisal of real estate, also with submission of accurate information about real estate tax system.

5.7. France

Real estate taxes (*taxe focière*) are usually calculated by cadastral value (*valeur locative cadastrale*), reducing base of tax by 50 percent. In acts of law is not elaborated by which concrete methods this value has be determined. Calculating a property tax is made a presumption, that cadastre value is the real value of market, but practically these values differ from each other. Evaluating property it is taken an account to the fact is a site with buildings or without them. Value of buildings is estimated simply by annual price of rent. Blanked site value is determined by cadastral its value, according to opportunities of appliance of sites in concrete locality. Reappraisal of property should be done every three years, but the last time it was done couple centuries ago. From then property value is indexed. It is foreseen an opportunity, that person also can estimate his/her property and commissioned institution verify this valuation. When a dispute appears, taxpayer can appeal it for higher institution. Summarizing an experience of foreign countries it is made a conclusion, that estimation of real estate value usually is followed by income method, this means, that it is regarded to what price is of property rent, and these income are capitalized into value of property. Blanked site, which is used in agriculture, is usually determined by its market price. On purpose of equality of taxpayers to exceptional circumstances, which maybe have some impact on property value, is not considered. It should be mentioned, that in detail was analyzed countries of West Europe and USA, which have a steady valuation systems. In these countries there are no essential problems, which are associated with valuation of property value, except the fact, that reappraisal of property was not made very usually and property taxable value is lower than its market value. Also, these countries instill paperless systems of property valuation.

Most countries of East and Central Europe now implement their reforms of real estate tax and merge into valuation of real estate taxable value by market value. Therefore in these countries is needed to prepare not only technical procedures of property valuation, but also new judicial base. In developing countries establishment of new modern administrative procedures of property valuation would not make a system of calculating tax enough functional, because in is hard to get information in it about real sale of property or rent price, there is little qualified labour force and etc.

In many developing countries complaints for taxable value directly reach a court, where rulings can take a year or more. That's why there are no many complaints. It is recommended that complaints would be applied for independent committee, which is composed from a competence and without economical interest. Committee can require and from taxpayer and

from valuer for information, which is needed for making a decision by laws. Members of committee also have a right to review a property of taxpayer. Appealing to court would be the last instance. Correct information, which was given to committee, is main duty for taxpayer. Information given by valuer about possessed property also gives extra and correct information and helps to extricate complaint.

6. Use of best practice while developing appeal system in Lithuania

Although real estate tax in Lithuania is many years ago, but changing calculating method, starting to count taxable value by market value a big wave of dissatisfaction appeared. It was analyzed many complaints. Analyzing other systems of examination of complaints in other countries, some conclusion can be done.

- Valuation in our country is made every five years. According to practice of Denmark and USA, it can be stated, that the term is too big to determine taxable value. During five years jumping of market value can be very huge, which means an increment of taxable values and also number of complaints. The best way is to estimate taxable value every year.
- Other important moment is lack of information. For society, together for taxpayer should be explained more about tax system, its work, also an order of submission of complaints.
- Analyzing appellant systems of other countries we can see, that they are similar as in Lithuania. Substantial similarity is a hierarchy of appellant procedure. First instance, in which the examination of complaint is made, usually is an valuer of real estate, the last instance is court. Though in some countries first instance is a committee organized by autonomy, in which to meetings are invited taxpayer and valuer. In this situation maybe the partiality would be evaded if complaint fall into the hands of valuer, but it can be penetrated and some negative causes, like: when complaint fall into the hands of committee of complaints of autonomy a mistakes of valuation is not corrected, which would be corrected if complaints firstly reached valuer.

6.1. Proposals and implementation program for the appeals system based on single valuation

Real property taxable value in Lithuania means the market value of real property calculated in a way of mass appraisal. When estimating this value in a way of standardized statistical programs, the market data are analyzed (information on transactions). Analysis identifies the factors influencing property value and their importance. Single valuation, which is recently applied in Lithuania for appeals of taxable values, is performed basically in the same way: information about property under valuation is collected as well as market data that help to assess the factors influence the property value on the market. On the basis of this analysis a model (equation) is derived in single as well as in mass appraisal that enables calculating the property market value by assessing property characteristics.

Main difference between mass appraisal and single valuation is the depth of analysis of property characteristics (attributes). In case of mass appraisal the basic and common property characteristics typical to the whole group of property that affect the value of property are singled out. In case of single valuation focus is made on singling out the single characteristics

of property under valuation and assess their importance. In most cases the characteristics important for the whole group and each single property are the same and there are not so many single attributes identified that may in principle change the property value. This is to mention that when analyzing the common characteristics for the entire group singlely they may deviate to one or another side. Seeking to improve the appeals system of real property taxable values and provide more grounds and definiteness but not change the appeals system in principle, the following system designing and implementation actions are performed.

It was mentioned that the sequence of valuation works and operations performed in both the single valuation and mass appraisal have many similarities. Therefore this project aims at developing similar information – analytical environment for the appeals system based on single valuation. The system should comprise the following elements:

1. Property identification system.
2. System of internal and external factors making up property value.
3. Market data search system.
4. Standardized data processing system.
5. Presentation of results.

6.2. Property identification system

When developing the real property appeals system it is very important to define the property under analysis in a precise and unified way. Mass appraisal of property is performed on the basis of real property data registered in the Real Property Register. Therefore when submitting the appeals, property must be defined using the official data registered in the Real Property Register. If the status of property is changed and the indicators identifying real property do not reflect the actual situation these features must be revised and registered in the real property register before submitting an appeal. The experience gained in the period 2006 - 2007 shows that about 20 % of all appeals were related to the fact that property was reconstructed and used for another purpose of use than registered in the Real Property Register (e.g., previous premises of a shop are now used as the warehouse despite the fact that in the real property register they are registered as commercial property, and similar) Having specified one source for property identification – the real property register - property identification is unified and the system for searching property description becomes simpler. Besides, the real property registered in the Real Property Register is described following the valid legal acts and the data are properly verified and reliable. All property in Lithuania is registered in the central (single) digital real property cadastre and register database and every interested user, having concluded a contract with the data provider, has the right to make a search for property on the Internet. The search may be done by the location of property as well as by owner of property. Below you will find an example of information search and its results.

EXCERPT FROM CENTRAL DATABANK OF THE REAL PROPERTY REGISTER
DEMO VERSION

1. Property registered in the Real Property Register:

Register No:	10/99956
Date of forming an entry:	1992-09-10
Version:	7 (2004-04-15)
Status:	Fully processed and legally correct data
Address:	Vilniaus m. sav. Vilniaus m. Barboros Radvilaitės g. 5-26 / Šiltadaržio g. 1-26

2. Immovable things:

2.1.	Flat/premise
Purpose:	Residential (flats)
Building with residential premise:	1094-0034-1020 , 2A2p
Unique No.:	1094-0034-1018:0021
Address:	Vilniaus m. sav. Vilniaus m. Barboros Radvilaitės g. 5-26Šiltadaržio g. 1-26
Year of completing construction works:	1940
Number of rooms:	2
Total area:	69.41 sq m.
Living area:	50.26 sq m.
Completeness:	100 %
Percentage of depreciation:	41 %
Stove:	Gas-stove
Heating:	District heating supplied from central systems
Water supply:	District water supply
Sewage:	District sewage
Gas:	Natural
Replacement value:	65818 Lt
Mean market value:	125054 Lt
Date of setting the values:	2003-01-28
Date of entry of cadastral data:	1992-09-10

3. Fixtures to the object from other register: no entries

4. Ownership:

4.1.	Ownership right

Owner:	XXXXXXXXXXXXXX, born 1972-02-23 ZZZZZZZZZZZZZZ, born 1971-10-29
Thing:	residential premise Nr.1094-0034-1018:0021, described in p. 2.1.
Basis for registration:	Purchase-Sales Contract, 2003-01-30, Nr. 2-996
Entry valid:	From 2003-02-12

5. Right of trust state & mun. land:

6. Other real rights:

7. Legal facts:

7.1.	Mortgage
Thing:	residential premise Nr.1094-0034-1018:0021, described in p. 2.1.
Basis for registration:	Notice about the Registration of Mortgage, 2003-02-20, Nr. 01120030001906
Entry valid:	From 2003-02-21
7.2.	Joint community property
Thing:	residential premise Nr.1094-0034-1018:0021, described in p. 2.1.
Basis for registration:	Purchase-Sales Contract, 2003-01-30, Nr. 2-996
Entry valid:	From 2003-02-12

8. Notices:

9. Special use conditions:

10. Cadastre notices:

11. Remarks and references of the register entry:

12. Other information:
Archive file No: 13/2950

13. Information on the issued Certificates for Transactions which are valid: no entries

Fig. 17. Excerpt from RP DB.

Property identification system about all legally registered and taxed property may be accessed via the Internet to both the local and foreign users using the European land information system EULIS.

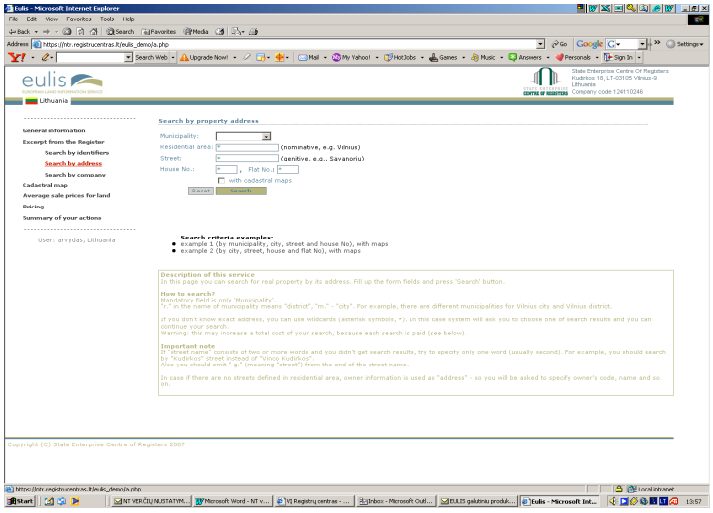


Fig. 18. EULIS homepage.

6.3. System of internal and external factors affecting property value and standardized data processing system

Real property taxpayers, property valuers, other interested institutions and persons may find the models and procedures for calculation of property value in a way of mass appraisal. Mass appraisal models placed on the Internet indicate the factors that have been selected as being important for developing these models, also the level of importance of these factors is indicated specifying when the importance of a factor is equal to 1.

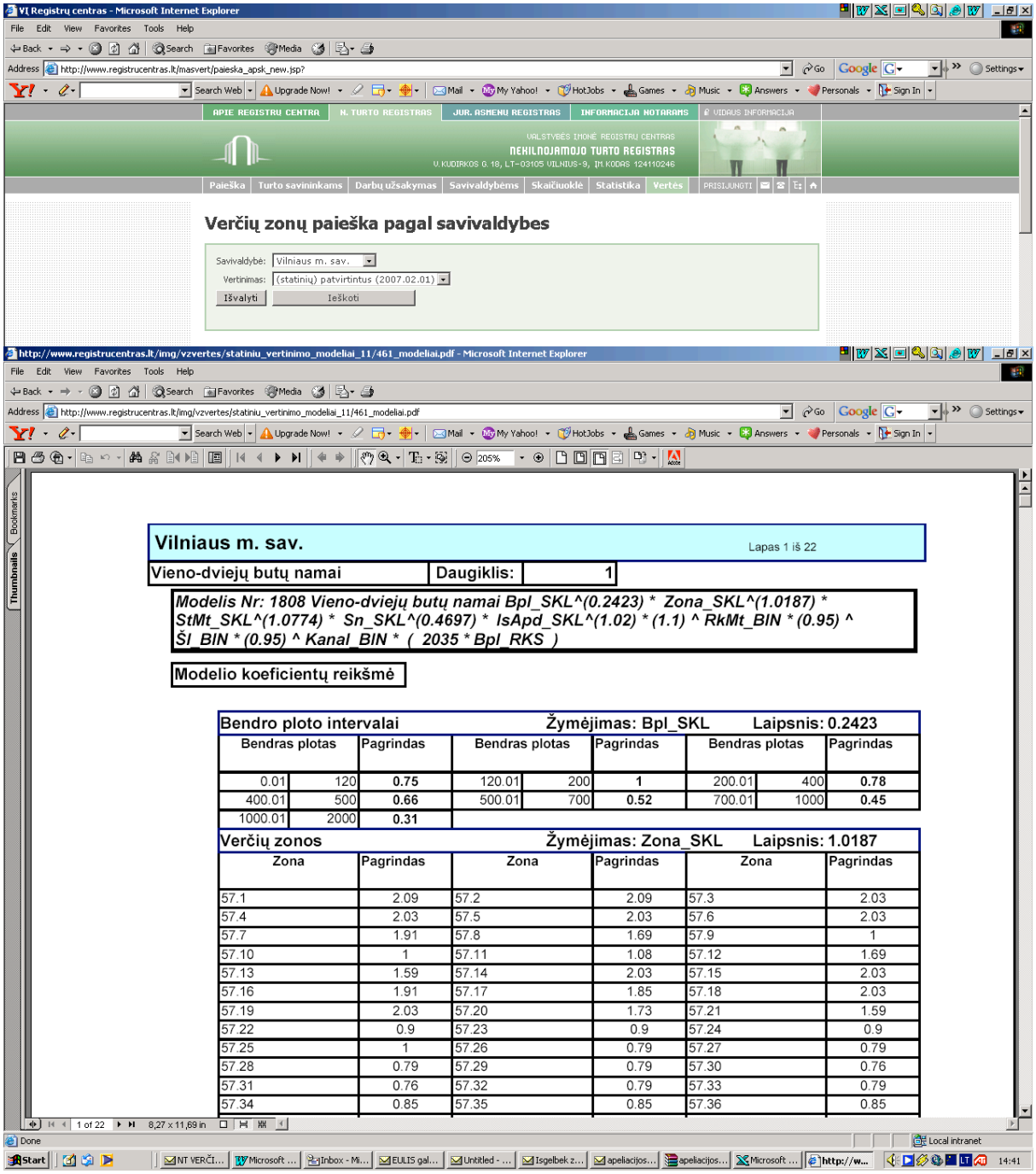


Fig. 19. Mass appraisal models internet page.

Currently, this system is static and does not provide an opportunity to change factors and their level of importance and to recalculate the value using the latest parameters. Seeking to adapt this system for appeals of real property taxable values, an active Internet system is under development, which will allow finding a valuation model by unique number of property. The matrica below shows the attributes used in the valuation model, their extent, types and impact on the value. Last column allows entering the values of attributes calculated by the way of single valuation, supplementing the model with the attributes that have not

been considered and that are identified during the single valuation and enables to develop a new model and recalculate property value using new indices.

Unique No	109390061020				
	Vilniaus m. sav. Vilniaus m. Ukmergės g. 281				
Model No	1804				
Value, LTL	3.685.447				
Valuation date	2007.01.22				
	Name of attribute	**Type of attribute**	**Importance attributes of an object**	**Importance in mass valuation model**	Importance when performing single valuation
Model attributes using Real Property Register data	Total area	Scalar	1039,19	0,862849273	0,85
	Zone	Scalar	57.52	0,818526896	0,8
	Purpose of use	Scalar	Trade	1	1,02
	Year of construction completion	Scalar	1998	1,064171821	1
	Wall material	Scalar	Metal with a framework	0,901922594	0,8
	Heating	Binary	Central heating	1	1,05
	Sewage	Binary	Local sewage	1	0,9
	Object type	Binary	Non-residential building	1,1	1
	Total area	Value	1039,19	5425	5000
	Auxiliary area	Value R	640,63	-1085	-1000
Additional attributes	Pollution		10%		0,9
	Noise		-5%		0,95
Value, LTL:				**3.685.447**	**2.042.283**

Fig. 20. Active mass appraisal models internet page.

Having developed this application, a property valuer, who prepares property single valuation report for appeals, would receive all the indices that have been assessed in the course of mass appraisal. He would only require comparing the results received during his own calculations (important factors and their level of importance) with the mass valuation model and to supplement the model with newly identified (single) attributes. After the new attributes and

their level of importance are entered into the program, property value will be immediately calculated and the difference will be assessed between the single and mass appraisal. The Lithuanian legal acts specify that an appeal may be subject to discussion if the difference exceeds 10 %.

6.4. Market data search system

The correctness and reliability of valuation results in mass as well as single valuation depend on the amount and correctness of market data. Centre of Registers performs mass appraisal in Lithuania and collects data about all transactions concluded since 1998. At present the computer transactions databank holds information about 700 000 transactions related to real estate.

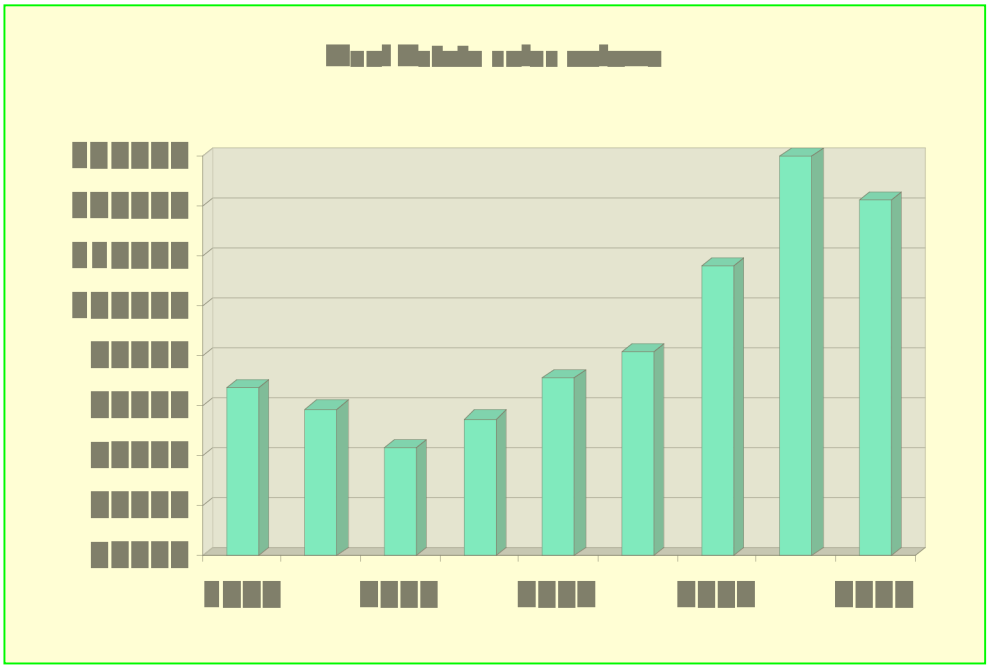


Table 11. Real Estate sales volume

At present, mass appraisal is made on the basis of these data. External users may also receive information about the values of executed transactions upon request in writing. This process is flexible for work and time therefore it is expensive and the results presented depend on the conditions of formed queries and do not reflect full picture on the market. In order to use this system for formation of real property appeals it is necessary to standardized and computerized the data search system and provide opportunities for valuers themselves to make on-line queries on the Internet. Currently, this system is in the process of development and in the nearest future will be accessible on the Internet. After the market information sources, used for mass and single valuation, are unified it will be possible to ground the calculations made during single valuation with actual market data.

The system under development aims at classifying all search parameters and providing an opportunity for a valuer himself to define what parameters should be used for the search of transaction data. At present the search is possible by 10 different parameters or their combinations. Seeking to present reliable market data they are subject to statistical processing. Specified ranges for reliability of statistical data allow ignoring accidental sales data that fall outside the ranges of reliable data.

The system gives an opportunity to a valuer preparing an appeal to verify the correctness of attributes selected during the mass appraisal on the basis of market data and by using statistical data processing packages to recalculate, justify and evaluate the correctness of the importance of attributes or the need for their correction. There are recent discussions going on whether the legal acts should require that the report of single valuation must indicate on what data it is based and how the importance of an attribute was calculated or corrected and why a new factor that was not assessed during the mass valuation was included.

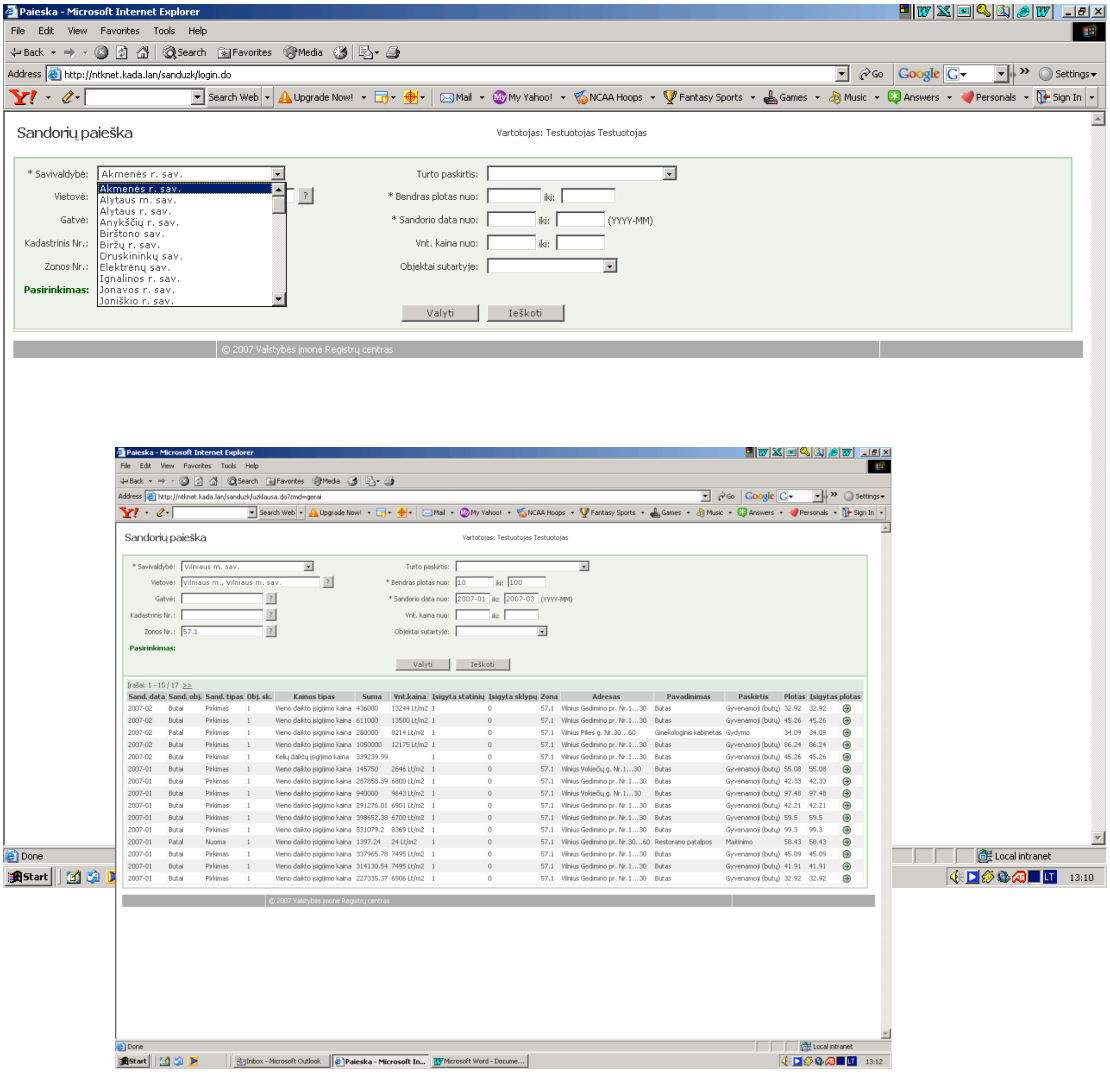
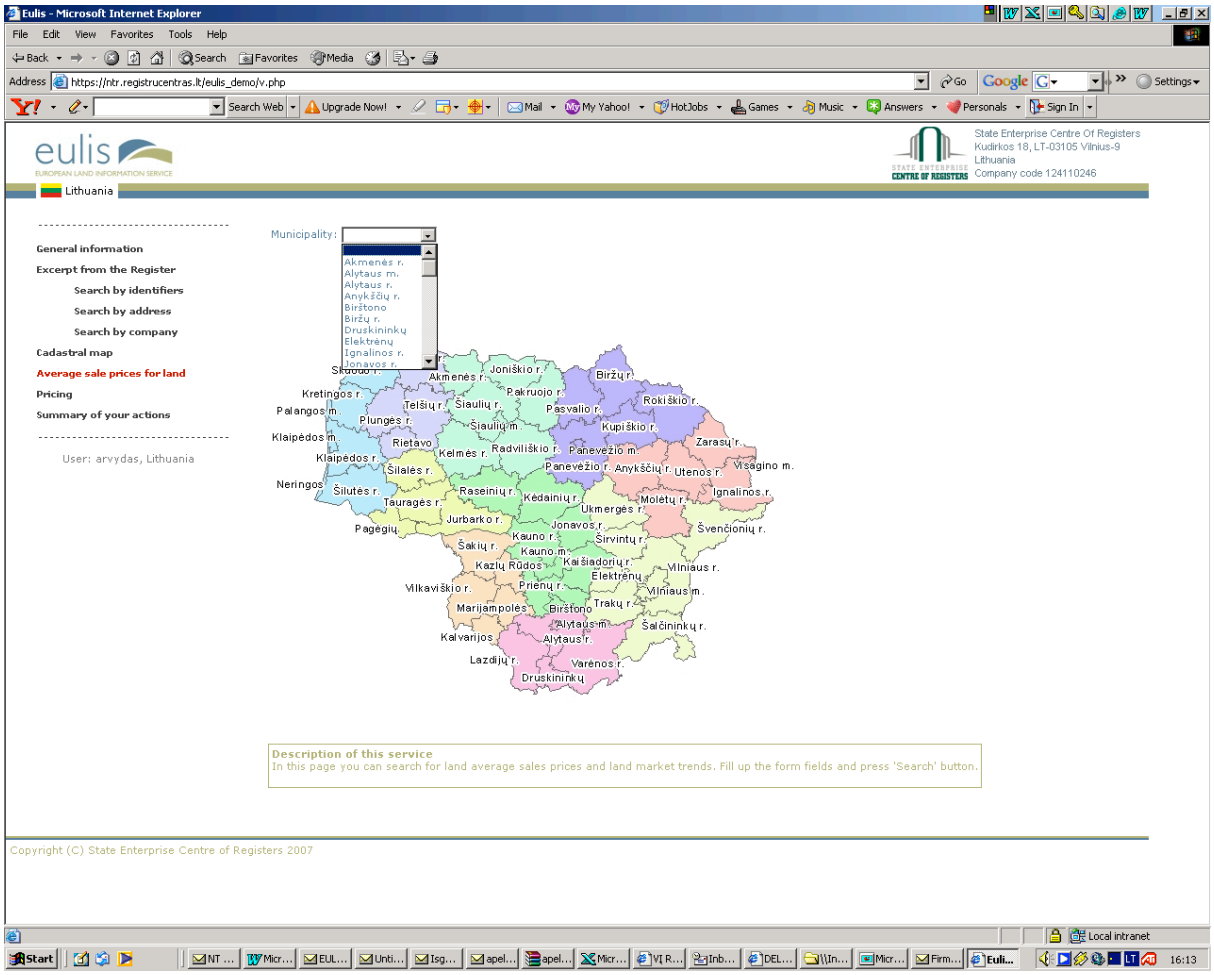
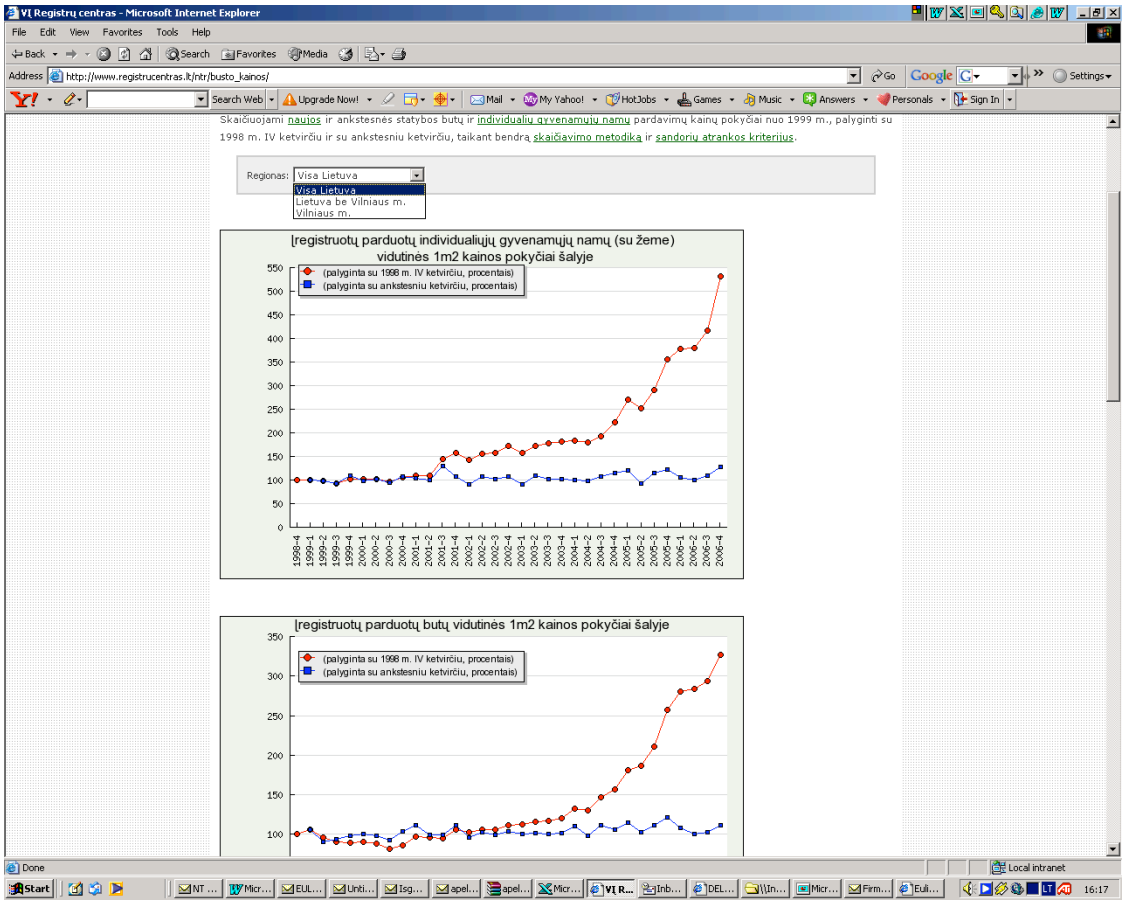


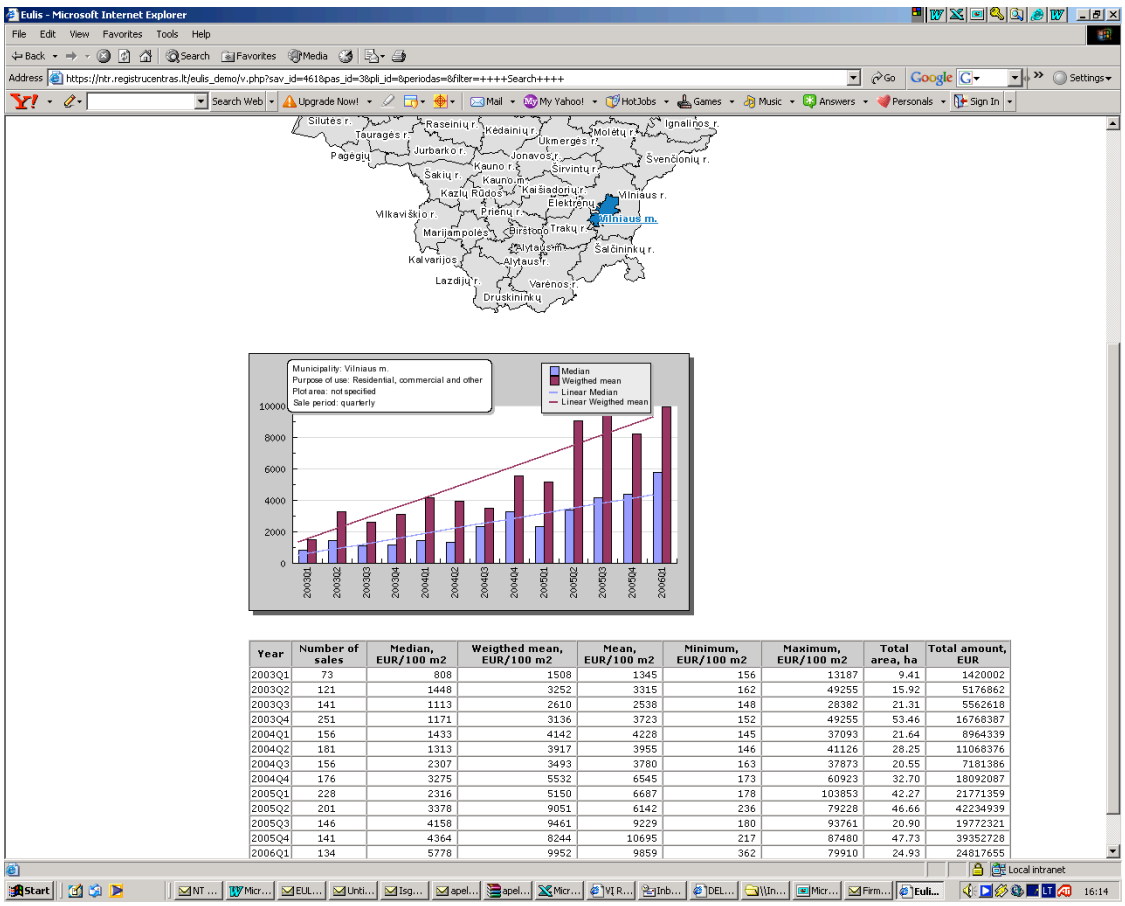
Fig. 21. Transaction data search internet page.

Specialists preparing the market (transactions) data appeals in addition would be supplied other market data too, such as market analysis, property price indices.

Property price index is one of more important factors that must be assessed during the mass appraisal and single valuation. Data of different periods are used for valuation. In Lithuania as well as in other countries with developing real property market significant changes in real property prices are visible, therefore it is very important to aggregate and enter all market data used in the process of valuation on one date. It is necessary to mention that not only valuers show great interest in the price changes of real property and indexes but oher real property market participants too banks, real estate agencies).







Year	Number of sales	Median, EUR/100 m2	Weigthed mean, EUR/100 m2	Mean, EUR/100 m2	Minimum, EUR/100 m2	Maximum, EUR/100 m2	Total area, ha	Total amount, EUR
2003Q1	73	808	1508	1345	156	13187	9.41	1420002
2003Q2	121	1448	3252	3315	162	49255	15.92	5176862
2003Q3	141	1113	2610	2538	148	28382	21.31	5562618
2003Q4	251	1171	3136	3723	152	49255	53.46	16768387
2004Q1	156	1433	4142	4228	145	37093	21.64	8964339
2004Q2	181	1313	3917	3955	146	41126	28.25	11068376
2004Q3	156	2307	3493	3780	163	37873	20.55	7181386
2004Q4	176	3275	5532	6545	173	60923	32.70	18092087
2005Q1	228	2316	5150	6687	178	103853	42.27	21771359
2005Q2	201	3378	9051	6142	236	79228	46.66	42234939
2005Q3	146	4158	9461	9229	180	93761	20.90	19772321
2005Q4	141	4364	8244	10695	217	87480	47.73	39352728
2006Q1	134	5778	9952	9859	362	79910	24.93	24817655

Fig. 22. RP market data in eulis internet page.

In addition to the analysis of actual transactions, the analysis of the entire real property market also plays an important role when analyzing the real property market. The analysis of property groups by type of its use, material, year of construction and other parameters in the subject area as well as on broader scale is performed. In this case the graphical visualization of property attributes and prices is a useful tool for a valuer. Graphical visualization is used in mass appraisal too. Within the framework of this project it is envisaged to present these data (maps) to general public and valuers as an additional material for valuation of property.

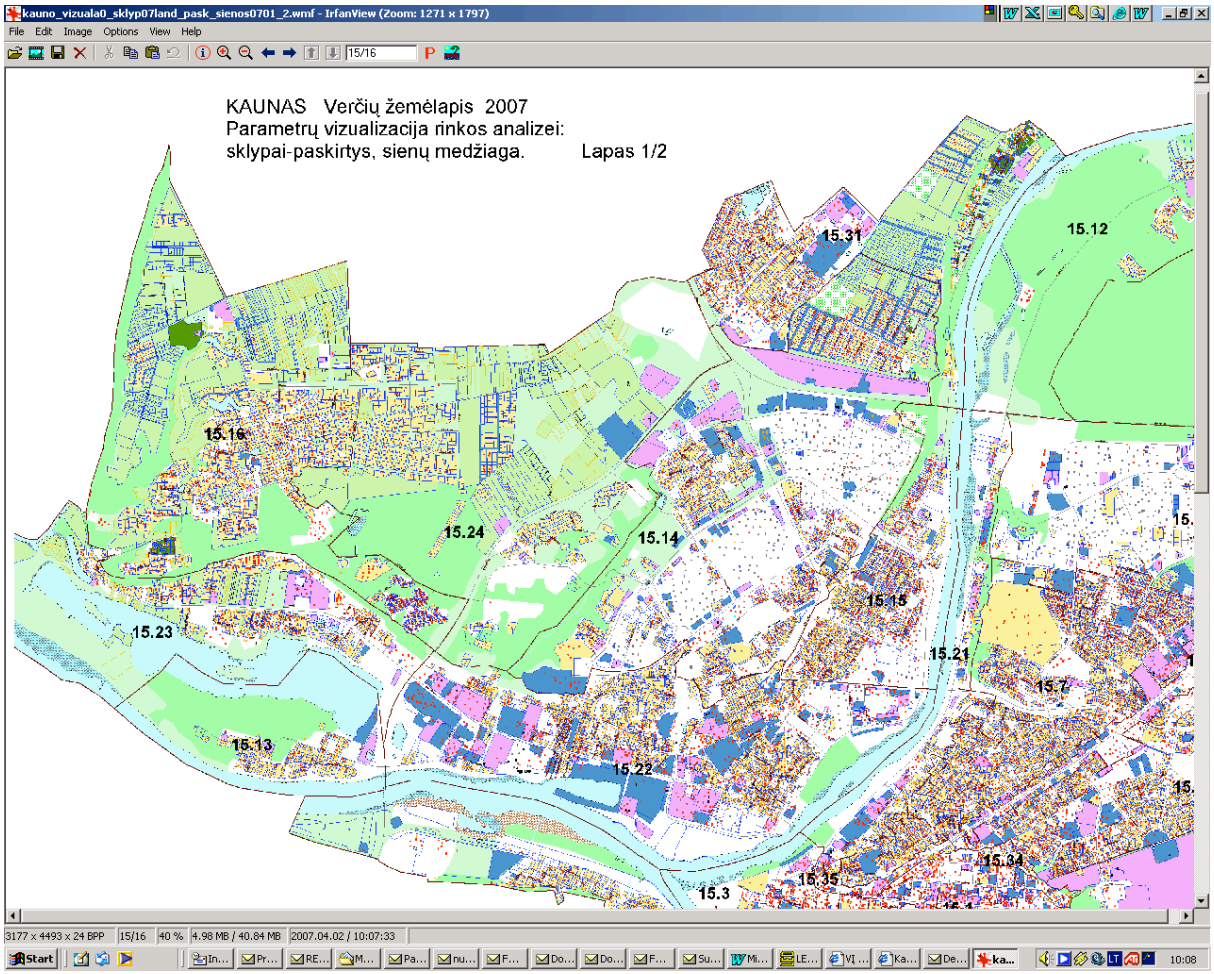


Fig. 23. RP market data visualization.

6.5 System for presentation of results

Real property taxpayers in Lithuania some months before the approval of new taxable values may have public access and get acquainted with future taxable values and the system for their estimation. Every taxpayer may present his remarks and suggestions on the correction of set up valuation models or the values of specific property. Public consideration of mass valuation

project results plays an important role in the process of appeals too, meaning an opportunity to of informal and minimally grounded appeal in advance. After the verification of facts and calculation algorithms there is an opportunity to correct valuation results before their approval. Discussion in public is organized directly during the meetings where valuation results are presented as well as by placing the results and opinion questionnaire on the Internet.

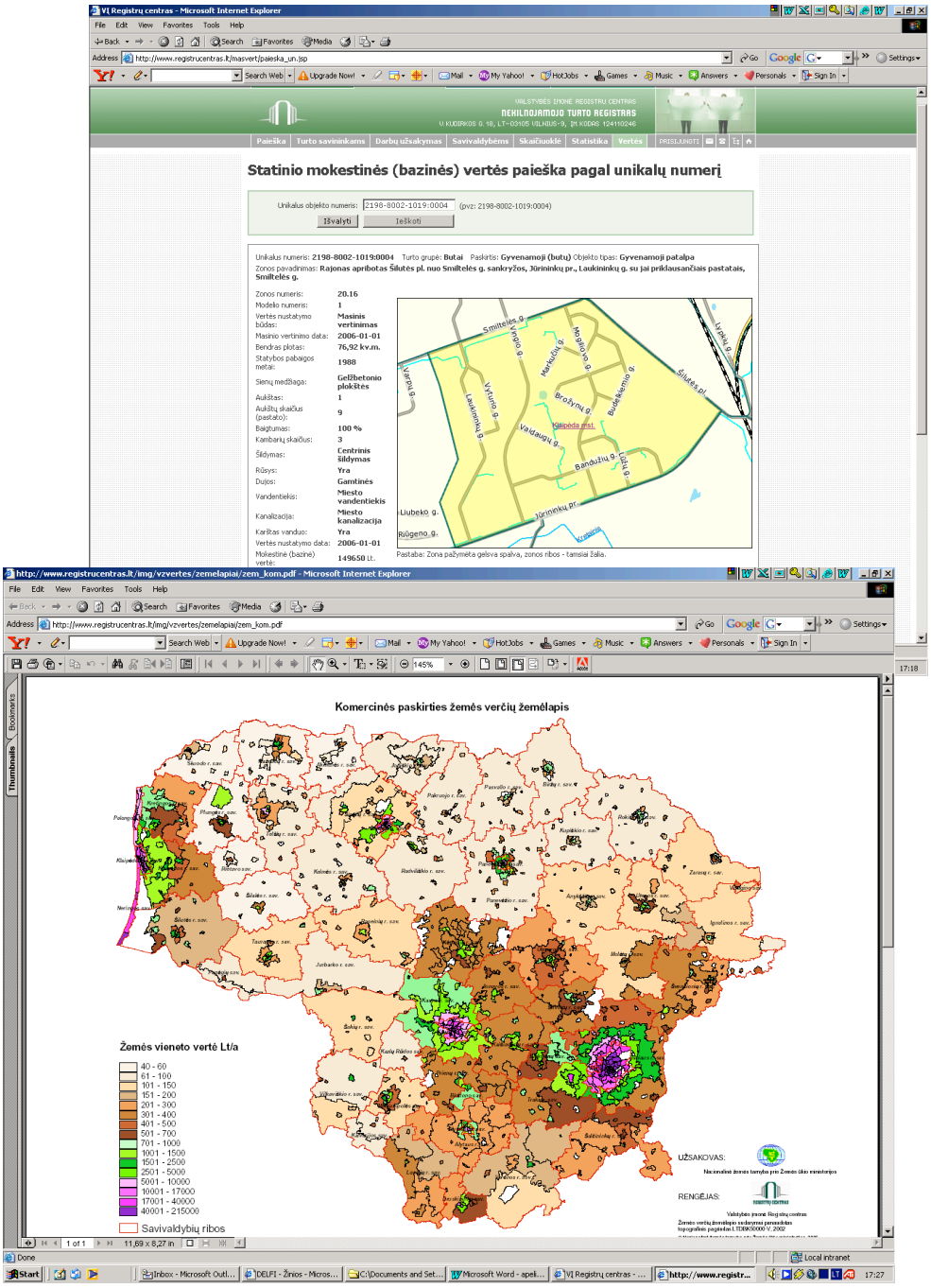


Fig. 24. Mass appraisal preliminary data presentation via Internet.

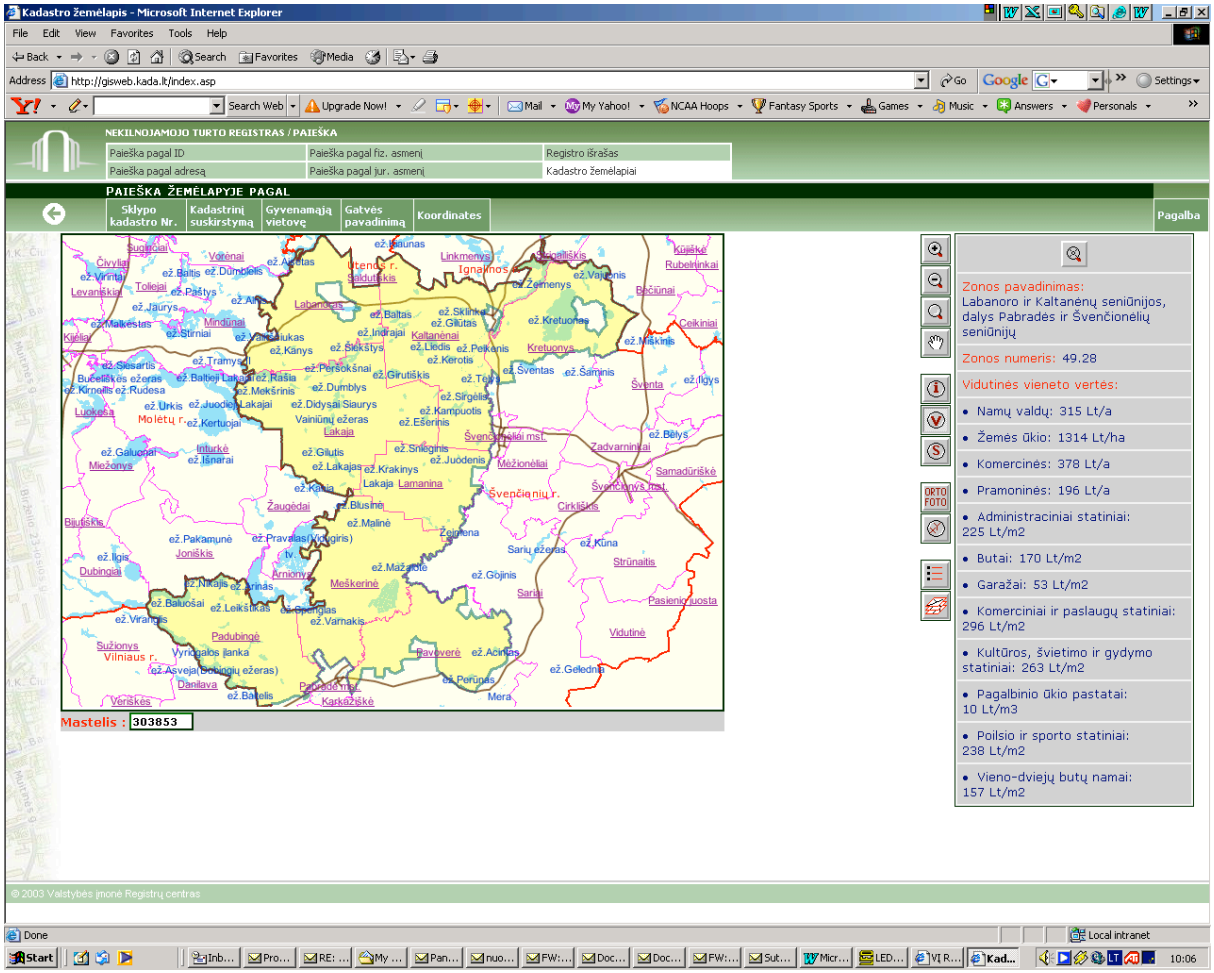


Fig. 25. Value maps presentation via Internet.

Information about future taxable values provides taxpayers with an opportunity to get familiar with the value in advance and reduces the number of probable inaccuracies that later may cause an appeal. The publication of final (approved) result should not only have an informative nature but should also provide grounds for the estimation of values. Taxpayer wishes to know not only the value of his own property but also general price level in the subject area as well as on the national scale and assess where the value of his property stands in respect of general trends and what are changes of his value in respect of previous years. Information to a valuer must be presented in an easy understandable and visual way. Possibilities to present results in graphical way are expanded within the framework of this project.

Comprehensive information about the real property object appraised and generalized information about all evaluated objects allows assessing the opportunities and expedience of probable appeals. This information to a valuer serves as an analytical material that may be analyzed in his appeal report.

Some of the projects presented were implemented in practice during the period of 2006-2007 and some of them will be realized in the nearest future, some proposals should be subject for further elaboration and discussion.

7. Automated valuation system of real estate for real estate tax appeals

During mass valuation of real estate there is a possibility of various inaccuracies of estimation. Therefore, according to conducted analysis, the opportunity for the real estate taxpayer to appeal for determined real estate taxing value is essential. However it should be noted, that applicable appeal systems of real estate taxing values are effective not in all countries. It should be admitted, that the system of appeals applied in Lithuania is not effective. The opportunity granted by legal acts to submit the report of real estate in a different way (by individual evaluation) as an appeal, does not permit to estimate specific factors, which determine inaccuracies during the evaluation process. The results, achieved during individual evaluation with a narrow scope (a smaller amount of market data), in most cases reflect the interests of taxpayer to reduce taxing value by accentuating only factors, which decrease the value, and ignoring the advantages of real estate.

While evaluating current situation, referring to the experience of other countries, a model "Automated evaluation system of real estate for appeals of taxing values" was created during the project.

The essence of model is that the estimator, who arranges the substantiation of appeal by his chosen criteria, estimates not a new value of real estate, but argues falseness of importance of determined criteria estimated by mass evaluation; also offer the calculations of criteria importance, complement the model of mass evaluation with other factors, which have not been estimated during the mass evaluation but are considered to be important by the estimator. Created model is also significant because criteria, which were calculated during mass evaluation, can be reviewed in a complex way; this means that an estimator can not separate factors, which decreases value from factors, which increases the value. Models of mass evaluation, which has to be refused by estimator, are made by the principle of Ad hoc and are evaluated automatically other factors, when one of these factors have been changed.

During the project of systems of data search of real estate, transactions were designed and introduced so that it would be possible to apply automated evaluation systems. From this system we will start analyzing automated evaluation system of real estate for appeals of taxing values.

7.1. The system of transactions search of real estate

A database of real estate cadastre, in which information is stored by digital shape about real estate, was created and used for real estate transactions internet system. Data is constantly resumed in this system when some changes appears in real estate and when property changes.

This system will be available in the internet and users will be able to search by chosen criteria. It is considered, that search could be done by 10 – 15 criteria. The most important criteria will be place, type of real estate, year of construction, a material of walls, size, date of

transaction and others. A window of search and main criteria are demonstrated in picture 1. Many of these criteria are standardized and classified for convenience of client; geo system is combined with register of addresses, so the location of real estate – municipality, locality and street could be chosen from references of system (Picture 2).

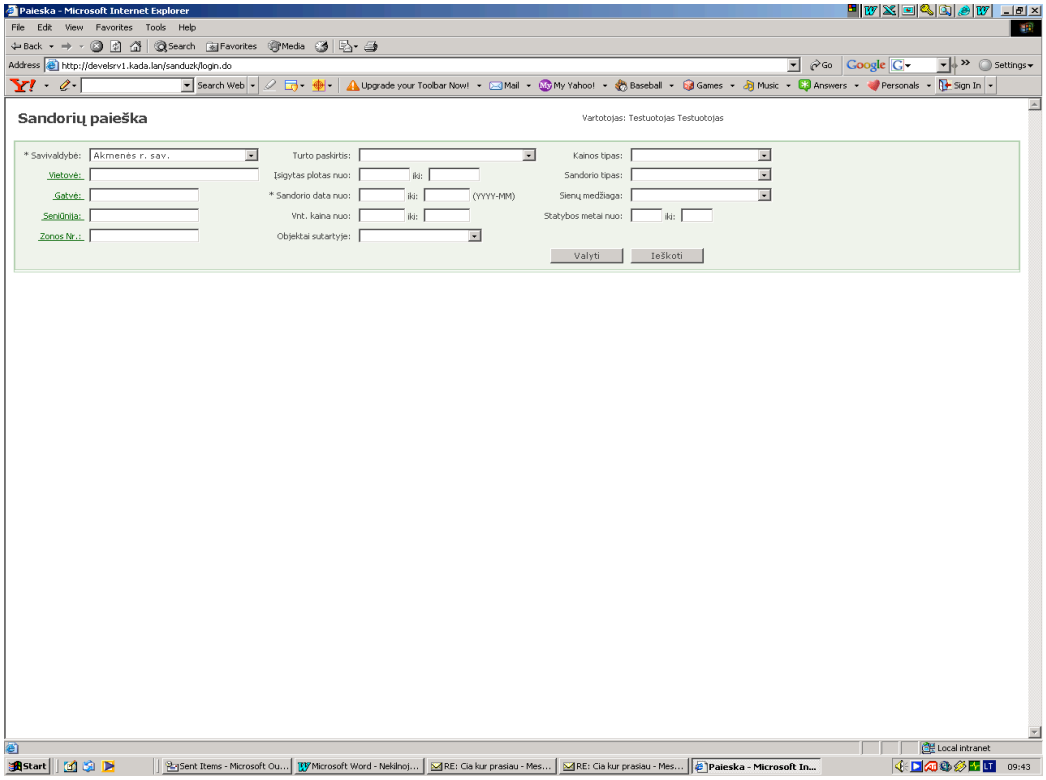


Fig. 26. Home page of a system of transaction search.

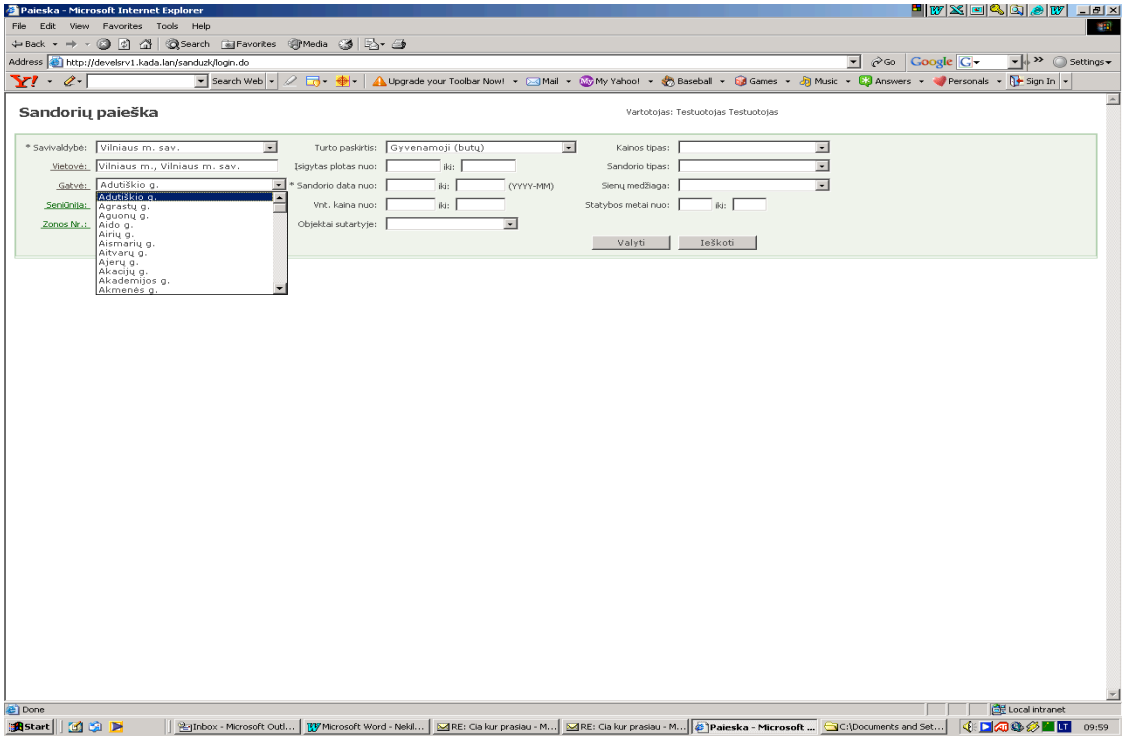


Fig. 27. Classified system of address search

Submitting search criteria for customer in computer screen all transactions, which have occurred, will be proposed quickly. It should be noticed, that data, which are stored in the system, are not only about buying – selling, but also rent, leasing, but also other transactions. A customer, who made a search, will get not only a price of transaction, but also all indexes of cadastre, which describe every sold object (picture 3), and which will be important during analysis of factors, which have an influence.

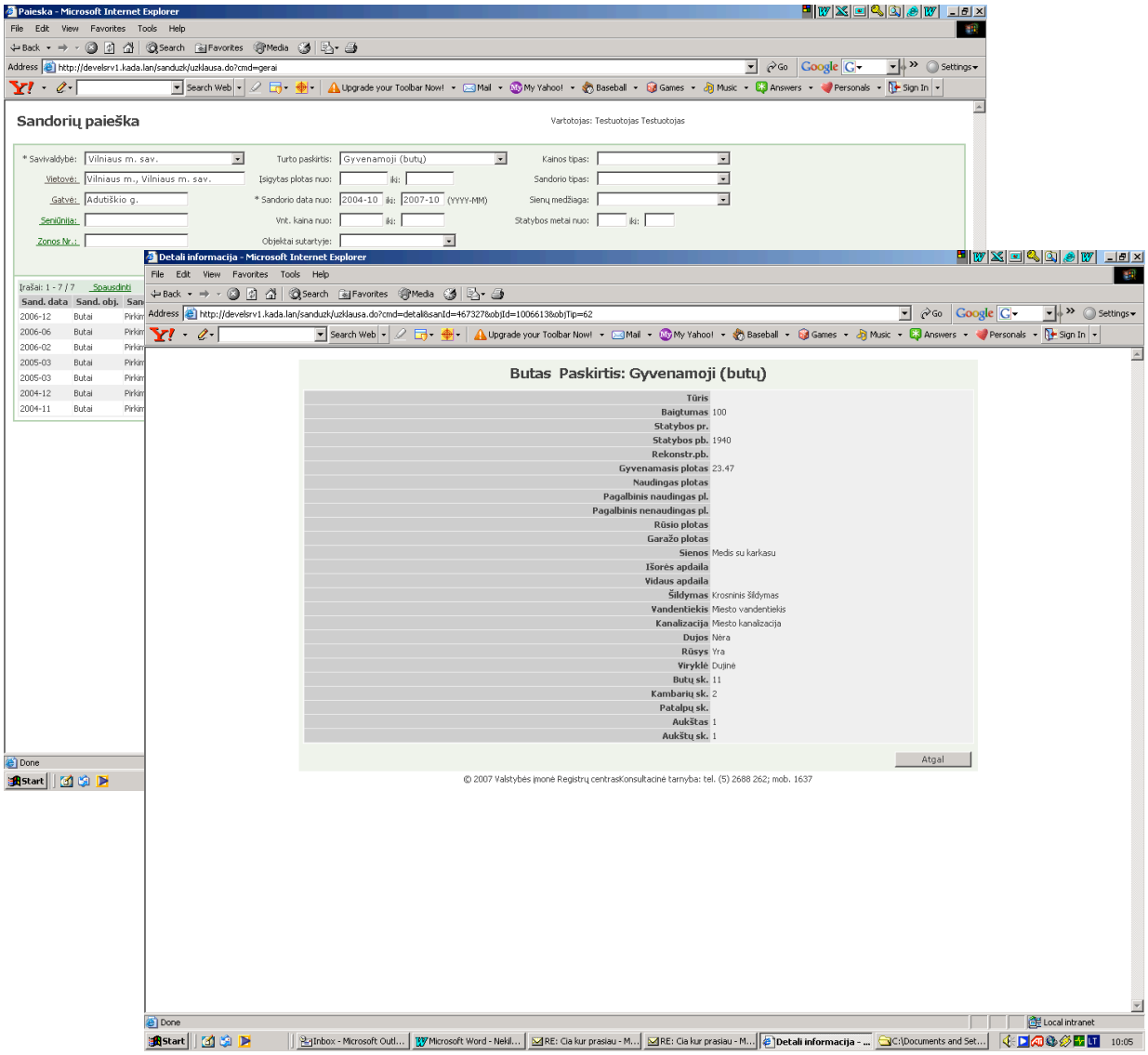


Fig.28. Table of results of transaction search system.

7.2. Internet spreadsheet of appeals and mass evaluation

In legal acts is written that the taxable value of immovable property may be the value of the immovable property determined by individual valuation of the immovable property in accordance with the Republic of Lithuania Law on Basics of Property and Business Valuation, where the individual valuation, regardless of a valuation instance for which a valuation report has been prepared, has been performed with the help of the methods of determination of value as indicated in paragraph 2 of Article 9 of this Law, and the market value specified in this valuation report corresponds to the average market price of a similar property, this report's terms and conditions permit use thereof for the adjustment of the taxable value, while the date of the valuation falls within a time limit laid down for the submission of applications as indicated in paragraph 1 of Article 10 of this Law. Taxpayers may submit a request to a property valuer to consider as the taxable value of immovable property the value of the immovable property determined by individual valuation of the immovable property, where the average market value of the immovable property as

determined with the help of mass valuation of the immovable property or the value of the immovable property specified in subparagraphs 3 and 4 of paragraph 2 of Article 9 of this Law determined by the recoverable value (costs) method is different from the value of the immovable property as determined by the individual valuation by more than 10 per cent, in the concrete two methods were legitimated for taxes – mass and individual as equalent. But also foreseed that estimator, who does a mass evaluation has also evaluate, accept or reject individual evaluation. . Complaints by payers of the tax in respect of the determined taxable value of immovable property and applications on the use of the value of the immovable property as determined by individual valuation for the calculation of the taxable value shall be submitted to a property valuer within one month of the determination of the taxable value of the immovable property. The property valuer shall examine the complaints and applications within one month of the receipt of a complaint or an application and shall take a decision thereon. The decision may be appealed against in accordance with the procedure set forth the Republic of Lithuania Law on Administrative Proceedings. Such indefinite system raises a lot of questions. First of all, both methosd of evaluation are different enough not only of acomplishment technique, but also of achieved results, so even when we get different values we can not state that evaluation is bad or good.

Since the admission of decision is endowed for estimator, who does a mass evaluation, he has a right to determine requirements for submission of appeal. Main condition should be that estimator has to do not new evaluation, but analyzing the model of mass evaluation, also offer arguments, that's why a value should be calculated in different way. This means, that estimator should indicate which factors are not valued, which are valued wrongly and submit reasonable calculations.

There is an internet spreadsheet of mass evaluation and appeals, which does analysis and calculations (picture 5), in which the information about property, also factors and their importance, is submitted when the unique number of real estate is entered.

Estimator can use this system in two ways:

1. Complement model with factors, which to his mind were not evaluated and are important for market value.
2. Create a new model and calculate newly the importance of evaluated or not factors and receive alternative (appellant) value.

Since not only the model of mass evaluation, but also other statistic values of real estate market, are important during the evaluation process, the influence of time on the prices and values of real estate (with the spreadsheet) is submitted to the estimator with the statistic analysis of market data associated with mass evaluation model, which reveals the influence of time on the prices and values, the relation between market value, estimated by mass evaluation, and evaluation, which was conducted preparing the appeal.

Nevertheless, the most important factor both to the estimator, who submitted the appeal, and to the estimator, who carried out the mass evaluation and analysis the submitted appeal, is the relation between the sale-price (if the real estate was sold) and the value, which was determined by mass evaluation during the appeal process including the influence of time to the sale-price (fig.29.).

Unique No	**1094011830150005**	Area	111,15 m2
Address	***Vilniaus m. sav. Vilniaus m. J. Basanavičiaus g. 19***		
Model	1804		
Mass appraisal 2007	548.264		
Appraisal data	2007.01.22		
MA value per unit	4.933		
Sale		**Time adjustment**	**with time adjustment**
Sale price	560.000	**1,75**	**979.000**
Sale data	1999.03.10		
Sale price per unit	5.038		**8.808**
Apeal			
Apeal value	470.000		
Appeal value per unit	4.229		
Ratios			
MA/appeal	1,17		
Appeal/sale	0,84	0,48	
MA/sale	0,98	0,56	

Fig.29. Example of statistic table of values.

Fig.30. Internet spreadsheet of mass evaluation and appeals.

Unique No	1094011830150005				
Address	Vilniaus m. sav. Vilniaus m. J. Basanavičiaus g. 19				
	Name of attribute	**Type of attribute**	**Attribute**	**Importance of attribute in MA**	**Importance of attribute in appeal**
Model attribute (RP data base)	Area	Skaliaras	111,15	0,93070237	0,93
	Zone	Skaliaras	57.12	0,927904319	1
	Type of use	Skaliaras	Maitinimo	1,05284991	1
	Construction year	Skaliaras	1940	1	0,86
	Wall material	Skaliaras	Plytos	1	1
	Reconstruction year	Skaliaras	1	1	1
	Heating	Binaras	Centrinis šildymas	1	1
	Sewage	Binaras	Miesto kanalizacija	1	1
	Type	Binaras	Negyvenamoji patalpa	1	1
	Area	Reiksme	111,15	5425	5425
	Auxiliary area				0
Additional attribute	Pollution		10%		0,9
	Noise		-5%		0,95
Value, LTL				**548.264**	**412.341**

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