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APPLICATION OF TRANSFORMATION ASSESSMENT TASKS HIGHWAYS MANAGMENT METHODOLOGY OF PROPERTY EVALUTION ROAD ON THE BASIS OF TRANSFORMATION

Анотація. В статті представлені основні методи перетворення якісних ознак у кількісні для проведення грошової оцінки ділянки автомобільної дороги. Стан об'єкту представлений у вигляді ієрархічної моделі сукупності властивостей. Під такою моделлю розуміється штучна багаторівнева система показників, яка всебічно і раціонально характеризує якісні ознаки. На основі вартісного методу визначені коефіцієнти вагомості конструктивних елементів дороги.
Ключові слова: перетворення якісних ознак у кількісні, автомобільна дорога, вартісний метод, коефіцієнти вагомості

Аннотация. В статье представлены основные методы преобразования качественных признаков в количественные для проведения денежной оценки участка автомобильной дороги. Состояние объекта представлено в виде иерархической модели совокупности свойств. Под такой моделью понимается искусственная многоуровневая система показателей, всесторонне и рационально характеризующая качественные признаки. На основе стоимостного метода определены коэффициенты весомости конструктивных элементов дороги.
Ключевые слова: преобразование качественных свойств в количественные, автомобильная дорога, стоимостный метод, коэффициенты весомости.

Abstract. The article presents the basic methods of converting qualitative features of quantitative monetary valuation for the road section. State of the object represented as a hierarchical model set of properties. Under this model refers to an artificial multi-level system of indicators that comprehensively and efficiently characterize quality attributes. Based on the method of cost factors determined the coefficients of ponderability of structural elements of the road.

Keywords: converting qualitative features of quantitative, automobile road, method of cost, coefficients of ponderability.

Formulation of the problem

The process of privatization in Ukraine lasts for over 20 years. All this period is accompanied by difficult formation and development assessment of property valuation, based on international methodology and practice. The main criteria for privatization according to the initial inherent law, principles of its legitimacy are economic efficiency and investment direction. Privatization - is the only possible relatively open and legal way to transfer ownership of the state and local territorial authorities to private owners. Development of valuation activity in Ukraine not only promotes privatization, the legal basis of which, require evaluation of buildings, property of state enterprises, unfinished objects [1]. Further due to the involvement of private capital, particularly in the transport sector has become necessary as the expert and monetary assessment and transport facilities.

Indeed, at present there is a real need for a tool with which it was possible to assess property in the road sector. It should be noted that the existing assessment methods buildings virtually no constructive proposals to solve this problem.

Art in the evaluation should be shown in selecting a reasonable methodology (approaches, methods, etc.), use representative input data, conducting formal correct calculations and the ability to reasonably convince all parties that are interested in the assessment of the correctness and accuracy of its results.

The evaluation of transport construction is necessary in the transformation of qualitative features in a quantitative assessment. The assessment of quality characteristics based on quality control - science, including the concept of measurement quality [2].

A good sign - is a sign that characterizes some property or condition of the object, and the presence or absence of properties. Quantitative trait - is a trait which individual value, the resulting measurements, observation or calculation, expressed a certain number. Quantitative evidence can be discrete and continuous. Discrete quantitative trait - a trait that accepts only individual values are generally integer. Continuous quantitative trait - is a trait that can take sweet numerical values within certain limits.

Presenting main material

State of the object can be represented as a hierarchical model set of properties. Under this model refers to an artificial multi-level system of indicators that

comprehensively and efficiently characterize quality attributes. Comprehensive indicator is at zero and includes the sum of all differential performance, simple properties of products that are at the highest level of the n-th model.

As the movement for right to left model properties become larger products P_i of (added together), they become more complex (group, complex) (Fig. 1).

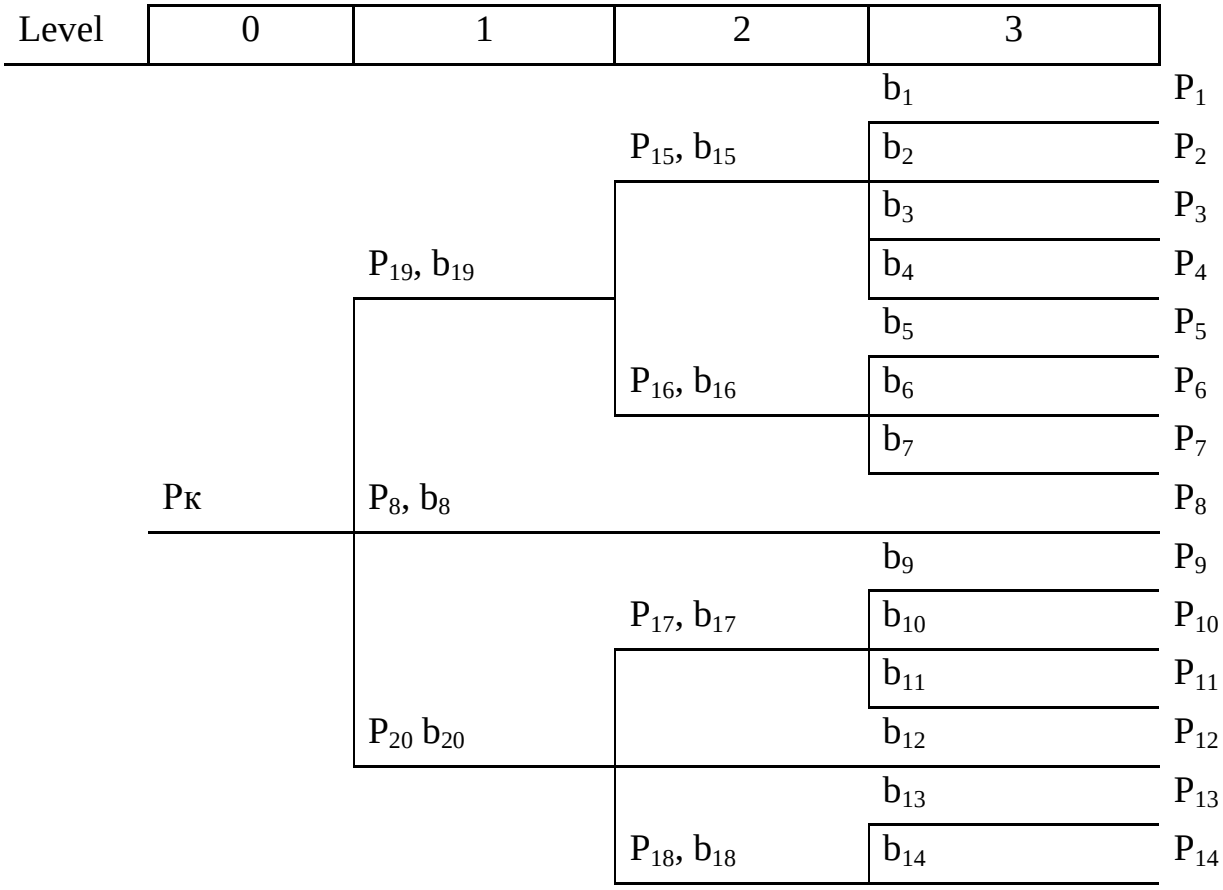

Figure 1 - The qualimeter model of quantity quality

The model can be written $P_k = P_{19} + P_8 + P_{20}$; $P_{19} = P_{15} + P_{16}$; $P_{15} = P_1 + P_2 + P_3 + P_4$ and so on.

In the third, the highest-level models are the most common features of products. The properties of the first and second levels of the reduced model are summarize. They can accordingly include, for example, group and complex. The simple fact is quasi-simple properties, because they always can be identify more easily.

To convert the qualitative features of the object used differential or complex methods. With the differential method of assessment of quality signs carried by single figures

$$K_i = P_i / P_{i6} \text{ or } K_i = P_{i6} / P_i, \quad (1)$$

where P_i - value of i-th indicator of rate quality properties;

P_{i6} - Value of i-th base (reference) indicator.

According to this formula, the increase in the unit rate corresponds to improving the overall quality of products, though K_i, being a dimensionless quantity determines the level of quality attributes of the object of evaluation.

Quantify the differential method allow one to assess the qualitative features in the two cases: 1) the level of product quality that is rated above or equal to the level of the base model, if all indicators $P_i \geq 1$; 2) the level of product quality, measured, below the level of the base model, if all indicators $P_i < 1$.

The uses of such relative quantify the qualitative characteristics makes it possible to bring a single indicator models all properties that transform all simple (quasi-simple) properties on a single scale.

Basic indicators of quality signs play an important role in the quantitative assessment. Their correct choice depends on the objectivity of the quality of state structures. Values P_{i6} can be: middle made in the industry; the highest achieved in the industry; perspective; matching the best foreign models; economically optimal, informed the relevant technical and economic calculations.

At any level, each property is assessed not only measure the differential K_i, but the weight factor b_i. The latter reflects the importance of the value differential indicator in the composite index. For each level

$$\sum_{i=1}^{n} b_i = M = const, \quad (2)$$

where n - the number of properties on the i-th level.

The value M is often take for 1 or 100.

From this expression shows that increasing the significance of some product properties can occur by reducing the significance of others. From the reliability coefficients of significance depends quantification of quality at every level, and the facility in general.

Quantifying the qualitative characteristics of the level or for the whole model

$$K_k = \sum_{i=1}^{n} b_i P_i / P_{i6}, \quad (3)$$

According to (2) condition and term (3):

$$b_{ik} = b_n \cdot b_{n-1} \cdot b_{n-2} \ldots b_1. \quad (4)$$

On the basis of this expression can determine the impact of index any simple properties of the value of the group or the quality of the composite indicator, which is of great practical importance

Construction of the model estimates the road section - crucial stage of its quantitative assessments, objectivity is determined by the right choice of model. In addition, it affects the role of simple and complex features a total evaluation weight of individual properties.

Building a model to start from left to right - from the individual index K_k to the generalized index K_i.

Select the number of levels depends on the purpose of assessment and the importance of the subject. With the growing number of levels m increases the information about the sign of quality of the object, its component properties. At the same time the choice of a large number of levels, so performance increases the number of qualitative features of measurements and calculations. Therefore, the model, if possible, should have a minimum number of levels, but sufficient to assess the quality of the required accuracy and consistent with this goal.

In assessing the quality of the object in the road sector is usually chosen from two to four levels. In some cases, an assessment can be made not by the full model, where the summit is simple (quasi simple) properties and reduced, limited right complex indicators. It must meet the conditions of the possibility of measuring or calculating complex properties.

In drawing up the new communications models must be entered so that they best meet, at this level, requirements and evaluation revealed the properties of the product prior.

Indicators anyone other than zero, the level should be equivalent, that is tantamount to characterize the state of the object.

Each level model should be minimal, but sufficient number of connections, defined completeness of description properties.

There are several methods for determining weight ratios: expert, marginal and nominal values equivalent ratios, the value [3].

Expert method is the most simple, affordable and in strict compliance technique ensures high reliability.

This method is a subjective consideration of situations of which you must select one or more optimal. The higher qualification specialists and experts, the higher the reliability of estimates.

The most common method in the peer review ranking in which phenomena are measured, arranged in order of preference $P_1 > P_2 > P_3,\ldots,P_n$. Evaluation of each expert based on the presumed dependence $K_i = f(P_i, b_i)$. If the figure P_i is better then indicator P_{i+1}, he was awarded the highest rank (degree) in the ranking. As a result of pair wise comparisons you can make the best (ranking) a number of properties.

The method of cost regression based on establishing close relationships between the costs of establishing and operating performance S and product quality P_i . This method is recommended when the number of comparable product variants (samples, projects, finished products) of a specific destination more than the number of accepted quality indicators.

Method of boundary and nominal values used when known thresholds of quality products P_{np}. Weight ratios are calculated using formulas based on the average composite indicator:

3) composite index is taken as the average arithmetic value

$$b_i = \lambda / (\bar{P_i} - P_{np.i}); \tag{5}$$

4) composite index is taken as a geometric weighted average values

$$b_i = \lambda / \lg \frac{P_i}{P_{np.i}}, \tag{6}$$

where $\bar{P_i}$ - the average statistical (nominal) values of quality;

$P_{np.i}$ - limit values of quality;

λ - constant multiplier.

Value method is based on the assumption that the qualitative properties of an object increases with its value. So between weight and value of properties there is proportional relationship.

Then

$$b_i = C_i / \sum_{i=1}^{n} C_i \,, \qquad (7)$$

where C_i - the estimated cost for placing an individual object and purpose of road improvement ;

$\sum_{i=1}^{n} C_i$ - The total estimated cost of works.

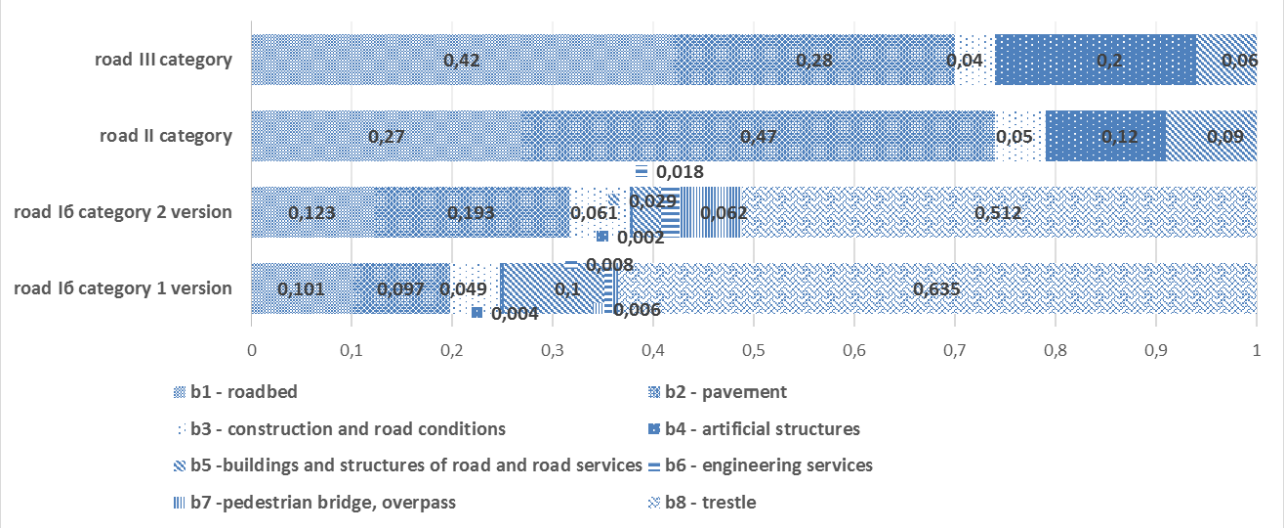

Figure 2 – Factors weight defined by costly in method for structural elements highways

Figure 2 shows calculated by this method, the formula (7), the ponderability coefficients for the structural elements of different categories of roads for the average climatic conditions. The calculation of ponderability coefficients held for road construction elements.

Conclusions

Depending on the availability of structural elements on the road, their importance in value changes significantly, which is very important in determining the corrective amendments to the technical level and operational condition of the road [4]. Therefore there is a need to conduct research areas of roads, bridges, tunnels, roadside strip of land, and the corresponding estimates to determine the estimated cost of construction projects and facilities, particularly transport facilities, and the allotted land.

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