

Architectural-Design Commercial Dwelling Models on a Social-Functional Basis (Through the Example of Rostov-On-Don)

Victor Mikhaylovich Molchanov and Marianna Viktorovna Blagova

The Academy of Architecture and Arts of the Southern Federal University,
Budyonovsky Ave. house 39, 344082, Rostov-on-Don, Russia

Abstract: The article examines the attributes of methods and technology to be used in the architectural design of commercial dwellings on a social-functional basis, which can help boost the social orientation and economic efficiency of commercial dwellings and improve the quality of the living environment. The authors bring forward a consumer social-functional dwelling model, which was developed based on the results of annual surveys of families in the city of Rostov-on-Don. Based on this model, the authors examine a nomenclature of architectural-design apartment models for urban commercial dwellings in the city of Rostov-on-Don.

Key words: Architectural-design models • Social-functional modeling • Commercial dwelling • Quality of the living environment • Architectural design technology

INTRODUCTION

Currently, urban dwellings are mainly becoming commercial, when the primary design objective is extracting maximum profit as opposed to maintaining the quality of the living environment. In designing a commercial dwelling, architects use professional clichés with regard to architectural forms and market stereotypes in reference to the need for a living space [1; 2]. At the architectural design stage, commercial dwellings are typically put together with no solid information available on a future tenant. This leads to poor architectural designs of apartments and homes, which are out of touch with the real cultural values and needs of potential clients. As a result, sizable material resources go wasted, which not only do not improve the quality of the living environment but do not even correspond to the consumer's notions of the living environment and demands as to the architectural organization of this environment. Next, at the stage where spaces can already be put in use, averaged general-professional apartment models are adapted to the buyer's demands. Here again material resources have to be expended.

In this regard, architects must form architectural-design models for dwellings, relying on not just marketing research but rather architectural-sociological studies, which help reveal the consumer's social-demographic characteristics and demands on the living environment [3]. To provide a better insight into the way this should work, the authors conducted a study into the social-functional attributes of organizing apartments and homes based on the identification of future tenants' architectural preferences and the capabilities of potential dwelling consumers.

MATERIALS AND METHODS

The construction of architectural-design models for commercial dwellings was implemented based on the empirical base of the annual survey of a standard sample of the population of the city of Rostov-on-Don spanning 18 years. The survey is called "Citizens' architectural preferences" (conducted under the scientific supervision of Head of the Department of Residential and Public Building Architecture of the Academy of Architecture and Arts of Southern Federal University, Prof. V.M. Molchanov, 1992-2008). Each questionnaire consists of

35 questions dealing with key aspects of the architectural organization of the living environment. For this study, the authors processed the responses of a total of 1683 respondents -nuclear urban families with 1-2 children, which live in an apartment dwelling.

The survey's primary objective was collecting information on citizen preferences for the functional and architectural-spatial organization of urban housing, which helps reveal the real needs and ideal notions of housing [4; 5] in Rostov-on-Don families.

The summarization of the survey data helped define social demands on the architectural organization of apartments within Rostov-on-Don commercial dwellings and draw up a regional consumer model.

Based on the regional consumer dwelling model and the authors' proposed typological classification of commercial dwellings, the authors worked out a nomenclature of social-functional dwelling models for commercial construction in Rostov Oblast. The nomenclature is a system of architectural-design models for apartments differentiated by the number of rooms in each commercial dwelling class.

The authors' proposed methodology for collecting, processing and interpreting social information (the monitoring of the social needs of model clients in the form of surveying based on a specifically designed questionnaire, a consumer model of a dwelling -architectural-design models of apartments) can be used to ensure the "social orientation" [6-11] of apartments within commercial dwellings in other regions.

Main Part: The social-functional model captures sustained social-spatial relations based on the major elements of a dwelling. This social-functional model answers the questions: *what* design elements are needed in the apartment and *how* can they be joined into the family's single living space (Fig. 1).

The annual monitoring of the consumer social-functional model for residential cells through the example of surveying Rostov-on-Don families revealed that respondent preferences for the architectural organization of apartments and homes have not changed over the period of 18 years. In the South of Russia, urban families are firmly oriented towards the values of an individual residential home with a plot.

Here are the attributes of the social-functional organization of a residential cell from the consumer's standpoint [12]:

- The entrance area. The majority of families prefer to have an entrance into the residential cell through the entryway into the sitting room and further -into the family room (60% of respondents); 28% of respondents opted for entering through the entryway into the family room.
- The common family use residential spaces -versatile and multi-functional. There is a steady trend towards having some space for various activities within the dwelling. The study is a separate space for professional activities in one's own apartment (68%).
- The personal use residential spaces. A family of 4 needs 3 bedrooms. Bedrooms should be positioned in the depth of the apartment (92%). The private residential space is intended not only for sleeping but for activities as well. This trend holds up for the bedrooms of adults and children.
- The kitchen area. Rostov-on-Don residents prefer to have in their residential cell a kitchen-dining-sitting room (46%), a multi-functional living space for cooking, eating and socializing.
- The sanitary-hygienic spaces must be connected to the bedroom: the bathroom (52%) and the toilet (26%).
- The open spaces. Positioning the loggia or terrace with a square area of 4 to 8 m² adjacent to the kitchen (36%) or the family room (35%), which indicates the use of summer spaces for socializing and homemaking activities. The apartment plot adjacent to the kitchen is preferable in corresponding types of building.
- The storage areas. In the structure of the apartment, pantry spaces with a square area of 4-8 m² for storing: seasonal reserves of produce, upper clothes, equipment and amateur activity objects.

To be able to take into account consumer demands, the architect has to always choose, at the architectural design stage, means and techniques according to the client's financial capabilities.

In social-spatial modeling, an apartment is regarded as a complex spatial formation consisting of the following social-spatial elements: the entrance framework, the common family and personal use residential spaces, the kitchen block, the sanitary-hygienic spaces, the open spaces and the storage block. Each social-spatial element comes in a typological number of architectural-design forms, from the simplest to the most complex. For instance:

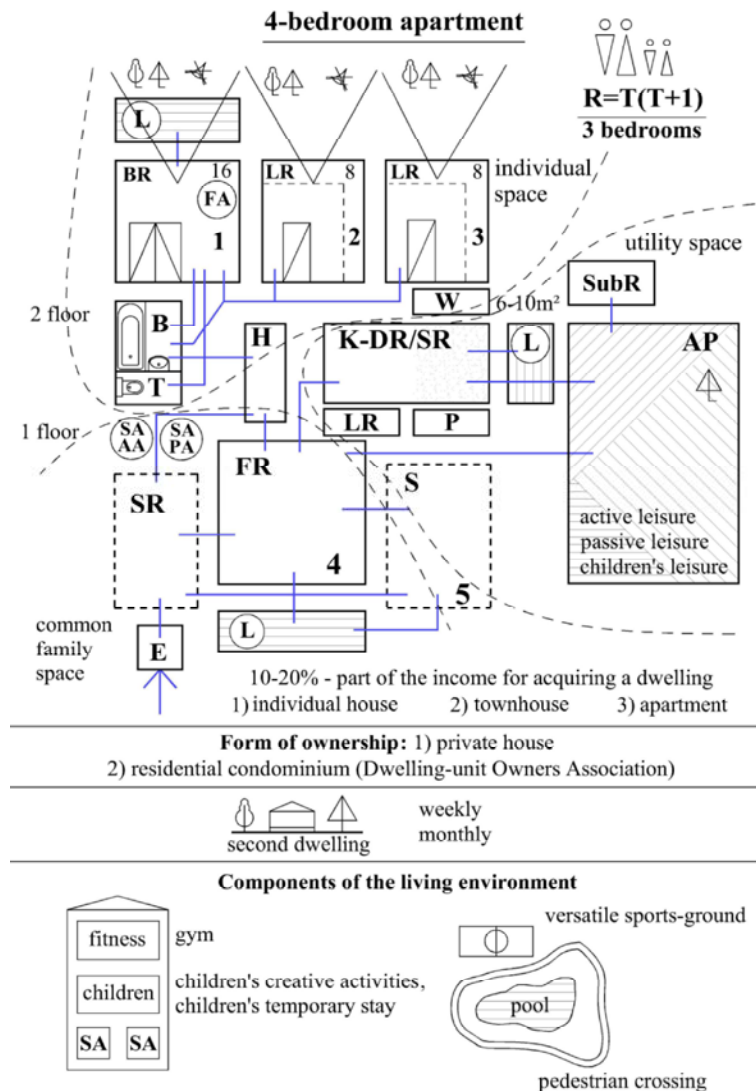


Fig. 1: A consumer social-functional model for residential cells through the example of the city of Rostov-on-Don.

Note: (BR) -bedroom, (LR) -living room, (FR) -family room, (SR) -sitting room, (S) -study, (K-DR/SR) -kitchen-dining room-sitting room, (B) -bathroom, (T) -toilet, (E) -entryway, (H) -corridor, (LR) -laundry room, (W) -wardrobe, (SubR) -subsidiary room, (P) -pantry, (SA) -storage area, (AA) -amateur activity area, (PA) -professional activity area, (FA) -fitness area, (L) -loggia, (AP) -apartment plot.

- The entrance framework: a part of the residential space -an entryway -an ante-room -a hall -a sitting room;
- The common family use residential spaces: a family room -a sitting-dining room -a sitting-dining-family room;
- The personal use residential spaces: a bedroom for 1 person -a bedroom for 2 persons (a children's room) -a bedroom for 3 persons (a parents' room) -a living room;
- The kitchen block: a niche-kitchen -a working kitchen -a kitchen-dining room -a kitchen-dining-sitting room;
- The sanitary-hygienic spaces: a toilet -a guest WC/bathroom -a bathroom -a combined WC/bathroom -a separate WC/bathroom -a health block (the sauna-bathroom-toilet-terrace-gym);
- The open spaces: a French balcony -a balcony -a loggia -a terrace -a patio -an apartment backyard;
- The storage block: a built-in closet -a pantry -a coat-room.

The professional dwelling model, taking account of the tenant's needs, must reflect the economic capabilities of the tenant or another class of consumers. The architect, in drawing up architectural-design models for apartments and homes, chooses from typological ranges of major design elements those that for the design period correspond, in his view, to the capabilities of the client group.

The analysis of design experience and commercial dwelling concepts helps formulate proposals on the differentiation of the architectural organization of apartments in commercial dwelling classes. In this work, a commercial dwelling is divided into three primary classes, which differ in the level of architectural-design solutions and primary design approach in accordance with the consumer's social-pecuniary class [13]:

- *An affordable commercial dwelling* (potentially medium class, 70.2%): 13-15 m² square-area living and 20-28 m² square area total space per person; the accommodation formula $-R=T$ ($R(\text{number of rooms}) = T(\text{number of tenants})$). The attributes of the architectural-design solutions for the apartment - clear-cut functional zoning and allocation of public and private space within the apartment;
- *A comfortable commercial dwelling* (medium class, 10-19%): 28-32 m² square-area total space per person; the accommodation formula $-R=T+1$. The attribute of the design approach - a variative design of apartments within the boundaries of the total area -small, medium, large;
- *An upscale commercial dwelling* (highest class, up to 4%): over 32 m² square-area total space per person; the accommodation formula $-R=T+3$ and more. The distinctive characteristic of the design approach - an individual solution for the design of the apartment based on an original functional program.

Identified social demands and the proposed typological structure of architectural-design solutions for a commercial dwelling served as the basis for working out a nomenclature for socially substantiated professional models for residential cells within a commercial dwelling in Rostov-on-Don (Fig. 2). Architectural-design apartment models can be used in houses of various types: multi-floor, medium-floor, townhouses and single-family houses.

As follows from Figure 2, in affordable commercial dwelling apartments, the architectural-design solution offers a minimal entrance framework (an entryway), a kitchen-dining room and family room block, one separate WC/bathroom and summer spaces (loggias); the number of living rooms is equal to the number of tenants. For instance, in a two-bedroom apartment there are two living rooms. By the apartment size, there are one-, two-, three- and four-bedroom apartments.

In comfortable commercial dwelling apartments, the architectural-design solution offers a spacious ante-room, a working kitchen, a dining room and a sitting room, two WC's/bathrooms and developed summer spaces; the number of living rooms exceeds the size of the household by one. There are models for two-, three-, four-, five- and six-bedroom apartments.

In upscale commercial dwelling apartments, the architectural-design solution offers a maximally developed entrance framework (a hall), a working kitchen, dining room and sitting room block, as well as a study and developed summer spaces (loggias, terraces); the number of living rooms exceeds the size of the household by three. There are models for four-, five- and six-bedroom apartments.

The design of an apartment must take into account steady and changeable factor groups. On one hand, it must be special, socially oriented and correspond to the consumer's specific quantitative parameters and the lifestyle peculiarities of different social groups. On the other hand, the design of an apartment must be sufficiently versatile, take account of steady factors and the general attributes of the person's lifestyle and possess a potential to remain unchanged in the face of changing factors.

By tradition, in designing commercial apartments, they do not match the design to the social client and just specify the number of rooms in the apartment. To facilitate creating a design solution for an apartment and assessing its quality, the authors suggest introducing a nominal social client -the *optimum consumer*, i.e. a household of a certain size and make-up, the residence of which in the designed apartment is convenient, since it matches the professional social-functional model. Thus, in each typological group of apartments, the designer must be oriented towards a specific type of household as a potential consumer and, consequently, specify the limits beyond which a decline in the comfort of the apartment's design is inevitable.

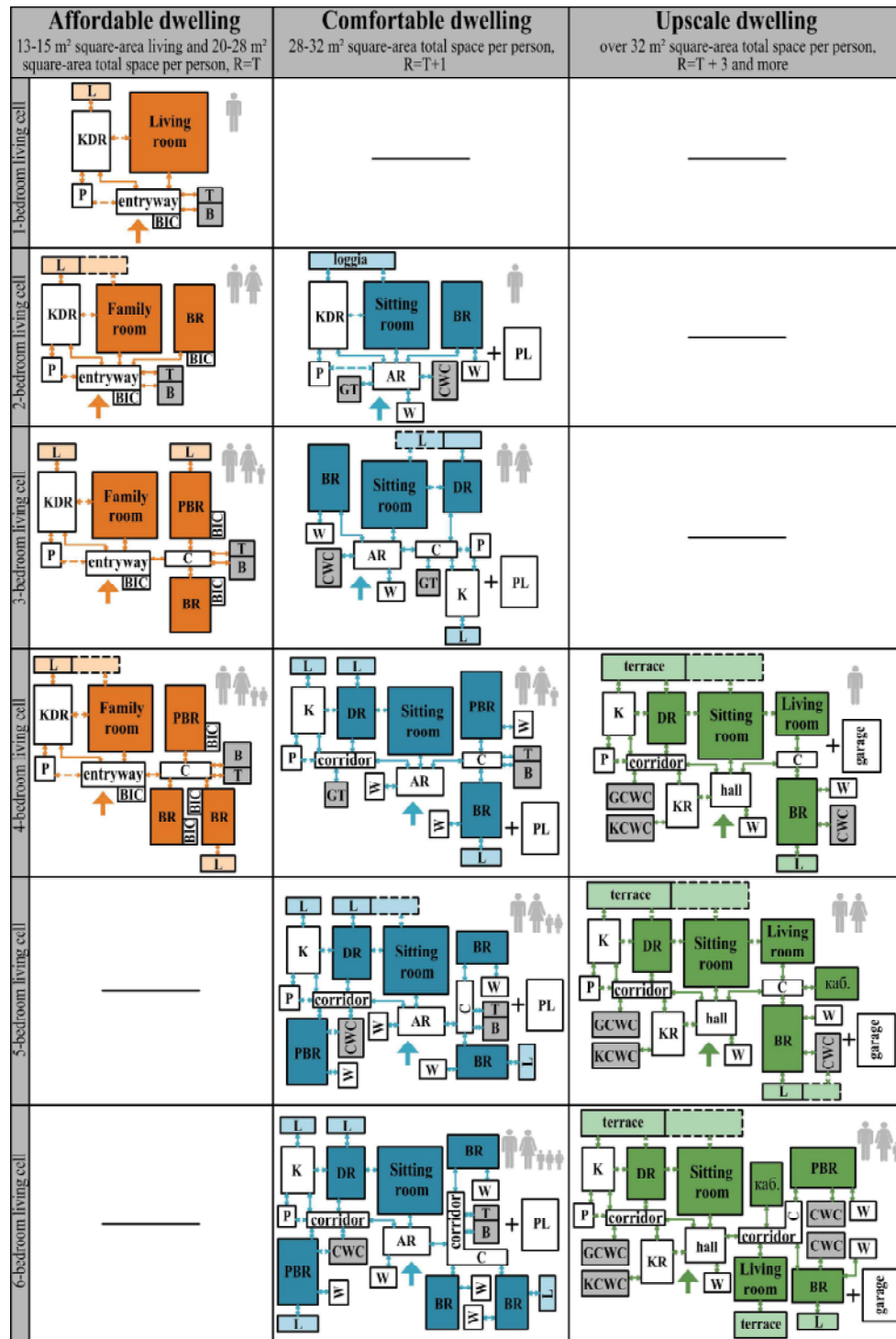


Fig. 2:” An architectural-design nomenclature for residential cells of a commercial dwelling worked out based on the regional consumer social-functional model

Note: (BR) -bedroom, (PBR) -parents' bedroom, (S) -study, (KDR) -kitchen-dining room, (DR) -dining room, (K) -kitchen, (B) -bathroom, (T) -toilet, (CWC) -combined WC/bathroom, (GT) -toilet for guests, (GCWC) -combined WC/bathroom for guests, (KCWC) -combined WC/bathroom for housekeepers, (KR) -room for housekeepers, (BIC) -built-in closet, (W)-wardrobe, (P) -pantry, (C) -corridor, (AR) -ante-room, (L) -loggia, (PL) -parking lot.

CONCLUSION

The design of a commercial dwelling must rely on sustainable social-spatial urban dwelling structures in regions, which would reflect the lifestyles, life activity of consumer groups (families of a certain category) and demands they put forth as to the architecture of a dwelling.

The proposed methodology for designing commercial dwellings makes it possible to unite in the design model stable and changeable factors and combine all demands on the social-spatial versatility and uniqueness of apartments. One of the methodology's attributes is taking account, during the architectural modeling process, of social-spatial demands of the *nominal* consumer -a household of a certain size and structure, for which optimum living comfort is being put together.

The nomenclature of architectural-design apartment models for commercial construction within Rostov-on-Don includes apartment types intended for different classes of commercial housing: affordable, comfortable and upscale.

Inferences. The methodology for the architectural design of commercial dwellings must include the study of the consumer model of dwellings. The means of this study must come in form of research into consumers' preferences for the architectural organization of dwellings (apartments and homes). For this purpose, the design team should include a researcher-architect competent in architectural-sociological research.

The objective of architectural-sociological research must lie in the formation and study of the regional social-spatial model of dwellings, which brings together the consumer's demands on the architectural-design organization of dwellings (the consumer model).

Using the consumer model enables the architect to form a social-functional model that reflects regional and local social-cultural factors of environment formation having a sustainable nature. In forming the professional dwelling model, which underlies architectural-design solutions, the architect takes account of the consumer's capabilities, choosing from the typological range an element that is the most suitable in given social-economic conditions.

In social-spatial modeling, the apartment is regarded as a complex spatial formation consisting of the following social-spatial elements: the entrance framework, the

residential spaces for common family and personal use, the kitchen block, the sanitary-hygienic spaces, the open spaces and the storage block. Each social-spatial element comes in a number of architectural-design forms, from simple to complex.

The regional consumer dwelling model serves as the basis for working out an apartment typology by size in each commercial dwelling class: affordable, comfortable and upscale.

The proposed nomenclature of architectural-design apartment models developed for the realities of Rostov-on-Don will make it possible to observe the balance between the consumer's social-spatial and the commercial developer's economic demands.

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