Supergraphics as a project and artistic method in design of a modern city

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Abstract. Supergraphics in the city design is considered as a special form of artistic synthesis of graphic design and architecture in the process of organizing the built environment of the city at various levels (urban ensemble, architectural object, subject forms).

The main stages in the formation and development of a supergraphic approach in the city design are revealed: atectonic color-graphic compositions in the architectural environment (until the middle of the 20th century), architectural supergraphics (the second half of the 20th century), anamorphic three-dimensional images in the pedestrian zones of cities (21st century.), Autonomous dynamic color and light composition in the architecture and subject-spatial environment of the city (modern time).

Current trends in the field of artistic synthesis and the foundations of the formation of a supergraphic approach in the design of a city based on the philosophy of traditional architectural supergraphics and the use of the latest technologies of the information society are outlined.

Keywords: architectural supergraphics, supergraphic approach, city design, artistic synthesis, architectural and spatial environment, graffiti.

1 Introduction

Having arisen in the second half of the 20th century, architectural supergraphics became widespread and quite firmly entered today in the arsenal of design and art tools of architects and designers as an effective way of transforming the appearance of city ensembles. Based on new materials and technologies, modern design and graphic methods, supergraphics came to the rescue, and in many cases replaced the traditional forms of artistic synthesis of plastic and monumental decorative arts in the city’s architecture. The tasks that were originally solved by supergraphics methods related to the dullness and impersonality of the urban environment have not lost their relevance at the present time, as, in fact, the supergraphics itself and street art. In addition, today in many of the largest cities in the world, the problem of “visual pollution” of the urban environment, caused by low-quality and poorly organized advertising and unauthorized graffiti, is quite acute. The latter are often generally regarded as “cultural aggression, occult crime,” which is being prosecuted in many places around the world.

Unfortunately, the issues of supergraphics as a tool of a modern designer, are rarely considered in modern publications. More often they raise the issue of shaping the image of the city, for example Harland, Robert George [1] Farias, Priscila Lena [2]. At the same time, supergraphics and graffiti are studied as an element of visual communication in urban space [3] or a special form of performance [4], touching upon the issues of semiotics [5] or even the formation of a kind of urban interface [6]. There are also works in which the question of the national or local use of supergraphics in the sea ranch [7] or the so-called mural arts in Cairo [8], Guadalajara [9] is investigated. The most widely studied area is graffiti and street art - this is the subject of works by Kramer, Ronald [11], Chatzidakis, M [12], Ortiz van Meerbek [13], Chang, T.C. [14], Figueras Ferrer [15], Elias, H. [16] and Bogerts, L. [17]. It is also worth noting that certain narrowly specialized issues, such as the use of augmented reality [18], street art as counter-terrorism [19], or the plurality of visual images [20] also become areas of research in this area. One way or another, a comprehensive study of supergraphics as a tool of
a modern designer is currently lacking. That is why the purpose of this study was to consider supergraphics as a design and art method in the environmental design of a modern city. The spatial and color-graphic environment of the city was considered, respectively, as an object of the study, and the methods and techniques of color and light organization of the architectural environment of the city, including supergraphics, became the subject of this research. The goal identified the following main objectives of the study:

— to reveal the concept of a supergraphic approach and identify the main features and levels of its application in the design of the city;
— to identify the historical background of the formation and the main stages in the development of supergraphics in the design of the city;

2 Methods
To solve the main tasks, as fundamental in the research process, the following scientific and methodological apparatus of research was used in the work:

— historical and cultural approach, which allowed in the first chapter to reveal the concept of supergraphics, to identify the prerequisites for its occurrence and the main stages of the formation of a supergraphic approach in the design of the city;
— a systematic approach has become decisive in the study and development of the principles of organizing supergraphic compositions in city design at various hierarchical levels;
— the method of interdisciplinary synthesis in the process of using knowledge from the methodology of architectural and urban planning, research on the history of urban environment design, infographics, as well as knowledge from the field of psychophysiology of human perception, ergonomic and design;
— retrospective analysis aimed at identifying and establishing the main stages of development of a supergraphic approach as a design and art method in the design of a city.

3 Results
3.1 The concept of "supergraphics"
Super graphics first appeared in the late 1960s. in the USA in the interior design of Sea Ranch condominiums, then it became widespread in the exterior, in the design of visual communications, outdoor advertising and the urban environment [4].

The author of the first supergraphic compositions in Sea Ranch, as well as the term “supergraphics”, was an American architect Charles Moore. He noted that “The main feature of supergraphics is the activity of interaction with the three-dimensional spatial form, due to the certain independence of colorography relative to this form. Supergraphics dynamically changes the nature of form, organizes space in a new way, gives it a new semantic content. At the same time, he emphasized that supergraphics is established as an artistic means not by visual destruction of the real geometry of forms, but by creating on their basis a new compositional integrity of a larger and more complex artistic and design ensemble by visual transformation of forms. Therefore, supergraphics may come into conflict with individual elements of the whole.” [5]. It is the visual transformation of the volumetric form by means of graphic methods, and in the certain independence and atectonicity of its colorographic solution that lies in the main feature of supergraphics that justifies the use of the prefix "super", or beyond traditional graphics, allowing it to be interpreted as "supergraphics", which is directly dependent on architectural surfaces, forms and its construction [6]. Young designers enthusiastically accepted Charles Moore's supergraphic experiments, viewing supergraphics as a means of quickly, efficiently and fairly economically solving design problems [4].

Today, supergraphics have become a common and attractive element of urban landscapes [4]. Depicted on the facades of buildings, retaining walls, bridges and walls of tunnels, super-graphics qualitatively transform their appearance, and placed on public transport, it turns into “live” visual pictures moving around the city. In an urban environment, super-graphics is capable of not only
creating an optical illusion, visually changing the geometry and shape of architectural buildings and urban spaces, but also introducing new images and meanings, changing the content of existing ones and creating a new visual context. By visually changing the shape of the object, supergraphics can be subordinated to the general compositional and storyline of the architectural and artistic ensemble, which often happens in reality, to develop and strengthen it, or to create completely new figurative and symbolic images.

Having arisen in the city from the very beginning on architectural structures, and often as a means of rehabilitation of artistically degraded objects, supergraphics then found wide distribution in urban sculpture, objects and forms, elements of urban design and transport, on street surfaces. Due to the active inclusion of supergraphics, the urbanized environment of the city was individualized and began to acquire a more personal character.

The active use of large color graphic compositions in the architecture of the city began to take place since the 1960s, during the period of large-scale post-war recovery and reconstruction of urban centers and the widespread construction of pedestrian streets in Europe, which required new effective means of artistic and aesthetic organization of the spatial environment. Pedestrian spaces in urban centers have become a kind of catalyst for the process of implementing design methods of supergraphics in the architecture of the city. Using colouristic and graphic design tools, artistic and stylistic ordering of the spatial environment of pedestrian street ensembles was carried out, compositional accents were introduced, the dead ends of buildings and low-value architectural facades were aesthetically ennobled, and in general, the status of the pedestrian street as a public center of the city increased. Pedestrian streets in the post-war period were considered as a kind of ideal city of the twentieth century. Well-equipped with valuable historical and architectural buildings, informationally and functionally rich, they set a new bar for the level of comfort of urban spaces.

3.2 Supergraphics at various hierarchical levels in city design
Super-graphics in city design are organized at several hierarchical levels: urban planning ensemble, architectural structure, environmental elements and their form. On each of them, supergraphic is involved in solving its own complex of architectural and artistic problems.

3.2.1 Super-graphics in solving urban planning problems (level of urban-building ensemble) Located on buildings and structures that occupy a special, dominant position in the functional and compositional structure of the city (urban ensemble), super-graphics begin to play a certain urban development role, becoming a city-planning landmark, compositional and figurative-semantic emphasis in urban spaces (Figure 1). And here we can distinguish at least four important aspects that determine the range of tasks facing the supergraphics at the level of urban planning ensemble:

— identification of the functional and spatial structure of the urban ensemble with the placement of supergraphic compositions in public centers, entrance nodes and other functionally significant objects, contributing to the improvement of the orientation of a person in the spatial structure of the ensemble;

— revealing the spatial composition of the architectural and urban planning ensemble with the placement of supergraphic images in key compositional nodes (squares, entrances to the city or its areas, in the alignment and at the intersections of the compositional axes), the formation of compositional centers, dominants and accents, rhythmic series (compositional axes) in the overall spatial composition of the ensemble by a system of supergraphic accents on buildings and structures, retaining walls of embankments, tunnels, transport highways, etc.;

— enrichment of the figurative and semantic structure of the urban ensemble by introducing new artistic and semantic accents (images, symbols, signs) into it; super-graphics here act as a work of art, becoming a unique object and landmark of the city;

— thematic supergraphic composition as a kind of memorial sign of a historical place (or event) in a city, a means of organizing a historical and architectural exposition of an urban ensemble.
3.2.2 Supergraphics in solving architectural and artistic problems (level of architectural volume)

Initially, the supergraphic in the design of the city was intended primarily for solving local problems at
the level of a single architectural volume, facade plane or building end. At this level, supergraphics

can act as a means:

— complications and details of the architectural facade or end of the building by introducing
decorative architectural details into the architectural, artistic, as well as tectonic structure by graphic
means at the visual level;

— creation of optical illusions, visual changes in the overall composition of the form, its
complexity, scale, rhythmic structure, etc.

— increasing the readability of the functional and compositional structure of the architectural
object (emphasizing entrance nodes, identifying rhythmic rows and main compositional elements),
enhancing its artistic expressiveness;

— rehabilitation and improvement of the artistic and aesthetic qualities of architecturally degraded
facades;

— creation of temporary and mobile decorative covers and screens for the period of reconstruction
and restoration with imitation of the future appearance of architectural facades, as well as fencing
construction of new objects.

3.2.3 The role of supergraphics in organizing the design content of urban spaces (level of subject forms)

At the turn of the XX-XXI centuries, with the advent of street art, supergraphics in the urban
environment significantly expanded its borders. Its carriers are subject forms and, first of all, various
technical devices and street equipment, which often have an unreasonable appearance. Artists and
designers give these forms a “second wind”, creating new artistic images through supergraphics and
incorporating them into urban life (Figure 2). At this level, supergraphic tools are used to:

— formations through new artistic and graphic images of an interactive city environment with a
“friendly” interface, which is in contact with a person;
— humanization of utilitarian and technogenic forms of engineering equipment of the urban environment and public transport, the formation of radically new images of subject forms by means of a graphic visual language;
— correction of existing and the creation of new environmental situations in urban spaces [7].

Figure 2. Supergraphics on urban public transport turns it into dynamically moving visual images (Helsinki, 2005)

3.3 The main stages of the formation and development of a supergraphic approach in city design
In the history of the formation and development of the supergraphic approach in the design of the city, four main stages can be distinguished.

3.3.1 The first stage (until the middle of the twentieth century). Atectonic color graphic compositions
We associate the emergence of atectonic architectural forms of color and graphic compositions primarily with the integrated decoration of city holidays and other major public events. In its style, the festive decoration was created a priori in contrast to the architectural context of the city, updating the design and sculptural forms, transforming them at the visual level, introducing completely new images of the holiday atmosphere. And such “thematic” design has, as a rule, temporary character. A striking example is the large-scale design of cities for the holidays of the October Revolution in Soviet Russia. Denying the remnants of the bourgeois past, the artists here turned to avant-garde forms, which, by their artistic style, color and general compositional solution, were deliberately opposed to the architecture of historical buildings. In the project of festive decoration of the center of Petrograd on the first anniversary of the October Revolution, the artist Altman presented the foot of the Alexander Column on the Palace Square in the form of a giant bonfire, and futuristic compositions, similar to theatrical scenery, were implicitly superimposed on the facades of buildings, obscuring their architectural details, destroying common tectonics and artistic style of the ensemble.

Street art “graffiti”, which originated in the 1970s and then became widespread in many cities of the world, can also be classified as atectonic color-graphic compositions in the architectural environment of the city. Today, this phenomenon is already in many respects a history, an object of research by design theorists and art historians [8]. At the same time, graffiti in the urban environment continues to exist today, having acquired legal and more organized forms in the late 1980s [9]. In
particular, the Philadelphia Art Program (1984) gained fame aimed at counteracting the negative influence of graffiti and created in order to give young violators of the law a chance to create art [10]. A similar example of regulated street art occurred in Bogod (Colombia) in 2011-2015, where the new legal framework, as opposed to the previous policy, promoted the so-called “responsible and artistic” graffiti and street art [11].

3.3.2 The second stage (second half of the twentieth century). Architectural Supergraphics As we have already noted, the active development of architectural supergraphics is associated with the large-scale construction of pedestrian streets in the center of European cities in the post-war period, and the increase in the expressiveness of these public spaces in urban centers. In contrast to the short-term festive artistic and decorative design, the architectural supergraphic was of a long-term nature, becoming, despite its radical mood, a part of the architectural and artistic ensemble, influencing, and often determining, its new figurative and semantic content.

3.3.3 The third stage (end of the twentieth century). Anamorphic 3D Images The emergence of anamorphic three-dimensional images in the pedestrian zones of urban centers as a form of supergraphic development of urban spaces. The comfortable environment of the pedestrian zones of urban centers created the conditions for the appearance and development of one of the types of street art here - anamorphic three-dimensional images (3D paintings) made with special colored crayons on a street surface. This type of street art, which is also called “street painting” or paving art, has become a kind of continuation and development of the plot line of architectural supergraphics. In addition, the origins of three-dimensional street painting can also be found in the principles of the construction of optical illusions of op art, as well as socially oriented graffiti art.

An important feature of three-dimensional street art that distinguishes it from traditional supergraphics is that the object of optical transformations here was not only and not so much individual architectural volumes and subject forms, but spatial situations in the city. Anamorphic three-dimensional images created illusions of completely new three-dimensional spaces, in which both real (architectural context) and virtual (artist's drawings) objects participated [1, 17].

3.3.4 The fourth stage (present). Autonomous dynamic color and light graphic compositions The emergence of conditionally dependent and completely autonomous from the architectural context and spatial situations of the city dynamic color and light compositions based on the use of the latest technical means - projection and LED technologies. Autonomous dynamic light compositions in the real and virtual space of the city. New technical capabilities that appeared at the beginning of the 21st century in city design, primarily projection and LED technologies, led to radically new visual forms in the architectural and artistic organization of the urban environment. These are light-music and laser shows, as well as media panels and media facades, architectural video-mapping (Figure 3), etc.

The product of the development of LED technology (light-emitting diode) has become media facades, which are gigantic screens with alternating graphic, photo and video images, destroying our traditional ideas about the architectural facade, its artistic style, details and composition. There have been changes in traditional graffiti - from the advent of Postgraffiti, Neograffiti, Urban Art of the late 1990s to the current "animated graffiti”[14].

Moreover, these technologies allow you to create light-graphic images, conditionally dependent or completely autonomous from the architectural form. In addition, these images can be dynamic, they can change in space and time, obeying their story, sometimes completely independent of the architectural context. One of the pioneers of the media façade with LED design, and today one of the most famous examples is the façade of the building of ABC television studio in Times Square in New York, which releases the famous TV show “Good morning, America!”. It consists of nine horizontal curved LED video tapes encircling the pediment of a building. The building has become like a giant
television screen, which displays network news, as well as announcements of new television and entertainment programs. Currently, this LED screen is the only LED sign in the world that is fully tied to a large television network, personifying the future of video signage and media facades [1].

The category of autonomous dynamic color and light compositions can include modern animated and interactive graffiti, which requires the interaction of a pedestrian equipped with a QR reader of a smartphone to visualize the work that the artist offers. Animated Blu graffiti or Insa animated GIFs can only be seen on the Internet [14]. Modern digital technologies have expanded the traditional notions of what constitutes public space and public art. Digital art in the public sphere, from network communities to city streets, can take various forms, including Internet art, local media, public interactive media, and mixed and augmented reality [15, 21].

4 Discussions

The study of publications in modern professional magazines showed a deep interest of art critics in the issues of artistic synthesis of art, architecture and design, experiments in the field of national coloristic within the framework of a common color culture, various aspects of the formation and development of street art and graffiti [8, 10]. For example, the city of Singapore, known as a city without graffiti and rubbish. Singapore’s recent turn to legalize illegal art illustrates a change in government’s outlook on creativity and the rule of law in the country. The legalization of graffiti in many cities has affected urban landscapes and the way artists and the public view graffiti, street art, and the city [11, 15]. The themes of the works of contemporary graffiti artists and muralists are multiculturalism, the connection of art and politics, and are aimed at causing debate between citizens [19, 20].

Actively influencing the architectural context, forming compositional accents and semantic dominants in it, supergraphic begins to play the role of an important, often determining, component of the general figurative-semantic structure of the ensemble. Introducing vivid and memorable images, updating and transforming the architectural environment, including the historical one, supergraphic
becomes a form of a new kind of artistic interaction between the architectural context and graphic design, replacing the traditional forms of synthesis of monumental and decorative art and architecture. In this article, the authors attempted to comprehensively consider the formation of a supergraphic approach in the design of a city when organizing a spatial environment at various hierarchical levels of an urban ensemble, architectural object, subject forms, revealing the features of this process and its individual stages.

5 Conclusions
Supergraphics in the city’s architecture initially arose as an effective means of enhancing its aesthetic qualities, improving the psychological comfort of urban spaces as a result of the visual transformation of inexpressive architectural structures, artistically degraded facades with the active use of color and graphics.

The modern arsenal of artistic means of color-graphic design of the city has expanded significantly, far beyond the boundaries of traditional ideas about supergraphics. There is dynamic artistic illumination of monumental art objects, architecture, urban and landscape design, video mapping, laser and LED technologies that can visually radically change the architectural forms and spatial situations in the city. In this case, one can speak of a supergraphics only with a certain conventionality. A more precise definition would be “supergraphic method” or an approach to the architecture and design of a city, aimed at active light-graphic and color conversion of architectural volumes at the visual level that form its built environment.

The revealed stages of the formation and development of a supergraphic approach in city design demonstrate the evolution of supergraphics as a design tool of an architect and designer, reflecting the development of the technical capabilities of society, design tasks and technologies:
— Stage 1, from the middle of the 20th century - thematic color-graphic compositions aective to architectural forms, mainly of a temporary nature: the decoration of building facades, spaces of city streets and squares for various holidays and other socially significant events;
— Stage 2, from the middle to the end of the 20th century, the formation of architectural supergraphics in the city as a form of aesthetic refinement of an unimpressive urban development, and the rehabilitation of artistically degraded architectural facades;
— Stage 3, the end of the 20th century, the appearance of anamorphic three-dimensional images in the pedestrian areas of the city as a new type of supergraphics (street art);
— Stage 4, the beginning of the 21st century, the emergence of autonomous dynamic light-graphic compositions in urban spaces: dynamic artistic illumination of urban objects, video mapping, laser projections, LED and other new technologies that dramatically expand the capabilities of traditional supergraphics.

In the process of its development, the traditional architectural supergraphics, focused on new technologies, has turned from means of active color-graphic transformation on the visual level of individual architectural volumes and objects of the spatial environment into a design and art method that brings with it new forms of art synthesis in city design.

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