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## THE PLACES OF INCREASED RISK IN LVIV CITY: ARCHITECTURAL AND URBAN ANALYSIS

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### ABSTRACT

In this article the author reflects the existing methodology of identification of the urban environment characteristics, which negatively affect the criminological safety. The particular areas with the high concentration of crime in Lviv are outlined. The criteria of their evaluation according to the structure of the urban environment are created. The existing spatial conflicts as well as the architectural and planning characteristics of these areas are researched. The architectural and spatial aspects that negatively affect the crime in the urban environment are also defined.

Key words: criminological safety, environment, architecture, planning, territory.

## 1. PROBLEM DEFINITION (or INTRODUCTION)

The phenomenon of street crime in the developed foreign countries gains special attention from specialized public institutions and from a lot of scientists in different science branches. The most important are the issues of emergence and distribution of crimes along the city territory and identifying of reasons and conditions that contribute to it. The author's preliminary research shows that crimes distribution in Lviv is not homogeneous, and that they are concentrated in certain areas according to three features: point-wise, line-wise, in groups. This phenomenon is peculiar to all types of buildings (except for manor ones) in the peripheral, middle and central areas of the city [6].

Starting from the 80<sup>th</sup> of XX century, many foreign urbanists and criminologists have been paying great attention not only to socio-demographical or demographic reasons of deviant behavior in urban environment but also to the so called «theories of crime» (or «theories of opportunities») related to the architectural and spatial organization of certain locations. The works of Colquhoun I. and Clarke R.V. testify to the fact that the majority of deviant acts are committed due to the range of reasons: easy access to private or semi-private territory, lack of control by residents, existence of «neutral areas», poor lighting, random landscaping and lack of proper social control [9, 5]. Therefore, certain architectural and spatial characteristics can negatively influence the crime level in some areas of urban territory.

All the abovementioned became the basis for creation of the theory of crime prevention through environmental design – CPTED [5]. Having analyzed its principles, methods and means, it is possible to outline major features of criminogenic areas and to detect existing problems of real urban territories taking into consideration their individual peculiarities and negative external and internal factors.

Certain Lviv territories have high concentration of crimes, but their relation to architectural and spatial organizations of certain city areas is still not researched by scientists and specialists. It is worth mentioning that this issue is important for proper reconstruction of existing territories or new construction in order to prevent mistakes that can negatively influence the crime level and therefore – the urban residents' quality of life. Thus, the analysis of architectural and spatial characteristics of the places of increased criminogenic risks in Lviv is the urgent matter of this research.

## 2. ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Methods of detecting and solving the problems of territories with increased criminologic risks by means of environmental design are outlined in methodical models – «SARA model» and CECAD, described in the works of B. Hill, R. Paynich, R. Santos, D. Zahm, etc. General issues of architectural and spatial organization of safe environment in terms of crime are described in the works of I. Colquhoun, S. Geason and P. Wilson, R. Atlas, and T. Crowe. Control issues and criteria of evaluation of urban territory elements' safety based on the abovementioned provisions are developed by scientists R. Atlas, G. Saville, V. Vijaykumar and T. Crowe.

## 3. RESEARCH FINDINGS

Research of architectural and spatial characteristics of certain places with increased criminological risks in urban space consists of the range of stages. On the basis of foreign sources analysis two methodical models of solving the problem of high crime level in urban space related to this topic can be outlined.

The first one is «SARA model» developed by Community Policing Consortium, International Association of Chiefs of Police (IACP), National Sheriffs' Association and Police

Executive Research Forum. Its basic provisions are the following: scanning (identifying places with low safety level); analysis (identifying causes of increased crime); response (developing and implementing strategies to address crime problems); assessment (evaluating the effectiveness of the responses) [2]. Only two stages were significant for this research: scanning and analysis.

The second method – CECAD – is the cyclic method of detection and fight against crime and has the following stages: collection, evaluation, collation, analysis, dissemination [1]. It is schematically shown in Fig. 1.

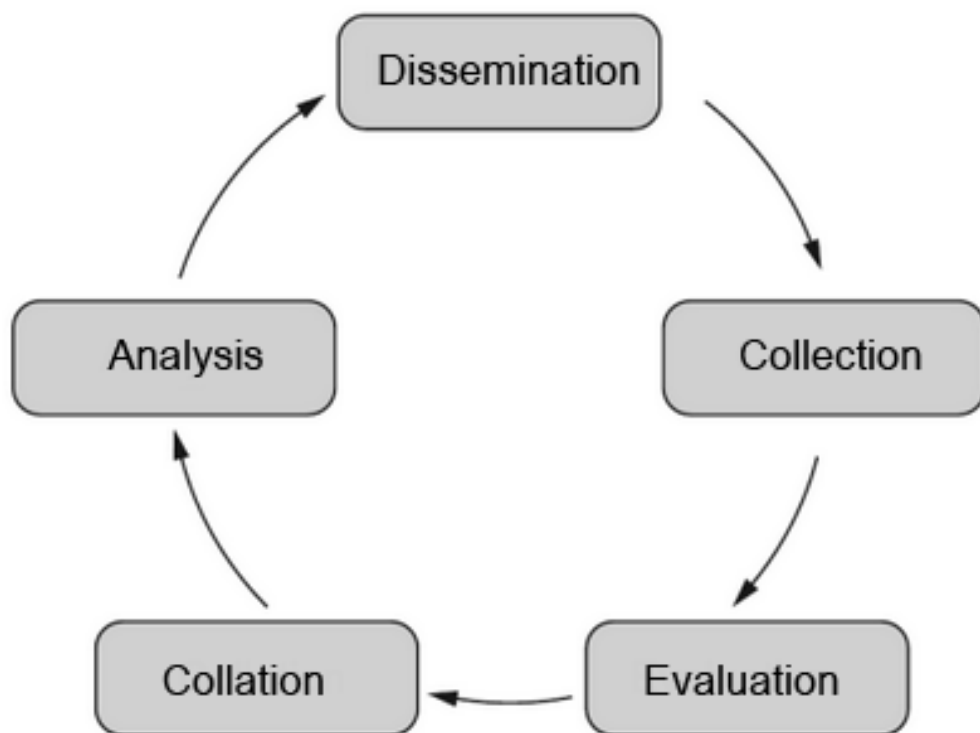


Fig. 1. Cycle of crime analysis process. Source: Ratcliffe, J. (2002)

These methods are based on primary and secondary empirical data. Secondary data are data that have been previously collected, i.e. information from electronic databases on committing certain crimes in the urban space. Use of secondary data is typical to the process of crime analysis, because they are regularly collected and stored by the police departments. However, they are not always enough. For the comprehensive crime analysis researchers use primary empirical data, in particular: sociological surveys (interviews, questionnaires), field research, etc. Information can be systematized in a table or in a report. Foreign scientists emphasize the fact that data accuracy and adequacy depends on careful and integrated approach to their collection [8].

Secondary data was obtained from the Department of Organizational and Analytical Maintenance and Rapid Response of the Police Headquarters in Lvivska oblast. In the course of preliminary research the author created a map of certain crime distribution (battery, car theft, hooliganism, robbery) in Lviv [6]. On the basis of graphic-analytical analysis 35 places of increased risk with the highest concentration of crimes were identified (Fig. 2). All of them were thoroughly researched and 15 of them were analyzed in detail (circles with double outline in Fig. 2). They encompass the territories with historic developments and territories with typical developments of the II half of XX century. The meth-

ods used in research are: field research, photofixation, survey of residents on certain space elements or objects that can pose a threat to personal safety.

However, qualitative analysis of reasons and problems of the places with increased crime level is not possible without outlining of criteria to evaluate architectural and spatial characteristics and defining the negative factors of criminogenic territories. Foreign scientists suggest studying the correspondence of spatial characteristics and expected individuals' behaviour according to CPTED (crime prevention through environmental design). Nowadays this is the most integrated and popular theory that is mainly based on architectural and planning means and methods of creating the criminologically safe environment.

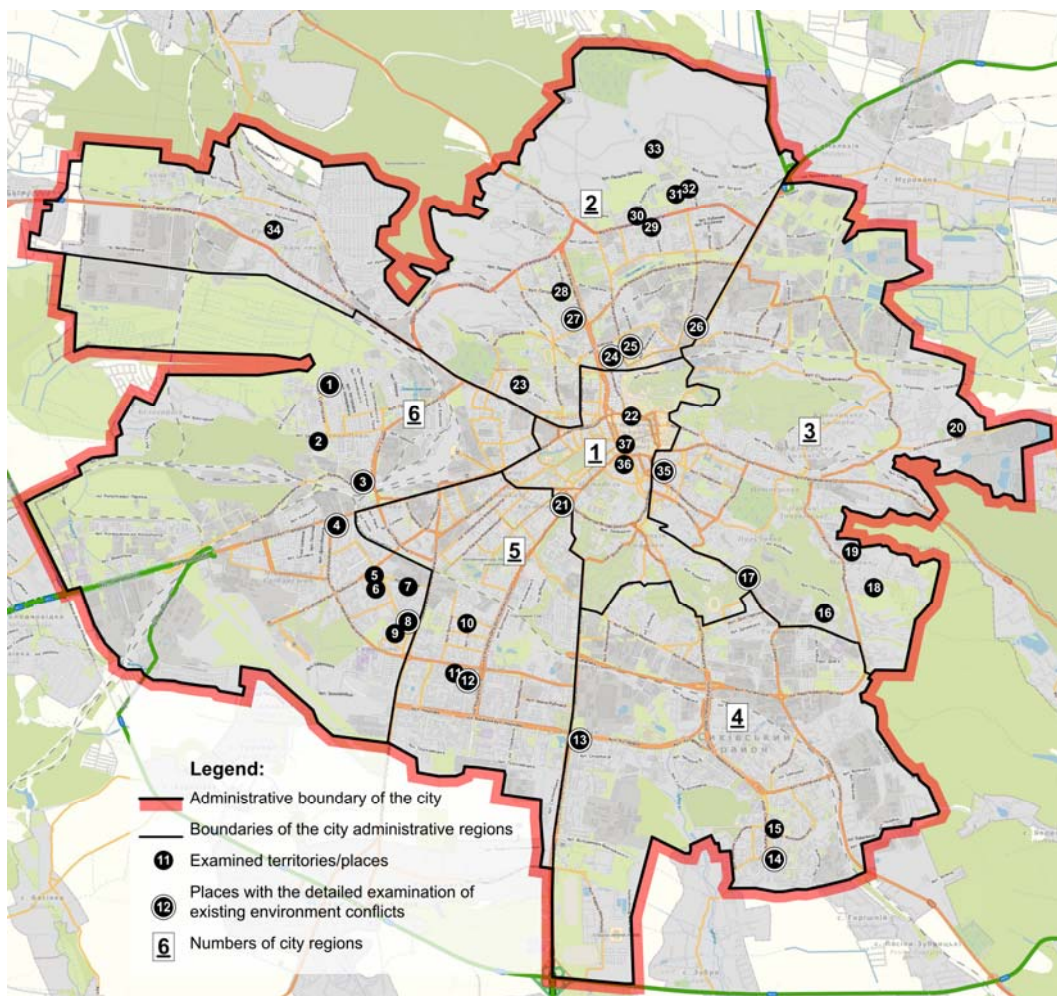


Fig. 2. Allocation of places with increased crimes concentration subject to research. Source: author. Note. Administrative regions: 1. Halytskyi; 2. Shevchenkivskyi; 3. Luchakivskyi; 4. Syhivskyi; 5. Frankivskyi; 6. Zaliznychnyi.

CPTED major objectives are:

- to provide suggested use of the territory with appropriately organized spaces;
- to create conditions for efficient use of functional zones and their control by residents;
- to create heterogeneous and compact urban spaces that positively influence the sense of belonging to them by residents and performing social control by the latter. Therefore, some spatial aspects, in particular diversity, accessibility, safety, co-

- immensity, should be taken into account at the stage of designing or reconstruction;
- to maintain availability and active exploitation of public and semi-public spaces by common visitors, by-passers and residents, which is an important factor of counter-acting vandalism, violent offence, robberies and other deviant and criminal phenomena;
  - to maintain social control and visibility of urban territories and isolated places avoidance.

Basic CPTED principles are outlined in the works of foreign urbanists and architects and in recommendations of urban municipalities or law enforcement institutions of many countries, in particular: USA, Australia, Great Britain, Netherlands, etc. They are also briefly described in the author's article, which shows their connection with historic architectural and planning methods and means of protection from the threats of violent nature and control of the territory. The basic CPTED principles are: social control and visibility (creation of possibility and stimulating to control the territory by urban residents and improvement of visibility); territoriality (delimitation of private and semi-private spaces, strengthening of the sense of belonging to the territory by its residents); access control (allocation of accurate number of entrances/exits and stimulation of their control); image (use of vandal-resistant materials, maintenance of proper external condition) [7; 5].

CPTED is the theoretical basis for existing recommendations over evaluation of urban environment crime level. The so-called 3'D approach is one of them. It stipulates the space evaluation by three criteria: designation, definition and design. Accordingly they are based on the following principles: the whole human space has certain designated objective; these spaces have social, cultural and physical characteristics that stipulate desirable or acceptable behaviour; all human spaces are organized in order to support and control the desirable behaviour [2]. The methodology of this approach stipulates the use of control questions that refer to the indicated criteria. They are shown in Table 1.

Table 1. Description of the Table. Source:

Designation	Definition	Design
What is the initial designated objective of the space? How does the space correspond to its current or intended use? Is there conflicts?	How is the space defined? Is it clear who it belongs to? Where are its borders? Are there social or cultural characteristics that influence the way it is used? Are there symbolic or informational signs? Are there conflicts or confusion between objectives and characteristics?	Does the environment design correspond to necessary functions? How well does the design support desirable or acceptable behaviour? Does the design conflict or hamper the efficient use of space or proper functioning of designated human activity?

This method helps understanding major conflicts but it is not directly related to the structure or objects of architectural space and to the factors that influence it. For this purpose foreign specialists and municipalities use certain criteria of urban environment evaluation that can be combined into the following categories: visibility; lighting; hidden or isolated routs; degraded places; territory isolation; mixed use of the territory; generators of «street» activity; boundaries of use, support and management of the environment; signs and information stands; general architectural and planning characteristics.

Scientific works of V. Vijaykumar also attract interest. In order to examine the issue of preventing crimes among youth she developed her own system of evaluation of urban environment crime level. It is based on the so called «morphological layers», which are the components of space and of urban development physical environment. The scientist has formed the conceptual frame on the basis of analysis of major concepts on crime prevention – analytical issues according to the «morphological layers». It encompasses: underlying landscape – topographical features, landscape unevenness; public space network – parks and green areas, distance from city centre, use of the territory (mixed, public or private), access to adjacent regions, allocation of public spaces (schools, parks, places of the residents' increased activity, etc), visibility, concentration and compactness of buildings; plots – size, defining the type of territory use, connection between the plot and street, density of buildings; buildings components – planning peculiarities, number of storeys, diversity of age pattern, surrounding landscaping, entrances/exits, parking lots; «components» – front and internal adjacent territories; stairs and elevators, physical barriers (fences); «interface» – connection of external (yard, street) and internal (building) spaces; management and maintenance of the territory [10].

Taking into account foreign experience, the author conducted the detailed analysis of 15 spaces with high level of crime with different location in city-planning structure and different type of residential development. This analysis can be divided into two parts:

The first one consists of drawings and graphic materials; the main ones are: drawings of existing situation (not to scale); drawings of conflicts analysis (not to scale) developed on the basis of the previous one; analysis of environment conflicts from the observer's viewpoint. For demonstration purposes this article shows only two places with different types of development (Fig. 4, 5).

The second one includes evaluation of these places according to the conceptual frame formed by the author based on the scale of research and understanding of urban environment structure (Fig. 3). The following are the categories on the basis of which analytical criteria were developed: overall planning, transport and pedestrian network, buildings and structures, landscaping and greening, service objects and public objects. The results of research are outlined in Table 2.

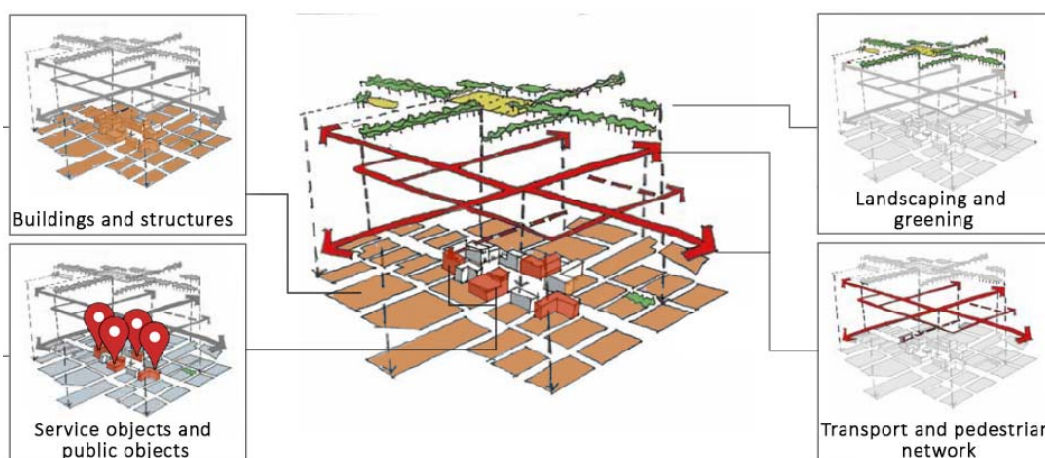


Fig. 3. Model of architectural and spatial structure of urban territory section. Source: author

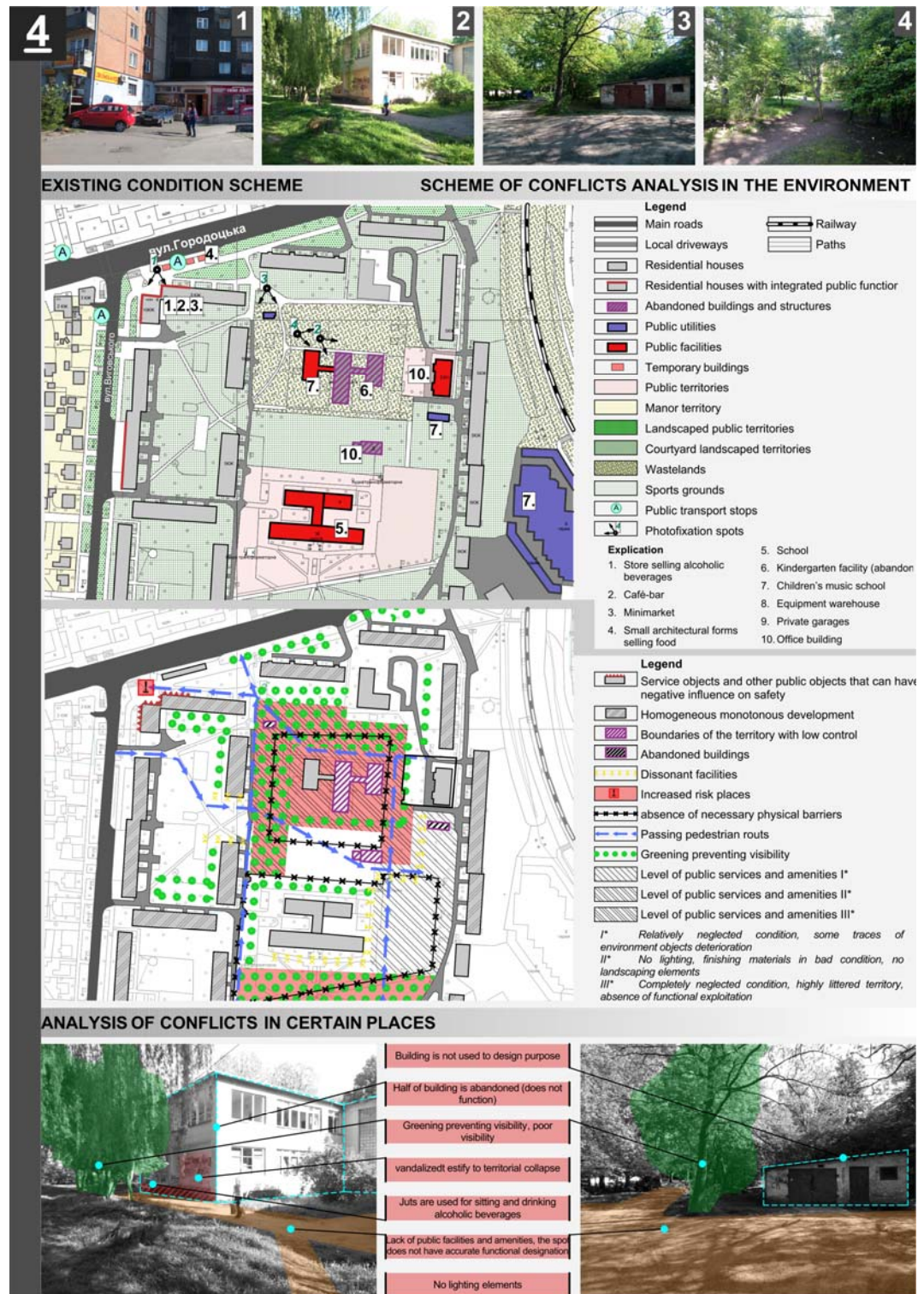


Fig. 4. Analysis of territory environment conflicts on the territory bounded by Horodotska Str.– V. Vyhovskoho Str.

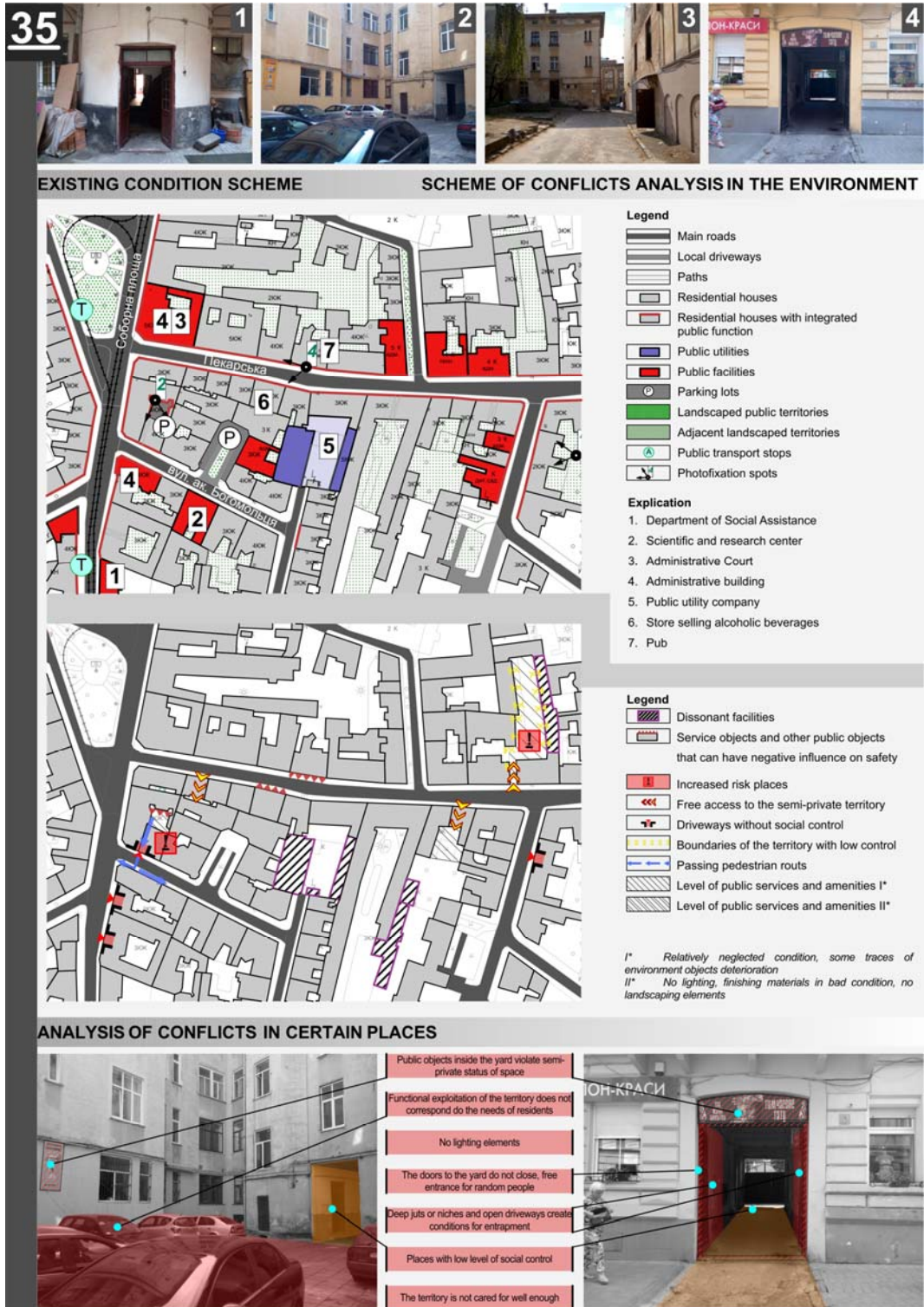


Fig. 5. Analysis of the environment conflicts on the territory bounded by Pekarska Str.– Dražomanova Str.– Ivana Franka Str.





per work of specialized institutions of local authorities, housing maintenance offices or associations of co-owners. Also these space characteristics can be influenced by the activity of the very residents, local communities and activists. Therefore, it is much easier to change architectural and spatial characteristics of this class from the viewpoint of criminological safety and it requires less social, financial and organizational resources.

It is worth reminding that in the Table 2 the examined sections of urban space are divided into territories with historic development and territories with typical development of the II half of XX century. When analyzing the obtained results it is obvious that the first group has generally better assessments over the safety at all morphological layers. The worst results are obtained in the column «landscaping and materials».

Let us pay more attention to the problems related to the characteristics of architectural and planning class. Their negative influence is of structural nature. Significant disadvantage of these territories lies in excessive density of buildings, the scale and geometric characteristics of which do not contribute to forming of comprehensive recreational, sports and playground zones in the yard as well as places for economic and creative activity of residents. Certain functions can be shifted outside the bloc but accessibility of certain population groups (elderly or disabled persons, mothers with small children) to them can constitute a problem due to the large number of road crossings and intensive traffic. Also planning structure of urban center does not correspond to existing level of automobilization. In particular, there are not enough spots for private parking lots, so owners leave their autos on pavements and in the yards, creating conflicts between different types of environment exploitation. These factors negatively influence the neighborhood level, quality of social contacts and residents' activity in solution of joint issues and control for adjacent territory. This leads to decreased sense of responsibility for the yard and can evoke its collapse and increase victimization.

Certain characteristics of examined territories with historic development that belong to administrative and architectural profile require special attention. Absence of gates or locks at entrances to residential yards is the negative factor that influences criminological safety. Their availability considerably decreases possibility of entering of random people or potential disturbers. Passes and yards are often poorly lighted and in case of easy access from the street this can create negative phenomena: vandalism, strengthening of residents' anonymity and sense of fear. This problem especially concerns driveways near buildings, where the level of social control is the lowest. It is negatively influenced by certain architectural characteristics: absence of windows; location at the border of public (street) and semi-public (yard) spaces; large depth and small width of drive that deteriorates side visibility when moving from one space to the other. Trees lines near pavements that come close to the buildings line deteriorate visual connections between buildings' windows and street.

There is also a problem with the public service objects formed within the housing group, where the entrance to them goes through the yard territory. So everybody has the right and possibility to freely access it, violating the semi-public status of this territory, which should belong to the residents of nearby buildings. This may lead to lower quality of social control, strengthening of disorganization among residents and emergence of conflicts between them and «outsiders». The lack of proper social control in the examined places is proved by deterioration and destruction of buildings' surfaces and paving, the presence of traces of vandalism, lack of cleanliness and order. And according to «the broken windows theory» it can reinforce deviant behaviour among residents and by-passers. The problem of historic area's space inadaptability to the needs of disabled persons should also be noted. It negatively influences the comfort of their movement and the possibility to use the yard and thus – the quality of social connections with other residents and the forming of efficient community.

As far as these problems are allocated for the territories with increased crime level, it can be assumed that their influence on criminological safety is significant. However, they can

be eliminated or their negative influence can be diminished due to proper economic policy and finance.

When comparing the historic development sections and those with the development of the II half of XX century it is obvious that the latter one has lower ratings of the environment safety almost by all criteria. The exception is the functional organization of the territory, which is provided with places for economic, sports and recreational activities according to the typical projects. However, currently the courtyard spaces are abandoned, so the residents' activity and its use intensity are much lower. This negatively influences social control. The persons with deviant behaviour can gather at undeveloped areas, forcing the legitimate users out. Returning again to the positive aspects of typical development territories comparing to the historical ones, we can name good accessibility to major social objects (schools, kindergartens) stipulated by their planning structure and well-developed pedestrian network. They promote safe (concerning the threats of car traffic) movement between different environment objects.

There are also good reasons to examine general negative aspects of typical development in detail. They are outlined in the works of scientists I. Hnes, A. Krasheninikov, O. Newman, etc, as following [3; 4; 5]:

- open space between buildings is hypertrophied and the boundaries of adjacent territories are absent or degraded, so the residents find it difficult to define the zone of their responsibility. The residents do not see the territories as theirs, so they are poorly controlled and do not have proper support;
- the relative position of apartment buildings creates large spots without distinct functional designation and pedestrian network in some cases is distant from the windows of buildings;
- system of driveways and pedestrian footpaths and compositional structure negatively influence the orientation in space and there are isolated routs without social control;
- mono-functional use of the territory does not maintain proper level of activity during the day, which can negatively influence the crime level according to CPTED. During work hours this residential territory can become deserted, which creates favourable situation for committing certain crimes (robberies, vandalism);
- monotonous development can damp mental state of residents and low artistic and aesthetical value can strengthen indifference to the environment;
- large number of floors, high population density and lack of recreational places and places for communication between the residents of a house negatively influence the development of social contacts and forming of efficient community able to solve common problems. Strengthening of anonymity among residents is also possible.
- The research of existing situation at certain territories with multi-dwelling development of the II half of XX century additionally detected the characteristics that negatively influence the criminological safety. They can be divided into two classes described above. The administrative and architectural class encompasses:
  - absence of fences at schools' and kindergartens' territories due to which the large uncontrolled areas emerge;
  - random greening (trees lines, certain groups of green spaces) prevents visibility and visual connections between the buildings' windows and adjacent territory and hinders orientation in space;
  - availability of abandoned objects and wastelands without fences or with possibility of free access. It attracts persons with deviant behaviour, which negatively influences the safety of nearby pedestrian footpaths and adjacent territories;
  - availability of sitting places and places for recreation at the areas that have low visual connections with environment. They can be used by the persons with deviant behaviour when it's dark.

- Architectural and planning class is characterized by:
- lack of accurate planning structure at the territories of multi-dwelling developments interspersed with groups of manor houses with complex configuration. There are dangerous and undeveloped areas at their boundaries. Transport and pedestrian network and general compositional structure are underdeveloped and complicated and hamper orientation in space;
- allocation of service objects' economic zone (restaurants, supermarkets, etc) at the courtyard territories negatively influences the comfort and aesthetical characteristics of a territory;
- availability of public utilities (boiler stations, electric substations) and temporary structures (garages, small architectural forms) prevent visibility and create isolated spots without proper control from street or buildings' windows This enables development of various kinds of negative social phenomena;
- architectural features of buildings and structures (juts and niches at human height level) and peculiarities of hardscape (retaining walls, low barriers, etc) at isolated spots or in cases of absence of proper control from environment attract persons with deviant behaviour.

As we can see, territories with historic development and multi-dwelling development of the II half of XX century with high crimes number have a range of environment characteristics that negatively influence criminological safety. In particular, the latter type accounts for the majority of them, but intensity of exploitation of central area territories makes them especially vulnerable in terms of crime threats taking into consideration the detected shortcomings. The latter were divided into administrative and architectural and architectural and spatial in order to facilitate development of the strategy of criminological safety increase taking into account available financial, material and administrative resources.

#### 4. THE STUDY ANALYSIS SUMMARY

This article is based on the research on allocation of certain crimes along the territory of Lviv conducted by the author in the past. In order to outline architectural and spatial characteristics of criminogenic territories 35 places with high crimes concentration were singled out and 15 of them were chosen for detailed analysis. They are represented with historic apartment development and multi-dwelling development of the II half of XX century. The methods of field research, photofixation and survey of residents were used.

Evaluation criteria of these places were formed on the basis of foreign experience on detection and analysis of architectural and spatial organization of urban territories' sections. These criteria were divided into groups according to the structural model of urban environment sections developed by author. It includes: general planning organization of environment; transport and pedestrian network; landscaping and greening; buildings and structures; service objects and public objects.

Detected architectural and spatial characteristics for both types of development are divided into 2 classes: architectural and planning and administrative and architectural. Characteristics included into the first one mostly depend on the quality of architectural project and existing conditions and limits for certain territory. Those included into the second one mostly are the consequence of management actions and maintenance of territory.

The following are the characteristics of the examined territories with historic development that belong to the architectural and planning class: excessive density of development; nonconformity of functional organization to basic needs of residents; negative influence of space geometric characteristics on the quality of life and social control; absence of recreational, sports and playgrounds; absence of parking lots, so the autos are in some cases parked in the yard or on the pavements; bad access to sports and recreational

objects; planning peculiarities of buildings and structures that create potential places for entrapments.

Administrative and architectural profile is characterized by: absence of gates or locks at entrances to residential yards, poorly lighted passes and yards, absence of conditions for control of driveways between buildings, availability of public objects at inter-bloc territories, bad condition and appearance of finishing materials, available traces of vandalism and deterioration; inadaptability of space to the needs of disabled persons; creation (lines of trees, bushes, etc) of obstacles to visibility due to landscaping; bad lighting of entrance zone and driveways.

Comparing the sections of historic development with the development of the II half of XX century we can see that the latter one has worse ratings of environment safety according to almost all criteria. The exceptions are: functional organization of territory that is provided with places for economic, sports and recreational activity according to typical projects; good access to basic social objects (schools, kindergartens) provided by their planning structure and developed pedestrian network.

The following are the characteristics of these territories included into administrative and architectural class: absence of fences at schools' and kindergartens' territories, random greening (trees lines, certain groups of green spaces), existing abandoned places; unfenced wastelands; poor visual connections of recreational places and environment.

The aspects of architectural and planning class are: absence of accurate planning structure at the territories of multi-dwelling development interspersed with groups of manor houses with complex configuration; allocation of service objects' economic zone in the yard; availability of public utilities (boiler stations, electric substations) and temporary structures (garages, street furniture); negative influence of peculiarities of architectural tectonics of buildings (juts and niches at human height level) and peculiarities of hardscape (retaining walls, low barriers, etc), which create conditions for gathering of persons with deviant behaviour in cases of absence of good control from environment; planning peculiarities of buildings and structures that create potential places for entrapment.

It is obvious that certain sections of historic and typical development of the II half of XX century have significant shortcomings in architectural and spatial organization. Main problems of historic one are low comfort of living and satisfactory condition of public services and amenities. At the same time territories with typical development have considerable disadvantages in terms of planning and compositional structure that negatively influence social control, visibility and sense of residents' responsibility for living environment.

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