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STATIONARY TRAFFIC IN THE URBAN PLANNING SYSTEM

ABSTRACT

Since ancient times human lives pulsed between two poles – moving and stationary. Moving as element of functioning is supplemented by standing. Today, when modern life in cities is based on using passenger cars as the dominant means of mobility, the explosion of their number is the generator of the growing problems both of the moving and of the stationary traffic. Considering parking as direct product of the moving traffic, usually its negative characteristics are mentioned such as greater volume of parking, fines, legal-regulative and safety aspects, degradation of other surfaces by the parked vehicles, etc. Never or almost never does one speak about the origin of the problem, and this would be the only way to find its solution.

KEY WORDS

stationary traffic, urban planning, parking standards

1. INTRODUCTION

Parking problems have originated together with the problem of the increased number of vehicles, experiencing in the transition European countries, including Croatia, an excessive growth. According to the available data, in the several recent years, over 70,000 new cars have been sold in our country. Every year the number of cars registered for the first time increases by about 120,000, and there are over 50,000 new drivers annually. Under the conditions of such increase in the number of vehicles, the gap between the demand and the supply of traffic surfaces cannot be harnessed even within the limits of the found situation. On the other hand, passenger cars are modestly used during the day. These vehicles are mainly used for the transport from the place of residence to the place of work, going shopping, or during leisure time. During this time, passenger vehicles spend little time moving. Experiences in the world show that passenger cars spend on the average 1.5 to 2.5 hours daily in motion. The rest of the time during the day they spend still, standing on some traffic surface in the town. However, with the expansion of the cities and the increase in the number of passenger cars, the stationary traffic problem is becoming greater all the time. The traffic surfaces are becoming insufficient, and parking uses up all the "free" surfaces in the cities. These are first of all sidewalks and pedestrian paths, green surfaces, squares, etc.

The disproportion between parking free space and the parking demands in the cities is growing annually. The lack of parking spaces is especially marked in the downtown area due to the concentration of activities and the inherited urban structure. However, the stationary traffic problem is present also in other urban zones where the same journey targets are summed based on the similar or same travelling motives. These are most often office zones and residential areas, where passenger cars gather occupying all the surfaces intended for this type of traffic, including other surfaces.

The stationary traffic problem in our conditions is not any more merely the consequence of the found urban structure which is not capable of accepting the increased number of passenger cars. Modern practice of city-building indicates that the parking problems are equally present in the zones of new construction, first of all of residential areas. The intense residential construction produces a great number of flats on a small space. The consequence is the lack of space for the stationary traffic. And when this space is lacking, then other free surfaces are used, so that every movement along residential area streets is made almost completely impossible. The same happens to the already inadequate space for the pedestrians or children playgrounds. In this way the living space of all the people is endangered.

Such situation is present in almost all the cities and it should be mentioned that very little has changed in

this respect. The urban spaces are left to local developers who are, in our contemporary practice, usually oriented to the market housing construction. They find fertile ground for their activities in today's administration which, in the state of present party politics does not want to compete by programmes and visions but rather goes hand in hand with investors, stimulated by "trivial" political or personal interests, although this should be solely in the service of human as individual and society as a whole. In such conditions even the standards determined by urban and physical plans regarding provision of the necessary space for stationary traffic, although insufficient, as a rule fail to be complied with. The investors, namely, in order to gain profit as fast and as easy as possible see the parking area only as the burden on investment. Parking areas are as a rule provided in the form of garages, due to the inadequate space for construction and expensive land. Although insufficient for the very object contents, garage places are offered on the market, since the buyers of residential and other premises are financially so stretched at such moments that they cannot afford a garage space as well. In this way the building users for whom the parking capacities had been built, are left without them, and the investors are interested in building minimal stationary traffic space, being obliged to do so by the urban planning documents or the size that the local market can bear.

Finally, there is also the phenomenon of the reallocation of the garage into office premises. This phenomenon has a double negative effect in the stationary traffic area. First, it reduces the available capacity for the stationary traffic. Secondly, the new office activities realised in the garage spaces generate new parking needs. In this way the disproportion of parking needs and possibilities only increases. Special problem of this phenomenon which usually occurs in consolidated urban zones lacking available spaces to increase the capacities of a part of stationary traffic.

2. STATIONARY TRAFFIC AND URBAN PLANS

Planning is a process of intellectual superstructure for high-quality development of society. The result of the planning process is a plan. In the process of planning the stationary traffic requirements, urban plans are of crucial importance. Urban plan, i. e. the urban plan documents are the scenarios that offer urban solutions for what will happen in space. They direct the live and continuous processes in space. At the same time, the urban planning document is a regulation, in "democratic" procedure adopted and determined liability for what is to happen in space; it is the act which produces the guidelines and actions for realization.

The process of planning stationary traffic capacities should be the integral part of the spatial and urban planning of cities, and should represent one of the basic documentation bases for bringing the finally agreed plans. In the urban planning process, apart from the agreed needs and possibilities for all the functional city facilities, the stationary traffic exceeds the framework of the past treatment of overall traffic. In today's considerations of space requirements for any of the functions the insurance of sufficient surfaces for the stationary traffic is simply a necessity.

However, in the modern urban layout of our towns one can notice the phenomenon of reserving the necessary but not sufficient surfaces for the traffic functions. Very rarely are the stationary traffic surfaces equally treated as the moving traffic surfaces. In the final realization of urban spaces or objects and their surroundings, such method does not provide either the necessary nor sufficient surfaces for the stationary traffic. It also happens regularly that at the moment when the stationary traffic problem enters the critical phase, alternative measures are used in order to try to solve it by using those surfaces that have been intended for other purposes. An especially difficult situation arises with the planning of urban reconstruction, construction of the so-called interpolated locations or construction of new zones, first of all the residential ones.

What are the causes for this situation? Of course, the answer has to be looked for in the valid system of physical planning and the legislative environment thereof. Today's system of physical planning is namely based on the Act on Physical Planning (Zakon o prostornom uređenju - "Official Gazette", No. 30/94, 68/98, 35/99 and 32/02), and the accompanying sublegal acts. For our considerations of the stationary traffic in the urban planning systems, a very important role belongs to the Regulations on Contents, Measures of Cartographic Presentations, obligatory spatial indicators and physical plan elaborate standards ("Official Gazette", No. 106/98). The mentioned Regulations determines through physical plans the scopes of purposeful organization, usage and intentions as well as measures and guidelines for organizing the physical space. Considering the provisions and contents of this Regulations we can see that only at the level of urban and detailed organization plans, in a certain way, the surfaces for stationary traffic are mentioned. At other levels of urban planning documents only the routes and surfaces of traffic infrastructure system (road, railway, air and ports) are promoted, having as consequence a relatively good coverage of moving traffic surfaces within urban plans.

However, in the realization of city-construction special significance lies on the detailed urban plans which determine the detailed allocation of the sur-

faces, surface organization regimes, methods of providing land with communal, traffic and telecommunication infrastructure, as well as conditions for the construction of buildings and undertaking of other activities within the physical space. The majority share of new construction in cities, including urban reconstruction is based on this level of urban planning documents. The stationary traffic condition in a certain part of the town is the direct consequence of the quality of the respective plans. With the previously mentioned Regulations, for this level of urban planning documents the focus is on public parking spaces and garages. Since these urban planning documents are limited regarding their scope, usually to the space of interest of the actual investors, the result is that there is almost no space for public parking lots and public garages, nor is there any interest in their planning.

In the given conditions the quality of solving the stationary traffic is based exclusively on the applied norms and standards in determining the necessary number of parking and/or garage spaces, in compliance with the planned objects and facilities, within the scope of the detailed urban plans. The norms for determining the necessary number of parking or garage spaces, in our conditions, are determined by plans of higher order in relation to the detailed urban plan, i. e. through Physical plans of organizing districts and the city or General Urban Plans. Direct application of these standards includes two levels of problems. First, Physical and General plans which are implemented in our modern practice of big cities are of a relatively older date (except in the recently adopted ones for the city of Zagreb), and completely inadequate with the today's needs and the status of the number of vehicles in the cities. Second, these standards have not been adapted to the obligatory physical indicators determined by the Regulation, which are applied in the urban plans regarding determination of the method of usage and organization of surfaces, which means at the same time the intensity of the usage of some space. These are the reasons that the norms and standards for the determination of the necessary stationary traffic surfaces are of crucial importance for the future condition in this area, and indirectly also in the condition of the overall road traffic system in the cities.

3. PARKING STANDARDS – NEW APPROACH

It is difficult today to give reliable norms and standards regarding stationary traffic capacity planning, that would be uniformly applied in all the conditions and all the spaces. This results from the exclusivity of single residential, office and other facilities, and their spatial distribution in the urban tissue, especially of big cities, as well as the valid legal regulations in the area of physical planning, which requires a completely different approach to planning of the necessary stationary traffic capacities.

The attitude of experts is justified referring to the fact that standards can be used as auxiliary technical means, for the actual conditions, i. e. only for the city for which they have been developed. Any direct application of the standards in other conditions of citizens' standard, method of using space, traffic system organization, etc. is not satisfactory. Therefore, it is necessary to carry out continuous research based on which the current and the future needs are to be defined, and the conditions provided for the correction or the development of new norms and standards applicable in a precisely determined environment and for the city space for which they are made.

This paper is in some kind of a conflict with the expressed expert attitudes, and justification is found in the factual state of the urban planning scope in Croatia and the relation of the urban and architectonic expert practice towards the need to insure the stationary traffic space. Here, the standard needs to be understood as an auxiliary means used by the designers to determine the necessary number of parking lots with or for the facility for which the project is being carried out. Therefore, there should be a difference between the plan and the design standards. The plan standards, namely, define the necessary number of parking spaces in relation to the obligatory physical indicators and their basic factor – total gross constructed area of the building. The design standards determine the number of parking spaces in relation to the capacity, quality and the method of construction, which as elements exceed the frames of the urban plan, and enter the domain of actual realization of objects and facilities. However, they are significant during urban planning for determining the needs of the existing objects which are located in space and within the scope of the urban plan. The inconsistency in the application of plan and design standards will be directly reflected on the quality of stationary traffic solution within the scope of the actual urban planning document. Here, the analysis is useful regarding the proposed standards within the proposal of the basic urban planning documents for the cities of Zagreb, Split and Rijeka (in the meantime the GUP – General Urban Plan, of the City of Zagreb has been accepted). The fact is that in determining the standards for the stationary traffic, the GUP of the City of Zagreb started from the gross constructed area as the basic element of the obligatory spatial indicators within the physical planning documents, which is a correct plan approach in the given legislative ambient. However, such approach has not been implemented consistently regarding the catering and tourism, culture and edu-

cation, health care and sport facilities, which use the design approach, which in turn has not been coordinated with the basic element of the obligatory space indicators. Another consideration refers to the ranges of the necessary number of parking spaces that need to be provided for individual purposes. Although such approach is justified in local conditions that significantly differ in the area of the City of Zagreb, under the conditions of the present practice they will certainly result in the supply of such a number of parking spaces that will be more favourable for the actual investor and location, and at the expense of the real needs. Therefore, ranges in the standards need to be avoided.

The proposal of the PPU of the City of Split is also inconsistent regarding determining of the standards according to the gross developed area of the object and facility, which is used exclusively for the industry and handicraft, public and commercial purposes, as well as trade. For all the other space allocations the design standard is used which has not been adapted to the obligatory physical indicators of the urban planning documents. The biggest drawback of certain norms is in case of residential construction expressed by designing norms of 2 PGM/1 apartments, without having analysed the local conditions i. e. the size of the apartment.

The mentioned lack of flexibility of the designers in case of the PPU of the City of Split regarding residential allocation, the proposal of the GUP of the City of Rijeka has tried to be compensated by the apartment structure. In any case, the respective approach of the City of Rijeka for the residential allocation, as well as any other allocation has not been harmonized with the basic obligatory space indicators of the urban planning documents, and that is the gross developed area of the planned building. In determining the Rijeka norms, one can feel the influence of the experiences acquired by the Zagreb GUP, but with an attempt to eliminate all its drawbacks, and to adapt the norms to the local conditions.

The analysis of the proposals of the new basic urban planning documents of our biggest cities has indicated the need of standardization and harmonization of these to the needs, but also to the sublegal acts which regulate the development of the urban planning documents. Thus, the proposal of the norm of the necessary number of parking or garage spaces has been made, which is exclusively based on the gross developed area of a building of a special allocation, reduced to our conditions regarding the standard of the citizens and the increase in the number of vehicles. It gives at the same time the designing norms whose aim is to calculate the number of parking spaces for the existing buildings which are kept in the space within the scope of the urban planning document.

The past experience in realizing urban planning documents in the area of the City of Split, along with the specifications of parking demands defined on the basis of the new approach, point to the need of determining the "obligatory instructions" for each allocation separately. Obligatory instructions, first of all, determine the way in which stationary traffic surfaces need to be solved in space, regulating the liability of the part of capacities that have to be insured in the open space in order to satisfy the needs of the visitors to single zones or facilities.

The necessary number of parking spaces defined by this proposal through a completely new approach, adapted to the valid legal and sublegal acts, is based on the selective application of both Croatian specifications as well as those of other countries. The necessary number of parking spaces is defined in the function of purpose of the facilities, traffic attractiveness of the facilities and the achieved level of motorization in our conditions. The table overview of these specifications interprets the parking demands according to the basic facilities of the planned buildings at the reached level of motorization.

4. CONCLUSION

With the actual increase in the needs, it will not be possible to provide the stationary traffic space, unless regulations about the liabilities of constructing parking lots and garages in relation to new construction designs are brought. Every new construction, as well as every additional construction and reconstruction which improves the quality of facilities generates new traffic both moving and stationary. Here, the investors, constructors and designers need to be made aware that parking is not a service for the vehicle, but rather a service for the driver and the passengers, i. e. for people, the users of buildings and their facilities. The users cannot complete their car ride to work, shopping or to recreation unless these necessary twenty square metres per parking space are insured – not for the vehicle, but for the people who use this vehicle.

The decisions about the design solutions in traffic are often left to those who, by a combination of circumstances, but usually out of political reasons, act as "traffic experts". This is certainly contributed by the legislative solutions such as Act on the Croatian Chamber of Architects and Engineers in Civil Engineering which prevents the traffic and transport engineers to obtain the authorities, among other things, also for equal and obligatory participation in the development of urban planning documents. This fact is especially significant, since failures once made in the region of urban planning acquire the syndrome of permanent error that stretches throughout all further activities, and are very difficult to correct by the traffic

control approach. This refers particularly to the insuring of the necessary space for the stationary traffic.

Until acquiring awareness about the need of detailed traffic analysis of a concrete location and concrete problem in the area of urban planning and during the process of developing the urban planning documents, the proposed specifications can certainly represent a contribution to the quality of solving the stationary traffic problem. The fact is that all the problems cannot be solved by one measure only, but the mentioned approach may certainly alleviate the current and future situation in the area of stationary traffic. With the application of parking specifications determined on the new principles, the tendency is to avoid that every new intervention into the tissue of our cities results at the same time in the deterioration of conditions in the zone of pedestrian, road or stationary traffic. Also, the traffic conditions should be avoided in the new construction zones such as those that we have in the inherited urban tissue from the times when cars did not dominate our environment. Finally, by applying adequate specifications in parking we should try to bring the syntagm of "sustainable development" of the traffic system of our cities to life.

Specification of the necessary number of parking or garage spaces (PGS number)

Purpose	Type of building	GUP proposal City of Zagreb	PPU proposal City of Split	GUP proposal City of Rijeka	Proposal – new approach		Obligatory instruction
					Plan	Design	
Residence	Apartment (in multi-apartment building)	average value 11 PGS/1000 m² BRP local conditions 8-14 PGS/1000 m² BRP	2 PGS/1 apartment	1 PS / 1 flatlet or one-room apartm. 1.5 PS / 1 two- or three-room aptm. 2 PS / 1 four- and more-room aptm.	1 PS / 50 m² BRP x 1.25 (multiplied by 25% for the needs of guests)	one-room: 1 PGS x 1.25 two-room: 1.5 PGS x 1.25 three+ room: 2 PGS x 1.25 (multiplied by 25% for the needs of the guests	– min. 30% needs to be realized on building plot as open parking space; – necessary no. of PGS generated by office premises in multi-apartment buildings determined acc. to the individual purpose specification
	Family houses			1 PS / 1 apartment 2 PS / 1 apartment of residential house	1 PGS / 60 m² BRP	2 PGS / 1 apartment	– solved within building plot of object with one driveway; – if family houses dominate residential area, on-street parking within building plot, roads for guests acc. to specific. 1 PS / 1 family house
Industry and handicrafts	Industrial objects	average value 8 PGS/1000 m² BRP local conditions 4-8 PGS/1000 m² BRP	1 PS / 80 m² BRP	0.4 PS / 1 employee	1 PGS / 70 m² BRP		parking space on building plot of the object, in the open
	Production handicrafts		1 PS / 60 m² BRP		1 PGS / 50 m² BRP		
	Warehouses	average value 30 PGS/1000 m² BRP local conditions 20-40 PGS/1000 m² BRP	1 PS / 80 m² BRP		1 PGS / 100 m² BRP		
	Car repair shops	———	———	———	1 PGS / 20 m² BRP		
Public and business	Banks, agencies, branch offices, management	average value 15 PGS/1000 m² BRP local conditions 10-20 PGS/1000 m² BRP	1 PS / 20 m² BRP	6 PS / 1 employee	1 PGS / 25 m² BRP		– 50% PG capacities must be realized in open parking areas – minimum 2 PS need to be provided
	Offices		1 PS / 80 m² BRP	0.4 PS / 1 employee	1 PGS / 50 m² BRP		
Commerce	Department stores (sales centres)	average value 15 PGS/1000 m² BRP local conditions 10-20 PGS/1000 m² BRP	1 PS / 40 m² BRP	6 PS / 1 employee	6 PGS / 100 m² BRP		– - 20% capacity in open area
	Supermarkets, hypermarkets		1 PS / 40 m² BRP	———	7 PGS / 100 m² BRP		– - 100% capacity in open area
	Individual stores		1 BB / 20 m² BRP	2 PS / 1 employee	5 PGS / 100 m² BRP		– - 50% capacity in open area
	Car showrooms	———	———	———	1 PGS / 100 m² BRP		– - 100% capacity in open area

Purpose	Type of building	GUP proposal City of Zagreb	PPU proposal City of Split	GUP proposal City of Rijeka	Proposal – new approach		Obligatory instruction
					Plan	Design	
Catering and tourism	Hotels, motels	1 PGS / 3-6 persons, acc. regulation on type and category of the building	1 PS / 1 – 4 rooms	1 PS / 3 -6 employees / guests 1 PS / 4-8 sitting places	1 PGS / 50 m² BRP	acc. to Regulations on classification, minimum conditions and categorization of catering facilities (NN 57/95,....)	– for public areas (shops, agencies, restaurants, etc.) it is necessary to insure additional open parking spaces re. specification
	Restaurants, cafés	average value 40 PGS/1000 m² BRP local conditions 30-60 PGS/1000 m² BRP	1 PS / 4 – 10 seats		10 PGS / 100 m² BRP	1 PS / 4 standing places	– 100% capacity in open area
	Other catering facilities (coffee bars, pastry shops, etc.)	1 PS / 4-12 sitting places	1 PS / 4 – 6 seats		4 PGS / 100 m² BRP	1 PS / 8 sitting places	– 100% capacity in open area – min. 2 PS need to be insured
	Singles' homes, board and lodgings	———	———	———	1 PGS / 100 m² BRP	0.5 PGS / 1 room	– min. 20% capacities in open area
	Homes for senior citizens and disabled	———	———	1 PS / 5 beds or 1 PS / 4 employees per shift	1 PGS / 100 m² BRP	0.5 PGS / 1 room	– min. 50% capacity in open area
Culture and education	Nurseries and kindergartens	1 PS / 1 group of children	1 PS / 15 users	1 PS / 1 group of children	1 PGS / 50 m² BRP	——	– 100% capacity in open area – min. 4 PS need to be provided
	Primary and secondary schools	1 PS / 1 classroom	1 PS / 1 classroom	1 PS / 1 classroom	1 PGS / 100 m² BRP	1 PS / 1 classroom	– 100% capacity in open area
	Faculties	average value 10 PS/1000 m² BRP local conditions 5-15 PGS/1000 m² BRP	1 PS / 5 students	———	1.5 PGS / 50 m² BRP	1 PS / 5 students	– 100% capacity in open area
	Institutes		1 PGS / 4 employees	———	1 PGS / 100 m² BRP	——	– 100% capacity in open area
	Cinemas, theatres, halls for public gatherings	1 PS / 20 seats	1 PS / 5 seats	1 PS / 20 seats	20 PGS / 100 m² BRP	1 PS / 5 seats	———
	Churches	1 PS / 5-20 seats	1 PS / 20 seats	1 PS / 5-20 seats	1 PGS / 50 m² BRP	1 PS / 20 seats	– 100% capacity in open area
	Museums, galleries, libraries	———	1 PS / 50 m² BRP	———	1 PGS / 50 m² BRP	———	– min. 4 PS need to be provided – for museums: 1 PS for bus
	Congress halls	———	———	———	2 PGS / 100 m² BRP	——	——
Health care	Clinics, hospitals	1 PS / 5 beds or 1 PS / 4 employees per shift	1 PS / 2 beds	1 PS / 5 beds or 1 PS / 4 employees per shift	1 PGS / 100 m² BRP	1 PS / 1 room	– 50% capacity in open area
	Outpatient facilities, polyclinics, health centres	1 PS / 4 employees per shift	1 PS / 20 m² BRP	———	5 PGS / 100 m² BRP	———	– 100% capacity in open area

Purpose	Type of building	GUP proposal City of Zagreb	PPU proposal City of Split	GUP proposal City of Rijeka	Proposal – new approach		Obligatory instruction
					Plan	Design	
Sport and recreation	Sport facilities with stands	1 PS / 20 seats and 1 PS for bus / 500 seats	1 PS / 10 spectators	1 PS / 20 seats	acc. to Regulations on space standards and urban-technological conditions for planning of sport facilities network (NN 38/91)	acc. to Regulations on space standards and urban-technological conditions for planning of sport facilities network (NN 38/91)	
	Sport facilities without stands	———	1 PS / 2-4 users	———	depending on type of sport minimum number of PPs needs to be provided equal to the number of concurrent users	depending on type of sport, it is necessary to provide min. number of PPs equal to the number of concurrent users	
Municipal services	Markets	———	———	———	10 PGS / 100 m² space	———	– 100% capacity in open area
	Technical facilities	———	———	———	2 PGS / 100 m² BRP	———	– min. 1 PS provided
	Petrol stations	———	———	———	4 PS / 100 m² BRP	———	———
Passenger transport terminals	Bus stations						obligatory traffic-technology design with calculated needed size of parking capacities, especially for: – station (only boarding and disboarding) – short-term parking (up to 1 hour) – long-term parking (over 1 hour)
	Railway stations						
	Ferry and passenger port						

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SAŽETAK

PROMET U MIROVANJU U SUSTAVU PROSTORNOG UREĐENJA

Od najranije povijesti ljudski je život pulsirao između dva pola – kretanja i mirovanja. Kretanje kao element funkcioniranja dopunjava se mirovanjem. Danas, kada se suvremeni život u gradovima zasniva na korištenju osobnog vozila kao dominantnog sredstva kretanja, eksplozija njegova broja generator je sve većih problema kako prometa u kretanju, tako i prometa u mirovanju. Kada se govori o parkiranju kao direktnom produktu prometa u kretanju, obično se spominju njegove negativnosti kao što su povećan volumen parkiranja, kazne, pravno-regulativni i sigurnosni aspekti, degradacija drugih površina od strane parkiranih vozila i sl. Nikada ili skoro nikada ne govori se o porijeklu problema, a u njemu jedino možemo naći i rješenje istog.

KLJUČNE RIJEČI

promet u mirovanju, prostorno planiranje, standardi parkiranja

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