

Using New Technologies for Public Parking in Isfahan City

M. Ahmadi Baseri, R. Mokhtari Malekabadi, A. Gandomkar

Abstract—Cities expansion, urban travels increase, the technology development, the automobile price cheapen, and the families' income ascending cause the considerable increase in automobile numbers of the city. This fact has led to the traffic creation and the automobile parking site shortage in the city. Also in Esfahan metropolis, the parking lots shortage has been the great problem of this town; in addition, in designing and constructing of the parking sites the traditional methods are utilized which do not have a reasonable and optimized usage of the valuable urban lands. In this article, by introducing the prefabricate mechanized parking system which is inexpensive, simple and quick, and occupies very small space, therefore provides the high content of parking site for the cities, we can eliminate the parking space shortage difficulty of the cities. The achieved results of this research represent that an optimized utilization of the existent urban spaces for parking site construction has not been accomplished. By employing the new parking site technologies such as mechanization categorized parking sites and the capacity prefabricate mechanized of each parking space have become 8 multiples; in this case, the valuable urban lands can be used in an optimized way.

Keywords—Public parking sites, New parking sites technologies, Prefabricate mechanized parking site, Isfahan City.

I. INTRODUCTION

THE fast growth of the urban population and the private vehicle's possession increase in the cities have eventuated the considerable demands for the automobile's parking sites; since land is too expensive and scarce, it is necessary to respond the increasing demands for the parking sites by the new technologies in order to design and construct new parking sites. In Esfahan city cause of the traditional methods application for designing and constructing of the parking sites, the reasonable and appropriate utilization of the valuable urban lands are not accomplished. In Esfahan, nevertheless the existence of 99 active public parking sites with 120872 automobile capacities and the space about 250000 square meters, the parking sites shortage problem has been existed extensively, yet; in addition, this matter has created lots of traffic problems for the city. Vang and Sung [1] in an article named "Combinatorial Optimization of Congested Road and Parking Charging" point to the congestion of the traffic as a dominant problem which has stockade the permanent development of the urban transportation; in addition, they have surveyed the analysis of the transportation network, travel charging and cost, and the traffic demand; They have come to this conclusion that TDM is an effective solution to reduce the traffic congestion of the urban regions and it is possible to lessen this congestion notably by the usage of the combinatorial optimization model.

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Farzanmanesh and etal [2] in an article named "Parking Site Selection Management Using Fuzzy Logic and Multi Criteria Decision Making" have surveyed the parking site selection in traffic jam regions of Esfahan and they have come to this conclusion that among various multi criteria decision making models for parking site selection, the usage of AHP model and fuzzy logic in GIS are the best public parking Sites Selection implements.

Casido [3] in an article named "Real-Time Parking Information Management to Reduce Search Time, Vehicle Displacement and Emissions" has surveyed the real time parking information management in order to reduce search time; in addition, he has pointed to the considerable environmental pollution emanated from the vehicles' search time finding a vacant parking site. He has concluded that by surveying the drivers' behavior and the accessible parking sites, also by evaluating the management and utilization of the parking site information, we can reduce the time and distance for parking site searching and lessen the environmental pollution emanated from this searching.

Lai and etal [4] in an article have considered the fire fighting stations' selection by the combination of GIS and AHP. They came to this conclusion that combination of the above methods for the urban applications selection are very useful and simplify the complicated problems.

About the parking site planning in Iran, the following cases could be pointed out:

- The advisor engineers of traffic designers [5] in a project named "Public Parking Sites Management Studies of Esfahan", whilst the survey of Esfahan Parking Spaces have come to this conclusion that there are considerable shortages in public parking sites facilities in Esfahan city center; in addition, these parking spaces do not possess a balanced distribution in the city.

- The advisor engineers of traffic designers [6] in a project named "The Hourly Parking Cards Project" performance and organization of the marginal parking sites of Esfahan have pointed out to the management policies and the marginal parking sites controlling; they have surveyed the parking sites status and marginal ceasing of this city; in addition, they have analyzed the marginal parking sites patterns and standards.

Abbaszadeh [7], in her MS thesis titled, "Survey of the problems and Difficulties of the Parking Sites Inexistence in Esfahan City: South of Zayanderood Case Study", whilst studying the parking sites applicability with the motivation for finding out a solution in order to solve the problems of the wandering cars searching for a parking site for their automobile on the main streets of the city came to this conclusion that with the considerable and specific attention to the public transportation, its quality increase and the appropriate parking sites construction in some regions of the city, the desirable condition for the city traffic will be achieved.

Sayed Moosavi [8] in his MS thesis proposal named, "The Geographical Analysis of the Problems and the Public Parking Sites Difficulties in Esfahan" studied and analyzed the public parking sites and their shortages and problems in Esfahan; in addition, by considering the problems in creating the public parking sites in Esfahan he concluded that parking sites in Esfahan do not have a logical emission, there is a considerable shortage in this regard and the vehicles parking sites demand in this city has not been accomplished.

Mokhtari [9] in an article named "An analysis in Functional Planning of the Parking Site in Esfahan City" by usage of the regional planning and functional models has surveyed a comprehensive statistical model about the applicability of parking sites in Esfahan with regard to three models of regional planning; in addition, has studied the other 11 regions of Esfahan from the view point of the applicable parking site capitation. From the results of this research, we can allude to the regions exploration about the parking space and capitation, also the regions precedence from the view point of the parking site shortage.

The purpose of this study is to introduce the new technologies of parking sites design and construction for the optimized utilization of the valuable urban spaces while improving the parking sites shortage problems and the distribution of them all around Esfahan city.

II. METHODOLOGY

Prefabricate mechanized parking sites which are designed and accomplished in various parking sites capacities of 8-10-12-14 or 16 vehicles is a modern phenomenon which occupies an arena of about 30 square meters. This system can be applied on the useless and even asymmetric lands with the approximate dimensions of 5 in 6 meters which usually there is the possibility of just two vehicles' parking, even there is no possibility for the vehicle's turning. The method is like a merry-go-round which some platforms are considered for the vehicle's parking. While these platforms turn, the driver is able to park his/her vehicle in one of them and in referral time in order to exist the parking by reusing of this merry-go-round system, the driver can take delivery of his/her car in bottom place [10].

Some particular traits of this complex are:

- Resistance against the earthquake: This system resists against the earthquake till 8 Richter attacks; in addition, it is provided with a manual conduction in emergency conditions.

- The little service and conservation charge which is declared as the charge of one elevator machine.

- Fast installation and initiation: the required time for its installation is 6 days. Of these 6 days, three days are for foundation performance which is surface extensively, and other three days for the installation of factors, electric connections and initiation are considered.

- The portable and relocation capability: it provides this possibility to remove the system from a place whenever and install in another site.

- Inexistence requirement to the operator: this system is available and operational conveniently by the drivers themselves and there is no need to the operator.

- The appropriate Price: the construction and initiation charge of this system is competitive with other mechanized parking systems charge. This matter besides the little conservation charge is numerated of its considerable advantages (www.SmartParking.ir). In figure 1, a sample of prefabricate mechanized parking has been brought.

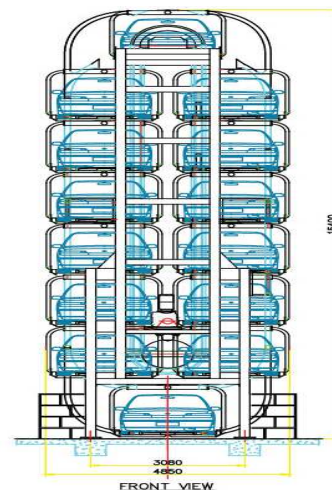


Fig. 1 Prefabricate mechanized parking From www.SmartParking.ir

III. DISCUSSION

The comparison between the present designs of the public parking sites of Esfahan which usually are made and designed with traditional methods, and the modern technologies and techniques of parking sites design and construction represents the unreasonable and inappropriate utilization of the valuable and scarce lands of Esfahan through the application of traditional methods. As an example, Saeidipoor flat parking in region 3 with the space of 260 square meters has provided the parking sites of 12 automobiles; while by the usage of prefabricate mechanized parking, we can provide this parking site amount in space of 30 square meters. In other words, by employing prefabricate mechanized parking in Saeidipoor parking site, the space for locating of 104 automobiles will be

obtained. This number is 9 multiples more than the present capacity of this parking site.

IV. CONCLUSION

The achieved results of this research display the unreasonable and inappropriate utilization of the valuable and scarce lands of Esfahan city through the traditional methods application. While, by employing prefabricate mechanized parking, the automobiles' parking sites capacity will be 9 multiples more than the present capacity of the present parking sites.

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