Proposed Parking Facilities for the Local Heritage Site of Iloilo City

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Abstract

Iloilo City is one of the Philippines' premiere cities. The city has 8,407 business establishments of which 1,182 were recently established.Every year, there is an estimated 11% of increase in the number of business establishments in the city. More business means more investors and consumers. The business transactions demand ample space for amenities such as parking facilities.The Downtown Central Business District (CBD) of Iloilo City is the proof of the economic activities of the city for the past decades. It is the main destination of people coming from Metro Iloilo-Guimaras region. Recently, it was declared as the Iloilo's Heritage Site inclusive of 26 buildings at least 75 years old. This heritage area is surrounded by a plaza, a university, a public market, private high schools, banks, restaurants, and retail businesses. This research is mainly focused on the design for a comprehensive parking facility for on-street and off-street parking for the local heritage zone of Iloilo City. A License Plate Survey was conducted in 23 areas to determine the parking characteristics of car owners, number of vehicles parked, turnover rate, and parking duration. An inventory of the road network and identification of open spaces for possible off-street parking were performed.The results of License Plate Survey showed that the average parking duration and turnover rate are 2.29 hr/veh and 0.296veh/space-hr respectively. Block 2-Guanco St has the longest parking duration of 5.42hr/veh and Block 5-Ortiz St and Block 5-Rizal St has the highest turnover rate of 0.393veh/space-hr. Seven (6) possible sites for off-street parking have been identified. Certain areas have been proposed as no parking zone.

Key Words: off-street parking, on-street parking, parking characteristics, turnover rate, parking duration

1. Introduction

1.1 Background and Rationale

A heritage site is a place or structure that has significant value to the cultural legacy of a city, town, or province. It carries the proof of the place's existence; past economic activities, and old traditions which are handed down from generation to generation. It conveys the identity and distinction of a place from among the other area. It will help improve the economic status of the area through tourism.

The City of Iloilo intends to preserve its cultural and historical value by giving importance to the heritage structures within its limits. The declared heritage site passes the following characteristics as described by the Local Cultural Heritage Conservation. (Local Cultural Heritage Conservation Ordinance of Iloilo City, Regulation Ordinance No. 00-054, Office of SanguniangPanglungsod, City of Iloilo, April 2000): (1) The old buildings, structures, or area in Iloilo City must speak of the culture and history of the Ilonggos. (2) These buildings must be part of our national history in general and regional history in particular. (3) The site must provide an evidence of history in particular. (4) The buildings, landmarks, plazas, and parks must be atleast 75 years or more in existence. (Local Cultural Heritage Conservation Ordinance of Iloilo City)

Iloilo City is located in the Island of Panay in Visayas Region of Philippines. It began as a fishing community and grew up to be one of the Philippine's premier cities. It was once considered as the "La Muy Leal y Noble Ciudad" which means "The Most Loyal and Noble City". Now it has 8,407 business establishments of which 1,182 are new.

Downtown Central Business District (CBD) of Iloilo City is declared as a heritage site. It is the main destination of people coming from Metro Iloilo-Guimaras region. It serves as a venue for economic activities for the traders in Iloilo River a long time ago. It is the representation of Iloilo's historical past. At present, the district has 26 declared heritage buildings which are 75 years old or more around the area. It also holds annual festivals like Dinagyang and Chinese New Year. It is packed with buildings, vehicles, and pedestrian.

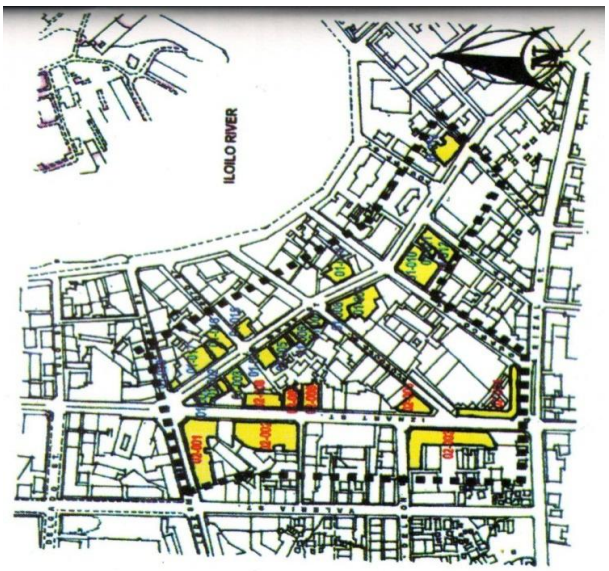

Figure 1.1 Map of Heritage Buildings
Source: ICCHCC

The declared heritage site is bounded by three main streets forming a triangle, namely: JM Basa (Call Real), Iznart and Rizal Street. It is surrounded by schools, markets, residences, banks, hotels, fast-food chains and restaurants, and other businesses. Because the declared heritage site and its surroundings cater to a lot of special events and socio-economic activities, there is a necessity for parking facilities.

1.2Problem Definition

Parking as part of an urban transportation system is one of the crucial issues of government and private business owners. The paragraphs that follow describe the existing conditions of the declared heritage site.

Figure 1.2 Cars parked on JM Basa Street

The main road JM Basa Street has been used for parking by privately owned vehicles.

This main street is supposedly intended only for running on moving vehicles. On certain lengths of this street, the loading and unloading of passengers on roads are allowed. Thus, the parked vehicles decrease the width of the road and cause traffic congestion.

As shown in figure 1.6, the nonexistence of parking spaces allotted for motorcycles draws the motorcycle drivers to park beside the private vehicles. The parking spaces therefore are not fully maximized. Heavy and large-sized trucks were also spotted parking on side-street thereby narrowing the streets.

Other problems observed by the research groups were a)Unregulated on-street parking b) Absence of parking signs c) No lines drawn to separate the parking area into stalls d) illegal vendors occupying the spaces for curb-side or on-street parking, and e) no provision for separation of vehicle types,

Figure 1.6 Cars and Motorcycles share parking spaces in Iznart Street

1.3 General Objective

The primary objective of this study is to design a comprehensive parking facility, both for off-street and on-street parking, for the heritage site in Iloilo City.

1.4 Specific Objective

The following specific objectives were done to complete the primary research objective.

1. Made a road network inventory.
2. Determined the parking characteristics of vehicle.
3. Identified areas for off-street parking
4. Define areas and regulate on-street parking

1.5 Significance of the Study

The beneficiaries of this research include car owner or drivers, commuters on the riding public, the city government and the environment.

*Car owners and drivers.*Areas for off-street and on-street parking were identified to be able to organize parking vehicles. The organization of vehicles could maximize the use of parking areas and road lots.

*Commuters on the Riding public.*The drivers and passengers of moving vehicles will be able to move more freely on the streets and reach their destination because of decongestions.

City Government. The proposed regulation and parking fees will provide funds for the city for

future projects. It will also encourage private vehicle owners to use mass transit such as public utility jeepneys as a mode of transportation.

Environment. An organized and planned urban transportation system will help minimize air pollution by reduction of traffic congestion.

1.6 Scope and Limitation

This research includes only the Downtown Central Business District in Iloilo City. It focuses on the proposed off-street and on-street parking facilities for the heritage site and its vicinity. The on-street parking facility considered passenger vehicles not more than 4.7meter long and 1.7meter wide. The off-street parking areas were located in identified vacant lots.

This research excludes the impact of the proposed parking facilities on the businesses and vendors at the Downtown Central Business District. Traffic flow analysis was not considered. Turnover rate and parking duration of vehicles is constant on weekdays.

2. Review of Related Literature

2.1Parking Facilities

Parking facilities and programs are of considerable importance in traffic engineering. Most persons to urban and regional commercial centers are accessed primarily by cars. The viability of these areas depends on the availability of convenient parking facilities adjacent to or easily accessible to desired destinations, especially off-street parking facilities. And various aspects of the parking related index are introduced as follows. (1) Parking demand: the number of need park space in a given area at some time interval. (2) Parking capacity: the number of parking behaviour a given area can accommodate. Parking capacity includes planning capacity and actual capacity. Planning capacity is the total parking spaces in the study area and the actual capacity is the number of park space which can be accommodated in the actual parking management and operation. (3) Parking turnover: Average parking times of a parking space in a given time interval. (4) Parking space utilization: Average service efficiency of a parking space in a given time. (5) Average parking duration: Average parking time of a vehicle in a given time interval, D. Parking duration is the length of time individual car taken park space. This characteristic is a distribution of individual values, and both the distribution and the average value are of great interest.

Many parking studies (Zhang, et al., 2005) stress on the establishing, the distribution of accumulation with time and to determine the peak accumulation and time at which it occurs. Of course, observed accumulation is limited by parking supply, and constrained demand cannot be directly observed. Here gives some optimal models and statistic data on parking demand and supply.

2.2 Off-street Parking

With limited land resource and restriction of the off-street parking facilities, it is impossible for the supply of the off-street parking facility to meet the growing parking requirement. Therefore, in the allocation of the off-street parking facilities, the major concern will be the efficiency of the facility. To reflect the critical decision criteria for the allocation of the off-street parking facilities, there are two types of goals are considered in this study. The first goal is to maximize the parking demand served by the parking facilities. The second goal is to minimize the total social cost. The major components of the social cost are: the construction cost, the operating cost, maintenance cost for the operators, the walking cost for the users, the anti-pollution cost of the noise reduction cost and die non-users, and penalty cost for the unsatisfied demand. (Chiu, 2005)

2.3 On-street parking

Parking is a critical component of transportation policy and management for any locale, but especially for the large central cities. The policies and management practices affecting parking lead to outcomes that, in turn, can affect land use, air quality, traffic congestion, travel behaviour, safety, and economic development, not to mention revenue lines. For example, policies that provide large amounts of unpriced parking may encourage automobile use, thereby increasing congestion. Effectively managing parking is an ongoing battle for the large central cities as they face competing, and sometimes contradictory, objectives along with an ever-increasing demand for space.

As mentioned by De Cerreno (2002) on-street parking is a key factor in promoting businesses in cities, particularly within central business districts. As a type of shared parking, on-street parking is an efficient means for allowing multiple users to each multiple destinations. On-street parking utilizes less land per space than off-street parking and provides easy access to businesses located on city streets. For pedestrians, on-street parking creates a buffer between moving traffic and individuals walking on the sidewalks, providing a measure of safety and reducing the level of perceived noise. Further, depending upon how on-street parking is situated on a street, it can also serve as a traffic calming device, thereby slowing vehicles and potentially reducing the number and severity of accidents.

3. Methodology

3.1Data Collection

*Road Network Inventory***.**Primary data were gathered by site investigation and documentation of observations and landmarks in the area. As seen in figure 3.1.

Vehicle Parking and On-street Parking Characteristics.A License Plate Survey was conducted to determine the parking duration and turnover rate of vehicles parked within the area of the study. The area for the survey was categorized by blocks and segments or street surrounding it. For Block 1 the areas for survey are Block 1-Iznart and Block 1-Aldeguer. JM Basa is a major road therefore it is not included in the survey. Please see figure 3.2.

Figure 3.1 Streets in the Heritage Site

Figure 3.2 Map of Blocks in CBD

A User Information Survey was conducted to determine the parking and travel characteristics of parkers within CBD with 248 sample size out of 1908 vehicles parked given 90% level of confidence was used.

Off-street Parking. The area was also inventoried for possible off-street parking facilities. Vacant lots, unused buildings, and etc were classified as a potential site fir off-street parking. The sites were categorized as big and small parking areas. Areas that can accommodate more than 50

vehicles were considered as big parking areas and small if otherwise.

And all secondary and supporting data were collected by using every available reference. Data connected with the details and plans of Downtown CBD was obtained by seeking assistance from the sector of the government in line with the said data and private professionals.

3.2 Data Analysis

3.2.1Parking Duration

Data for Parking Duration can be determined by the formula:

$$D = (30)\sum N_x(X)/N_T \qquad (1)$$

where D is the average parking duration (hour/vehicle), N_x is the number of vehicles parked for X intervals, X is the number of time intervals the vehicles parked, time interval use is 30 minutes, and N_T is the total number of vehicles observed.

3.2.2 Parking Turnover Rate

Turnover Rate can be determined by the formula:

$$TR = N_T/(S)T_S \qquad (2)$$

whereTR is the turnover rate, N_T is the total number of vehicles observed, is the number of parking slots, and T_S is the time of study in hours.

3.2.3 Parking Revenue

Parking Revenue can be determined by the formula:

$$R = (N)\left(PF_j\right) + \sum_i (i)(n_i)(PF_i) \qquad (3)$$

where *PFj* is the preset parking fee for the *j* time, *i*is the hourly increment, or fraction thereof, of vehicles parked more than *j* time, *ni*is the number of vehicles for every hourly increment *i*, or fraction thereof, that parked more than *j* time, *PFi* is the increment in parking fee for the hourly increment *i* greater than *j* time, *R* is the total parking revenue (in pesos). The rest of the variable are as previously defined.

4. Results and Discussions

4.1 Road Network Inventory

There are a total of 672 registered establishments located within the heritage area that affects the parking behaviour of vehicles. The table below shows the different business categories and the corresponding number of establishments registered. The retails/wholesale business dominates the market.

Table 4.1 Types of Establishments Registered Within the CBD

Type of Establishment	Total
Retailer/Wholesalers	237
Contractors	38
Essential	71
Banks/Financial	95
Lessor	84
Other Kinds	85
Café and Restaurant	37
Non-Stock	10
Insurance Company	5
Service	60
Amusement	17
Producers	4
Francise	6
Manufacturing	8

As shown in Figure 4.1, the most number of registered business establishments in CBD is located at JM Basa Street. Central Market, which is located at the intersection of Rizal, Iznart, Guanco, and Aldeguer Streets, is considered as another category because of the significantly varied businesses in it.

Passenger cars is the main mode of transportation used by people going to school, work, and other business transactions. Block 3-Guanco St has the most number of vehicles parked. Establishments such as central market, school, and mall is located within this area. (please refer to Figure 4.2)

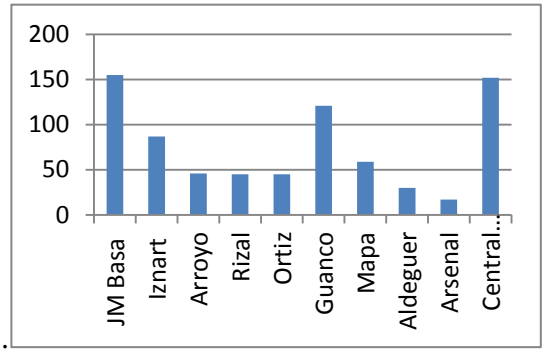

Figure 4.1 Number of Establishments Registered on Streets in CBD

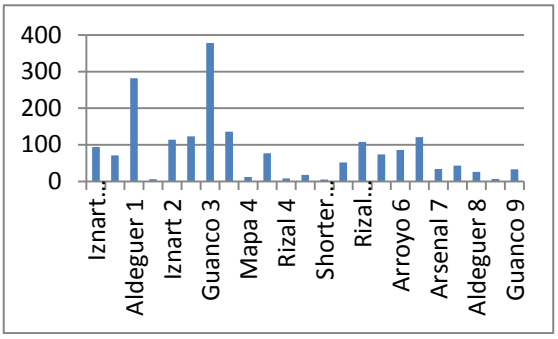

Figure 4.2 Number of Vehicles Parked in CBD

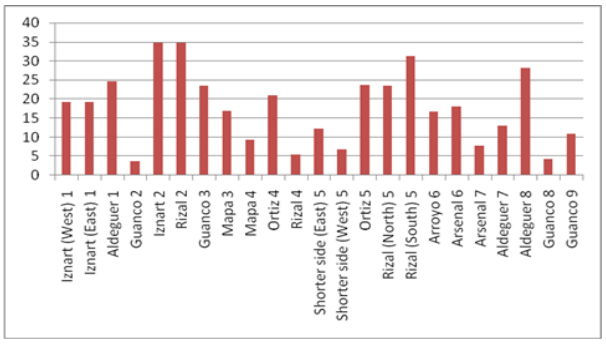

Figure 4.3 Turnover Rate (veh/sp-min)

Turnover rate or the use of vehicle over occupied space and time is shown in Figure 4.3. Block 2 Rizal and Iznart have the highest turnover rate which is 19.2 veh/sp-min. It was observed that most of the people going to this area deal with short-time business. Majority of the parker's trip purpose is to shop. Block 2 Guanco St. has the lowest turnover rate.

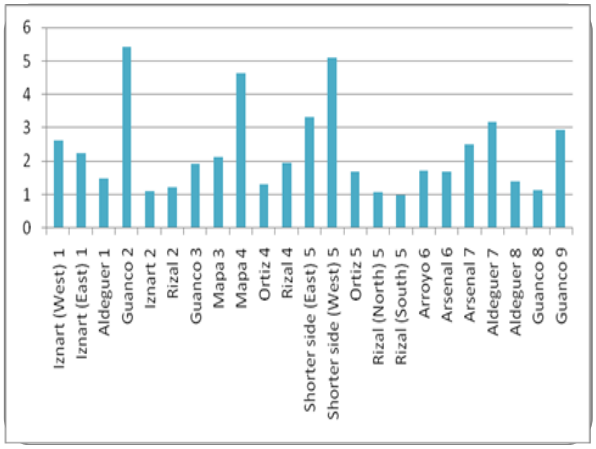

Figure 4.4 Parking Duration (hr/veh)

Parking duration or the time spent by the vehicle parked in the same area is shown in Figure 4.4. Block 2- Guanco has the highest rate of parking duration of 5.417 hr/veh. It was then observed that long-time businesses such as office, school,and etc., are within the area. The area where the least number of parking duration is in the Block 5 Rizal, both north and south.

4.2 Areas for Possible Off-street Parking

Figure 4.3.0 shows the areas for possible off-street parking. It was identified that there are six areas located within the CBD. The areas were categorized as big and small parking space. For big parking space, 150 vehicles in maximum can be accommodated and for small parking space, a maximum of 80 vehicles can occcupy the area.

4.3 Parking Characteristics

User information survey was done to determine the parking characteristics of drivers parked in CBD. There were a total of 248 respondents who willingly participated in the survey and 77 refused to be interviewed.

The following pie charts show the trip origin and duration of stay. About 28% of the parked vehicles came from outside the city and about 38% of them stay for 1-3 hours.

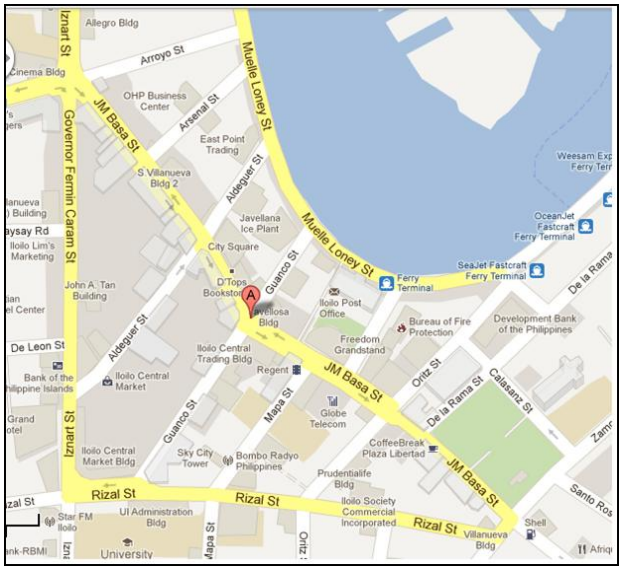

Figure 4.3.0 Areas for Possible Off-street Parking

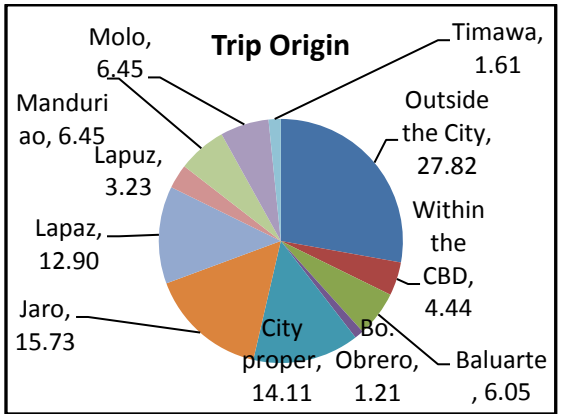

Figure 4.3.1

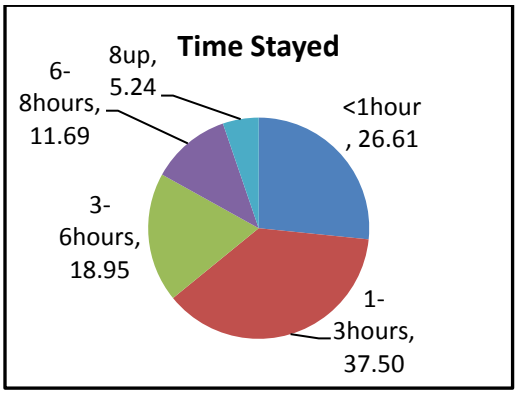

Figure 4.3.2 Duration of Stay

The following tables who the results of the user information survey conducted.

Table 4.3.1 Trip Purpose

Trip Purpose	School	Shop	Work	Home	Others
Total	8	89	83	2	66

Table 4.3.2 Mode of Transportation

Mode of Transportation	Car	Motorcycle	Others
Total	154	38	56

Table 4.3.4 Parking Fee

Flat Rate	Php 5	Php10	Php 15	Php 15 up
Total	47	30	4	1

Table 4.3.5 Time Willing to Walk

Time Willing to Walk	1 min.	2-5 min.	5-10 min.	15 min.
Total	80	128	38	2

Table 4.3.6 Employment

Employ mment	Priv ate	Gover nment	Self-empl oyed	Unemp loyed	Oth ers
Total	100	17	82	25	24

Majority of the car owners parked are the shoppers and the workers. Most of them are using passenger or private cars.They are will to pay a parking fee of Php5.00 and can walk as long 2-5 min from the parking lot. Most of the parkers work in a private company.

5. Conclusions and Recommendations

All specific objectives in this research have been met in order to design the proposed parking facilities in the heritage site in Iloilo City. A road network inventory has been made, the parking characteristics of vehicles have been determined, and areas for on-street and off-street parking have been identified.

The road network inventory showed the areas with unregulated on-street parking and the lack of designated off-street parking. The parking characteristics of vehicles showed that the top reasons of people going to CBD are to shop and to work. The on-street parked vehicles are mostly due to short time business transactions. Possible off-street parking sites were identified to be used by vehicles that need to stay long such as business owners and employees.

Several observations have been noted by the research group. The on-street parking facilities are not properly labelled as to the type of vehicles. The number of privately owned vehicles parked on the main roads obviously adds to the traffic congestion in Iloilo City.

It is with these observations that certain recommendations are being made. On-street parking must be regulated as to the type of vehicle and parking duration. Parking fees must be implemented for both on-street and off-street parking. The owners of the privately owned vehicles then can opt to use public utility vehicles and thus reduce the volume of vehicles.

It is recommended that further studies are to be conducted on the feasibility of parking buildings that must be located a certain distance from the heritage site.

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