Assessing the Viability of Unplanned Parking Spaces Within the Premises of Federal Polytechnic Ilaro, Ogun State, Nigeria

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ABSTRACT
This study investigates the parking capacity of organized parking lots at the Federal Polytechnic Ilaro, Nigeria. Unlike previous studies, this research explores the environmental dimension of parking capacity utilization, assessing parking volumes, indices, and turnover rates. The objectives are to identify organized parking spaces, determine parking capacity, and propose optimal and sustainable parking solutions. Using observational field surveys and secondary data from the institution's master plan, the study reveals that parking indices are consistently below 1, indicating underutilization of parking spaces. Recommendations include promoting walking as a healthy alternative, constructing walkways linking parking facilities to activity points, and optimizing parking space utilization. This research contributes to the development of sustainable parking solutions, enhancing the overall campus experience and environmental sustainability.
KEYWORDS: Analysis, Capacity, Parking, Facilities, Utilization.

I. Introduction

The increasing number of vehicles owned by students and staff in tertiary institutions has led to a growing demand for parking spaces. However, the tendency for vehicle owners to park as close as possible to their destinations within campuses often results in the use of unorganized parking spaces or incidental open areas. These informal parking spaces, which are not designated for parking in institutional master plans, can lead to unsustainable parking practices. As noted by Janak et al. (2020), parking decisions are influenced by demographic and economic factors, including age, income, parking policies, and accessibility. The lack of sustainable parking practices can pose significant hazards, particularly during peak hours and special events. This study aims to investigate the viability of unorganized parking lots at the Federal Polytechnic Ilaro, with a view to proposing more sustainable parking solutions. The objectives include identifying unorganized parking spaces, determining parking volumes, assessing the potential for converting these spaces to organized parking areas, and proposing optimal and sustainable parking strategies for the institution.

II. Methodology

The Federal Polytechnic Ilaro, located in Ogun State, Southwestern Nigeria, was established on July 25, 1979, and began operations on November 15, 1979. Situated in Ilaro, Yewa South Local Government Area, the institution's geographical coordinates are 6° 53' 0" North and 3° 1' 0" East. Over the years, the polytechnic has undergone significant infrastructural expansion, currently providing educational services to over 19,000 students across its six schools.
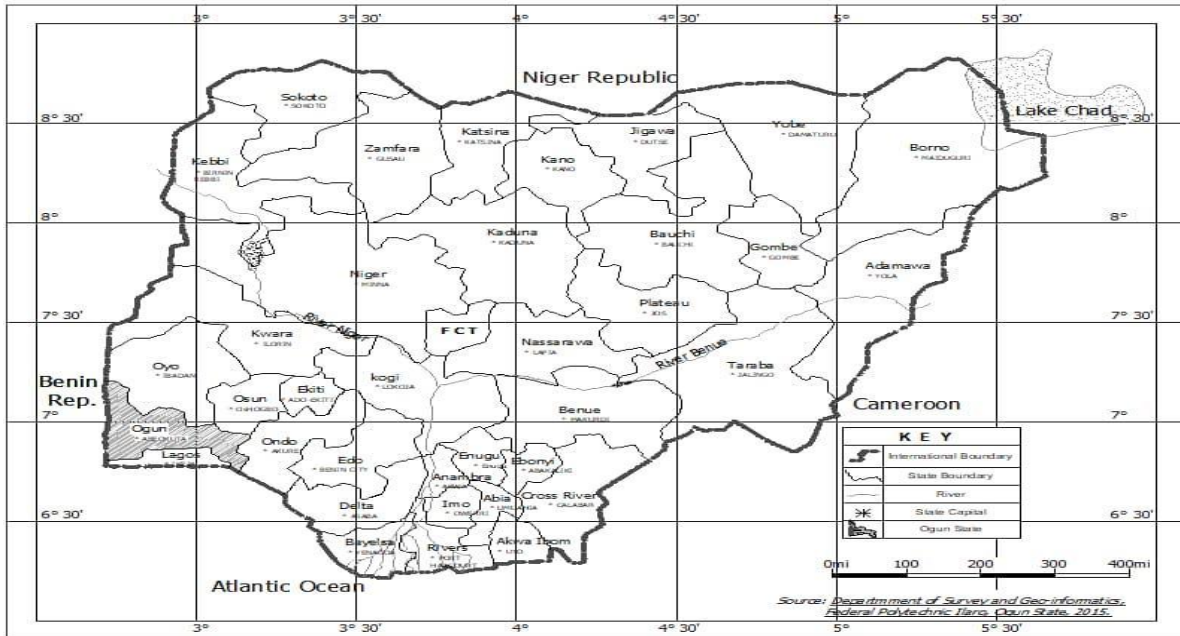
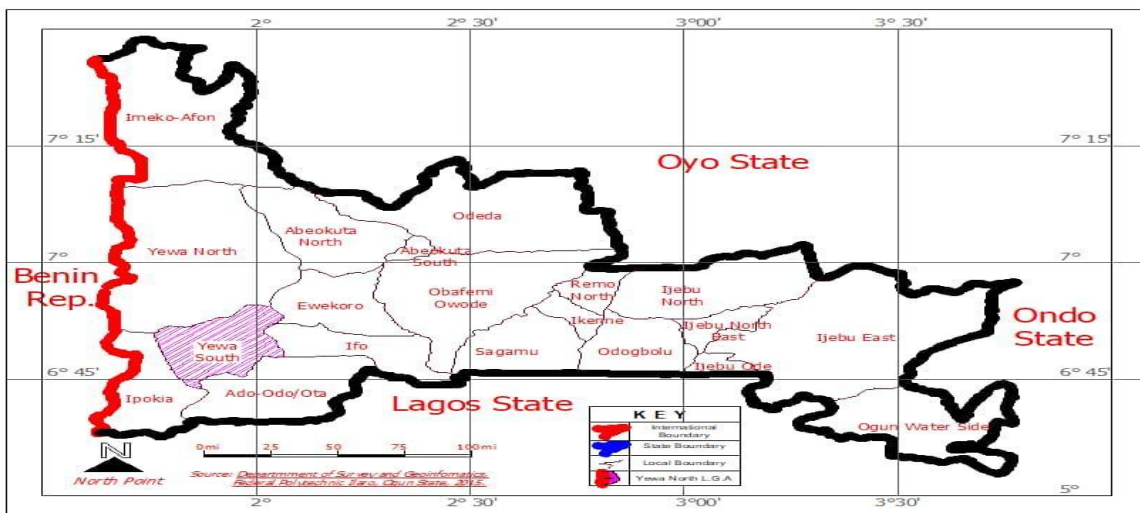Figure 1: Map of Nigeria. *Source: Department of survey and Geo Informatics, Federal polytechnic Ilaro, 2025.*

Figure 2: Map of Ogun State.   *Source: Department of survey and Geo Informatics, Federal polytechnic Ilaro, 2025.*
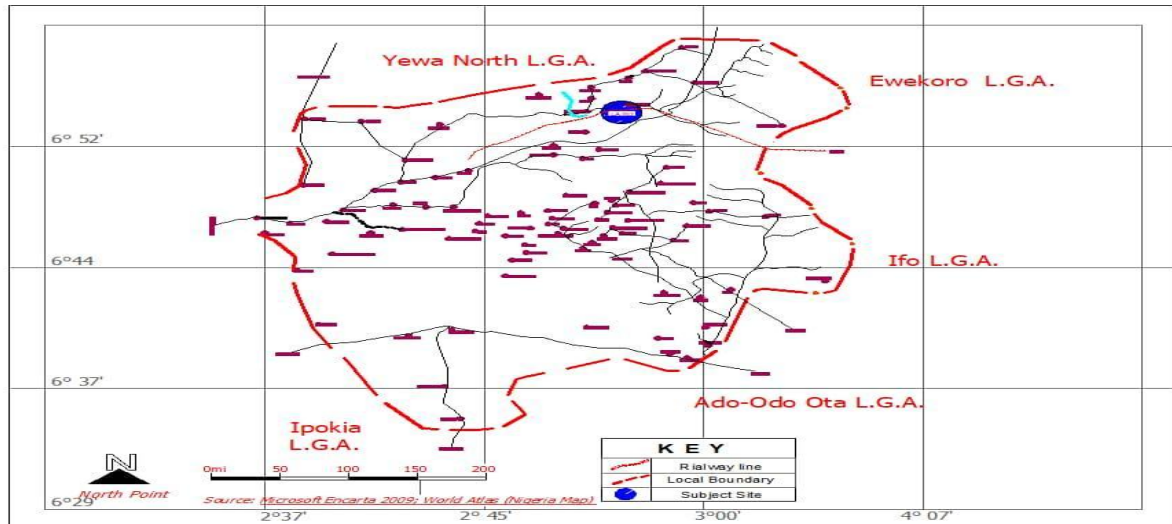
Figure 3: Map of Yewa South Local Government Area. *Source: Federal Polytechnic Ilaro, 2025.*
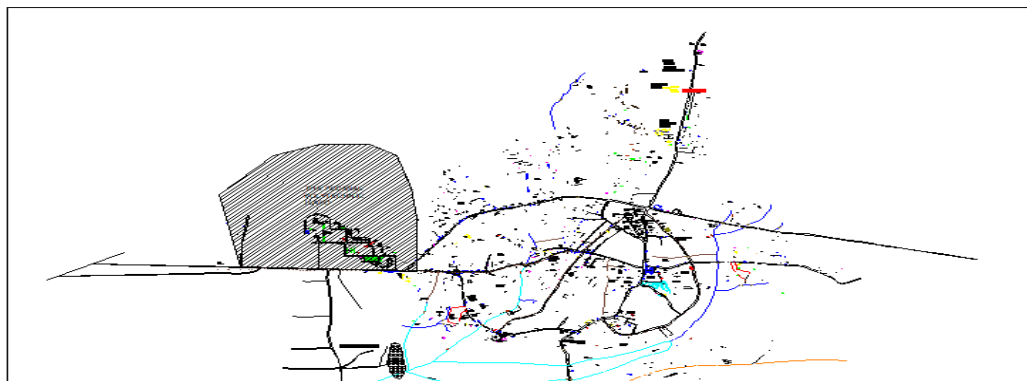

Figure 4: Map of Ilaro Town Showing the Study Area. *Source: Ilaro Zonal Planning Authority,2025.*

The study adopted an observatory approach in the form of field surveys. Secondary data were sourced from the Polytechnic's Master Plan and Strategic Plan. A week-long parking survey spanning 10 hours (between 7.00am to 5.00pm) per day parking surveys were conducted. Organized parking spaces were those confirmed to be delineated in the Polytechnic's Master Plan. They were effectively parking spaces that had been tarred and, in some cases, laid out into parking units. The different surveys conducted were related to parking volume, parking capacity, parking load, parking index and parking turnover. Parking volume is the total number of vehicles parked within a given period of observation. This really doesn't involve repetition of count for same vehicle still parked in the subsequent hourly interval during which another observation will be taken. Parking capacity refers to the total number of parking units/spaces laid out or available for parking within the lot being assessed. Parking load is obtained by getting the average of the vehicle counts parked per hour obtained within the surveyed parking space. The obtained average volume is multiplied by 0.25 (15 minutes) presumed to be the average duration within which a random vehicle is parked (University of Idaho, 2023). Moreover, parking index is the percentage of parking bays actually occupied by parked vehicles as compared to the number of bays available in the theoretical sense. Parking turnover is a ratio gotten by the division of the total number of vehicles parked for the whole duration of survey by the total number of parking lots available (Kadiyali., 2007).

Average Parking Volume=∑N0. 0f Parking Volume/No. of days
Parking Load=   Average Vehicle Count Per Hour *0.25
Parking Capacity = No. of bays.
Parking Index =Parking Load/Parking Capacity
Parking Turnover = Parking Volume/No. of available bay

III.   Results/Discussion

3.1 Parking Spaces in the Study Area.

Findings gotten through survey of the entire stretch of the institution's developed space and complemented with spatial information in the Polytechnic's Master Plan and Strategic Plan show that there are 15 organized parking spaces within the institutions. Of course, there are 27 unorganized parking spaces, which is the classification for either the incidental open spaces, on-street parking, and undeveloped spaces meant for other uses, where vehicle owners were parking illegally parking on account of proximity to activity areas.
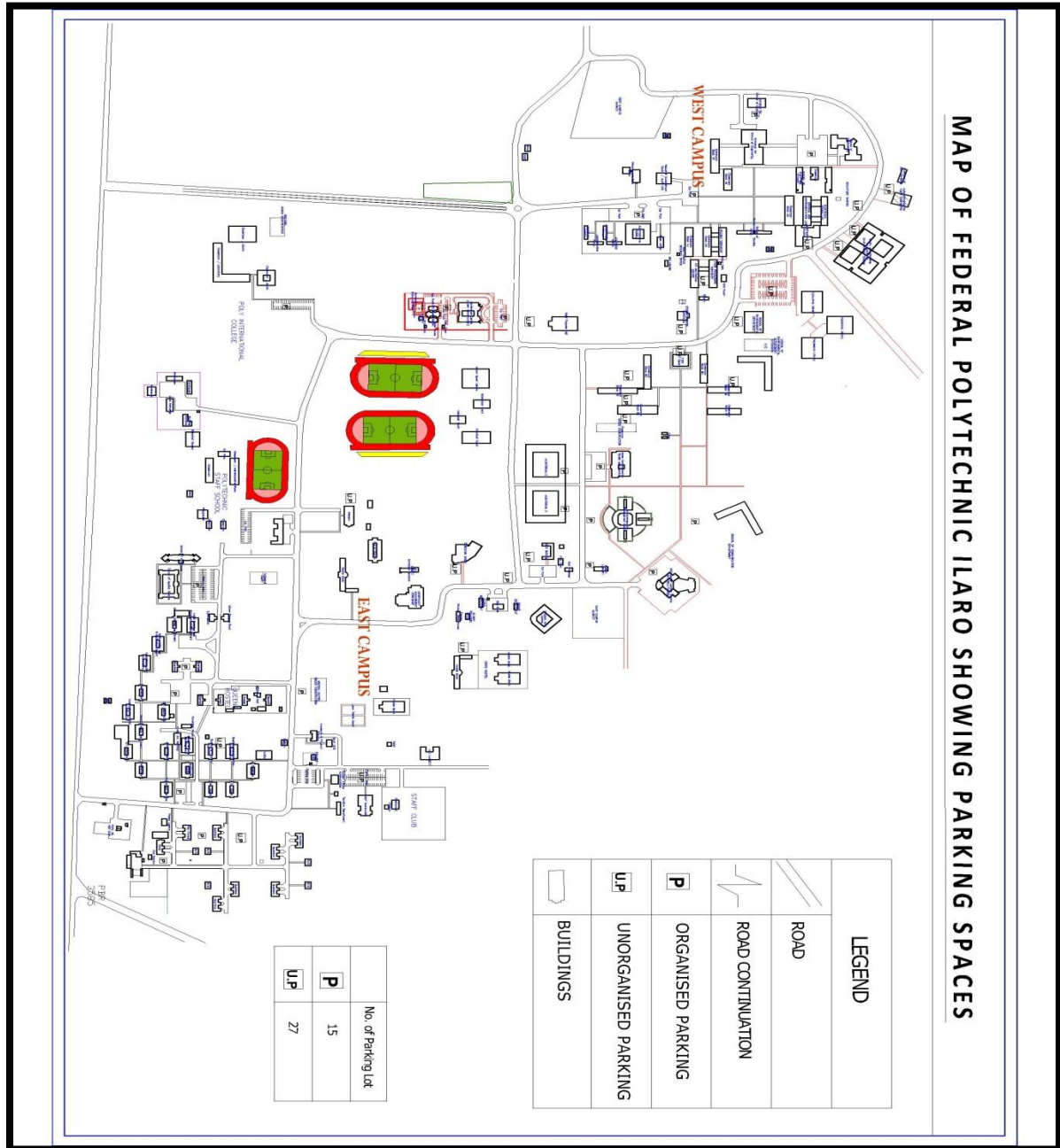

Figure 6: Parking Spaces in the study area
Source: Field survey, 2022

3.2   UNORGANISED PARKING SPACES

From the data presented in Table 1, the organized parking capacity for the Federal Polytechnic Ilaro is about 380. Considering the average parking time of about 15 minutes per random vehicle, barring special occasions like convocations or examination periods when parking periods can exceed that average limit, the parking capacity can accommodate about 1520 in one hour. This is about 15,200 parking spaces available within

the entire 10 hours period considered as the activity period for the institution. All the metrics assessed- parking volume, parking capacity, parking load, parking index and parking turnover, show that the parking spaces are not optimally utilized. From the 1.25 observed average parking volume per hour in Guest House to the 70.2 in admin block, it is evident that the parking spaces are underutilized. For instance, the average per hour capacity for admin block with 75 parking units should be 300, considering the duration of about 15 minutes that should be the average parking time for any random vehicle as espoused by University of Idaho (2023). Of course, this excludes special occasions like convocations or examination periods when parking periods definitely exceed that average limit. The most important evidence of underutilization of the parking spaces is the parking index estimations, as all the outcomes are less than 1. This effectively implies that, in all the parking spaces, the number of bays occupied within specific hours is lower than the theoretical number of bays available.

Table 1: Average Parking Volumes at Different Unplanned Parking Spaces Within the Campus

S/N	Location		Average Parking Volume
1	i.	Sculpture Garden	4
2	i.	Architecture studio	9.2
3	i.	Environmental studies Studio and workshop	9
4		Mechanical Engineering Workshops	2.4
5		West campus market	0.8
6	i.	Nearby Raheem Oloyo Conference Hall	2.4
7	i.	Multipurpose Hall	1.6
8	i.	Poly Staff College	10
9	v.	Poly Primary School	10.6
10		Poly Mosque	10.6
11		Poly Pure Water Factory	5.4
12		Poly School of Applied science	20
13		Microfinance bank	5.2
14		Pavilion ground	6.8
15		Near Poly First Gate	5.8
16		Opposite Dean of Students Affairs Office	14.4
17		CCL Hall	3
18	v.	Main Library	8.4
19	i.	School of Environmental Studies	10.4
20	i. i.	ASUP Hall	2.8
21	x. x.	Christian Union	9
22	i.	Opposite East Campus market	5.2
23	i.	CICS	4
24	i. v.	B Block (BA, BB, BC, BD, BE, BF & Oba Hall)	17.2
25	v. i.	PTDF	4.8
26	i. i.	ICT center	11.8
27	x. x.	Environmental / AG block	11

IV.   Conclusion/ Recommendations

From the findings, it is evident that there are about 15 organized parking facilities within the institution. It is also evident that all the parking spaces are currently underutilized. This implies that the ubiquitous parking in incidental open spaces, roads setbacks' parking, and undeveloped spaces within the campus is not explained by quantitative limitation of parking facilities. It is also not explained by the capacity of the institution's parking facilities. It is rather most logically explained by the behavioral tendency to opportunistic parking in the most proximate locations to accessibility areas, as canvassed by Mohammed (2016) and Janak, Sanjay, Pritikana, and Maulana (2020). This is usually the case when parking policies are non-existent, weak, and hardly enforced with punitive measures in form of fines. In order to optimize utilization of the current parking facilities and prevent illegal parking, it is imperative that the Management of the Polytechnic

improves existing parking facilities, most especially in terms of ensuring sheds are provided to obviate the tendency of indiscriminate parking under trees under the guise of looking out for canopies that is the common wont of vehicle owners. There is the need to not just promote the health advantages of walking, walkways should be adequately provided to link parking facilities with activity points that have been planned to be serviced by the parking facilities. Given the need to restore order, the Management of the school should design guidance systems like road signs and employ institutional wardens that would be saddled with the onus of enforcing parking policies of the institution. Fines can be imposed on erring vehicle owners. To further modify the micro-climatic conditions of parking facilities, trees can be aggressively planted around existing parking lots that are canopy free. This would represent a big leap in the attempt to implement the Federal Polytechnic Ilaro's campus green initiative program. Through the institution's community radio and social media, the Management should create necessary awareness and education regarding its parking policies towards a sustainable campus. Lastly, abandoned cars, machineries and supplies kept in parking lots, especially those in desirable areas, should be completely removed to optimize capacity utilization of the parking facilities.

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