

# Analysis Of Traffic Volume And Parking At Ishi -Gate, Umuahia, Abia State, Nigeria

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*Abstract: The aim of this study was to analyse traffic volume and parking at Ishi-Gate, Umuahia in Abia State. The study appraised vehicular characteristics, hourly traffic volumes, accessibility, waiting times, ribbon development and overall congestion in the Central Business District. The study concluded that increase in the volume of traffic and the Ribbon development or street trading around Ishi-Gate, has significantly reduced the level of service of the major roads around this CBD. The Land use pattern or structural lay-out should be adjusted to accommodate the envisaged traffic flow and increase socio-economic activities effectively. Secondly, there should be proper channelization of the road junction and installation of appropriate road marks and signs. There should also be a provision of an inner ring road at the junction to create a standard roundabout. Adequate law enforcement on street trading should be made since only a law enforcement vehicle is seen, moving from one place to the other, without being stationed. Street parking along these narrow roads should be avoided and the roads should be expanded to accommodate adequate traffic flow.*

**Keywords: Traffic, Congestion, Parking, Volume, Vehicular, Road, Street, Waiting Time**

## I. INTRODUCTION

Parking problems and traffic congestion, especially at any Central Business District (CBD), constitute socio-economic and spatial problems for any town. The Central Business District (CBD) is the economic life wire of most cities and it is the center, where commercial and trading activities are at its crescendo. A characteristic of many developing cities, even some of the very largest is their mono-centric spatial form (Fouracre and Turner, 1992). The CBD attracts and generates more person trips, and it is the origin and terminus of most trips within an urban center (Owolabi, 2002). According to the severity of congestion, it may be required to have limited parking facilities or higher parking charges in the more congested zones (Owolabi and Ojuri, 2004). A city's CBD is usually typified by a concentration of retail and office buildings. The CBD usually has an urban density higher than the surrounding districts of the city, and is often the location of the tallest buildings in the city.

## II. THE STUDY AREA

In the account of Wikipedia, Umuahia (pronounced [ʊmʊɑːhiɑː]) is the capital city of Abia State in southeastern Nigeria. Umuahia is located along the rail road that lies between Port Harcourt to Umuahia's south and Enugu city to its north. Geographically, it is located between longitude 7° 25' 30" to 7° 39' 0" and latitude 5° 19' 30" to 5° 42' 0" and has a total land mass of 657 km<sup>2</sup> and projected population of 659826 (NPC, 2006).

Umuahia's indigenous ethnic groups are the Igbo. Umuahia is well known as being an agricultural market center since 1916. It is also a railway collecting point for crops such as yams, cassava, corn (maize), taro, citrus fruits, and palm oil and kernels. There are several breweries in Umuahia, and there is also a palm-oil-processing plant. Nigeria's National Root Crops Research Institute, at Umudike, is adjacent to the town. Umuahia also has several colleges including Trinity College (theological) and several hospitals.

Umuahia comprises two local government areas: Umuahia North and Umuahia South. These local governments

are also composed of clans such as the Umuopara, Ibeku, Olokoro, Ubakala and Ohuhu communities. Umuahia town is traditionally owned by the Ibeku after early British administrators based the town in their lands. According to popular legend, the name Umuahia derives from the Igbo word *OmaAhia* or "Oma Ahia", which means "market place or market center", respectively. British colonists, who arrived the area and invaded it sometime around the mid-to late 19th century, upon learning the name, mispronounced and misspelled it as "Umuahia". Other legends exist regarding the origin of Umuahia, but the foregoing version seems most probable by consensus. In pre-colonial times, it served as one of the central marketplaces in the region for commerce.

Given its serenity and proximity to other towns, such as Ohafia, Abiriba, Arochukwu, Obowo, Ngwa, Okigwe, Uzuakoli, Bende, Nnewi, Akwa Akpa (Old Calabar), and Kalabari, merchants of produce, pottery, crafts, textile, traditional medicine, palm wine, and tools travelled from afar to trade at the busy market center with many roads leading to it.

The Ishi-gate at Umuahia appears to be a Central Business District of the town. There is actually no real gate at the place, except a long metallic bar which is usually employed to close vehicular traffic routes when trains are passing in order to avoid accidents. Quite significantly, the gate identifies the main market at the centre of the metropolis and the many loading points of several inter-state transport companies.

The place is a melting pot that captures the heartbeat of the city. (<http://www.vanguardngr.com/2013/10/gate-umuahia/>). Markets have a particular importance as well as being the crucial link point, in the sophisticated batter mechanism of our society by which labour is exchanged for goods. Besides this, they provide one of the main day-to-day reasons for people to meet each other. This leads to high vehicular volumes, especially on market days and environmental pollution (WHO, 2016). For markets that operate on daily basis, such as that of Umuahia, there is always a high daily vehicular volume (The Economic Times, 2016).

### III. TRAFFIC VOLUME AND ACCESSIBILITY AT THE ISHI-GATE

At the 'Gate' there is a highly pronounced urban pressure, with all its tension and conflicts, including activities at the old gates with the commotion and environmental pollution that are the hallmarks of this central place of Umuahia. A lot of vehicles are observed on daily basis at the 'gate'. The three major roads that cross each other at that point are the Warri Street, Calabar and Umuwaya Roads. The Umuwaya and Calabar roads are dual carriage ways but the Warri Street is a single lane. There is no functional parking lot at the intersection of Umuwaya road and Warri Street. The next streets where vehicles park, illegally, are Ohafia and Item Streets. At the intersection of Calabar Road and Warri Street, there is a little piece of land where vehicles park. Because of lack of space, some vehicles also park illegally, along Lagos Street, Nkwerre Street and Enugu Road.

Transportation system serves as a major instrument of every society's economic growth and development. Again, urban road network plays a major role in the spatial structure of the area and it is the main catalyst for city socio-economic development and transportation carrier. It provides the primary means of transportation for cities socio-economic activities and making many developmental projects to depend on it. It is also the major factor determining the speed of growth and development of a particular place (UNCHS, 1984)

The major transportation routes in use comprise the railway and road. The road transportation network is the most dominant means of transportation. The major road links Umuahia to other cities within the state and other states while secondary roads link within the town and other settlements. The railway route links Umuahia to other towns in the State such as Uzuakoli/Ovim- Enugu State in the North side and Umuahia- Aba / Port- Harcourt in the south. At the Ishi-Gate, passengers and other commuters travel or arrive from places such as: Warri, Port-Harcourt; Aba; Lagos; Ibadan; Enugu; Abakaliki; Calabar; Owerri; Benin and Abuja. Those who come from or travel to adjoining communities or villages include commuters to or from Umudike, Ndioru, Ariam, Express, Alala Ariam and Isiala Ariam. Fourteen-seater and seven-seater buses as well as the 'keke na pep' tri-cycle cars usually convey passengers to their various local destinations. The fourteen-seater buses and seven-seater cars are used for external journeys.

Name of street (road)	Vehicles in motion		Parked vehicles	Total No. of vehicles
	No.	%		
Umuwaya	780	43.58	31	811
Calabar	520	29.05	26	546
Warri	490	27.37	15	505
Total	1790	100.00	72	1862

Source: Authors' aerial photograph, 2014-2016

Table 1: Vehicular Traffic Distribution At Major Roads At Ishi-Gate, Umuahia Per Hour (Average Of Three- Year Data)

S/No	Type of vehicle	No. of vehicles in motion
1	Private	310
2	Taxi/ commercial	240
3	Pick-up/ commercial	80
4	Lorry/ Tipper	120
5	14- seater Buses	310
6	7-seater Buses	250
7	Keke na pep	300
8	>Two- Axles	180
	Total	1790

Source: Authors' Field Traffic Survey, 2014-2016

Table 2: Classified Traffic Survey of The Ishi-Gate Junction per hour (average of three- year data)

Name of Major Local Route	Mean Passenger Waiting Time (in Minutes)
Umudike	25
Ndioru-Ariam/ Isiala Ariam- Alala Ariam	33

Source: Authors' Field Traffic Survey, 2014-2016

Table 3: Mean Passenger Waiting Times At Ishi-Gate (14-Seater Buses)

Name of Major Local Route	Mean Passenger Waiting Time (in Minutes)
Umudike	12
Ndioru-Ariam/ Isiala Ariam-Alala Ariam	20

Source: Authors' Field Traffic Survey, 2014-2016  
Table 4: Mean Passenger Waiting Times At Ishi-Gate (7-Seater Buses)

Name of Major Local Route	Mean Passenger Waiting Time (in Minutes)
Umudike	10
Express	12
Aba Road	8

Source: Authors' Field Traffic Survey, 2014-2016  
Table 5: Mean Passenger Waiting Times At Ishi-Gate (Keke Na Pep)

#### IV. DISCUSSION OF RESULTS

The highest average volume of traffic 1862 vph for the year 2016 could be projected for six years (2016-2021) using equation 1 (Barclay, 1958):

$$V_D = V_p (1 + r)^n \dots\dots\dots 1$$

Where:

$V_D$  = Projected volume;

$V_p$  = Known volume;

$r$  = Growth Rate (3% as recommended by Transport and Road Research Laboratory, 1997 for developing countries);

$n$  = No. of years of projection.

Using the above formula for the situation at Ishi-Gate,

$$V_D = 1862 (1+0.030)^6 = 1862 (1.030)^6 = 2223 \text{ vph.}$$

Given that the road capacity is 3000vph for 2 lanes as specified by the Federal Ministry of Works and Housing (1973), the volume/capacity ratio,  $v/c = 0.741$ . At a very low spot speed of about 18km/h, there is a very poor level of service created by this forced flow of traffic.

#### V. CONCLUSION AND RECOMMENDATIONS

The increase in the volume of traffic and the Ribbon development or street trading around Ishi-Gate, has significantly reduced the level of service of the major roads around this CBD. The Land use pattern or structural lay-out should be adjusted to accommodate the envisaged traffic flow and increase socio-economic activities effectively. Secondly, there should be proper channelization of the road junction and installation of appropriate road marks and signs.

There should also be a provision of an inner ring road at the junction to create a standard roundabout. Adequate law enforcement on street trading should be made since only a law enforcement vehicle is seen, moving from one place to the other, without being stationed. Street parking along these narrow roads should be avoided and the roads should be expanded to accommodate adequate traffic flow.



Figure 1: Traffic Congestion at Ishi-Gate (view at the junction of Warri street, Calabar and Umuwaya Roads)



Figure 2: Traffic Congestion at Ishi-Gate (view from Calabar Road)



Figure 3: Traffic Congestion at Ishi-Gate (view from Umuwaya Road)

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