



**DESIGN AND PLANNING PROPOSAL FOR TRUCKS AND TANKERS
GARAGE IN JIMETA, YOLA NORTH LOCAL GOVERNMENT AREA
ADAMAWA-NIGERIA**

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Abstract

The paper proposes a Transit Truck Park for short and long-term parking demand in Jimeta, Adamawa state. This was done by examining the challenges and prospect faced by truck and trailer drivers and suitability of the selected site for the proposal. The data was collected from primary (field study) and secondary (existing literature, data Government reports and allied documents) sources. Alternatives sites were evaluated with regard to suitability of siting a Transit Truck Park, standards and design consideration were used as guiding principle for the design and proposal in the study area. The study concludes that the introduction of technology enabled solution, investment in building attractive truck transit parks, and proper regulation of the road freight sectors are recommended as short and medium plans for minimizing truck fatigue induced accidents on Nigerian roads. The study also recommends that the truck organization should work with the local jurisdictions to identify and adopt guidelines for accommodating and developing truck parking facilities, including identifying ways to accommodate truck parking in local land use development and redevelopment processes among others.

Keywords: *Transit Truck Park, Tankers parking facilities, Garage, standards.*

Introduction

Parking lots are similar in that they all share a common characteristic; they are used to park vehicles. They also need to be able to effectively perform for an extended period of time. Vehicles come in all shapes and sizes, however, like giant 18-wheelers and transportation trucks. Due to the sheer size and weight of these types of vehicles, their parking lots also need to be adapted to handle the extra weight. Parking lots are subject to a number of environmental and man-made factors that need to be taken into consideration before construction, and truck stop parking lots are no different. The materials required to support these massive trucks can't be anything less than the best if you want your parking lot to last. A truck stop parking lot built with average or low-quality materials will degrade much faster than a regular supermarket parking lot, for instance. In case you are looking to build a truck stop parking lot, let's go over everything you need to know so you can create the highest-performing parking lot possible and minimize any unnecessary maintenance costs as well.

The design of all parking, loading and site access facilities (including streets, sidewalks, and driveways) shall comply with the "Parking and Access Design Standards". Every parking lot and driveway shall be graded for proper drainage and provided with an all-weather surface (concrete, HOT mix asphaltic concrete, surface treatment) as approved by the City Engineer, maintained at all times in such a manner as to prevent the release of dust, and shall be kept free of dust, trash and debris.

Driveways, except where designed for one-way traffic flow within a parking lot, shall not be less than 24 feet in width or more than 40 feet in width. The driveway system shall allow for unobstructed emergency access at least 16 feet in width as close as possible to each structure, and shall be clearly marked to prohibit parking or other obstruction of such emergency access (See Part V, "Off-Street Parking and Loading", Waco Zoning Ordinance).

The aim of the paper is to design planning proposal for truck and tanker garage in Jimeta, Yola North L.G.A, through the following objectives:

1. To examine the existing parking of Tankers and Truck in Jimeta.
2. To examine characteristics in terms of security and services that are needed to make a parking facility sufficiently safe and secure which can meet the needs of the users
3. To examine the need for a safe and secure truck parking capacity needed in the study area
4. Design planning proposal that meets the standard and criteria for providing safe and reliable Garage for Truck and Tankers in the study area

The Study Area

Yola North Local government is located between Latitude $9^{\circ} 13'N$ and $9^{\circ} 17'N$ and Longitude $12^{\circ} 24'E$ and $12^{\circ} 26'E$ with total land area of approximately 231.64km² and altitude of 185m above sea level. Yola North was initially merged with Yola South and was called Yola. Jimeta (Yola North) gained independent town status with its own council in 1955. With the construction of a spur road to Yola (5.5 miles [9km] South-Southeast), the town became a river port for Yola, gradually taking over most of the river-borne traffic along the Benue River, from mid-July to mid-October, when the Benue has deep water, boats carry peanuts (groundnuts) and cotton from Cameroon and hides and skin from the hinter-land of Yola-Jimeta downstream to the Niger river Delta ports for export. Today Jimeta as located in fig. 1.1 is the administrative centre of Adamawa. Jimeta has a daily market (Jimeta Modern Market), Zoo and Airport, Nipost and NITEL offices as well as the main mosque and cathedral. Being a state capital it's also a major transport hub with buses and taxis heading North to Mubi and Maiduguri, West to Numan, Gombe and Bauchi and South to Makurdi and Katsina. There is a State Polytechnic (SPY) and Federal University of Technology, Yola (FUTY) and other educational institutions, (Web, 2010 and Encyclopedia Britannica, 2010).

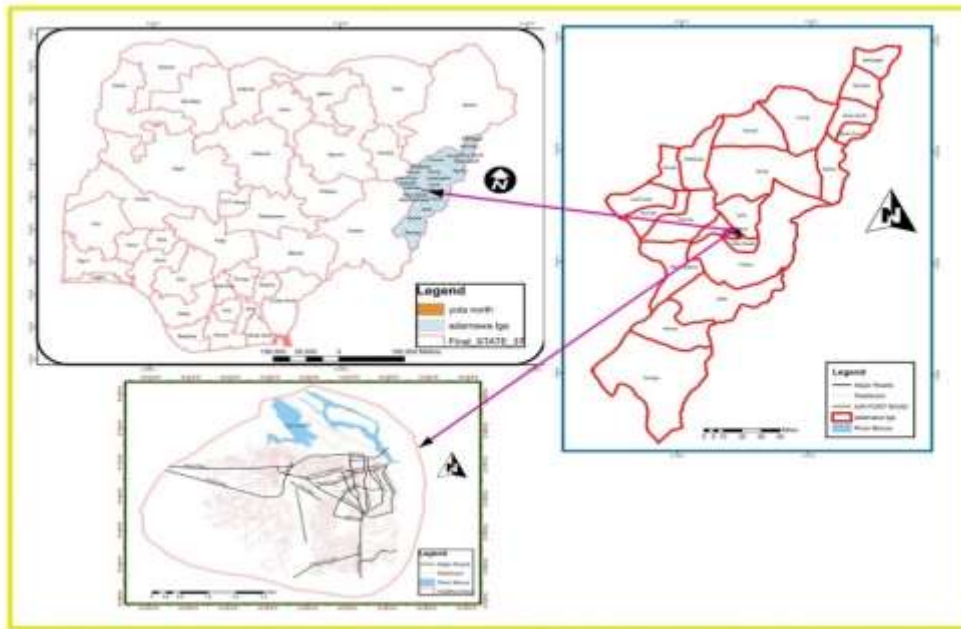


Figure 1: Locational map of the study area: Jimeta Metropolis Yola North L.G.A

Source: Field survey (2021)

Physical characteristics

i. Geography and Topography

Jimeta has many topographical features and is located in a very distinct Geographic region. Jimeta lies on the banks of the River Benue which is the main tributary to the River Niger. Jimeta is also close to the Mandara Mountains which lie to the South and the Shebshi Mountains which lie to the North. The Shebshi Mountains, Dimlang (Vogel) Peak, is the second highest point (2,042 m) in Nigeria. Chappal Waddi also known as the "mountain of death" lies in the Gashaka Gumpti Nature Reserve with an access point to the Reserve in Yola. Jimeta is also where the Mambila Plateau starts its elevation with it reaching 1828 metres above sea level in some places.

ii. Soil and Vegetation

The Soil of Jimeta is derived from the basement complex rock. However, there is some alluvial soil along the Benue flood plains. The soil of the study area is loamy and it drains easily when it rains (Barton, J. etal). The vegetation of the study area falls within the sub-Sudan

vegetation zone of Nigeria consisting of short grasses. Medium to short trees and shrubs, more especially in the months of August and September during which the area records higher amount the rainfall. Over the years, the soil vegetation of the study area has been altered by anthropogenic activities such as uncontrolled bush burning and falling of trees for agricultural activities, overgrazing by herders as well as the over. Presently the vegetation found in the study area are mostly economic trees and are planted by government and individual most, of the trees are fruit trees for personal consumption and are found within one's land area while those planted by government are mostly found in schools, ministries, along major roads and other governmental organization. These trees Includes *Parkia charpertoniana*, *Butyrosperum parodoxam*, *Andasonia digitata*, *Tamarindus indica*, mahogany tree, neem tree, mango tree, dead palm tree and guava tree.

iii. Relief and Drainage

The study area is located along river Benue. It is a flood plain land and river Benue is the major river in the state which rises from highland of Cameroun and flows southward to join the river Niger at Lokoja another minor river in the study area is river Chochi which is seasonal in nature, it flows from south-west of the study area and join river Benue in Yola south. Lake Gerio is one of the water body found in the study area, it has a stream that flow from southern part of the study area.

iv. Climatic condition

Jimeta/Yola has a tropical climate mark by two season; wet and dry. The rainy season begins in May and end in October while the dry season last for mainly from November to April. The mean length of rainy season ranges from 120-210 days, while the mean annual rainfall ranges from 900 – 1100mm (Farhan, B. And A.T. Murray, 2008.). Temperature in this climatic region is high throughout the year, however there is usually a seasonal change. The seasonal maxima usually occur in April with maximum temperature of 40⁰C while the minimum can be as low as 18⁰C between December and January (Farhan, B. And A.T. Murray, 2008.).

It has abundant sunshine hours 2750 per annum; the average monthly relative humidity ranges from 15% in February to 68% in August with an average annual relative humidity of 40.5%.

v. Population and Land Use

According to Federal Republic of Nigeria official gazette (2009), the total population of Yola north (in effect Jimeta) was 199,674 people with male having 108,379 and female 91,295. The growth rate of this population is 2.7%. It was believed that the increase in total population is as a result of the area being an administrative capital of Adamawa State, Yola north local government area and increase in commercial activities.

Land uses commonly found in Jimeta Yola are administrative, residential, institutional, industrial commercial and open space or land undeveloped. Residential land use dominates the total land of the study area. Jimeta being the only first order core settlement in Adamawa state has three residential zones, low, medium and high density residential areas. The high density is characterized with high commercial activities. The major ethnic groups found in Yola north are Fulani, Laka and Hausa, and the common languages are Fulfulde and Hausa, (Barton, J. etal).

Materials and Methods

After the preliminary investigations which gave the researcher firsthand information about the physical environment of the study area to be able to effectively determine the relevant constraints and potentials of the study area. The chosen sample for the study which are the union of truck transport and truck drivers were interviewed using the interview guide, out of which 100 drivers were interviewed with the aim of sourcing reliable information so as to proffer solution to the prevailing problems. The following instruments were used for the collection of the data required for the research: Direct/Personal Observation, Interview guide, Journals, Textbooks, Documents from the Internet and other forms of Literature, Satellite Imagery; Google Earth, GPS (Global Positioning System) and Camera. Data collected will be analysed using Descriptive Statistics. Data collected would also be analysed with the aid of AutoCAD 2021, SPSS and ArcGIS 10.6. Also, Descriptive statistical method which

involves the use of tables, charts, and maps would be employed in the presentation of research finding.

Results and Discussions

The study seeks to identify and evaluate potential sites for facilities that would accommodate truck parking for truck vehicles of four or more axles and respond to the needs of truck drivers in Jimeta and Adamawa state at large. Today, truck drivers are doing at least three things that create this objective. Drivers are parking just for a few minutes at any number of sites that may not be meant to be used for truck parking, some of which create issues with the general public or private landowners. Drivers are parking for a period of at least 10 hours at any number of sites that are not really meant to be used for extended parking, some of which may create issues with the general public or private land owners. Drivers are leaving vehicles (primarily just tractors without the trailers, but sometime with trailers) at the curb or on private property in residential areas. Usually this is for a minimum of overnight or over a weekend



Figure 2: Locational Site Map of the proposed site.
Source: Field survey (2021)

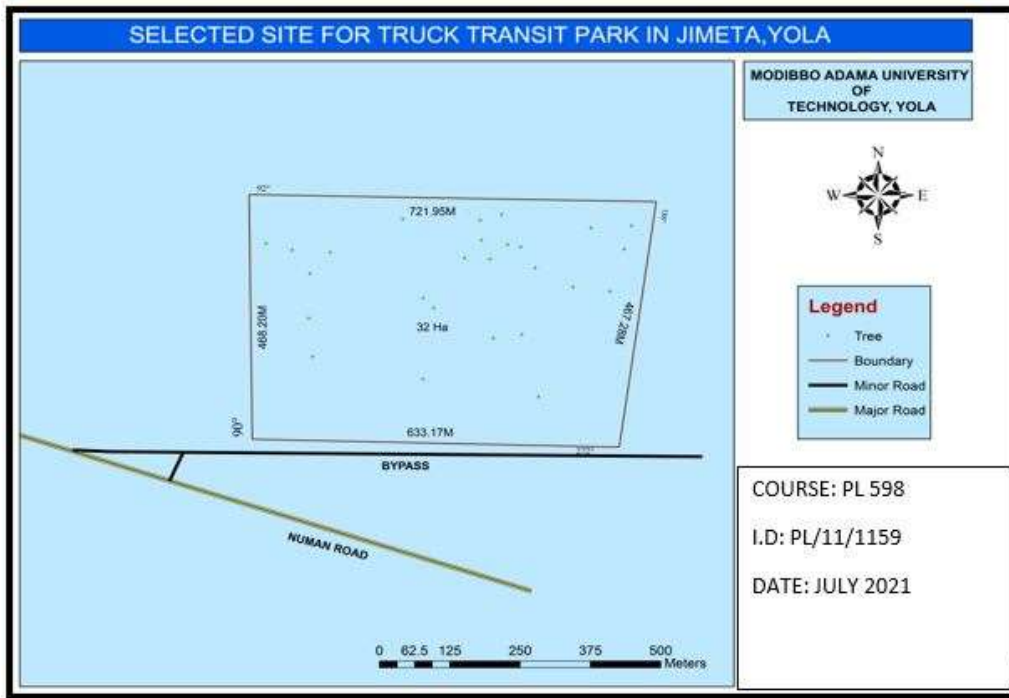


Figure 3: Site Plan of the proposed site
Source: Field survey (2021)

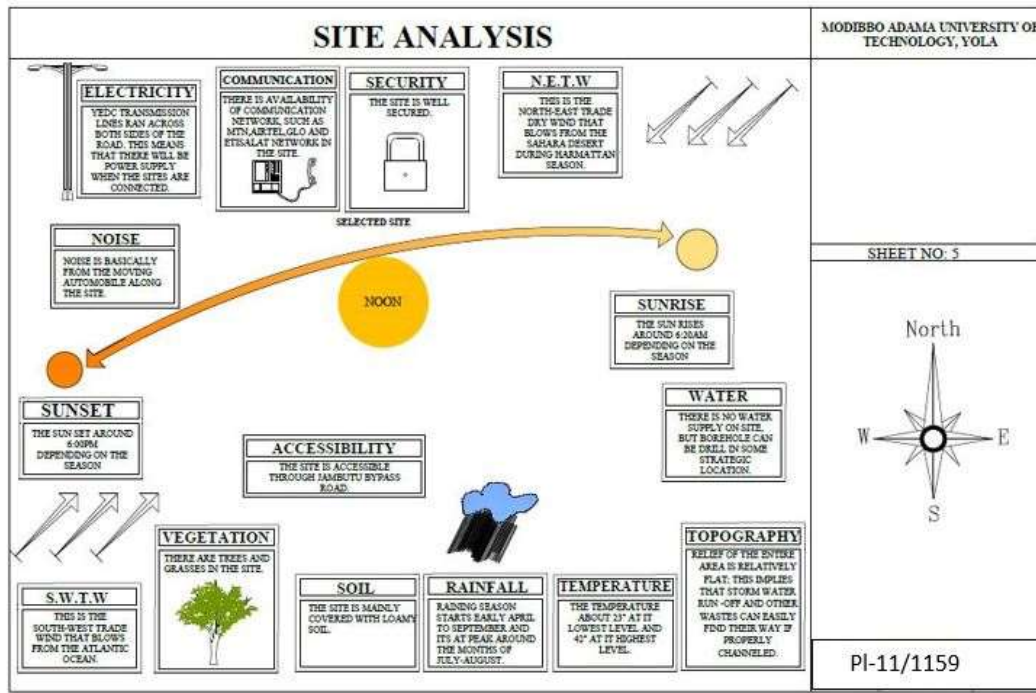


Figure 4: Site Analysis of the proposed site
Source: Field survey (2021)

Types of Truck Parking Sites

Parking Site Types

There are three characteristics of truck parking sites that need to be considered when determining what type or types of facilities are appropriate for Alameda or nearby counties. These characteristics are:

1. The site,
2. What goes on (or into) the site (herein labeled facilities) and
3. The activities (herein labeled activities or services provided) conducted on the site at the facilities that are on the site.

There are two perspectives from which to evaluate the three characteristics:

- Truck drivers and
- The host community. These perspectives can be very different, but are equally important. This section focuses on the characteristics that are most important to the truck driver(s) and
- The host community that surrounds a prospective site. This is based on the experience and observations by the study team including comments from the surveys of drivers and truck stop operators.

Sites, Facilities and Activities

Sites, facilities, and activities or services are defined differently depending on whether one is a truck driver or a member of the community. To the driver, the definition of an acceptable site can run the gamut from “just a place to pull over (hopefully safely and securely) for a short moment” to a “full service” truck stop that may be patronized for up to a week at one visit. (The special case of an emergency stop by the truck is not considered here.) To the community, it can range from a minor, temporary nuisance to a major, permanent complication for established or prospective residents/businesses.

- **Site criteria versus facility criteria**

There are various criteria to be considered when evaluating sites, facilities and activities. Valid site criteria tend to be land use and zoning, access to major truck routes, ease of ingress and egress, topography, type of neighborhood and the impact thereon, and cost to prepare the site. Valid facility criteria tend to be the nature of improvements needed such as surfacing, lighting, physical security, space to maneuver a tractor-

trailer combination, clearances, setbacks and screening. Valid activities or services criteria tend to be the basics that the user would patronize such a trash receptacle, toilet facilities, and fast food/coffee vendors or machines, but they can run to more complex needs such as tire service, truck wash and repair, sleeping facilities. They can also run to unique conveniences and aesthetics such as dog run and “peace and quiet”. Those mentioned are not intended to be exhaustive.

- **Criteria based on truckers’ needs**

The truck driver is the party that selects the site and is the exclusive user. Hence, for a site to be meaningful, it has to meet certain minimal criteria. These criteria will vary depending on the circumstance and duration of a given driver’s expected use of the site. To a truck driver, the primary site criteria are:

- Vehicle safety and security
- Personal safety and security
- Proximity to expected route of travel
- Sufficient space available to maneuver and park the vehicle the driver is operating

To a truck driver, the basic facility criteria are:

- Ease of ingress/egress
- Level, stable surface
- Free from intrusion by outsiders (fenced)
- Secure (personal, vehicle and cargo) enough to allow sleeping and/or leaving the vehicle

To a truck driver, the basic service criteria are:

- Truck parking available and authorized
- No or low cash cost to access site
- Low cash costs to use services
- No or low indirect cost of added trip miles
- No or low risk of adding driving time due to unexpected traffic complications
- Toilet
- Waste receptacles
- Coffee/soft drink service

- Public or shuttle transportation to nearby services (or walking distance)
- Sit down restaurant

- **Criteria based on community needs**

The immediate community around the parking/stopping site wants little or no disruption to the community. Therefore, many residential and mixed used communities do not want such sites in their vicinity. This is true even if the present community arrived after the pre-existing trucking use. Hence, the task is to mitigate impacts of a truck parking facility or work with the community to permit a facility that will have acceptable impacts to the surrounding area.

This is accomplished by locating the truck parking facility at a site that has appropriate General Plan or master planning designations and which includes:

- Compatible surroundings, e.g. industrial, warehousing, commercial, or open land
- Access that does not disturb existing neighbors
- Natural barriers to light and noise emitted from the site

It is done by having facilities that have:

- Artificial barriers to light and noise emission
- Auxiliary power that makes engine idling unnecessary, e.g. Idle-Aire installation

It is done by having services that are:

Benign in character

Attractive to local neighbors as patrons

Provide employment for locals

Support local community programs

Long Term or Short-Term Stopping or Parking Needs

When all that is required is truck parking for a short-term stop, the site requirements are the same as a long-term stop but the situation is materially different than if facilities and services have to accommodate long-term truck parking. When only short-term stopping is involved, the facilities can be minimal and sparse even if it requires the driver to stay with his truck. If long-term parking is required, then the facilities have to have the features outlined above in the driver's site and facilities criteria. Often, there need not be any

services other than receptacles and portable toilets. However, from the community's point of view, the situation is best when all of the site and facilities are operated to a high level of excellence and satisfaction. Well-located sites with basic functionality and limited facilities are a good option. Particularly before and during the business day, when there is a demand for long-term parking. Long-term parking facilities are more complex, but again, basic functionality with limited facilities at sites that have limited community impact has potential. Here the demand is less obvious and less well quantified because it is being met by the actions of individual truck drivers to cope with the present limited parking conditions. Specifically, the driver survey showed that one of the actions is for regional and interregional trucks and drivers to time their entry to and retreat from the Bay Area so as to congregate on the perimeter of the region and to avoid being "stuck" in the Bay Area overnight. However, that is not a fully satisfactory practice, because at least some regional and national drivers do get "stuck" and have few options for satisfactory overnight or long-term parking.

Proposal

Table 1: Facilities and services proposed

<i>S/N</i>	Facilities and Services	Quantity	Size (m)
<i>1</i>	Security/ ICT center	1	30 x 60
<i>2</i>	Parking lot	400	4 x 19m each
<i>3</i>	Restaurant	1	38.5 x 62.5
<i>4</i>	Motel	52 rooms	6 x 6m each
<i>5</i>	Fire service	1	40 x 50
<i>6</i>	Mechanic Workshop	1	60 X 70
<i>7</i>	Toilet	5	6 x 20
<i>8</i>	Borehole	2	
<i>9</i>	Shop	73	4 x m each
<i>10</i>	Reception	1	18 x 56
<i>11</i>	Clinic	1	26 x 48
<i>12</i>	Admin Block	1	20 x 60
<i>13</i>	Filing station	1	15 x 60

Source: field survey, 2021

Table 2: Land coverage by various land uses

S/N	Facilities	Land coverage (m)
1	Mechanic workshop	124 x 50
2	Truck wash	140 x 152
3	Recreational	105 x 112
4	Open space	182 x 287
5	Parking area	340 x 530
6	Administrative area	140 x 342
7	Motel	123 x 426

Source: field survey, 2021

Conclusion

The introduction of technology enabled solution, investment in building attractive truck transit parks, and proper regulation of the road freight sectors are recommended as short and medium plans for minimizing truck fatigue induced accidents on Nigerian roads. The socio-economic implications of technological solutions will include reductions in numbers of fatal road crashes and improved service delivery.

Recommendations

The following were recommended:

- Harmonized data collection on truck parking demand, capacity and deficits: Develop a standard methodology for the monitoring, measurement and forecast of truck parking demand, capacity and deficit problems so as to enable early proffering of solutions.
- The truck organization should work with the local jurisdictions to identify and adopt guidelines for accommodating and developing truck parking facilities, including identifying ways to accommodate truck parking in local land use development and redevelopment processes.
- Local jurisdictions should be encouraged to adopt and implement the guidelines
- Financial institution can also be asked to contribute to the success of the commercial aspect and the landscape area of the project. Contribution by these stakeholders will be mandatory rather than voluntary. The preventive approach will serve as the process by which it will provide

these missing facilities to avoid movement of the resident to other places or wards by increasing overcrowding.

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