

Traffic Control System: A Conceptual Framework of Developing an Urban Airport Design Intelligent Parking Guidance System for MM International Airport, Lagos, Nigeria

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Abstract

When people complain about traffic congestion in cities, the non-specialist imagines a lot of car drivers, who may be in each others way, but who at least all want to get to a certain destination. There is an increasing interest from motorists to have access to real-time information while en-route to a particular destination, advances in Intelligent Transportation Systems (ITS) has focused on the dissemination of real time information. As central business districts, airports, transit stations, and shopping centers continue to become more crowded during peak times, demand for real-time parking information is increasing. With decreasing parking supply and increasing MMI airport patrons, Federal government of Nigeria needs to beginning to realize the importance of properly allocating available parking. Intelligent Parking Systems (IPS) can provide the positive guidance necessary to help MMI airport patrons find available

parking quickly and safely without missing the plane. The purpose of this paper is to develop a conceptual model of parking guidance information system (PGIS). The reality is quite different: Up to 40 percent of car drivers are just cruising around hoping to find a parking space. It should be noted that, looking for parking spaces is a major cause of inner-city traffic especially Lagos. Keeping urban traffic flowing therefore means helping drivers find parking spaces. As experience has shown, the complexity of traffic means that real improvements can only be achieved with carefully harmonized complete solutions taking all factors into account. An Intelligent Parking System could help the Federal government of Nigeria reallocate parking and reduce congestion and illegal parks within the airport and its environment.

Keyword: Urban design, IPS, ITS, Advanced traveler systems, Urban parking guidance

1. Introduction

There is an increasing interest from motorists to have access to real-time information while en-route to a particular destination, advances in Intelligent Transportation Systems (ITS) have focused on the dissemination of real time information. As central business districts, airports, transit stations, and shopping centers continue to become more crowded during peak times, demand for real-time parking information is increasing. With decreasing parking supply and increasing MMI airport patrons, Federal government of Nigeria need to beginning to realize the importance of properly allocating available parking. Intelligent Parking Systems (IPS) can provide the positive guidance necessary to help MMI airport patrons find available parking quickly and safely without missing the plane.

Stout et.al. (1997) reported that for over thirty years, traffic information has been provided to help motorists make en-route decisions. In more recent years, the development of Intelligent Transportation Systems (ITS) and Advanced Traffic Management Systems (ATMS) have begun to improve transportation through the use of technology.

2. Purpose of the Paper

The purpose of this paper is to develop a conceptual model of parking guidance information system (PGIS) that will assist drivers to locate a car parking space within airport and its environs

Along the same lines, Intelligent Vehicle Highway Systems (IVHS), systems that “acquire, analyze, communicate, and present information to assist surface transportation travelers in moving from a starting location (origin) to their desired destination,” can now be utilized for en-route assistance as well as traffic data collection (Stout et.al. (1997).

However, Polak et.al. (1991) also reported that technology is beginning to recognize the importance of post-trip information dissemination by providing information on the location and availability of parking. Real-time information can be accurately provided to motorists through Intelligent Parking Systems (IPS) to reduce congestion in or near parking areas, insufficient utilization of the available parking space stock, road congestion caused by space-searching traffic, access problems and safety hazards caused by illegal parking, and environmental strains.

The best MMI airport IPS application will provide real-time parking information, reduce congestion, and reallocate parking for all patrons creating more efficient use of airport parking supply.

3. Conceptual Model of Parking Guide Information System

The figure 1 below illustrates the operation of the parking guide information system (PGIS). The system includes the following components: Outstation unit, Car park site, Vehicle detectors, variable message sign and control center.

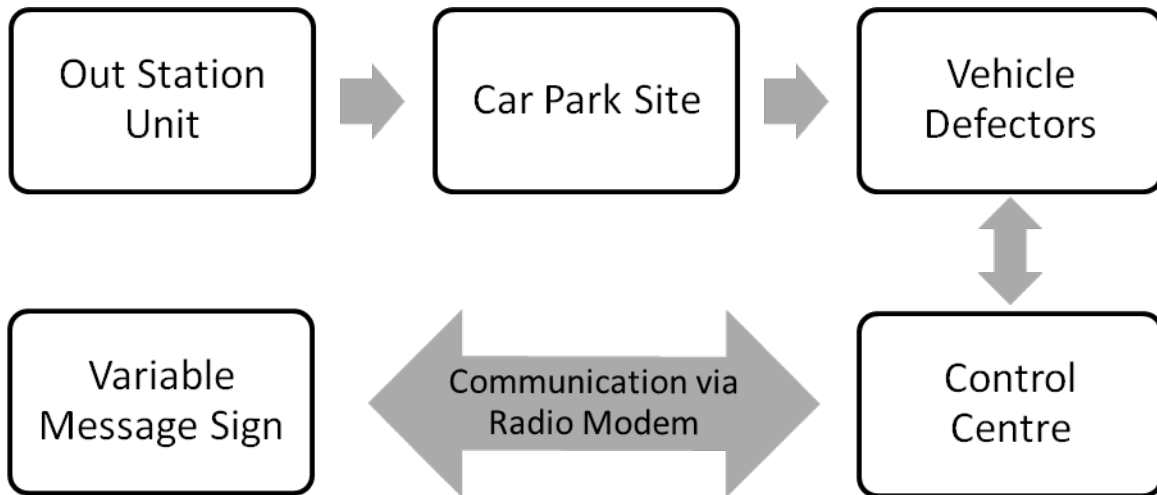


Figure 1: Conceptual Model of PGI System Operation

4. Analysis of Conceptual Model of Parking Guidance Intelligent System Operations

Basic System that Coordinates a Multiple Facility Intelligent Parking System

The basic system that coordinates a multiple facility intelligent parking system contains the three main elements of (1) parking facility equipment, (2) central computer and connections, and (3) signage. The parking facility equipment includes the vehicle counters, space monitors and processing units found on site to monitor ingress and

egress traffic, which is sent usually by modem to a central computer. The central computer then controls the variable message signage producing the desired LED displays to direct traffic to open garages or other parking areas. The central computer can also be programmed to send simultaneous messages by radio frequency, dedicated phone line, or Ethernet connection to the local radio, television station, or Internet.

Design of the System

The system includes the following components:

- vehicle detectors will be located at the entrances and exits to car parks, which are capable of detecting the passage of a vehicle;
- variable Message Signs (VMS) will be located at strategic points on the road network, which provide

information to drivers on the occupancy status of car parks or car park areas and direct drivers to car parks or car park areas with available spaces;

- a central computer which calculates the number of available spaces in each car park and car park area and commands the VMS to display the appropriate legend;
- a communications subsystem over which the central computer communicates with the vehicle detectors and VMS.

Possible Applications of Intelligent Transportation Systems

5. Conclusions

The paper concludes that an Intelligent Parking System could help the Federal government of Nigeria reallocate parking and reduce congestion and illegal parks within the airport and its environment. However, even the best parking guidance system will not help if a tailback in front of a multi-storey car park blocks the road. Car park guidance must work just as smoothly as the equipment installed on the periphery and must be completely integrated.

Intelligent Transportation Systems has a number of possible applications in relation to parking alert to drivers. Parking guidance systems have traditionally linked counters (microwave, inductive loop or infrared) at the entrances and exits of off-street car parks (which monitor occupancy and queueing) to variable message signs on key links into and around the town or city center, in order to advise drivers where they are most likely to find a space, close to their final destination.

In an effort to balance competing transportation objectives as well as meet urban design criteria, the MM International Airport Parking Guidance and Information will be strategically designed to group car parks into distinct parking areas to restrict cross-town movement around the airport and its environ.

In order to meet the efficiency demands, the Intelligent Parking System needs to be utilized; if not utilized, IPS will have little or no affect on the parking problems. The real challenge for the Federal government is to begin to develop a parking system that meets the demands of the workers and visitors that utilize parking. Current parking policy may hinder IPS effectiveness; however, if progressive changes are made to MMI airport parking policy, IPS could have positive effects on the supply and efficiency of parking at MMI airport.

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