

Lagos Congestion Series: Traffic Lights to the rescue

Since J.P. Knight installed the world's first traffic light in London in 1868, their use has become wide spread across all continents. Today traffic lights can be found at many junctions on roads all over the world. This article is not about the history of traffic lights but about assessing the effectiveness of the increasing number of traffic light installations in Lagos, a city known for its traffic problems. The goal here is to explore whether or not such installations have been beneficial to traffic management efforts within the state. When faced with a red light active for endless period of time, then drivers around the city tend to ask the question; why do we have these lights? Traditionally, the reason for installing traffic lights is to coordinate vehicle movements at junctions to prevent accidents or disorderliness in traffic flow across such junctions. They have also been used to regulate traffic flows on links connected to junctions.

To understand how the use of traffic lights can assist in traffic congestion management, it is important to know how congestion occurs on roads. Congestion can be as a result of excessive demand for road space, which, for instance, could be as a result of short term increase in vehicle arrival rate or a reduction in road capacity following an incident on the road link in question. Whatever the cause, once a saturation flow of vehicles is reached, congestion quickly develops. Also, on a road already experiencing saturation flow, a single driver braking unexpectedly can send a shock wave of delay backwards. Consequently, a prolonged accumulation of such delays will cause traffic to grind to a halt. This is what is now happening in Lagos; where the current generation of installed traffic lights are unable to cope with increasing traffic demand. However, help may be at hand as traffic lights have since evolved into an intelligent system which now forms part of an integrated approach to traffic management in many developed countries.

With intelligent traffic control system, traffic lights are fed information about traffic flows into their vicinity. This information is used to alter their on/off signal timing accordingly such that the most congestion prone links are given flow priority. The use of live information about traffic flows into a traffic light controlled junction has a clear advantage in that green/red light signal-on times can be adapted dynamically using live traffic flow rates on individual links as reference. This ensures that a temporary surge in traffic experienced on one link can be quickly dispersed before such link gets saturated. This adaptive feature of intelligent traffic light system makes it a better option than the fixed time plan based traffic lights in preventing congestion build up.

Traffic lights in close proximity can also be implemented to share information about traffic flows such that a balanced effect of traffic flow regulation can be achieved across a wider area of the road network. Such intelligent traffic control system may include features such as buses or emergency vehicles priority flow; where traffic lights can adapt green timing accordingly to ensure that road links with buses or emergency services vehicles are given priority. Specialized intelligent traffic control software applications have also been developed to function with traditional fixed-time plan based traffic lights so as to make them adaptive. Adaptive traffic light control solutions such as these are needed if optimum benefits from traffic light interventions are to be realised. However, when procuring such systems, government must ensure that the unique requirements of the locations for which the solutions are being procured for, forms the basis for such procurement. In other words, traffic light solutions must be procured and implemented against the strict demands of specific individual junctions. Any procurement that is not based on this guiding principle will most likely fail to deliver the full expected benefits. Therefore, it is important to seek relevant advice from professionals on all aspect of traffic intervention plans, strategies, procurements and project implementations. This model has worked in most developed

countries and has proven to be a cost effective way for government to deliver beneficial traffic management interventions to the commuting public.

From the foregoing, it is clear that traffic lights have matured significantly from the initial fixed time plan concept on which most of the installations in Lagos are based. Since optimal flows across majority of the junctions could not be achieved with fixed time plans, the intended benefits have not been realised. Going forward, Lagos State Traffic Management Authority could seek professional advice on all aspect of the fight against congestion. This should include advice on transport policy direction as well as traffic technology procurement strategies. A monitoring team of experts could be set up to keep the government aware of advances in traffic management technologies and best practice. Their role may also be extended to include conducting local trials for promising solutions and advising on adaptability to the unique requirements of the local environment. It is a fact that Lagos is fast becoming an important economic African city and that congestion may be a sign of its thriving economy. Nonetheless, proactive steps must be taken to mitigate the congestion problem. Investing in intelligent traffic control systems and traffic lights, or an upgrade to existing ones where applicable, will be a definite step in the right direction.

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