

## Press Release: Vehicle Actuated Wireless Traffic Signal Controller at Vellayambalam Junction

Vellayambalam is one of the busiest and most important junctions in Trivandrum that has saturated vehicular traffic during morning and evening peak hours. The junction geometry restricts conventional traffic control approach. Proximity of Raj Bhavan and Ministers' residences adds to the criticality of Vellayambalam junction. Recognizing this Dr. N. S. Srinivasan (Technical Adviser, Kerala Road Fund Board) advised CDAC, a premier R&D Institution under the Department of Electronics and Information Technology (DeitY), Govt. of India, to apply its expertise and experience in the area of traffic signalling to deploy an intelligent traffic signal controller at Vellayambalam Junction as a research project, in collaboration with Kerala Road Fund Board (KRFB) and KELTRON.

Accepting the advice the three agencies arrived on consensus under which CDAC is giving their latest traffic signal controller, WiTraC, and their expertise free of cost to the project. CDAC will also setup a remote monitoring station for Vellayambalam junction at their office. Funding of the project is done by KRFB and the installation is entrusted on KELTRON.

WiTraC is an advanced Area Traffic Control System (ATCS) compatible Vehicle Actuated Traffic Signal Controller using wireless technology for switching the traffic signal lights. Digging of finished roads for the purpose of installing traffic signal controller is thus avoided. WiTraC is designed for solar power operation and remote administration. Unlike the conventional pre-timed traffic signal controllers, WiTraC controls the signal timing based on the actual demand on the road, verifying camera images of the traffic. For example, the green signal for a road where there is no vehicle will be skipped, roads with low volume of traffic will be given less green time and that with high volume will be given more green time during the control cycle. This will provide proper service of queues avoiding wastage of green time and unnecessary waiting at the traffic junction. WiTraC is capable of providing synchronized green signal with the adjacent traffic signal controllers to minimize stops and delay on a signal corridor. By providing appropriate network connectivity, it is also possible to monitor and manage the traffic junction from a remote traffic monitoring station.

Traffic signalling of Vellayambalam junction is considered as research project for the following reasons:

1. Morning and evening peak hour traffic exceeds the capacity of the roundabout. Managing the junction with conventional pre-timed traffic signal controller is not possible. In fact, the junction is recommended for a flyover. Bus-stops close to the junction, narrow roads and parking near the junction seriously affects the traffic movement.
2. Installation of vehicle actuated wireless traffic signal controller is the first of its kind in the Country.

Vellayambalam signal is under field tests for last two months. A monitoring station is setup at CDAC from where it is possible to observe the traffic and the signal operation. Fluctuations in the traffic is monitored and recorded continuously by the computer at CDAC, and analyzed for optimum signal settings. Signal sequencing and time limits are set based on this analysis. This type of scientific approach is not possible in conventional controllers, where the sequence and timings are set by rule- of-thumb. Four number of vehicle detection cameras are installed at the junction. Based on the input received from these cameras, WiTraC adjusts

the signal time in realtime, ensuring minimum junction delay. Now WiTraC is ready for handing over to the Police and the public. CDAC and KRFB are planning to conduct junction delay survey at Vellayambalam to quantify the results, once the system is commissioned. The data will be made available to the students and planners for research purpose.

Series of studies were conducted at Vellayambalam junction in various situations, viz. roundabout without any traffic signal, roundabout with pre-timed fixed time signal and roundabout with vehicle actuated signal. The preliminary findings of the studies conducted so far are:

1. The junction carries as much as 10,000 vehicles during peak hours. The Kowdiar road carries maximum volume of traffic throughout the day.
2. In the case of pre-timed signal control, cycle time required was 120Sec; but the traffic from Kowdiar could not be controlled effectively and vehicles waiting in the queue could not be cleared during green signal.
3. With installation of vehicle actuated wireless traffic controller, the cycle time has been reduced from 120Sec to 90Sec during peak hours. During slack hours the vehicle actuated control operates even with 48Sec cycle time. Accumulated queue in each approach is cleared in this scheme.
4. Though the cycle time in the vehicle actuated signal is only 90Sec (max), by overlapping signal stages an effective cycle time of 157Sec has been achieved, thereby reducing the delay at the intersection drastically. The average waiting time in pre-timed fixed time control is 90Sec. This is reduced to 51Sec (max) by deploying vehicle actuated control and signal overlapping. On Kowdiar road the maximum waiting time is only 37Sec.
5. It is to highlight that signalization of a roundabout carrying heavy volume of traffic is very difficult job, and is rarely done. This particular intersection having peculiar traffic flow condition cannot be controlled successfully with pre-timed fixed time traffic signal. Only vehicle actuated signal controller like WiTraC can tackle the problem effectively.