1. TRC16CETRP1_Preparation of an Inventory Map of Various Road User Facilities for Selected Roads in Thiruvananthapuram City (Joint Project with NATPAC)

Inventory data collection is being carried out for selected road stretches In Trivandrum city. The data collection includes data on various road user facilities such as details on pavement, footpath, traffic signals, road signs, markings, openings etc. Along with this, video data of existing traffic conditions is collected during peak and non-peak hour. The inventory data collection was done for a stretch from Pravachambalam - Killipalam, Killipalam - Kesavadasapuram, Kesavadasapuram - Mannanthala , Kuzhivila – Ulloor. The inventory done for a stretch from Pravachambalam - Killipalam, Killipalam - Kesavadasapuram, Kesavadasapuram - Mannanthala, Kuzhivila – Ulloor is shown in Fig.1.

Deliverables:

- ✓ Comprehensive report on road user facilities
- ✓ Video data of existing traffic conditions during peak and non-peak hours
- ✓ Detailed inventory data for each road stretch

Fig. 1 Inventory Map

Societal Relevance:

- ✓ Improved road safety and infrastructure
- ✓ Better traffic management and planning
- ✓ Potential for reduced traffic congestion and environmental impact

2. TRC16CETRP2_Surrogate Safety Measures and Pedestrian Vulnerability

Traffic safety is commonly measured in terms of the number of traffic crashes and the consequences of these accidents with regard to their outcome in terms of severity. This historical data approach (reactive approach) requires that a significant number of crashes must be recorded with precise locations before a particular traffic safety problem is identified and remedial measures are applied. A further drawback with this approach is the quality and availability of crash data and the time-period required for statistical validation. Conventional method requires a long observation time to obtain an adequate sample of crash data. Information on the user's behaviour prior to crash is often not available or are unreliable. Hence surrogate safety measures are used in developed countries to overcome the drawbacks of conventional method of hotspot identification. The main advantage of such measures is related to their resource-effectiveness given that they occur more frequently than accidents and require relatively short periods of observation in order to establish statistically reliable results. In developed countries surrogate safety measures are in an application level. However in India, these measures are in developing stage. Development of these measures in heterogeneous traffic condition is very useful in safety assessment of road intersections in India. The purpose of this study was to develop, and analyze the predictive capabilities of crash prediction models based on surrogate safety measures that could be used in evaluating safety of signalised and un- signalised intersections, and median openings in mid blocks in heterogeneous traffic conditions.

Objectives of the study is to develop a risk index to compare the safety level ofcrosswalks based on surrogate safety measures and to model the pedestrian-vehicle conflicts using surrogate safety measures. Analytical Hierarchy Process (AHP) is used to rank the intersections. Data collection was carried out at major intersections in Trivandrum city. Video data was collected at pedestrian crosswalks. Road geometric details were also collected at the locations. Time to Collision (TTC) between pedestrian and vehicles were extracted from the video data. TTC lies between 0 to 1 second is considered as severe conflicts. The safety level of pedestrian cross walks is calculated based on the TTC value. Pedestrian cross walk with more percentage of severe conflicts has least safety level.

From the study it is revealed that traffic conflicts (Fig. 2 and 3) can be used for predicting crashes at both signalised and un-signalised intersections in heterogeneous traffic condition. The main advantage of traffic conflict technique is that it is a least resource demanding method and it can predict crashes with same accuracy as that of data intensive conventional methods.

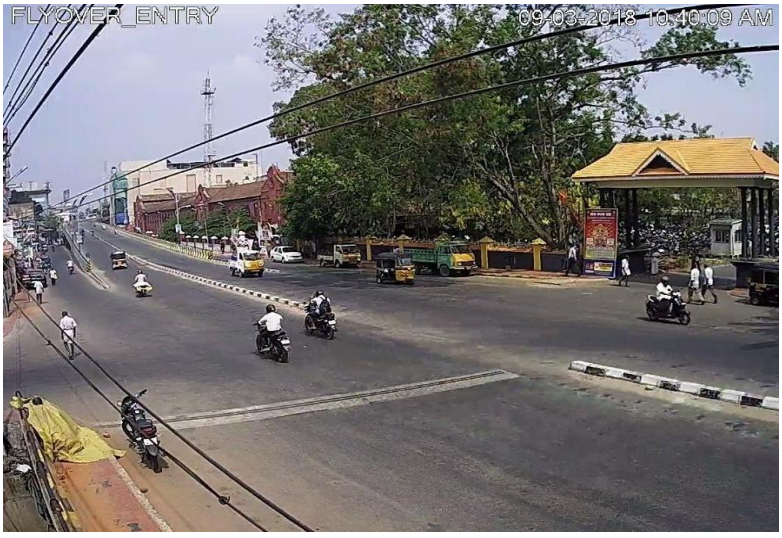

Fig.2 Entry II to railway station, Thiruvananthapuram

Fig.3 Traffic conflicts at Nalumukku Junction, Thiruvananthapuram

Deliverables:

- ✓ A valid list of hotspots and potential hotspots
- ✓ Risk Index for Crosswalk Safety
- ✓ Recommendations for Intersection Design

Societal Relevance:

- ✓ Improved Pedestrian Safety
- ✓ Data-Driven Decision Making

- ✓ Reduction in Traffic Accidents
- ✓ Enhanced Urban Mobility
- ✓ Public Awareness

3. TRC16CETRP5_Analysis of Short Paneled Concrete Pavements (SPCP)

SPCP is an alternative to conventional concrete pavements in villages and city streets with low traffic volume. Stress-strain characteristics were analysed due to static wheel load and temperature variation for different panel sizes and thickness. Critical combination of stress developed in panel increases with decrease in panel thickness and panel size. Panels of size 2x2x0.150m shows minimum percentage increase in critical stress. Maximum percentage increase in critical stress of 61.8% was shown by panel of size 1x1x0.075m. From the analysis results it can be concluded that, SPCP is a better solution for the Indian traffic and climatic conditions.