**OPERATIONAL ANALYSIS OF ROUNDABOUT UNDER MIXED TRAFFIC FLOW CONDITIONS**

**ABSTRACT**

This thesis addresses the most important element of operational performance of roundabout traffic intersections in Rourkela on capacity analysis. The movements of the vehicles were observed at 5 roundabouts along ring road in Rourkela. Gap acceptance and follow up time were estimated for cars for one hour analysis. The relation between a roundabout performance measure and capacity is expressed in terms of degree of saturation (volume – Capacity ratio). The capacity analysis is done based on gap acceptance method that is adopted by Tanner based on the HCM 2010. The traffic movement data with vehicle characteristics were collected from 5 roundabouts in Rourkela. These 5 roundabouts are directly related to their approach leg numbers.

Approach entry capacity has been analysed for all 5 roundabouts at their legs. Effective capacity verses entry flow relationship have been developed in order to find out the causes of their over Saturation (v/c ratio greater than 0.85) And the result indicates; number of entry lanes, number of circulatory lanes and high traffic flow are the major causes of their over saturation. Tanner models use the gap-acceptance theory (or critical headway) to simulate the behaviour of entering vehicles and vehicles circulating within the roundabout. Finding a safe gap (or headway) within circulating traffic stream to enter the roundabout is the controlling variable that determines the ability of approach vehicles to enter the roundabout. Current research work on roundabout models mostly concentrates on determining the capacity of an approach based on the entering and circulating flows. Approach capacity is calculated as a mathematical function of critical headway and follow-up headway. Several roundabout capacity models exist and can be classified into two broad categories - theoretical and empirical.

The Tanner model is based on gap- acceptance theory with gapacceptance parameters. The Highway Capacity Manual (HCM 2010) roundabout tanner capacity model is an analytical (exponential regression) model with clear basis in gapacceptance theory. The NCHRP Report 572model is based on empirical exponential regression) capacity model with no explicitly. Capacity analysis results indicated that out of 5 roundabouts 1 of them has greater than 0.85 degree of saturation and this roundabout has critical for traffic flow because this has degree of saturation more than 0.85. This 0.85 value is recommended by analysis procedure of iv tanner model. So roundabouts are designed to operate at less than 85 percent of their estimated capacity.