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### **Master Thesis Defense**

Entitled

CALIBRATING AND EVALUATING DYNAMIC RULE-BASED TRANSIT-SIGNAL-PRIORITY CONTROL  
SYSTEMS IN URBAN TRAFFIC NETWORKS

by

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Abstract

Setting the traffic controller parameters to perform efficiently in real-time is a challenging task, and it entails setting several parameters to best suit some predicted traffic conditions. This study presents the framework and method that entail the application of the Response Surface Methodology (RSM) to calibrate the parameters of any control system incorporating advanced traffic management strategies. The integrated system is a rule-based heuristic controller that reacts to specific triggering conditions, such as identification of priority transit vehicle, downstream signal congestion, and incidents by penalizing the predefined objective function with a set of parameters corresponding to these conditions. The integrated system provides real-time control of actuated signalized intersections with different phase arrangements (split, protected and dual).

**Keywords:** Integrated traffic control system, transit signal priority, calibration, optimization, response surface methodology, multi-objective function, micro-simulation.