Notice of the Final Oral Examination for the Degree of Master of Applied Science of

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“A Macroscopic Traffic Flow Model for Adverse Weather Conditions”

Department of Electrical and Computer Engineering

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12:00 P.M.
Engineering and Computer Science Building
Room 468

Supervisory Committee:
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Dr. Zawar Khan, Department of Electrical and Computer Engineering, UVic (Co-Supervisor)

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Abstract

Adverse weather has a direct effect on traffic congestion and the time delay on roads. Weather conditions today are changing rapidly and are more likely to have a severe effect on traffic in the future. Although different measures have been taken to mitigate these conditions, it is important to study the impact of these events on road conditions and traffic flow. For example, the surface of a road is affected by snow, compacted snow, and ice. The objective of this thesis is to characterize the effect of road surface conditions on traffic flow. To date, traffic flow under adverse weather conditions has not been characterized. A macroscopic traffic flow model based on the transition velocity distribution is proposed which characterizes traffic behavior during traffic alignment under adverse weather conditions. The model proposed realistically characterizes the traffic flow based on snow, compacted snow, and ice. Results are presented which show that this model provides a more accurate characterization of traffic flow behavior than the well known Payne-Whitham model. The results in this thesis indicate that the proposed model can be used to reduce accidents and improve road safety during adverse weather conditions.