

M.A.SC. THESIS EXAMINATION

CONCORDIA INSTITUTE FOR INFORMATION SYSTEMS ENGINEERING

Notice of Thesis Defence

TO: Faculty, Graduate Students, Guests

FROM: Dr. A. Hammad, Graduate Program Director,
Concordia Institute for Information Systems Engineering

DATE: February 18, 2009

You are invited to attend the following M.A.Sc. (Quality Systems Engineering) thesis examination:

Candidate: **BaoJin Hu**

Thesis Title: **Quality of Spatial Information for Municipal Infrastructure Management**

Date & Time: **Tuesday, March 3, 2009 @ 1:00 P.M.**

Location: **EV009.221**

Examining Committee:

<u>Dr. S. Li</u>	Chairman
<u>Dr. A. Hammad</u>	Supervisor
<u>Dr. A. Awasthi</u>	CIISE Examiner
<u>Dr. A. Bagchi</u>	External Examiner (BCEE)

ABSTRACT:

Management of municipal infrastructure involves many processes such as planning, construction, operation, and maintenance of various assets. Municipal infrastructure management systems require gathering and combining a large amount of data from

different sources. These data consist of spatial and non-spatial data for describing the process information about each facility. In recent years, Geographic Information Systems (GIS) are widely used in municipal infrastructure management to spatially locate the elements of roads, sewers and water networks. However, the data used in these systems are collected from different sources using different methods with little information about the quality of the data. Problems regarding spatial data quality can affect all fields that use geographic data. Furthermore, the aging of municipal infrastructure assets combined with limited maintenance budgets presents unprecedented challenges to municipalities and public work agencies. A new integrated Municipal Infrastructure Management System (MIMS) is required to perform better quality performance for optimizing maintenance, repair and replacement activities. In this research, first a literature review is conducted about the existing MIMS software solutions, various spatial technologies are introduced, and data standards and quality concepts are discussed. Then, a new framework for MIMS spatial data quality assurance process is proposed. This framework is developed to cover all aspects of data quality and several practical methods for achieving spatial data quality assurance. One case study with four implementations is used to demonstrate the applications of the proposed approach.