

# **Data Management Group Annual Report 2008**

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## **INTRODUCTION**

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The Data Management Group (DMG) was established in 1988 on the basis of a proposal from the University of Toronto's Joint Program in Transportation for an autonomous research group with the following objectives:

- a) establish a common, centrally-accessible database containing information on transportation activities, zone systems, transportation networks and land use activity,
- b) provide a transportation data retrieval service to the participating agencies,
- c) monitor the adequacy of available data and propose approaches for adding to or updating the data as mutually agreed upon by the agencies,
- d) promote greater interaction between university researchers and practitioners in the field of urban transportation planning,
- e) promote the communication of transportation information and data obtained or administered by the Data Management Group to interested agencies and to the public,
- f) further the improvement of transportation demand analysis, research, and forecasting in the Greater Toronto Area.

Although the administration of the group has changed to the Department of Civil Engineering at the University of Toronto, the DMG continues to be guided by these objectives into this its 20th year of continuous operation.

Program approval and funding of the DMG is the collective responsibility of members of the Transportation Information Steering Committee (TISC) with the following membership:

City of Hamilton  
City of Toronto  
GO Transit  
Ministry of Transportation, Ontario  
Regional Municipality of Durham  
Regional Municipality of Halton  
Regional Municipality of Peel  
Regional Municipality of York  
Toronto Transit Commission

Each participating agency appoints a member of their technical staff to the Transportation Research and Data Management Group (TRADMAG), which is a standing committee of TISC, and is responsible for coordinating the needs of the funding agencies and the activities of the research project.

This report provides a brief profile of the staff employed during the calendar year 2008 and a description of the activities undertaken by the DMG under the headings of information processing, preparing for a 2011 Transportation Tomorrow Survey, computer resources and technical support.

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## **STAFF AND LOCATION**

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The DMG is located in offices at;  
Department of Civil Engineering  
University of Toronto  
Galbraith Building, Room 305  
35 St. George Street  
Toronto, Ontario M5S 1A4  
Telephone: (416) 978-3916  
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### Full-time Technical Staff in 2008

Susanna Choy, B.A.Sc. (Industrial Engineering), M.Eng. (Civil Engineering) University of Toronto, P.Eng.  
Reuben Briggs, B.A.Sc. (Civil Engineering), M.A.Sc. (Civil Engineering) University of Toronto, P.Eng.

### Urban Transportation Planning Interns in 2008

Jamshaid Muzaffar, B.A.Sc. (Civil Engineering) University of Toronto  
Justin Chin, B.A.Sc. (Civil Engineering) University of Toronto

### Software Development and Technical Support in 2008

Michael O'Cleirigh, B.Computing (Computing & Information Science), University of Guelph  
Andre Madarang, B.Sc. (Computer Science), University of Toronto Mississauga

### Summer Students in 2008

Adam Beausoleil, 3rd year undergraduate, Department of Civil Engineering, University of Toronto

### Part-time Director

Gerald N. Steuart, Professor Emeritus, Department of Civil Engineering, University of Toronto

Data Management Groups Web Site

<http://www.dmg.utoronto.ca>

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## **INFORMATION PROCESSING**

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The term ‘information processing’ is used in this instance to describe a set of activities supporting the management, storage and distribution of urban travel information. The principle components of this information are the results of the Transportation Tomorrow Surveys and a collection of all Cordon Count surveys.

### Transportation Tomorrow Surveys and iDRS

Under the guidance of TISC, a series of urban travel surveys have been conducted every five years since 1986. The DMG administers the data files on urban travel contained in the 1986, 1991, 1996, 2001 and 2006 Transportation Tomorrow Surveys in the form of a set of relational databases with various methods of access. Direct access to the original files is restricted to DMG staff to ensure that information on a particular household cannot be identified. Currently, data files available to iDRS users contain the following information:

Year	Number of Records			
	Households	Persons	All Trips	Transit Detail
1986	61,453	171,086	370,248	56,615
1991	24,507	72,496	157,349	14,896
1996	115,193	312,781	657,971	70,295
2001	136,379	374,182	817,744	85,095
2006	149,631	401,653	864,348	87,244

The increasing size of the databases reflects not only growth in the area but also changes in the size of the area surveyed.

As part of a work plan for 2008, the Data Management Group assumed the responsibility for assembling data from the 2006 TTS into a series (3) of summary reports. The first of these reports, “2006, 2001, 1996 & 1986 Travel Summary Report for the Greater Toronto and Hamilton Area”, contains household, person and travel data for some 44 geographic areas from 4 travel surveys. The second report, “2006, 2001 and 1996 Travel Survey Summary for the Transportation Tomorrow Survey Area”, contains the same information for some 21 geographic areas representing the entire survey areas in the last three travel surveys. The first two reports were compiled in 2008 for release early in 2009. The final report representing the Wards within the Greater Toronto Area and Hamilton will not be produced until 2009.

Originally, a staff member at the DMG processed every request for travel information and stored the results in a computer file that was then forwarded to the end user. Several years ago, in an effort to improve access, staff at the DMG developed a text-based data retrieval system (drs) as the original method for external users to gain access to the data files and complete the data extraction themselves. This retrieval system was very effective when a modem was used as the principle method of remote access to the DMG’s computer system. Over the past ten years, as the demand for travel data grew and the Internet became the preferred method

## **Data Management Group 2008 Annual Report**

of remote access, a data retrieval system specifically designed for Internet access was developed (iDRS) and the drs process was phased out. During the phasing-out period, all the attractive features of drs were incorporated into the browser-based iDRS.

The initial release of iDRS was restricted to use by the funding agencies. As the DMG gained more experience with the procedure and continuous improvements were made, more users were allowed access. In 2002, access to iDRS was made available to any individual that requested access. The individual is required to sign an agreement form and system security is maintained by giving each user a unique login and password. This procedure has the added benefit that agencies outside the GTA plus Hamilton that participated in the 1996, 2001 and 2006 Transportation Tomorrow Surveys can access their data without the need to set up their own database system. The iDRS procedures are reasonably complex, therefore, the DMG staff compiled a user's manual in 2004. The manual is available to all existing and potential users at:

[http://www.dmg.utoronto.ca/pdf/idrs/idrs\\_manual.pdf](http://www.dmg.utoronto.ca/pdf/idrs/idrs_manual.pdf)

A majority of data requests processed by iDRS use one of the several zone systems that have been defined by the participating agencies over the years. In 2007, the DMG completed the task of assigning travel data for all TTS (including the 2006 TTS) to the 2001 GTA zone system. The result is that users can trace historical trends using a consistent spatial definition. In 2008, the DMG began the task of assembling a new 2006 GTA zone system from files submitted by the six regions. Initially, only 2006 TTS data will be assigned to the new zone system.

Access through iDRS needs to be used in conjunction with the latest description of the data files, which is documented in the publication '2006 Transportation Tomorrow Survey: Data Guide', available at:

<http://www.dmg.utoronto.ca/reports/ttsreports.html>

## Data Management Group 2008 Annual Report

### Summary of Browser Based 'iDRS' Data Requests in 2008

<b>Month</b>	<b>Number of Data Queries</b>	<b>Number of Sessions</b>
January	1837	409
February	1638	380
March	1695	355
April	1667	332
May	1641	323
June	1375	271
July	2516	326
August	1509	259
September	1550	337
October	2301	424
November	1651	355
December	1626	274
<b>Total 2008</b>	<b>21006</b>	<b>4045</b>
<b>Total 2007</b>	<b>18971</b>	<b>2950</b>

### Browser Based 'iDRS' Users in 2008

AECOM  
 Arizona State University  
 ARUP  
 BA Group  
 Boston Consulting Group  
 Brock University  
 Canadian Urban Institute  
 Cansult Ltd.  
 Capacity Strategic Networks  
 CBS Outdoor Canada  
 Centre for Sustainable Transportation  
 CF Crozier and Associates  
 City of Barrie  
 City of Brampton  
 City of Brantford  
 City of Burlington  
 City of Guelph  
 City of Mississauga  
 City of Oshawa  
 City of Rotterdam  
 City of Toronto  
 Cole Engineering Group  
 Earth Tech Canada Inc.  
 Halton Community Development

## Data Management Group 2008 Annual Report

### Browser Based 'iDRS' Users in 2008 (continued)

Community Foundation of Oakville  
Concordia University  
Dillon Consulting  
Entra Consultants  
Environmental assistant to Councillor Gord Perks  
GO Transit  
Golder Associates  
Halcrow Consulting  
IBI Group  
iTrans Consulting Inc.  
Jade Acoustics  
Lawrence Frank and Company  
LEA Consulting Ltd.  
Lehman and Associates  
London School of Economics  
Mark Engineering  
McMaster University  
Metrolinx  
Metropolitan Knowledge International  
MMM Group  
Morrison Hershfield Ltd.  
McCormick Rankin Corporation  
Ministry of Transportation Ontario  
Ontario Early Years  
Paradigm Transportation Solutions  
Poulos & Chung Ltd.  
Queen's University  
Region of Durham  
Region of Halton  
Region of Niagara  
Region of Peel  
Region of Waterloo  
Region of York  
Ryerson University  
Sernas Group Inc.  
Sernas Transtech  
Service Canada  
Smart Commute Association  
SNC-Lavalin Inc.  
St. Michaels Hospital  
Statistics Canada  
Synectics Inc.  
Town of Markham  
Town of Oakville  
Town of Richmond Hill  
Tranplan Associates  
Transit Policy Liaison Office

## **Data Management Group 2008 Annual Report**

### Browser Based 'iDRS' Users in 2008 (continued)

Toronto Transit Commission  
UEM Consulting Inc.  
UMA Engineering Ltd.  
University of Montreal  
University of Buffalo  
University of New South Wales (Australia)  
University of Toronto  
University of Waterloo  
York Region Transit  
York University

### Special Data Requests

The interactive procedures available with iDRS satisfy the majority of data needs. However, some data needs are too complex and require the intervention of an experienced analyst to formulate a custom query from the database. In addition, the DMG's staff can often help define the most relevant data for the problem at hand. Although special data requests are an important function, an objective of the DMG continues to be to reduce the number of such data requests in favour of users processing their request through iDRS. The success of this strategy is apparent in that all special data requests in 2008 were associated with a funding partner or a research project. Although the number of special data requests increased from 4 in 2007 to 16 in 2008, each request required special manipulation of the full database. The special requests are listed below in two categories; requests from funding agencies, requests from the research community.

### Data Requests from Funding Agencies

The City of Toronto requested the number of transit and all-mode trips originating from or destined to the area within 500m of each subway and RT station during morning peak period from the 2006 TTS database.

Transit mode split was provided to the City of Toronto for 2006 TTS morning peak trips with trip ends within 500m of three locations: Yonge St., and Cummer Ave., Yonge St. and Steeles Ave. and Yonge St. and Sheppard Ave. in North York.

2006 TTS origin-destination trip records with travel mode were provided to the Region of Waterloo.

The Ministry of Transportation, Ontario requested the individual records from the 2006 TTS database version 0.1 (without coordinates).

Statistics on household, person, trip and transit attributes from the 2006 TTS database were requested by Lawrence Frank & Company for the development of Peel Region Urban Design Health Assessment Tool.

2006 TTS data were assigned to the ward boundary in the City of Toronto as requested by the City.



## **Data Management Group 2008 Annual Report**

### Data Requests from Funding Agencies (continued)

Origins and destinations from the 2006 TTS database were assigned to a specific zone system in Peel Region for the Hurontario Modelling study carried out by the MMM Group and Eric Miller for the City of Mississauga.

Total kilometers traveled by auto driver for each origin-destination at regional level from the 1986, 1991, 1996, 2001, and 2006 TTS were requested by the Ministry of Transportation, Ontario.

2006 TTS data were assigned to a specific zone system for the City and County of Peterborough.

Toronto Transit Commission requested individual household, person, trip and transit records from the 2006 TTS database for which transit trips were made.

Morning peak period subway trips broken down by access modes and distances traveled (200m bands) by region of residence from the 1996, 2001 and 2006 TTS databases were provided to Halcrow Consulting Inc. for the study of cross boundary travel and transit use pattern.

### Data Requests from the Research Community

2001 TTS origin-destination TTC trip matrices and transit trip records were requested by a Ph. D. student at the University of Toronto.

Based on 2006 TTS, total daily vehicle kilometres of travel in private cars by GTA residents and total daily passenger kilometres in private cars by GTA residents were provided to Prof. Chris Kennedy of the Department of Civil Engineering at the University of Toronto.

Straight-line and Manhattan trip distances for trip records from the 2001 TTS were provided to Prof. Matt Roorda of the Department of Civil Engineering at the University of Toronto for his research project with L'Ecole Polytechnique de Montreal.

2006 TTS disaggregate household, person, trip and transit records for the Toronto CMA were provided to Mark Babij at the London School of Economics and Political Science for his research in the impact of changing urban mobility in the Toronto CMA on public transit.

Trip week and trip day of households were requested by a graduate student, Sheyda Saneinejad, for her thesis with Prof. Matt Roorda of the Department of Civil Engineering at the University of Toronto.

## Data Management Group 2008 Annual Report

### A History of iDRS Data Requests

The growth in use of TTS data is reflected in the growth of the use of iDRS for data extraction. The following table shows the growth since iDRS was first introduced in 1999. The 'Number of Sessions' reflect the number of times registered users, including DMG staff, have initiated a data retrieval session. The 'Number of Queries' reflects the number of times an output was generated during a session. Almost without exception, many queries are generated during a given session.

#### History of Browser Based 'iDRS' Data Requests

<b>Year</b>	<b>Number of Data Queries</b>	<b>Number of Sessions</b>
1999	536	160
2000	1508	370
2001	7495	727
2002	6924	1411
2003	16239	2695
2004	13124	2142
2005	10654	2032
2006	9369	1771
2007	18971	2950
2008	21006	4045

### Cordon Counts and CCDRS

The City of Toronto (then the Regional Municipality of Metropolitan Toronto) began collecting detailed information on the type and volume of traffic crossing selected points on the road system as early as 1975. The counting locations were selected such that screen lines or cordon lines could be defined and the counting program has continued on a regular basis since that time, usually twice in a five year cycle. Subsequently, other Regions began similar programs. Given the number of Regions with a similar program, they began coordinating their count programs and defining a common set of data standards. In 1998, this cooperation made it possible for the DMG to assemble the most recent of such traffic counts in a common database structure and develop a Cordon Count Data Retrieval System (CCDRS).

Participating agencies are now using CCDRS as a tool in verifying their cordon count results. The Data Management Group, on completion of a verified database for a cordon count (in this case the 2006 count), has traditionally prepared two summary reports. In 2008, the reports "Greater Toronto Area - 2006 Cordon Count Program Analysis of Peak Periods" and "Greater Toronto Area - Cordon Count Summary Analysis of Traffic Trends 1985 to 2006" were prepared and distributed. The CCDRS procedures are reasonably complex and new users should refer to the user's manual. The manual is available to all existing and potential users at: <http://www.jpint.utoronto.ca/PDF/doc104.html>

## Data Management Group 2008 Annual Report

### Summary of CCDRS Data Requests in 2008

<b>Month</b>	<b>Number of Data Queries</b>	<b>Number of Sessions</b>
January	467	102
February	204	61
March	140	58
April	168	66
May	143	54
June	212	66
July	156	41
August	193	46
September	231	62
October	206	75
November	148	54
December	124	40
<b>Total 2008</b>	<b>2392</b>	<b>725</b>

<b>Total 2007</b>	<b>5243</b>	<b>1416</b>
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### Browser Based CCDRS Users in 2008

AECOM  
BA Group  
Canadian Out-of-Home Measurement Bureau  
City of Brampton  
City of Mississauga  
City of Toronto  
GO Transit  
Halcrow Consulting  
IBI Group  
iTrans Consulting Inc.  
Jade Acoustics  
Kings College, London  
LEA Consulting Ltd.  
MMM Group  
McCormick Rankin Corporation  
Ministry of Transportation Ontario  
Peter Dalton Consulting  
Poulos & Chung Ltd.  
Region of Durham  
Region of Halton  
Region of Peel  
Region of York  
SNC-Lavalin Inc.

## Data Management Group 2008 Annual Report

### Browser Based CCDRS Users in 2008 (continued)

Transport Canada  
True North Brands  
Toronto Transit Commission  
Totten Sims Hubicki Associates  
UMA Engineering Ltd.  
Valcoustics Canada Limited  
University of Toronto

### A History of CCDRS Data Requests

The growth in access to the CCDRS data is reflected in the increased number of data extraction. The following table shows the growth since CCDRS was first introduced in 1999. The 'Number of Sessions' reflect the number of times registered users, including DMG staff, have initiated a data retrieval session. The 'Number of Queries' reflects the number of times an output was generated during a session. Almost without exception, many queries are generated during a given session. The busiest years were just after restrictions on access to the data were removed. An increase in activity is usually associated with the release of a new cordon count.

### History of CCDRS Data Requests

<b>Year</b>	<b>Number of Data Queries</b>	<b>Number of Sessions</b>
1999	411	108
2000	2207	558
2001	2662	713
2002	5596	931
2003	2439	642
2004	2392	631
2005	3724	767
2006	3611	798
2007	5243	1416
2008	2392	725

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## **2011 TRANSPORTATION TOMORROW SURVEY**

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On completion of the Data Management Group's management responsibilities for the 2006 Transportation Tomorrow Survey, the policy committee (TISC) asked the group to investigate the issues that should be considered if a similar travel survey is to be carried out in 2011. The DMG commissioned three independent consultant's reports as a first step. The reports were prepared and distributed in 2008:

The Future of the Transportation Tomorrow Survey

Author: Halcrow Consulting Inc.

2011 Transportation Tomorrow Survey:

Revisions to the 2006 Survey Methodology

Author: Peter Dalton

Transportation Data Collection in the GGH:

A Framework and Priorities for Improvement

Author: Matthew J. Roorda and Amer Shalaby

The reports are available on the DMG web site at:

<http://www.dmg.utoronto.ca/reports/otherreports.html>

The DMG summarized the findings of these reports and prepared a series of considerations to be addressed if a travel survey is to be undertaken in 2011. The steering committee agreed in principle to a 2011 TTS and asked the DMG to undertake some of the development work to make a first phase of the travel survey feasible in the year 2010. Given the anticipated growth in cell phone use and current reliance on telephone billing records to provide a sample of households, procedures need to be developed that will encourage participation by households that do not have a land-line. One important component of new procedures would be to allow respondents to complete a travel survey using a web browser.

Development of the software to support the use of a web browser for a respondent to complete the travel survey began in 2008. An early prototype showed considerable promise and work on the development will continue in 2009. In addition, the feasibility of allowing respondents to access a call centre and the conduct of a accompanying survey of post-secondary students are being investigated.

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## COMPUTER RESOURCES AND TECHNICAL SUPPORT

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The concept of a university research centre providing shared computer resources and technical support in the development and operation of a large-scale computer simulation of urban travel began as a small research initiative in 1989. The logic at the time, which is still the case, is that the Data Management Group maintains a multi-user computing platform to support the storage and distribution of urban travel data and this resource could be used to support a shared resource for travel simulation software. An independent evaluation of available simulation software was undertaken and the Canadian developed product EMME/2 was selected.

The early experiment with two participants has grown over years to include all regional planning agencies in the Greater Toronto Area and Hamilton. The current participants in the shared resource are:

- City of Brampton
- City of Hamilton
- City of Mississauga
- City of Toronto
- GO Transit
- Ministry of Transportation, Ontario
- Regional Municipality of Durham
- Regional Municipality of Halton
- Regional Municipality of Peel
- Regional Municipality of York
- Toronto Transit Commission
- University of Toronto

The EMME/2 software operates on a UNIX platform with the necessary access software supplied by the DMG. In 2007, the developers of EMME/2 announced they were phasing out the multi-user EMME/2 software in favour of developing a single user product (EMME3) more suitable for single user systems such as a personal computer. As an alternative to every user having a single user licence the DMG developed a procedure for administering a license allowing a number of concurrent users. The manner in which agencies use the simulation software had changed by 2008 and software supporting larger transportation networks was required. Accordingly, on behalf of the funding partners, the DMG negotiated with the developers to increase the capabilities of the software, supply an initial 6 user concurrent licence for EMME3, and allow the continued use of EMME/2 with support gradually phased out.

Early users were concerned about the method of connecting to the DMG computer system to establish permission to run the software locally. The initial process required the establishment of a virtual private network (VPN). The DMG responded to this concern in 2008 by establishing a secure connection over the Internet using SSH software. A potential user can use either method and both have proven to be secure and reliable.

As was the case with EMME/2, access to the software is granted to a registered user

## **Data Management Group 2008 Annual Report**

from a participating agency including any designated consultant. The number of concurrent users representing a funding agency is restricted to the number of licences originally purchased by that agency. In 2008, all the necessary software and instructions on its use was made available to registered users, after receiving a login and password, on the DMG's secure web site at:

<https://www.jpint.utoronto.ca/dmg/general.html>

The computer support group at the DMG continued to support and assist in the development of all activities. In particular, development work on improvement to the iDRS and CCDRS procedures was undertaken. Some aspects of the new procedures are operational and working in parallel with the current on-line versions seen by external users. The objective is to give these procedures more features and reduce processing time. A new and enhanced DMG web site was established during the year. In addition to improved graphics, the manner in which external users can view summaries of the TTS data was improved. It is now possible for users to download pdf images of the summary reports.