datamanagementgroup

Annual Report
2010

prepared by:
Data Management Group
Department of Civil Engineering
University of Toronto
Telephone: (416) 978-3916

INTRODUCTION

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 22nd 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
Metrolinx
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 and a description of the activities undertaken by the DMG during the calendar year 2010.

STAFF AND LOCATION

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
FAX: (416) 978-3941

Full-time Technical Staff in 2010

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.

Sharon Kashino, B.E.S. (Environmental Studies) University of Manitoba, G.I.S.A.S. Sir Sandford Fleming College

Urban Transportation Planning Interns in 2010

Ragu Kanagalinham, B.A.Sc. (Civil Engineering) University of Toronto

Brian Wong, B.A.Sc. (Civil Engineering) University of Toronto

Software Development and Technical Support in 2010

Michael O'Cleirigh, B.Computing (Computing & Information Science), University of Guelph

Summer Students in 2010

Taras Myslyvchuk, 3rd year undergraduate, Department of Civil Engineering, University of Toronto

Karthik Arcot, 3rd year undergraduate, Department of Electrical and Computer 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

INFORMATION PROCESSING

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:

	Number of Records			
Year	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 plans for 2008 and 2009, 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 and released early in 2009. The final report representing the Wards within the Greater Toronto Area and Hamilton was relaesed in 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. In the mid 1990s, 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 of remote access, a data retrieval system specifically designed for Internet access was developed (iDRS). All the features of drs were incorporated into the browser-based iDRS and the drs process was phased out. In order to meet the changing needs of the data, the DMG continues to improve the functions of iDRS and is in the process of develping a new version of the software.

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 Greater Toronto and Hamilton Area 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

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 zone system. The result is that users can trace historical trends using a consistent spatial definition. In 2009, the DMG assembled a new 2006 zone system from files submitted by the 2006 TTS participants. Only the 2006 TTS data set has been 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

Summary of Browser Based 'iDRS' Data Requests in 2010

Month	Number of Data Queries	Number of Sessions
January	955	358
February	883	331
March	1094	405
April	1511	492
May	1415	590
June	1090	381
July	1145	454
August	1461	478
September	1616	468
October	1442	658
November	1268	541
December	618	223
Total 2010	**14498**	**5379**
Total 2009	**19745**	**3788**

Since the public release, the use of the TTS data have been expanded. In 2010, there were over 80 different agencies and groups that extracted the data through iDRS.

Affiliations of the Browser Based 'iDRS' Users in 2010

Active Transportation Startup
AECOM
Agence Metropolitaine de Transport Montreal
ARUP
BA Group
Boston Consulting Group
Burlington Sustainable Development Committee
CAA South Central Ontario
CBS Outdoor
CC Tatham & Associates
Centre for Sustainable Transportation
CF Crozier and Associates
CIRAIG École polytechnique de Montréal
City of Brampton
City of Guelph
City of Mississauga
City of Pickering
City of Toronto
City of Vancouver

Affiliations of the Browser Based 'iDRS' Users in 2010 (continued)

Cole Engineering Group
Community Development Halton
Dalhousie University
Delcan
Dillon
Durham Sustain Ability
Earth Tech Aecom
Entra Consultants
Garrod & Associates
GHD
GO Transit
Halcrow Consulting
Hamilton
IBI Group
iTrans
KTH Royal Institute of Technology
LEA Consulting
Mark Engineering
McMaster University
Metrolinx
MMM
MRC
MTO
Neptis Foundation
New Brunswick Department of Transportation
Northwest Atlantic Canada Inc
Paradigm Transportation Solutions
Poulos & Chung
Queen's University
R.A. Malatest & Associates Ltd
Read Voorhes & Associates Ltd
Region of Durham
Region of Niagara
Region of Peel
Region of Waterloo
Region of York
Richmond Hill
Ryerson University
Sernas Group Inc
Social Planning and Research Council of Hamilton
St. Michaels Hospital
Stantec
Suncor Energy
Taurus Consulting
Tennessee Technological University PhD Student
The Conference Board of Canada

Affiliations of the Browser Based 'iDRS' Users in 2010 (continued)

The Pennsylvania State University
Toronto Parking Authority
Town of Markham
Town of Whitby
TSH
TTC
UEM Consulting
UMA
University of McGill School of Urban Planning
University of Toronto
University of Waterloo
Upper Canada College Student
URS Canada
Veolia Transportation
York University

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' reflects 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.

Year	Number of Data Queries	Number of Sessions
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
2009	19745	3788
2010	14498	5379

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 since 2009 have been associated with a funding partner or a research project. 12 special data requests were made in 2009 and each required special manipulation of the full database, but only three were requested in 2010. The special requests are listed below.

Data Requests from All Agencies

MTO requested TTS data on Employment vs Employed Labour Force, median trip lengths by travel mode and Population growth for the years 1986 to 2006.

Prof Eric Miller, University of Toronto requested data on the spatial area of the TTS by Survey year for a research presentation.

The area of 2006 Traffic zones was requested by graduate student Phil Orr of York University for his research on a downtown subway relief line.

Development of Zone Boundary Files

The dramatic reduction in the number of agencies requiring help from the Data Management Group when compiling travel information is indicative of the success of iDRS. At the same time, many users have asked for maps showing the boundaries used in iDRS. Over the years, a set of PDF files have been made available on the DMG's web site.

1996 Traffic Zone Boundaries (January 1998)
http://dmg.utoronto.ca/reports/report94.html

2001 Traffic Zone Boundaries (January 2003)
http://dmg.utoronto.ca/reports/report94.html

2006 Traffic Zone Boundaries (June 2009)
http://dmg.utoronto.ca/reports/znbdy2006.html

However, a growing number of users have requested zone boundary files that can be used directly in GIS software, usually MapInfo or ArcInfo. Using TTS data in GIS software is made more complicated by the changes over the years in the coordinate system as well as changes in actual maps used to define the x-y coordinates. The result is that new TTS data becomes increasingly difficult to place in old mapping systems.

The result is that only certain years are available for any given zone boundary definition. The only boundary definition in which all TTS data can be compared are the 2001 Traffic Zone Boundaries. A summary of the TTS years and available zone bound-

ary definitions are shown below.

TTS DATA TO BOUNDARIES					
BOUNDARY DATA	2006 TTS	2001 TTS	1996 TTS	1991 TTS	1986 TTS
Local Municipality	X	X	X	X	X
2006 zones	X				
2001 zones	X	X	X	X	X
1996 zones		X	X		
1991 zones			X	X	X
1989 zones				X	X
TARMS zones				X	X

The complete set of Survey Boundary Files (November 2010) are available at:
http://dmg.utoronto.ca/spatial/boundary.html
The files are available in two formats; MapInfo Table (.tab), ESRI Shape File (.shp).

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. In 2009, another Cordon Count was undertaken by the participating regions. Updates to the existing Cordon Count database to include the 2009 counts were completed in 2010. 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

Summary of CCDRS Data Requests in 2010

Month	Number of Data Queries	Number of Sessions
January	161	49
February	381	131
March	232	74
April	183	61
May	648	138
June	317	48
July	233	65
August	846	93
September	194	55
October	240	61
November	136	44
December	39	22
Total 2010	**3610**	**841**

Total 2009	**2223**	**557**

Browser Based CCDRS Users in 2010

AECOM
Boston Consulting Group
Brampton
Canadian Out
Canadian Tire Corporation
City of Mississauga
City of Toronto
Civil Eng
Delcan
Dillon Consulting
Halcrow Consulting
IBI
iTrans
Jade Acoustics
McMaster Institute for Transportation and Logistics
MMM
MRC
MTO
Northwest Atlantic Canada Inc
Region of Durham

Browser Based CCDRS Users in 2009 (continued)

Region of Peel
Region of York
Self Employed Marketing Consultant
TSH
TTC
URS Canada Inc
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.

Year	Number of Data Queries	Number of Sessions
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
2009	2223	557
2010	3610	841

COMPUTER RESOURCES AND TECHNICAL SUPPORT

Transportation Modeling:
Since 1989 the Data Management Group has operated a multi-user computing platform to support the storage and distribution of urban travel data and to support a shared licence for professional grade travel simulation software.

Starting with two participating agencies, it has grown over the years to include all the regional planning agencies in the Greater Toronto and Hamilton Area. The current participants 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 Canadian developed EMME/2 software was selected after an independent evaluation as the simulation software that would be shared between the participating agencies. For several years, members of the participating agencies or authorized consultants working on their behalf were able to access one of several SUN Solaris based multi-user servers residing within the offices of the Data Management Group. The travel simulation work was conducted within a shared environment. The total processing power, storage and network bandwidth were split between the demands of the active users.

In 2007, the developer of EMME/2 announced they would phase out the multi-user EMME/2 software in favour of a single user EMME/3 software more suited to running on a personal computer. As an alternative to every user having a single user licence the DMG proposed converting the existing EMME/2 licences to a licence allowing a set of concurrent users to run EMME3 on their local computer. The DMG developed a mechanism to host and administer licences centrally. In EMME/3, modeling work takes place on the users personal computer which acquires the licence from the DMG through a secure connection over the Internet. Users are gradually migrating to EMME3 as although EMME/2 is still available, it is no longer supported.

Each EMME3 user is allocated access according to the number of access privileges they have purchased over the years. The web access developed by the DMG and fully activated in 2010, allows the user to monitor use of their available licences. An additional licences were acquired for teaching purposes and access are controlled with

the same procedure. These licences are only capable of using a small network, but are suitable for investigating the features of EMME3. In 2010, the DMG developed a small network representing the City of Mississauga as an aid in using the smaller licences.

Support for a 2011 Transportation Tomorrow Survey:

The Transportation Information Steering Committee (TISC) reviewed a series of issues identified in the 2006 TTS and commissioned a set of three consultant studies to provide guidance on how to proceed with any further surveys. The process and final decision to proceed with the planning of a 2011 TTS is described in the DMG's 2008 Annual Report (http://dmg.utoronto.ca/pdf/reports/dmgannualreports/an_rpt2008.pdf).

A final agreement in a workable funding formula for another travel survey was not established until June of 2010. A decision was taken to delay the interviewing phases until the Fall of 2011 and 2012. During the intervening time, the DMG continued to develop software to support the use of a web browser for a respondent to complete the travel survey. A first of pilot test of the software was conducted in early October 2010. The response was disappointing and was a preliminary warning of changes that would be necessary.

The most significant change was to the operation of the software used to manage the sample. A link was necessary between the households interviewed by telephone and those choosing to complete the survey on the web.

Additional pilot tests were scheduled for early 2011.