datamanagementgroup

2013 DMG Annual Report

Prepared by:

Data Management Group
Department of Civil Engineering
University of Toronto

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) to establish a common, centrally-accessible database containing information on transportation activities, zone systems, transportation networks and land use activity,
(b) to provide a transportation data retrieval service to the participating agencies,
(c) to monitor the adequacy of available data and propose approaches for adding to or updating the data as mutually agreed upon by the agencies,
(d) to promote greater interaction between university researchers and practitioners in the field of urban transportation planning,
(e) to promote the communication of transportation information and data obtained or administered by the Data Management Group to interested agencies and to the public,
(f) to 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 25th 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 2013.

STAFF AND LOCATION

Director

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

Technical Staff

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

Jason Chan, B.A.Sc. (Electrical & Computer Engineering) University of Toronto

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

Urban Transportation Planning Intern

Gordon Hui, B.A.Sc. (Civil Engineering) University of Toronto

Summer Students

Tian Yang Lin, 3rd year undergraduate, Department of Civil Engineering, University of Toronto

Janany Ragunathan, 3rd year undergraduate, Department of Civil Engineering, University of Toronto

Web Site

http://www.dmg.utoronto.on.ca

Office Location

Department of Civil Engineering
University of Toronto
Galbraith Building, Room 305
35 St. George Street
Toronto, Ontario M5S 1A4
Telephone: (416)978-3916
Email: info@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, 2006 and 2011 Transportation Tomorrow Surveys (TTS) 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:

TTS 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
2011	159,157	410,404	858,848	86,703

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

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 developing 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 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, which is available to all existing and potential users at:

http://www.dmg.utoronto.ca/pdf/idrs/idrs_manual.pdf

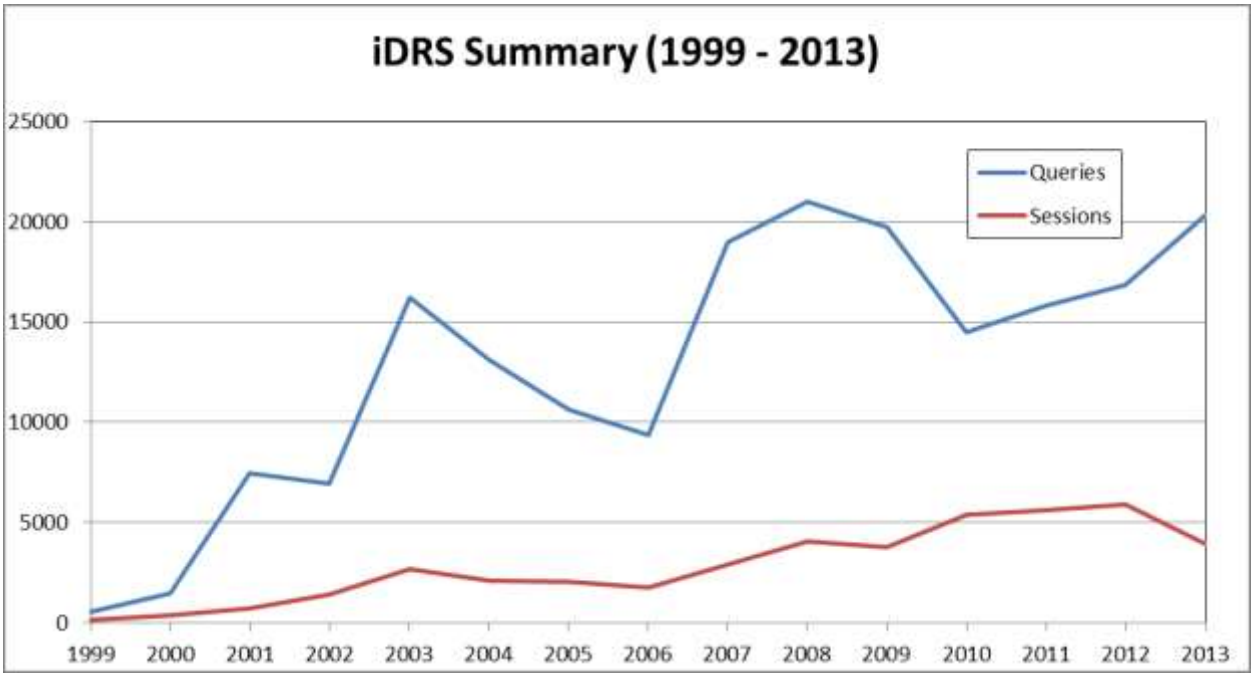
A majority of data requests processed by iDRS use one of the several zone systems that have been defined by the participating agencies over the years. In 2009, the DMG assembled a new 2006 zone system from files submitted by the 2006 TTS participants. Only the 2006 and 2011 TTS data set have been assigned to the new zone system. In order for users to trace historical trends using a consistent spatial definition, travel data for all TTS are linked to the 2001 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 '2011 Transportation Tomorrow Survey: Data Guide', available at:

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

A History of iDRS Data Requests

When the browser based data extraction procedure (iDRS) was first released in 1999, the users were registered users of the DMG's computer system. The initial use of iDRS was encouraging. Subsequently in late 2000, the Steering Committee gave approval for use by anyone registering and providing information on their affiliation. The growth in use of TTS data is reflected in the growth of the use of iDRS for data extraction. The following chart 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. Note that the iDRS usage peaked at the year after a new TTS dataset was released in 2002, 2007 and 2013.



Summary of iDRS Data Requests in 2013

In 2013, there were 20,308 iDRS queries within 3,969 sessions. The following table shows the monthly summaries.

Month	Queries	Sessions
January	1348	276
February	1200	251
March	1501	270
April	1145	247
May	1148	231
June	1384	210
July	1741	316
August	1498	340
September	1609	350
October	2804	482
November	2465	499
December	2465	497

Total 2013	**20308**	**3969**
Total 2012	16818	5938

Affiliations of iDRS Users in 2013

The following is a list of 74 different agencies and groups that extracted the data through iDRS in 2013.

AECOM
Altus Group Ltd.
Arup Canada
BA Consulting Group
C D Howe Institute
CBS Outdoor Canada
CC Tatham & Associates
Centre for Sustainable Transportation
Centre for Urban Transportation Research
CF Crozier and Associates
City of Brampton
City of Brantford
City of Guelph
City of Hamilton
City of Hamilton
City of Mississauga
City of Ottawa
City of Peterborough
City of Toornto
Coach Canada
Cole Engineering Group Ltd.
Community Development Halton
Consumer Policy Institute
Darmstadt University
Delcan Corp.
Dillon Consulting Ltd.
Entra Consultants
EXP services
Genivar Inc.
GHD
GO Transit
GreenUP (Peterborough)
Halcrow Consulting Inc.
Hatch Mott MacDonald
HDR Inc
Hemson Consulting Ltd.
IBI Consulting Group
LEA Consulting Inc.
McChesney Law
McGill University
McMaster University
Memorial University Of Newfoundland
Metro College of Technology
Metrolinx
MMM Group Ltd.
Mohawk College
Moving Righ Along Inc.
Ministry of Transportation Ontario
Neptis Foundation
Paradigm Transportation Solutions
Peter Dalton Consulting
Poulos & Chung
Queen's University
Region Municipality of Durham
Region Municipality of Niagara
Region Municipality of Peel
Region Municipality of Waterloo
Region Municipality of York
Rutgers University
Ryerson University
Sernas Group Inc.
Stantec Architecture Ltd.
Steer Davies Gleave
Tedesco Engineering
Toronto Cycling Think and Do Tank
Toronto Transit Commission
Town of Markham
Tri-cities Transport Action Group
UEM Consulting
University of Toronto
University of Waterloo
URS Canada
Veitch Lister Consulting
York University

TTS 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 staff can often help define the most relevant data for the problem at hand. One of the typical data requests involves assigning the x-y coordinates of households or trip ends to a specified spatial aggregation different from the predefined traffic zone system as these coordinates are not available to any non DMG staff in order to protect the privacy of the survey respondents. There is also a growing interest in using disaggregate data for travel forecasting among academic researchers. Here is a list of agencies that have made a special data request in 2013:

Toronto Transit Commission
Ryerson University
University of Toronto

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 the DMG assembled the most recent of such traffic counts in a common database structure and developed a Cordon Count Data Retrieval System (CCDRS). CCDRS is now widely used by a wide variety of public and private agencies.

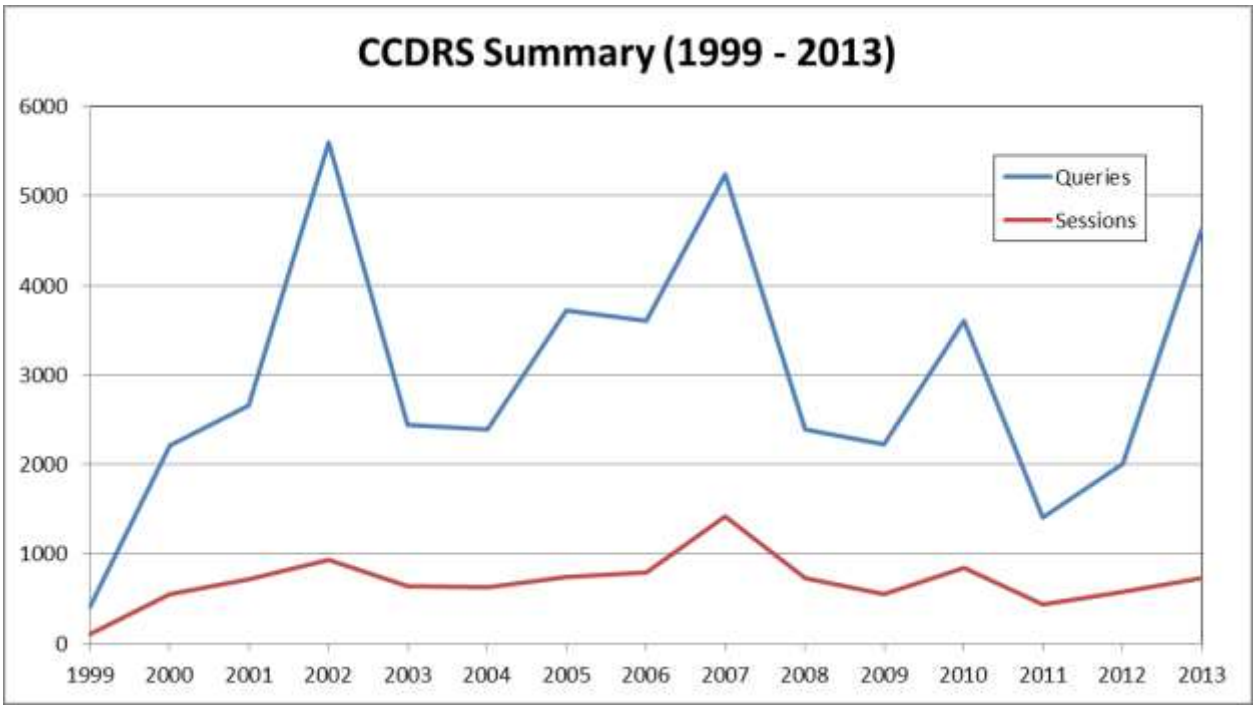
In addition, participating agencies now use CCDRS as a tool in verifying their cordon count results. The approved procedure is to place new cordon count data directly into the CCDRS database with a disclaimer notice to all users that the new information is preliminary. The last Cordon Count was undertaken by the participating regions in 2011 and the information is available in CCDRS.

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.dmg.utoronto.ca/pdf/ccdrs/ccdrs_manual.pdf

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 chart shows the growth since CCDRS 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. 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.



Summary of CCDRS Data Requests in 2013

In 2013, there were 4,624 CCDRS queries within 729 sessions. The following table shows the monthly summaries.

Month	Queries	Sessions
January	1725	156
February	727	101
March	370	73
April	250	45
May	374	49
June	331	70
July	220	53
August	204	54
September	133	46
October	140	38
November	61	22
December	89	22

Total 2013	**4624**	**729**
Total 2012	1407	431

Affiliations of CCDRS Users in 2013

The following is a list of 30 different agencies and groups that extracted the data through CCDRS in 2013.

AECOM
BA Consulting Group
City of Brampton
City of Mississauga
City of Toronto
Cole Engineering Group Ltd.
Delcan Corp.
Dillon Consulting Ltd.
Genivar Inc.
GHD
Halcrow Consulting Inc.
HDR Inc.
IBI Consulting Group
Lakehead University
LEA Consulting Inc.
McMaster University
Metrolinx
MMM Group Inc.
Ministry of Transportation Ontario
Peter Dalton Consulting
Region Municipality of Durham
Region Municipality of Peel
Region Municipality of York
Ryerson University
Toronto Transit Commission
University of Toronto
University of Waterloo
URS Canada Inc.
Valcoustics Canada Ltd.
Veitch Lister Consulting

CCDRS Special Data Requests

The interactive procedures available with CCDRS 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 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 is to reduce the number of such data requests in favour of users processing their request through CCDRS. There were no special data request related to the cordon counts in 2012 or 2013.

TRANSPORTATION TOMORROW SURVEY SUPPORT

In a manner similar to all Transportation Tomorrow Surveys since 1991, the Data Management Group assumed the role of project management. This arrangement facilitates the coordination of the two projects (TTS and DMG) with the added advantage that the DMG staff becomes conversant with all aspects of the data they subsequently administer for the funding agencies.

Agreement on a workable funding formula for another travel survey was not established until June of 2010. A decision was then 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 pilot test of the web browser procedure was carried out in October 2010 with subsequent tests carried out in the spring of 2011. The response was disappointing, which resulted in changes to the options available to households in the pre-interview letter. Essentially, the option to complete a questionnaire using a web browser became an effective method of establishing contact with a household.

The 2011 TTS includes a total of 23 local, regional, provincial and transit operating agencies in South Central Ontario. The survey collected approximately 65,000 and 94,000 households in the first and second interviewing phases respectively using both the traditional telephone and the new web browser methods. During the data validation process, age distribution bias was discovered showing that certain age cohorts such as 18 to 32 were under-represented whereas others were over-represented. Therefore a two-step expansion procedure different from previous years was applied. In step one, the data were expanded at dwelling unit level by postal area using 2011 Canada Census data and Canada Post household counts. In step two, adjustment factors were applied to population based on age group and municipality using Census data. Details on the data expansion and validation of the 2011 TTS can be found in the report “2011 TTS Version 1.0 Data Expansion & Validation”. The final dataset was released in November of 2013.

The Transportation Information Steering Committee (TISC) is reviewing the issues identified in the 2011 TTS and various possible alternate survey methods. The decision to conduct the next survey is yet to be made.

COMPUTER RESOURCES AND TECHNICAL SUPPORT

DMG is the custodian of the TTS, Cordon Count, 1964 MTARTS and GO Transit survey (prior to 1997) databases. These data are stored in Oracle, a relational database system, on a SUN Ultra Sparc server running Solaris. This server also hosts the DMG web site. In addition, the DMG operates a computer system including a server for running EMME2, a server for running GTA model, a server to manage the EMME3/EMME4 licences, a server to handle the DMG mail, a backup server, and a file server where the data files of the funding agencies are stored. All these servers are located behind the DMG firewall for security reasons.

Information from the databases can be obtained using the DMG web site (http:\\dmg.utoronto.ca) and one of the two interactive data retrieval systems, iDRS or CCDRS. An individual is required to complete a data access request form to obtain a user account. Once the account is set up, the individual can use the retrieval system at any time and as often as required. All years of the TTS and Cordon Count Data are compiled and stored in a consistent way, and the TTS and Cordon Count data are frequently used together in regional planning projects or traffic impact studies. A summary of the use and the users of this service is contained earlier in this annual report.

The DMG maintains a server for running EMME2 remotely to support agencies that have not completed migrating their modelling efforts to the newer EMME3 or EMME4. INRO, the developers of the EMME software, no longer provide support for EMME2 but allow the DMG to operate the software without support. The software required for remote access to EMME2 is available to registered users. A registered user must be directly associated with one of the funding partners, either as an employee or a consultant.

The newer EMME3/EMME4 software is run locally on a personal computer with all relate files stored locally. This results in much faster operation. Each local machine requires access to an authentication key to operate the software. Rather than each agency purchasing a licence from INRO to use the software locally, DMG negotiated a concurrent licence for authentication of several machines operating at the same time.

The DMG then dedicated a server to provide remote authentication to the participating partners. The DMG is in the process of migrating the current suite of supporting hardware and software to more recent and cost effective alternatives.