Minnesota Department of Transportation

getTraf_data: User Manual

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Contents

1. Introduction

getTraf_data (get MnDOT Traffic Data) is a software utility tool provided to public for retrieving traffic data from the traffic sensors managed by the RTMC (Regional Transportation Management Center), a division of MnDOT (Minnesota Department of Transportation). RTMC manages and collects traffic data in every 30 seconds from the two types of traffic sensors, inductive loop detectors and Wavetronix radar detectors, installed on the Twin Cities' (Minneapolis and St. Paul's) freeway network. The objective of this software was to provide a simple and easy-to-use tool for data retrievals to anybody interested in the RTMC traffic data. Please feel free to download and install on your PC (works on any Windows version).

Types of data can be retrieved using the getTraf_data tool presently include (1) 30-second volumes, (2) 30-second occupancies, (3) 30-seconds speeds, (4) hourly volumes, (5) daily volumes, (6) hourly average speeds, and (7) hourly speed bins. Additional data types are expected to be added in the future versions.

2. How to Use getTraf_data

2.1 Collecting Detector ID information

For simplicity, you may assume that a traffic detector is installed on one device per lane at a designated location on the road. Thus, each detector volume represents the traffic volume on that lane where the detector is installed (or located). Each detector is identified by a unique detector ID number. To find detector IDs of the location you are looking for, please visit the following link. It is a pdf map that shows detailed detector locations on the Twin Cities' freeways.

http://www.dot.state.mn.us/rtmc/reports/ADR_2014.pdf

If this link does not work, please check the RTMC web site (https://www.dot.state.mn.us/rtmc/) and click on the link labeled "MnDOT Traffic Operations." On this web page, please look for the link that says "data tools to access traffic data," which leads to the MnDOT traffic data web page. From this web page, click on the link labeled, "All Detector Report," which would be the detailed pdf detector map shown in the above link.

Once detector IDs were identified, you can check if data for the detectors are available for the date you are looking for. List of detectors available for the given date can be retrieved using the following query on a web browser. Suppose that you wish to check what detector data are available for July 15, 2021. The date string is then created using 8 characters as "20210715" and the query string can be composed as:

```
http://iris.dot.state.mn.us/mayfly/detectors?date=20210715
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Here, http://iris.dot.state.mn.us/mayfly/ is the server URL and "detectors?date=20210715" is the query string requesting the available detector IDs on July 15, 2021.

Please type in or copy and paste the string at the URL textbox of your web browser and then the list will be retrieved on the web browser. Figure 1 shows a screen that this query pasted on the URL textbox on a Chrome web browser and the returned result. The result is always returned in JSON (JavaScript Object Notation), and presently about 7,450 detector IDs are live. In this list, if the detector ID has an R-prefix such as R78, it means the detector is located in the Rochester city roads. If an ID does not have a prefix and is a pure numeric number, this detector is then located in one of the Twin Cities' roads. If the detector ID has a T-prefix, it means the detector is temporary and it may be removed or changed to a permanent one without the T-prefix in the future.
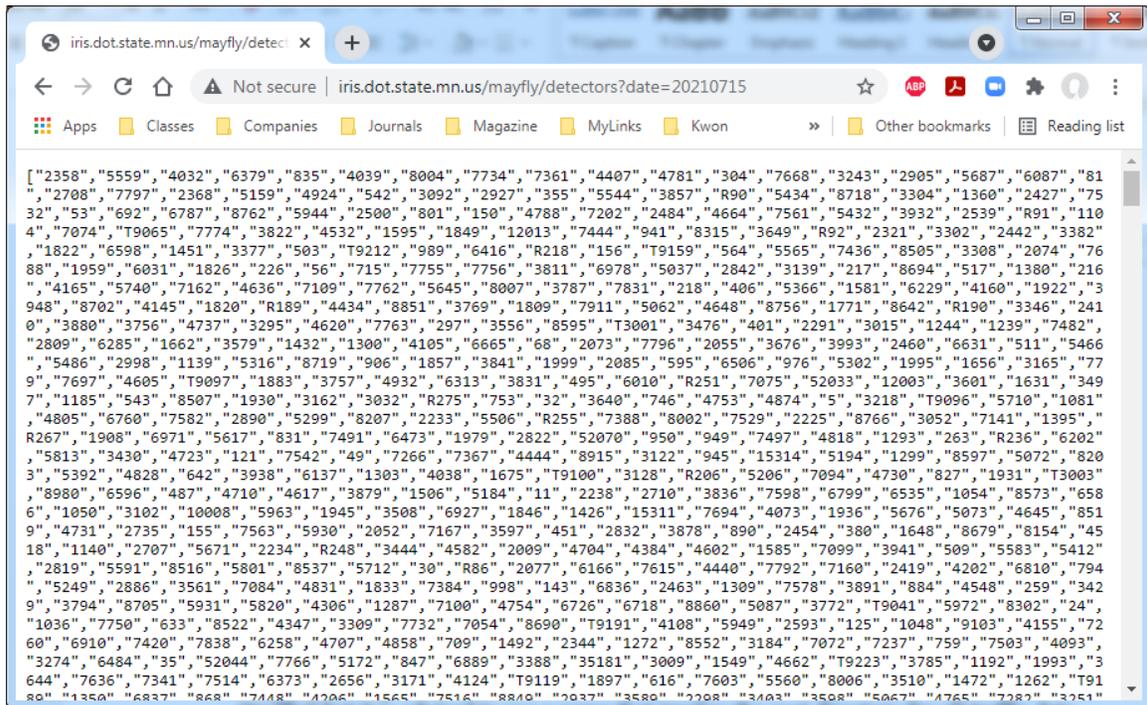
FIGURE 1: Query result of detector list of the given date

2.2 How To Use getTraf_data

The software user interface consists of the top portion for setting up the begin/end dates and detector list; and the bottom portion for buttons on retrieving different types of traffic data (see Figure 2). Data retrieval is simple and done by two steps.

Step 1: Select the begin/end dates and enter detector IDs
Step 2: Press the button that matches with the data type you wish to retrieve
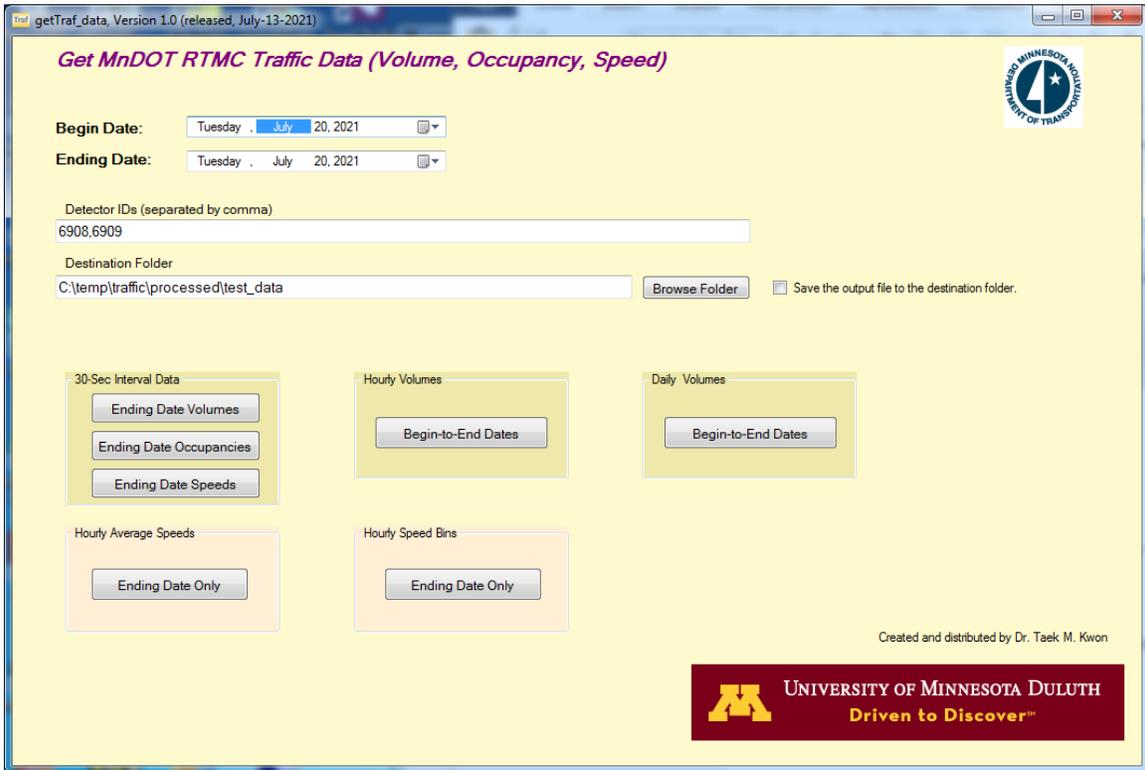
Figure 2: SC-TDA3 screen

More details are described below.

Step 1: Select the Begin/Ending dates and then enter detector IDs

Begin and ending dates must be selected using the date-picker tool provided (see Figure 3). The begin date must be older or same as the end date, and the end date must be older than today.

Detector IDs should be entered each separated by comma. Non-numeric detector IDs are allows for temporary (T-prefix) and Rochester (R-prefix) detectors. There is no limit on the number of detectors you can enter, but entering too many detectors (such as several hundreds) at once would require a long retrieval time.
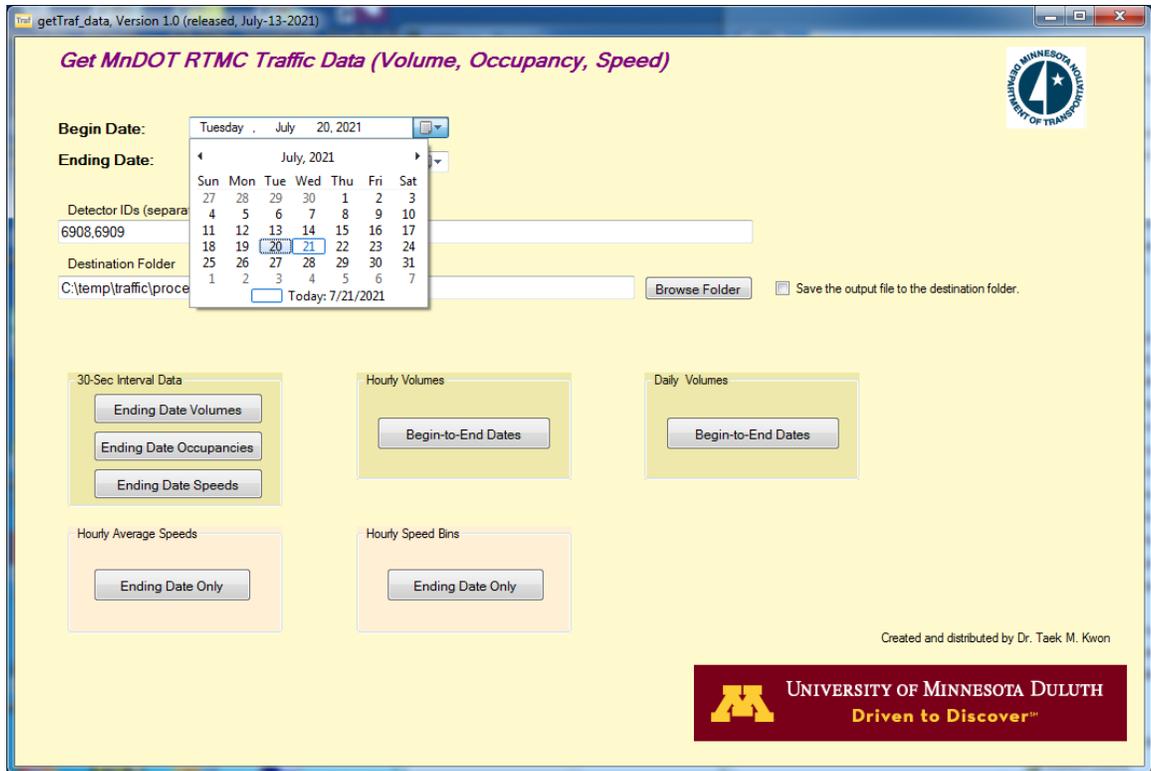
FIGURE 3: Use the date-picker tool provided to select Begin/Ending dates

Step 2: Press the button that matches with the data type

Pressing one of the retrieval buttons provided accesses the RTMC server and retrieves the data requested. All outputs are produced in CSV (Comma Separated Value) format and displayed on an Excel spreadsheet. When the check mark "Save the output file to the destination folder" is marked (on), all output files are saved in the Destination folder specified. A destination folder must be specified using the **Browse Folder** button provided. If the check-mark is off, all files are saved in the software default directory, which is located at C:\Users*user_name*\AppData\Roaming\Bulldog\getTraf_data where *user_name* is the user name of the PC you logged in. You can still save the file at the desired location using the "File/Save As" menu in the Excel spreadsheet.

2.3 Output File Data Formats

All outputs are generated in CSV file, and the format for each data type is described in this section. A table describing each column is first shown, and then an example the corresponding spreadsheet screen is attached. Multiple columns used to list data for multiple detector IDs are shown using parenthesis, (...) in the format description. It means the format repeats for the listed detectors. If a datum was missing, negative one (-1) value was filled in the data cell. Thus, -1 simply means that no sensor data is available. All examples are shown using two detectors IDs, 6908 and 6909 in the subsequent format descriptions.

30-Sec Data: Ending Date Volumes

Detector volume data in every 30-sec interval.

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
time	start time of the 30 sec period in hh:mm:ss format where hh=hour, mm=minute, ss=second
(Detector_ID)	30 second volume of the detector (=Detector_ID)

1	date	time	6908	6909
2	7/20/2021	0:00:00	2	3
3	7/20/2021	0:00:30	3	2
4	7/20/2021	0:01:00	8	3
5	7/20/2021	0:01:30	2	2
6	7/20/2021	0:02:00	3	1
7	7/20/2021	0:02:30	3	0
8	7/20/2021	0:03:00	4	0
9	7/20/2021	0:03:30	6	3
10	7/20/2021	0:04:00	1	2
11	7/20/2021	0:04:30	6	1
12	7/20/2021	0:05:00	0	0
13	7/20/2021	0:05:30	5	3
14	7/20/2021	0:06:00	2	0
15	7/20/2021	0:06:30	3	2

30-Sec Data: Ending Date Occupancies

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
time	start time of the 30 sec period in hh:mm:ss format where hh=hour, mm=minute, ss=second
(Detector_ID)	30 second occupancy in percent of the detector. For example, 4.35 means that the occupancy of the 30-second time slot was 4.35 percent, i.e., 1.29 seconds.

1	date	time	6908	6909
2	7/20/2021	0:00:00	1.71	2.43
3	7/20/2021	0:00:30	2.54	1.4
4	7/20/2021	0:01:00	9.24	4.35
5	7/20/2021	0:01:30	4.83	1.47
6	7/20/2021	0:02:00	4.35	0.71
7	7/20/2021	0:02:30	2.3	0
8	7/20/2021	0:03:00	3.39	0
9	7/20/2021	0:03:30	4.95	2.03
10	7/20/2021	0:04:00	0.75	1.4
11	7/20/2021	0:04:30	5.5	0.73
12	7/20/2021	0:05:00	0	0
13	7/20/2021	0:05:30	6.26	2.19
14	7/20/2021	0:06:00	1.55	0
15	7/20/2021	0:06:30	2.41	1.45
16	7/20/2021	0:07:00	0.84	1.58
17	7/20/2021	0:07:30	4.73	0
18	7/20/2021	0:08:00	0.88	0
19	7/20/2021	0:08:30	0	0

30-Sec Data: Ending Date Speeds

Column Heading	Description
date	date in mm/dd/yyyy format where mm=month, dd=date, yyyy=year
time	start time of the 30 sec period in hh:mm:ss format where hh=hour, mm=minute, ss=second
(Detector_ID)	average speed in mph of all vehicle passed over the detector during the 30 sec time slot.

	date	time	6908	6909
1	date	time	6908	6909
2	7/20/2021	0:00:00	57	64
3	7/20/2021	0:00:30	59	70
4	7/20/2021	0:01:00	56	66
5	7/20/2021	0:01:30	58	68
6	7/20/2021	0:02:00	62	77
7	7/20/2021	0:02:30	57	-1
8	7/20/2021	0:03:00	56	-1
9	7/20/2021	0:03:30	62	72
10	7/20/2021	0:04:00	70	68
11	7/20/2021	0:04:30	60	69
12	7/20/2021	0:05:00	-1	-1
13	7/20/2021	0:05:30	63	72
14	7/20/2021	0:06:00	64	-1
15	7/20/2021	0:06:30	60	65
16	7/20/2021	0:07:00	66	65
17	7/20/2021	0:07:30	60	-1

Begin-to-End Date: Hourly Volume

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
hour	hour in 24-hour system, i.e., 0, 1, ..., 23
(Detector_ID)	volume of the corresponding hour
Total Vol	total of all detector volumes in the hour
(detector_ID-miss%)	number of 30-sec time slots with missing data in percent, i.e., (m/120)*100 where m is the number of 30 sec time slots with missing data within the hour period specified in the second column

date	hour	6908	6909	Total Vol	6908-mis%	6909-mis%
7/19/2021	0	154	163	317	0	0
7/19/2021	1	110	99	209	0	0
7/19/2021	2	83	76	159	0	0
7/19/2021	3	86	80	166	0	0
7/19/2021	4	145	158	303	0	0
7/19/2021	5	388	452	840	0	0
7/19/2021	6	612	766	1378	0	0
7/19/2021	7	781	1015	1796	0	0
7/19/2021	8	879	1107	1986	0	0
7/19/2021	9	913	1128	2041	0	0
7/19/2021	10	909	1100	2009	0	0
7/19/2021	11	935	1200	2135	0.8	0
7/19/2021	12	1046	1239	2285	0	0
7/19/2021	13	1012	1296	2308	0	0
7/19/2021	14	1135	1486	2621	0	0
7/19/2021	15	1362	1975	3337	0.8	1.7
7/19/2021	16	1518	2132	3650	0	0
7/19/2021	17	1360	1990	3350	0	0
7/19/2021	18	997	1330	2327	0	0
7/19/2021	19	734	950	1684	0	0.8
7/19/2021	20	634	814	1448	0	0.8
7/19/2021	21	505	612	1117	0	0
7/19/2021	22	369	479	848	0	0
7/19/2021	23	321	267	588	0	0

Begin-to-End Date: Daily Volume

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
(Detector_ID)	volume of the day
Total Vol	total of all detector volumes on that day
(detector_ID-miss%)	number of 30-sec time slots with missing data on the day in percent for the specified detector. A single day consists of 2,880 30-sec time slots, and the miss-percent is defined as (m/2,880)*100 where m is the total number of times slots with missing data on the day.
(Total-miss%)	number of 30-sec time slots with missing data on the day in percent for all detectors specified

	date	6908	6909	Total vol	6908-mis%	6909-mis%	Total-mis%
1	date	6908	6909	Total vol	6908-mis%	6909-mis%	Total-mis%
2	7/10/2021	13179	16512	29691	0	0	0
3	7/11/2021	11807	14638	26445	0	0.1	0
4	7/12/2021	16575	21686	38261	0.1	0.2	0.2
5	7/13/2021	17420	22624	40044	0	0	0
6	7/14/2021	16103	21109	37212	0.1	0.1	0.1
7	7/15/2021	17685	23345	41030	0	0	0
8	7/16/2021	17148	22992	40140	0.1	0.1	0.1
9	7/17/2021	14467	18557	33024	0	0	0
10	7/18/2021	12940	16899	29839	0	0.1	0.1
11	7/19/2021	16988	21914	38902	0.1	0.1	0.1
12	7/20/2021	17283	22797	40080	0.1	0.1	0.1

Ending Date: Hourly Average Speeds

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
hour	hour in 24-hour system, i.e., 0, 1, …, 23
(Detector_ID)	average speed of all vehicles passed over the detector in the specified hour
Avg Spd	average of all detector speeds in the hour
(detector_ID-miss%)	number of 30-sec time slots with missing data in percent, i.e., $(m/120)*100$ where m is the number of 30 sec time slots with missing data within the specified hour

	date	hour	6908	6909	Avg Spd	6908-mis%	6909-mis%
2	7/20/2021	0	59	66	62	23.3	40
3	7/20/2021	1	62	68	65	35.8	35
4	7/20/2021	2	62	68	65	49.2	45
5	7/20/2021	3	60	67	64	63.3	49.2
6	7/20/2021	4	64	68	66	34.2	37.5
7	7/20/2021	5	65	71	68	5	7.5
8	7/20/2021	6	64	71	68	0	0
9	7/20/2021	7	63	70	66	0.8	0
10	7/20/2021	8	62	69	66	0	0
11	7/20/2021	9	63	70	66	0	0
12	7/20/2021	10	62	70	66	0	0
13	7/20/2021	11	62	69	66	0	0
14	7/20/2021	12	63	70	66	0	0
15	7/20/2021	13	62	69	66	0	0
16	7/20/2021	14	62	68	65	0	0
17	7/20/2021	15	60	66	63	0	0
18	7/20/2021	16	60	66	63	0	0
19	7/20/2021	17	60	66	63	0	0
20	7/20/2021	18	63	71	67	0	0
21	7/20/2021	19	64	72	68	0	0
22	7/20/2021	20	63	71	67	0.8	0
23	7/20/2021	21	61	69	65	0	0
24	7/20/2021	22	61	69	65	2.5	2.5
25	7/20/2021	23	61	68	64	7.5	5.8

Ending Date: Hourly Speed Bins

Column Heading	Description
date	date in MM/dd/yyyy format where MM=month, dd=date, yyyy=year
hour	hour in 24-hour system, i.e., 0, 1, ..., 23
0->20	counts of vehicles traveling in the range 0≤speed<20 mph
20->25	counts of vehicles traveling in the range 20≤speed<25 mph
25->30	counts of vehicles traveling in the range 25≤speed<30 mph
30->35	counts of vehicles traveling in the range 30≤speed<35 mph
35->40	counts of vehicles traveling in the range 35≤speed<40 mph
40->45	counts of vehicles traveling in the range 40≤speed<45 mph
45->50	counts of vehicles traveling in the range 45≤speed<50 mph
50->55	counts of vehicles traveling in the range 50≤speed<55 mph
55->60	counts of vehicles traveling in the range 55≤speed<60 mph
60->65	counts of vehicles traveling in the range 60≤speed<65 mph
65->70	counts of vehicles traveling in the range 65≤speed<70 mph
70->75	counts of vehicles traveling in the range 70≤speed<75 mph
75->80	counts of vehicles traveling in the range 75≤speed<80 mph
80->85	counts of vehicles traveling in the range 80≤speed<85 mph
85->	counts of vehicles traveling in the range speed ≥ 85 mph
vol	total vehicle counts in the hour

detID	Date	Hour	0->20	20->25	25->30	30->35	35->40	40->45	45->50	50->55	55->60	60->65	65->70	70->75	75->80	80->85	85->	Vol
6908	7/21/2021	0	0	0	0	0	0	0	0	11	47	80	32	11	3	0	0	185
6908	7/21/2021	1	0	0	0	0	0	1	1	10	24	32	29	7	2	0	0	106
6908	7/21/2021	2	0	0	0	1	5	1	2	5	25	41	8	6	3	1	0	100
6908	7/21/2021	3	0	0	0	0	0	0	1	6	19	29	20	9	3	0	0	87
6908	7/21/2021	4	0	0	0	0	0	0	0	3	22	49	35	22	3	1	0	137
6908	7/21/2021	5	0	0	0	0	0	0	1	4	52	130	106	46	9	3	0	352
6908	7/21/2021	6	0	0	0	0	0	0	0	18	80	258	149	88	14	4	0	612
6908	7/21/2021	7	0	0	0	0	0	1	2	35	157	320	189	63	17	1	0	788
6908	7/21/2021	8	0	0	0	1	0	1	5	55	253	280	110	38	8	0	0	760
6908	7/21/2021	9	0	0	0	0	0	0	17	98	293	327	115	38	5	2	0	899
6908	7/21/2021	10	0	0	0	0	0	1	13	56	252	376	144	43	10	0	0	900
6908	7/21/2021	11	0	0	0	0	0	1	5	76	269	389	192	59	15	1	0	1012
6908	7/21/2021	12	0	0	0	0	0	0	3	55	239	420	199	70	8	0	0	999
6908	7/21/2021	13	0	0	0	0	5	3	23	93	263	415	171	55	8	1	0	1041
6908	7/21/2021	14	0	0	0	0	0	2	16	80	292	479	198	59	6	1	0	1139
6908	7/21/2021	15	0	0	0	0	0	4	57	160	436	478	173	49	10	3	0	1376
6908	7/21/2021	16	0	0	0	1	6	21	80	213	491	467	147	50	4	2	1	1488
6908	7/21/2021	17	0	0	0	0	0	9	50	193	365	465	192	64	2	1	0	1346
6908	7/21/2021	18	0	0	0	0	0	2	15	52	248	450	187	69	19	1	0	1046
6908	7/21/2021	19	0	0	0	0	0	0	5	38	232	298	161	69	19	2	0	827
6908	7/21/2021	20	0	0	0	0	1	2	6	44	171	243	136	48	15	3	0	673
6908	7/21/2021	21	0	0	0	0	0	1	4	53	176	204	76	37	4	2	0	563
6908	7/21/2021	22	0	0	0	0	0	2	6	39	128	156	51	33	4	1	0	421
6908	7/21/2021	23	0	0	0	0	2	5	16	42	99	105	42	17	3	0	0	331

3. Concluding Remarks

The objective of making this software was to provide a free, easy-to-use tool for retrieving traffic data from the traffic sensors (vehicle detectors) installed on the Twin Cities' freeway network. These detectors are managed by MnDOT RTMC, and they use them to supply traffic data for ramp metering, incident management, freeway capacity management, transportation planning, etc. RTMC traffic data is a collection of very valuable resources for many applications and studies, and this software package was intended to provide an easy access to that data.

I am hoping that this software is easy-to-use for anyone interested in traffic and can serve the data needs. This software package will be updated when the needs rise. Please don't hesitate to write an email to me (tkwon@umn.edu) if you have any questions or suggestions. The latest version of the software will be distributed through the web site:

http://www.d.umn.edu/~tkwon/Download/mndotDownload.htm