Chapter 7

Data Extraction Cookbook

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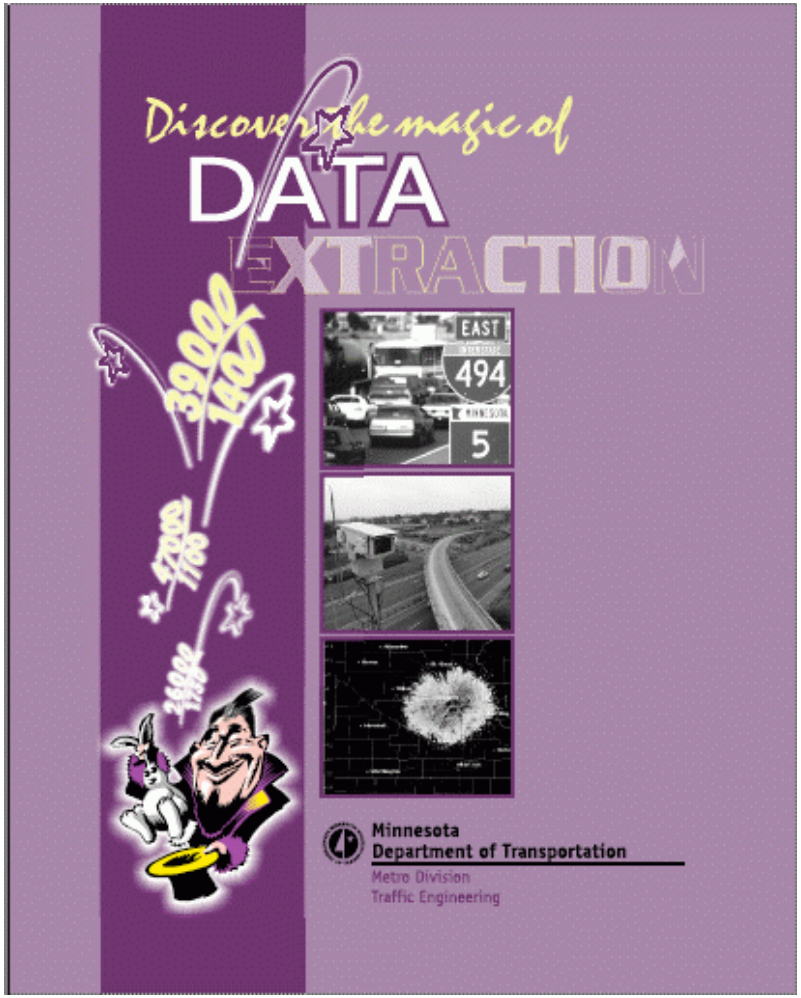
Data Extraction Cookbook



External Customers Have Access to:

- System Data
- Internal Tools & Programs
- Database Information
- System Resource Materials

Data Extraction Workstation

The Workstation is Located at the Water's Edge Facility in the Traffic Engineering Office on the 2nd Floor Behind the Secretary's Station

Contact Person For Access:
Kevin Sommers
kevin.sommers@DOT.state.mn.us
651-634-2413

Data Extraction Cookbook
User Requirements

- Register at the Front Desk
- Data Pulls Conducted During Off-Peak Periods
- Bring CD or Floppy Disk to Store Data
- Sign the Log Book in Metro Traffic
- Provide Feedback

Resource Materials

- Available on Website:
  - All Detector Report
  - Stratified Zone Metering Algorithm
  - Ramp Metering Status
  - Freeway Ramp Metering Locations Map

Resource Materials

- Available @ Workstation:
  - DataPlot User Manual
  - DataExtract User Manual
  - Continuity User Manual
  - IRIS User Manual

Data Extraction Support

Support Areas	Specific Topics	Contacts
Computer Problems	Physical Computer, Network & Office Packages	Metro MIS Jim Cray 582-1202
Extraction Tools	DataExtract, DataPlot, Continuity Program & IRIS	RTMC Computer Support Tim Johnson 634-5252
Technical Questions	Ramp Metering Status or Timing	RTMC Operations Gabriella Tsurutani 634-5277
RTMC Operations	Control Room Observations	RTMC Operations 634-5311
Modeling Requirements	Data Requirements	Metro Modeling Kevin Sommers 634-2413

Data Extraction Workstation
Software Packages

- Office Packages
  - Access 97
  - Word
  - Excel
  - WinZip
  - Ex CD creator
- Customized Packages
  - DataPlot
  - DataExtract
  - IRIS
  - Continuity Program

Data Extraction Procedure

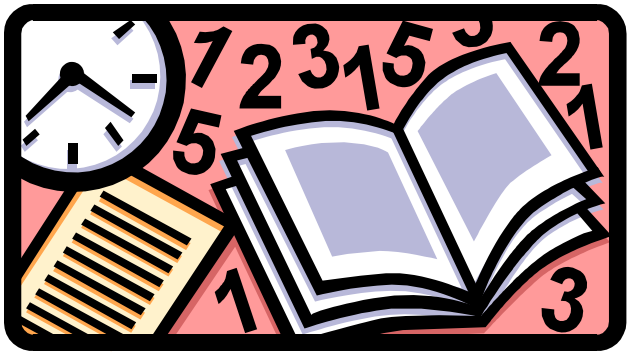
- Step 1: Access Workstation
- Step 2: Determine Feasible Dates
- Step 3: Determine Peak Periods
- Step 4: Determine Influence Area
- Step 5: Extract System Data
- Step 6: Extract Ramp Control Data
- Step 7: Save Data to Disk

Access Workstation

- Sign the Login Sheet
- Computer Should be “on” If Not Power Up Computer
- No Username or Password Required
- Use the Workstation Icons to Access Programs

Determine Feasible Dates

- September – October Timeframe
- Eliminate Fridays, Weekends & Mondays
- Eliminate Holiday and Days Following a Holiday
- Eliminate Bad Weather Days
- Eliminate Dates Impacted by Incidents

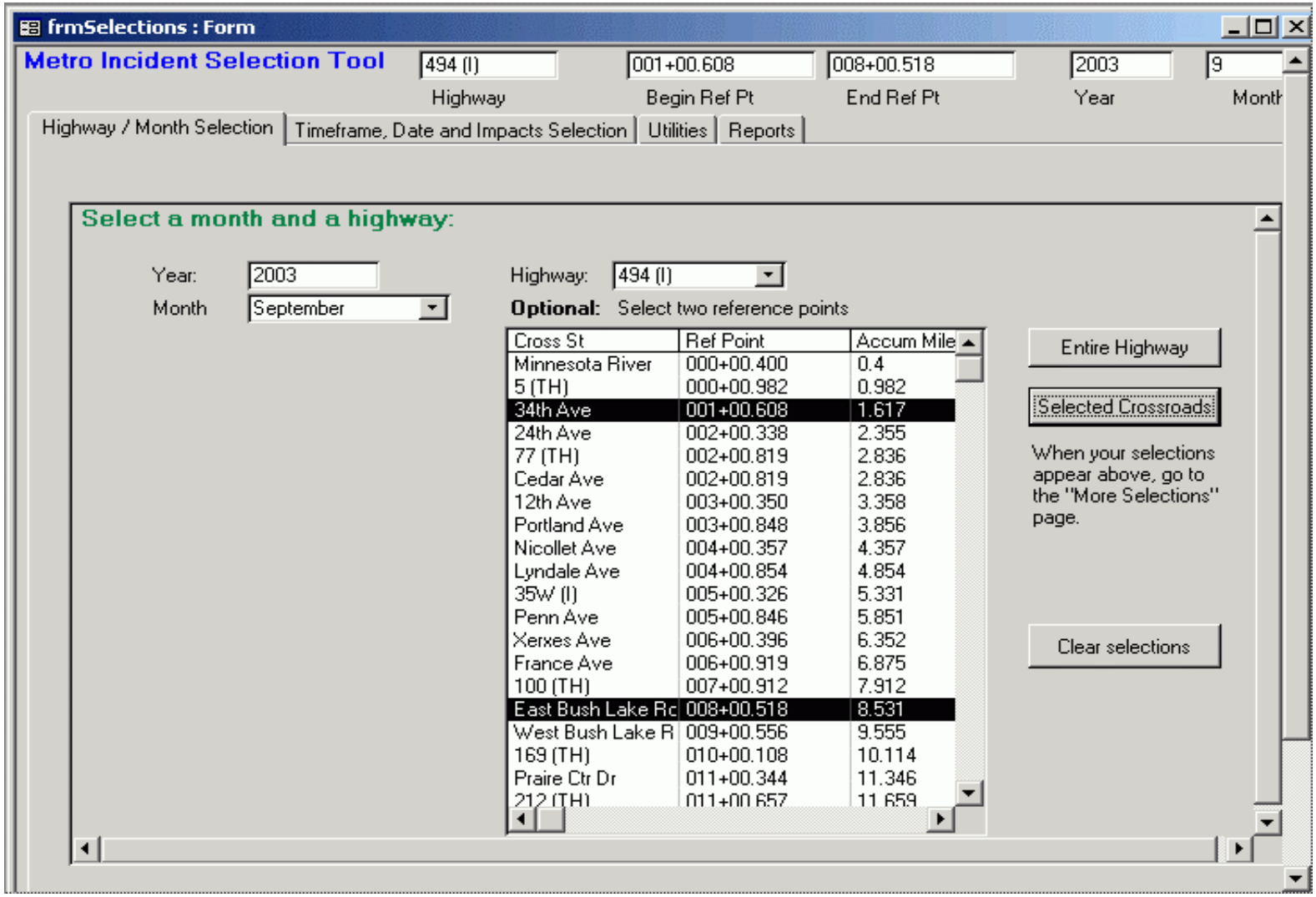


Eliminate Bad Weather Days

- Log Onto the National Weather Service Website: http://www.crh.noaa.gov/mpx/mpxmoncli/
- Eliminate Dates That:
  - Column 7 : Precipitation .20 Inches or Greater
  - Column 8 : Snow
  - Column 16: Code Indicating Fog, Hail Etc.

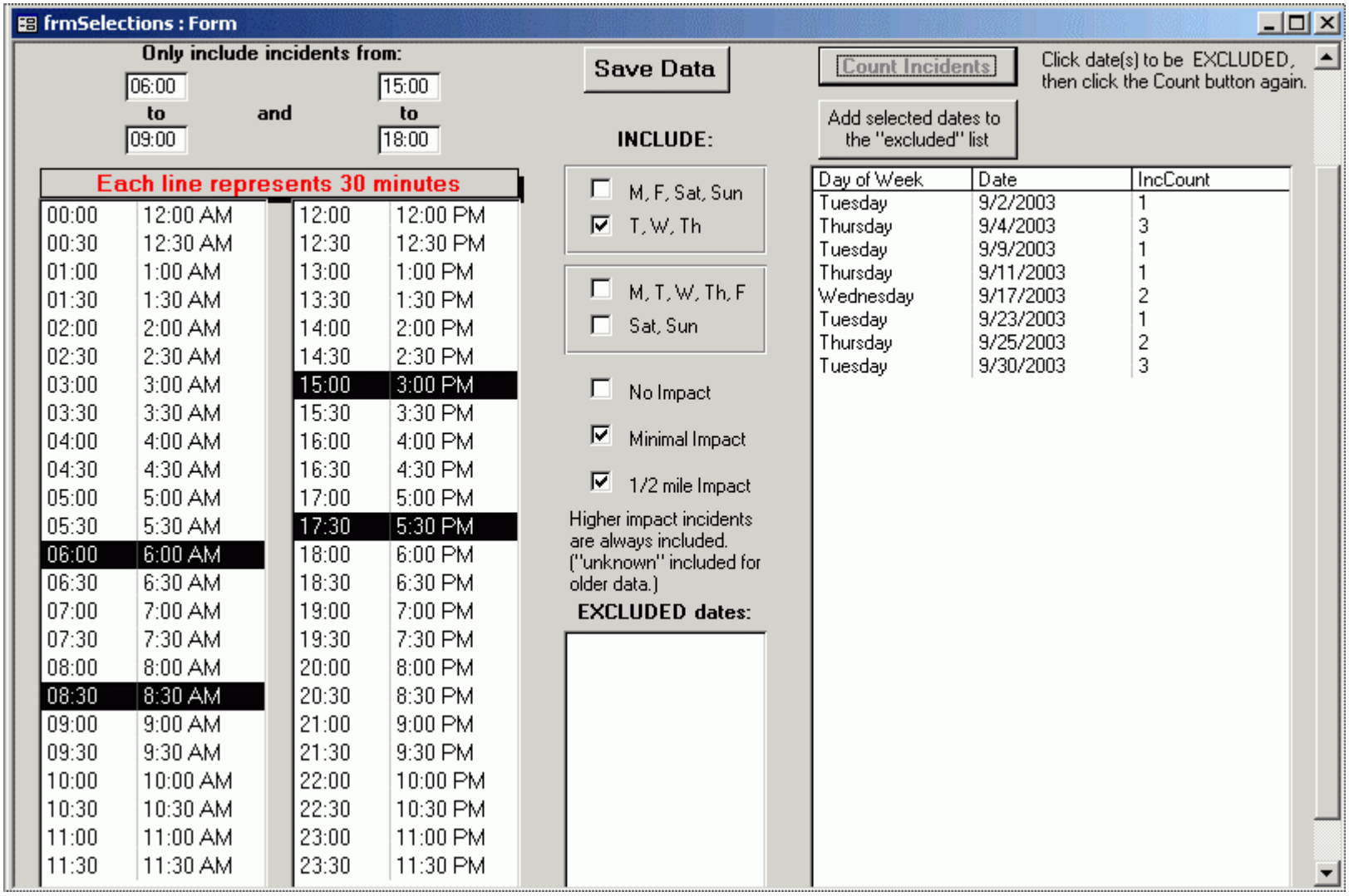
Eliminate Dates Impacted by Incidents

MIST (Metro Incident Selection Tool)



MIST Program

Define Timeframe, Dates, & Criteria



MIST Incident Impacts

INCLUDE:

- ☐ M, F, Sat, Sun
- ☑ T, W, Th
- ☐ M, T, W, Th, F
- ☐ Sat, Sun
- ☐ No Impact
- ☑ Minimal Impact
- ☑ 1/2 mile Impact

Higher impact incidents are always included. ("unknown" included for older data.)

	Impact:	ImpRating:
▶	No Impact	0
	Minimal Impact	0.1
	1/2 Mile or less	0.5
	1 Mile or less	1
	2 Miles or less	2
	3 Miles or less	3
	4 Miles or less	4
	5 Miles or less	5
	6 Miles or less	6
	7 Miles or less	7
	8 Miles or less	8
	9 Miles or less	9
	10 Miles or less	10
	At least 10 miles	12
*		0

MIST Summary Report

Metro Traffic Modeling - Summary Report by Date and Type 10/31/2003

SELECTION CRITERIA: Highway: 494 (I) Year: 2003 Month: September

Begin RefPt: 001+00.608 End RefPt: 001+00.608

Impacts included:: Min, 1/2 mi., all major impacts

Days included:: T, W, Th

Peak Times, From: 06:00 To: 09:00 AND 15:00 To: 18:00

Date:	Type:	Count of Incidents:	Count Mainline effected	Avg Hours:	Std Deviation:	Avg Impact Miles:	Std Deviation:
9/2/2003	Stall	1	0	1.0		0.1	
9/4/2003	Crash	3	3	0.6	0.28	0.8	0.29
9/9/2003	Crash	1	0	0.5		0.5	
9/11/2003	Stall	1	0	0.3		0.1	
9/17/2003	Debris	1	0	0.7		1.0	
9/17/2003	Stall	1	1	0.3		0.1	
9/23/2003	Crash	1	1	0.5		0.5	
9/25/2003	Crash	1	1	0.1		1.0	
9/25/2003	Stall	1	0	0.1		0.1	

MIST Detailed Reports

Metro Traffic Modeling - Incident Detail Report 10/31/2003

SELECTION CRITERIA: Highway: 494 (I) Begin RefPt: 001+00.608 End RefPt: 001+00.608 Year: 2003 Month: September

Peak Times, From: 06:00 To: 09:00 AND 15:00 To: 18:00 Days included:: T, W, Th Impacts included:: Min, 1/2 mi.

Date:	Type:	No of Veh:	LS	L5	L4	L3	L2	L1	RS	Off	Aux	Ent	Exit	HOV	Impact:	StartTime:	LanesClear:	AllClear:	
9/2/2003	Stall	2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Minimal Impact	16:04		17:02	Tuesday
		Road: 494 (I)								100 (TH)									
9/4/2003	Crash	3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	1 Mile or less	15:01	15:06	15:48	Thursday
		Road: 494 (I)								Penn Ave									
9/4/2003	Crash	2	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	1/2 Mile or less	17:22	17:22	17:37	Thursday
		Road: 494 (I)								Penn Ave									
9/4/2003	Crash	3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	1 Mile or less	17:29	17:39	18:10	Thursday
		Road: 494 (I)								Penn Ave									
9/9/2003	Crash	2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	1/2 Mile or less	7:19		07:46	Tuesday
		Road: 494 (I)								East Bush Lake Rd									

Determine Peak Period

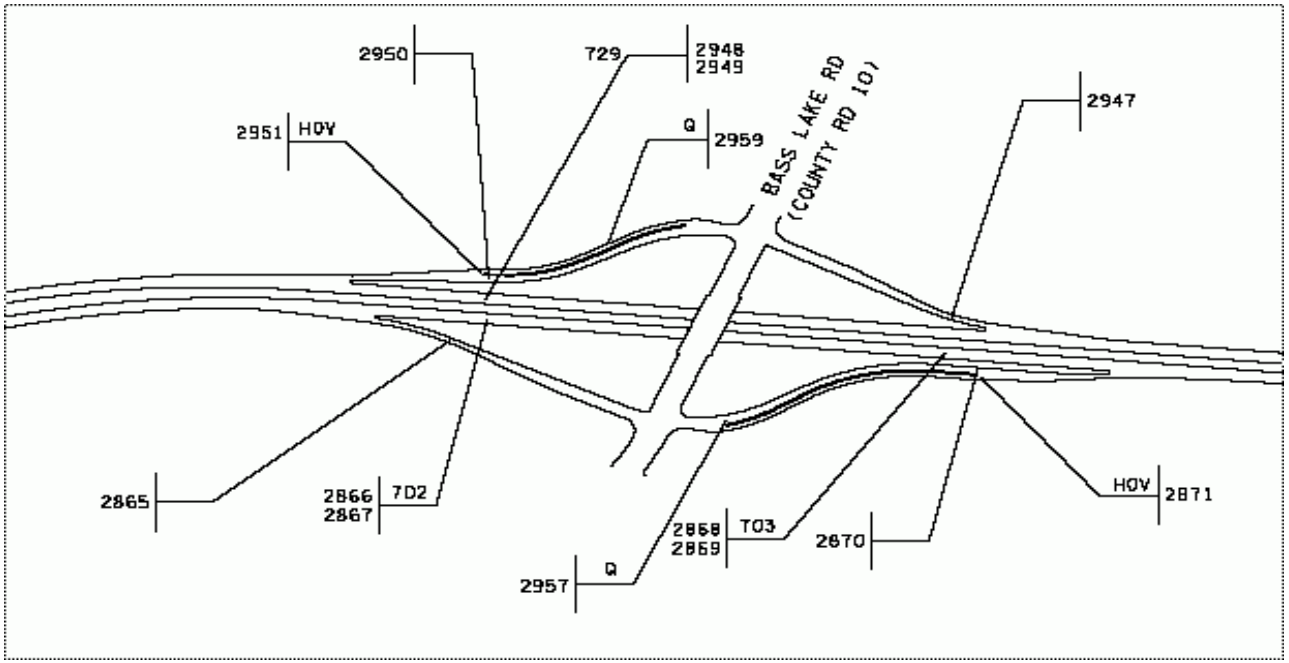
- All Detector Report
  - Define Critical Mainline Stations & Detectors
- DataPlot
  - Plot the Critical Detector & Stations For 24 Hour Period
  - Determine Peak Periods For Modeling Influence Area (Don’t Assume 6-9 AM & 3-6 PM)

Process for Extracting System Data

- Step 1: Identify Detector Numbers
- Step 2: Decide on Data Pull Option
- Step 3: Select the Mainline & Ramp Detector Numbers
- Step 4: Define Data Pull Parameters
- Step 5: Extract the Data
- Step 6: Store & Save Data

Note: This Used to be a Labor Intensive Process That Would Take Weeks to Pull and Format the Data.

Identify Detector Numbers

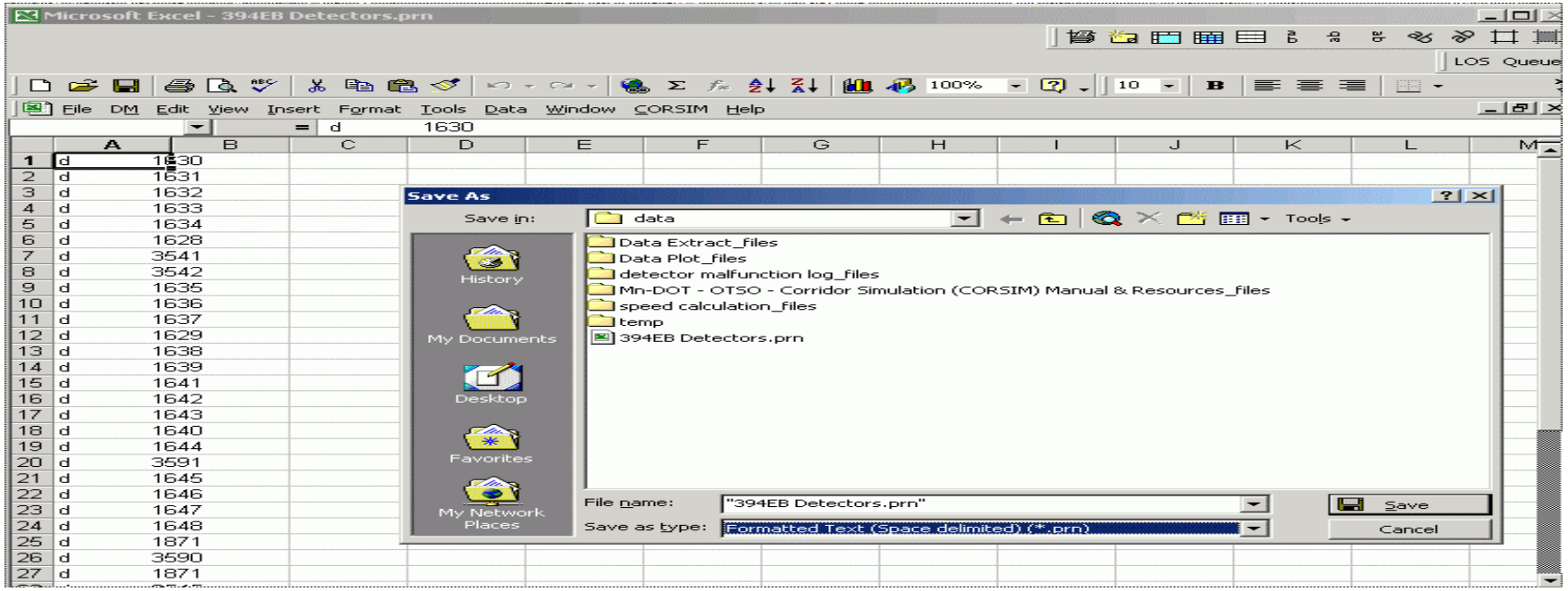


- Break Up the Data by Major Freeway and Direction
- Record Detectors (Not Stations) in Sequential Order
- Record Detectors by Direction of Flow
- Queue Detectors Are Optional

Decide on Data Pull Options

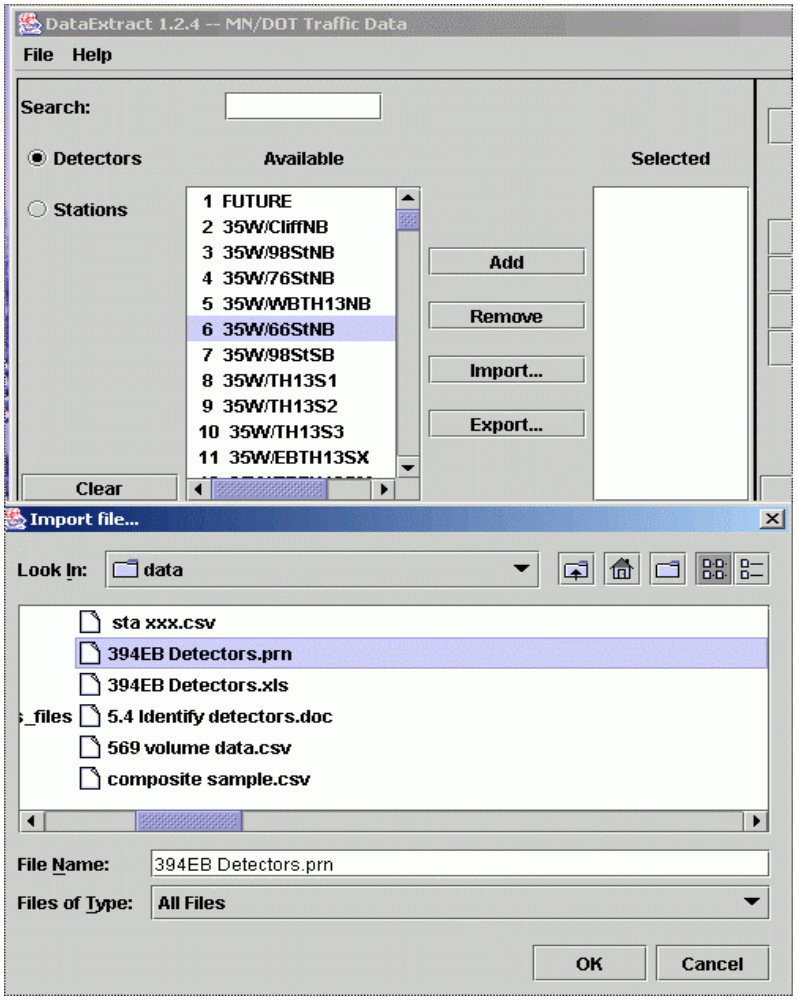
- Direct Data Pull
  - Use DataExtract Program
  - Faster For Small Projects
  - Verify Detector Number Are Entered Correctly
- Indirect Data Pull
  - Import Detectors Into DataExtract Program
  - Ideal For Large Modeling Projects
  - Create Input File Using Word, Excel, Textpad, or Notepad

Indirect Data Pull



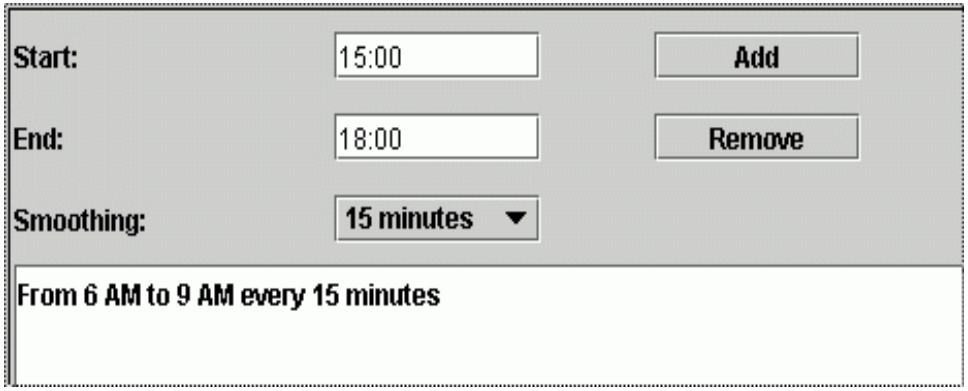
- One Entry Per Line,
- Start With “d” or “s”
  - “d” = Detector Id
  - “s” = Station Id
- Detector or Station #
- Save File as Formatted Text (Space Delimited) as *.prn file

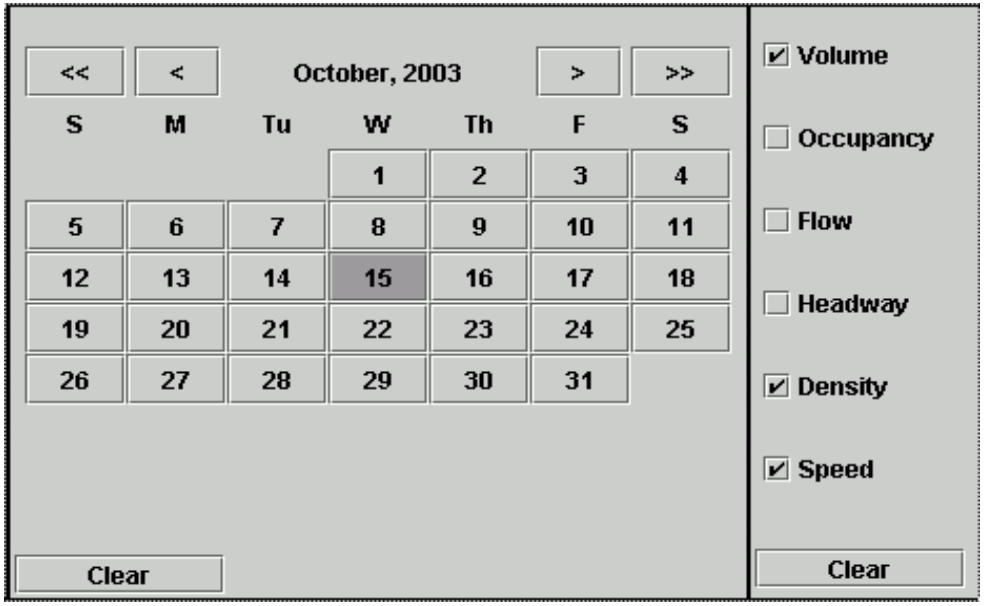
Select Mainline & Ramp Detectors



- Open DataExtract Program
- Select Detector Button
- Click “Import” Button
- Select File Name
  - 394EB Detectors.prn
- Click OK

Define the Data Pull Parameters

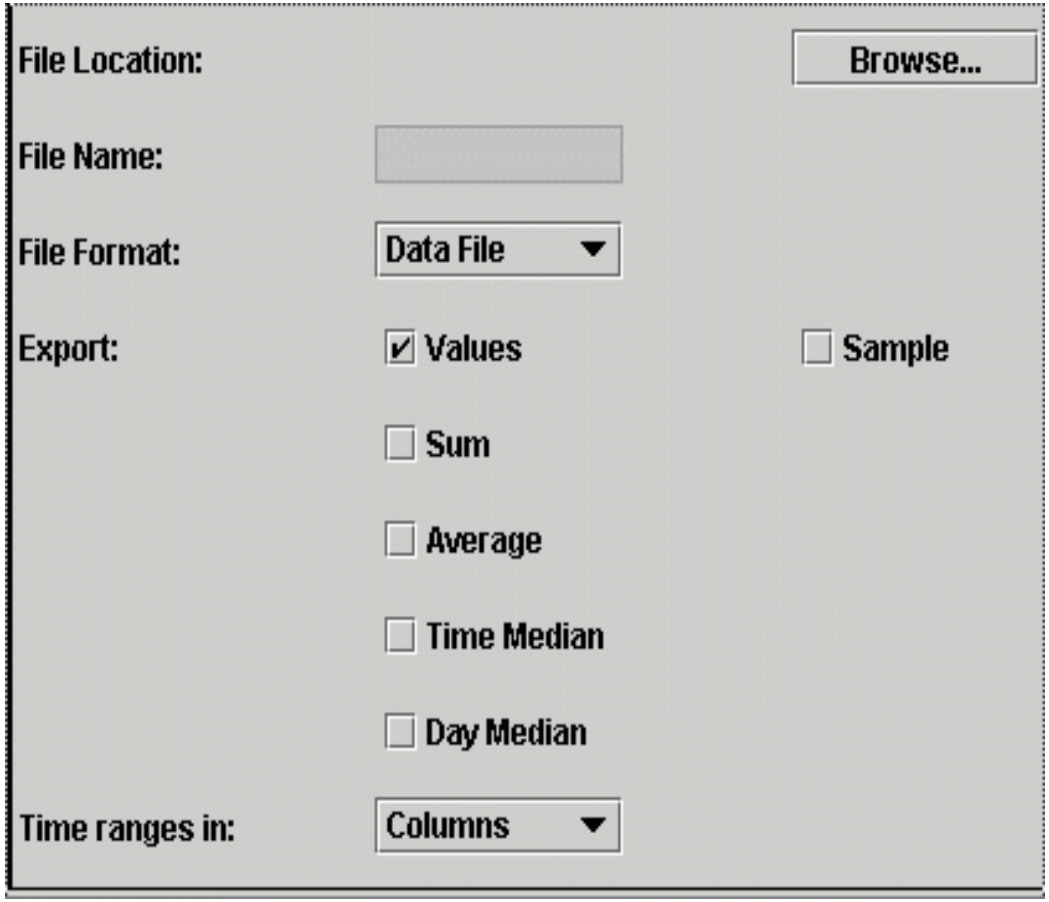




- Enter the Start & End Time as Military Time
- Enter Time Interval (15 minutes)
- Select Year, Month & Day From Calendar
- Select Type of Data (Volume, Density & Speed)

It is Recommended to Pull Data For the Entire Day.

Define the Data Pull Parameters Cont.



- Define Storage Location & Filename
  - If Not Using Data Format Option
- Define File Format Structure (**Data File**)
- Select Export Options (**Values)**
- Select the Time Range (**Rows**)

Note: The Default Storage Location is d:/temp.

Data Extraction

- Verify the Data File Was Created
- Make Sure the Data in the Correct Format
- Rename the Default Files
  - speed.csv to 394EB speed.csv
  - volume.csv to 394EB volume.csv
  - density.csv to 394EB density.csv
- Repeat Process Until All Data Has Been Collected

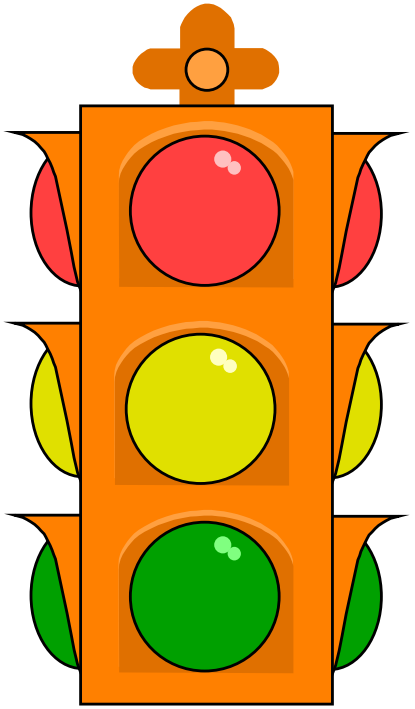
Reminder: The Default Files Are Over-Written With Each New Data Extraction Query

Saving Data

- Remember to Rename & Save Files After Each Data Query
- Save Data to Diskette or CD
- WinZip Software Program Available
- Verify That All Files Have Been Copied

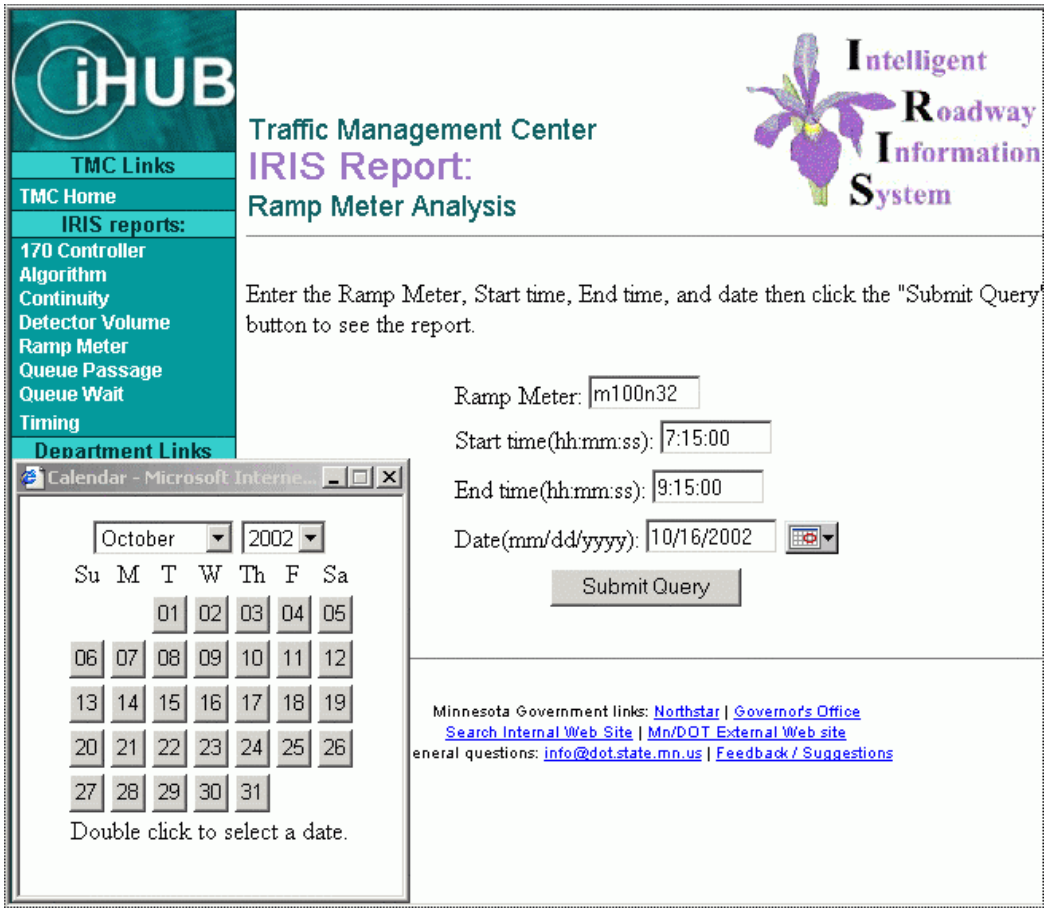
Operation Complete!

Ramp Control Data



- Identify Affected Ramp Meters
  - *Freeway Ramp Meter Location Map*
- Determine Ramp Metering Operations
  - *Ramp Meter Status Report*
  - *Verify metering w/RTMC Operations*

Extract Ramp Meter Rates



- Enter Ramp Meter ID
  - i.e.. M100n32
- Enter Start & End Time in Military Time
  - (hh:mm:ss) Format
- Select the Date
  - Direct Entry (mm/dd/yyyy) or
  - Calendar Entry
- Submit the Query

Ramp Control Data

- Cycle Time is the Time Between the Beginning of One Green to the Beginning of the Next Green.
- Yellow (.7 sec.) + Green (1.3 sec.) = 2 sec.
- Green Count is the Number of Cycles in a 30 Second Time Period
- Dual Metering: Double the Green Count

Ramp Meter M100N32 Excelsior Blvd
October 16, 2002
Download csv file

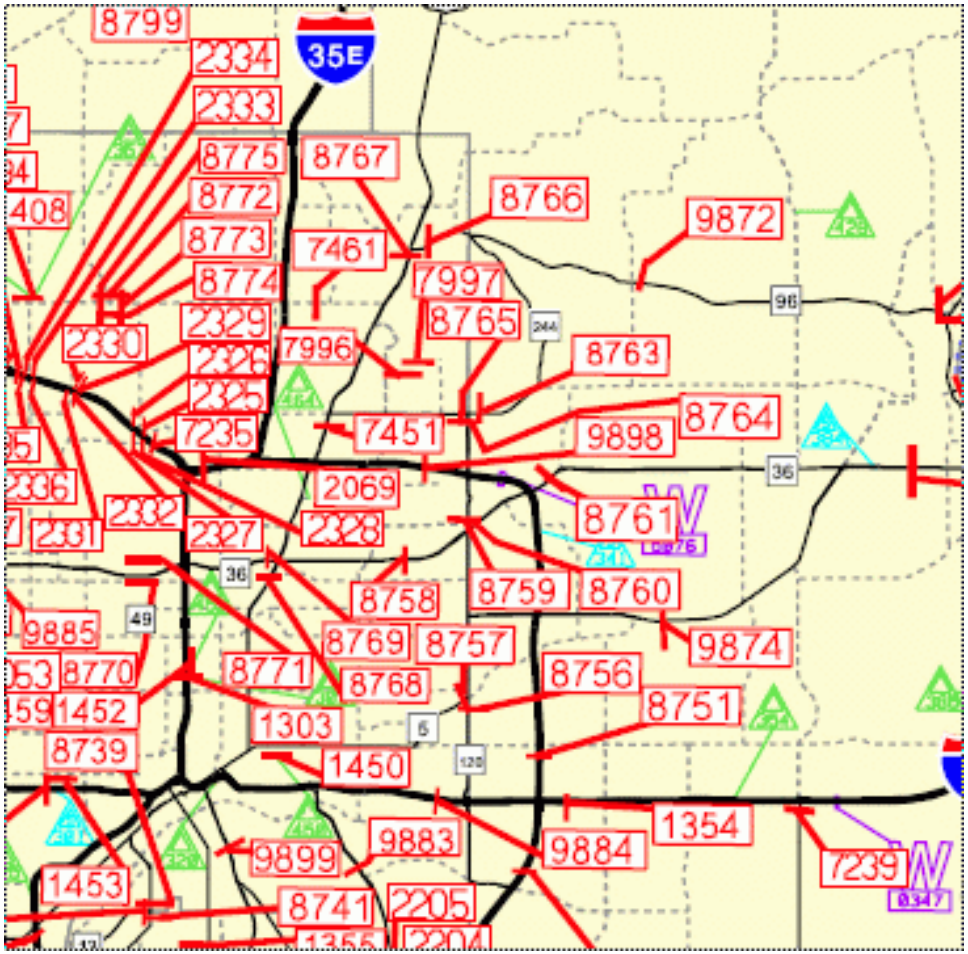
Time	Cycle Time	Green Count	Greens/ Merge	Queue Occupancy	Queue Volume
07:15:00	10.0	3	0.6	14.2	8
07:15:30	10.0	3	1.0	0.0	0
07:16:00	10.0	3	1.0	8.7	5
07:16:30	10.0	3	1.0	19.9	9
07:17:00	10.0	3	1.0	4.2	2
07:17:30	10.0	3	1.0	8.3	4
07:18:00	10.0	3	1.0	22.3	8
07:18:30	10.0	3	1.0	0.0	0
07:19:00	10.0	3	1.0	2.2	1
07:19:30	10.0	3	1.0	15.8	6
07:20:00	10.0	3	1.0	2.2	1
07:20:30	10.0	3	1.0	13.2	5
07:21:00	10.0	3	1.0	15.8	3
07:21:30	10.0	3	1.0	18.8	3

Save and Store Files

- Select the Download *.csv File
- Save File to Disk
  - Select Drive From Pop-Down Menu
  - Enter a Unique File Name For Each Meter
  - Repeat Procedure Until All Ramp Meter Timing Has Been Stored
  - Verify Files Are Stored on Disk
  - Operation Complete!

Metro Data Collection Site

http://www.dot.state.mn.us/tda/atr/atr.html



Numbers and cycles of counts:

1000 = 2 year trend (summer and fall)

2000 = Special request

3000 = Special CSAH (County State Aid Highway)

4000-6000 = CSAH/County Road

6000 = N/A

7000-9000 = Update sites (6 year cycle, summer)

Count Inventory

by Site, Date and Data Collection Method

SITE	ROUTE	DESCRIPTION	D	COUNTY	83	84	85	86	87	88	89	90	91	92	93	94	95
1050	CSAH 30	N OF CSAH31 WYOMING	5	CHISAGO		1		1		1		1			1		2
1052	CSAH 30	W OF CSAH21	1	PINE	1		1		1		1		1		1		2
1053	CSAH 14	1.3 MI N OF CSAH45	2	POLK	1		1		1		1		1			1	
1055	CSAH 1	W OF CR134 W OF MANHATTAN BEACH	3	CROW WING	1		1		1		1		1		1		1
1164	TH 53	1.25 MI S OF TH 37 AND CSAH 132	1	ST LOUIS		1		1	1	1		1		1		1	
1166	TH 169	W OF JCT CSAH83 NEAR CALUMET	1	ITASCA		1		1	1	1		1		1		1	
1170	TH 2	W OF JCT CSAH20	2	CLEARWATER	1		1		1		1		1		1		
1172	TH 10	0.3 MI W OF JCT CR68	4	CLAY	1		1		1		1		1		1		2
1175	I-94	W OF CR 186 NEAR SAUK CENTRE	3	STEARNS		1		1		1		1		1		1	
1179	TH 59	S OF S JCT CSAH14	8	LYON		1		1	1	1	1	1		1			2

Data Collection Methods

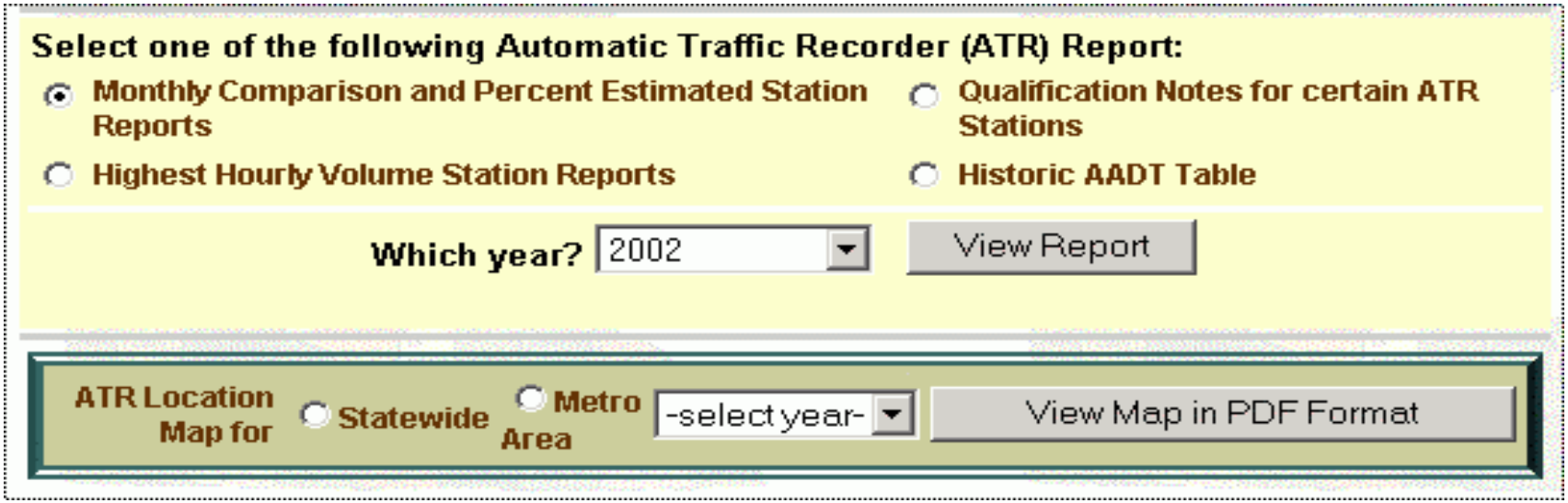
1 & 3: Manual Counts- 16 hour

2 & 4: 48 Hour Tube Counts

Tube counts go back to 1994

Manual Counts back to 1993

Reports and Historical Information



STA. NO.	1982	1984	1986	1988	1990	1992	1994	1996	1997	1998	1999	2000	2001	STA. NO.
METRO AREA INTERSTATE HIGHWAYS														
301				123665	127078	124235		140418	148979	150898	159254	159710	159355	301
302	57139	58888		105844				130051	132036	137907	139656	141065		302
303	75496	77994		90825	88336	99819	117049	125988	128780	131669	133782	135978	137,598	303
305	25320		33351	39799	46503	50333	57688	58475	64355	75871	84321	88362	92,379	305
306	79297	102174	113646	123445		135176	141392	143592	152605	157213	159244	158827		306
312	118391	135538	143131	155547	156808	162210		160620	164212	170584	170341	168313		312
313	114721	123100	130818	139309	146132	147056	143809	143038	138800	144229	141267	144403		313
314	67457	78214	82533	90594	91928	93099		90942	98045	101883	98782	90742		314
315	64237	74317	80524	87003	89323			98511	100745	104532	105378	103929	105,259	315
319	93991	102098	112997		129434	142296	151311	152184	155916	158609	160745	159990		319
321	102655	119410	130796	144198	148331	160852	167841	166976	171420	174306	176106	174936	167465	321