



Tennessee Traffic Information Management and Evaluation System (TN-TIMES)

Presentation by: Ben Chen, PE, PTOE

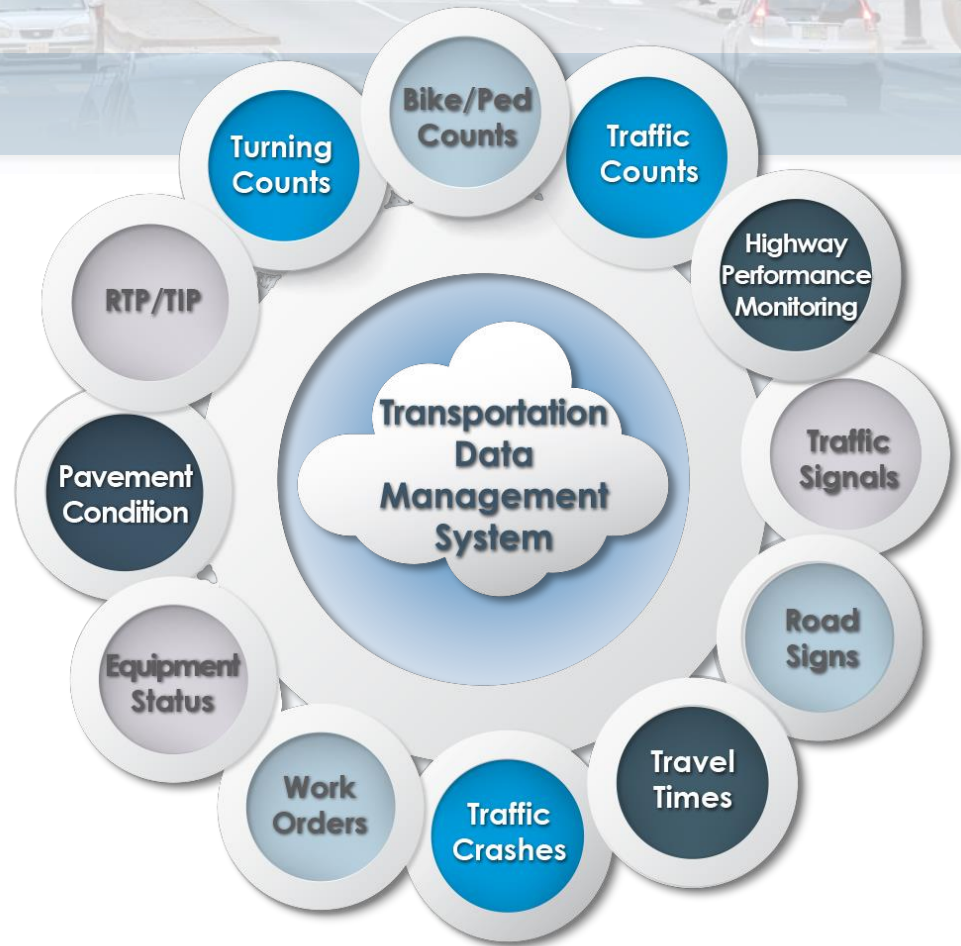


Agenda

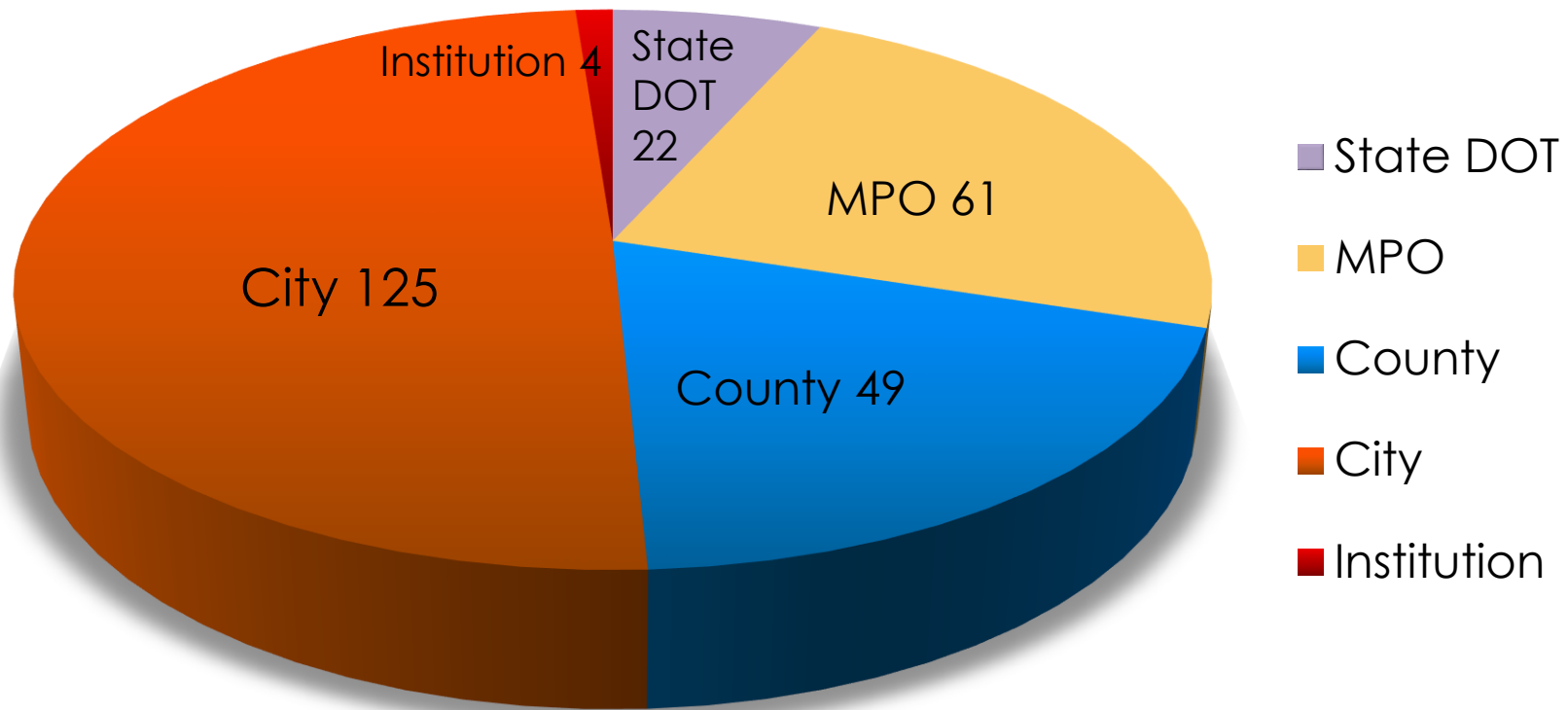
1. MS2 Overview
2. TN-TIMES Project
3. TCDS/HPMS Features
4. Q&A



Pioneer and National
Leader of cloud-
based TDMS used by
more than 250
agencies in 30 states,
including DOTs, MPOs,
counties and cities



Over 250+ Users



22 State DOT Clients

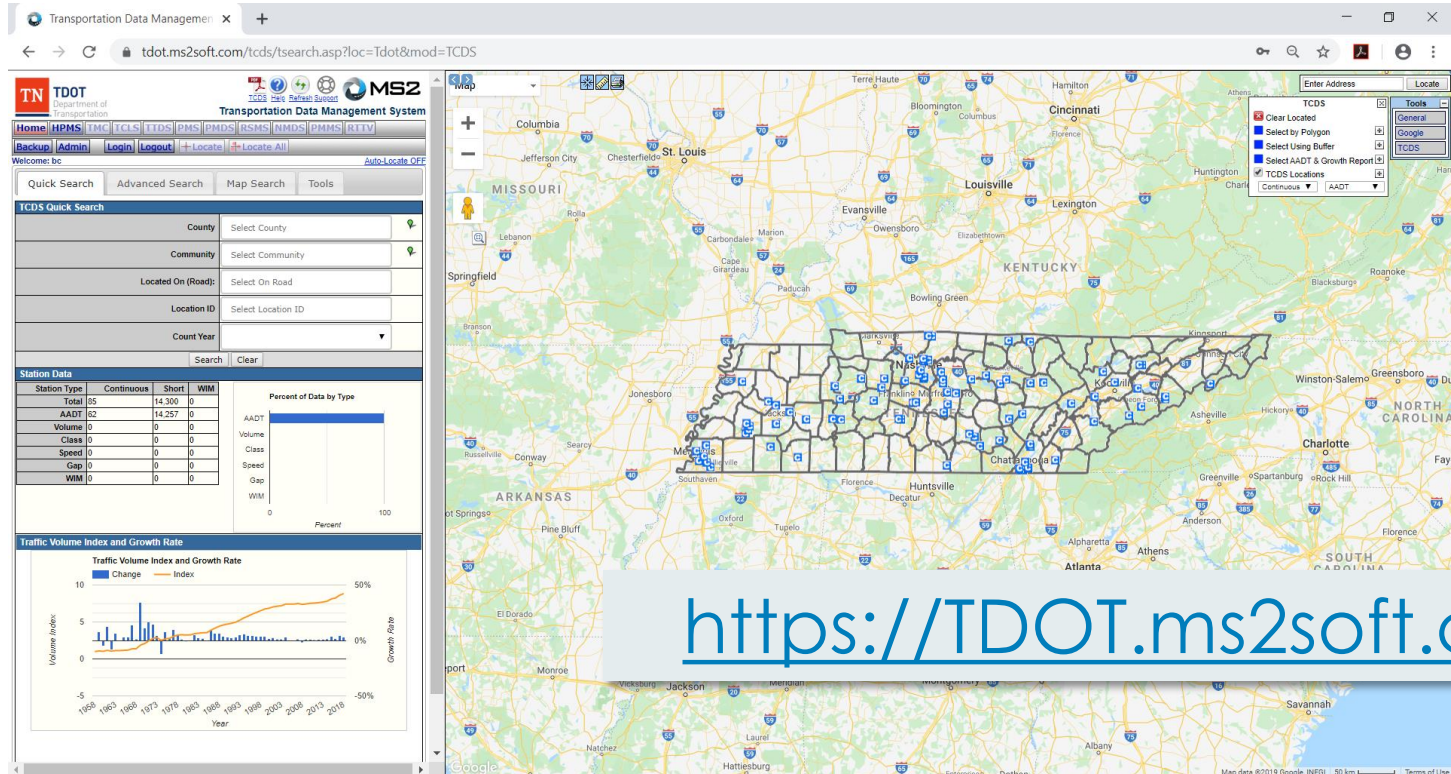




Agenda

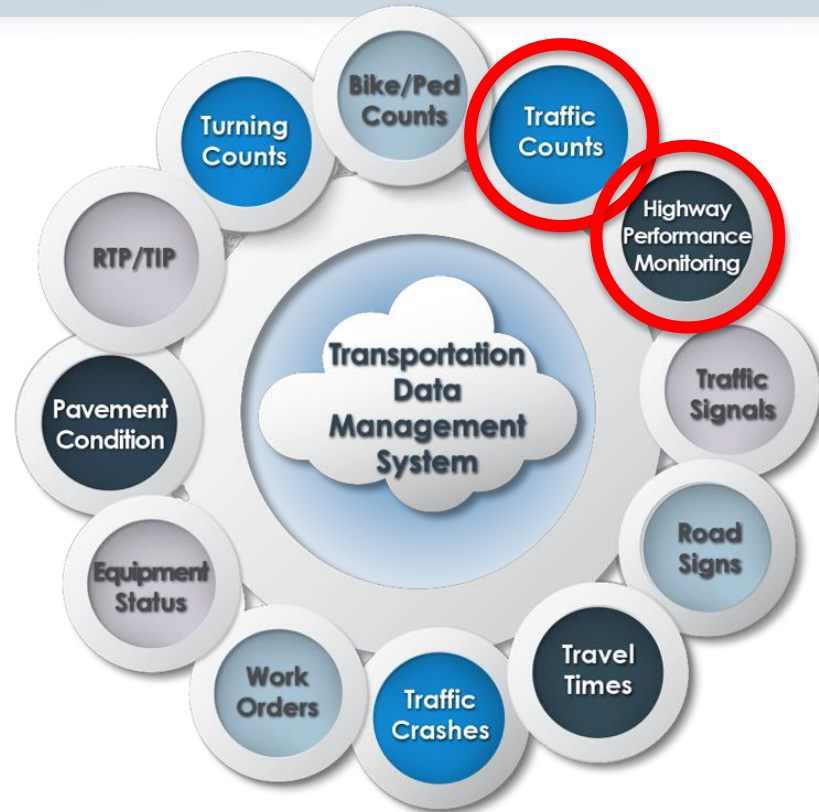
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TN TIMES



Proposed Modules

- TCDS
- HPMS



Traffic Data Modules/Extensions

Modules and Extensions	License Type	Included
TCDS (Traffic Count)	Enterprise (unlimited agency users)	Yes
Data Backup API		Yes
Autopolling		No
Scheduler		No
Field Tool		No
ESRI R&H		No
TMC (Turning Movement)	Enterprise (unlimited agency users)	No
HPMS (Traffic Network Analysis)		Yes
NMDS (Bike and Ped)		No
WOTS (Work Order)		No
ESTS (Equipment Status)		No

Project Schedule

Task	Month						
	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Contract Award							
Project Kickoff							
Deliverable 1							
Project Plan							
Test Plan							
Data Migration							
Deliverable 2							
Enable Test Environment							
Complete Contractor Testing							
Complete Interface Testing							
Complete User Acceptance Testing							
Deliverable 3							
Training Provided							
Go-Live for Production Site							
Deliverable 4							
Sixty Day Warranty							
License, Hosting, Maintenance & Support Begins							



Agenda

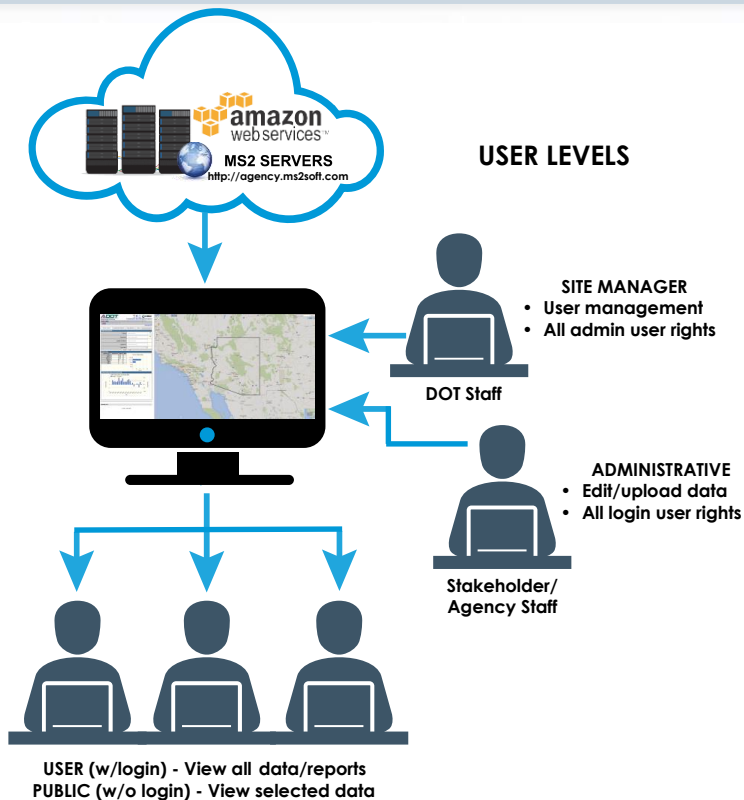
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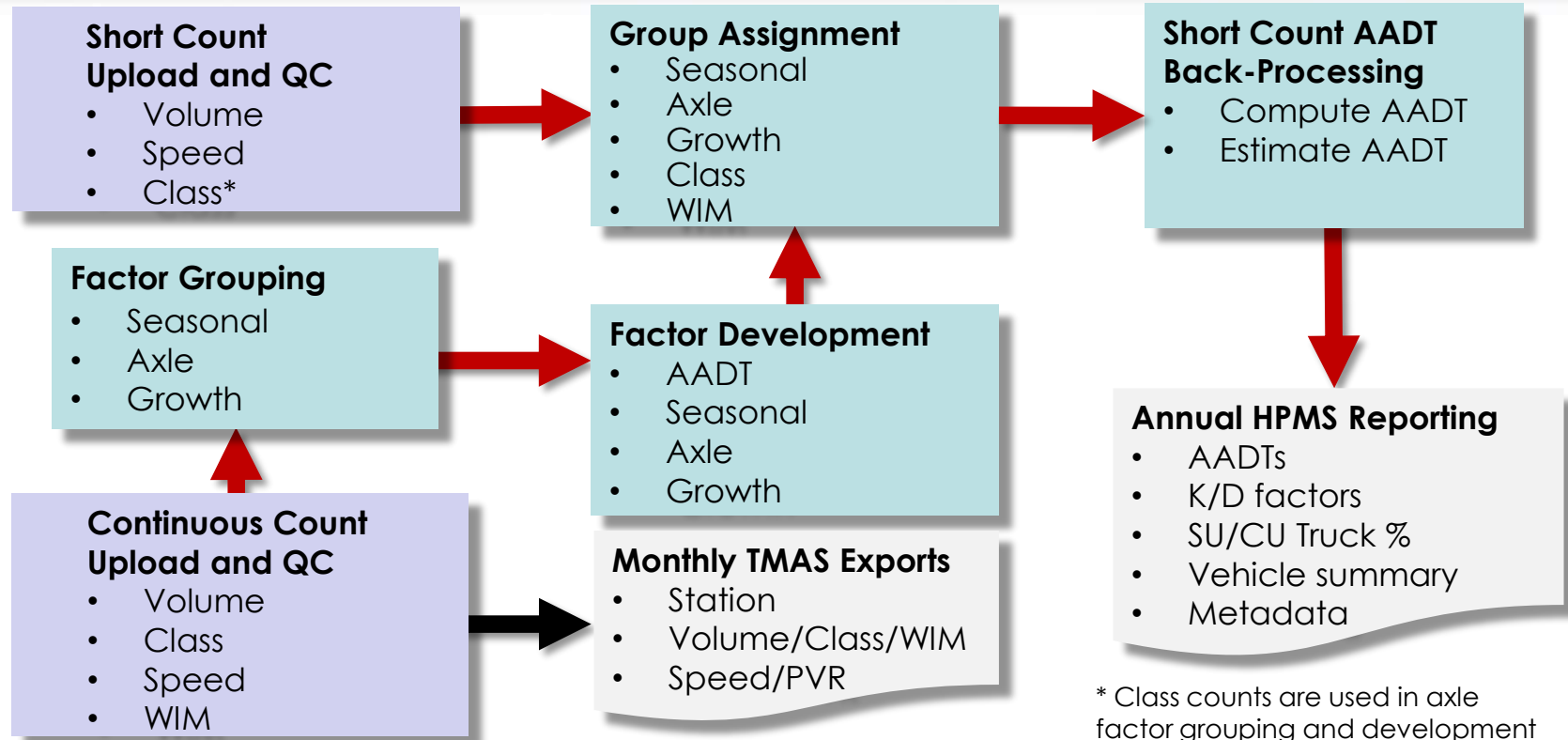
Traffic Data Functions

- Device Polling
- Raw File Upload
- Automated Quality Control (QC)
- Comprehensive Reporting
- Annual Statistics and Factoring
- Monthly TMAS Exports
- Annual HPMS Reporting

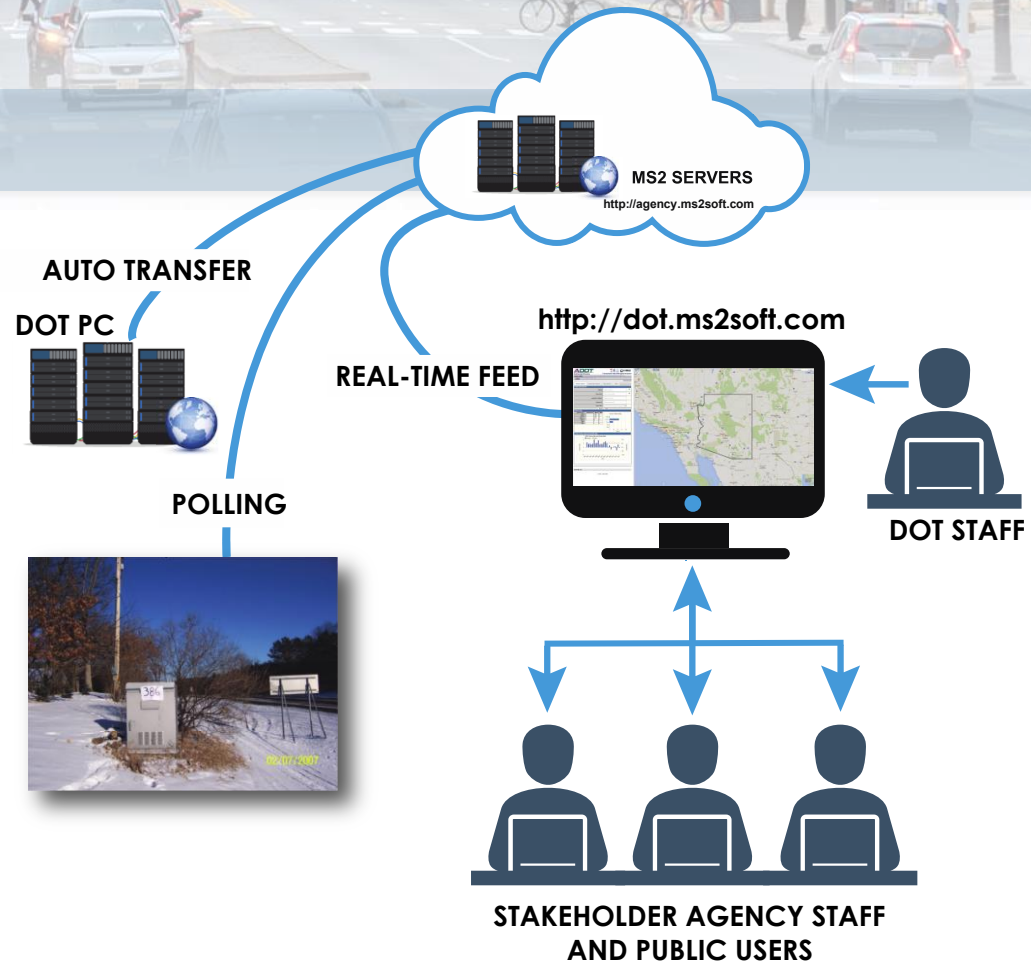
Multiple User Levels



Traffic Data Processing

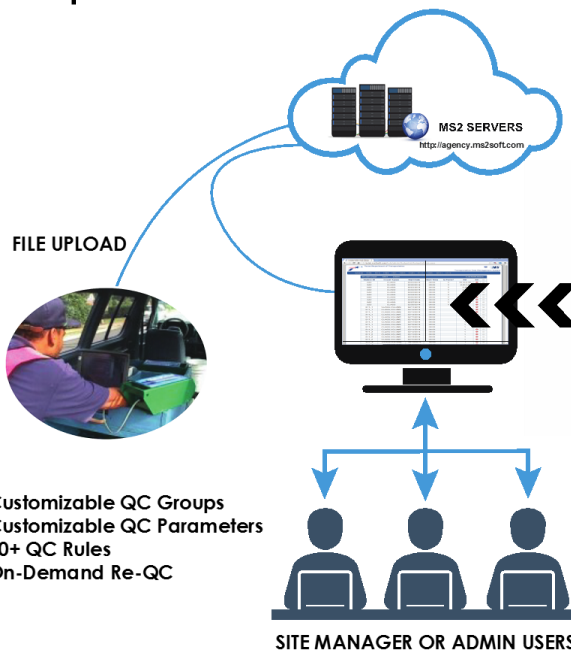


- Auto Assign
- Auto QC
- Failure Recovery



Automated QC

- Customizable QC Groups and Parameters
- 20+ QC Rules
- Ad-hoc QC Rules
- On-Demand Re-QC

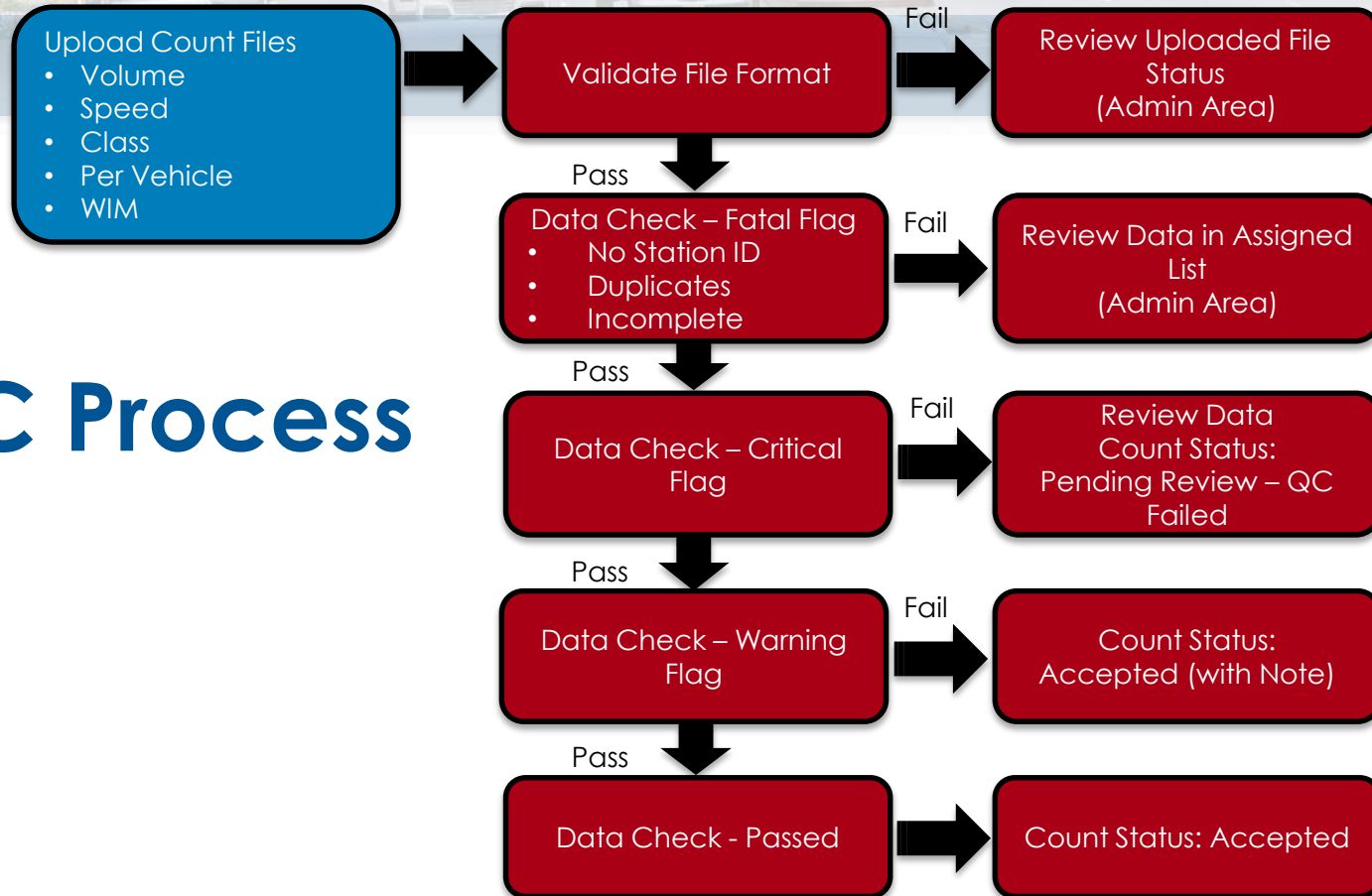


- Customizable QC Groups
- Customizable QC Parameters
- 20+ QC Rules
- On-Demand Re-QC

Texas Department of Transportation
Transportation Data Management System

Station ID	Count Types	Start Date	Start Time	Is Perm?	QC
S22	CLASS	02/03/2014	00:00	Y	14,16,2,20
S22	CLASS	02/20/2014	09:00	Y	2,20,3,8
S22	CLASS	02/21/2014	00:00	Y	2,20
S22	CLASS	02/22/2014	00:00	Y	2,20
S22	CLASS	02/23/2014	00:00	Y	2,20
S22	CLASS	02/24/2014	00:00	Y	2,20
S22	CLASS	02/25/2014	00:00	Y	2,20
S22	CLASS	02/26/2014	00:00	Y	2,20
S22	CLASS	02/27/2014	00:00	Y	16,2,20
S22	CLASS	02/28/2014	00:00	Y	2,20
S11_1	CLASS VOLUME	02/11/2014	00:00	1	
S11_1	CLASS VOLUME	02/12/2014	00:00	1	
S11_1	CLASS VOLUME	02/13/2014	00:00	1	
S11_1	CLASS VOLUME	02/14/2014	00:00	1	
S11_1	CLASS VOLUME	02/15/2014	00:00	1	
S11_1	CLASS VOLUME	02/16/2014	00:00	1	
S11_1	CLASS VOLUME	02/17/2014	00:00	1	
S11_1	CLASS VOLUME	02/18/2014	00:00	1	
S11_1	CLASS VOLUME	02/19/2014	00:00	1	
S11_2	CLASS VOLUME	02/11/2014	00:00	1	
S11_2	CLASS VOLUME	02/12/2014	00:00	1	
S11_2	CLASS VOLUME	02/13/2014	00:00	1	
S11_2	CLASS VOLUME	02/14/2014	00:00	1	
S11_2	CLASS VOLUME	02/15/2014	00:00	1	
S11_2	CLASS VOLUME	02/16/2014	00:00	1	

QC Process

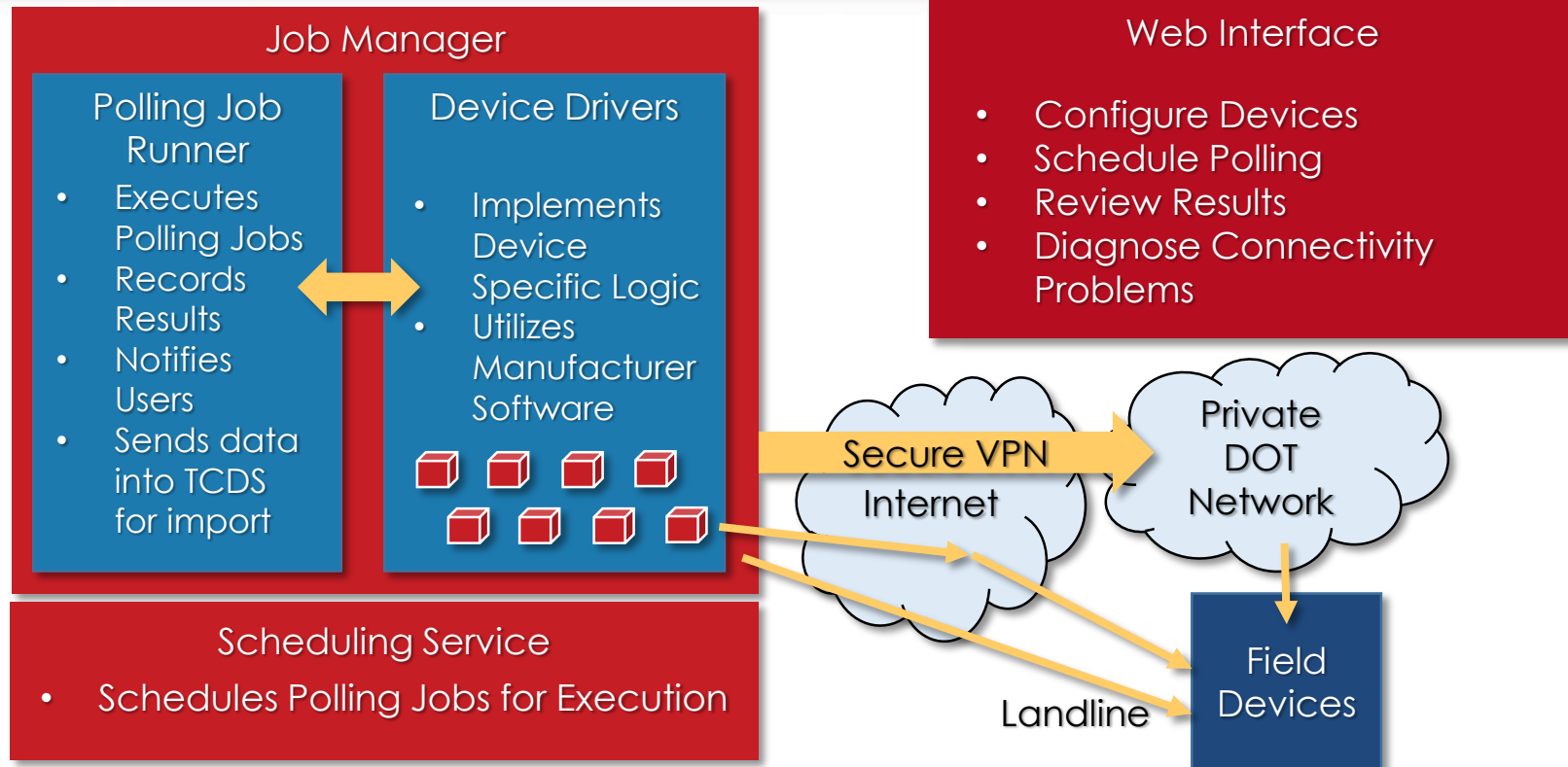


Ad-Hoc QC Rule Engine

- If a "RuleAction" is 1, a vehicle violating the rule will be marked as Invalid.
- The "RuleCode" field uses error codes with an E appended for Error, W for Warning.

RuleSetId	RuleCode	RuleName	RuleExpression	RuleAction	IsActive
2	31W	Axle Count High Warning	item.NumberOfAxes >= 14	0	True
2	31E	Axle Count High Error	item.NumberOfAxes >= 20	1	True
2	30E	Axle Count Low	item.NumberOfAxes <= 1	1	True
2	33W	Axle Spacing High Warning	item.AxleSpacingMax >= 50	0	True
2	33E	Axle Spacing High Error	item.AxleSpacingMax >= 99	1	True
2	32W	Axle Spacing Low Warning	item.AxleSpacingMin <= 3	0	True
2	32E	Axle Spacing Low Error	item.AxleSpacingMin <= 2	1	True
2	26E	Axle Weight <> GVW	item.TotalWeightOfVehicle > 0 && (Math.Abs(item.TotalWeightOfVehicle - item.SumOfAxleWeight) / item.TotalWeightOfVehicle) >= (decimal).1	1	True
2	42E	Axle Weight High	item.AxleWeightMax >= 50	1	True
2	41E	Axle Weight Low	item.AxleWeightMin <= (decimal).5	1	True
2	24E	Axes vs Spaces	item.NumberOfAxleWeights != (item.NumberOfAxleSpacings + 1)	1	True
2	27E	Axes vs Total Axes	item.NumberOfAxleWeights != item.NumberOfAxes	1	True
2	37W	High 9/11 First Axle Weight Warning	item.NumberOfAxleWeights > 0 && (item.VehicleClass == "09" item.VehicleClass == "11") && item.AxleWeight1 >= 15	0	True
2	37E	High 9/11 First Axle Weight Error	item.NumberOfAxleWeights > 0 && (item.VehicleClass == "09" item.VehicleClass == "11") && item.AxleWeight1 >= 40	1	True
2	36W	Low 9/11 First Axle Weight Warning	item.NumberOfAxleWeights > 0 && (item.VehicleClass == "09" item.VehicleClass == "11") && item.AxleWeight1 <= 7	0	True
2	36E	Low 9/11 First Axle Weight Error	item.NumberOfAxleWeights > 0 && (item.VehicleClass == "09" item.VehicleClass == "11") && item.AxleWeight1 <= (decimal).5	1	True
2	21E	No Class Code	item.VehicleClass == "00" item.VehicleClass == ""	1	True
2	20E	Speed Zero	!IsNull(item.VehicleSpeed) item.VehicleSpeed == 0	1	True
2	29W	Speed High Warning	!IsNull(item.VehicleSpeed) && item.VehicleSpeed >= 90	0	True
2	29E	Speed High Error	!IsNull(item.VehicleSpeed) && item.VehicleSpeed >= 155	1	True
2	28W	Speed Low Warning	!IsNull(item.VehicleSpeed) && item.VehicleSpeed <= (decimal)39.9	0	True
2	28E	Speed Low Error	!IsNull(item.VehicleSpeed) && item.VehicleSpeed <= (decimal)9.9	1	True

Autopolling Process





Expanded Imports

- Permanent Counter Brands (6)
- WIM Counter Brands (6)
- Portable Counter Brands (10)
- ITS Systems (4)
- Signal Control Systems (9)



Compatible Counters / Formats

- Actra
- Centracs
- Diamond
- DV03
- ECM
- FHWA TMG
- Golden River
- HiStar/Numetrics
- IRD
- JAMAR
- Kistler
- MarcNX
- Metrocount
- Mettler Toledo
- Miovision
- Peek
- Pico
- PRN
- Q-Free TDC/EMU
- RTMS
- SCATS
- Seimens i2
- Sensys
- Smartway
- TIRTL
- Timemark
- Wavetronix

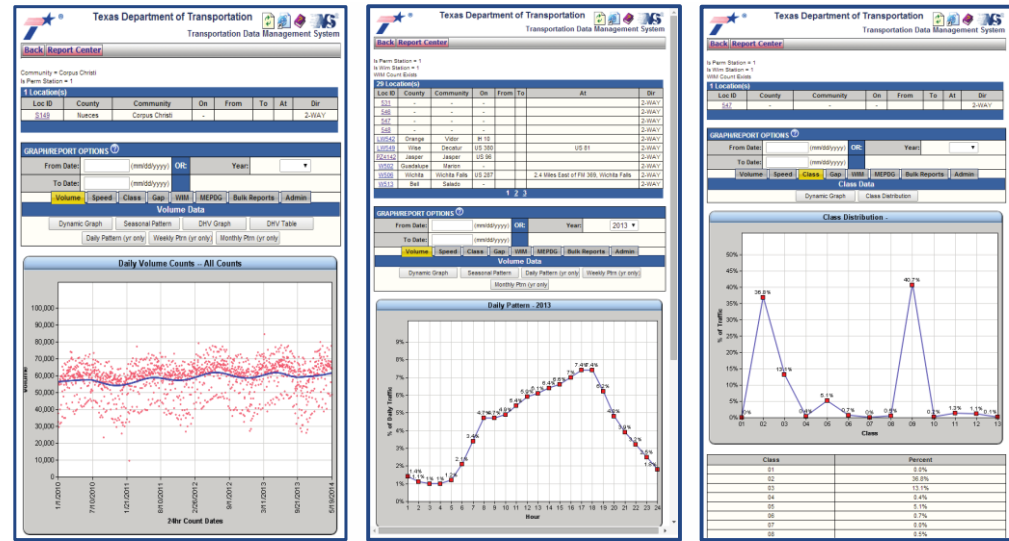


Compatible Signals

- Actra
- Centrac
- GridSMART
- Iteris Vantage
- MarcNX
- NAZTEC
- SCATS
- SEIMENS i2
- TransCore TransSuite

Comprehensive Reporting

- Single Station
- Multi-Station
- Single Day
- Multi-Day
- Volume, Speed, Class Gap, WIM, MEPDG, HPMS
- Patterns: Seasonal, Hourly, Daily, Day of Week, Monthly
- Report Center
- Dynamic Graphs
- Ad Hoc Reports
- QC Reports
- Export to File




USERS


Report Center

Transportation Data Management System - Internet Explorer

http://txdot.ms2soft.com/tcds/tsearch.asp?loc=Txdot&mod=TCDS

File Edit View Favorites Tools Help

 **Texas Department of Transportation**

 **MS2**

TCDS Help Refresh Support

Transportation Data Management System

Report : None
Dates : None

Process : ☒ Immediately ☐ Submit Job (long running reports)

Home Go Back

Locations Reports Options Output Previous Next

County = Travis, Is Perm Station = 1

17 Location(s) Found						17 Location(s) Selected		
Loc ID	County	Community	On	From	To	At	Dir	✓
A348	Travis	Austin	US0183				2-WAY	✓
A53	Travis	-	SH0071				2-WAY	✓
S131	Travis	Austin	US 183			3.3 miles south of SH0071	2-WAY	✓
S132	Travis	Austin	IH0035			North of Town Lake Bridge	2-WAY	✓
S190	Travis	Round Rock	IH0035			1.9 miles south of FM1825	2-WAY	✓
S209	Travis	Austin	SL0001				2-WAY	✓
S216	Travis	Austin	US0290			4.2 miles west of FM1826	2-WAY	✓
S241	Travis	Austin	SL0001			0.9 mile North of Braker Lane	2-WAY	✓
S253	Travis		SH0130			SH 130, 0.5 Mile North of FM 812	2-WAY	✓
S284	Travis	Austin	SH0045			SH 45, 2.3 Miles East of IH 35	2-WAY	✓
S347	Travis	Austin	US0183				2-WAY	✓
S348	Travis	Austin	US0183			US 183, Just North of Mopac	2-WAY	✓

Report Center



Texas Department
of Transportation



TCDS



Help



Refresh



Support



MS2

Transportation Data Management System

Report : None

Dates : None

Process : ☒ Immediately ☐ Submit Job (long running reports)

Home

Go

Back

Locations

Reports

Options

Output

Previous

Next

Station



Volume



Class



Length



Speed



WIM



HPMS



MEPDG



Export



Admin



Custom



Top 10 This User



Top 10 All Users



Detail Reports

AADT and AADT Trucks by Year (Chart)

AADT by Year by Direction (Chart)

AADT by Year Comparison (Chart)

AADT by Year Comparison Matrix (Chart)

AADT/AAWDT/AAWET Year Over Year Comparison

ADT by Day of Week by Month for Year

Avg Hourly Traffic by Day of Week for Year

High Hourly Volumes for Year

K/D Factor For High Hour By Year

MADT by Direction for Year

Monthly Traffic Calendar

Representative Counts by Quarter

Volume by Hour by Day for Month


Volume By Hour By Week






Report Center

Transportation Data Management System - Internet Explorer

http://txdot.ms2soft.com/tcds/tsearch.asp?loc=Txdot&mod=TCDS

File Edit View Favorites Tools Help

 **Texas Department of Transportation**

     **MS2**

[TCDS](#) [Help](#) [Refresh](#) [Support](#)

Transportation Data Management System

Report : Volume > Traffic Volume Index and Growth Rate by Year (Chart)

Dates : 1/1/2011 - 12/31/2015

Process : ☒ Immediately ☐ Submit Job (long running reports)

[Home](#) [Go](#) [Back](#)

[Locations](#) [Reports](#) [Options](#) [Output](#)

Choose Dates

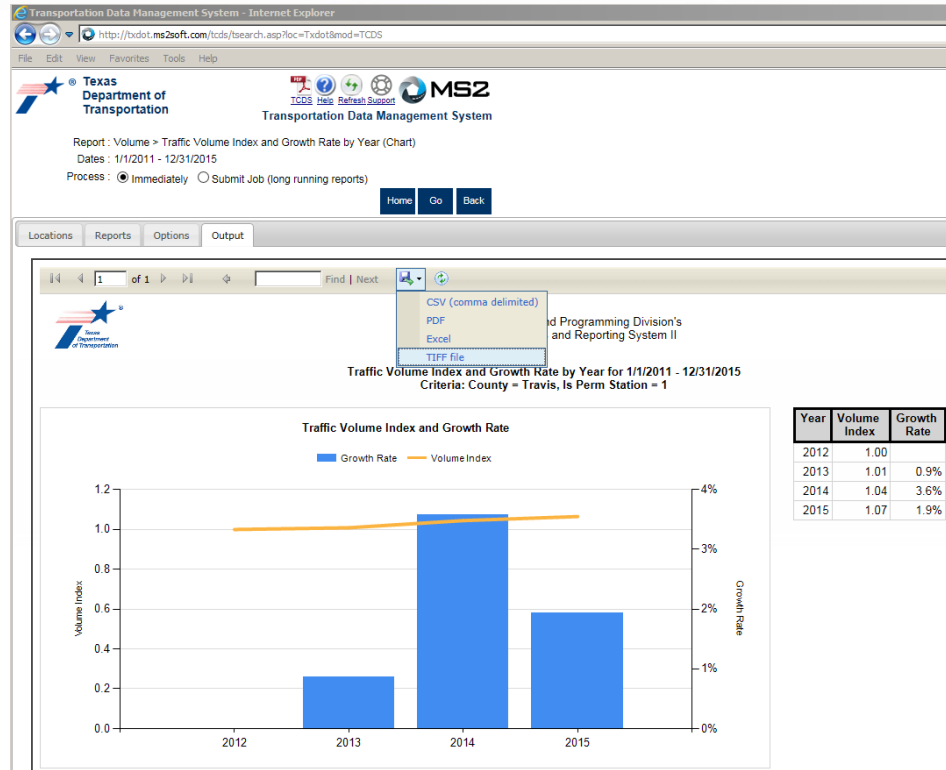
Time Span :

* Start Date :

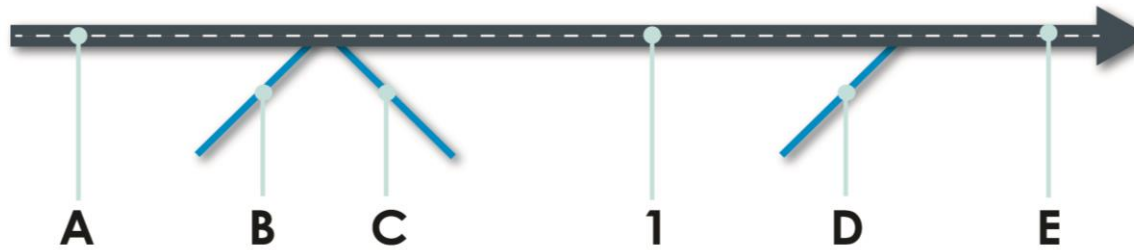
* End Date :

* Required Fields

Report Center



Volume Balancing



Volume Balancing Computations

Name	Type	Fixed?	AADT	Weight	Error Offset	Adjusted	Final AADT
A	Start Node	Yes	11,995			11,995	11,995
B	On Ramp		923	.3341	+134	1,057	1,057
C	Off Ramp		1,053	.3812	-153	900	899
1	Virtual Station						12,153
D	On Ramp		786	.2845	+114	900	900
E	End Node	Yes	13,053			13,053	13,053
	Error		-402			-1	0

Online Backup

TCDS Backup - Internet Explorer

http://bxdot.ms2soft.com/tcds/tcds_backup.aspx?childWindow=1

Microsoft Access Backup

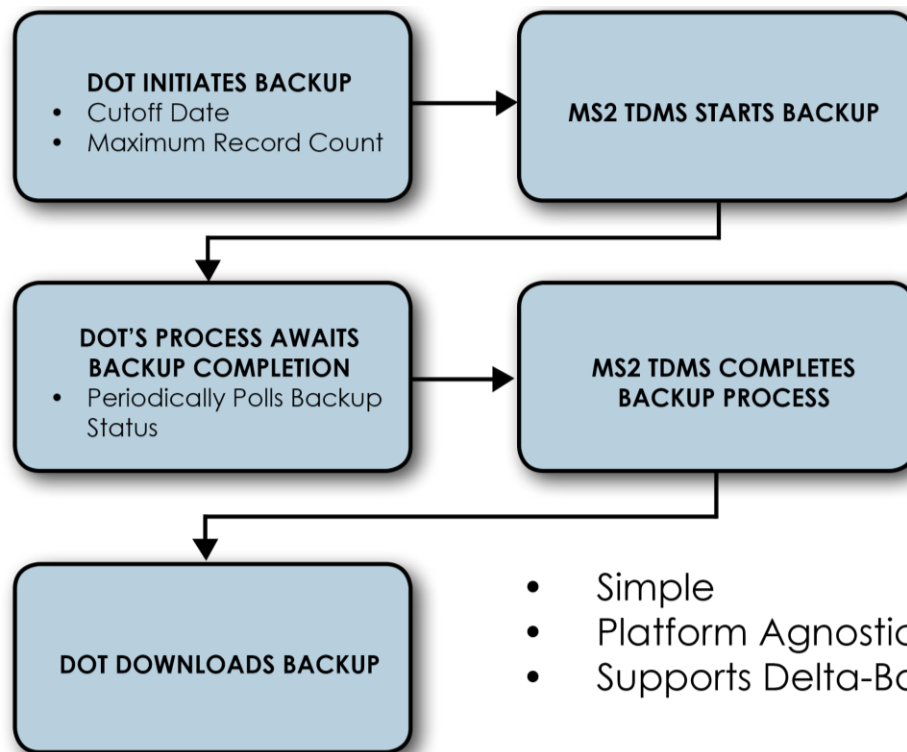
If a Location search has been done, the results will serve as the basis for the backup, further refined by the criteria values below (if any). If the total count of the rows in all backup tables exceeds 10,000,000 rows, or if the criteria are too complicated, you will be asked to refine your search.
[Microsoft Access Backup data dictionary](#)

Search Criteria

Start Date	<input type="text"/>	End Date	<input type="text"/>	(Dates are inclusive)
<input checked="" type="checkbox"/> Include Child (Directional and Lanes) Locations				
<input type="checkbox"/> Include Permanent Locations				
<input type="button" value="Compute Size"/>		<input type="button" value="Cancel"/>		

100%

Backup API




- Simple
- Platform Agnostic
- Supports Delta-Based Workflow


HPMS (Traffic Network)

Transportation Data Management System - Internet Explorer

http://odot.ms2soft.com/hpms/

File Edit View Favorites Tools Help

 **OHIO DEPARTMENT OF TRANSPORTATION**

 **MS2**
Highway Performance (HPMS)

Welcome: Ben Chen [Logout](#) [Login](#)

Modules

Tasks

Segment Information

RIA Route ID	SFRAUS00042**C
Flagged for Review	False
TCDS Location ID	5925
HPMS Year	2013
Design Year	2043
District	6
County	Franklin
Functional Class	4
Control	
Section	
Begin Milepoint	3.620000
End Milepoint	4.740000
Length in Miles	1.120000
Hwy. System	
Hwy. Number	
Hwy. Suffix	
Highway	
Population Code	U
Direction of Travel	

[Edit Segment](#) [Return to List](#) [Locate](#)

AADT Information

AADT	13,653	Year	2013
Daily VMT	15,291	# of Trks	421
Design Hour Volume	0		
K-Factor	0.0	Dir Dist	0.00
Flex (K)	0	Rigid (K)	0
%Trks in AADT	3.0	%Trks in DHV	0.0
ATHW LD (Sin)	0	ATHW LD (Tan)	0
%Single Unit AADT	0.0	%Combo Unit AADT	0.0
%Single Unit DHV	0.0	%Combo Unit DHV	0.0
Design Year AADT	13,650	Design Year	2043
Design Year Daily VMT	15,288	%Annual Growth Factor	0.0

Map

Enter Address [Locate](#)

HPMS

- ☐ Clear Located
- ☒ TCDS Locations
- ☒ HPMS Segments
- ☐ ALL
- ☐ Traffic Flow 2013

[Tools](#)

- [General](#)
- [Google](#)
- [HPMS](#)

BMP: 3.620
EMP: 4.740
Milepoint: 3.628
Location ID: 5925
AADT: 13653

[View Detail](#) [Select Segment](#) [Search](#)

Map data ©2015 Google 200 m

Terms of Use Report a map error



HPMS (Traffic Network)

- Road segmentation management
- Spatial editing of traffic segments
- Assignment of count station to road segments
- Estimating of HPMS traffic statistics for segments without actual traffic count data
- Network VMT Calculation
- FHWA HPMS traffic reporting



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Questions & Answers

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