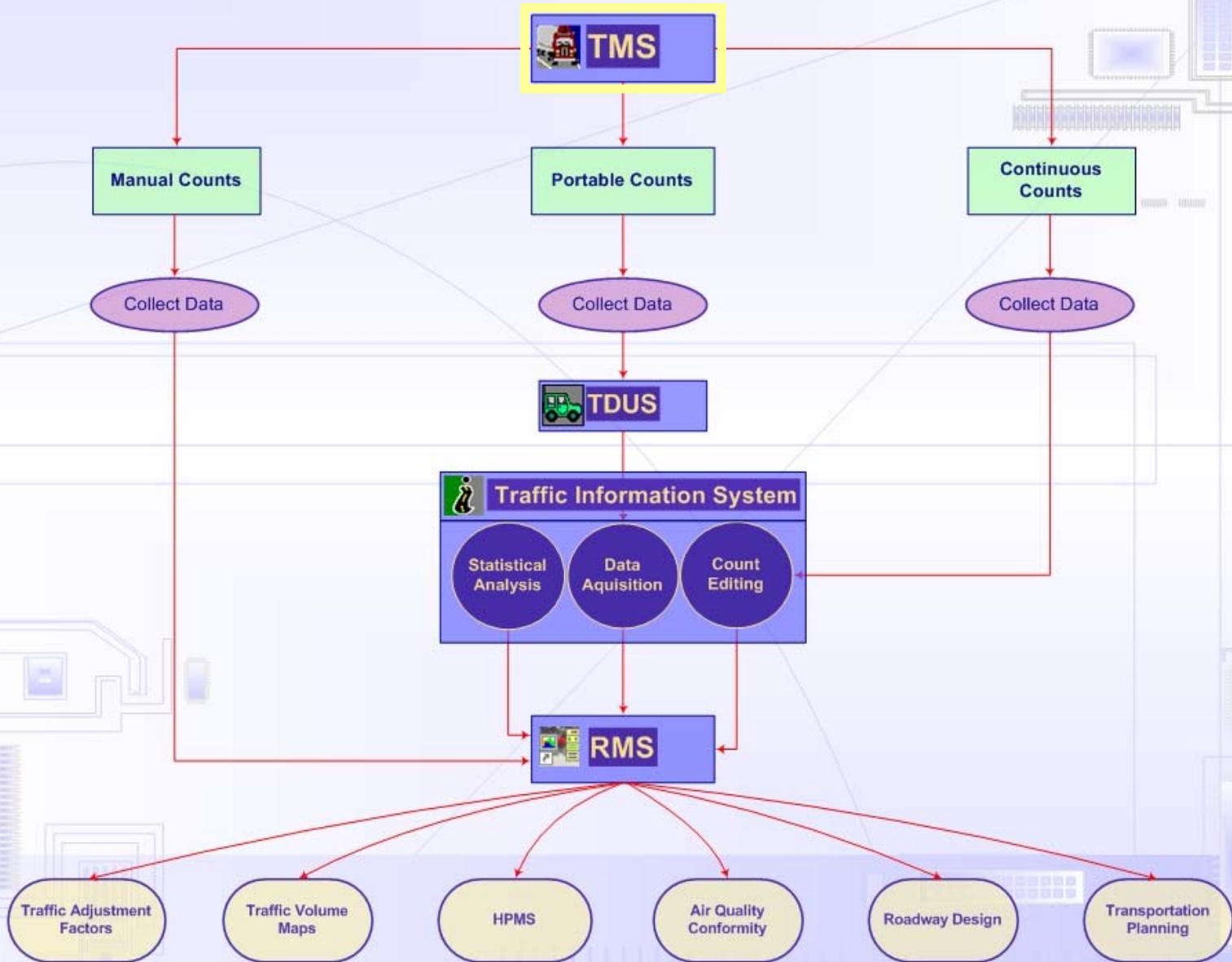


# PENNDOT's Traffic Data Collection Program

Chris Allison PENNDOT  
Greg Ulp Ciber



# PENNDOT Traffic Monitoring Flowchart



# PENNDOT's Traffic Data Collection Program

## What is the Traffic Monitoring System?

- ❖ TMS: A tool used by PENNDOT for coordinating traffic data collection activities
  - Traffic data is a crucial data source for GIS analysis
  
- ❖ Enables PENNDOT analysts to:
  - Add/change/delete traffic site data
  - Schedule and assign traffic counts
  - Produce maps and reports of traffic count sites



# PENNDOT's Traffic Data Collection Program

## Report Builder

## Site Information / Interactive Map

**TMS Site Maintenance**  
Create, Edit, and Delete Traffic Monitoring Site and Station Information...

**Search Criteria**

Locate By Site Number:

County:  Route:  Segment:  Lanes:  FSC:  TPG:  Juris:  NHS:  HFMS Sample No.:

**Site Information**

Site No:  \*Right Click to Tag Site as an Additional Count

Municipality:  Record 1 of 1

Comments:

Count Location:

Schedule Priority:  Site Notes:  Last Update:  -

**Limit Information**

	Begin				End			
	County	Route	Seg	Intersecting Street	County	Route	Seg	Intersecting Street
Limit 1	01	0015	0150	2541 SR 8003	01	0015	0210	2343 SR 8005
Limit 2	01	0015	0151	2466 SR 8003	01	0015	0211	2303 SR 8005

**Station Information**

County	Route	Seg	Offset	Status	Plot Site	Agency	Cycle Freq	Cycle Year	Schedule	Duration	Prg.
01	0015	0170	519	Existing	Y	AD	03	01	1 TIME/YR	24 HRS	04
01	0015	0171	401	Existing	N	AD	03	01	1 TIME/YR	24 HRS	04

Additional Station Information:  Current AADT - 8806 as of 06/16/1998 For Station 1 Of 2  
Next Count Year - 2003  
HPMS Count - No

**Cross Reference Information:**

Add Record Delete Record Exit

**TMS Map**

**TMS-REPORTS and MAPS**  
Choose a Report and customize the results by selecting from the criteria below...

**Report Name:**

**Site Location:**

**Report Scope:** District  County/Agency  Agency:  County:

**Special Filters:** All Sites (no filter)  Additional Counts Only  HPMS Sites Only  NHS Sites Only  Interstate Sites Only  Educated Limits Only  Freeway/Expressway Sites Only  Local Federal Aid Sites Only

**Status of Sites:** Existing  Programmed  Future

**Output Options:** Report  Map  Printer Name for Report:

**Cycle Information:** Cycle Freq:  Cycle Year:  Actual Year:

**Function:** Selected:  Unselected:  Remove Add

**Equipment:** Selected:  Unselected:  Remove Add

**Customer:** Selected:  Unselected:  Remove Add

**Data Type:** Selected:  Unselected:  Remove Add

**Reports of Planning and Research 2002 Site Location Report**

Agency	Route	Segment	Offset	Status	Plot Site	Agency	Cycle Freq	Cycle Year	Schedule	Duration	Prg.
01	0015	0150	2541	Existing	Y	AD	03	01	1 TIME/YR	24 HRS	04
01	0015	0151	2466	Existing	N	AD	03	01	1 TIME/YR	24 HRS	04

## Reports



# PENNDOT's Traffic Data Collection Program

## ❖ Database Structure

TMSEQUIP	
	<b>TMS_SITE_NO</b> <b>SEQ_NO</b> <b>MONTR_EQUIP</b> <b>MONTR_TELEMETRY</b> <b>ACTIVATE_MO</b> <b>ACTIVATE_YR</b> <b>MSLINK</b> <b>MAPID</b>

TMSCOUNTS	
<b>PK</b>	<b><u>ST_RT_NO</u></b>
<b>PK</b>	<b><u>CTY_CODE</u></b>
<b>PK</b>	<b><u>SEG_PT</u></b>
<b>PK</b>	<b><u>VOL_CNT DATE</u></b>
	<b>DISTRICT_NO</b> <b>JURIS</b> <b>SEG_NO</b> <b>SEG_OFFSET</b> <b>TYPE_OF_CNT</b> <b>SET_UP_INIT</b> <b>ENTER_INIT</b> <b>MSLINK</b> <b>MAPID</b> <b>NLF_ID</b> <b>SIDE_IND</b> <b>NLF_CNTL</b> <b>CUM_OFFSET_T1</b> <b>RECORD_UPDATE</b>

TMSCUSTOMER	
<b>PK</b>	<b><u>TMS_SITE_NO</u></b>
<b>PK</b>	<b><u>SEQ_NO</u></b>
<b>PK</b>	<b><u>CUSTOMER</u></b>
	<b>CUSTOMER_SEQ</b> <b>USER_UPDATE</b> <b>RECORD_UPDATE</b>

TMSFUNCTN	
	<b>TMS_SITE_NO</b> <b>SEQ_NO</b> <b>FUNCTION_ID</b> <b>FUNCTION_TYPE</b> <b>MSLINK</b> <b>MAPID</b>

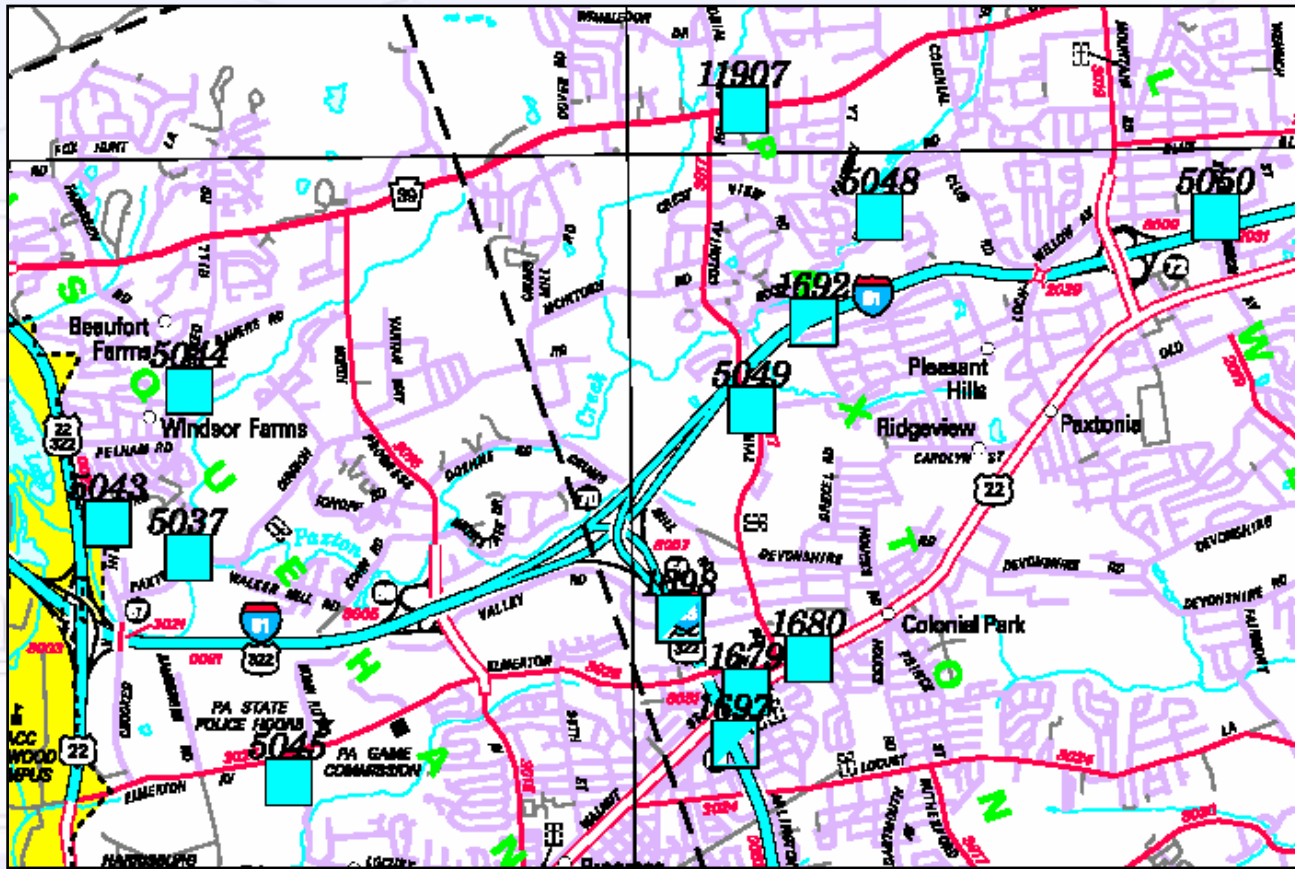
TMS SITE	
	<b>TMS_SITE_NO</b> <b>SCHED_PRTY</b> <b>TMS_SITE_COMMENT</b> <b>USER_UPDATE</b> <b>RECORD_UPDATE</b> <b>MSLINK</b> <b>MAPID</b> <b>COUNT_LOCAL</b> <b>ADDITIONAL_COUNT</b>

TMS SITENOTES	
	<b>TMS_SITE_NO</b> <b>NOTES</b>

TMS STATION	
<b>PK</b>	<b><u>TMS_SITE_NO</u></b>
<b>PK</b>	<b><u>SEQ_NO</u></b>
	<b>ST_RT_NO</b> <b>CTY_CODE</b> <b>DISTRICT_NO</b> <b>SEG_NO</b> <b>SEG_OFFSET</b> <b>SEG_PT</b> <b>SIDE_IND</b> <b>JURIS</b> <b>MAP_SITE_IND</b> <b>AGENCY_CODE</b> <b>CONTROL_COUNT_IND</b> <b>CYCLE_YEAR</b> <b>FREQ_CYCLE</b> <b>CLASS_REQD_IND</b> <b>TMS_PROGRAM_IND</b> <b>TMS_SITE_STATUS</b> <b>FUNCTN_CNT</b> <b>EQUIP_CNT</b> <b>MSLINK</b> <b>MAPID</b> <b>NLF_ID</b> <b>NLF_CNTL</b> <b>CUM_OFFSET_T1</b> <b>X_VALUE</b> <b>Y_VALUE</b> <b>LOCATION_FLAG</b> <b>DURATION</b> <b>SCHEDULE</b>

# PENNDOT's Traffic Data Collection Program

## ❖ Mapping





# PENNDOT's Traffic Data Collection Program

## Reports

March 7, 2003  
 Agency : HARRISBURG  
 Total Sites : 41

Bureau of Planning and Research 2003 Site Location Report

DAUPHIN COUNTY

Site No.	Agency	County	SR	Seg.	Offset	# Lanes	Street	Municipality	State	Function	Equipment	Cycle Freq		
1677	HB	22	0022	0154	0	2	WILLIAM PENN HW	MIDDLE PAXTON	Existing	STIP		01/01		
			0022	0155	0	2								
Last Count Date -			04/06/2002		Current AADT -			34410						
LIMIT BEG:			22	0022	0050	1592	STREET: SR 8004	LIMIT END:		22	0022	0154	2534	STREET: SR 8045
LIMIT BEG:			22	0022	0051	1715	STREET: SR 8004	LIMIT END:		22	0022	0155	2006	STREET: SR 8045
Latitude :			40.22:10.125579			LOCATION			2000 FEET WEST OF PA 225 RAMP			COMMENTS		
Longitude :			-76.57:46.03038									48 hour count req		
2526	HB	22	0022	0194	0	2	WILLIAM PENN HW	MIDDLE PAXTON	Existing	STIP		01/01		
			22	0022	0195	0	2							
Last Count Date -			04/06/2002		Current AADT -			46756						
LIMIT BEG:			22	0022	0154	2534	STREET: SR 8045	LIMIT END:		22	0022	0200	1180	STREET: SR 3009
LIMIT BEG:			22	0022	0155	2006	STREET: SR 8045	LIMIT END:		22	0022	0211	1486	STREET: SR 8006
Latitude :			40.21:59.315723			LOCATION			0.2 MILE WEST OF RAILROAD OVERPASS.			COMMENTS		
Longitude :			-76.56:07.41325									48 hour count req		
1678	HB	22	0022	0240	1464	2	WMB LENTZ HW	SUSQUEHANNA	Existing	STIP	DL	01/01		
			22	0022	0241	2027								
Last Count Date -			04/06/2002		Current AADT -			14335						
LIMIT BEG:			22	0022	0250	0466	STREET: SR 8008	LIMIT END:		22	0022	0251	0446	STREET: SR 8008
LIMIT BEG:			22	0022	0251	0446	STREET: SR 8008	LIMIT END:		22	0022	0251	0446	STREET: SR 8008
Latitude :			40.21:59.315723			LOCATION			0.2 MILE WEST OF RAILROAD OVERPASS.			COMMENTS		
Longitude :			-76.56:07.41325									48 hour count req		

### TMS Annual Agency Count Distribution Report

3/7/2003

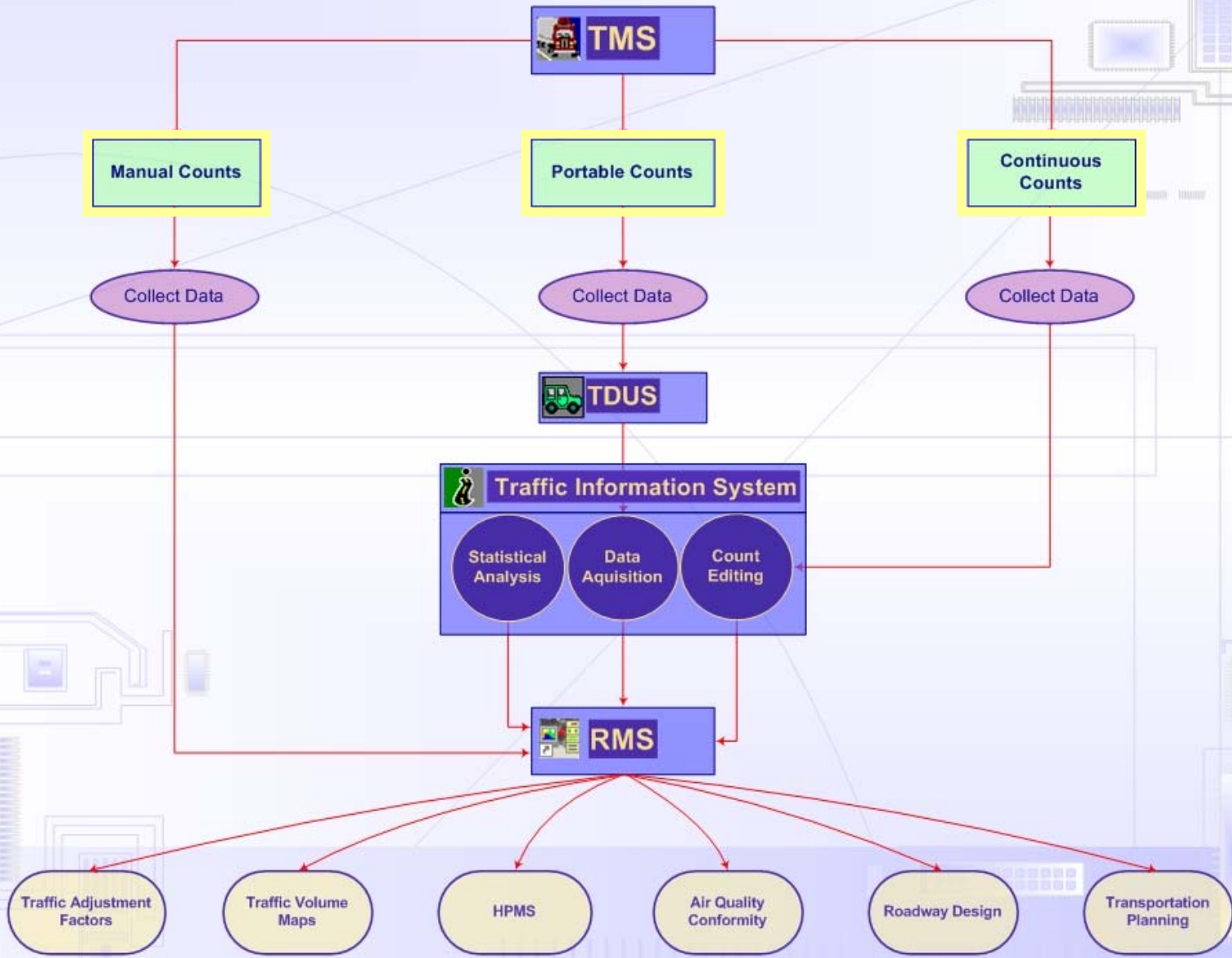
#### CYCLE YEAR

#### HARRISBURG

TMS PROGRAM IND	2002	2003	2004	2005	2006	Totals:	Ave.
1-YR NHS/HPMS	18	18	18	18	18	90	18
3-YR NHS/HPMS	5	12	10	5	12	44	9
1-YR NHS/NON-HPMS	5	5	5	5	5	25	5
3-YR NHS/NON-HPMS	10	2	7	10	2	31	6
1-YR HPMS/NON-NHS	2	2	2	2	2	10	2
3-YR HPMS/NON-NHS	28	47	29	28	47	179	36
5-YR NON-NHS/NON-HPMS	26	4	15	21	32	98	20
<b>Totals:</b>	<b>94</b>	<b>90</b>	<b>86</b>	<b>89</b>	<b>118</b>	<b>477</b>	<b>68</b>
<b>Ave:</b>	<b>13</b>	<b>13</b>	<b>12</b>	<b>13</b>	<b>17</b>		



# PENNDOT Traffic Monitoring Flowchart





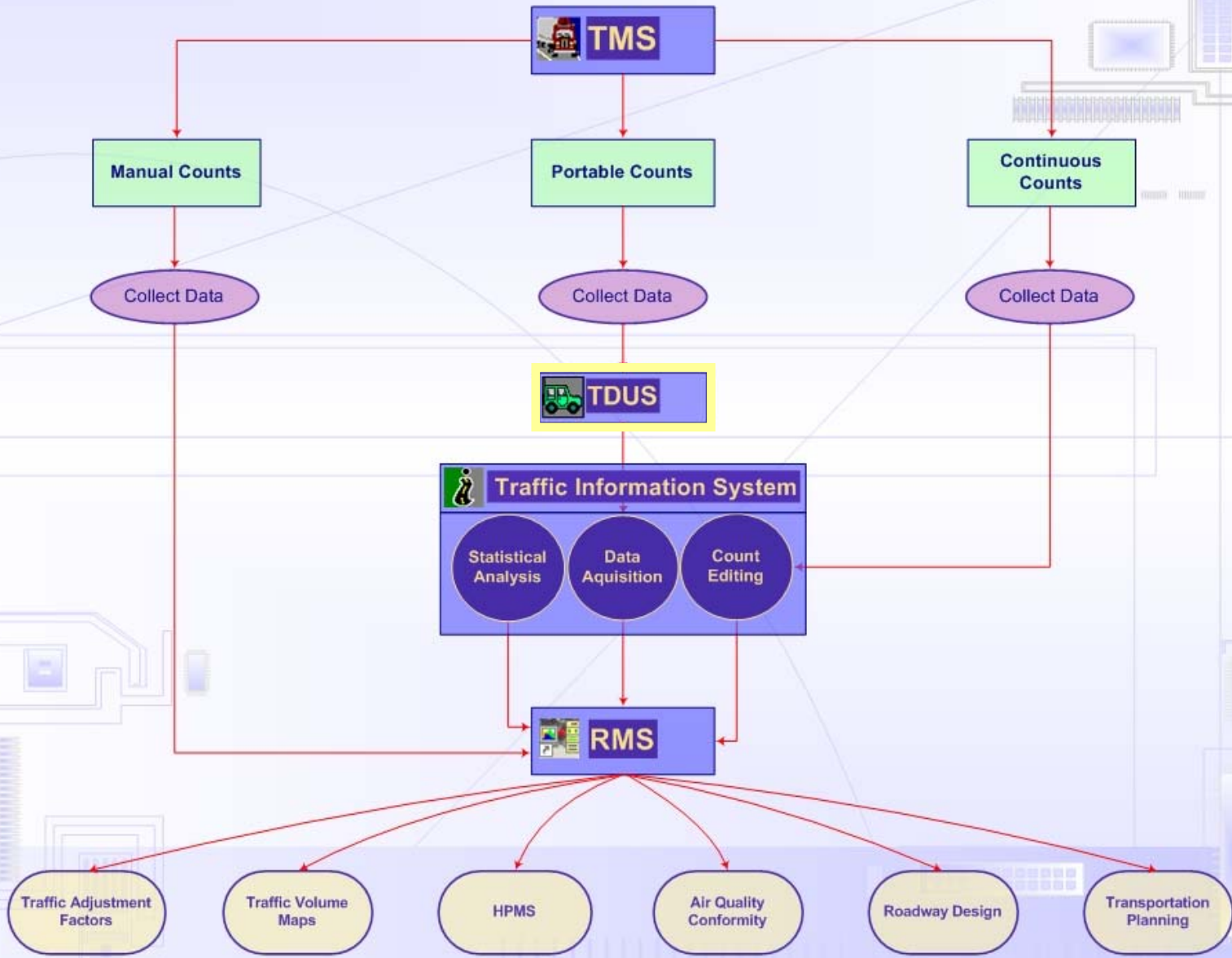
# PENNDOT's Traffic Data Collection Program

## Traffic Monitoring Program Scope

- ❖ 30,000 locations
- ❖ 1,3 and 5 year cycles
- ❖ 6,500 counts annually



# PENNDOT Traffic Monitoring Flowchart



# PENNDOT's Traffic Data Collection Program

## TDUS

### Traffic Data Upload System

- ❖ Relates site number to PENNDOT linear referencing system
- ❖ Converts data file format from 6 different types of traffic counters

The screenshot shows a software window titled "Process Site(s)" with a table and several input sections.

File Name	Site No	District	Juris	County	Route No	Segment	Offset	Status
2laneClassNB.prn	04316	03	1	58	0049	0530	0100	Not Processed

**Lane Information**

S or W      N or E

N or E bound lane(s)     1     2     3

Click on lane.

**User Input Information:**

Count Type:       Speed Limit:

Start Hour:       Counter Number:

End Hour:       Weather:

Set By:       Date Set:       Date Stopped:

Entered By:       Date Entered:

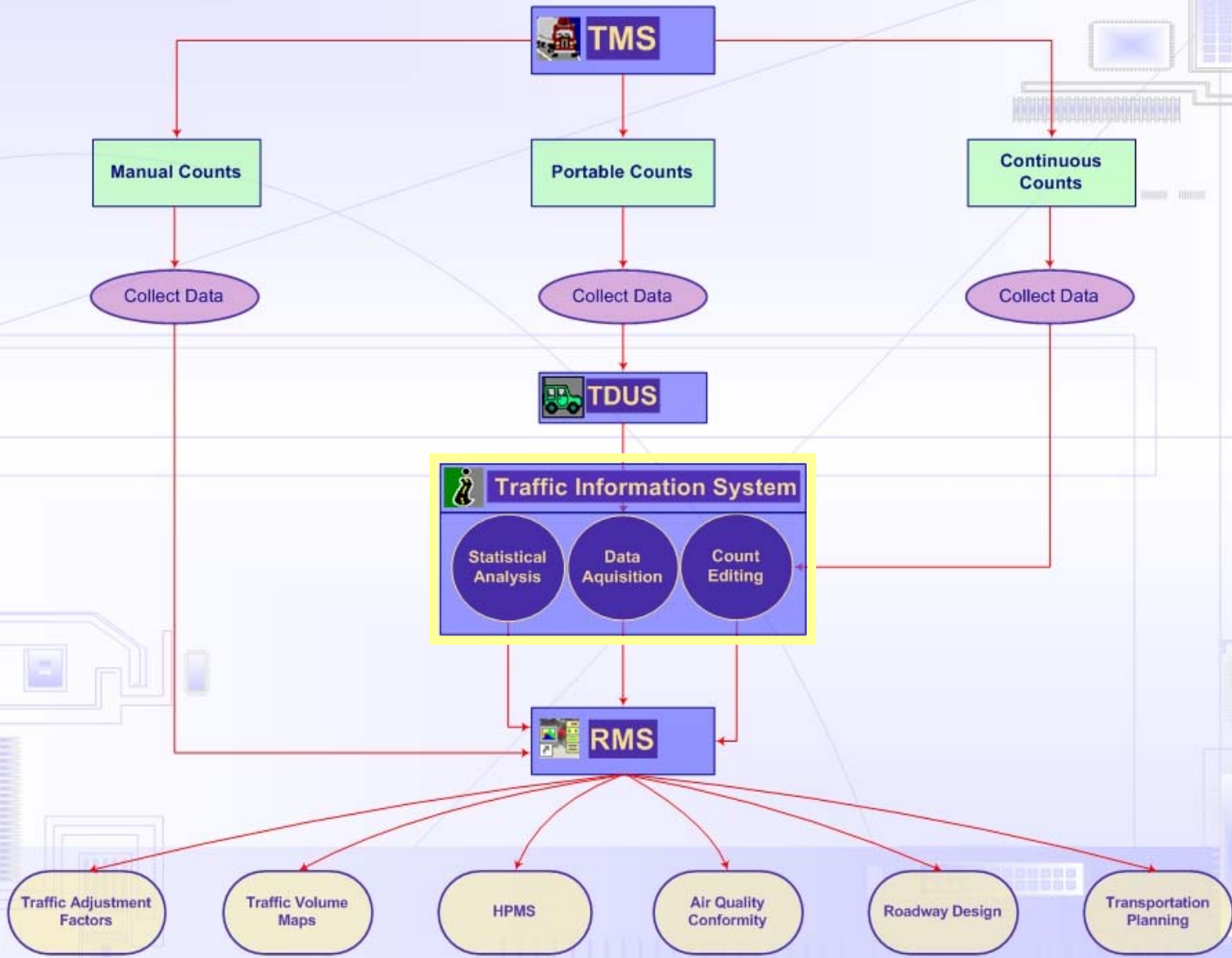
From Location:       To Location:

Comments:

C02003031408.txt

# PENNDOT Traffic Monitoring Flowchart

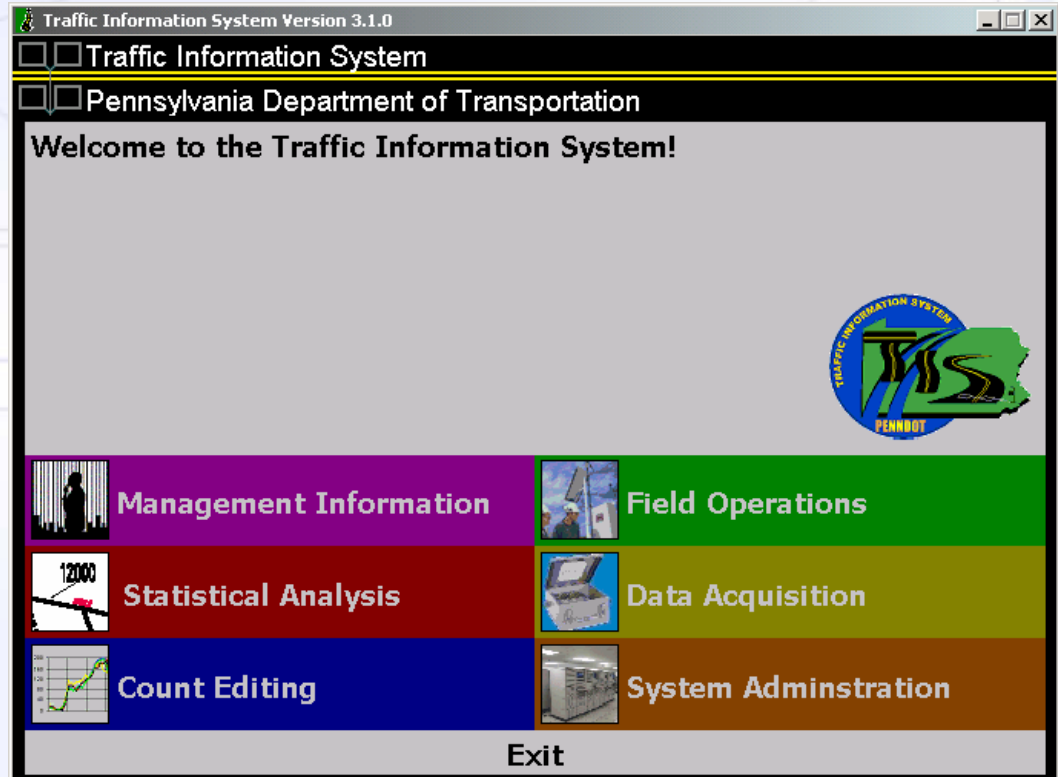


# PENNDOT's Traffic Data Collection Program

## TIS

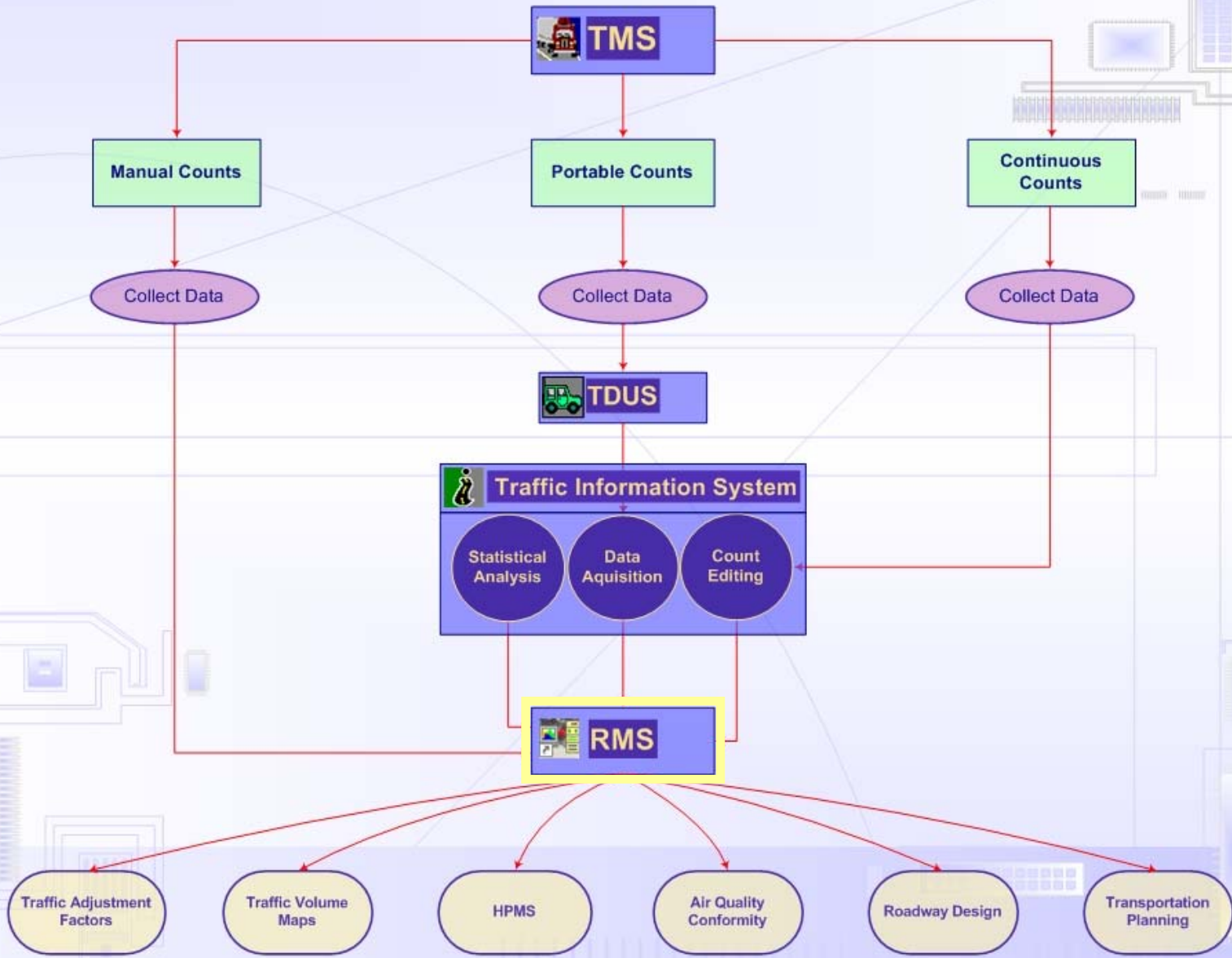
### Traffic Information System

- ❖ Edits continuous count data
- ❖ Calculates traffic adjustment factors
- ❖ Compiles TDUS files
- ❖ Produces data reports





# PENNDOT Traffic Monitoring Flowchart





# PENNDOT's Traffic Data Collection Program

## RMS

### Roadway Management System

- ❖ Processes raw traffic data

- ❖ Stores and disseminates all PENNDOT traffic data

```
Session A - [32 x 80]
File Edit Transfer Appearance Communication Asgist Window Help
PtScrn Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Support Index

RMSRM466 ROADWAY MANAGEMENT INFORMATION SYSTEM 03/14/2003 08:08:47
LTERM: A6025106 CURRENT TRAFFIC COUNT DATA (DIRECTIONAL)
COUNT - KEY.: 22/0022/0580/0200
STATE ROUTE: 0022 BASE YR: 2002 - DATE.: 07/25/2002
SEGMENT.: 0580 - TYPE.: MACHINE
OFFSET.: 0000 - REF. NO.: 2002224
LGTH - FT: 1723 MI: 0.326 DIRECTION.: EAST
MI: 0.326 DURATION (HOURS): 24
TOTAL VEHICLES (ADT): 5372 5372 TRUCKS PERCENT TRUCKS.: 11
TOTAL TRUCKS (ADT): 613 613 TRAF PATTERN GROUP: 07
2 AXLE TRUCK OR BUS: 104 104 17 DAILY - TOTAL VMT.: 1751
3 AXLE SINGLE UNIT.: 55 55 9 - TRUCK VMT.: 200
4 AXLE SINGLE UNIT.: 37 37 6
4 AXLE SEMI-TRAILER.: 43 43 7
5 AXLE SEMI-TRAILER.: 356 356 58
5 AXLE TWIN-TRAILER.: 0 0 0
6 OR MORE AXLE ALL.: 6 6 1
WEEKDAY TRUCKS.: 785 785
18K ESAL - RIGID.: 966 966
- FLEXIBLE.: 638 638

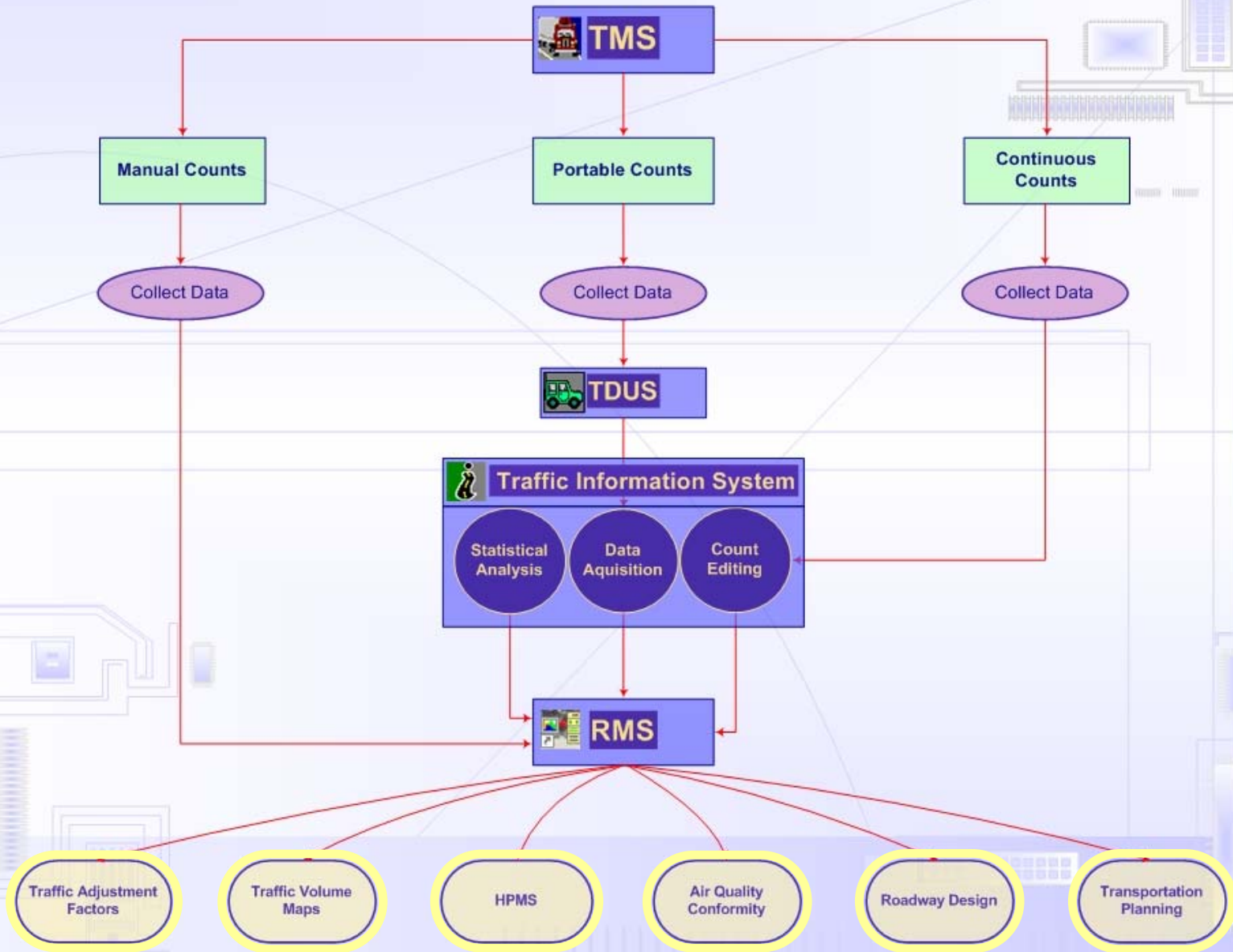
ACTION: I (A B E F G H I J L Q R S V W X Y)
MESSAGES:

-----DESIGN HR VOL FACTORS-----
K: 9 D: 65 T: 8
-----TRAFFIC COUNT LIMITS-----
FROM: 22 0022 0570 0000
TO.: 22 0022 0630 0000
-----PARALLEL LIMITS-----
FROM: 22 0022 0571 0000
TO.: 22 0022 0631 0000

MB a 03/014
Connected to Host using LU @L000001.
```



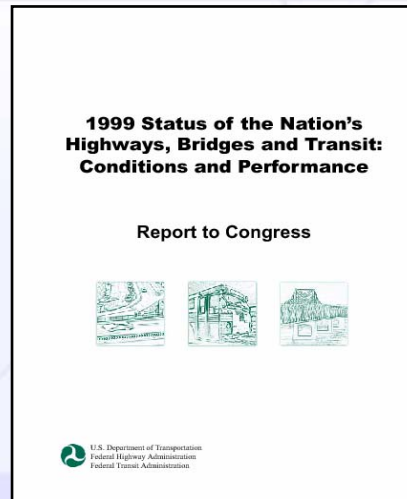
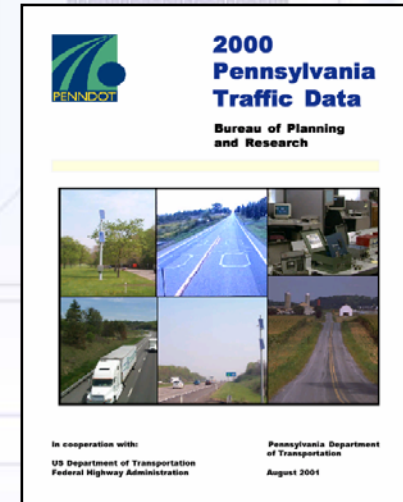
# PENNDOT Traffic Monitoring Flowchart



# PENNDOT's Traffic Data Collection Program

## Products

- ❖ Traffic Volume Maps
- ❖ Federal Reporting
- ❖ Highway Design
- ❖ HPMS



ROADWAY MANAGEMENT INFORMATION SYSTEM 03/14/2003 08:08:47

LEIGH: A6025106 CURRENT TRAFFIC COUNT DATA (DIRECTIONAL)

COUNT - REV: 22/0022/0580/0200

STATE ROUTE: 0022 BASE YR: 2002 DATE: 07/25/2002

SEGMENT: 0000 TYPE: MACHINE REF: 200224

OFFSET: 0000

LGTH - FT: 1723

RI: 0.228

DIRECTION: EAST

DURATION (HOURS): 24

DAILY - TOTAL VHT: 1751

PERCENT TRUCKS: 11

TRAF PATTERN GROUP: 07

TRUCK VHT: 200

DESIGN HR VOL FACTORS:

K: 9 D: 55 I: 8

FROM: 22 0022 0520 0000

TO: 22 0022 0630 0000

PARALLEL LIMITS:

FROM: 22 0022 0521 0000

TO: 22 0022 0631 0000

	BASE	CURRENT	% OF
	YEAR	ESTIMATE	TOTAL
TOTAL VEHICLES (ADT):	5372	5372	TRUCKS
TOTAL TRUCKS (ADT):	610	610	
2 AXLE TRUCK OR BUS:	104	104	17
3 AXLE SINGLE UNIT:	55	55	9
3 AXLE SEMI-TRAILER:	12	12	2
4 AXLE SINGLE UNIT:	37	37	6
4 AXLE SEMI-TRAILER:	43	43	7
5 AXLE SEMI-TRAILER:	356	356	56
5 AXLE TRAILER:	0	0	0
6 OR MORE AXLE ALL:	6	6	1
WEEKDAY TRUCKS:	785	785	
TRK ESAL - RIGID:	966	966	
- FLEXIBLE:	638	638	

ACTION: (A B E F G H I J L O R S V U X Y)

MESSAGES:

03/014



# PENNDOT's Traffic Data Collection Program

## TMS Features

### ❖ Interface (GIS)

- Visual Basic 6.0
- Geomedia 4.0

### ❖ Database

- Oracle 8i

### ❖ Mapping

- Intergraph MGE
- Segment Manager

### ❖ Reports

- Crystal Reports 8.5



# PENNDOT's Traffic Data Collection Program

## TMS Demonstration



# PENNDOT's Traffic Data Collection Program

## What's Next?

### ❖ Integration of Traffic Monitoring Applications

- TMS
- TIS
- TDUS
- RMS

### ❖ Web-based system





# PENNDOT's Traffic Data Collection Program

## Questions?

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