

**GEORGIA TECH  
TECHNOLOGY TRANSFER CENTER**

**DATA COLLECTION EQUIPMENT PROJECT**

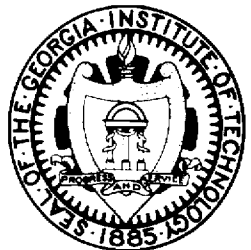
**Prepared By:**

**Georgia Tech  
Technology Transfer Center**

**Submitted To:**

**Federal Highway Administration  
and  
Georgia Department of Transportation**

**GEORGIA INSTITUTE OF TECHNOLOGY**  
A UNIT OF THE UNIVERSITY SYSTEM OF GEORGIA  
**SCHOOL OF CIVIL ENGINEERING**  
**ATLANTA, GEORGIA 30332**



**GEORGIA TECH  
TECHNOLOGY TRANSFER CENTER**

**DATA COLLECTION EQUIPMENT PROJECT**

**Prepared By:**

**Georgia Tech  
Technology Transfer Center**

**Submitted To:**

**Federal Highway Administration  
and  
Georgia Department of Transportation**

**JANUARY, 1989**

## TABLE OF CONTENT

Introduction .....	1
Purpose .....	2
Status .....	2
Problems .....	3
Summary .....	4

APPENDIX A -- Equipment Inventory

APPENDIX B -- Operating Instruction

APPENDIX C -- Sample Output

## INTRODUCTION

In February, 1984, Dr. John Moskaluk, Director of the Georgia Tech Technology Transfer Center initiated a request for support and participation in the Rural Technical Assistance Program (RTAP) project "Traffic Data Collection Equipment." Dr. Moskaluk's proposal included justification for funding up to an amount of \$89,000 for the purchase of twenty-five traffic counters, four collectors, assorted support equipment, and the man-hours to administrate the project.

Dr. Moskaluk's proposal was accepted by the Federal Highway administration in May, 1984 and submitted to the Georgia Department of Transportation. The approximated funding breakdown presented to the Department of Transportation was as follows:

1. Equipment Procurement: \$40,000 (counters, printers, sensors, miscellaneous items, etc.).
2. Training of local agency users: \$10,000.
3. T<sup>2</sup> Center Operating Budget: \$18,500/year for 2 years
4. Workshop Travel Expenses: \$1,000/person for two persons.

The Georgia Department of Transportation authorized funding in August, 1984. The project was originally intended to be of a two year duration, but was subsequently granted a no-cost time extension through December, 1988.

The Control Specialists Company of Orlando, Florida was selected as vendor of the traffic data collection equipment. The equipment was duly ordered and paid for by Georgia DOT, but was not received by the Technology Transfer Center until September, 1985. The Georgia department of transportation purchased the equipment and charged the project because the Georgia DOT had better purchasing power for this equipment.

## PURPOSE

The purpose of the traffic data collection project was to provide local transportation agencies (both cities and counties) with the ability to collect traffic data using data collection equipment borrowed from the Georgia Tech Technology Transfer Center. To assist in achieving this goal, three objectives were established:

- o To assist local agencies in collecting traffic information, namely traffic volumes and speeds.
- o To loan local agencies the necessary traffic data collection equipment.
- o To summarize the traffic data collected by the local agency. No evaluation of the summaries was provided to the local agencies.

Assistance was provided in situations where a defined problem exists and further traffic data was necessary in order to achieve a solution. Also, installation of the equipment was accomplished by the local agency.

## STATUS

At the present time, the Technology Transfer Center has access to twenty-four traffic counters and four retrievers, which are the property of the Georgia Department of Transportation. One of the original twenty-five counters was stolen during July, 1987, while being used by the Traffic Engineering Department of Conyers/Rockdale County and has not been replaced. Of the twenty-four traffic counters, thirteen are currently being used by Fulton County Public Works and four by Peachtree City. Also two of the four collectors are currently in field use, one by Peachtree City and one in Walton County. An inventory of equipment is included in Appendix A.

## PROBLEMS

The equipment and the software accompanying it are products of Streeter-Richardson, Inc. and are very self-explanatory and easy to use. Only minimal instructions are required for a person with no knowledge of the equipment to operate it successfully. A copy of the instructions which are provided for the users in the local agencies is included in Appendix B.

The Streeter-Richardson software which was initially acquired from Control Specialists was found to be slow and cumbersome. Printing the data was a lengthy process, and the format in which it was presented was difficult to interpret.

An updated version of the software was acquired in December, 1986. Data retrieval and printing with the newer software is faster and is presented in concise, tabular form. An example is presented in Appendix C.

As mentioned earlier, one counter was stolen while in use in Rockdale County. The counter was chained and padlocked to a street sign, as is the standard procedure. The vandals/thieves broke the chain and removed the counter. This information was reported to Georgia DOT and a mutual decision of not to purchase replacement equipment was concluded.

## SUMMARY

The data collection equipment has been utilized by seventeen agencies since October, 1985. This includes 38 different loan transactions, with an average of approximately six counters per loan. summary of the transactions is provided in Table 1.

Based on conversation with each of these agencies, it is concluded that the loaning of equipment to local agencies is a worth while endeavor. It is recommended that this equipment continue to be made available to local agencies.

**TABLES 1**

<u>AGENCY</u>	<u>NUMBER OF</u>		<u>DATE</u>	
	<u>RECORDERS</u>	<u>COLLECTORS</u>	<u>TAKEN</u>	<u>RETURNED</u>
Clayton Co.	8	1	10/1/85	10/23/85
Carrollton	8	1	10/22/85	11/27/85
Decatur	2	1	11/6/85	11/27/85
Dalton	7	1	11/12/85	1/10/86
Waycross	5	1	12/11/85	12/20/85
Georgia DOT Traffic Safety	4	1	12/85	5/86
Carrollton	4	1	1/10/86	2/14/86
Winder	8	1	2/10/86	5/1/86
Forsyth Co.	4	1	2/19/86	4/7/86
Carroll Co.	4	1	3/5/86	4/7/86
Waycross	12	2	4/22/86	7/9/86
Atlanta	9	1	3/4/86	9/3/86
Decatur	2	1	5/13/86	7/10/86
Rockdale Co.	6	1	9/3/86	11/3/86
Walton Co.	6	2	9/16/86	10/17/86
Decatur	2	1	9/25/86	11/14/86
Dekalb Co.	4	1	10/30/86	12/18/86
Coastal Georgia APDC	7	1	11/5/86	1/28/87
Waycross	15	1	1/28/87	5/15/87
Forsyth Co.	10	1	3/24/87	4/28/87
Georgia DOT	9	1	5/1/87	9/21/87
Forsyth Co.	4	1	6/2/87	6/16/87
Rockdale Co.	10	1	6/15/87	9/28/87
Peachtree City	6	1	7/29/87	9/19/87
Decatur	3	1	8/27/87	12/3/87
Fulton Co.	6	1	10/26/87	1/14/88
Fulton Co.	3	1	11/20/87	1/14/88
Fulton Co.	4	1	6/16/87	7/27/87
Decatur	2	1	7/16/87	8/11/87
Decatur	2	1	4/18/88	5/19/88
Cartersville	2	1	6/22/88	8/29/88
Decatur	2	1	7/12/88	7/26/88
Forsyth Co.	4	1	8/22/88	9/6/88
Peachtree City	6	1	9/27/88	11/16/88
Rockdale Co.	8	1	7/1/88	10/4/88
Wayne Sarasua	7	1	11/17/88	12/12/88
Peachtree City	4	1	11/28/88	IN USE
Fulton Co.	13	0	12/1/88	IN USE
Walton Co.	<u>0</u>	<u>1</u>	1/17/89	IN USE
 TOTAL 38 Users	 222	 40		

## **APPENDIX A**

## EQUIPMENT INVENTORY

### At Georgia Tech's T<sup>2</sup>

#### Seven Counters

# 4569  
# 4450  
# 4517  
# 4459  
# 4329  
# 4452  
# 4802

#### Two Collectors

### Loaned To Fulton County Public Works

#### Thirteen Counters

# 4332  
# 4326  
# 4756  
# 4224  
# 4320  
# 4455  
# 4456  
# 4324  
# 4735  
# 4527  
# 4457  
# 4226  
# 4451

### Loaned To Peachtree City

#### Four Counters

# 4526  
# 4806  
# 4327  
# 4458

#### One Collector

### Loaned To Walton County

#### One Collector

## **APPENDIX B**

TRAFFIC DATA COLLECTION EQUIPMENT FOR CITIES AND COUNTIES  
RURAL TECHNICAL ASSISTANCE PROGRAM -RTAP

INSTRUCTIONS  
ON  
USE OF DATA COLLECTION EQUIPMENT  
-----

PREPARED  
BY  
GEORGIA TECH TECHNOLOGY TRANSFER CENTER  
-----

SEPTEMBER 1985

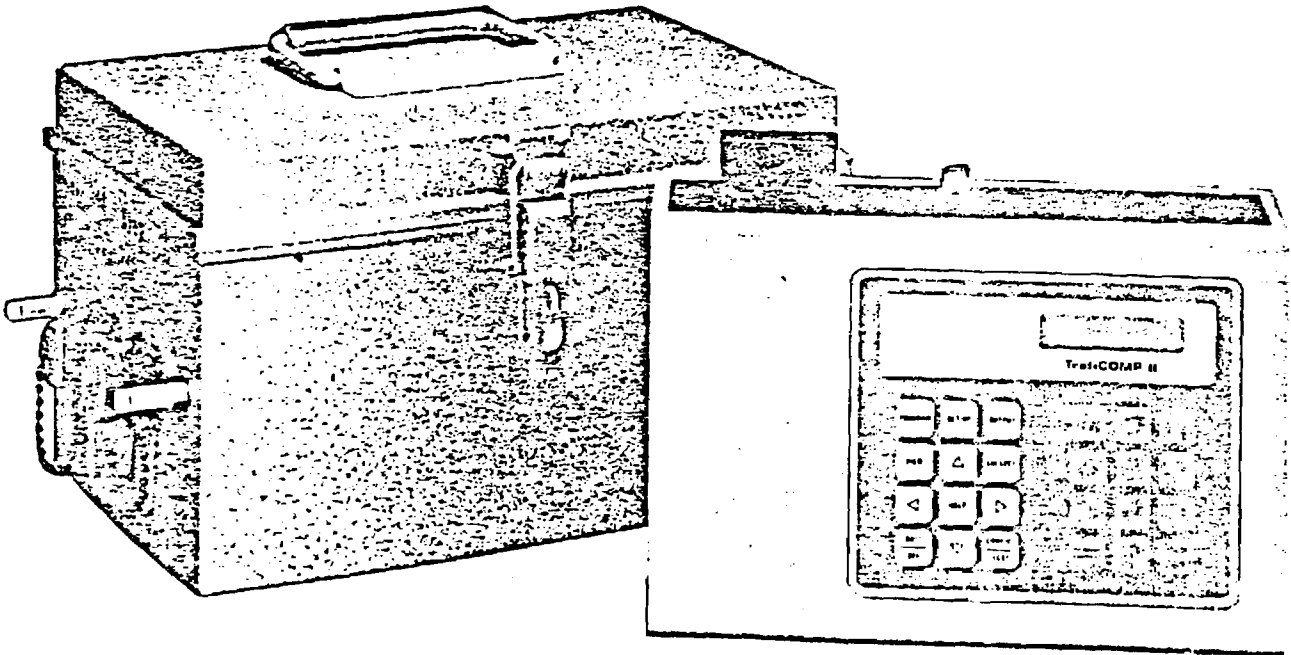
## FUNCTIONS OF THE EQUIPMENT

### Field Recorder:

This unit records traffic measurements by accepting input from up to two road tubes. A road tube is a hose that is closed on one end, with the other end connected to an air switch in the field recorder. After appropriate programming from the data collector unit, the recorder senses changes in air pressure in the road tube(s) to perform any of the traffic measurements.

### Data Collector:

The data collector is used to program and set up the recorder for any desired traffic measurement, and to retrieve the data from the recorder after the data had been recorded. In addition, the collector allows the user to view the data during the recording period or after retrieving the data from the recorder.



FIELD RECORDER

DATA COLLECTOR

## GETTING STARTED

Data collection is preceded by the following steps:

- 1 - Select locations for data collection.
- 2 - Determine the types of measurements needed at each location.
- 3 - Determine the Number of recorders and the amount of road tubes needed to perform the above measurements.
- 4 - Make a schedule for data collection and assign numbers to the sites (locations).
- 5 - Draw a map of the study area and specify data collection locations, site numbers, types, and schedule.

When a schedule for data collection is ready, and before leaving the office to set up the recorders at the selected locations, make sure you have the following:

- Reflective vest(s)
- Hammer
- Knife
- Crow bar
- 12-foot tape
- Screwdriver
- Nails
- Clamps
- Rope

## INSTALLATION

- 1 - Install the road tubes according to instructions for the type measurement needed.
- 2 - Switch the field recorder on and connect to road tube(s).
- 3 - Connect the field recorder to the data collector.
- 4 - Turn the data collector on.

---

## MEASUREMENTS

TRAFFIC VOLUME  
VEHICLE VELOCITY  
VEHICLE TYPE  
DIRECTIONAL VOLUME

## PROGRAMMING THE RECORDER

The data collector must be connected to the field recorder.

- 1 - Press the PROGRAM key
- 2 - Select the desired program by pressing the  $\triangle$  and  $\nabla$  keys to locate the appropriate measurement.
- 3 - Press the ENTER key - Now the selected program is being loaded into the recorder.
- 4 - Wait for the initial message to reappear.

Note: If a recorder has already been programmed for the desired measurement, it is not necessary to reprogram. A recorder can be programmed for only one measurement at a time.

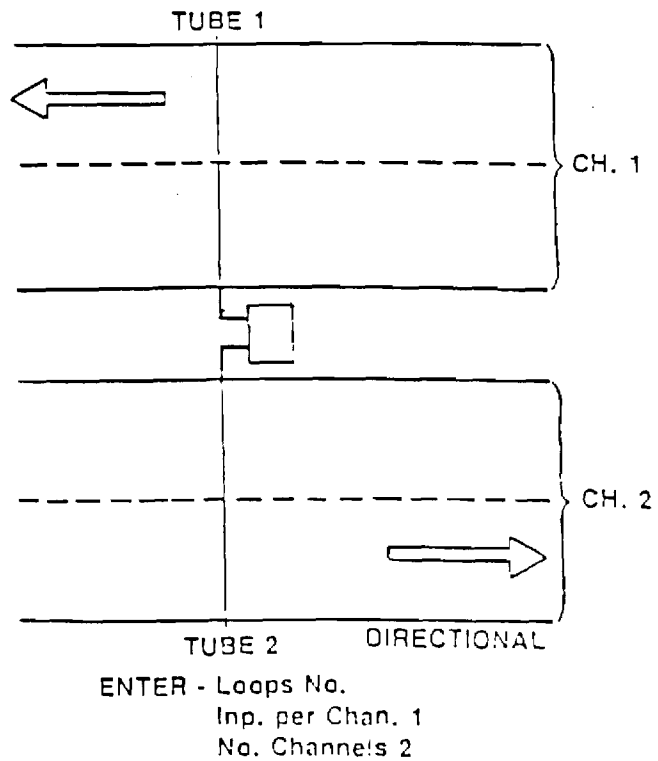
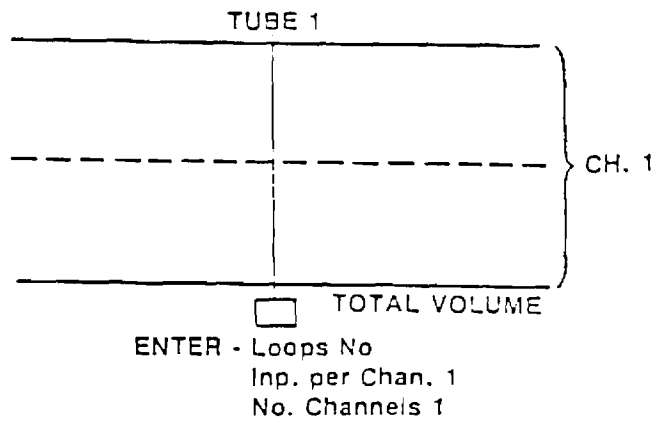
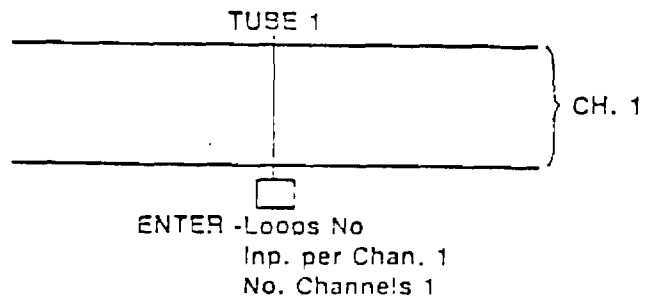
## TRAFFIC VOLUME

This program counts the number of vehicles that pass over the road tube during a given interval. Volume data may be obtained for a single traffic lane or for multiple lanes.

### Procedure:

- 1 - Program the recorder for VOLUME if it is not programmed for that type measurement.
- 2 - Press the SET UP key.
- 3 - Assign a station number and press ENTER. The station number should be between 0 and 4095.
- 4 - Assign an I.D. number and press ENTER. The I.D. number should also be between 0 and 4095.
- 5 - Select counting intervals (15-minute intervals are recommended) and press ENTER.
- 6 - Answer NO to "Loops" and press ENTER.
- 7 - Select the number of inputs per channel and the number of channels according to the specific configuration - Check the figures on the next page for the desired configuration. Press ENTER after each selection.
- 8 - Answer NO to "Save Setup" and press ENTER.
- 9 - Answer YES to "Clear 141 Data" and press ENTER.

-----

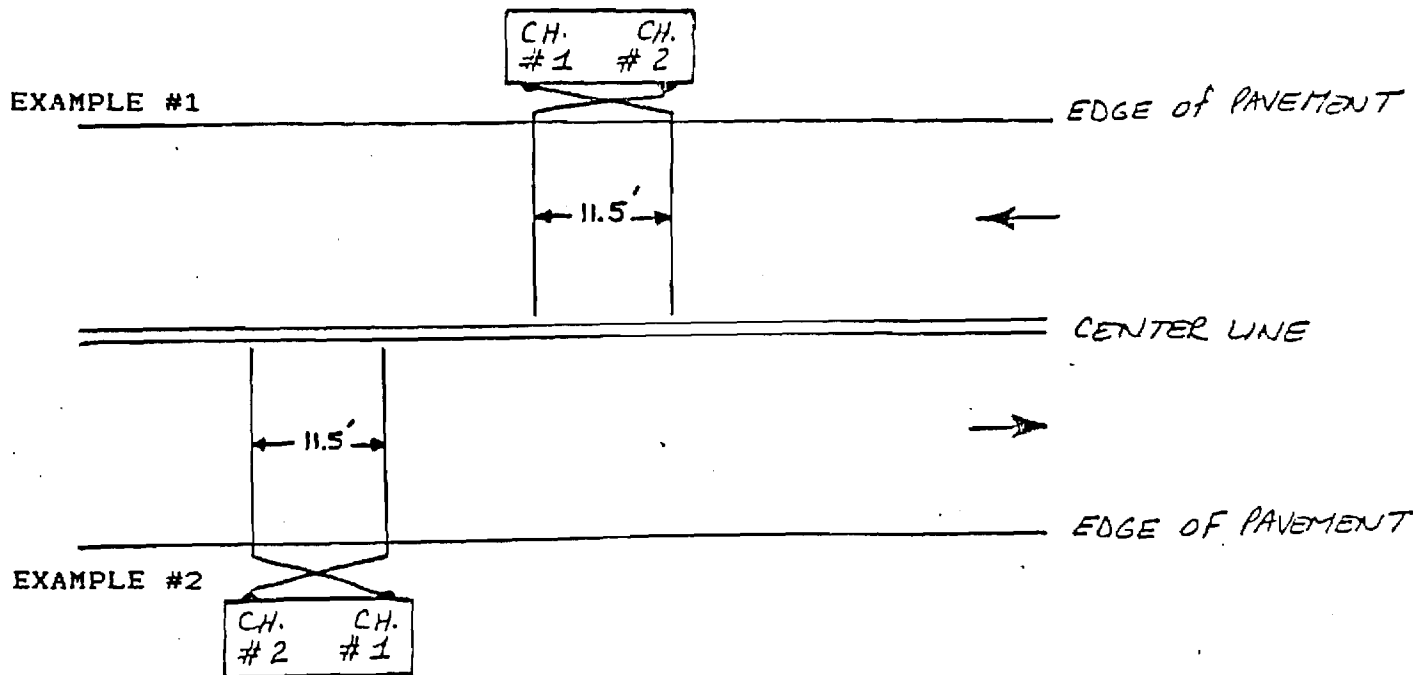


## VEHICLE VELOCITY

This program uses two road tubes to measure vehicle velocity in one lane. The tubes should be 11.5 feet apart and the tube connected to channel 1 should be the one that the vehicles pass over first.

### Procedure:

- 1 - Program the recorder for TUBE VELOCITY if it is not programmed for this type measurement.
- 2 - Press the SET UP key.
- 3 - Assign a station number and press ENTER. The station number should be between 0 and 4095.
- 4 - Assign an I.D. number and press ENTER. The I.D. number should also be between 0 and 4095.
- 5 - Select the measurement intervals (An interval of 15 minutes is recommended) and press ENTER.
- 6 - Select the number of bins (speed categories) desired. The maximum number of bins is 12. Press ENTER key.
- 7 - Assign the lower limits for the speed categories to be used. Press the ENTER key after assigning each of the lower limits.
- 8 - Enter the spacing of the road tubes. A spacing of 11.5 ft (138 inches) is recommended. Make sure that the spacing entered here is the actual spacing of the tubes on the road. Press ENTER key.
- 9 - Answer NO to "Save Setup" and press ENTER.
- 10- Answer YES to "clear 141 Data" and press ENTER.



Note: During the VIEW mode, it is possible to calibrate the vehicle velocity shown on the data collector display with the actual velocity of that vehicle if it is known. First press ENTER when you are in the VIEW mode and then answer YES for "Calibrate" and press ENTER again. If there is a difference between the actual and displayed velocities, the actual velocity is entered via the keyboard and the displayed number of inches that the tubes are apart will be changed automatically by the collector.

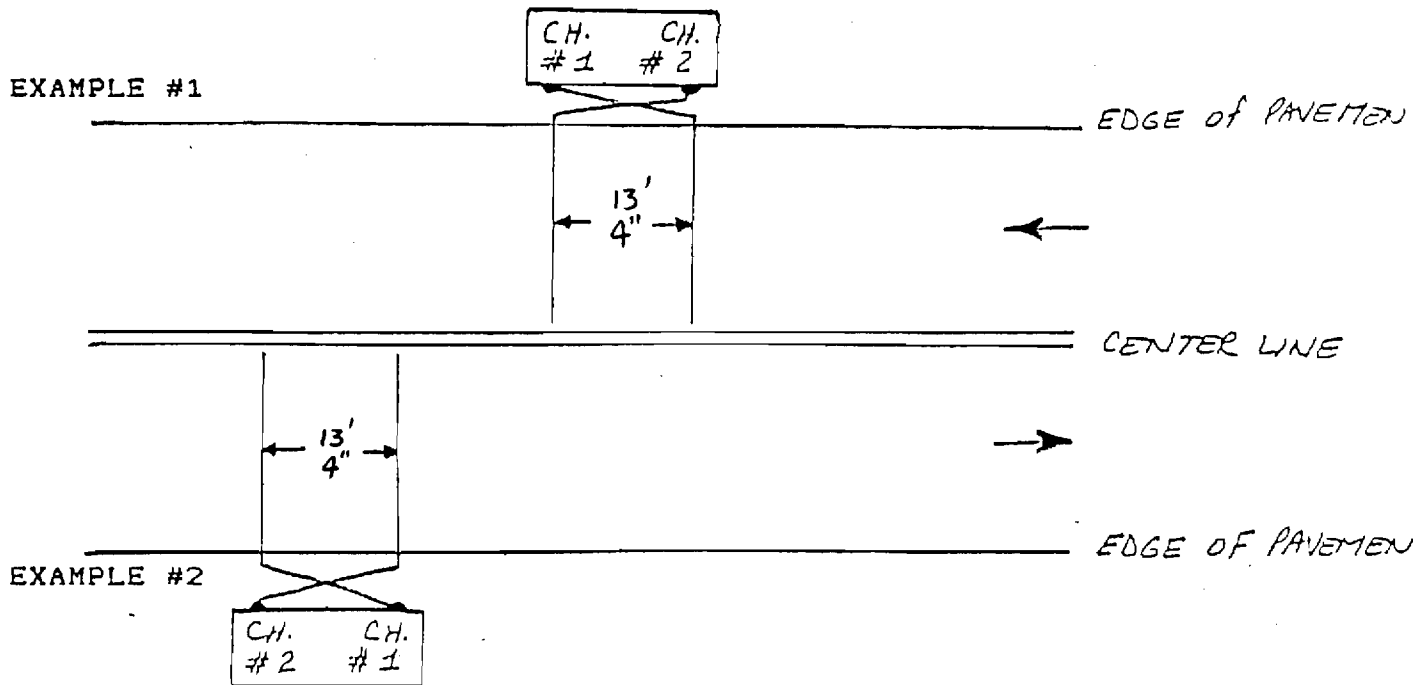
-----

## VEHICLE TYPE

This program uses two road tubes, spaced 13 feet 4 inches apart, to classify vehicles in one lane. Vehicles are classified into 14 categories. The tube connected to channel one should be the tube to be passed over first by the moving vehicles.

### Procedure:

- 1 - Program the recorder for VEHICLE TYPE if it is not programmed for that type measurement.
- 2 - Press the SET UP key.
- 3 - Assign a station number and press ENTER. The station number should be between 0 and 4095.
- 4 - Assign an I.D. number and press ENTER. The I.D. number should also be between 0 and 4095.
- 5 - Select the measurement intervals (intervals of 15 minutes are recommended) and press ENTER.
- 6 - Answer NO to "Save Set up" and press ENTER.
- 7 - Answer YES to "Clear 141 Data" and press ENTER.



## VIEWING THE DATA

After setting up the recorder and the road tubes, you may want to verify that the road tubes, recorder, and data collector are interconnected correctly and are functioning properly. To accomplish this, do the following:

- 1 - With the collector connected to the recorder, press the VIEW key.
- 2 - Depending on what kind of measurements we are taking, the data will be displayed and modified as more data is collected.

---

## COLLECTING THE DATA

Connect the recorder to the collector and press the COLLECT key and the ENTER key. The data will be collected and placed on a new file in the collector. It is necessary to collect the data after each measurement.

---

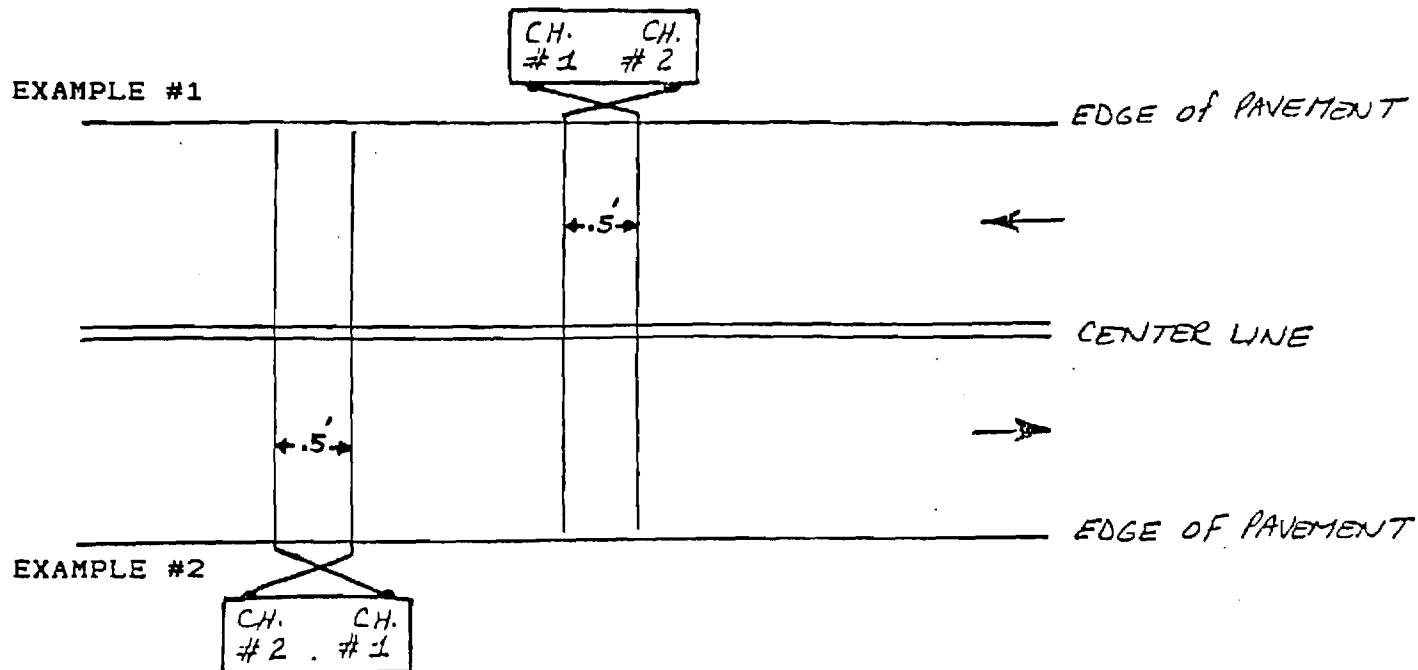
## DIRECTIONAL VOLUME

The directional volume program records traffic volume in two lanes. Two road tubes are used for this type measurement. The tubes should be placed across both lanes and should be 6 inches apart.

### Procedure:

- 1 - Program the recorder for DIRECTIONAL VOLUME if it is not programmed for this type measurement.
- 2 - Press SET UP key.
- 3 - Assign a station number and press ENTER. The station number should be between 0 and 4095.
- 4 - Assign an I.D. number and press ENTER. The I.D. number should also be between 0 and 4095.
- 5 - Select the measurement intervals (intervals of 15 minutes are recommended) and press ENTER.
- 6 - Answer NO to "Save Setup" and press ENTER.
- 7 - Answer YES to "Clear 141 Data" and press ENTER.

Note: Channel #1 in the recorder corresponds to Lane #1 and Channel #2 corresponds to Lane #2.



DATA COLLECTION INFORMATION SHEET

AGENCY NAME \_\_\_\_\_ OPERATOR \_\_\_\_\_

TELEPHONE \_\_\_\_\_

WEATHER \_\_\_\_\_ PAVEMENT: DRY \_\_\_ WET \_\_\_

TIME OF INSTALLATION \_\_\_\_\_ DATE \_\_\_\_\_

STATION \_\_\_\_\_ I.D. \_\_\_\_\_ FILE # \_\_\_\_\_

STREET NAME \_\_\_\_\_

DISTANCE FROM NEAREST INTERSECTION \_\_\_\_\_

TYPE DATA COLLECTION: TRAFFIC VOLUME \_\_\_ VEHICLE VELOCITY \_\_\_

VEHICLE TYPE --- DIRECTIONAL VOLUME ---

DIRECTION OF TRAFFIC:

CHANNEL #1 \_\_\_\_\_

CHANNEL #2 \_\_\_\_\_

DIAGRAM OF INSTALLATION  
-----

# StreeterAmet

Measurement  
Systems Division



---

## TRAFICOMP II

The TraficOMP II Portable Traffic Counting and Classification System provides the most flexible roadside data collection system today.

This system consists of two main units, Field Recorders and Data Collectors:

The Field Recorders are available with roadtube only or loop and roadtube inputs. Functionally versatile, they can perform volume and various classification functions in the same unit.

The lightweight Data Collector is a "user friendly" device which prompts the operator through each operation. The Data Collector contains many resident programs which it transmits to the field station:

- Volume
- Velocity classification
- Vehicle type classification
- Vehicle length classification
- Headway/Gap
- Lane logic

These programs are user format selectable for items such as traffic configuration and speed categories.

The Data Collector stores 32K Bytes of collected data in internal memory. Adding the optional 32K Data Module provides additional memory, allowing the operator to collect data from a large number of stations before returning to the office.

The TraficOMP System will interface with many printers and computers. The operator selects the "raw data" or processed data format for output at user selected baud rate. The processed data includes various percentile analysis, averages, and/or peak hour indication as appropriate for each type of program.

A truly state of the art system, TraficOMP II can monitor, collect and analyze varied traffic data without a separate computer!

# StreeterAmet

Measurement  
Systems Division



---

## TrafiCOMP II

### MODEL 240 DATA COLLECTOR GENERAL SPECIFICATION

Size - 3" W x 11" D x 7-3/4" H  
(7.6 cm x 27.9 cm x 18.7 cm)

Weight - 9 lbs. including battery

Housing Type - Compact, portable, weather resistant metal cabinet. Comes complete with handy carrying case with shoulder strap.

Functions -  
a) Set up and program Model 141 recorders for various data collection functions.  
b) Collects data stored in recorders  
c) Outputs to a printer or computer  
d) Tests display, batteries and memory

Display - 32 character alpha numeric display identifying current traffic count, vehicle velocity, etc. as well as information contained in recorder unit for Station No., Ident., Time and Date.

Controls - 28 key moistureproof keypad

Power Source -  
a) 6 volt rechargeable lead gel battery  
b) 115 or 230 VAC 50/60 Hz wall charger to automatically charge batteries.  
c) Cigarette lighter charger cable (optional)

Output - Formatted ASCII output via an RS232C interface, user programmable baud rate.

Connector -  
a) 25 pin D output connector for printer or computer  
b) 9 pin D connector for charger and 141 recorder

Basic Electronics - Quality fiberglass printed circuit board construction, secured with removable fasteners. Designed to take rugged field service.

110 VAX, 50/60 Hz  
240 VAC, 50/60 Hz

# StreeterAmet

Measurement  
Systems Division



---

## TrafiCOMP II

### ACCESSORIES

#### DESCRIPTION

Model TTY 43 KSR printer (friction feed)	2139302
Model TTY 43 KSR printer (pin feed)	2139301
Model TTY 43 RO printer (friction feed)	2139310
Model TTY 43 RO printer (pin feed)	2139309
Model Epson MX 80 dot matrix printer (sprocket drive)	2204551/2204554
Model Epson MX 80 dot matrix printer (sprocket/friction drive)	2204552/2204554
Model TTY 43 paper roll (friction drive)	2203741
Originate/auto answer modem	2058641
Acoustic coupler	2058544
Data Module (additional 32K data storage)	

# StreeterAmet

Measurement  
Systems Division



---

TrafiCOMP - continued

## TURNING MOVEMENT CLASSIFIER (MODEL 520)

Optional manual turning movement classifier gives the Model 141 recorder the capability of recording data for intersection studies. This accessory may be installed on any Model 141 recorder, which requires customer to modify cabinet and install accessory.

### Accessory Includes:

- Turning movement classifier (hand held)
- Internal interface cable
- Mounting hardware
- Appropriate program (2136980)
- Installation instructions (1050210)

P/N 0205549

## VEHICLE CLASSIFIER (MODEL 521)

Optional manual twelve (12) category vehicle classifier gives the Model 141 recorder the capability of being used as a manual vehicle classifier. This accessory may be installed on any Model 141 recorder, which requires customer to modify cabinet and install accessory.

### Accessory Includes:

- Vehicle classifier (hand held)
- Internal interface cable
- Mounting hardware
- Appropriate program (2136990)
- Installation instructions (1050211)

P/N 0205550

# StreeterAmet

Measurement  
Systems Division



## TrafiCOMP - continued

### MODEL 141A/2 TrafiCOMP RECORDER

- Heavy duty weather tight housing
- Two (2) air switch input
- 3K ram standard
- Volume program standard in prom
- Two (2) dry cell batteries (rechargeable batteries optional)
- Security lock
- This model for two (2) lane or directional volume counting or  
one (1) lane velocity classification or  
one (1) lane vehicle type classification

P/N 0205596

### MODEL 141A/4 TrafiCOMP RECORDER

- Heavy duty weather tight housing
- Two (2) dual 750PB detector input
- Two (2) air switch input
- 3K ram standard
- Volume program standard in prom
- Two (2) dry cell batteries (rechargeable batteries optional)
- Security lock
- This model for four (4) lane volume counting or  
two (2) lanes or two (2) directions velocity classification or  
two (2) lanes length classification or  
one (1) lane vehicle type classification

P/N 0205598

## ACCESSORIES

<u>DESCRIPTION</u>	<u>PART NO.</u>
Dry cell battery kit (standard)	0205595
Lead gel batteries (optional)	0205597
Lead gel trickle charger kit (110 VAC)	0205615
Lead gel trickle charger kit (240 VAC)	0205616
Dual 750PB detector assembly	0205582
Electronic air switch (replacement)	0205230
6V dry cell battery (replacement)	2045270
6V lead gel battery (replacement)	2058419

# StreeterAmet

Measurement  
Systems Division



TrafiCOMP - continued

## MODEL 141A TrafiCOMP RECORDER GENERAL SPECIFICATION

Size - 8-1/4"H x 8-1/2"D x 13"W (21.0 cm x 21.6 cm x 33.0 cm)

Weight - 18 lbs. (8.2 Kg) including batteries and detectors

Housing Type - Compact, portable, weatherproof metal cabinet with carrying handle and lock hasp. Full length hinge and gaskets

Functions - Volume counting, velocity classification, length classification, vehicle type classification, multi-directional or multi-lane

Power Source - a) 2-6 volt dry cell batteries;  
b) 2-6 volt 4 amp hr. rechargeable lead gel batteries (optional)

Temperature Range - -40°F to 158°F (-40°C to 70°C)

Recording Intervals - Available: 1, 2, 3, 4, 5, 6, 10, 15, 20, 30, or 60 minute periods

Maximum Count Rate - 20 vehicles per second; 4095 vehicles per recording period

Memory Storage (Data) - Up to 2500 maximum recording periods

Maximum Vehicles Per Counting Period - 4095 per lane

Power Consumption - 1.6 ma for two roadtube applications; road loop 2 ma per loop-application may vary. Dry cell batteries will yield approximately 200 days of operation for roadtube applications

Recorder Connections - a) 10 pin female MS connector for reader cable;  
b) 10 pin male MS connector for road loop inputs; (loop detection models)  
c) 2 air switch tubes for roadtube (roadtube models)

Vehicle Detection - Up to two air switches for roadtubes  
Up to four internal loop detectors (Model 750P)  
Up to eight external loop detectors (special order)

Controls and Displays - Loop detector adjustment and LED indicator (if used)

Basic Electronics - CMOS - Microprocessor based. Modular plug-in boards to allow for field service and optional functions

**StreeterAmet**

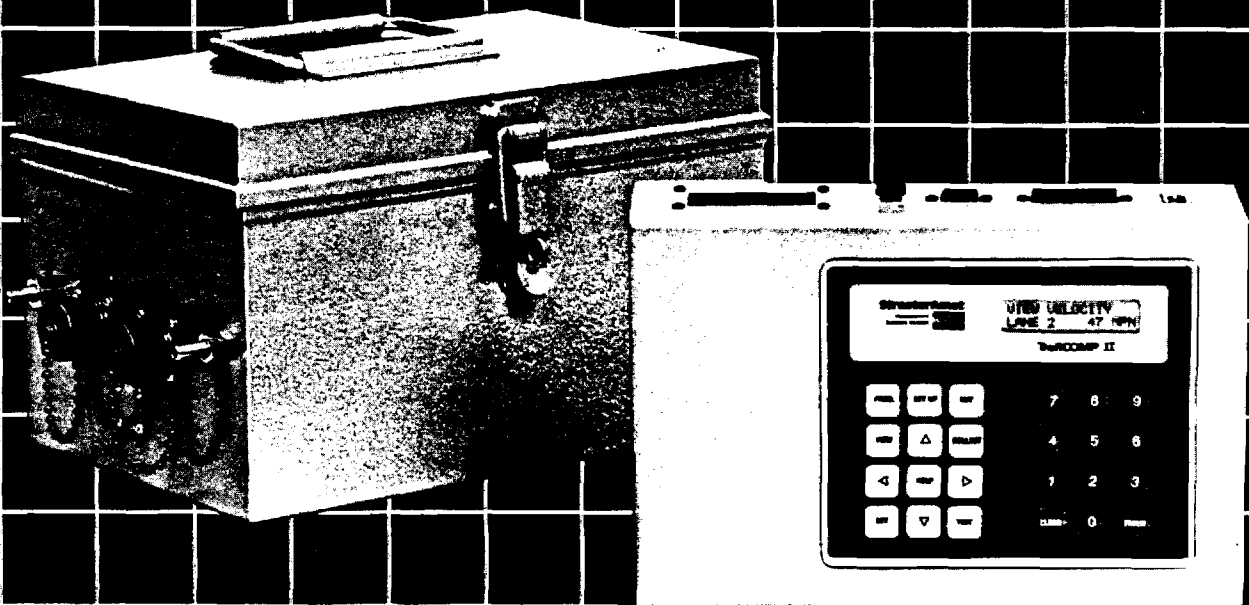
Measurement  
Systems Division

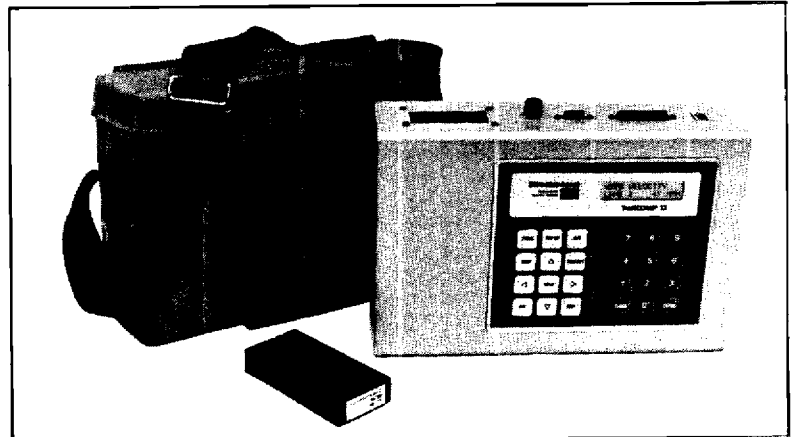
**The  
Mangoood  
Group**

# TrafiCOMP<sup>®</sup> II

## Portable Traffic Counting & Classification System

**Traffic Volume & Classification • Special Collection Programs**





The Traficom II Data Collector features a handy carrying case and optional data modules for additional storage.

(Photo at left) Lightweight and versatile, the Traficom II system was designed for ease of use.

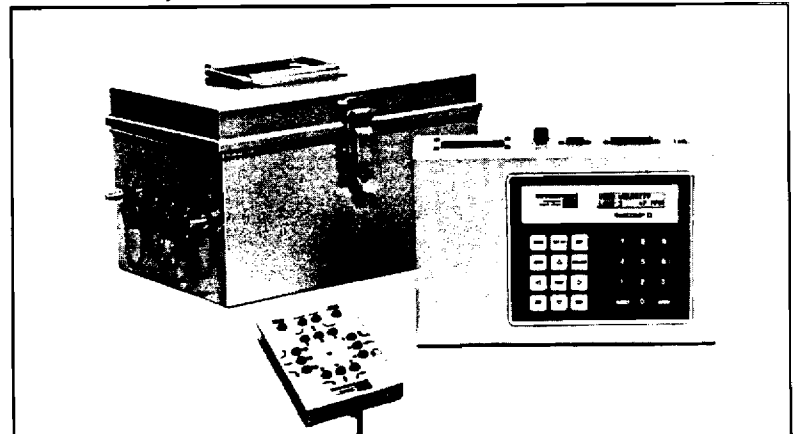
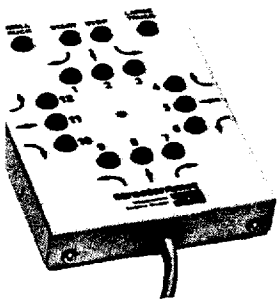
The Model 520 turning movement accessory provides additional flexibility for the Traficom system.

## MODEL 520 & 521

Traficom Turning Movement & Vehicle Classification Accessories

### Model 520

This accessory consists of a handheld keyboard featuring easy data entry. The program records the data into 12 directional categories for intersection classification. In addition, it separates these categories into three types such as cars, small trucks, and large trucks. (See sample printout)



### Model 521

The Model 521 Vehicle Classifier gives Traficom the additional flexibility of being used as a manual vehicle classifier. The handheld keyboard is similar to the Model 520. This accessory may be used with any Model 141 Field Recorder.

Sample Printout of Turning Movement Program

		STATION 120		IDENT 1020	PROC 1001	INTRVL 60 MINUTES	12 directional categories		
		SETUP DATE 1125		RETRIEVAL DATE 1125		SETUP TIME 1201	RETRIEVAL TIME 1505		
	HOUR	CHANNEL	1	2	3	11	12	13	total for each vehicle type
car									
small truck									
large truck									
hour	13		22	16	13	38	26	267	hour totals all categories
			10	7	5	23	6	167	
			3	3	4	2	2	48	
			2	2	0	6	2	30	
	14		15	12	9	31	10	245	
			7	19	7	68	7	200	
			1	4	1	4	0	26	

## **APPENDIX C**

RT Dir Volume Program with 24 Hour Totals

\*\*\*\*\*  
 Data File : 022388 .TRF Position : 2  
 Station : 806 Ident : 806  
 Start Date : Feb 18 ,1988 End Date : Feb 19 ,1988  
 Start Time : 13:30 End Time : 13:30  
 Location : Sample print out  
 \*\*\*\*\*

Feb 18/Feb 19 \*\* Lane 1 \*\*

Begin	00	01	02	03	04	05	06	07	08	09	10	11
00	2	1	0	1	0	0	0	0	11	13	11	8
15	2	0	0	1	0	0	2	3	16	11	10	8
30	3	1	1	1	0	0	0	5	10	15	11	4
45	3	1	0	1	0	1	2	10	9	20	11	14
Hr Total	10	3	1	4	0	1	4	18	46	59	43	34

Begin	12	13	14	15	16	17	18	19	20	21	22	23
00	9	8	9	11	4	4	5	4	3	3	6	6
15	5	8	10	5	5	8	3	1	2	5	0	1
30	10	16	9	6	6	9	7	3	1	1	5	2
45	6	10	10	9	6	3	9	12	2	2	2	2
Hr Total	30	42	38	31	21	24	24	20	8	11	13	11

Total volume : 496  
 \*\*\*\*\*

Feb 18/Feb 19 \*\* Lane 2 \*\*

Begin	00	01	02	03	04	05	06	07	08	09	10	11
00	2	2	2	1	0	2	0	0	3	2	0	1
15	0	2	0	0	0	0	0	2	2	1	4	5
30	6	1	2	0	0	0	0	0	3	1	1	2
45	0	1	1	1	0	0	0	0	0	0	1	8
Hr Total	8	6	5	2	0	2	0	2	8	4	6	16

Begin	12	13	14	15	16	17	18	19	20	21	22	23
00	5	9	1	8	4	4	8	10	6	5	3	0
15	4	4	5	3	8	9	3	2	6	5	1	0
30	3	8	5	2	14	3	2	8	4	4	6	1
45	2	6	5	8	8	13	6	6	5	3	3	2
Hr Total	14	27	16	21	34	29	19	26	21	17	13	3

Total volume : 299  
 \*\*\*\*\*

