

California Department of Transportation



TRANSPORTATION SYSTEM NETWORK (TSN)

Presented at NATMEC 2002 by
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The following will be presented:

- What is TSN
- Why switch to TSN from Legacy Systems
- Illustrate some Traffic Volume features of TSN
- Challenges Faced

Transportation System Network (TSN), the first building block for Caltrans Corporate database

- New Information System for a Corporate Caltrans
- New way of looking at data and data ownership. (Corporate v/s Divisional data)
- New way of sharing data using relational database platform.

What Is TSN ?

TSN is a system that combines the key functions of four existing legacy systems

- Accidents/Inventory
- Traffic Volumes
- Highway Performance Monitoring (HPMS)
- Pavement Management

- a single application with one highway network built with Oracle tools whose data resides on an Oracle database

TSN Key Features

- Tracks history; this allows users to see the roadway as it existed at a point in time
- Uses a Windows graphical user interface rather than a terminal-keyboard approach
- TSN stores location data in a way that is independent of any location reference system.

TSN Key Features

- Capable of integration with products like MS Word, Excel, and Access.
- Data is accessible via SQL which is fairly easy to use by programmer and end user alike and can be used with data browser products for user queries.
- All documentation--user guides, glossaries, training materials, etc.--are available on-line and are easy to use, update, and distribute.
- Codes have been made more intuitive and have easy pick-lists on-screen to choose from rather than from a manual, card or memory.

Why TSN Is Necessary

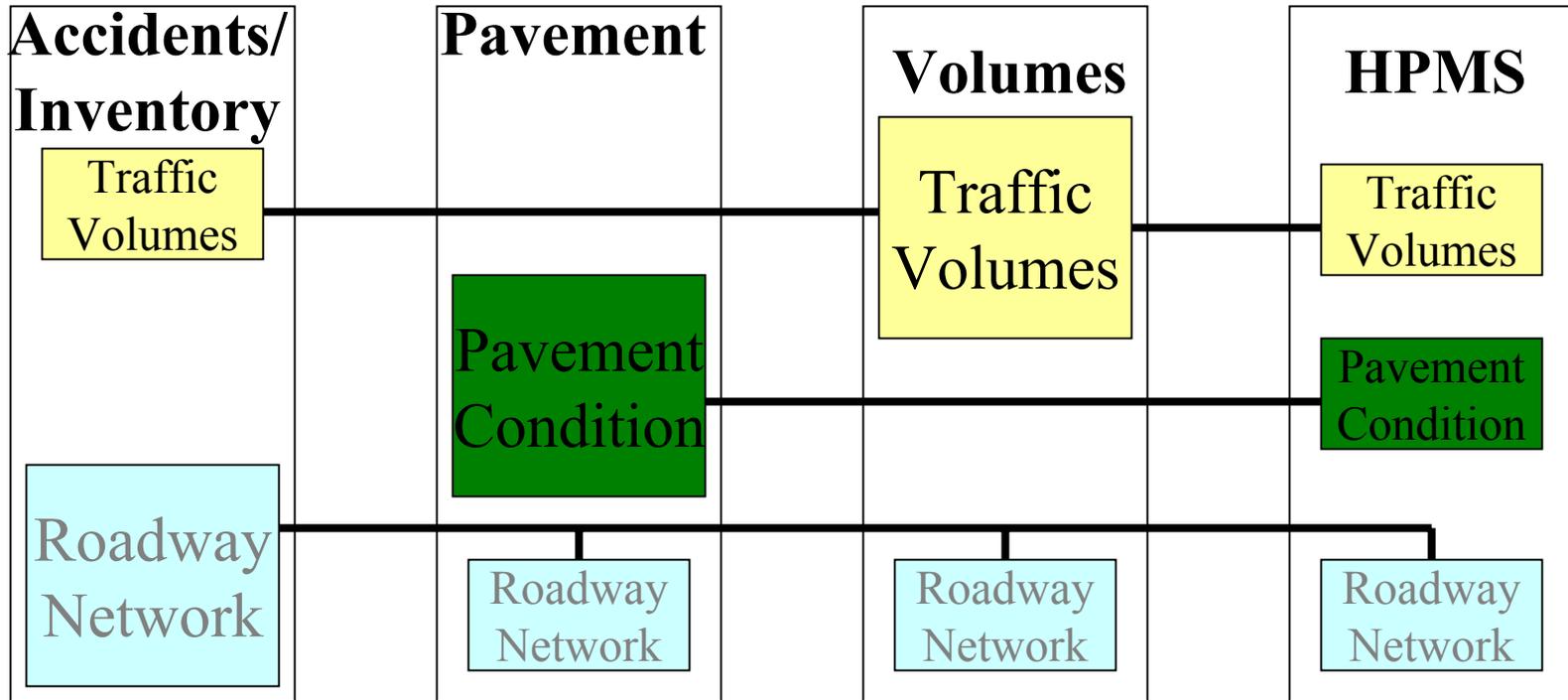
- The pace of the business world is getting faster and organizational changes require flexible tools to support that change.
- Our legacy systems contained many programs with different kinds of data, rules, logic, etc. coded into the application itself which made it hard to change.
- In relational databases, the data and many rules to ensure the integrity of the data are maintained in flexible tables that can be changed quickly and disseminated statewide. Mainframe-based applications have lots of power but lack flexibility.

Why TSN Is Necessary

- Security: new technologies allow a high-degree of control over the data, screens, fields, menu options, etc.
- Archiving and tracking change
- Learning curve can be substantially reduced since codes are easily available and explained in lists that pop up, GUI buttons, and menus, etc.
- Data can be shared internally or externally more easily. Data does not have to be “locked” by the organization chart

Where We Were

4 Legacy Systems with the
Roadway Network built into TASAS



- Cobol
- Mainframe

- Character User Interface
- Redundant System Islands

Where We Are Going

INVENTORY	ACCIDENTS	VOLUMES	PAVEMENT	HPMS
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Roadway Network & Inventory

- * Client-Server
- * Graphic User Interface
- * Relational Database
- * Eliminated System Islands

TSN

Roadway Network and Inventory

Provides the Foundation for Future Legacy System Additions
to the Corporate Database Environment

TASAS	TV	PMS	HPMS	Project Management
Roadway Network District County Route PM				
Sign Inventory	MMS	SMS	GIS	

Design and Build Process

- Teams consisting of staff from functional area, Caltrans IT and Oracle Corp. formed to develop:
 - Functional Requirements
 - Design Specifications
- Approval needed by managers of the three groups before coding could begin

Design and Build Process

- Design specifications coded
- Data Conversion
- Testing

TSN Main Page

Oracle Transportation Manager - Test Instance - []
Action System Administer Window Help



U.S. Department of Transportation
Federal Highway
Administration

HPMS



TSN



Traffic Volumes



PMS



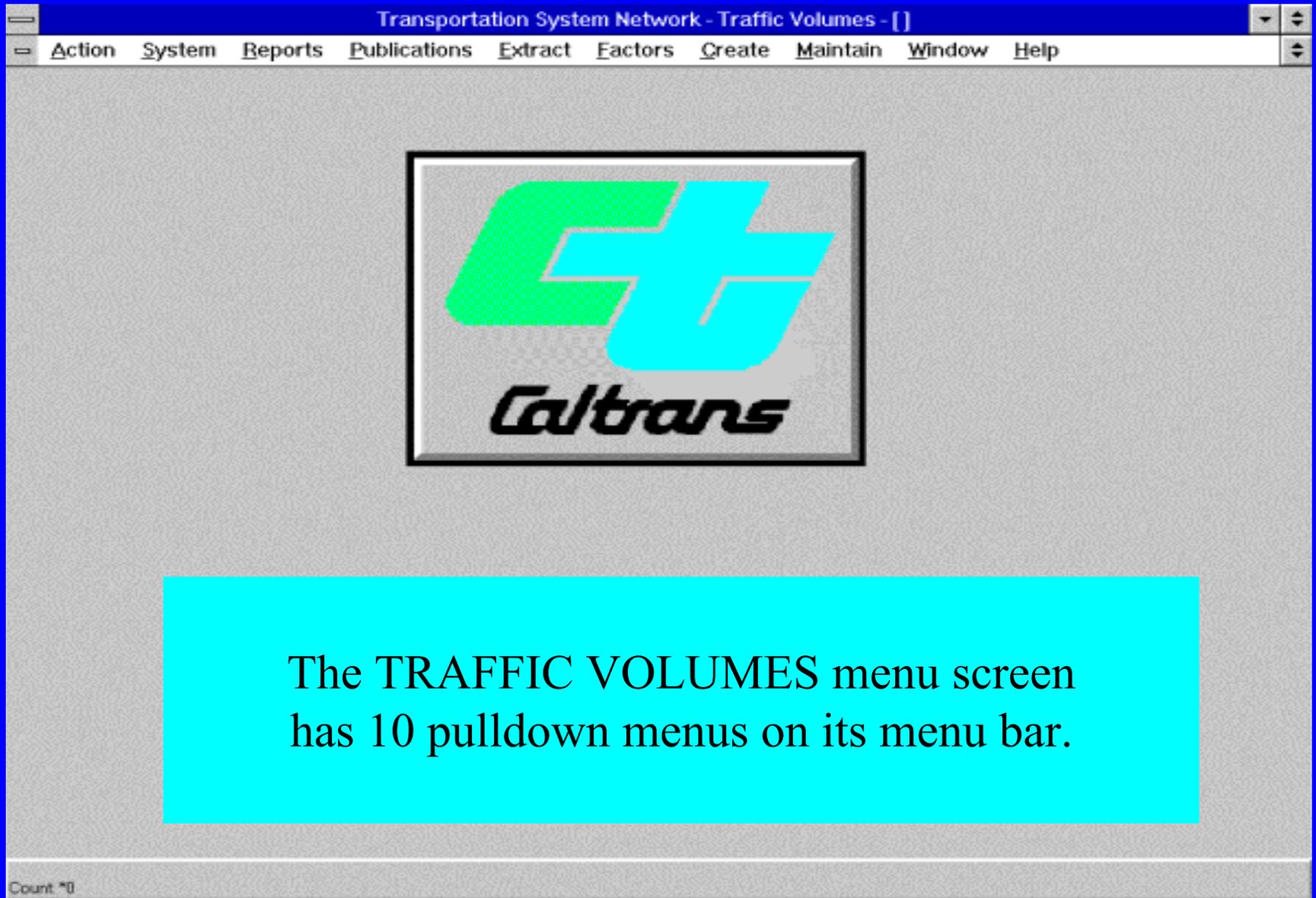
Inventory



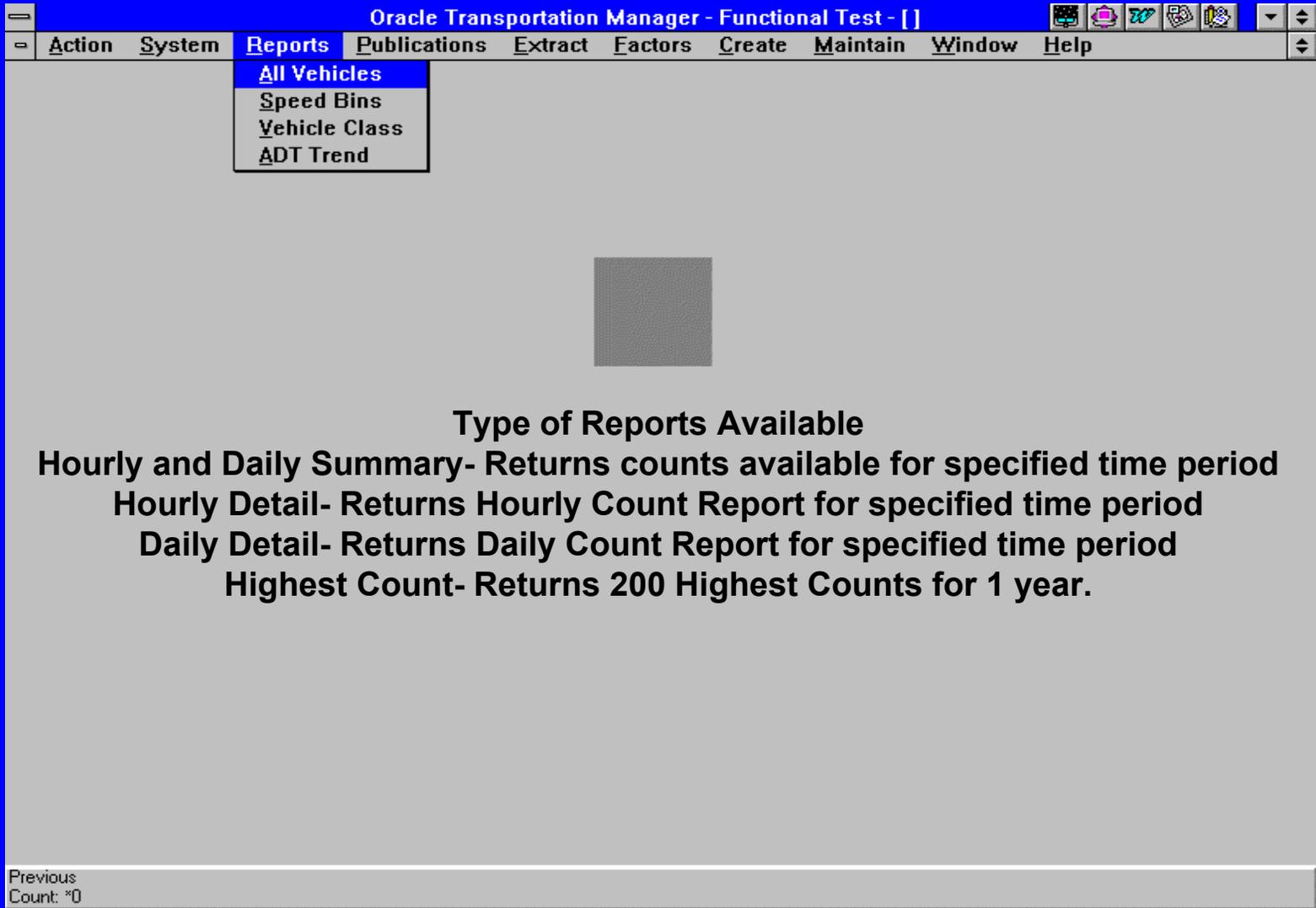
Accidents

Record 1/1

Traffic Volumes Menu Screen



Reports - All Vehicles



The screenshot shows the Oracle Transportation Manager interface. The title bar reads "Oracle Transportation Manager - Functional Test - []". The menu bar includes "Action", "System", "Reports", "Publications", "Extract", "Factors", "Create", "Maintain", "Window", and "Help". The "Reports" menu is open, showing options: "All Vehicles", "Speed Bins", "Vehicle Class", and "ADT Trend". The "All Vehicles" option is highlighted. Below the menu, a grey square placeholder is visible. The main content area contains the following text:

Type of Reports Available
Hourly and Daily Summary- Returns counts available for specified time period
Hourly Detail- Returns Hourly Count Report for specified time period
Daily Detail- Returns Daily Count Report for specified time period
Highest Count- Returns 200 Highest Counts for 1 year.

Previous
Count: *0

Request Reports

Oracle Transportation Manager - Functional Test - [All Vehicles - Parameters]

Action Edit Block Field Record Query Window Help

OTM30520 Reference C03/07/1997

1. Enter dates (mm/dd/yyyy)

From to

Hourly Summary Daily Summary Highest Count
 Hourly Detail Daily Detail

2. Select report type (REQUIRED)

By Station By Route By Range By Location Printer Options

District (Leave blank for statewide)

Traffic Stations (Leave blank for districtwide or statewide)

Enter value for District
Count: *0 <List>

Tdc - EXTRA! Personal Client

File Edit View Tools Session Options Help

TRAFFIC VOLUME REPORT REQUEST

PF1	OPTION 1 - SELECT BY CONTROL STATION	(1-17)
PF2	OPTION 2 - SELECT BY ROUTE NUMBER (ALL)	(1-13)
PF3	OPTION 3 - SELECT BY ROUTE NUMBER (OTHER)	(1-13)
PF4	OPTION 4 - SELECT BY CNTY-RTE-POSTMILE	(1 OR RANGE)
PF5	OPTION 5 - SELECT BY CNTY-RTE-POSTMILE	(1-4)

PRESS DESIRED PF KEY TO ENTER THAT OPTION...PRESS PF12 TO QUIT

01/01

Connected :00.3 NUM 9:14 AM

Start Tdc - EXTRA! Person... Document - WordPad Microsoft Word 9:14 AM

Tdc - EXTRA! Personal Client

File Edit View Tools Session Options Help

REQUEST FOR REPORT FROM TRAFFIC VOLUMES DATA BASE
OPTIONS 2 - SELECT SPECIFIC ROUTES (ALL STATIONS)

REQUESTOR DISTRICT: _ NAME: _____ PHONE: _____

INFORMATION REQUESTED:
FILE READ: _ (D=DAY TOTALS, H=HOOR TOTALS)
DISTRICT: _____
DATE: _____ (MONTH OF SELECTION - IE JAN)
_____ (YEAR OF SELECTION - IE 06)

OPTION: _ (T=DATES FOR WHICH COUNTS ARE AVAIL,R=DATES PLUS ACTUAL COUNTS)

ENTER ROUTES (M/SUFFIX) TO BE INCLUDED IN REPORT (13 MAXIMUM):

SELECT RUN OPTION: 0 (E=EXPRESS, 0=OVERNIGHT - OVERNIGHT SAVES 50% OF COST)

OUTPUT PRINT DESTINATION: _____ (RDR=READER,RMT=YOUR REMOTE,RMTXX=REMOTE XX)

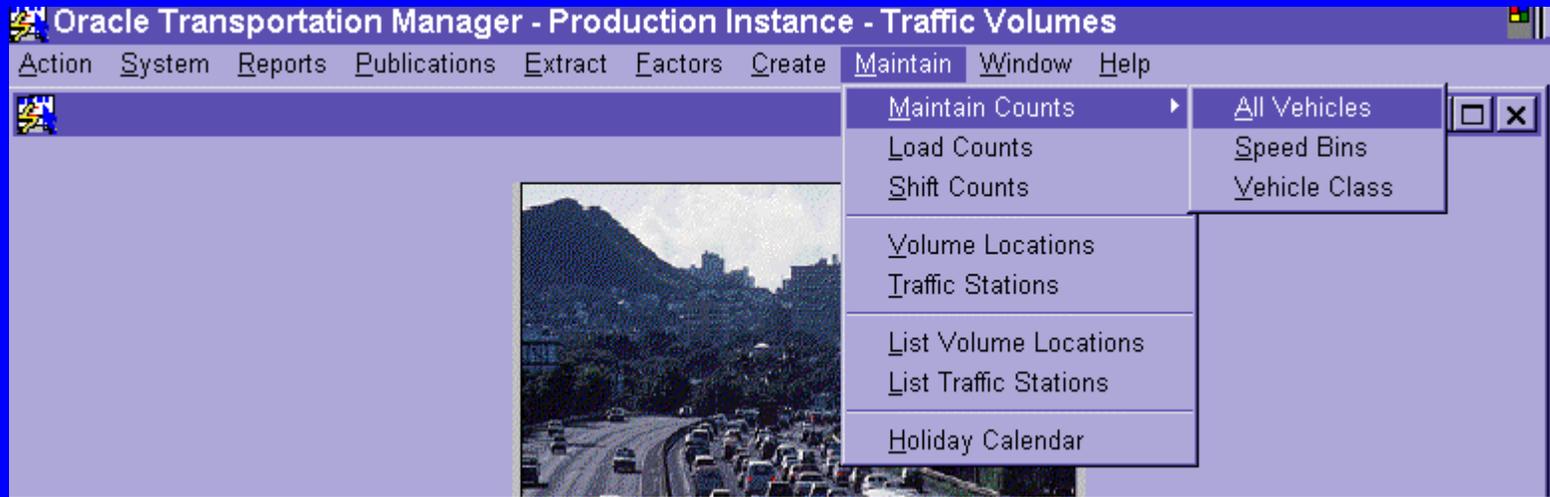
ENTER SELECTION INFORMATION AND PRESS 'ENTER' KEY TO SUBMIT
PRESS PF12 KEY TO RETURN TO OPTION MENU

40 :00.2 04/22

Connected NUM 9:16 AM

Start Tdc - EXTRA! Person... Document - WordPad Microsoft Word - Document4 9:16 AM

Maintain Counts - All Vehicles



Maintain Counts - All Vehicles

Oracle Transportation Manager - Production Instance - Traffic Volumes - [All Vehicle Detail Count]

Action Edit Block Field Record Query Help

Volume Location Legs

Traffic Station: 9 905 Direction: N Date: 02/22/1999 Leg: A Location Type: T Recalc

Dist: 09 Cnty: INY Rte: 395 Stx: Ptx: Locn: 96.5 Hwy: Click on Detail

Day and Hourly counts. Arrow keys change days.

Detail Daily Monthly LFactor RFactor IFactor << < > >>

	Mon 22nd	Tue 23rd	Wed 24th	Thu 25th	Fri 26th	Sat 27th	Sun 28th
00 - 01	20 A	16 A	22 A	35 A	105 A	174 A	19 A A
01 - 02	16 A	25 A	32 A	24 A	54 A	66 A	6 A A
02 - 03	16 A	18 A	19 A	22 A	43 A	45 A	9 A A
03 - 04	3 A	27 A	24 A	21 A	32 A	20 A	7 A A
04 - 05	9 A	22 A	13 A	25 A	35 A	18 A	5 A A
05 - 06	26 A	23 A	24 A	26 A	43 A	39 A	12 A A
06 - 07	34 A	39 A	42 A	46 A	64 A	71 A	35 A A
07 - 08	53 A	58 A	58 A	85 A	120 A	86 A	43 A A
08 - 09	88 A	61 A	73 A	81 A	138 A	92 A	67 A A
09 - 10	84 A	93 A	102 A	120 A	193 A	126 A	102 A A
10 - 11	124 A	119 A	97 A	114 A	182 A	137 A	133 A A
11 - 12	106 A	93 A	110 A	121 A	181 A	143 A	126 A A
24 Hr Amt	1830 A	1786 A	1980 A	3172 A	4613 A	2289 A	2137 A A
Day Total	1830 A	1786 A	1980 A	3172 A	4613 A	2289 A	2137 A A

Scroll bar moves the hourly counts.



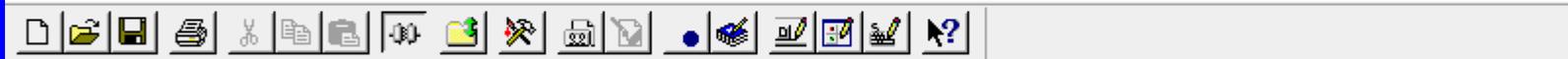
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_TPUCM21          CALTRANS - TRAFFIC VOLUMES SYSTEM          TPUM21M
                   USER SELECTION MENU

- PRESS THE PF-KEY WHICH CORRESPONDS TO YOUR DESIRED SELECTION -

PF13  - HOURLY COUNTS ADD-INQUIRY-UPDATE
PF14  - DAY-TOTAL COUNTS ADD-INQUIRY-UPDATE
PF15  - LRI AND MADT INQUIRY

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PF1   - HELP
CLEAR - EXIT
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TPUAS22                CALTRANS - TRAFFIC VOLUMES SYSTEM                TPUS22M
                        HOURLY COUNTS RECORD SELECTION

*THESE FIELDS REQUIRED FOR ALL SELECTS
DISTRICT                -
DIRECTION
YEAR
MONTH
DAY

*CONTROL STATION SELECTION
CONTROL STATION

*POSTMILE/ROUTE SELECTION
COUNTY
ROUTE
ROUTE SUFFIX
POSTMILE PREFIX
POSTMILE
LEG
TYPE
DESCRIPTION

-KEY ALL FIELDS NEEDED FOR SELECTION TYPE AND CHOOSE A FUNCTION BELOW
PF1/HELP                PF3/RETURN                PF12/MAIN MENU
PF13/CONTROL STATION    PF14/POSTMILE-ROUTE        CLEAR/EXIT

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TPUAP22		CALTRANS - TRAFFIC VOLUMES SYSTEM							TPUP22M
HOURLY COUNTS INQUIRY/UPDATE									
DISTRICT	02	COUNTY	TEH	DIRECTION	N	ROUTE	005	POSTMILE	31.043
CONTROL STATION	202		TYPE	FC		WILCOX	ROAD		
DATE	DAY		12-1	1-2	2-3	3-4	4-5	5-6	DAILY
			6-7	7-8	8-9	9-10	10-11	11-12	TOTAL
10/20/97	MON	AM	147 A	119 A	124 A	116 A	151 A	260 A	
			554 A	810 A	846 A	833 A	730 A	998 A	
		PM	851 A	1146 A	1107 A	1281 A	1315 A	1225 A	
			872 A	597 A	441 A	395 A	248 A	250 A	15416 A
10/21/97	TUE	AM	195 A	178 A	188 A	146 A	212 A	305 A	
			556 A	874 A	910 A	887 A	834 A	966 A	
		PM	1033 A	1022 A	1147 A	1139 A	1318 A	1317 A	
			864 A	540 A	516 A	434 A	288 A	234 A	16103 A
10/22/97	WED	AM	178 A	158 A	194 A	159 A	211 A	297 A	
			540 A	877 A	871 A	1091 A	947 A	932 A	
		PM	995 A	1043 A	1083 A	1233 A	1273 A	1359 A	
			963 A	647 A	511 A	428 A	320 A	297 A	16607 A

Challenges

- Stay within scope of project.
- Run simultaneous systems, with no additional resources
- Momentum- waning interest
- Sell the big picture to staff and users.