TRAFVU

File Description Document

Version 1.4

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Table of Contents

Preface

TRAFVU displays and animates the results of traffic simulations. It was designed to obtain simulation data via two separate communication media: data files and sockets. Socket communications were developed primarily to serve the needs of traffic research laboratories where simulation elements are distributed across several computer platforms. The Traffic Research Laboratory (TReL) Graphics Processor Interface Control Document (ICD 5.0) describes the socket interface between TRAFVU and the TReL traffic simulator.

The file interface was developed primarily for stand-alone desktop applications of the CORSIM simulation. However, recent laboratory demonstrations have shown that the file interface can also be employed in distributed configurations as well. This, coupled with the fact that the socket interface has not been fully tested, has promoted the file interface to the primary interface to TRAFVU. This document specifies and describes the TRAFVU file interface.

Along with this document we have compiled and released a Data Description Document (DDD). The DDD is a living document that is updated to accommodate enhancements to CORSIM and TRAFVU. It provides detailed information about the data passed from CORSIM to TRAFVU. However, this document is self-contained. We reference the ICD and DDD only to supply background information concerning message structure and traffic simulation data.

Finally, in those situations where the information supplied by this document deviates from either the ICD or DDD, this document takes precedence in specifying the file interface to TRAFVU.

Version Notes

This version differs from version 1.3 as follows:

- In all previous versions, time-step data were contained in a single (***.tsd***) file. To work around the 2-Gigabyte file size limit imposed by TRAFVU, multiple files are now used to hold the time-step data. See Section 2 for details.
- The Signal and Ramp Meter messages have been modified to support separate left diagonal and right diagonal turn movements.
- To improve tool maintainability and eliminate differences in MOE reported by CORSIM and TRAFVU, TRAFVU no longer computes MOE. Consequently, the Link Measures Of Effectiveness (MOE) Message has been modified to include the MOE that TRAFVU used to calculate. The message now contains 182 MOE. **NOTE: this message now contains MOE that are both interval-specific (cumulative or averaged over the interval) and cumulative (cumulative or averaged over the entire simulation).**
- The version identifier for the time interval data file, listed on page 5, has been updated to reflect the correct value currently in use.

Disclaimer

We continue to update and enhance TRAFVU to meet the changing needs of the CORSIM simulation. Some of those enhancements affect the file contents described in this document. Therefore, this document is subject to change without notice.

Furthermore, the files described in this document were designed with the CORSIM simulation in mind. Although we designed TRAFVU to be independent of its source of data, many of the data elements contained in the files are specific to CORSIM. Therefore, McTrans cannot guarantee that files produced outside of the TSIS/CORSIM environment will operate properly with TRAFVU.

1. Introduction

This File Description Document (FDD) defines the file-based communications interface between the TRAFVU graphics processor and the CORSIM traffic simulation. Specifically, this document describes the format and content of the five files used by TRAFVU to animate and display traffic simulation data.

The set of five files includes the CORSIM input file that is designated with the ***.trf*** file extension. TRAFVU obtains all static (time-invariant) and user-specified data from this ASCII format file. The CORSIM input file is described in detail in the CORSIM User's Manual, and will not be described here. The remaining four files are binary data files that convey dynamic (time-varying) data from the simulation to TRAFVU. These data include vehicle state data, signal state data, and measures of effectiveness (MOE) data.

Section 2 of this document describes the format of the two files that contain vehicle and signal data that vary with the simulation time step. Section 3 describes the two files that contain MOE data that vary with the simulation time interval. Section 4 specifies the format of the messages that form the contents of the data files.

2. Time Step Data Files

The time step data files contain the state of the vehicles, incidents, and signals at each time step in the simulation. The upper limit for the size of files that TRAFVU can process is 2^{31} bytes (or 2 GB). Thus, for simulations that cover a large portion of time or a large network, multiple time step data files may be required. The names of the time step data files are based on the root name of the simulation input data file. For example, if the simulation input data file is ***MyNetwork.trf,*** the names of the time step data files will be ***MyNetwork.ts0, MyNetwork.ts1, MyNetwork.ts2, …, MyNetwork.ts#***, where # is the number of data files required.

In addition to the time step data files, the time step index file, ***MyNetwork.tsi***, is required by processors using the time step data files to be able to "look up" vehicle or signal data for a specific time step.

2.1 Time Step Data File

The first 16 bytes of the of the ***first*** time step data (***.ts0***) file compose the file header. The file header contains two items of information used for maintaining the data interface. The first item, which comprises the first 15 bytes of the header, is an identifier that specifies the version of the interface specification currently used by TRAFVU. If this identifier does not match the identifier in TRAFVU, TRAFVU will not process the file and will issue an error message indicating the mismatched version identifiers. The value of the identifier for the current release of TRAFVU is:

```
5.01_01-NOV-04
```

The second item, which occupies the 16th byte of the header, is a byte order key. For PC versions of TRAFVU, the byte order key must be set to the character "L" indicating little endian. For Sun Solaris versions of TRAFVU, the byte order key must be set to the character "B" indicating big endian.

The remainder of the ***.ts0*** and subsequent time step data files contain ***data*** and ***complete*** messages. ***Data*** messages are sorted first by time, second by type, and third by link. At the end of the set of messages for each type of data, the file contains a ***complete*** message. Section 3 specifies the format and content of these ***data*** and ***complete*** messages. Figure 1 illustrates the layout of the ***.ts#*** files for a traffic network that has ***L*** links and ***N*** time steps. The data messages in this file consist of four types: vehicle, incident, signal, and ramp meter. Of these messages, only the vehicle message is required; the others will exist only if the traffic features they represent are present in the network.

Each vehicle message contains vehicle information for all vehicles on a particular link. Therefore, at a given time step there are multiple vehicle messages (provided there is more than one link in the network). Vehicle messages can vary in size (number of bytes) from one time step to the next depending on the number of vehicles on the specified link at the specified time step. Each incident message contains information for all incidents in the network. Therefore, at a given time step there is only one message for incidents. The incident message will vary in size depending on the number of incidents that occur at the specified time step. Each signal and ramp meter message contains state information for all signals or ramp meters in the network. Therefore, at a given time step there is only one message for signals and one message for ramp meters. The sizes of these messages do not vary from time step to time step.

Vehicle and incident messages are grouped together and are terminated by a single ***complete*** message. Signal and ramp meter messages are grouped together and are terminated by a single ***complete*** message. The entire set of vehicle, incident, ***complete***, signal, ramp meter, and ***complete*** messages is then repeated for each time step.

2.2 Time Step Index File

Because TRAFVU animates both forward and backwards in time and can jump to any point in simulation time, it needs an efficient means for jumping to specific messages within the time step data files. The time step index (***.tsi***) file provides quick access to data within the time step data files. The ***.tsi*** file contains a file index and

indexes (pointers) to sections of data within the ***.ts#*** files. For each time step, there are three indexes: file index, vehicle index, and signal index. The file index specifies which time step data (***.ts#***) file contains the data for the specified time step, i.e., the file index is the value of the # in the file extension. The vehicle and signal indexes point to the starting byte of the specific messages in the ***.ts#*** file and are illustrated in Figure 1 by the arrows marked with lower case letters. For example, the ***.tsi*** file associated with the ***.ts#*** file illustrated in Figure 1, has the following layout:

f1, v1, s1, f2, v2, s2, …, fn, vN, sN.

In the above sequence, the "f" index identifies which file contains the data for the specified time step. The "v" and "s" indexes are pointers into the data file at which the vehicle and signal data can be found for the specified time step. In the last two indexes in the sequence, "N" represents the last time step.

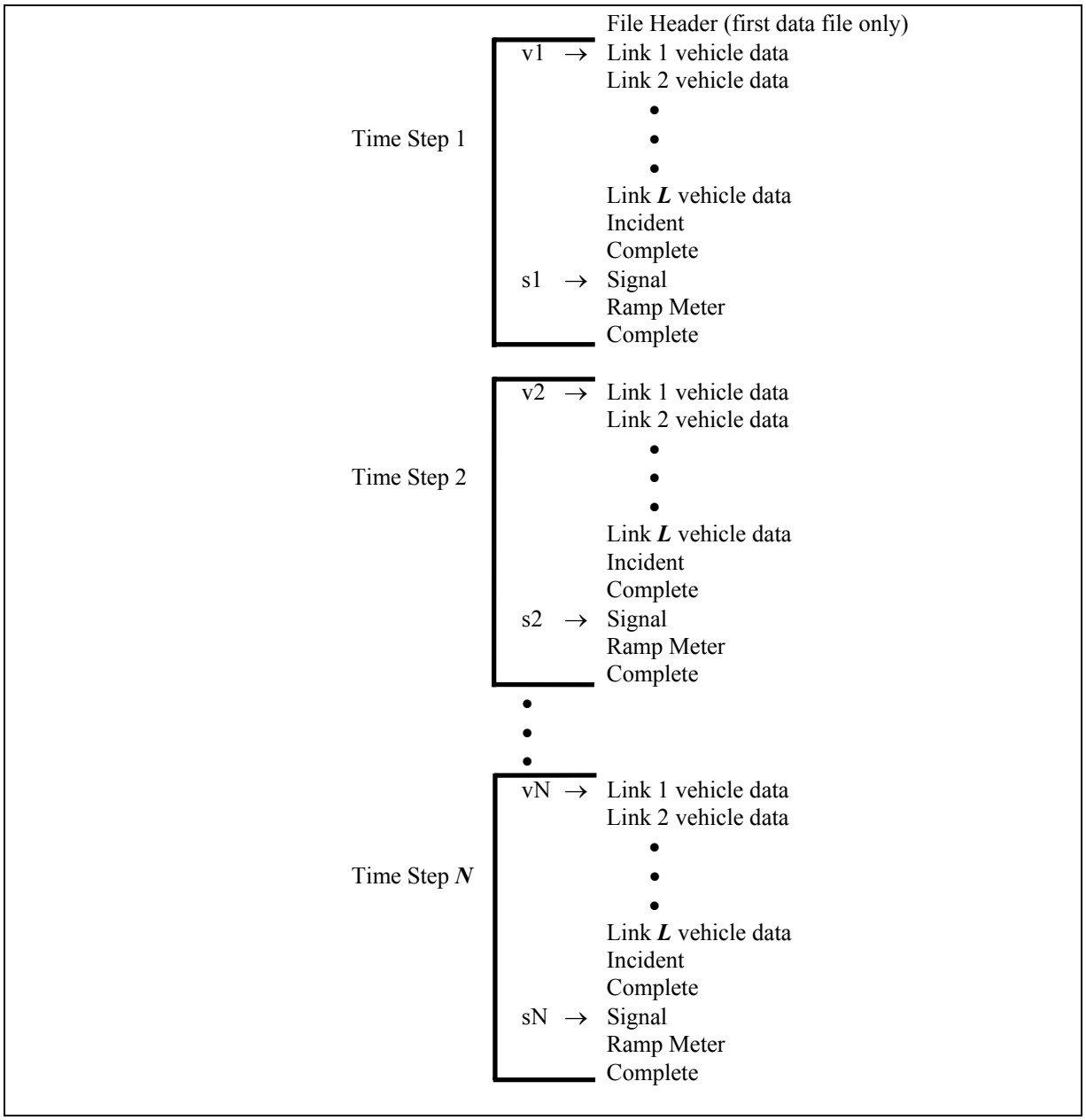

Figure 1. Layout of the time step data file.

The file index is a 4-byte unsigned integer and the vehicle and signal indexes are of the C++ type, `streampos`, which is typically (but not necessarily) 4 bytes. If a network contains no signals or ramp meters, the second index for each time step (i.e., s1, s2, …, sN) is zero.

3. Time Interval Data Files

The time interval data files contain measures of effectiveness (MOE) data that are generated by CORSIM at the end of each time interval in the simulation. The time interval is a user-specified parameter consisting of an integer number of time steps. The names of the two time interval data files are based on the root name of the simulation input data file. For example, if the simulation input data file is ***MyNetwork.trf*** the names of the time interval data files will be ***MyNetwork.tii*** and ***MyNetwork.tid***. Both files are required to view and animate MOE data. The ***.tii*** extension denotes the time interval index file used to "look up" data in the time interval data (***.tid***) file.

3.1 Time Interval Data File

The first 16 bytes of the of the time interval data (***.tid***) file compose the file header. The file header contains two items of information used for maintaining the data interface. The first item, which comprises the first 15 bytes of the header, is an identifier that specifies the version of the interface specification currently used by TRAFVU. If this identifier does not match the identifier in TRAFVU, TRAFVU will not process the file and will issue an error message indicating the mismatched version identifiers. The value of the identifier for the current release of TRAFVU is:

```
5.01_01-NOV-04
```

The second item, which occupies the 16th byte of the header, is a byte order key. For PC versions of TRAFVU, the byte order key must be set to the character "L" indicating little endian. For Sun Solaris versions of TRAFVU, the byte order key must be set to the character "B" indicating big endian.

The remainder of the ***.tid*** file contains ***data*** and ***complete*** messages. ***Data*** messages are sorted by time. At the end of the data message for a time interval, the file contains a ***complete*** message. Section 3 specifies the format and content of these ***data*** and ***complete*** messages. Figure 2 illustrates the layout of the ***.tid*** file for a traffic network that has ***L*** links and ***M*** time intervals.

There is only one type of time interval data message: link MOE data. Each link MOE data message contains MOE data for all links in the network. Therefore, for a given time interval there is only one message for link MOE data. The size of this message does not vary from time interval to time interval. The link MOE data message is followed by a single ***complete*** message, indicating the end of the time interval.

		File Header
Time Interval 1	a→	Link MOE data: link 1, link 2, …, link ***L***
		Complete
Time Interval 2	b→	Link MOE data: link 1, link 2, …, link ***L***
		Complete
		•
		•
		•
Time Interval ***M***	z→	Link MOE data: link 1, link 2, …, link ***L***
		Complete

Figure 2. Layout of the time interval data file.

3.2 Time Interval Index File

Because TRAFVU animates both forward and backwards in time and can jump to any point in simulation time, it needs an efficient means for jumping to specific messages within the time interval data file. The time interval index (***.tii***) file provides quick access to data within the time interval data file. The ***.tii*** file contains indexes

(pointers) to sections of data within the ***.tid*** file. For each time interval, there is an index for the link MOE data message. These indexes point to the starting bytes of the link MOE data messages in the ***.tid*** file and are illustrated in Figure 2 by the arrows marked with lower case letters. For example, the ***.tii*** file associated with the ***.tid*** file illustrated in Figure 2, has the following layout:

a, b, …, z

Each index is of the C++ type, `streampos,` which is typically (but not necessarily) 4 bytes.

4. Message Content

Each of the messages described in the preceding sections has a well-defined format and content. The formats of these messages are the same as those used in TRAFVU's socket communications interface. In this section, we describe, in detail, the structure and content of each of the messages. For an understanding of the underlying concepts that led to this message design, please refer to the Traffic Research Laboratory Graphics Processor Interface Control Document (ICD 5.0). ICD 5.0 presents the messages in a generic format; however, in this document we present only the specific message structure and content as it applies to the file interface. Additional information regarding individual fields in the messages can be found in the TRAFVU Data Description Document.

The first three fields of every message specify the name, size and simulation time of the message. The second field specifies the size of the message in bytes, excluding the first three fields (12 bytes).

In the value column of the following tables, we specify certain values using symbolic names rather than actual values. These symbolic names are used by TRAFVU rather than hard-coded values to provide software maintainability. Appendix A provides a cross reference between the symbolic names and their values. Within TRAFVU the symbolic names are specified in C++ header (***.h***) files. Those files are available to anyone coding this file interface. In the following tables, symbolic names are indicated using bold **`Courier`** font.

In all messages specified in this section, Link ID values are formed by multiplying the link's upstream node ID (USN) by 10,000 and adding the link's downstream node ID (DSN). That is,

$$\text{Link ID} = \text{USN} * 10000 + \text{DSN}.$$

4.1 Vehicle Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	**LG_Data_GP**
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time in seconds that the data in this message represents
Request Type	unsigned integer	4	**DR_TS_VEHICLE**
Request Handle	unsigned integer	4	1
Class ID	unsigned integer	4	**Link**
Action ID	unsigned integer	2	**UPDATE**
Attribute ID Count	unsigned integer	2	0
Number of Aggregate Classes	unsigned integer	2	1
Class ID	unsigned integer	4	**Vehicle**
Action ID	unsigned integer	2	**SEARCH**
Attribute ID Count	unsigned integer	2	1
Attribute ID	unsigned integer	2	**V_InputAndAnimate**
Number of Aggregate Classes	unsigned integer	2	0
Instance ID Count	unsigned integer	2	1
Instance ID	unsigned integer	4	ID of link containing vehicles for which this message is reporting
Instance ID Count	unsigned integer	2	number of vehicles on the specified link at the specified simulation time
Global Vehicle ID	unsigned integer	4	global vehicle ID of first vehicle in this message
Fleet	unsigned integer	1	0 = Auto, 1 = truck, 2 = carpool, 3 = bus
Vehicle Type	unsigned integer	1	CORSIM vehicle type
Vehicle Length	unsigned integer	1	vehicle length in feet
Driver Type	unsigned integer	1	CORSIM driver type
Lane ID	unsigned integer	1	CORSIM ID of lane in which vehicle is traveling

Field	Type	Size (bytes)	Value
Vehicle Position	signed integer	4	vehicle's distance from the upstream end of the link in feet
Previous USN	unsigned integer	2	upstream node ID of the previous link the vehicle traveled
Turn Code	unsigned integer	1	vehicle turn code:0 = left, 1 = through, 2 = right, 3 = left diagonal, 4 = right diagonal, 5 = source emission
Queue Status	unsigned integer	1	0 = vehicle is currently not in queue, 1 = vehicle is currently in queue
Acceleration	signed integer	1	vehicle's instantaneous acceleration in feet/second/second
Velocity	unsigned integer	1	vehicle's instantaneous velocity in feet/second
Lane Change Status	unsigned integer	1	0 = vehicle does not want to change lanes, 1 = vehicle wants to change lanes
Target Lane	unsigned integer	1	CORSIM ID of lane vehicle would like to occupy
Destination Node	unsigned integer	2	node ID of the vehicles destination node
Leader Vehicle ID	unsigned integer	4	global ID of vehicle's leader vehicle
Follower Vehicle ID	unsigned integer	4	global ID of vehicle's follower vehicle
Previous Lane ID	unsigned integer	1	lane ID of lane the lane that the vehicle was previously in
REPEAT PREVIOUS 18 FIELDS FOR EACH VEHICLE IN THIS MESSAGE			

4.2 Incident Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	**LG_Data_GP**
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time in seconds that the data in this message represents
Request Type	unsigned integer	4	**DR_TS_INCIDENT**
Request Handle	unsigned integer	4	1
Class ID	unsigned integer	4	**Incident**
Action ID	unsigned integer	2	**SEARCH**
Attribute ID Count	unsigned integer	2	12
Attribute ID #1	unsigned integer	2	**IN_IncidentId**
Attribute ID #2	unsigned integer	2	**IN_LinkId**
Attribute ID #3	unsigned integer	2	**IN_IncidentType**
Attribute ID #4	unsigned integer	2	**IN_IncidentPosition**
Attribute ID #5	unsigned integer	2	**IN_IncidentLength**
Attribute ID #6	unsigned integer	2	**IN_OccurrenceTime**
Attribute ID #7	unsigned integer	2	**IN_Duration**
Attribute ID #8	unsigned integer	2	**IN_IncidentReactionPointPosition**
Attribute ID #9	unsigned integer	2	**IN_RubberneckFactor**
Attribute ID #10	unsigned integer	2	**IN_ModelType**
Attribute ID #11	unsigned integer	2	**IN_IncidentState**
Attribute ID #12	unsigned integer	2	**IN_AffectedLaneSLT**
Number of Aggregate Classes	unsigned integer	2	0
Instance ID Count	unsigned integer	2	number of incidents in the network at the specified simulation time
Instance ID	unsigned integer	4	ID of first incident in this message

Field	Type	Size (bytes)	Value
Incident ID	unsigned integer	4	ID of the incident (same value as previous field)
Link ID	unsigned integer	4	ID of link on which the specified incident is occurring
Type	unsigned integer	2	Incident Type: 0 = unknown, 1 = freeway, 2 = long term, 3 = parking, 4 = short term
Position	float (IEEE format)	4	position of incident along link measured in feet from link's upstream end
Length	float (IEEE format)	4	length of the incident in feet
Occurrence Time	unsigned integer	4	time step at which this incident begins
Duration	unsigned integer	4	number of time steps this incident affects traffic
Reaction Point Position	float (IEEE format)	4	distance upstream from the start of the incident at which vehicles begin to react to the incident
Rubbernecking Factor	float (IEEE format)	4	CORSIM rubbernecking factor in %
Model Type	unsigned integer	2	CORSIM model type: 3 = NETSIM, 8 = FRESIM
State	unsigned integer	2	incident state: 0 = not in progress, 1 = in progress
Number of Affected Lanes	unsigned integer	2	number of lanes affected by the incident (maximum = 11)
Affected Lane ID	unsigned integer	4	CORSIM lane ID of first lane affected by the incident
Status Code	unsigned integer	2	incident code for first lane: 0 = unaffected, 1 = rubbernecking, 2 = blocked
Affected Lane ID	unsigned integer	4	CORSIM lane ID of second lane affected by the incident
Status Code	unsigned integer	2	incident code for second lane: 0 = unaffected, 1 = rubbernecking, 2 = blocked
• • •			
Affected Lane ID	unsigned integer	4	CORSIM lane ID of last lane affected by the incident
Status Code	unsigned integer	2	incident code for last lane: 0 = unaffected, 1 = rubbernecking, 2 = blocked
REPEAT THE PREVIOUS 15 to 35 FIELDS FOR EACH INCIDENT IN THIS MESSAGE			

4.3 Signal Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	**LG_Data_GP**
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time in seconds that the data in this message represents
Request Type	unsigned integer	4	**DR_TS_SIGNAL**
Request Handle	unsigned integer	4	1
Class ID	unsigned integer	4	**Link**
Action ID	unsigned integer	2	**UPDATE**
Attribute ID Count	unsigned integer	2	1
Attribute ID	unsigned integer	2	**LK_SignalState**
Number of Aggregate Classes	unsigned integer	2	0
Instance ID Count	unsigned integer	2	number of links under signal control
Link ID	unsigned integer	4	ID of first link in the message
Left Turn Code	unsigned integer	2	Signal code for left turns: 0 = red, 1 = yellow, 2 = protected green, 3 = green 4 = none
Left Diagonal Turn Code	unsigned integer	2	Signal code for left diagonal turns
Through Code	unsigned integer	2	Signal code for through movements
Right Diagonal Turn Code	unsigned integer	2	Signal code for right diagonal turns
Right Turn Code	unsigned integer	2	Signal code for right turns
REPEAT THE PREVIOUS 6 FIELDS FOR EACH SIGNAL IN THIS MESSAGE			

4.4 Ramp Meter Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	**LG_Data_GP**
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time in seconds that the data in this message represents
Request Type	unsigned integer	4	**DR_TS_RAMPMETER**
Request Handle	unsigned integer	4	1
Class ID	unsigned integer	4	**Link**
Action ID	unsigned integer	2	**UPDATE**
Attribute ID Count	unsigned integer	2	1
Attribute ID	unsigned integer	2	**LK_SignalState**
Number of Aggregate Classes	unsigned integer	2	0
Instance ID Count	unsigned integer	2	number of links with ramp meters
Link ID	unsigned integer	4	ID of first link in the message
Left Turn Code	unsigned integer	2	Signal code for left turns = 4 (none)
Left Diagonal Turn Code	unsigned integer	2	Signal code for left diagonal turns = 4 (none)
Through Code	unsigned integer	2	Signal code for through movements: 0 = red, 2 = protected green
Right Diagonal Turn Code	unsigned integer	2	Signal code for right diagonal turns = 4 (none)
Right Turn Code	unsigned integer	2	Signal code for right turns = 4 (none)
REPEAT THE PREVIOUS 6 FIELDS FOR EACH RAMP METER IN THIS MESSAGE			

4.5 Link Measures Of Effectiveness (MOE) Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	**LG_Data_GP**
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time in seconds that the data in this message represents
Request Type	unsigned integer	4	**DR_TI_LINK**
Request Handle	unsigned integer	4	1
Class ID	unsigned integer	4	**Link**
Action ID	unsigned integer	2	**UPDATE**
Attribute ID Count	unsigned integer	2	0
Number of Aggregate Classes	unsigned integer	2	1
Class ID	unsigned integer	4	**LinkMOE**
Action ID	unsigned integer	2	**SEARCH**
Attribute ID Count	unsigned integer	2	182
Attribute ID #1	unsigned integer	2	**LM_TimeInterval**
Attribute ID #2	unsigned integer	2	**LM_TimeInterval_Cum**
Attribute ID #3	unsigned integer	2	**LM_BusDelayTotal**
Attribute ID #4	unsigned integer	2	**LM_BusDelayTotal_Cum**
Attribute ID #5	unsigned integer	2	**LM_BusMoveTimePerTravelTimeRatio**
Attribute ID #6	unsigned integer	2	**LM_BusMoveTimePerTravelTimeRatio_Cum**
Attribute ID #7	unsigned integer	2	**LM_BusPersonTrips**
Attribute ID #8	unsigned integer	2	**LM_BusPersonTrips_Cum**
Attribute ID #9	unsigned integer	2	**LM_BusSpeedAverage**
Attribute ID #10	unsigned integer	2	**LM_BusSpeedAverage_Cum**
Attribute ID #11	unsigned integer	2	**LM_BusTravelTimeTotal**
Attribute ID #12	unsigned integer	2	**LM_BusTravelTimeTotal_Cum**

Field	Type	Size (bytes)	Value
Attribute ID #13	unsigned integer	2	**LM_BusTrips**
Attribute ID #14	unsigned integer	2	**LM_BusTrips_Cum**
Attribute ID #15	unsigned integer	2	**LM_BusesThatStopped**
Attribute ID #16	unsigned integer	2	**LM_BusesThatStopped_Cum**
Attribute ID #17	unsigned integer	2	**LM_ContentAverage**
Attribute ID #18	unsigned integer	2	**LM_ContentAverage_Cum**
Attribute ID #19	unsigned integer	2	**LM_ContentCurrent**
Attribute ID #20	unsigned integer	2	**LM_ContentCurrent_Cum**
Attribute ID #21	unsigned integer	2	**LM_DelayControlPerVehicle**
Attribute ID #22	unsigned integer	2	**LM_DelayControlPerVehicle_Cum**
Attribute ID #23	unsigned integer	2	**LM_DelayControlPerVehicleLeft**
Attribute ID #24	unsigned integer	2	**LM_DelayControlPerVehicleLeft_Cum**
Attribute ID #25	unsigned integer	2	**LM_DelayControlPerVehicleRight**
Attribute ID #26	unsigned integer	2	**LM_DelayControlPerVehicleRight_Cum**
Attribute ID #27	unsigned integer	2	**LM_DelayControlPerVehicleThrough**
Attribute ID #28	unsigned integer	2	**LM_DelayControlPerVehicleThrough_Cum**
Attribute ID #29	unsigned integer	2	**LM_DelayControlTotal**
Attribute ID #30	unsigned integer	2	**LM_DelayControlTotal_Cum**
Attribute ID #31	unsigned integer	2	**LM_DelayControlTotalLeft**
Attribute ID #32	unsigned integer	2	**LM_DelayControlTotalLeft_Cum**
Attribute ID #33	unsigned integer	2	**LM_DelayControlTotalRight**
Attribute ID #34	unsigned integer	2	**LM_DelayControlTotalRight_Cum**
Attribute ID #35	unsigned integer	2	**LM_DelayControlTotalThrough**
Attribute ID #36	unsigned integer	2	**LM_DelayControlTotalThrough_Cum**
Attribute ID #37	unsigned integer	2	**LM_DelayQueuePerVehicle**

Field	Type	Size (bytes)	Value
Attribute ID #38	unsigned integer	2	**LM_DelayQueuePerVehicle_Cum**
Attribute ID #39	unsigned integer	2	**LM_DelayQueueTotal**
Attribute ID #40	unsigned integer	2	**LM_DelayQueueTotal_Cum**
Attribute ID #41	unsigned integer	2	**LM_DelayQueueTotalLeft**
Attribute ID #42	unsigned integer	2	**LM_DelayQueueTotalLeft_Cum**
Attribute ID #43	unsigned integer	2	**LM_DelayQueueTotalRight**
Attribute ID #44	unsigned integer	2	**LM_DelayQueueTotalRight_Cum**
Attribute ID #45	unsigned integer	2	**LM_DelayQueueTotalThrough**
Attribute ID #46	unsigned integer	2	**LM_DelayQueueTotalThrough_Cum**
Attribute ID #47	unsigned integer	2	**LM_DelayStopPerVehicle**
Attribute ID #48	unsigned integer	2	**LM_DelayStopPerVehicle_Cum**
Attribute ID #49	unsigned integer	2	**LM_DelayStopTotal**
Attribute ID #50	unsigned integer	2	**LM_DelayStopTotal_Cum**
Attribute ID #51	unsigned integer	2	**LM_DelayStopTotalLeft**
Attribute ID #52	unsigned integer	2	**LM_DelayStopTotalLeft_Cum**
Attribute ID #53	unsigned integer	2	**LM_DelayStopTotalRight**
Attribute ID #54	unsigned integer	2	**LM_DelayStopTotalRight_Cum**
Attribute ID #55	unsigned integer	2	**LM_DelayStopTotalThrough**
Attribute ID #56	unsigned integer	2	**LM_DelayStopTotalThrough_Cum**
Attribute ID #57	unsigned integer	2	**LM_DelayTravelPerVehicle**
Attribute ID #58	unsigned integer	2	**LM_DelayTravelPerVehicle_Cum**
Attribute ID #59	unsigned integer	2	**LM_DelayTravelPerVehicleLeft**
Attribute ID #60	unsigned integer	2	**LM_DelayTravelPerVehicleLeft_Cum**
Attribute ID #61	unsigned integer	2	**LM_DelayTravelPerVehicleRight**
Attribute ID #62	unsigned integer	2	**LM_DelayTravelPerVehicleRight_Cum**

Field	Type	Size (bytes)	Value
Attribute ID #63	unsigned integer	2	**LM_DelayTravelPerVehicleThrough**
Attribute ID #64	unsigned integer	2	**LM_DelayTravelPerVehicleThrough_Cum**
Attribute ID #65	unsigned integer	2	**LM_DelayTravelTotal**
Attribute ID #66	unsigned integer	2	**LM_DelayTravelTotal_Cum**
Attribute ID #67	unsigned integer	2	**LM_DelayTravelTotalLeft**
Attribute ID #68	unsigned integer	2	**LM_DelayTravelTotalLeft_Cum**
Attribute ID #69	unsigned integer	2	**LM_DelayTravelTotalRight**
Attribute ID #70	unsigned integer	2	**LM_DelayTravelTotalRight_Cum**
Attribute ID #71	unsigned integer	2	**LM_DelayTravelTotalThrough**
Attribute ID #72	unsigned integer	2	**LM_DelayTravelTotalThrough_Cum**
Attribute ID #73	unsigned integer	2	**LM_DensityPerLane**
Attribute ID #74	unsigned integer	2	**LM_DensityPerLane_Cum**
Attribute ID #75	unsigned integer	2	**LM_EmissionsRateCO**
Attribute ID #76	unsigned integer	2	**LM_EmissionsRateCO_Cum**
Attribute ID #77	unsigned integer	2	**LM_EmissionsRateHC**
Attribute ID #78	unsigned integer	2	**LM_EmissionsRateHC_Cum**
Attribute ID #79	unsigned integer	2	**LM_EmissionsRateNOx**
Attribute ID #80	unsigned integer	2	**LM_EmissionsRateNOx_Cum**
Attribute ID #81	unsigned integer	2	**LM_EmissionsTotalCO**
Attribute ID #82	unsigned integer	2	**LM_EmissionsTotalCO_Cum**
Attribute ID #83	unsigned integer	2	**LM_EmissionsTotalHC**
Attribute ID #84	unsigned integer	2	**LM_EmissionsTotalHC_Cum**
Attribute ID #85	unsigned integer	2	**LM_EmissionsTotalNOx**
Attribute ID #86	unsigned integer	2	**LM_EmissionsTotalNOx_Cum**
Attribute ID #87	unsigned integer	2	**LM_FuelConsumptionTotal**

Field	Type	Size (bytes)	Value
Attribute ID #88	unsigned integer	2	**LM_FuelConsumptionTotal_Cum**
Attribute ID #89	unsigned integer	2	**LM_FuelConsumptionTotalAutos**
Attribute ID #90	unsigned integer	2	**LM_FuelConsumptionTotalAutos_Cum**
Attribute ID #91	unsigned integer	2	**LM_FuelConsumptionTotalBuses**
Attribute ID #92	unsigned integer	2	**LM_FuelConsumptionTotalBuses_Cum**
Attribute ID #93	unsigned integer	2	**LM_FuelConsumptionTotalCarpools**
Attribute ID #94	unsigned integer	2	**LM_FuelConsumptionTotalCarpools_Cum**
Attribute ID #95	unsigned integer	2	**LM_FuelConsumptionTotalTrucks**
Attribute ID #96	unsigned integer	2	**LM_FuelConsumptionTotalTrucks_Cum**
Attribute ID #97	unsigned integer	2	**LM_LaneChangesTotal**
Attribute ID #98	unsigned integer	2	**LM_LaneChangesTotal_Cum**
Attribute ID #99	unsigned integer	2	**LM_MoveTimePerTravelTimeRatio**
Attribute ID #100	unsigned integer	2	**LM_MoveTimePerTravelTimeRatio_Cum**
Attribute ID #101	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioLeft**
Attribute ID #102	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioLeft_Cum**
Attribute ID #103	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioRight**
Attribute ID #104	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioRight_Cum**
Attribute ID #105	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioThrough**
Attribute ID #106	unsigned integer	2	**LM_MoveTimePerTravelTimeRatioThrough_Cum**
Attribute ID #107	unsigned integer	2	**LM_MoveTimeTotal**
Attribute ID #108	unsigned integer	2	**LM_MoveTimeTotal_Cum**
Attribute ID #109	unsigned integer	2	**LM_MoveTimeTotalLeft**
Attribute ID #110	unsigned integer	2	**LM_MoveTimeTotalLeft_Cum**
Attribute ID #111	unsigned integer	2	**LM_MoveTimeTotalRight**
Attribute ID #112	unsigned integer	2	**LM_MoveTimeTotalRight_Cum**

Field	Type	Size (bytes)	Value
Attribute ID #113	unsigned integer	2	**LM_MoveTimeTotalThrough**
Attribute ID #114	unsigned integer	2	**LM_MoveTimeTotalThrough_Cum**
Attribute ID #115	unsigned integer	2	**LM_PersonDelayTotal**
Attribute ID #116	unsigned integer	2	**LM_PersonDelayTotal_Cum**
Attribute ID #117	unsigned integer	2	**LM_PersonTripsTotal**
Attribute ID #118	unsigned integer	2	**LM_PersonTripsTotal_Cum**
Attribute ID #119	unsigned integer	2	**LM_PhaseFailures**
Attribute ID #120	unsigned integer	2	**LM_PhaseFailures_Cum**
Attribute ID #121	unsigned integer	2	**LM_QueueAverageNumberVehiclesSLT**
Attribute ID #122	unsigned integer	2	**LM_QueueAverageNumberVehiclesSLT_Cum**
Attribute ID #123	unsigned integer	2	**LM_QueueMaximumNumberVehiclesSLT**
Attribute ID #124	unsigned integer	2	**LM_QueueMaximumNumberVehiclesSLT_Cum**
Attribute ID #125	unsigned integer	2	**LM_SpeedAverage**
Attribute ID #126	unsigned integer	2	**LM_SpeedAverage_Cum**
Attribute ID #127	unsigned integer	2	**LM_SpeedAverageLeft**
Attribute ID #128	unsigned integer	2	**LM_SpeedAverageLeft_Cum**
Attribute ID #129	unsigned integer	2	**LM_SpeedAverageRight**
Attribute ID #130	unsigned integer	2	**LM_SpeedAverageRight_Cum**
Attribute ID #131	unsigned integer	2	**LM_SpeedAverageThrough**
Attribute ID #132	unsigned integer	2	**LM_SpeedAverageThrough_Cum**
Attribute ID #133	unsigned integer	2	**LM_StoppedVehicles**
Attribute ID #134	unsigned integer	2	**LM_StoppedVehicles_Cum**
Attribute ID #135	unsigned integer	2	**LM_StoppedVehiclesPercent**
Attribute ID #136	unsigned integer	2	**LM_StoppedVehiclesPercent_Cum**
Attribute ID #137	unsigned integer	2	**LM_StoragePercent**

Field	Type	Size (bytes)	Value
Attribute ID #138	unsigned integer	2	**LM_StoragePercent_Cum**
Attribute ID #139	unsigned integer	2	**LM_TravelDistanceTotal**
Attribute ID #140	unsigned integer	2	**LM_TravelDistanceTotal_Cum**
Attribute ID #141	unsigned integer	2	**LM_TravelDistanceTotalLeft**
Attribute ID #142	unsigned integer	2	**LM_TravelDistanceTotalLeft_Cum**
Attribute ID #143	unsigned integer	2	**LM_TravelDistanceTotalRight**
Attribute ID #144	unsigned integer	2	**LM_TravelDistanceTotalRight_Cum**
Attribute ID #145	unsigned integer	2	**LM_TravelDistanceTotalThrough**
Attribute ID #146	unsigned integer	2	**LM_TravelDistanceTotalThrough_Cum**
Attribute ID #147	unsigned integer	2	**LM_TravelTimePerVehicle**
Attribute ID #148	unsigned integer	2	**LM_TravelTimePerVehicle_Cum**
Attribute ID #149	unsigned integer	2	**LM_TravelTimePerVehicleLeft**
Attribute ID #150	unsigned integer	2	**LM_TravelTimePerVehicleLeft_Cum**
Attribute ID #151	unsigned integer	2	**LM_TravelTimePerVehicleRight**
Attribute ID #152	unsigned integer	2	**LM_TravelTimePerVehicleRight_Cum**
Attribute ID #153	unsigned integer	2	**LM_TravelTimePerVehicleThrough**
Attribute ID #154	unsigned integer	2	**LM_TravelTimePerVehicleThrough_Cum**
Attribute ID #155	unsigned integer	2	**LM_TravelTimeTotal**
Attribute ID #156	unsigned integer	2	**LM_TravelTimeTotal_Cum**
Attribute ID #157	unsigned integer	2	**LM_TravelTimeTotalLeft**
Attribute ID #158	unsigned integer	2	**LM_TravelTimeTotalLeft_Cum**
Attribute ID #159	unsigned integer	2	**LM_TravelTimeTotalRight**
Attribute ID #160	unsigned integer	2	**LM_TravelTimeTotalRight_Cum**
Attribute ID #161	unsigned integer	2	**LM_TravelTimeTotalThrough**
Attribute ID #162	unsigned integer	2	**LM_TravelTimeTotalThrough_Cum**

Field	Type	Size (bytes)	Value
Attribute ID #163	unsigned integer	2	**LM_Trips**
Attribute ID #164	unsigned integer	2	**LM_Trips_Cum**
Attribute ID #165	unsigned integer	2	**LM_TripsLeft**
Attribute ID #166	unsigned integer	2	**LM_TripsLeft_Cum**
Attribute ID #167	unsigned integer	2	**LM_TripsRight**
Attribute ID #168	unsigned integer	2	**LM_TripsRight_Cum**
Attribute ID #169	unsigned integer	2	**LM_TripsThrough**
Attribute ID #170	unsigned integer	2	**LM_TripsThrough_Cum**
Attribute ID #171	unsigned integer	2	**LM_VehiclesDischarged**
Attribute ID #172	unsigned integer	2	**LM_VehiclesDischarged_Cum**
Attribute ID #173	unsigned integer	2	**LM_VehiclesDischargedLeft**
Attribute ID #174	unsigned integer	2	**LM_VehiclesDischargedLeft_Cum**
Attribute ID #175	unsigned integer	2	**LM_VehiclesDischargedRight**
Attribute ID #176	unsigned integer	2	**LM_VehiclesDischargedRight_Cum**
Attribute ID #177	unsigned integer	2	**LM_VehiclesDischargedThrough**
Attribute ID #178	unsigned integer	2	**LM_VehiclesDischargedThrough_Cum**
Attribute ID #179	unsigned integer	2	**LM_Volume**
Attribute ID #180	unsigned integer	2	**LM_Volume_Cum**
Attribute ID #181	unsigned integer	2	**LM_VolumePerLane**
Attribute ID #182	unsigned integer	2	**LM_VolumePerLane_Cum**
Number of Aggregate Classes	unsigned integer	2	0
Instance ID Count	unsigned integer	2	number of links contained in this message
Link ID	unsigned integer	4	ID of link containing MOE for which this message is reporting
Number of Time Intervals	unsigned integer	2	1

Field	Type	Size (bytes)	Value
Time Interval ID	unsigned integer	4	9999 (indicates “current” time interval)
Time Interval	unsigned integer	4	index of the time interval
Time Interval – Cumulative	unsigned integer	4	index of the time interval (same as previous value; repeated for TRAFVU tables)
Bus Delay; Total	float (IEEE format)	4	total time discharged buses were delayed on this link
Bus Delay; Total – Cumulative	float (IEEE format)	4	total time discharged buses were delayed on this link
Bus M / T	float (IEEE format)	4	ratio of moving time to travel time for buses on this link
Bus M / T – Cumulative	float (IEEE format)	4	ratio of moving time to travel time for buses on this link
Bus Person Trips	unsigned integer	4	total number of people that have completely traversed this link in a bus
Bus Person Trips – Cumulative	unsigned integer	4	total number of people that have completely traversed this link in a bus
Bus Speed; Average	float (IEEE format)	4	average speed of buses that traversed this link
Bus Speed; Average – Cumulative	float (IEEE format)	4	average speed of buses that traversed this link
Bus Travel Time; Total	float (IEEE format)	4	total time discharged buses have traveled on this link
Bus Travel Time; Total – Cumulative	float (IEEE format)	4	total time discharged buses have traveled on this link
Bus Trips	unsigned integer	4	total number of buses that have completely traversed the link
Bus Trips – Cumulative	unsigned integer	4	total number of buses that have completely traversed the link
Buses That Stopped	unsigned integer	4	total number of buses that stopped at least once on this link
Buses That Stopped – Cumulative	unsigned integer	4	total number of buses that stopped at least once on this link
Content; Average	float (IEEE format)	4	average number of vehicles on the link
Content; Average – Cumulative	float (IEEE format)	4	average number of vehicles on the link
Content; Current	unsigned integer	4	current number of vehicles on the link at the end of the interval
Content; Current – Cumulative	unsigned integer	4	current number of vehicles on the link at the end of the interval
Delay; Control; Per Vehicle	float (IEEE format)	4	average time a vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle – Cumulative	float (IEEE format)	4	average time a vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle Left	float (IEEE format)	4	average time a left-discharging vehicle has been delayed by controls on this link (seconds/vehicle)

Field	Type	Size (bytes)	Value
Delay; Control; Per Vehicle Left – Cumulative	float (IEEE format)	4	average time a left-discharging vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle Right	float (IEEE format)	4	average time a right-discharging vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle Right – Cumulative	float (IEEE format)	4	average time a right-discharging vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle Through	float (IEEE format)	4	average time a through-discharging vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Per Vehicle Through – Cumulative	float (IEEE format)	4	average time a through-discharging vehicle has been delayed by controls on this link (seconds/vehicle)
Delay; Control; Total	float (IEEE format)	4	total time all vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Control; Total – Cumulative	float (IEEE format)	4	total time all vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Control; Total Left	float (IEEE format)	4	total time left-discharging vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Control; Total Left – Cumulative	float (IEEE format)	4	total time left-discharging vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Control; Total Right	float (IEEE format)	4	total time right-discharging vehicles have been delayed by controls on this link (vehicle- minutes)
Delay; Control; Total Right – Cumulative	float (IEEE format)	4	total time right-discharging vehicles have been delayed by controls on this link (vehicle- minutes)
Delay; Control; Total Through	float (IEEE format)	4	total time through-discharging vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Control; Total Through – Cumulative	float (IEEE format)	4	total time through-discharging vehicles have been delayed by controls on this link (vehicle-minutes)
Delay; Queue; Per Vehicle	float (IEEE format)	4	average time that a vehicle has been in queue on this link (seconds/vehicle)
Delay; Queue; Per Vehicle – Cumulative	float (IEEE format)	4	average time that a vehicle has been in queue on this link (seconds/vehicle)
Delay; Queue; Total	float (IEEE format)	4	total time all vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total – Cumulative	float (IEEE format)	4	total time all vehicles have been in queue on this link (vehicle-minutes)

Field	Type	Size (bytes)	Value
Delay; Queue; Total Left	float (IEEE format)	4	total time left-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total Left – Cumulative	float (IEEE format)	4	total time left-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total Right	float (IEEE format)	4	total time right-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total Right – Cumulative	float (IEEE format)	4	total time right-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total Through	float (IEEE format)	4	total time through-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Queue; Total Through – Cumulative	float (IEEE format)	4	total time through-discharging vehicles have been in queue on this link (vehicle-minutes)
Delay; Stop; Per Vehicle	float (IEEE format)	4	average time a vehicle has been stopped on this link (seconds/vehicle)
Delay; Stop; Per Vehicle – Cumulative	float (IEEE format)	4	average time a vehicle has been stopped on this link (seconds/vehicle)
Delay; Stop; Total	float (IEEE format)	4	total time all vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total – Cumulative	float (IEEE format)	4	total time all vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Left	float (IEEE format)	4	total time left-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Left – Cumulative	float (IEEE format)	4	total time left-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Right	float (IEEE format)	4	total time right-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Right – Cumulative	float (IEEE format)	4	total time right-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Through	float (IEEE format)	4	total time through-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Stop; Total Through – Cumulative	float (IEEE format)	4	total time through-discharging vehicles have been stopped on this link (vehicle-minutes)
Delay; Travel; Per Vehicle	float (IEEE format)	4	average time a vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle – Cumulative	float (IEEE format)	4	average time a vehicle has been delayed on this link (seconds/vehicle)

Field	Type	Size (bytes)	Value
Delay; Travel; Per Vehicle Left	float (IEEE format)	4	average time a left-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle Left – Cumulative	float (IEEE format)	4	average time a left-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle Right	float (IEEE format)	4	average time a right-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle Right – Cumulative	float (IEEE format)	4	average time a right-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle Through	float (IEEE format)	4	average time a through-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Per Vehicle Through – Cumulative	float (IEEE format)	4	average time a through-discharging vehicle has been delayed on this link (seconds/vehicle)
Delay; Travel; Total	float (IEEE format)	4	total time all vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total – Cumulative	float (IEEE format)	4	total time all vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Left	float (IEEE format)	4	total time left-discharging vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Left – Cumulative	float (IEEE format)	4	total time left-discharging vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Right	float (IEEE format)	4	total time right-discharging vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Right – Cumulative	float (IEEE format)	4	total time right-discharging vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Through	float (IEEE format)	4	total time through -discharging vehicles have been delayed on this link (vehicle-minutes)
Delay; Travel; Total Through – Cumulative	float (IEEE format)	4	total time through -discharging vehicles have been delayed on this link (vehicle-minutes)
Density; Per Lane	float (IEEE format)	4	average link density averaged over the fractional number of full-length lanes on the link
Density; Per Lane – Cumulative	float (IEEE format)	4	average link density averaged over the fractional number of full-length lanes on the link
Emissions Rate; CO	float (IEEE format)	4	total amount of CO emitted divided by the product of the link length and time since simulation start (kg-mi/hr)

Field	Type	Size (bytes)	Value
Emissions Rate; CO – Cumulative	float (IEEE format)	4	total amount of CO emitted divided by the product of the link length and time since simulation start (kg-mi/hr)
Emissions Rate; HC	float (IEEE format)	4	total amount of HC emitted divided by the product of the link length and time since simulation start (kg-mi/hr)
Emissions Rate; HC – Cumulative	float (IEEE format)	4	total amount of HC emitted divided by the product of the link length and time since simulation start (kg-mi/hr)
Emissions Rate; NOx	float (IEEE format)	4	total amount of NOx emitted divided by the product of the link length and time since simulation start (kg-mi/hr)
Emissions Rate; NOx - Cumulative	float (IEEE format)	4	total amount of NOx emitted divided by the product of the link length and time since simulation start (kg-mi/hr)
Emissions; Total CO	float (IEEE format)	4	total amount of CO emitted per mile of link length (grams/mi)
Emissions; Total CO – Cumulative	float (IEEE format)	4	total amount of CO emitted per mile of link length (grams/mi)
Emissions; Total HC	float (IEEE format)	4	total amount of HC emitted per mile of link length (grams/mi)
Emissions; Total HC – Cumulative	float (IEEE format)	4	total amount of HC emitted per mile of link length (grams/mi)
Emissions; Total NOx	float (IEEE format)	4	total amount of NOx emitted per mile of link length (grams/mi)
Emissions; Total NOx - Cumulative	float (IEEE format)	4	total amount of NOx emitted per mile of link length (grams/mi)
Fuel Consumption; Total	float (IEEE format)	4	total fuel consumption by all vehicles on the link
Fuel Consumption; Total – Cumulative	float (IEEE format)	4	total fuel consumption by all vehicles on the link
Fuel Consumption; Total Autos	float (IEEE format)	4	total fuel consumption by autos on the link
Fuel Consumption; Total Autos – Cumulative	float (IEEE format)	4	total fuel consumption by autos on the link
Fuel Consumption; Total Buses	float (IEEE format)	4	total fuel consumption by buses on the link
Fuel Consumption; Total Buses – Cumulative	float (IEEE format)	4	total fuel consumption by buses on the link
Fuel Consumption; Total Carpools	float (IEEE format)	4	total fuel consumption by carpool autos on the link
Fuel Consumption; Total Carpools – Cumulative	float (IEEE format)	4	total fuel consumption by carpool autos on the link
Fuel Consumption; Total Trucks	float (IEEE format)	4	total fuel consumption by trucks on the link

Field	Type	Size (bytes)	Value
Fuel Consumption; Total Trucks – Cumulative	float (IEEE format)	4	total fuel consumption by trucks on the link
Lane Changes; Total	unsigned integer	4	total number of lane changes on this link
Lane Changes; Total – Cumulative	unsigned integer	4	total number of lane changes on this link
M / T	float (IEEE format)	4	total move time to travel time ratio for all vehicles on this link
M / T – Cumulative	float (IEEE format)	4	total move time to travel time ratio for all vehicles on this link
M / T Left	float (IEEE format)	4	total move time to travel time ratio for left-discharging vehicles on this link
M / T Left – Cumulative	float (IEEE format)	4	total move time to travel time ratio for left-discharging vehicles on this link
M / T Right	float (IEEE format)	4	total move time to travel time ratio for right-discharging vehicles on this link
M / T Right – Cumulative	float (IEEE format)	4	total move time to travel time ratio for right-discharging vehicles on this link
M / T Through	float (IEEE format)	4	total move time to travel time ratio for through-discharging vehicles on this link
M / T Through – Cumulative	float (IEEE format)	4	total move time to travel time ratio for through-discharging vehicles on this link
Move Time; Total	float (IEEE format)	4	total time all vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total – Cumulative	float (IEEE format)	4	total time all vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Left	float (IEEE format)	4	total time left-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Left – Cumulative	float (IEEE format)	4	total time left-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Right	float (IEEE format)	4	total time right-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Right – Cumulative	float (IEEE format)	4	total time right-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Through	float (IEEE format)	4	total time through-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)
Move Time; Total Through – Cumulative	float (IEEE format)	4	total time through-discharging vehicles have been moving (travel time at the free-flow speed with no delay) on this link (vehicle-minutes)

Field	Type	Size (bytes)	Value
Person Delay; Total	float (IEEE format)	4	total delay to persons completely traversing the link (person-minutes)
Person Delay; Total – Cumulative	float (IEEE format)	4	total delay to persons completely traversing the link (person-minutes)
Person Trips; Total	float (IEEE format)	4	total number of people that have traversed the link
Person Trips; Total – Cumulative	float (IEEE format)	4	total number of people that have traversed the link
Phase Failures; Total	unsigned integer	4	total number of phase failures on this link
Phase Failures; Total – Cumulative	unsigned integer	4	total number of phase failures on this link
Queue; Average – # of Lanes	unsigned integer	2	number of lanes in link for which average queue is being reported NOTE: this number is fixed to 7 lanes
Queue; Average Lane 1	float (IEEE format)	4	average queue in lane 1 (vehicles)
Queue; Average Lane 2	float (IEEE format)	4	average queue in lane 2 (vehicles)
Queue; Average Lane 3	float (IEEE format)	4	average queue in lane 3 (vehicles)
Queue; Average Lane 4	float (IEEE format)	4	average queue in lane 4 (vehicles)
Queue; Average Lane 5	float (IEEE format)	4	average queue in lane 5 (vehicles)
Queue; Average Lane 6	float (IEEE format)	4	average queue in lane 6 (vehicles)
Queue; Average Lane 7	float (IEEE format)	4	average queue in lane 7 (vehicles)
Queue; Average – # of Lanes	unsigned integer	2	number of lanes in link for which average queue is being reported NOTE: this number is fixed to 7 lanes
Queue; Average Lane 1 – Cumulative	float (IEEE format)	4	average queue in lane 1 (vehicles)
Queue; Average Lane 2 – Cumulative	float (IEEE format)	4	average queue in lane 2 (vehicles)
Queue; Average Lane 3 – Cumulative	float (IEEE format)	4	average queue in lane 3 (vehicles)
Queue; Average Lane 4 – Cumulative	float (IEEE format)	4	average queue in lane 4 (vehicles)
Queue; Average Lane 5 – Cumulative	float (IEEE format)	4	average queue in lane 5 (vehicles)
Queue; Average Lane 6 – Cumulative	float (IEEE format)	4	average queue in lane 6 (vehicles)
Queue; Average Lane 7 – Cumulative	float (IEEE format)	4	average queue in lane 7 (vehicles)
Queue; Maximum – # of Lanes	unsigned integer	2	number of lanes in link for which maximum queue is being reported NOTE: this number is fixed to 7 lanes

Field	Type	Size (bytes)	Value
Queue; Maximum Lane 1	float (IEEE format)	4	maximum queue in lane 1 (vehicles)
Queue; Maximum Lane 2	float (IEEE format)	4	maximum queue in lane 2 (vehicles)
Queue; Maximum Lane 3	float (IEEE format)	4	maximum queue in lane 3 (vehicles)
Queue; Maximum Lane 4	float (IEEE format)	4	maximum queue in lane 4 (vehicles)
Queue; Maximum Lane 5	float (IEEE format)	4	maximum queue in lane 5 (vehicles)
Queue; Maximum Lane 6	float (IEEE format)	4	maximum queue in lane 6 (vehicles)
Queue; Maximum Lane 7	float (IEEE format)	4	maximum queue in lane 7 (vehicles)
Queue; Maximum – # of Lanes	unsigned integer	2	number of lanes in link for which maximum queue is being reported NOTE: this number is fixed to 7 lanes
Queue; Maximum Lane 1 – Cumulative	float (IEEE format)	4	maximum queue in lane 1 (vehicles)
Queue; Maximum Lane 2 – Cumulative	float (IEEE format)	4	maximum queue in lane 2 (vehicles)
Queue; Maximum Lane 3 – Cumulative	float (IEEE format)	4	maximum queue in lane 3 (vehicles)
Queue; Maximum Lane 4 – Cumulative	float (IEEE format)	4	maximum queue in lane 4 (vehicles)
Queue; Maximum Lane 5 – Cumulative	float (IEEE format)	4	maximum queue in lane 5 (vehicles)
Queue; Maximum Lane 6 – Cumulative	float (IEEE format)	4	maximum queue in lane 6 (vehicles)
Queue; Maximum Lane 7 – Cumulative	float (IEEE format)	4	maximum queue in lane 7 (vehicles)
Speed; Average	float (IEEE format)	4	average speed of a vehicle traversing the link (miles/hour)
Speed; Average – Cumulative	float (IEEE format)	4	average speed of a vehicle traversing the link (miles/hour)
Speed; Average Left	float (IEEE format)	4	average speed of a left-discharging vehicle traversing the link (miles/hour)
Speed; Average Left – Cumulative	float (IEEE format)	4	average speed of a left-discharging vehicle traversing the link (miles/hour)

Field	Type	Size (bytes)	Value
Speed; Average Right	float (IEEE format)	4	average speed of a right-discharging vehicle traversing the link (miles/hour)
Speed; Average Right – Cumulative	float (IEEE format)	4	average speed of a right-discharging vehicle traversing the link (miles/hour)
Speed; Average Through	float (IEEE format)	4	average speed of a through-discharging vehicle traversing the link (miles/hour)
Speed; Average Through – Cumulative	float (IEEE format)	4	average speed of a through-discharging vehicle traversing the link (miles/hour)
Stopped Vehicles	unsigned integer	4	count of cumulative stops on the link
Stopped Vehicles – Cumulative	unsigned integer	4	count of cumulative stops on the link
Stopped Vehicles; Percent	float (IEEE format)	4	percent of vehicles discharged from the link that have stopped
Stopped Vehicles; Percent – Cumulative	float (IEEE format)	4	percent of vehicles discharged from the link that have stopped
Storage; Percent	float (IEEE format)	4	percent of the available storage on the link that is occupied by vehicles
Storage; Percent – Cumulative	float (IEEE format)	4	percent of the available storage on the link that is occupied by vehicles
Travel Distance; Total	float (IEEE format)	4	total number of miles that all vehicles have traversed on this link
Travel Distance; Total – Cumulative	float (IEEE format)	4	total number of miles that all vehicles have traversed on this link
Travel Distance; Total Left	float (IEEE format)	4	total number of miles that left-discharging vehicles have traversed on this link
Travel Distance; Total Left – Cumulative	float (IEEE format)	4	total number of miles that left-discharging vehicles have traversed on this link
Travel Distance; Total Right	float (IEEE format)	4	total number of miles that right-discharging vehicles have traversed on this link
Travel Distance; Total Right – Cumulative	float (IEEE format)	4	total number of miles that right-discharging vehicles have traversed on this link
Travel Distance; Total Through	float (IEEE format)	4	total number of miles that through-discharging vehicles have traversed on this link
Travel Distance; Total Through – Cumulative	float (IEEE format)	4	total number of miles that through-discharging vehicles have traversed on this link
Travel Time; Per Vehicle	float (IEEE format)	4	average time that a vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle – Cumulative	float (IEEE format)	4	average time that a vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle Left	float (IEEE format)	4	average time that a left-discharging vehicle has been on this link (seconds/vehicle)

Field	Type	Size (bytes)	Value
Travel Time; Per Vehicle Left – Cumulative	float (IEEE format)	4	average time that a left-discharging vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle Right	float (IEEE format)	4	average time that a right-discharging vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle Right – Cumulative	float (IEEE format)	4	average time that a right-discharging vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle Through	float (IEEE format)	4	average time that a through-discharging vehicle has been on this link (seconds/vehicle)
Travel Time; Per Vehicle Through – Cumulative	float (IEEE format)	4	average time that a through-discharging vehicle has been on this link (seconds/vehicle)
Travel Time; Total	float (IEEE format)	4	total time that all vehicles have been on this link (vehicle-minutes)
Travel Time; Total – Cumulative	float (IEEE format)	4	total time that all vehicles have been on this link (vehicle-minutes)
Travel Time; Total Left	float (IEEE format)	4	total time that left-discharging vehicles have been on this link (vehicle-minutes)
Travel Time; Total Left – Cumulative	float (IEEE format)	4	total time that left-discharging vehicles have been on this link (vehicle-minutes)
Travel Time; Total Right	float (IEEE format)	4	total time that right-discharging vehicles have been on this link (vehicle-minutes)
Travel Time; Total Right – Cumulative	float (IEEE format)	4	total time that right-discharging vehicles have been on this link (vehicle-minutes)
Travel Time; Total Through	float (IEEE format)	4	total time that through-discharging vehicles have been on this link (vehicle-minutes)
Travel Time; Total Through – Cumulative	float (IEEE format)	4	total time that through-discharging vehicles have been on this link (vehicle-minutes)
Trips	float (IEEE format)	4	total number of vehicles that have completely traversed the link
Trips – Cumulative	float (IEEE format)	4	total number of vehicles that have completely traversed the link
Trips Left	float (IEEE format)	4	total number of left-discharging vehicles that have completely traversed the link
Trips Left – Cumulative	float (IEEE format)	4	total number of left-discharging vehicles that have completely traversed the link
Trips Right	float (IEEE format)	4	total number of right-discharging vehicles that have completely traversed the link
Trips Right – Cumulative	float (IEEE format)	4	total number of right-discharging vehicles that have completely traversed the link
Trips Through	float (IEEE format)	4	total number of through-discharging vehicles that have completely traversed the link
Trips Through – Cumulative	float (IEEE format)	4	total number of through-discharging vehicles that have completely traversed the link

Field	Type	Size (bytes)	Value
Vehicles Discharged	unsigned integer	4	total number of vehicles that discharged the link
Vehicles Discharged – Cumulative	unsigned integer	4	total number of vehicles that discharged the link
Vehicles Discharged Left	unsigned integer	4	total number of vehicles that discharged the link turning left
Vehicles Discharged Left – Cumulative	unsigned integer	4	total number of vehicles that discharged the link turning left
Vehicles Discharged Right	unsigned integer	4	total number of vehicles that discharged the link turning right
Vehicles Discharged Right – Cumulative	unsigned integer	4	total number of vehicles that discharged the link turning right
Vehicles Discharged Through	unsigned integer	4	total number of vehicles that discharged the link moving through
Vehicles Discharged Through – Cumulative	unsigned integer	4	total number of vehicles that discharged the link moving through
Volume	float (IEEE format)	4	average volume on the link in vehicles per hour
Volume – Cumulative	float (IEEE format)	4	average volume on the link in vehicles per hour
Volume; Per Lane	float (IEEE format)	4	average volume on the link in vehicles per hour per lane
Volume; Per Lane – Cumulative	float (IEEE format)	4	average volume on the link in vehicles per hour per lane
REPEAT PREVIOUS 213 FIELDS FOR EACH LINK IN THIS MESSAGE			

4.6 Complete Message

Field	Type	Size (bytes)	Value
Message Name	unsigned integer	4	LG_Complete_GP = 3003
Message Length	unsigned integer	4	length of this message in bytes, excluding the first three fields
Simulation Time	unsigned integer	4	the simulation time at which this message is sent
Request Type	unsigned integer	4	the Request Type of the data message with which this complete message is associated
Request Handle	unsigned integer	4	1

5. References

Federal Highway Administration, “CORSIM User’s Guide, Version 6.0”, April 2005.

Federal Highway Administration, “CORSIM Reference Manual, Version 6.0”, April 2005.

Kaman Sciences Corporation, “TRAFVU Data Description Document”, Contract No. DTFH61-95-C-00074, 1996, DRAFT.

Kaman Sciences Corporation and Viggen Corporation, “Traffic Research Laboratory Interface Control Document, Version 5.0”, Contract No. DTFH61-95-C-00074, 1996, DRAFT.

Appendix A: Symbolic Name Cross Reference

Message Name Cross Reference

Symbolic Name	Value
LG_Complete_GP	3003
LG_Data_GP	3001

Request Type Cross Reference

Symbolic Name	Value
DR_TI_LINK	13000
DR_TS_INCIDENT	14400
DR_TS_RAMPMETER	14300
DR_TS_SIGNAL	14200
DR_TS_VEHICLE	14000

Class ID Cross Reference

Symbolic Name	Value
Incident	13000
Link	18000
LinkMOE	19000
Vehicle	33000

Action ID Cross Reference

Symbolic Name	Value
CREATE	0
SEARCH	2
UPDATE	1

Attribute ID Cross Reference

Symbolic Name	Value
IN_AffectedLaneSLT	13501
IN_Duration	13106
IN_IncidentId	13100
IN_IncidentLength	13104
IN_IncidentPosition	13103
IN_IncidentReactionPointPosition	13107
IN_IncidentState	13500
IN_IncidentType	13102
IN_LinkId	13101
IN_ModelType	13109
IN_OccurrenceTime	13105
IN_RubberneckFactor	13108
LK_SignalState	18500
LM_BusDelayTotal	19401
LM_BusDelayTotal_Cum	19701
LM_BusesThatStopped	19407
LM_BusesThatStopped_Cum	19707
LM_BusMoveTimePerTravelTimeRatio	19402
LM_BusMoveTimePerTravelTimeRatio_Cum	19702
LM_BusPersonTrips	19403
LM_BusPersonTrips_Cum	19703
LM_BusSpeedAverage	19404
LM_BusSpeedAverage_Cum	19704
LM_BusTravelTimeTotal	19405
LM_BusTravelTimeTotal_Cum	19705
LM_BusTrips	19406
LM_BusTrips_Cum	19706
LM_ContentAverage	19408
LM_ContentAverage_Cum	19708
LM_ContentCurrent	19409
LM_ContentCurrent_Cum	19709
LM_DelayControlPerVehicle	19410
LM_DelayControlPerVehicle_Cum	19710
LM_DelayControlPerVehicleLeft	19411
LM_DelayControlPerVehicleLeft_Cum	19711
LM_DelayControlPerVehicleRight	19412
LM_DelayControlPerVehicleRight_Cum	19712
LM_DelayControlPerVehicleThrough	19413
LM_DelayControlPerVehicleThrough_Cum	19713

Symbolic Name	Value
LM_DelayControlTotal	19414
LM_DelayControlTotal_Cum	19714
LM_DelayControlTotalLeft	19415
LM_DelayControlTotalLeft_Cum	19715
LM_DelayControlTotalRight	19416
LM_DelayControlTotalRight_Cum	19716
LM_DelayControlTotalThrough	19417
LM_DelayControlTotalThrough_Cum	19717
LM_DelayQueuePerVehicle	19418
LM_DelayQueuePerVehicle_Cum	19718
LM_DelayQueueTotal	19419
LM_DelayQueueTotal_Cum	19719
LM_DelayQueueTotalLeft	19420
LM_DelayQueueTotalLeft_Cum	19720
LM_DelayQueueTotalRight	19421
LM_DelayQueueTotalRight_Cum	19721
LM_DelayQueueTotalThrough	19422
LM_DelayQueueTotalThrough_Cum	19722
LM_DelayStopPerVehicle	19423
LM_DelayStopPerVehicle_Cum	19723
LM_DelayStopTotal	19424
LM_DelayStopTotal_Cum	19724
LM_DelayStopTotalLeft	19425
LM_DelayStopTotalLeft_Cum	19725
LM_DelayStopTotalRight	19426
LM_DelayStopTotalRight_Cum	19726
LM_DelayStopTotalThrough	19427
LM_DelayStopTotalThrough_Cum	19727
LM_DelayTravelPerVehicle	19428
LM_DelayTravelPerVehicle_Cum	19728
LM_DelayTravelPerVehicleLeft	19429
LM_DelayTravelPerVehicleLeft_Cum	19729
LM_DelayTravelPerVehicleRight	19430
LM_DelayTravelPerVehicleRight_Cum	19730
LM_DelayTravelPerVehicleThrough	19431
LM_DelayTravelPerVehicleThrough_Cum	19731
LM_DelayTravelTotal	19432
LM_DelayTravelTotal_Cum	19732
LM_DelayTravelTotalLeft	19433
LM_DelayTravelTotalLeft_Cum	19733

Symbolic Name	Value
LM_DelayTravelTotalRight	19434
LM_DelayTravelTotalRight_Cum	19734
LM_DelayTravelTotalThrough	19435
LM_DelayTravelTotalThrough_Cum	19735
LM_DensityPerLane	19436
LM_DensityPerLane_Cum	19736
LM_EmissionsRateCO	19437
LM_EmissionsRateCO_Cum	19737
LM_EmissionsRateHC	19438
LM_EmissionsRateHC_Cum	19738
LM_EmissionsRateNOx	19439
LM_EmissionsRateNOx_Cum	19739
LM_EmissionsTotalCO	19440
LM_EmissionsTotalCO_Cum	19740
LM_EmissionsTotalHC	19441
LM_EmissionsTotalHC_Cum	19741
LM_EmissionsTotalNOx	19442
LM_EmissionsTotalNOx_Cum	19742
LM_FuelConsumptionTotal	19443
LM_FuelConsumptionTotal_Cum	19743
LM_FuelConsumptionTotalAutos	19444
LM_FuelConsumptionTotalAutos_Cum	19744
LM_FuelConsumptionTotalBuses	19445
LM_FuelConsumptionTotalBuses_Cum	19745
LM_FuelConsumptionTotalCarpools	19446
LM_FuelConsumptionTotalCarpools_Cum	19746
LM_FuelConsumptionTotalTrucks	19447
LM_FuelConsumptionTotalTrucks_Cum	19747
LM_LaneChangesTotal	19448
LM_LaneChangesTotal_Cum	19748
LM_MoveTimePerTravelTimeRatio	19449
LM_MoveTimePerTravelTimeRatio_Cum	19749
LM_MoveTimePerTravelTimeRatioLeft	19450
LM_MoveTimePerTravelTimeRatioLeft_Cum	19750
LM_MoveTimePerTravelTimeRatioRight	19451
LM_MoveTimePerTravelTimeRatioRight_Cum	19751
LM_MoveTimePerTravelTimeRatioThrough	19452
LM_MoveTimePerTravelTimeRatioThrough_Cum	19752
LM_MoveTimeTotal	19453
LM_MoveTimeTotal_Cum	19753

Symbolic Name	Value
LM_MoveTimeTotalLeft	19454
LM_MoveTimeTotalLeft_Cum	19754
LM_MoveTimeTotalRight	19455
LM_MoveTimeTotalRight_Cum	19755
LM_MoveTimeTotalThrough	19456
LM_MoveTimeTotalThrough_Cum	19756
LM_PersonDelayTotal	19457
LM_PersonDelayTotal_Cum	19757
LM_PersonTripsTotal	19458
LM_PersonTripsTotal_Cum	19758
LM_PhaseFailuresTotal	19459
LM_PhaseFailuresTotal_Cum	19759
LM_QueueAverageNumberVehiclesSLT	19460
LM_QueueAverageNumberVehiclesSLT_Cum	19760
LM_QueueMaximumNumberVehiclesSLT	19461
LM_QueueMaximumNumberVehiclesSLT_Cum	19761
LM_SpeedAverage	19462
LM_SpeedAverage_Cum	19762
LM_SpeedAverageLeft	19463
LM_SpeedAverageLeft_Cum	19763
LM_SpeedAverageRight	19464
LM_SpeedAverageRight_Cum	19764
LM_SpeedAverageThrough	19465
LM_SpeedAverageThrough_Cum	19765
LM_StoppedVehicles	19466
LM_StoppedVehicles_Cum	19766
LM_StoppedVehiclesPercent	19467
LM_StoppedVehiclesPercent_Cum	19767
LM_StoragePercent	19468
LM_StoragePercent_Cum	19768
LM_TimeInterval	19400
LM_TimeInterval_Cum	19700
LM_TravelDistanceTotal	19469
LM_TravelDistanceTotal_Cum	19769
LM_TravelDistanceTotalLeft	19470
LM_TravelDistanceTotalLeft_Cum	19770
LM_TravelDistanceTotalRight	19471
LM_TravelDistanceTotalRight_Cum	19771
LM_TravelDistanceTotalThrough	19472
LM_TravelDistanceTotalThrough_Cum	19772

Symbolic Name	Value
LM_TravelTimePerVehicle	19473
LM_TravelTimePerVehicle_Cum	19773
LM_TravelTimePerVehicleLeft	19474
LM_TravelTimePerVehicleLeft_Cum	19774
LM_TravelTimePerVehicleRight	19475
LM_TravelTimePerVehicleRight_Cum	19775
LM_TravelTimePerVehicleThrough	19476
LM_TravelTimePerVehicleThrough_Cum	19776
LM_TravelTimeTotal	19477
LM_TravelTimeTotal_Cum	19777
LM_TravelTimeTotalLeft	19478
LM_TravelTimeTotalLeft_Cum	19778
LM_TravelTimeTotalRight	19479
LM_TravelTimeTotalRight_Cum	19779
LM_TravelTimeTotalThrough	19480
LM_TravelTimeTotalThrough_Cum	19780
LM_Trips	19481
LM_Trips_Cum	19781
LM_TripsLeft	19482
LM_TripsLeft_Cum	19782
LM_TripsRight	19483
LM_TripsRight_Cum	19783
LM_TripsThrough	19484
LM_TripsThrough_Cum	19784
LM_VehiclesDischarged	19485
LM_VehiclesDischarged_Cum	19785
LM_VehiclesDischargedLeft	19486
LM_VehiclesDischargedLeft_Cum	19786
LM_VehiclesDischargedRight	19487
LM_VehiclesDischargedRight_Cum	19787
LM_VehiclesDischargedThrough	19488
LM_VehiclesDischargedThrough_Cum	19788
LM_Volume	19489
LM_Volume_Cum	19789
LM_VolumePerLane	19490
LM_VolumePerLane_Cum	19790
V_InputAndAnimate	33500