

AMS Pasadena Testbed – Simulation Results

Identification Information

Citation

Citation Information

Originator: Booz Allen Hamilton and Heusch Boesefeldt America
Project: Analysis, Modeling and Simulation (AMS) Testbed Development and Evaluation to Support Dynamic Mobility Applications (DMA) and Active Transportation and Demand Management (ATDM) Programs
Title: AMS Pasadena Testbed Simulation Results
Geospatial Data Presentation Form: Latitude and longitude

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Description

This sub-repository consists of the simulation output data generated during Pasadena simulations. The testbed files are provided as a separate sub-repository and can be used to generate additional data. Output data was obtained by running simulations in VISSIM software and consists of (1) Network operational performance, (2) Individual Link Travel Time, (3) TRANSIMS plans recommendations.

The following shows a table of the listed scenarios for the data contained within the repositories for operational condition 1.

ID	Sub-Plans	Strategy Scenario					Prediction Scenario					Notes
		ARM	DSC	HSR	DJC	DSL+QW	DRG	PH	PL	PA	TC	
0	1							-	-	-	0	Base
1	1	X						-	-	-	100	Without Prediction
2	3		X					-	-	-	100	Without Prediction
3	3			X	X			-	-	-	100	Without Prediction
4	1					X		-	-	-	100	Without Prediction
5	6						X	-	-	-	100	Without Prediction
6	1					X		-	-	-	50	Without Prediction
7	1					X		-	-	-	20	Without Prediction
8	-	X						60	5	100	-	With Prediction
9	-		X					60	5	100	-	With Prediction
10	-			X	X			60	5	100	-	With Prediction
11	-						X	60	5	100	50	With Prediction
12	-						X	60	5	100	20	With Prediction
13	-	X						60	10	50	-	With Prediction
14	-		X					60	10	50	-	With Prediction
15	-			X	X			60	10	50	-	With Prediction
16	-						X	60	10	50	50	With Prediction
17	-	X						60	10	90	-	With Prediction
18	-		X					60	10	90	-	With Prediction
19	-			X	X			60	10	90	-	With Prediction
20	-						X	60	10	90	50	With Prediction
21	-	X						30	5	100	-	With Prediction

22	-		X					30	5	100	-	With Prediction
23	-			X	X			30	5	100	-	With Prediction
24	-						X	30	5	100	50	With Prediction
25	-	X						60	10	100	-	With Prediction
26	-		X					60	10	100	-	With Prediction
27	-			X	X			60	10	100	-	With Prediction
28	-						X	60	10	100	50	With Prediction
29	-	X						15	5	100	-	With Prediction
30	-		X					15	5	100	-	With Prediction
31	-						X	15	5	100	50	With Prediction
32	-	X		X	X	X		60	5	100	50	With Prediction
33	-	X		X	X			60	5	100	50	With Prediction
34	-	X	X	X	X		X	60	5	100	50	With Prediction
35	-		X				X	60	5	100	50	With Prediction
36	-	X	X	X	X	X	X	60	5	100	50	With Prediction
37	-	X						TOD	TOD	TOD	TOD	Without Prediction
38	-		X					TOD	TOD	TOD	TOD	Without Prediction
39	-			X	X			TOD	TOD	TOD	TOD	Without Prediction
40	-						X	TOD	TOD	TOD	TOD	Without Prediction

The following shows a table of the listed scenarios for the data contained within the repositories for operational condition 2 and 3.

ID	Sub Plans	Strategy						Prediction Scenario				Note
		ARM	DSC	HSR	DJC	DSL + QW	DRG	PH	PL	PA	TC	
0	1							-	-	-	0	Base
1	1	X						-	-	-	100	Without Prediction
2	3		X					-	-	-	100	Without Prediction
3	3			X	X			-	-	-	100	Without Prediction
4	1					X		-	-	-	100	Without Prediction
5	4						X	-	-	-	100	Without Prediction
6	1					X		-	-	-	50	Without Prediction
7	1					X		-	-	-	20	Without Prediction
8	-	X						30	5	100	-	Prediction
9	-	X						60	5	100	-	Prediction
10	-	X						60	10	100	-	Prediction
11	-			X	X			60	5	100	-	Prediction
12	-						X	60	5	100	50	Prediction
13	-						X	60	5	100	20	Prediction
14	-		X					30	5	100	-	Prediction
15	-		X					60	5	100	-	Prediction
16	-		X					60	10	50	-	Prediction

The three data files within each sub-repository use the following naming convention:

- Network: {ID#}_{Strategy}_{Plan or Prediction Scenario}_Vehicle Network Performance Evaluation Results.att
- Travel Time: {ID#}_{Strategy}_{Plan or Prediction Scenario}_Vehicle Travel Time Results.att
- TRANSIMS: {ID#}_{Strategy}_{Prediction Scenario}_TRANSIMS.prn

Spatial Domain

Bounding Coordinates

West Bounding Coordinate: -118.196°
East Bounding Coordinate: -118.059°
North Bounding Coordinate: 34.198°

South Bounding Coordinate: 34.121°

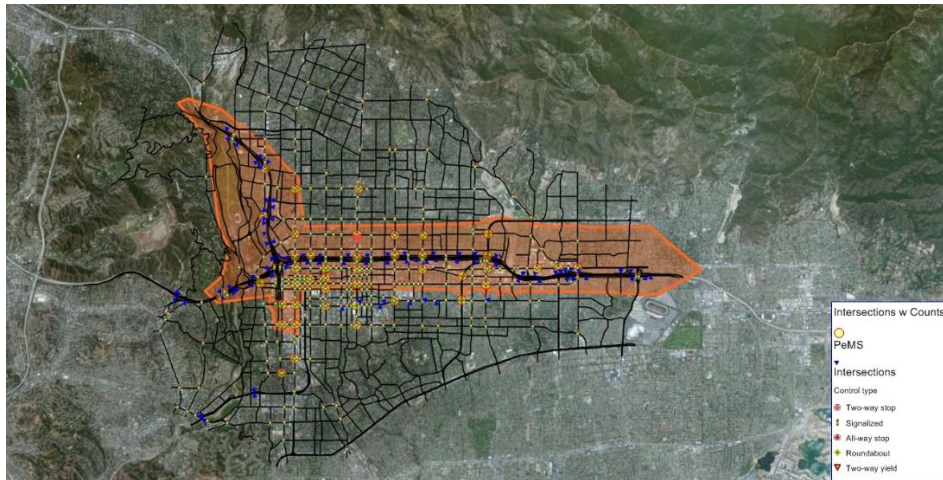
The microsimulation network used for data collection includes roadways in Pasadena, California. The arterial used for dynamic signal control evaluation are Colorado Street, Marengo Avenue, North Sierra Madre Boulevard, Lake Avenue, Allen Avenue, Fair Oaks Boulevard, Walnut Street, Fair Oaks Boulevard which has a total of 60 signalized intersections with dynamic signal control capability. Further details on the testbeds are provided on Table 2.

Table 1: Characteristics of the Pasadena Testbeds

	Pasadena Testbed
Freeway Length	12.1 miles
Freeway Speed Limit	65 mph
Arterial Speed Limit	25-35 mph
Number of Dynamic Signal Controls	60 intersections
Total Number of Traffic Signals	182 intersections

Pasadena Testbed network consists of 12.1 miles freeway in Pasadena in the figure below. For additional details on the network, its geometry, calibration etc., users are encouraged to utilize the following documents:

1. Analysis Plan for Pasadena Testbed: FHWA-JPO-16-371
2. Calibration Report for Pasadena Testbed: FHWA-JPO-16-378
3. Evaluation Report for ATDM Strategies: FHWA-16-385



Native Data Set Environment:

Documentation: This data environment contains three data sets: (1) Network operational performance which includes a 5-minute aggregate of the simulation data, (2) Individual Link Travel Time which includes a 5-minute aggregate of the simulation data, (3) TRANSIMS plans recommendations at every for every prediction horizon at every 5-minute with network results for each strategy assessed.

Folder Organization:

The files' organization include the following files:

1. VISSIM Simulation Output file (recognized by `.att` extension)
2. TRANSIMS Summary Output file (recognized by `.prn` extension)

Entity and Attribute Information

Description for Network Operations Data Set

This dataset contains network operational performance at 5-minute resolution. Each file uses the following naming convention: {ID#}_{Strategy}_{Plan or Prediction Scenario}_Vehicle Network Performance Evaluation Results.att. This file format is a semicolon (;) delimited with description of the file content and headers from line 1 to 47.

Attribute

Attribute Label: SIMRUN – (Column A)

Attribute Definition: This field contains the simulation run number for the associated file.

Attribute Domain Values: Integer

Attribute

Attribute Label: TIMEINT – (Column B)

Attribute Definition: This field contains time stamp in seconds reported in start time to end time.

Attribute Domain Values: String

Attribute

Attribute Label: DELAYAVG(ALL) – (Column C)

Attribute Definition: This field contains the average vehicle delay reported in seconds per vehicle for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYAVG(80) – (Column D)

Attribute Definition: This field contains the average vehicle delay reported in seconds per vehicle for all vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYAVG(90) – (Column E)

Attribute Definition: This field contains the average vehicle delay reported in seconds per vehicle for all vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPAVG(ALL) – (Column F)

Attribute Definition: This field contains the number of stops reported in stops per vehicles for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPAVG(80) – (Column G)

Attribute Definition: This field contains the number of stops reported in stops per vehicles for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPAVG(90) – (Column H)

Attribute Definition: This field contains the number of stops reported in stops per vehicles for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: SPEEDAVG(ALL) – (Column I)

Attribute Definition: This field contains the network average speed reported in miles per hour for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: SPEEDAVG(80) – (Column J)

Attribute Definition: This field contains the network average speed reported in miles per hour for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: SPEEDAVG(90) – (Column K)

Attribute Definition: This field contains the network average speed reported in miles per hour for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPAVG(ALL) – (Column L)

Attribute Definition: This field contains the average stop delay reported in seconds per vehicle for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPAVG(80) – (Column M)

Attribute Definition: This field contains the average stop delay reported in seconds per vehicle for VEHICLE CLASS 80..

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPAVG(90) – (Column N)

Attribute Definition: This field contains the average stop delay reported in seconds per vehicle for VEHICLE CLASS 90.

Attribute Domain Values: Float

Attribute

Attribute Label: DISTTOT(ALL) – (Column O)

Attribute Definition: This field contains the total vehicle miles traveled reported in miles for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: DISTTOT(80) – (Column P)

Attribute Definition: This field contains the total vehicle miles traveled reported in miles for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: DISTTOT(90) – (Column Q)

Attribute Definition: This field contains the total vehicle miles traveled reported in miles for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: TRAVTMTOT(ALL) – (Column R)

Attribute Definition: This field contains the total vehicle travel times reported in seconds for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: TRAVTMTOT(80) – (Column S)

Attribute Definition: This field contains the total vehicle travel times reported in seconds for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: TRAVTMTOT(90) – (Column T)

Attribute Definition: This field contains the total vehicle travel times reported in seconds for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYTOT(ALL) – (Column U)

Attribute Definition: This field contains the total vehicle delay reported in seconds for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYTOT(80) – (Column V)

Attribute Definition: This field contains the total vehicle delay reported in seconds for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYTOT(90) – (Column W)

Attribute Definition: This field contains the total vehicle delay reported in seconds for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPSTOT(ALL) – (Column X)

Attribute Definition: This field contains the total vehicle stops reported in total stops for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPSTOT (80) – (Column Y)

Attribute Definition: This field contains the total vehicle stops reported in total stops for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: STOPSTOT (90) – (Column Z)

Attribute Definition: This field contains the total vehicle stops reported in total stops for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPTOT(ALL) – (Column AA)

Attribute Definition: This field contains the total vehicle stop delay reported in seconds for all vehicle classes.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPTOT(80) – (Column AB)

Attribute Definition: This field contains the total vehicle stop delay reported in seconds for vehicle class 80.

Attribute Domain Values: Float

Attribute

Attribute Label: DELAYSTOPTOT(90) – (Column AC)

Attribute Definition: This field contains the total vehicle stop delay reported in seconds for vehicle class 90.

Attribute Domain Values: Float

Attribute

Attribute Label: VEHACT(ALL) – (Column AD)

Attribute Definition: This field contains the total number of active vehicles in the network during the associated time period for all vehicle classes.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHACT(80) – (Column AE)

Attribute Definition: This field contains the total number of active vehicles in the network during the associated time period for vehicle class 80.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHACT(90) – (Column AF)

Attribute Definition: This field contains the total number of active vehicles in the network during the associated time period for vehicle class 90.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHARR(ALL) – (Column AG)

Attribute Definition: This field contains the total number of vehicles that entered the network during the associated time period for all vehicle classes.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHARR(80) – (Column AH)

Attribute Definition: This field contains the total number of vehicles that entered the network during the associated time period for vehicle class 80.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHARR(90) – (Column AI)

Attribute Definition: This field contains the total number of vehicles that entered the network during the associated time period for vehicle class 90.

Attribute Domain Values: Integer

Attribute

Attribute Label: DELAYLATENT – (Column AJ)

Attribute Definition: This field contains the total delay caused by vehicles denied entry into the network reported in seconds for the associated time period.

Attribute Domain Values: Integer

Attribute

Attribute Label: DEMANDLATENT – (Column AK)

Attribute Definition: This field contains the total number of vehicles denied entry into the network during the associated time period.

Attribute Domain Values: Integer

Description for Travel Time Data Set

This dataset contains all link travel times at 5-minute resolution. Each file uses the following naming convention: {ID#}_{Strategy}_{Plan or Prediction Scenario}_Vehicle Travel Time Results.att. This file format is a semicolon (;) delimited with description of the file content and headers from line 1 to 19.

Attribute

Attribute Label: SIMRUN – (Column A)

Attribute Definition: This field contains the simulation run number for the associated file.

Attribute Domain Values: Integer

Attribute

Attribute Label: TIMEINT – (Column B)

Attribute Definition: This field contains time stamp in seconds reported in start time to end time.

Attribute Domain Values: String

Attribute

Attribute Label: VEHICLETRAVELTIMEMEASUREMENT – (Column C)

Attribute Definition: This field contains the unique numerical identification for the travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHS(ALL) – (Column D)

Attribute Definition: This field contains the vehicle counts for all vehicle classes during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHS(80) – (Column E)

Attribute Definition: This field contains the vehicle counts for vehicle class 80 during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: VEHS(90) – (Column F)

Attribute Definition: This field contains the vehicle counts for vehicle class 90 during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: TRAVTM(ALL) – (Column G)

Attribute Definition: This field contains the average vehicle travel time for all vehicle classes across the travel time segment the during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: TRAVTM(80) – (Column H)

Attribute Definition: This field contains the average vehicle travel time for vehicle class 80 during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Attribute

Attribute Label: TRAVTM(90) – (Column I)

Attribute Definition: This field contains the average vehicle travel time for vehicle class 90 during the associated time period for the corresponding vehicle travel time segment.

Attribute Domain Values: Integer

Description for TRANSIMS Summary Output

This dataset contains the summary output from the TRANSIMS analysis of assessing various strategy combination. The summary of the strategy assessment begins after the line containing the following text: Time Step = 15:00 -- Heavy Congestion Flag = 0 Incident Flag = 0. TRANSIMS continues to assess the preset strategies operational performances based on the

Information Segment

Block Initial Line: Option = 0

Block Description: Strategy activation and combination

Attribute Definition: This information segment indicates the possible strategies activated individually or in combination assessed for their operational performance. “Option = 0” is defaulted as the baseline case with no strategy activation. All preceding “Options” totals to the number of preset plans available and are indicated by the individual plan numbers for each Active Traffic Demand Management.

Information Segment

Block Initial Line: Strategy 0 Performance

Block Description: Strategy performance measure value

Attribute Definition: This information segment indicates the performance measure for each strategy plans using three performance measures listed as follows: Vehicle Hours of Delay; Congested Vehicle Hours; and Total Performance Score. The end of the block indicates the recommended strategy for implementation based on the lowest “Total Performance Score”.

Distribution Information

Distributor

Contact Information

Contact Organization Primary

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Spatial Domain

Bounding Coordinates

West Bounding Coordinate: -118.196°

East Bounding Coordinate: -118.059°

North Bounding Coordinate: 34.198°

South Bounding Coordinate: 34.121°

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Table 2: Characteristics of the Pasadena Testbeds

	Pasadena Testbed
Freeway Length	12.1 miles
Freeway Speed Limit	65 mph
Arterial Speed Limit	25-35 mph
Number of Dynamic Signal Controls	60 intersections
Total Number of Traffic Signals	182 intersections

Access Constraints:

To access the data set, users must register through the USDOT Research Data Exchange (RDE) portal (<https://www.its-rde.net/>). The registration process will include a request for contact information and agreement to terms of use for the data. What information is optional versus mandatory for registration has not been finalized; however in order to encourage broad access and use, mandatory information will be kept to a minimum and ease of use maximized. See the RDE Terms of Use and Data Privacy

Policy on how registration information is kept secure and for uses only applicable to the RDE administration.

Keywords

Keywords: Pasadena, I-210, AMS Testbed, ATDM Strategies, VISSIM, Adaptive Ramp Metering, Dynamic Signal Control, Hard Shouldering Running, Dynamic Junction Control, Dynamic Speed Limit, Queue Warning, Dynamic Route Guidance.

User Constraints:

Those who use data and data processing tools distributed by the Research Data Exchange have the following responsibilities:

1. Where the contributed materials have been utilized to any extent to enable, verify, supplement or validate performance measurement, analysis, research or software development, to fully reference the Research Data Exchange Program and the contributions of the individuals in all subsequent and related publications or public events, specifically:
 - a. In publications, reference the Research Data Exchange website and the date accessed, data and/or data processing tools (by name and version number), and the individual contributors identified on the reference template associated with each data and/or data processing tool.
 - b. In presentations or other oral communication, by noting the data and/or data processing tool by name and version number, and communicating the address of the Research Data Exchange website.
2. Users are encouraged to accurately post and update within the Research Data Exchange website a description of the project utilizing the data and/or the data processing tools, including:
 - a. A description of the project, including a brief statement of the project goals.
 - b. A summary of the hypotheses and findings (when available) of the project.
 - c. Individuals directing and/or substantively participating in the project.
 - d. The name and version number of the data and/or data processing tools downloaded and utilized in the project.
 - e. The current state of the project (upcoming, underway, completed).
 - f. References to published materials (if any).
3. Users are encouraged to report anomalies, errors or other questionable data elements using the Data Forum of the Research Data Exchange website, referencing the specific data or data processing tool by name and version number.
4. To refrain from duplication and dissemination of the data and data processing tools to third parties.
Publication of certain derived information such as location of residence, specific stores visited, purpose of trips, etc. must be cleared with the data set originator prior to publication.

Point of Contact

Contact Information

Contact Organization Primary

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