



PATIENT CARE CONTINUUM REPORT 2018

NOVEMBER 27TH, 2019

PREPARED FOR RIVERSIDE COUNTY EMS AGENCY, EMERGENCY MANAGEMENT DEPARTMENT

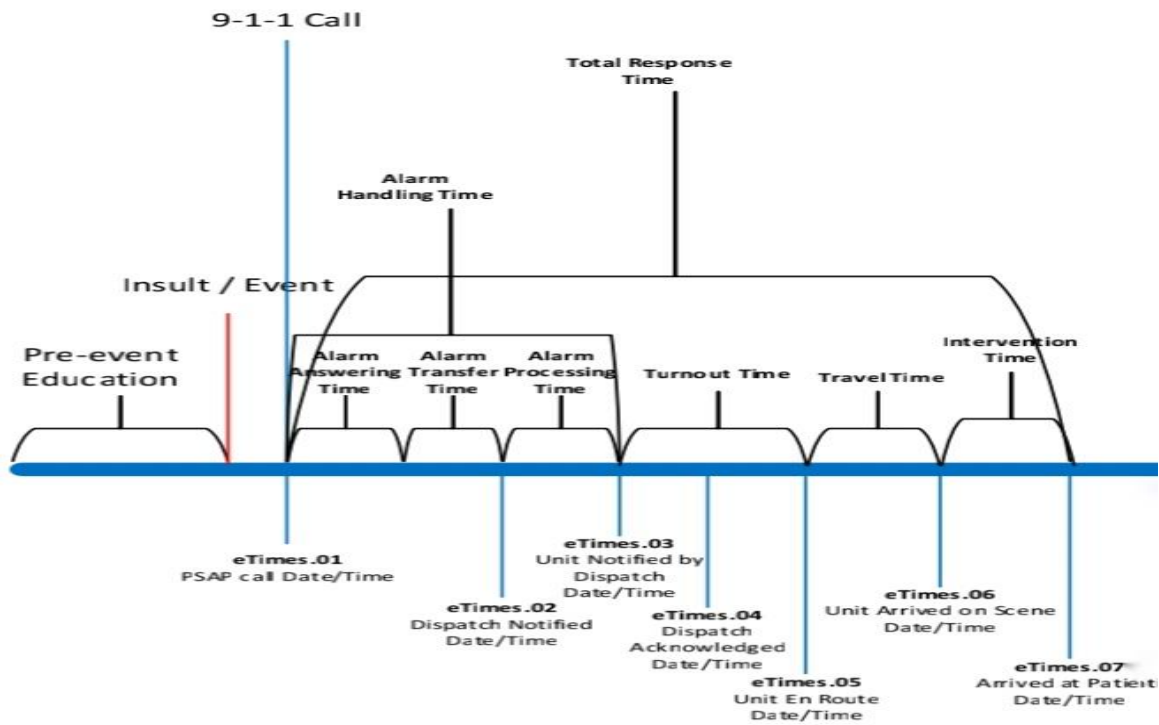
PATIENT CARE CONTINUUM REPORT

The purpose of this report is to provide analysis of the prehospital time intervals identified in REMSA Policy 2203-Patient Care Continuum Time Standards. Additional time intervals were added to the analysis to further measure the prehospital continuum of patient care from dispatch to hospital arrival.

Below are time interval definitions and their corresponding NEMSIS 3.4 timestamps. Time intervals in italics are intervals not currently in Policy 2203.

- Alarm Answering Time – eTimes.01 to eTimes.02
- Alarm Transfer Time – eTimes.01 to eTimes.02 (when the call is transferred to another designated entity)
- Alarm Handling Time – eTimes.01 to eTimes.03
- Alarm Processing Time – eTimes.02 to eTimes.03
- Turnout Time – eTimes.03 to eTimes.05
- Travel Time – eTimes.05 to eTimes.06
- Intervention Time – eTimes.06 to eTimes.07
- *Unit Response Time – eTimes.03 to eTimes.06*
- Total Response Time – eTimes.01 to eTimes.07
- *Arrived On Scene To Arrived At Destination Time – eTimes.06 to eTimes.11*
- *Total On Scene Time – eTimes.06 to eTimes.09*
- *Total Time On Scene With Patient – eTimes.07 to eTimes.09*
- *Transport Time – eTimes.09 to eTimes.11*
- *Unit Prehospital Time With Patient – eTimes.07 to eTimes.11*
- *Total Unit Prehospital Time – eTimes.03 to eTimes.11*
- *Total Prehospital Time – eTimes.01 to eTimes.11*

Pre-hospital Patient Care Continuum from dispatch to arrival at patient. Adapted from REMSA Policy 2203.



Data

373,169 EPCRs were initially identified on ImageTrend Elite Report Writer between 1/1/2018 and 12/31/2018. Each EPCR utilized contained 30 data points. Based on this we theoretically should have 11,195,070 data points to utilize for analysis. **261,041 EPCRs** were identified to use for time interval analysis after downloading, compiling, and cleaning the raw data. This dataset was created utilizing 7,831,230 datapoints.

Exclusions

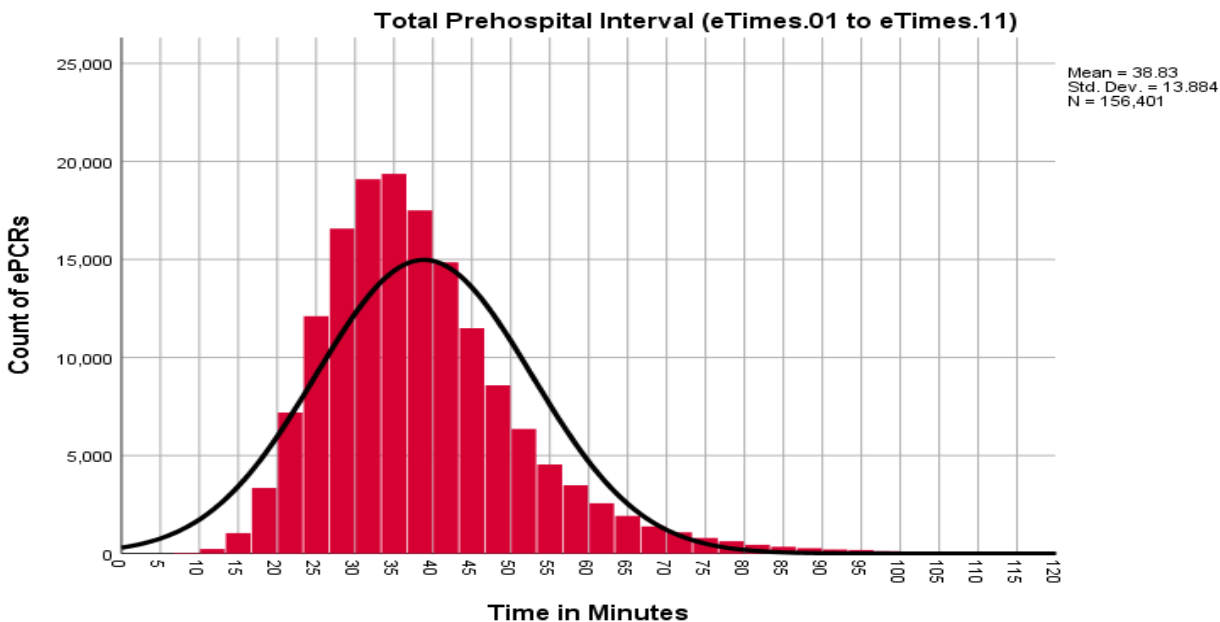
112,128 (30.05% of total) EPCRs were excluded due to missing data points, incorrect times, disposition, or a combination of these. EPCRs were excluded for the following dispositions: Canceled Prior to Enroute, Canceled Enroute, Canceled at Scene by Another Unit, No Patient Contact, No Patient Found, Standby: No Services or Support Provided, Standby: Public Safety, Fire, or EMS Operational Support Provided, or for leaving the disposition field blank. EPCRs were excluded for missing time stamps for eTimes.01, eTimes.02, and eTimes.07. EPCRs were also excluded for being unable to calculate time intervals: Total Response Time (eTimes.01 to eTimes.07). These intervals were unable to be calculated due to either a missing timestamp or an incorrect time stamp. Additional EPCRs were excluded due to having an Total Response Time interval greater than or equal to 60 minutes.

Inclusions:

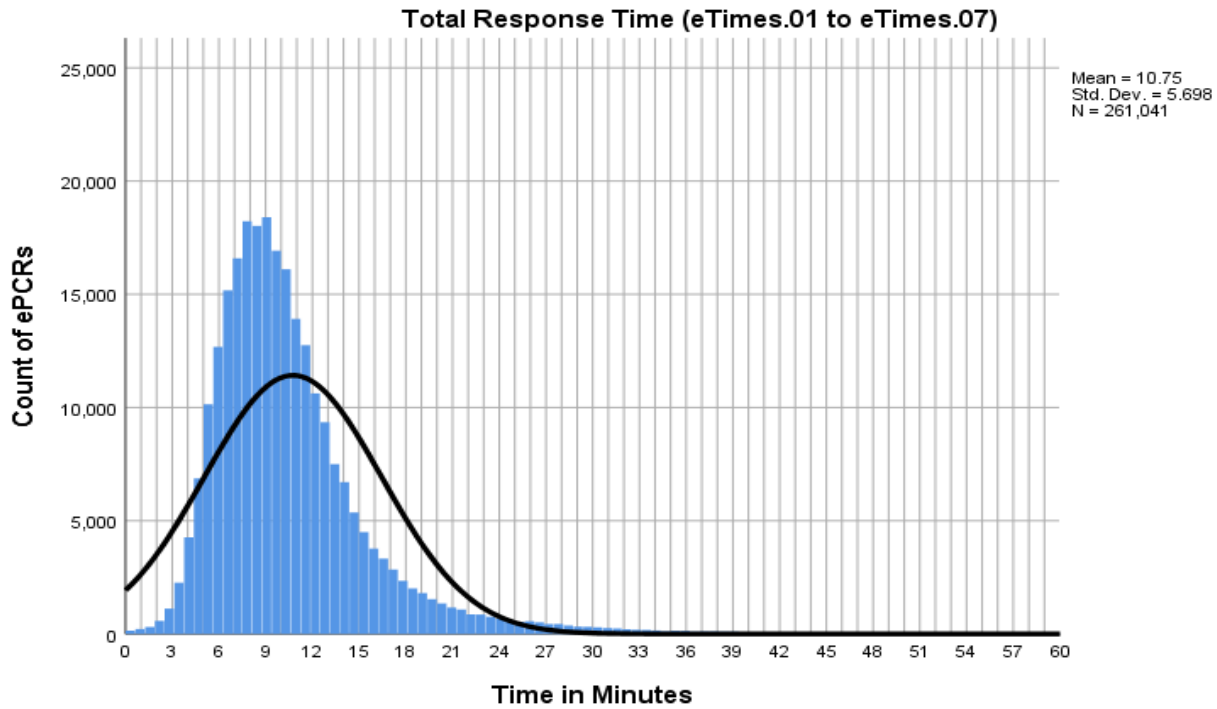
Data from 8 timestamps were included and used to create the time intervals from policy 2203 as well as the additional intervals created. 15-time intervals were included in this dataset. Data from 16 agencies were included in the dataset. To be included the agency had to be a fire department or transport agency providing 911 services in Riverside County. Disposition and EMD card data were also included in the dataset.

Timeline and Findings

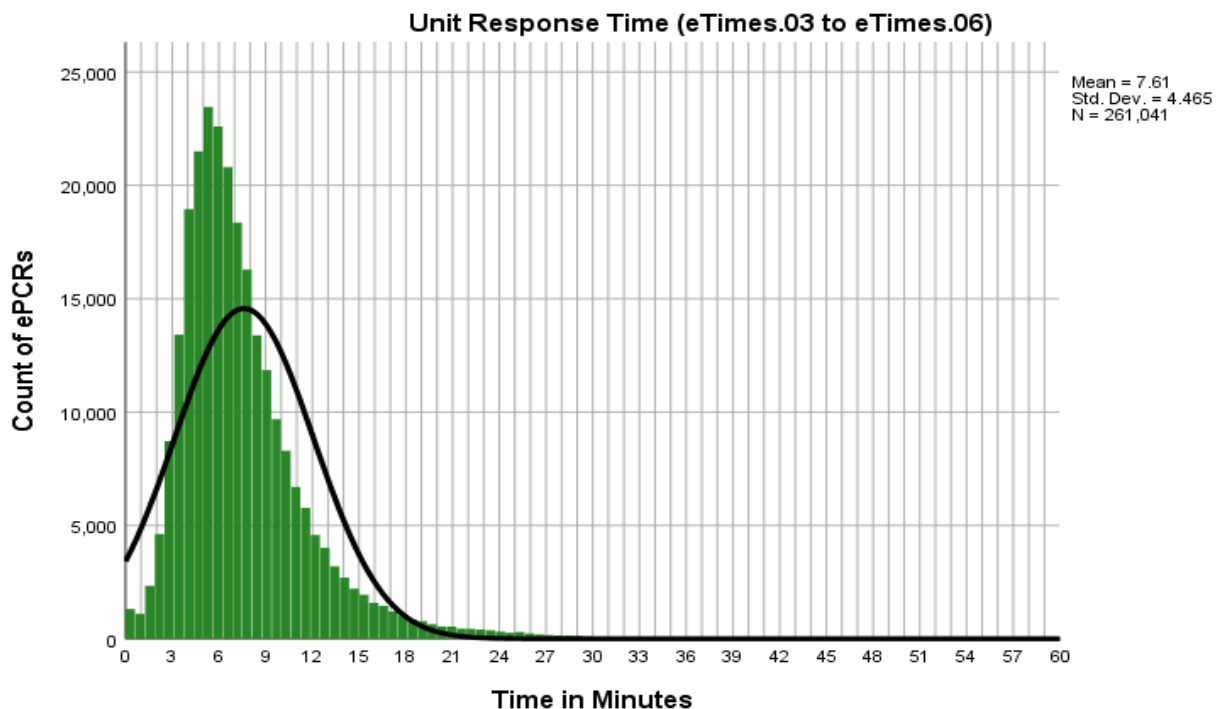
Total Prehospital Interval – eTimes.01 to eTimes.11 begins when a 911 call is made to a public safety answering point (PSAP) requesting an EMS unit response and ends when the responding EMS unit arrives with the patient at the hospital or alternate destination.



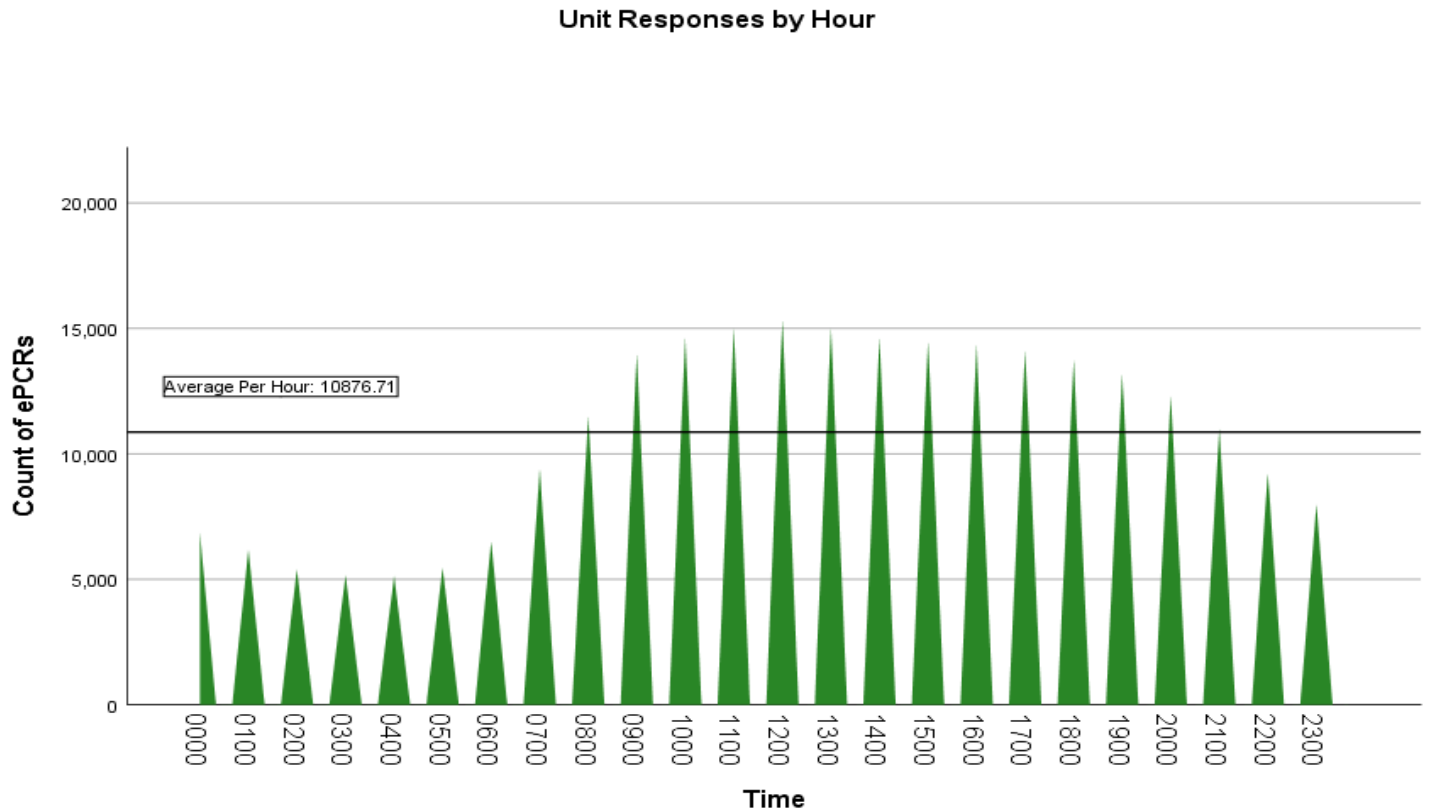
Total Response Time – eTimes.01 to eTimes.07 begins when a 911 call is made to a public safety answering point (PSAP) requesting an EMS unit response and ends when the responding EMS unit arrive at the patient's side.



Unit Response Time – eTimes.03 to eTimes.06 begins when the responding EMS unit is notified by dispatch and ends when the responding EMS unit arrives on the scene.



Unit Responses by Hour shows call volumes by time of day and indicates which hours are busiest on average. It contains ePCR data for the entire 2018 year.



Time Interval Analysis

The tables below contain time interval statistics for all fire department and transport agencies providing 911 services in Riverside County. The intervals are listed at the top of the tables along with their corresponding NEMSIS 3.4 timestamps.

Statistics Definitions Used

- **N Total** is the total number of ePCRs.
- **N Valid** is the number of cases which met criteria for the time interval analysis.
- **N Missing** is the number of cases excluded from the **N Valid** cases for calculation of the time interval. These exclusions are due to incorrect or missing data points.
- **Mean** represents the average of the data in minutes.
- **Median** represents the midpoint in the data in minutes.
- **Standard Deviation (Std. Deviation)** measures distribution of the data in minutes.
- **90th Percentile (Percentile 90)** represents time in minutes at which 90% of the responses fall under.

Total Response Time

Table I. Time interval statistics from *dispatch to hospital arrival* (a) and from *dispatch to patient contact* (b) for all fire departments and transport agencies providing 911 services in Riverside County. The intervals are listed at the top of the tables along with their corresponding NEMIS 3.4 timestamps.

All 911 Agencies		Alarm Answering/Alarm Transfer Time (eTimes.01 to eTimes.02)	Alarm Handling Time (eTimes.01 to eTimes.03)	Alarm Processing Time (eTimes.02 to eTimes.03)	Turnout Time (eTimes.03 to eTimes.05)	Travel Time (eTimes.05 to eTimes.06)	Intervention Time (eTimes.06 to eTimes.07)	Unit Response Time (eTimes.03 to eTimes.06)	Total Response Time (eTimes.01 to eTimes.07)
Total		373,169	373,169	373,169	373,169	373,169	373,169	373,169	373,169
N	Valid	239,364	260,871	261,041	261,041	261,041	261,038	261,041	261,041
	Missing	21,677	170	0	0	0	3	0	0
Mean		0.69	1.44	0.84	0.97	6.64	1.70	7.61	10.75
Median		0.00	0.48	0.28	0.70	5.58	1.15	6.62	9.58
Std. Deviation		1.29	2.73	2.51	1.00	4.48	2.09	4.47	5.70
Percentiles 90		2.40	3.22	1.35	2.13	11.82	3.00	12.67	16.70

All 911 Agencies		Total On Scene Time (eTimes.06 to eTimes.09)	Total Time On Scene With Patient (eTimes.07 to eTimes.09)	Arrived On Scene To Arrived At Destination Time (eTimes.06 to eTimes.11)	Transport Time (eTimes.09 to eTimes.11)	Unit Prehospital Time With Patient (eTimes.07 to eTimes.11)	Total Unit Prehospital Time (eTimes.03 to eTimes.11)	Total Prehospital Time (eTimes.01 to eTimes.11)
Total		373,169	373,169	373,169	373,169	373,169	373,169	373,169
N	Valid	160,444	160,444	156,400	156,385	156,396	156,401	156,401
	Missing	100,597	100,597	104,641	104,656	104,645	104,640	104,640
Mean		14.79	13.11	29.02	14.34	27.34	37.59	38.83
Median		13.70	12.02	27.12	12.40	25.48	35.47	36.52
Std. Deviation		7.14	6.96	11.89	9.27	11.71	13.50	13.88
Percentiles 90		23.37	21.55	43.18	25.15	41.32	53.77	55.35

Total Response Time by Agency Type

Table III. Time interval statistics from *dispatch to patient contact* for all *transport agencies* providing 911 services in Riverside County. The intervals are listed at the top of the tables along with their corresponding NEMSIS 3.4 timestamps.

Transport Agencies		Alarm Answering/ Alarm Transfer Time (eTimes.01 to eTimes.02)	Alarm Handling Time (eTimes.01 to eTimes.03)	Alarm Processing Time (eTimes.02 to eTimes.03)	Turnout Time (eTimes.03 to eTimes.05)	Travel Time (eTimes.05 to eTimes.06)	Intervention Time (eTimes.06 to eTimes.07)	Unit Response Time (eTimes.03 to eTimes.06)	Total Response Time (eTimes.01 to eTimes.07)
N	Total	174,904	174,904	174,904	174,904	174,904	174,904	174,904	174,904
	Valid	150,243	150,257	150,287	150,287	150,287	150,286	150,287	150,287
	Missing	44	30	0	0	0	1	0	0
Mean		0.00	1.05	1.05	0.62	8.03	1.69	8.65	11.38
Median		0.00	0.30	0.30	0.35	6.97	1.07	7.57	9.85
Std. Deviation		0.18	3.14	3.14	0.89	4.99	2.10	5.09	6.55
Percentiles 90		0.00	1.77	1.75	1.38	13.85	3.00	14.57	18.67

Table IV. Time interval statistics from *dispatch to patient contact* for all *fire departments* providing 911 services in Riverside County. The intervals are listed at the top of the tables along with their corresponding NEMSIS 3.4 timestamps.

First Response Agencies		Alarm Answering/ Alarm Transfer Time (eTimes.01 to eTimes.02)	Alarm Handling Time (eTimes.01 to eTimes.03)	Alarm Processing Time (eTimes.02 to eTimes.03)	Turnout Time (eTimes.03 to eTimes.05)	Travel Time (eTimes.05 to eTimes.06)	Intervention Time (eTimes.06 to eTimes.07)	Unit Response Time (eTimes.03 to eTimes.06)	Total Response Time (eTimes.01 to eTimes.07)
N	Total	198,265	198,265	198,265	198,265	198,265	198,265	198,265	198,265
	Valid	89,121	110,614	110,754	110,754	110,754	110,752	110,754	110,754
	Missing	21,633	140	0	0	0	2	0	0
Mean		1.86	1.98	0.55	1.44	4.76	1.72	6.20	9.89
Median		1.87	1.97	0.28	1.33	4.28	1.23	5.73	9.30
Std. Deviation		1.50	1.91	1.14	0.94	2.72	2.07	2.90	4.12
Percentiles 90		3.18	3.62	1.12	2.55	7.88	3.12	9.57	14.28

Total Response Time *by Agency*

Table V. *Total Response Time – eTimes.01 to eTimes.07* begins when a 911 call is made to a public safety answering point (PSAP) requesting EMS services and ends when the responding EMS unit arrive at the patient's side. The tables below show Total Response Times by each agency providing 911 services in Riverside County. One agency has been excluded from the analysis due to all of their ePCRs missing required timestamps. A 90th percentile was not calculated for one agency due to a low volume of ePCRs.

Total Response Time (eTimes.01 to eTimes.07)	Agency 1	Agency 2	Agency 3	Agency 4	Agency 5
Mean	11.7	10.42	11.62	7.31	11.1
Median	9.33	8.83	10.32	6.63	10.4
Std. Deviation	7.94	6.49	6.18	3.5	3.98
90 th Percentiles	21.85	16.85	18.65	10.53	15.2

Total Response Time (eTimes.01 to eTimes.07)	Agency 6	Agency 7	Agency 8	Agency 9	Agency 10
Mean	10.64	8.8	8.59	7.77	8.57
Median	9.95	8.52	8.1	7.33	7.8
Std. Deviation	4.42	2.67	3.17	2.8	3.97
90 th Percentiles	15.26	11.5	12.03	10.85	12.39

Total Response Time (eTimes.01 to eTimes.07)	Agency 11	Agency 12	Agency 13	Agency 14	Agency 15
Mean	11.59	5.31	12.01	10.73	9.94
Median	10.82	6.28	11.9	9.63	9.22
Std. Deviation	4.10	2.03	3.35	4.59	2.94
90 th Percentiles	16.56		15.49	16.69	15.33