



I-95 Corridor Coalition

I-95 Corridor Coalition Vehicle Probe Project: Validation of INRIX Data

Monthly Report: New Jersey



December 2013

I-95 CORRIDOR COALITION VEHICLE PROBE PROJECT VALIDATION OF INRIX DATA DECEMBER 2013

Monthly Report

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December 2013

Evaluation Results for the State of New Jersey

Executive Summary

The data from the Vehicle Probe Project is validated using Bluetooth™ Traffic Monitoring (BTM) technology on a near monthly basis. BTM sensors were deployed at the beginning and ending points of five segments along the US-1 corridor, four segments along the NJ-42 corridor, and five segments along the US-130 corridor, for both directions. The Bluetooth sensor deployment covers the range from US-1 Bus/Brunswick Pike to Scudders Mill Rd along US-1, the range from US-322/CR-536 Spur/Sicklerville Rd to NJ-168/Atlantic City Expy along NJ-42, and the range from New Albany Rd/Taylors Ln to NJ-413/Keim Blvd/Washington Ave along US-130. Travel time data was collected for both directions along the arterials from September 10, 2013 through September 24, 2013. The dataset collected represents approximately 4,437 hours of observations along 14 arterial segments, totaling approximately 41 miles. The number of effective five-minute travel time samples observed was 53,241 in total.

ES Table 1 summarizes the results of the comparison between the validation data and the INRIX data for arterial segments during the above noted periods. As shown, the average absolute speed error (AASE) were within specification in all speed bins. Speed Error Bias (SEB) were within specification in all speed bins except for the 0-15 MPH category. Even when errors are measured against the mean (rather than the SEM band), INRIX data quality meets this contract quality standard for the AASE.

ES Table 1 – New Jersey Evaluation Summary for Arterial						
Speed Bin	Absolute Speed Error (<10mph)		Speed Error Bias (<5mph)		Number of 5 Minute Samples	Hours of Data Collection
	Comparison with SEM Band	Comparison with Mean	Comparison with SEM Band	Comparison with Mean		
0-15 MPH	5.7	9.9	5.7	9.6	515	42.9
15-25 MPH	4.6	9.6	4.5	9.4	4047	337.3
25-35 MPH	3.3	7.7	3.1	7.0	9725	810.4
>35 MPH	2.0	5.9	-1.1	-2.6	38954	3246.2
All Speeds	2.0	6.0	-1.0	-2.3	53241	4436.8

Based upon data collected from September 10, 2013 through September 24, 2013 across 40.9 miles of roadway.

As part of the on-going validation process, vehicle probe data from each state is validated on a rotating basis. This is the 11th time that data has been validated in New Jersey. As additional validation is performed, a summary of the cumulative validation effort will be provided.

Data Collection

The data from the Vehicle Probe Project is validated using Bluetooth™ Traffic Monitoring (BTM) technology on a near monthly basis. BTM sensors were deployed at the beginning and ending points of five (5) segments along the US-1 corridor, four (4) segments along the NJ-42 corridor, and five (5) segments along the US-130 corridor. The Bluetooth sensor deployment covers the range from US-1 Bus/Brunswick Pike to Scudders Mill Rd along US-1, the range from US-322/CR-536 Spur/Sicklerville Rd to NJ-168/Atlantic City Expy along NJ-42, and the range from New Albany Rd/Taylor's Ln to NJ-413/Keim Blvd/Washington Ave along US-130. Travel time data was collected for both directions along the arterials from September 10, 2013 through September 24, 2013, with the assistance of New Jersey Department of Transportation (NJDOT) personnel. This round of data collection in New Jersey was designed to capture the traffic data on a sample of arterials anticipated to have significant traffic. Segment locations are chosen with a high-likelihood of observing recurrent and non-recurrent congestion during peak or off-peak periods.

Figures 1, 2, and 3 presents an overview snapshot of the roadway segments, over which Bluetooth sensors were deployed along the US-1, NJ-42, and US-130 corridor in New Jersey. Blue segments represent arterial segments selected for analysis.

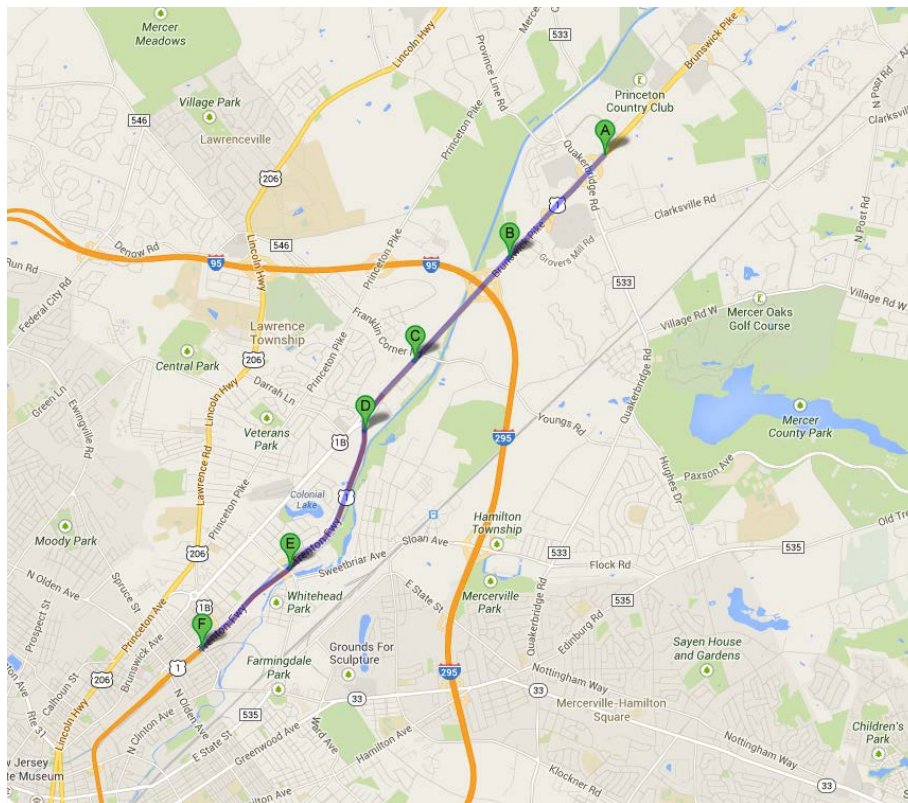


Figure 1 — Locations of segments US-1 corridor selected for analysis in New Jersey

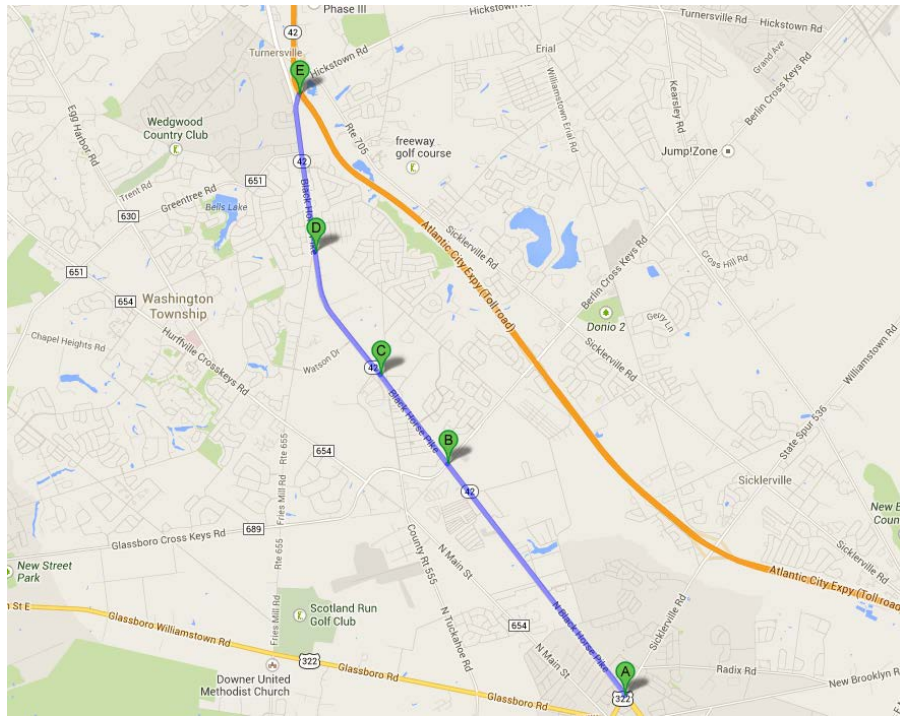


Figure 2 — Locations of segments NJ-42 corridor selected for analysis in New Jersey

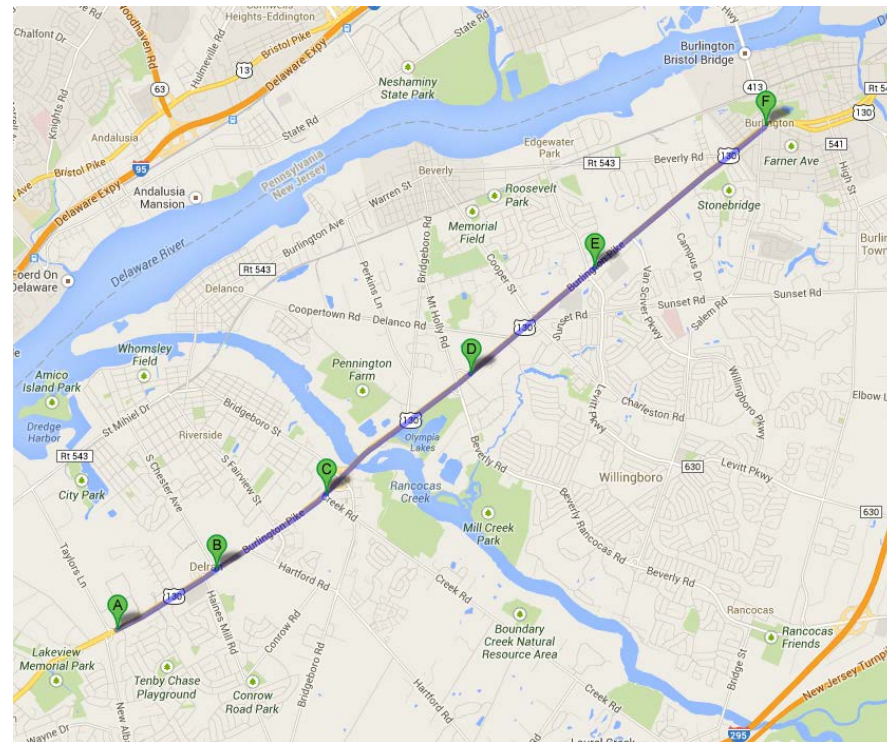


Figure 3 — Locations of segments US-130 corridor selected for analysis in New Jersey

TMC segments selected for validation in New Jersey

Table 1 presents a list of data collection segments in New Jersey. In total, these segments cover a length of 40.9 arterial miles. Data collection segments are comprised of one or more Traffic Message Channel (TMC) base segments, such that total length of the data collection segment is one mile long or greater on the arterial. When appropriate, consecutive TMC segments are combined to form a data collection segment longer than one mile. The results of validation performed on the 14 arterial segments for both directions are included in this report. Table 1 contains summary information on each data collection segment. The latitude/longitude coordinates of the locations at which the Bluetooth sensors were deployed throughout the state of New Jersey are provided in Table 1 as well as an active map link to view the data collection segment in detail. Click on the map link to see a detailed map for the respective data collection segment. It should be noted that the configuration of test segments is often such that the endpoint of one segment coincides with the start point of the next segment, so that one Bluetooth sensor covers both data collection segments.

Table 1 also provides data on the precise length of the TMCs comprising the test segment as compared to the measured length between BluetoothTM Traffic Monitoring (BTM) sensors placed on the roadway. Details of the algorithm used to estimate equivalent path travel times based on INRIX data feeds for individual data collection segments are provided in a separate report. This algorithm finds an equivalent INRIX travel time (and therefore travel speed) corresponding to each sample BTM travel time observation on the test segment of interest.

Table 1
Segments selected for validation in New Jersey

SEGMENT (Map Link)	DESCRIPTION			TMC CODES		Deployment		
	Highway Direction	State County	Starting at Ending at	Begin End	Number Length	Begin Lat/Lon End Lat/Lon	Length % Diff	
Arterial								All Lengths in Miles
A1 NJ11-0003	US-1 Northbound	New Jersey Mercer	US-1 Bus/Brunswick Pike Bakers Basin Rd/Franklin Corner Rd	103P04923 103P04924	3 0.75	40.266831 -74.715116 40.275121 -74.706071	0.74 -1.25%	
A2 NJ11-0004	US-1 Northbound	New Jersey Mercer	Bakers Basin Rd/Franklin Corner Rd I-295/I-95	103+04925 103P04925	2 1.13	40.275121 -74.706071 40.287159 -74.691516	1.12 -1.08%	
A3 NJ11-0005	US-1 Northbound	New Jersey Mercer	I-295/I-95 Quakerbridge Rd	103+04926 103P04926	2 1.16	40.287159 -74.691516 40.299465 -74.676541	1.12 -3.52%	
A4 NJ11-0006	US-1 Northbound	New Jersey Mercer	Quakerbridge Rd Washington Rd	103+04927 103+04927	1 2.98	40.299465 -74.676541 40.331238 -74.638209	3.01 0.85%	
A5 NJ11-0007	US-1 Northbound	New Jersey Mercer	Washington Rd Scudders Mill Rd	103P04927 120+07572	3 1.19	40.331238 -74.638209 40.341726 -74.62577	0.99 -16.94%	
A6 NJ11-0008	US-1 Southbound	New Jersey Mercer	Scudders Mill Rd Washington Rd	120-07571 103N04927	3 0.98	40.341726 -74.62577 40.331313 -74.63833	1.00 2.25%	
A7 NJ11-0009	US-1 Southbound	New Jersey Mercer	Washington Rd Quakerbridge Rd	103-04926 103-04926	1 2.77	40.331313 -74.63833 40.301833 -74.673974	3.01 8.59%	
A8 NJ11-0010	US-1 Southbound	New Jersey Mercer	Quakerbridge Rd I-295/I-95	103N04926 103-04925	2 1.29	40.301833 -74.673974 40.288112 -74.69056	1.12 -13.29%	
A9 NJ11-0011	US-1 Southbound	New Jersey Mercer	I-295/I-95 Bakers Basin Rd/Franklin Corner Rd	103N04925 103-04924	2 1.15	40.288112 -74.69056 40.275853 -74.70534	1.12 -2.73%	
A10 NJ11-0012	US-1 Southbound	New Jersey Mercer	Bakers Basin Rd/Franklin Corner Rd US-1 Bus/Brunswick Pike	103N04924 103N04923	3 0.82	40.275853 -74.70534 40.266777 -74.71524	0.74 -9.76%	

Table 1 (Cont'd)
Segments selected for validation in New Jersey

SEGMENT (Map Link)	DESCRIPTION			TMC CODES		Deployment		
	Highway Direction	State County	Starting at Ending at	Begin End	Number Length	Begin Lat/Lon End Lat/Lon	Length % Diff	
Arterial								All Lengths in Miles
A11 NJ11-0015	NJ-42 Northbound	New Jersey Gloucester	US-322/CR-536 Spur/Sicklerville Rd CR-689/Cross Keys Berlin Rd	103+09624 103+09624	1 2.62	39.689482 -74.992874 39.71951 -75.022849	2.64 0.90%	
A12 NJ11-0016	NJ-42 Northbound	New Jersey Gloucester	CR-689/Cross Keys Berlin Rd Tuckahoe Rd/Stagecoach Rd	103+09625 103P09625	2 0.96	39.71951 -75.022849 39.730577 -75.033837	0.89 -7.53%	
A13 NJ11-0017	NJ-42 Northbound	New Jersey Gloucester	Tuckahoe Rd/Stagecoach Rd Fries Mill Rd	103+09626 103+09626	1 1.33	39.730577 -75.033837 39.747184 -75.045213	1.38 3.62%	
A14 NJ11-0018	NJ-42 Northbound	New Jersey Gloucester	Fries Mill Rd NJ-168/Atlantic City Expy	103P09626 103+04295	3 1.33	39.747184 -75.045213 39.766269 -75.048378	1.36 2.38%	
A15 NJ11-0019	NJ-42 Southbound	New Jersey Gloucester	NJ-168/Atlantic City Expy Fries Mill Rd	103-09627 103N09626	3 1.37	39.766772 -75.048833 39.74704 -75.045339	1.35 -1.76%	
A16 NJ11-0020	NJ-42 Southbound	New Jersey Gloucester	Fries Mill Rd Tuckahoe Rd/Stagecoach Rd	103-09625 103-09625	1 1.33	39.74704 -75.045339 39.730493 -75.033947	1.38 3.93%	
A17 NJ11-0021	NJ-42 Southbound	New Jersey Gloucester	Tuckahoe Rd/Stagecoach Rd CR-689/Cross Keys Berlin Rd	103N09625 103-09624	2 0.96	39.730493 -75.033947 39.719404 -75.022965	0.89 -7.61%	
A18 NJ11-0022	NJ-42 Southbound	New Jersey Gloucester	CR-689/Cross Keys Berlin Rd US-322/CR-536 Spur/Sicklerville Rd	103-09628 103-09628	1 2.62	39.719404 -75.022965 39.689347 -74.992983	2.64 0.85%	

Table 1 (Cont'd)
Segments selected for validation in New Jersey

SEGMENT (Map Link)	DESCRIPTION			TMC CODES		Deployment		
	Highway Direction	State County	Starting at Ending at	Begin End	Number Length	Begin Lat/Lon End Lat/Lon	Length % Diff	
Arterial								All Lengths in Miles
A19 NJ11-0023	US-130 Northbound	New Jersey Burlington	New Albany Rd/Taylor's Ln S Chester Ave	103+05929 103P05929	2 1.06	40.007586 -74.972077 40.015469 -74.954929	1.06 -0.08%	
A20 NJ11-0024	US-130 Northbound	New Jersey Burlington	S Chester Ave Bridgeboro St	103+05930 103+05930	1 1.13	40.015469 -74.954929 40.024761 -74.937394	1.13 -0.08%	
A21 NJ11-0025	US-130 Northbound	New Jersey Burlington	Bridgeboro St Beverly Rancocas Rd/Mount Holly Rd	103P05930 103P05930	3 1.51	40.024761 -74.937394 40.038678 -74.915634	1.51 0.31%	
A22 NJ11-0026	US-130 Northbound	New Jersey Burlington	Beverly Rancocas Rd/Mount Holly Rd CR-629/Levitt Pkwy	103+05932 103P05933	3 1.47	40.038678 -74.915634 40.052395 -74.894477	1.46 -0.53%	
A23 NJ11-0027	US-130 Northbound	New Jersey Burlington	CR-629/Levitt Pkwy NJ-413/Keim Blvd/Washington Ave	103+05934 103+05934	1 2.03	40.052395 -74.894477 40.071068 -74.864916	2.02 -0.56%	
A24 NJ11-0028	US-130 Southbound	New Jersey Burlington	NJ-413/Keim Blvd/Washington Ave CR-629/Levitt Pkwy	103-05933 103-05933	1 1.93	40.070981 -74.865755 40.053057 -74.893664	2.02 4.73%	
A25 NJ11-0029	US-130 Southbound	New Jersey Burlington	CR-629/Levitt Pkwy Beverly Rancocas Rd/Mount Holly Rd	103N05933 103-05931	3 1.38	40.053057 -74.893664 40.040146 -74.913531	1.46 5.83%	
A26 NJ11-0030	US-130 Southbound	New Jersey Burlington	Beverly Rancocas Rd/Mount Holly Rd Bridgeboro St	103N05931 103N05930	3 1.63	40.040146 -74.913531 40.025123 -74.937124	1.51 -7.30%	
A27 NJ11-0031	US-130 Southbound	New Jersey Burlington	Bridgeboro St S Chester Ave	103-05929 103-05929	1 1.16	40.025123 -74.937124 40.015558 -74.955012	1.13 -2.39%	
A28 NJ11-0032	US-130 Southbound	New Jersey Burlington	S Chester Ave New Albany Rd/Taylor's Ln	103N05929 103-07021	2 1.00	40.015558 -74.955012 40.008073 -74.971146	1.06 5.95%	

Analysis of Arterial Results

Table 2 summarizes the data quality measures obtained as a result of comparison between Bluetooth and all reported INRIX speeds. Specifications include the Average Absolute Speed Error (AASE) and the Speed Error Bias (SEB).

Average Absolute Speed Error (AASE)

The AASE is defined as the mean absolute value of the difference between the mean speed reported from the VPP and the ground truth mean speed for a specified time period. The AASE is the primary accuracy metric. Based on the contract specifications, the speed data from the VPP shall have a maximum average absolute error of 10 miles per hour (MPH) in each of four speed ranges: 0-15 MPH, 15-25 MPH, 25-35 MPH, and > 35 MPH.

Speed Error Bias (SEB)

The SEB is defined as the average speed error (not the absolute value) in each speed range. SEB is a measure of whether the speed reported in the VPP consistently under or over estimates speed as compared to ground truth speed. Based on the contract specifications, the VPP data shall have a maximum SEB of +/- 5 MPH in each of speed ranges as defined above.

The results are presented as compared against the mean of the ground truth data as well as the 95th percent confidence interval for the mean, referred to as the Standard Error of the Mean (SEM) band. The SEM band takes into account any uncertainty in the ground truth speed as measured by BTM equipment due to limited samples and/or data variance. Contract specifications are assessed against the SEM band. (See the *Vehicle Probe Project: Data Use and Application Guide* for additional details on the validation process.) The AASE in the lower two speed bands have proven to be the critical specification (and most difficult) to attain, and are highlighted in Table 2. AASE below 10 MPH meet contract specifications. SEB below 5 MPH are considered exceptional quality. As shown, the speed error bias (SEB) was within specification for speed bins 15-25 MPH, 25-35 MPH, and > 35 MPH. SEB for speed bin 0-15 MPH falls out of the specifications by a small margin.

TABLE 2
Data quality measures for arterial segments in New Jersey.

SPEED BIN	Data Quality Measures for				No. of 5 Minute Samples	Hours of Data Collection
	1.96 SEM Band		Mean			
	SEB	AASE	SEB	AASE		
	5 mph	10 mph				
(contract specifications)						
0-15	5.7	5.7	9.6	9.9	515	42.9
15-25	4.5	4.6	9.4	9.6	4047	337.3
25-35	3.1	3.3	7.0	7.7	9725	810.4
35+	-1.1	2.0	-2.6	5.9	38954	3246.2

Table 3 shows the percentage of the time INRIX data falls within 5 mph of the SEM band and the mean for each speed bin for all arterial data segments in New Jersey.

Table 3
Percent observations meeting data quality criteria for arterial segments in New Jersey

SPEED BIN	Data Quality Measures for				No. of Obs.
	1.96 SEM Band		Mean		
	Percentage falling inside the band	Percentage falling within 5 mph of the band	Percentage equal to the mean	Percentage within 5 mph of the mean	
0-15	19%	54%	0%	36%	515
15-25	24%	62%	0%	31%	4047
25-35	42%	73%	0%	36%	9725
35+	58%	85%	0%	55%	38954

Tables 4 and 5 present detailed data for individual TMC segments in New Jersey in a similar format as Tables 2 and 3, respectively. Note that for some segments and in some speed bins the comparison results may not be reliable due to small number of observations.

Table 4
Data quality measures for individual arterial validation segments
in the state of New Jersey

TMC	Standard TMC length	Bluetooth distance	SPEED BIN	Data Quality Measures for				No. of Obs.
				1.96 SEM Band		Mean		
				Speed Error Bias	Average Absolute Speed Error	Speed Error Bias	Average Absolute Speed Error	
NJ11-0003	0.75	0.74	0-15	2.8	2.9	3.9	4.8	134
			15-25	4.5	4.5	9.0	9.7	107
			25-35	2.0	2.0	8.9	10.1	150
			35+	-6.2	6.3	-13.3	14.3	2133
NJ11-0004	1.13	1.12	0-15	-	-	-	-	-
			15-25	9.2	9.2	28.0	28.0	2*
			25-35	2.8	2.8	19.0	19.0	10*
			35+	-0.1	1.0	-0.3	3.7	2727
NJ11-0005	1.16	1.12	0-15	-	-	-	-	-
			15-25	3.9	4.3	4.0	5.4	5*
			25-35	1.4	2.6	7.2	9.1	20*
			35+	-0.8	1.2	-2.4	4.1	2328
NJ11-0006	2.98	3.01	0-15	-	-	-	-	-
			15-25	3.3	3.6	4.0	4.5	129
			25-35	4.1	4.2	5.9	6.3	156
			35+	-0.5	1.6	-1.3	4.3	2108
NJ11-0007	1.19	0.99	0-15	5.9	5.9	6.9	6.9	4*
			15-25	8.2	8.2	9.8	9.8	376
			25-35	6.4	6.4	10.6	10.8	1229
			35+	-0.1	1.8	1.1	6.6	1497
NJ11-0008	0.98	1	0-15	2.5	2.6	3.3	3.5	55
			15-25	5.0	5.1	6.7	7.0	861
			25-35	5.2	5.6	8.1	9.1	1226
			35+	0.8	2.3	2.2	6.3	1080
NJ11-0009	2.77	3.01	0-15	2.8	2.9	3.4	3.7	17*
			15-25	3.2	3.4	5.0	5.4	101
			25-35	2.5	2.8	7.8	9.1	109
			35+	-1.3	2.1	-2.3	4.9	2196
NJ11-0010	1.29	1.12	0-15	-	-	-	-	-
			15-25	0.9	1.7	1.6	3.3	130
			25-35	0.0	2.2	0.2	4.1	133
			35+	0.1	1.4	-0.2	4.4	2239
NJ11-0011	1.15	1.12	0-15	3.4	3.4	4.0	4.0	14*
			15-25	7.9	8.1	10.9	11.2	31
			25-35	6.6	6.6	12.2	12.5	112
			35+	0.6	1.5	1.9	5.2	2400
NJ11-0012	0.82	0.74	0-15	-	-	-	-	-
			15-25	-	-	-	-	-
			25-35	0.7	0.7	12.7	13.5	10*
			35+	-4.2	4.3	-10.7	11.3	2568

*Results in the specified row may not be reliable due to small number of observations

Table 4 (Cont'd)
Data quality measures for individual arterial validation segments
in the state of New Jersey

TMC	Standard TMC length	Bluetooth distance	SPEED BIN	Data Quality Measures for				No. of Obs.
				1.96 SEM Band		Mean		
				Speed Error Bias	Average Absolute Speed Error	Speed Error Bias	Average Absolute Speed Error	
NJ11-0015	2.62	2.64	0-15	-	-	-	-	-
			15-25	3.5	3.5	20.5	20.5	28*
			25-35	1.0	1.0	11.6	11.6	68
			35+	-1.5	1.6	-3.1	4.6	730
NJ11-0016	0.96	0.89	0-15	16.9	16.9	28.5	28.5	8*
			15-25	7.1	7.1	19.6	19.6	83
			25-35	2.4	2.4	10.0	10.0	350
			35+	-0.5	1.0	-0.8	4.6	563
NJ11-0017	1.33	1.38	0-15	-	-	-	-	-
			15-25	3.6	3.6	17.3	17.3	21*
			25-35	0.9	0.9	11.4	11.4	47
			35+	-2.1	2.3	-5.8	6.7	1525
NJ11-0018	1.33	1.36	0-15	8.0	8.0	16.8	16.8	47
			15-25	3.8	3.8	9.5	9.6	384
			25-35	0.5	0.8	1.6	3.9	628
			35+	-1.9	2.0	-5.5	6.0	240
NJ11-0019	1.37	1.35	0-15	5.4	5.4	10.2	10.2	183
			15-25	3.0	3.0	6.2	6.5	787
			25-35	0.8	1.1	2.6	3.9	720
			35+	-0.4	0.9	-1.4	3.2	130
NJ11-0020	1.33	1.38	0-15	25.4	25.4	30.0	30.0	7*
			15-25	3.9	3.9	19.7	19.7	100
			25-35	2.1	2.1	11.2	11.2	183
			35+	-1.4	1.6	-3.4	5.4	1235
NJ11-0021	0.96	0.89	0-15	14.4	14.4	23.9	23.9	13*
			15-25	4.5	4.5	16.1	16.1	122
			25-35	0.9	0.9	6.5	7.3	286
			35+	-1.4	1.6	-4.5	5.9	532
NJ11-0022	2.62	2.64	0-15	25.5	25.5	31.7	31.7	3*
			15-25	2.7	2.7	20.3	20.3	42
			25-35	0.8	0.8	13.8	13.8	67
			35+	-1.8	2.1	-3.9	5.7	558

*Results in the specified row may not be reliable due to small number of observations

Table 4 (Cont'd)
Data quality measures for individual arterial validation segments
in the state of New Jersey

TMC	Standard TMC length	Bluetooth distance	SPEED BIN	Data Quality Measures for				No. of Obs.
				1.96 SEM Band		Mean		
				Speed Error Bias	Average Absolute Speed Error	Speed Error Bias	Average Absolute Speed Error	
NJ11-0023	1.06	1.06	0-15	10.9	10.9	18.6	18.6	26*
			15-25	4.9	4.9	10.7	10.8	339
			25-35	1.6	1.8	4.3	5.3	1025
			35+	-1.2	1.4	-4.4	5.8	835
NJ11-0024	1.13	1.13	0-15	-	-	-	-	-
			15-25	4.1	4.1	20.2	20.2	60
			25-35	1.5	1.5	10.1	10.3	198
			35+	-1.0	1.5	-1.9	4.8	1792
NJ11-0025	1.51	1.51	0-15	-	-	-	-	-
			15-25	3.6	3.6	19.8	19.8	4*
			25-35	4.7	4.7	10.5	10.5	86
			35+	-0.4	1.9	-1.3	5.7	1796
NJ11-0026	1.47	1.46	0-15	-	-	-	-	-
			15-25	5.4	5.4	17.9	17.9	46
			25-35	4.5	4.5	8.2	8.4	482
			35+	-0.3	0.9	0.2	4.5	621
NJ11-0027	2.03	2.02	0-15	20.0	20.0	28.5	28.5	3*
			15-25	4.8	4.8	20.0	20.0	42
			25-35	2.4	2.4	11.6	11.7	122
			35+	-0.4	1.3	-0.3	4.0	843
NJ11-0028	1.93	2.02	0-15	21.1	21.1	29.3	29.3	1*
			15-25	5.1	5.1	21.8	21.8	40
			25-35	3.7	3.8	11.4	11.5	75
			35+	-0.4	1.1	-0.5	4.2	892
NJ11-0029	1.38	1.46	0-15	-	-	-	-	-
			15-25	5.7	5.7	11.5	11.5	1*
			25-35	1.6	1.6	6.5	6.6	72
			35+	-2.1	2.3	-5.1	6.1	1069
NJ11-0030	1.63	1.51	0-15	-	-	-	-	-
			15-25	10.8	10.8	24.3	24.3	1*
			25-35	3.4	3.4	10.1	10.1	77
			35+	0.3	1.2	0.4	4.0	2060
NJ11-0031	1.16	1.13	0-15	-	-	-	-	-
			15-25	9.1	9.1	12.9	13.1	18*
			25-35	3.2	3.3	6.8	7.1	698
			35+	-0.7	1.5	-1.6	5.4	1531
NJ11-0032	1.00	1.06	0-15	-	-	-	-	-
			15-25	5.4	5.4	12.8	12.8	187
			25-35	2.5	2.7	5.6	6.4	1386
			35+	-0.4	1.6	-0.6	4.5	726

Table 5
Observations meeting data quality criteria for individual arterial validation segments
in the state of New Jersey

TMC	SPEED BIN	Data Quality Measures for								No. of Obs.
		1.96 SEM Band				Mean				
		Speed Error Bias		Average Absolute Speed Error		Speed Error Bias		Average Absolute Speed Error		
		No. falling inside the band	% falling inside the band	No. falling within 5 mph of the band	% falling within 5 mph of the band	No. equal to the mean	% equal to the mean	No. within 5 mph of the mean	% within 5 mph of the mean	
NJ11-0003	0-15	56	42%	110	82%	0	0%	91	68%	134
	15-25	43	40%	74	69%	0	0%	36	34%	107
	25-35	94	63%	125	83%	0	0%	38	25%	150
	35+	847	40%	1200	56%	0	0%	338	16%	2133
NJ11-0004	0-15	-	-	-	-	-	-	-	-	-
	15-25	0	0%	1	50%	0	0%	0	0%	2*
	25-35	3	30%	8	80%	0	0%	0	0%	10*
	35+	1744	64%	2564	94%	0	0%	1979	73%	2727
NJ11-0005	0-15	-	-	-	-	-	-	-	-	-
	15-25	2	40%	4	80%	0	0%	4	80%	5*
	25-35	6	30%	16	80%	0	0%	10	50%	20*
	35+	1446	62%	2165	93%	5	0%	1601	69%	2328
NJ11-0006	0-15	-	-	-	-	-	-	-	-	-
	15-25	18	14%	99	77%	0	0%	89	69%	129
	25-35	29	19%	109	70%	0	0%	84	54%	156
	35+	1080	51%	1894	90%	1	0%	1357	64%	2108
NJ11-0007	0-15	0	0%	1	25%	0	0%	1	25%	4*
	15-25	9	2%	128	34%	0	0%	75	20%	376
	25-35	233	19%	560	46%	0	0%	218	18%	1229
	35+	950	63%	1295	87%	0	0%	650	43%	1497
NJ11-0008	0-15	14	25%	47	85%	0	0%	42	76%	55
	15-25	136	16%	498	58%	0	0%	392	46%	861
	25-35	262	21%	629	51%	0	0%	333	27%	1226
	35+	578	54%	882	82%	0	0%	531	49%	1080
NJ11-0009	0-15	3	18%	13	76%	0	0%	12	71%	17*
	15-25	26	26%	79	78%	0	0%	71	70%	101
	25-35	35	32%	87	80%	0	0%	48	44%	109
	35+	1008	46%	1886	86%	0	0%	1299	59%	2196
NJ11-0010	0-15	-	-	-	-	-	-	-	-	-
	15-25	51	39%	118	91%	0	0%	102	78%	130
	25-35	41	31%	115	86%	0	0%	97	73%	133
	35+	1321	59%	2030	91%	2	0%	1542	69%	2239
NJ11-0011	0-15	1	7%	12	86%	0	0%	10	71%	14*
	15-25	3	10%	12	39%	0	0%	9	29%	31
	25-35	29	26%	51	46%	0	0%	15	13%	112
	35+	1459	61%	2136	89%	3	0%	1316	55%	2400
NJ11-0012	0-15	-	-	-	-	-	-	-	-	-
	15-25	-	-	-	-	-	-	-	-	-
	25-35	9	90%	9	90%	0	0%	1	10%	10*
	35+	1072	42%	1708	67%	0	0%	551	21%	2568

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Table 5 (Cont'd)
Observations meeting data quality criteria for individual arterial validation segments
in the state of New Jersey

TMC	SPEED BIN	Data Quality Measures for								No. of Obs.
		1.96 SEM Band				Mean				
		Speed Error Bias		Average Absolute Speed Error		Speed Error Bias		Average Absolute Speed Error		
		No. falling inside the band	% falling inside the band	No. falling within 5 mph of the band	% falling within 5 mph of the band	No. equal to the mean	% equal to the mean	No. within 5 mph of the mean	% within 5 mph of the mean	
NJ11-0015	0-15	-	-	-	-	-	-	-	-	-
	15-25	11	39%	20	71%	0	0%	0	0%	28*
	25-35	51	75%	61	90%	0	0%	3	4%	68
	35+	425	58%	637	87%	0	0%	447	61%	730
NJ11-0016	0-15	0	0%	0	0%	0	0%	0	0%	8*
	15-25	19	23%	33	40%	0	0%	0	0%	83
	25-35	190	54%	273	78%	0	0%	27	8%	350
	35+	422	75%	522	93%	0	0%	343	61%	563
NJ11-0017	0-15	-	-	-	-	-	-	-	-	-
	15-25	12	57%	17	81%	0	0%	0	0%	21*
	25-35	33	70%	45	96%	0	0%	3	6%	47
	35+	838	55%	1222	80%	0	0%	684	45%	1525
NJ11-0018	0-15	3	6%	11	23%	0	0%	2	4%	47
	15-25	135	35%	249	65%	0	0%	69	18%	384
	25-35	459	73%	592	94%	1	0%	434	69%	628
	35+	131	55%	204	85%	0	0%	111	46%	240
NJ11-0019	0-15	18	10%	77	42%	0	0%	26	14%	183
	15-25	246	31%	596	76%	0	0%	329	42%	787
	25-35	469	65%	664	92%	2	0%	498	69%	720
	35+	97	75%	124	95%	1	1%	106	82%	130
NJ11-0020	0-15	0	0%	0	0%	0	0%	0	0%	7*
	15-25	38	38%	64	64%	0	0%	0	0%	100
	25-35	104	57%	147	80%	0	0%	12	7%	183
	35+	797	65%	1074	87%	1	0%	675	55%	1235
NJ11-0021	0-15	1	8%	1	8%	0	0%	0	0%	13*
	15-25	50	41%	80	66%	0	0%	0	0%	122
	25-35	217	76%	268	94%	0	0%	106	37%	286
	35+	348	65%	466	88%	0	0%	274	52%	532
NJ11-0022	0-15	0	0%	0	0%	0	0%	0	0%	3*
	15-25	24	57%	32	76%	0	0%	0	0%	42
	25-35	54	81%	63	94%	0	0%	3	4%	67
	35+	322	58%	454	81%	1	0%	289	52%	558

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Table 5 (Cont'd)
Observations meeting data quality criteria for individual arterial validation segments
in the state of New Jersey

TMC	SPEED BIN	Data Quality Measures for								No. of Obs.
		1.96 SEM Band				Mean				
		Speed Error Bias		Average Absolute Speed Error		Speed Error Bias		Average Absolute Speed Error		
		No. falling inside the band	% falling inside the band	No. falling within 5 mph of the band	% falling within 5 mph of the band	No. equal to the mean	% equal to the mean	No. within 5 mph of the mean	% within 5 mph of the mean	
NJ11-0023	0-15	1	4%	6	23%	0	0%	2	8%	26*
	15-25	79	23%	186	55%	0	0%	54	16%	339
	25-35	575	56%	887	87%	1	0%	548	53%	1025
	35+	580	69%	735	88%	0	0%	445	53%	835
NJ11-0024	0-15	-	-	-	-	-	-	-	-	-
	15-25	17	28%	41	68%	0	0%	0	0%	60
	25-35	118	60%	178	90%	0	0%	31	16%	198
	35+	1103	62%	1597	89%	0	0%	1089	61%	1792
NJ11-0025	0-15	-	-	-	-	-	-	-	-	-
	15-25	1	25%	2	50%	0	0%	0	0%	4*
	25-35	23	27%	52	60%	0	0%	11	13%	86
	35+	1084	60%	1518	85%	0	0%	925	52%	1796
NJ11-0026	0-15	-	-	-	-	-	-	-	-	-
	15-25	11	24%	24	52%	0	0%	0	0%	46
	25-35	113	23%	271	56%	0	0%	95	20%	482
	35+	464	75%	576	93%	0	0%	376	61%	621
NJ11-0027	0-15	0	0%	0	0%	0	0%	0	0%	3*
	15-25	10	24%	23	55%	0	0%	1	2%	42
	25-35	56	46%	97	80%	0	0%	9	7%	122
	35+	528	63%	772	92%	0	0%	586	70%	843
NJ11-0028	0-15	0	0%	0	0%	0	0%	0	0%	1*
	15-25	8	20%	22	55%	0	0%	0	0%	40
	25-35	25	33%	51	68%	0	0%	7	9%	75
	35+	570	64%	828	93%	0	0%	589	66%	892
NJ11-0029	0-15	-	-	-	-	-	-	-	-	-
	15-25	0	0%	0	0%	0	0%	0	0%	1*
	25-35	45	63%	63	88%	0	0%	20	28%	72
	35+	568	53%	861	81%	0	0%	502	47%	1069
NJ11-0030	0-15	-	-	-	-	-	-	-	-	-
	15-25	0	0%	0	0%	0	0%	0	0%	1*
	25-35	29	38%	53	69%	0	0%	13	17%	77
	35+	1305	63%	1910	93%	0	0%	1409	68%	2060
NJ11-0031	0-15	-	-	-	-	-	-	-	-	-
	15-25	1	6%	4	22%	0	0%	3	17%	18*
	25-35	254	36%	505	72%	0	0%	246	35%	698
	35+	1023	67%	1346	88%	0	0%	869	57%	1531
NJ11-0032	0-15	-	-	-	-	-	-	-	-	-
	15-25	31	17%	95	51%	0	0%	14	7%	187
	25-35	490	35%	1084	78%	0	0%	561	40%	1386
	35+	418	58%	637	88%	0	0%	457	63%	726