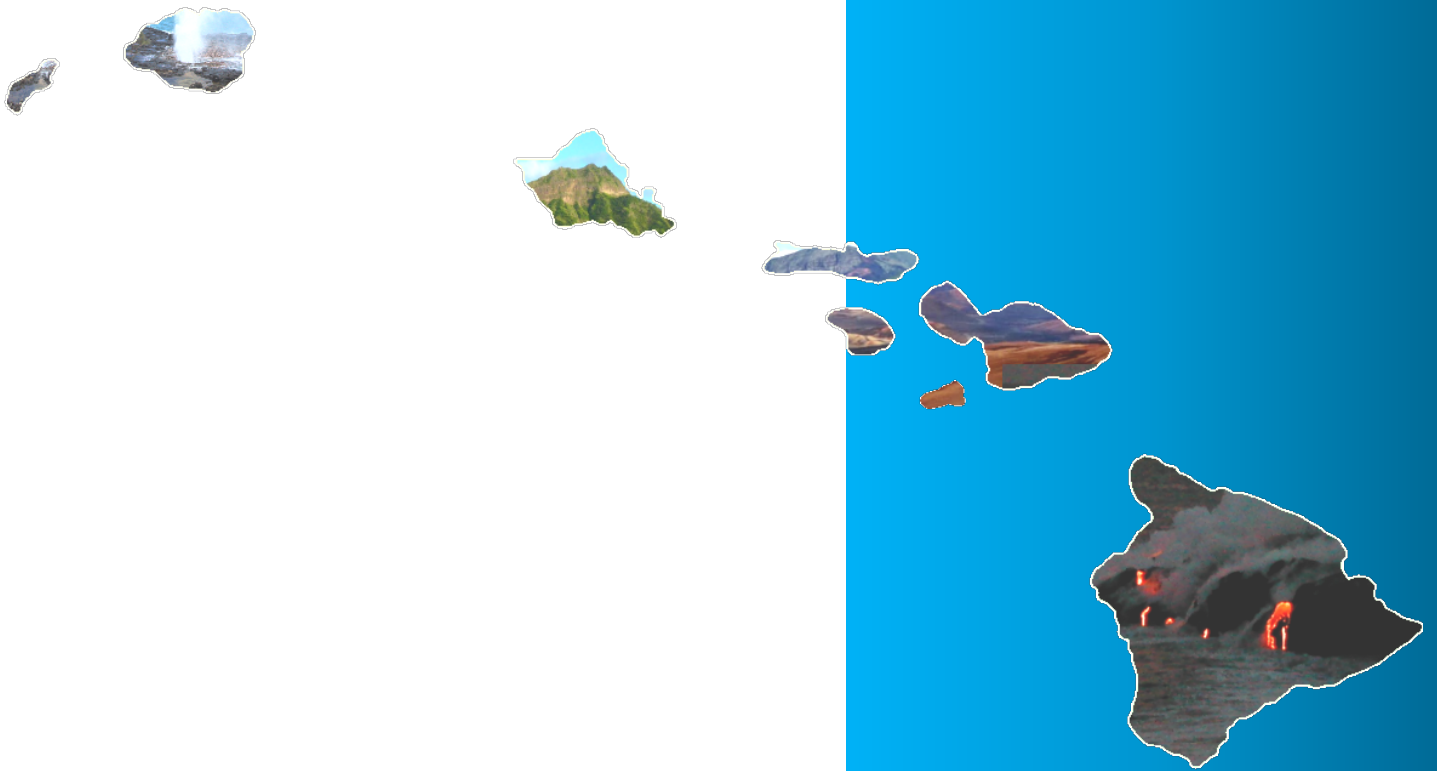




Report on Fixed Wireline Broadband Speeds in Hawaii



Department of Commerce and
Consumer Affairs

State of Hawaii

June 2018

Report on Fixed Wireline Broadband Speeds in Hawaii

Broadband speed data for Hawaii can assist policymakers in understanding the State of Hawaii's evolving broadband picture, thereby enabling more informed policies and strategies to advance the State towards its broadband goals. To help provide this information, the Department of Commerce and Consumer Affairs (DCCA), in addition to participation in the Federal Communications Commission's (FCC) Measuring Broadband America Program, has obtained consumer-initiated fixed wireline speed data for Hawaii from Ookla® the proprietor of Speedtest® and a widely-recognized source for fixed broadband and mobile network testing applications, data, and analysis. Ookla was able to provide significant quantities of Speedtest data for Hawaii from tests that used servers physically located in Hawaii. This data, provided via Ookla's Speedtest Intelligence® data platform (Speedtest Intelligence data), offers insights to help understand the performance of the State's broadband networks and to monitor improvements to those networks over time.¹

The following tables, charts, and maps reflect fixed wireline broadband performance in Hawaii based on DCCA's analysis of the Speedtest Intelligence data. The Speedtest results are generated from fixed wireline tests performed by Internet users in Hawaii from Quarter 3 of 2016 through Quarter 1 of 2018.²

For the State overall, the Speedtest results for December 2016 show a mean of approximately 81 Megabits per second (Mbps) download speed and a median download speed of approximately 53 Mbps. For December 2017, the Speedtest results show increased speeds to approximately 102 Mbps mean download speed and 65 Mbps median download speed.

¹ In using Ookla's Speedtest Intelligence data subscribed for this report, we agree with the benefits and possible limitations of this crowd-sourced data noted by the FCC, International Bureau, in its use of Ookla's Speedtest Intelligence data for its 2018 International Broadband Data Report: "We note that generally, crowd-sourced data (such as Ookla's) can provide the benefit of generating a large volume of data at a very low cost and of measuring actual consumer experience on a network in a wide variety of locations, indoor and outdoor. Crowd-sourced data, however, are often not collected pursuant to statistical sampling techniques, and may require adjustments to construct a representative sample from the raw data. For instance, crowd-sourced mobile data come from a self-selected group of users, and there often is little control for most tests regarding such parameters as when people implement the test, whether the test is performed indoors or outdoors, the geographic location of the tester, and the vintage of the consumer's device." International Comparison Requirements Pursuant to the Broadband Data Improvement Act, International Broadband Data Report, GN Docket No. 17-199, DA 18-99, rel. Feb. 2, 2018 at 5, n.28.

² Results of tests from users located outside of the State were not used for this report. The fixed wireline tests may be taken by going to <http://www.speedtest.net/> or by downloading Ookla's Speedtest desktop application.

The following charts, tables, and maps are included in this report:

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Statewide Speeds

This set of tables and charts shows aggregated Speedtest results statewide year-over-year and by quarter.

Aggregated Speedtest Results Year-Over-Year

State Fixed Wireline Speeds – Year-Over-Year (Mbps)*					
Year	Mean†		Median††		Sample Count
	Download	Upload	Download	Upload	
2016	81.11	16.05	53.12	11.56	29,834
2017	101.69	19.68	65.02	11.85	30,070
Total Change	+20.58	+3.63	+11.9	+0.29	
% Change	+25.37%	+22.62%	+22.40%	+2.51%	

*Table compares Speedtest Intelligence data collected from December 1 to December 31 for each year.

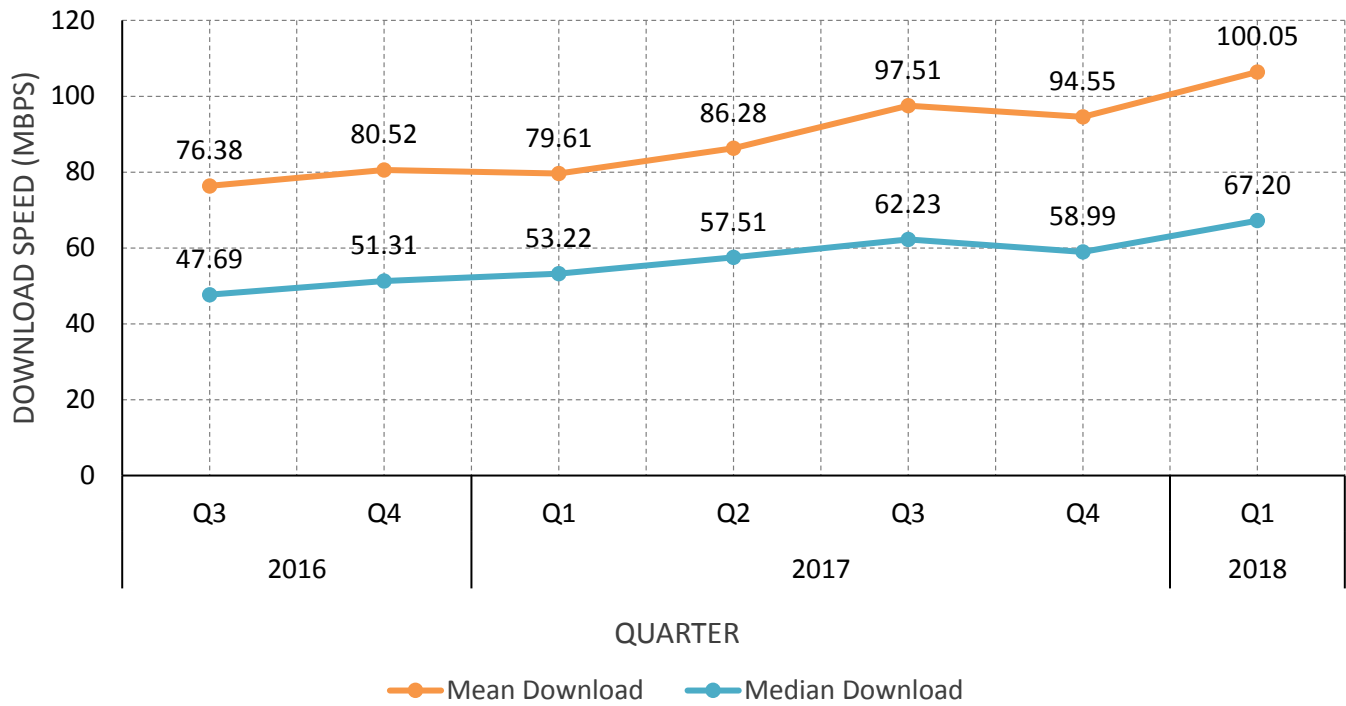
†The mean (or average) is the sum of the data set numbers divided by the total number in the data set.

††The median is the “middle” value separating the higher half of a data set from the lower half.

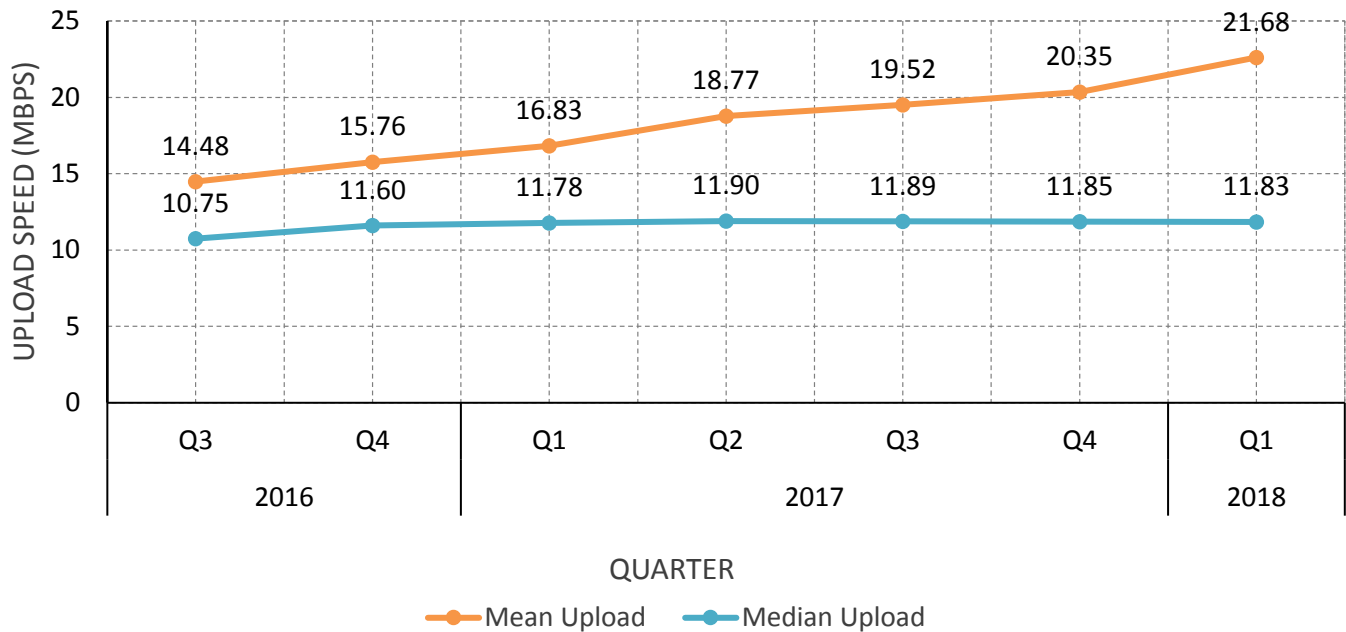
Aggregated Speedtest Results by Quarter

State Fixed Wireline Speeds – Quarterly (Mbps)						
Year	Quarter	Mean		Median		Sample Count
		Download	Upload	Download	Upload	
2016	Q3	76.38	14.48	47.69	10.75	83,195
	Q4	80.52	15.76	51.31	11.60	81,964
2017	Q1	79.61	16.83	53.22	11.78	80,428
	Q2	86.28	18.77	57.51	11.90	80,391
	Q3	97.51	19.52	62.23	11.89	85,654
	Q4	94.55	20.35	58.99	11.85	85,594
2018	Q1	100.05	21.68	67.20	11.83	88,761

State Fixed Wireline Download Speeds Q3 2016 - Q1 2018



State Fixed Wireline Upload Speeds Q3 2016 - Q1 2018



Speeds by County

This set of tables and charts shows Speedtest results for each county year-over-year and by quarter.

Aggregated Speedtest Results Year-Over-Year

County Fixed Wireline Speeds – Year-Over-Year (Mbps)*						
County	Year	Mean		Median		Sample Count
		Download	Upload	Download	Upload	
Hawaii	2016	61.18	10.20	39.96	6.01	3,724
	2017	69.04	12.32	43.83	8.24	3,778
	Total Change	+7.86	+2.12	+3.87	+2.23	
	% Change	+12.85%	+20.78%	+9.68%	+37.10%	
Honolulu	2016	87.94	18.10	57.92	11.93	21,471
	2017	111.84	22.41	70.27	12.07	21,681
	Total Change	+23.90	+4.31	+12.35	+0.14	
	% Change	+27.18%	+23.81%	+21.32%	+1.17%	
Kauai	2016	75.75	11.78	54.54	11.05	1,248
	2017	75.30	11.48	53.99	7.71	1,284
	Total Change	-0.44	-0.30	-0.54	-3.33	
	% Change	-0.58%	-2.55%	-0.99%	-30.13%	
Maui	2016	61.71	11.07	40.05	6.00	3,391
	2017	82.85	13.36	54.61	10.46	3,326
	Total Change	+21.14	+2.29	+14.56	+4.46	
	% Change	+34.26%	+20.69%	+36.35%	+74.33%	

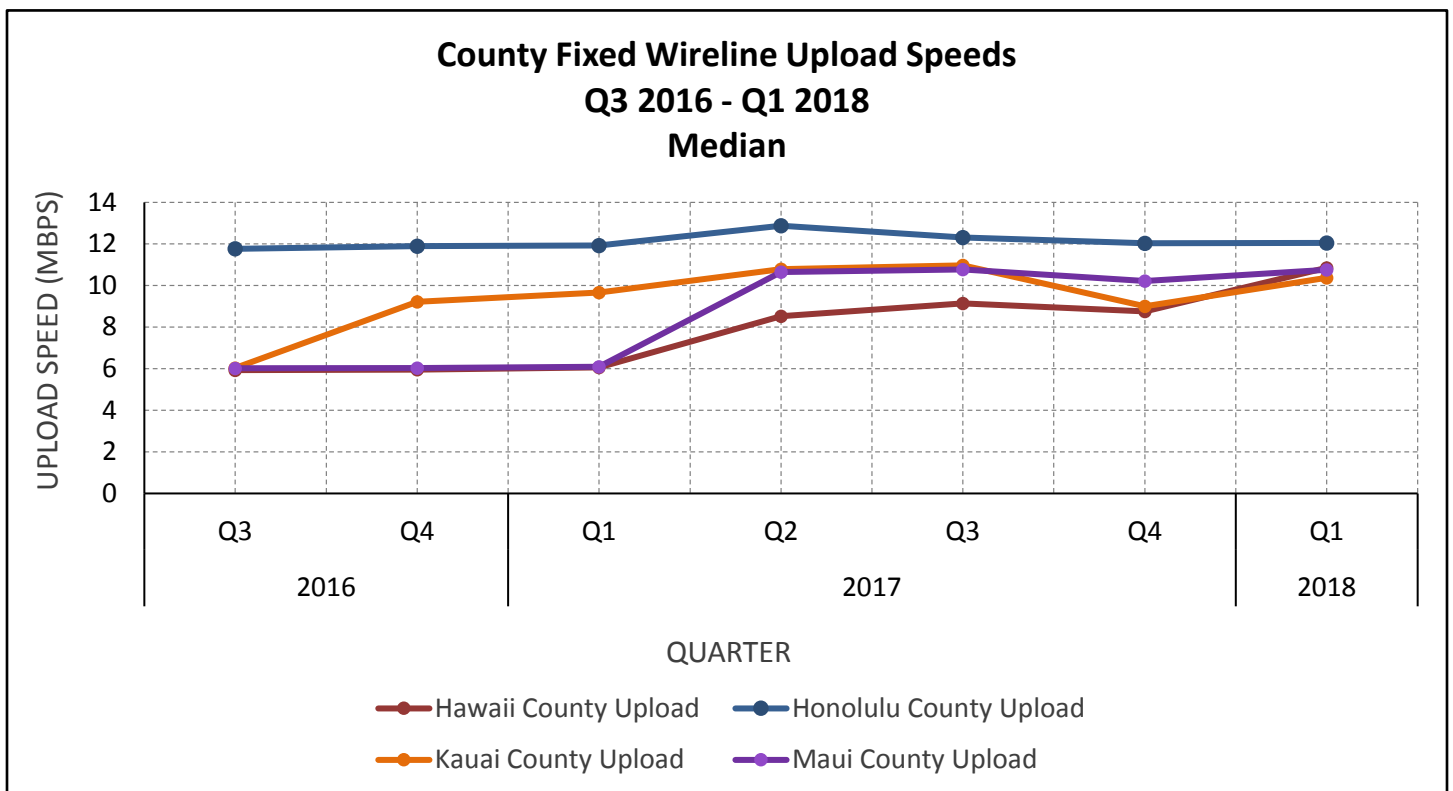
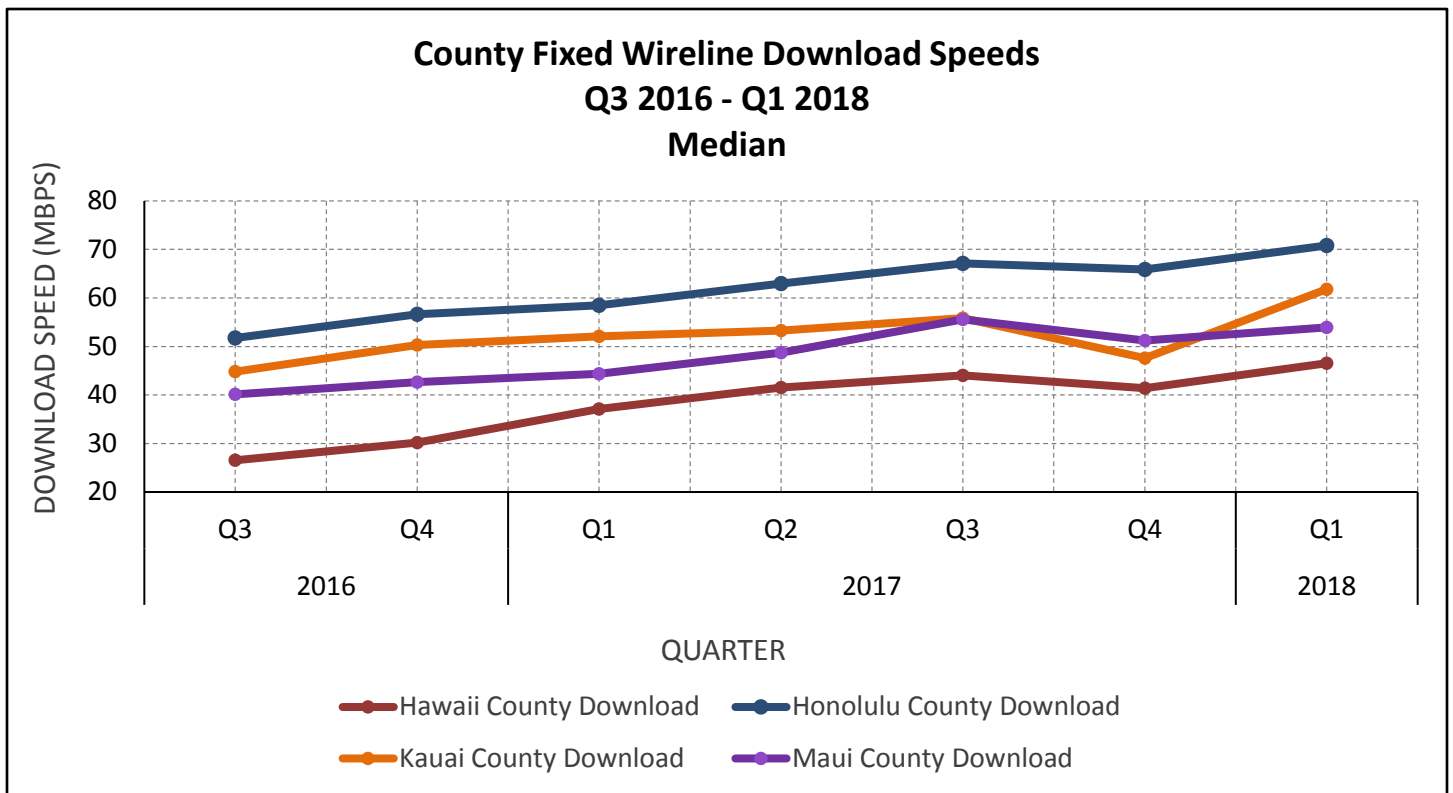
*Table compares Speedtest Intelligence data collected from December 1 to December 31 for each year.

Aggregated Speedtest Results by Quarter

County Fixed Wireline Speeds – Quarterly (Mbps)							
County	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Hawaii	2016	Q3	55.84	9.08	26.54	5.93	10,326
		Q4	56.55	9.51	30.16	5.96	10,063
	2017	Q1	58.52	10.99	37.13	6.06	9,229
		Q2	64.72	13.18	41.55	8.53	9,077
		Q3	68.75	11.37	44.06	9.14	9,540
		Q4	67.42	12.85	41.37	8.76	10,409
	2018	Q1	71.57	14.26	46.55	10.86	12,307

(continued)

County	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Honolulu	2016	Q3	82.36	16.13	51.75	11.77	60,839
		Q4	87.83	17.74	56.67	11.89	59,445
	2017	Q1	85.88	18.80	58.46	11.92	59,480
		Q2	92.95	20.81	62.98	12.88	59,553
		Q3	104.78	21.98	67.12	12.32	64,471
		Q4	102.67	23.19	65.85	12.04	62,446
	2018	Q1	109.94	24.67	70.82	12.05	63,377
Kauai	2016	Q3	66.45	10.25	44.81	6.04	3,410
		Q4	70.45	11.19	50.33	9.22	3,390
	2017	Q1	72.48	11.69	52.11	9.66	3,129
		Q2	70.71	12.25	53.30	10.79	3,375
		Q3	80.18	11.21	55.84	10.97	3,349
		Q4	71.18	11.10	47.59	9.00	3,607
	2018	Q1	79.84	13.88	61.81	10.37	3,600
Maui	2016	Q3	62.10	10.98	40.13	6.02	8,469
		Q4	62.99	11.41	42.63	6.04	9,007
	2017	Q1	61.69	11.32	44.36	6.09	8,552
		Q2	68.59	12.93	48.74	10.64	8,385
		Q3	81.16	13.08	55.59	10.77	8,279
		Q4	79.14	13.15	51.22	10.22	9,130
	2018	Q1	75.18	13.85	53.93	10.76	9,348



Speeds by Cities

This set of tables and charts shows Speedtest results for select cities in each county year-over-year and by quarter. For Speedtest results on all cities in Hawaii for which Speedtest Intelligence data is available, please see Appendix 1.

Aggregated Speedtest Results Year-Over-Year

Select Cities Fixed Wireline Speeds – Year-Over-Year (Mbps)*						
Location (City/Island)	Year	Mean		Median		Sample Count
		Download	Upload	Download	Upload	
Hilo Hawaii	2016	70.99	10.87	48.95	7.99	704
	2017	81.56	13.70	57.54	11.77	779
	Total Change	+10.57	+2.83	+8.59	+3.78	
	% Change	+14.89%	+26.05%	+17.54%	+47.25%	
Kailua-Kona Hawaii	2016	85.65	12.63	64.31	11.46	226
	2017	80.83	12.15	63.82	11.59	111
	Total Change	-4.82	-0.48	-0.50	+0.13	
	% Change	-5.63%	-3.82%	-0.77%	+1.16%	
Honolulu Oahu	2016	77.20	16.83	49.76	11.59	10,857
	2017	100.71	20.00	63.20	11.87	10,966
	Total Change	+23.50	+3.17	+13.44	+0.28	
	% Change	+30.45%	+18.81%	+27.00%	+2.38%	
Pearl City Oahu	2016	90.57	16.61	58.34	14.18	270
	2017	116.86	17.33	71.59	12.37	506
	Total Change	+26.29	+0.72	+13.25	-1.82	
	% Change	+29.02%	+4.34%	+22.70%	-12.82%	
Kapaa Kauai	2016	65.62	11.24	46.00	8.90	83
	2017	43.72	5.58	29.24	5.75	50
	Total Change	-21.90	-5.66	-16.76	-3.15	
	% Change	-33.37%	-50.37%	-36.43%	-35.41%	
Lihue Kauai	2016	89.63	13.79	51.32	11.93	41**
	2017	112.75	14.26	69.04	14.80	29**
	Total Change	+23.11	+0.48	+17.72	+2.87	
	% Change	+25.79%	+3.46%	+34.53%	+24.05%	

(continued)

Location (City/Island)	Year	Mean		Median		Sample Count
		Download	Upload	Download	Upload	
Kahului Maui	2016	81.70	13.08	56.91	11.72	406
	2017	94.42	13.24	61.65	11.74	528
	Total Change	+12.72	+0.16	+4.74	+0.02	
	% Change	+15.57%	+1.21%	+8.32%	+0.14%	
Kihei Maui	2016	62.62	9.91	44.95	6.00	490
	2017	92.63	12.06	66.75	10.93	565
	Total Change	+30.01	+2.15	+21.80	+4.93	
	% Change	+47.92%	+21.71%	+48.49%	+82.14%	
Lanai City Lanai	2016	59.03	6.08	59.03	6.08	1**
	2017	66.29	6.69	69.88	5.80	11**
	Total Change	+7.26	+0.61	+10.85	-0.28	
	% Change	+12.29%	+10.09%	+18.39%	-4.65%	
Kaunakakai Molokai	2016	68.09	5.97	68.09	5.97	1**
	2017	50.37	4.93	62.52	5.89	8**
	Total Change	-17.71	-1.04	-5.57	-0.08	
	% Change	-26.02%	-17.46%	-8.18%	-1.31%	

*Table compares Speedtest Intelligence data collected from December 1 to December 31 for each year.

** Directional due to low sample count.

Aggregated Speedtest Results by Quarter

Select Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location (City/Island)	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Hilo Hawaii	2016	Q3	66.49	10.60	38.56	5.98	2,030
		Q4	70.54	11.21	48.69	10.18	1,786
	2017	Q1	64.07	11.78	45.96	11.12	1,828
		Q2	64.31	12.97	46.85	9.64	2,315
		Q3	79.50	12.85	55.20	11.70	2,184
		Q4	78.79	13.38	55.41	11.72	2,437
	2018	Q1	78.73	14.83	56.99	11.73	2,351
Kailua-Kona Hawaii	2016	Q3	75.46	11.83	58.18	10.24	511
		Q4	81.58	12.90	57.99	11.72	630
	2017	Q1	83.60	14.93	66.31	11.87	550
		Q2	79.84	13.46	60.91	11.90	230
		Q3	87.75	13.93	61.84	11.86	421
		Q4	73.02	11.97	50.90	11.44	441
	2018	Q1	78.66	13.56	57.23	11.73	601

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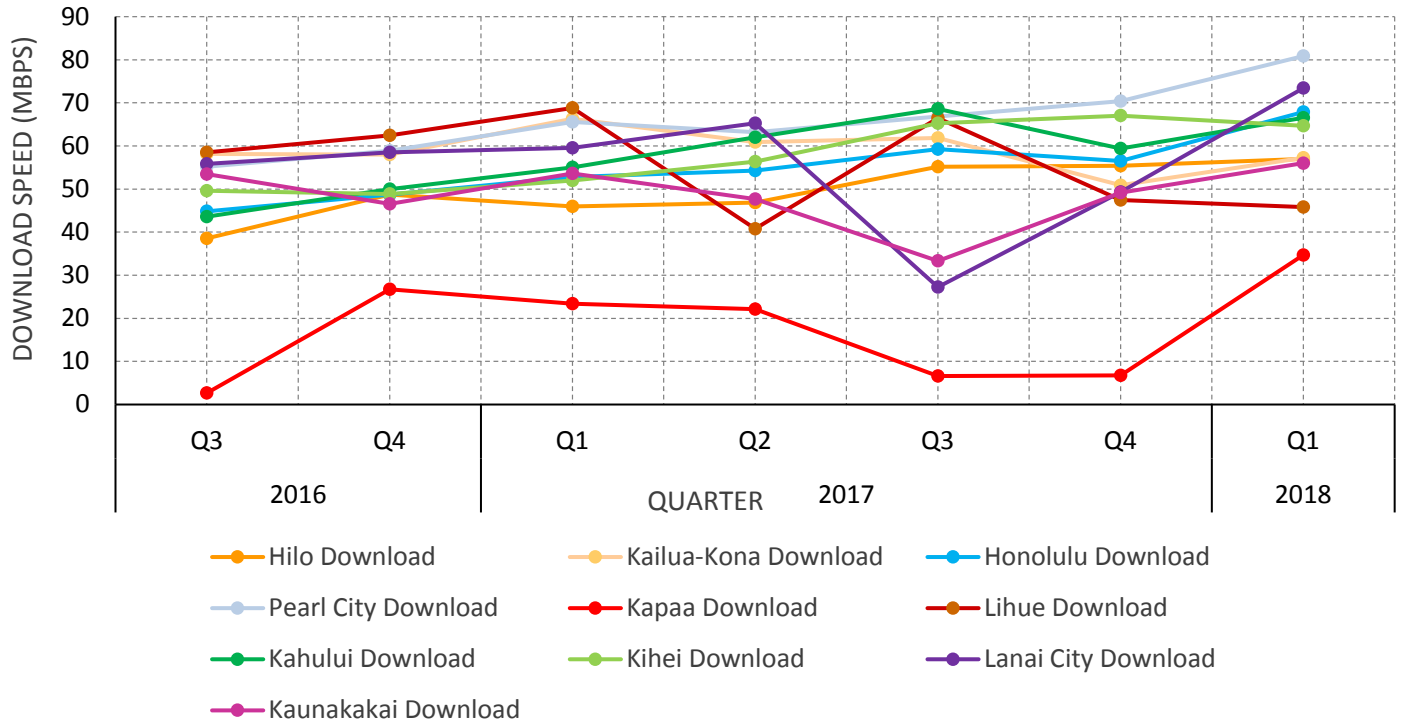
Location (City/Island)	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Honolulu Oahu	2016	Q3	72.96	15.05	44.83	10.60	31,139
		Q4	76.48	15.95	48.75	11.47	30,141
	2017	Q1	78.10	17.27	52.79	11.75	31,358
		Q2	81.87	18.28	54.31	11.86	29,535
		Q3	95.00	19.42	59.27	11.89	32,004
		Q4	93.10	20.76	56.50	11.88	31,337
	2018	Q1	100.61	22.75	67.87	11.88	32,056
Pearl City Oahu	2016	Q3	84.54	13.08	55.18	11.71	2,005
		Q4	95.84	15.07	58.89	11.96	1,356
	2017	Q1	88.14	14.66	65.60	11.84	1,138
		Q2	95.09	16.63	63.23	16.04	1,240
		Q3	112.68	29.83	66.84	13.21	1,819
		Q4	109.22	21.24	70.43	15.15	1,676
	2018	Q1	126.00	22.61	80.86	18.30	1,278
Kapaa Kauai	2016	Q3	18.92	8.49	2.67	0.68	140
		Q4	52.06	9.28	26.74	5.89	173
	2017	Q1	53.60	9.10	23.38	5.80	232
		Q2	55.52	9.24	22.13	5.91	241
		Q3	39.99	6.45	6.59	0.96	180
		Q4	38.16	5.66	6.76	0.96	104
	2018	Q1	56.16	9.16	34.70	5.84	191
Lihue Kauai	2016	Q3	75.54	12.32	58.54	11.86	110
		Q4	94.09	14.15	62.44	11.97	135
	2017	Q1	73.60	13.22	68.81	11.88	70
		Q2	71.25	10.99	40.79	8.94	86
		Q3	80.81	10.22	66.43	5.97	38**
		Q4	86.28	12.81	47.42	11.76	126
	2018	Q1	68.70	11.64	45.81	11.48	66
Kahului Maui	2016	Q3	76.48	12.29	43.59	10.29	1,466
		Q4	82.19	13.20	49.95	11.43	1,150
	2017	Q1	70.85	12.62	55.00	11.69	1,556
		Q2	80.99	14.11	61.99	11.86	1,331
		Q3	97.12	13.02	68.59	11.79	1,382
		Q4	87.12	13.20	59.39	11.72	1,426
	2018	Q1	93.41	12.58	66.52	11.41	1,354
Kihei Maui	2016	Q3	76.35	11.59	49.62	11.05	1,471
		Q4	69.10	10.97	48.84	7.77	1,503
	2017	Q1	67.20	11.00	52.01	7.64	1,530
		Q2	71.96	12.43	56.33	11.53	1,191
		Q3	86.63	12.93	65.28	11.44	1,363
		Q4	88.13	12.50	67.02	11.64	1,449
	2018	Q1	84.06	11.98	64.69	11.49	1,471
Lanai City Lanai	2016	Q3	48.24	5.97	55.84	6.01	8**
		Q4	89.72	9.82	58.50	5.97	20**
	2017	Q1	60.09	5.57	59.53	5.74	3**
		Q2	50.47	5.14	65.29	5.80	8**
		Q3	44.55	8.93	27.25	11.05	6**
		Q4	48.96	6.54	49.28	5.91	40**
	2018	Q1	86.26	8.99	73.41	9.41	21**

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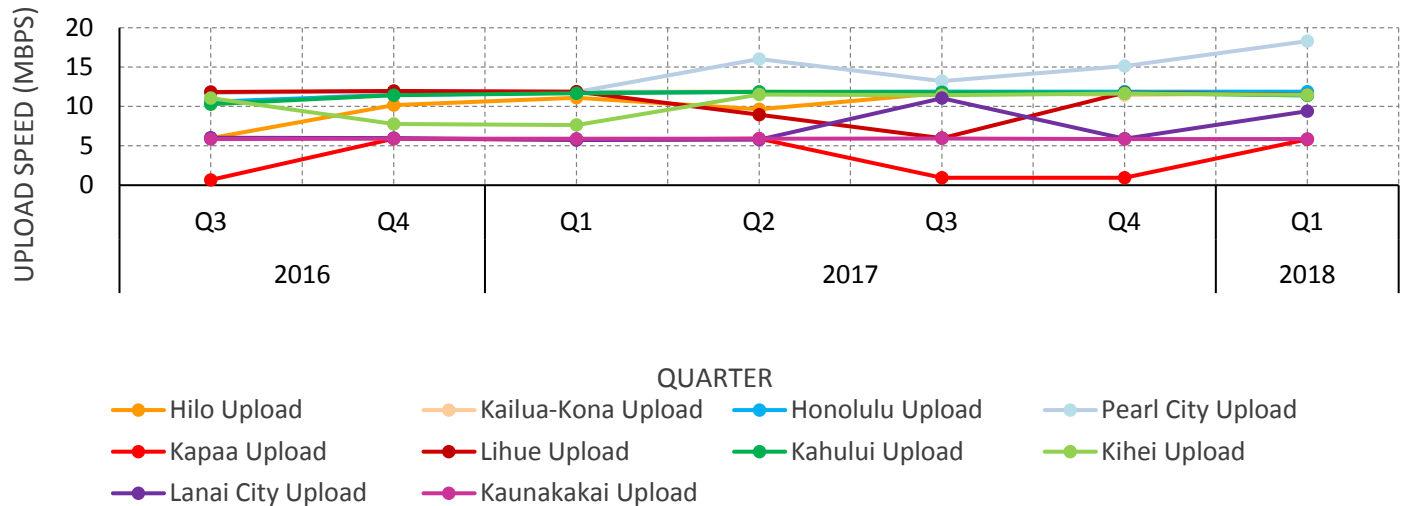
Location (City/Island)	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Kaunakakai Molokai	2016	Q3	43.04	4.99	53.49	5.86	14**
		Q4	41.54	5.45	46.55	5.89	29**
	2017	Q1	49.49	5.63	53.60	5.92	39**
		Q2	38.55	5.31	47.69	5.91	9**
		Q3	33.09	5.28	33.31	5.93	17**
		Q4	45.52	5.28	49.19	5.86	24**
	2018	Q1	65.26	21.29	56.02	5.87	42**

** Directional due to low sample count.

Select Cities Fixed Wireline Download Speeds Q3 2016 - Q1 2018 Median



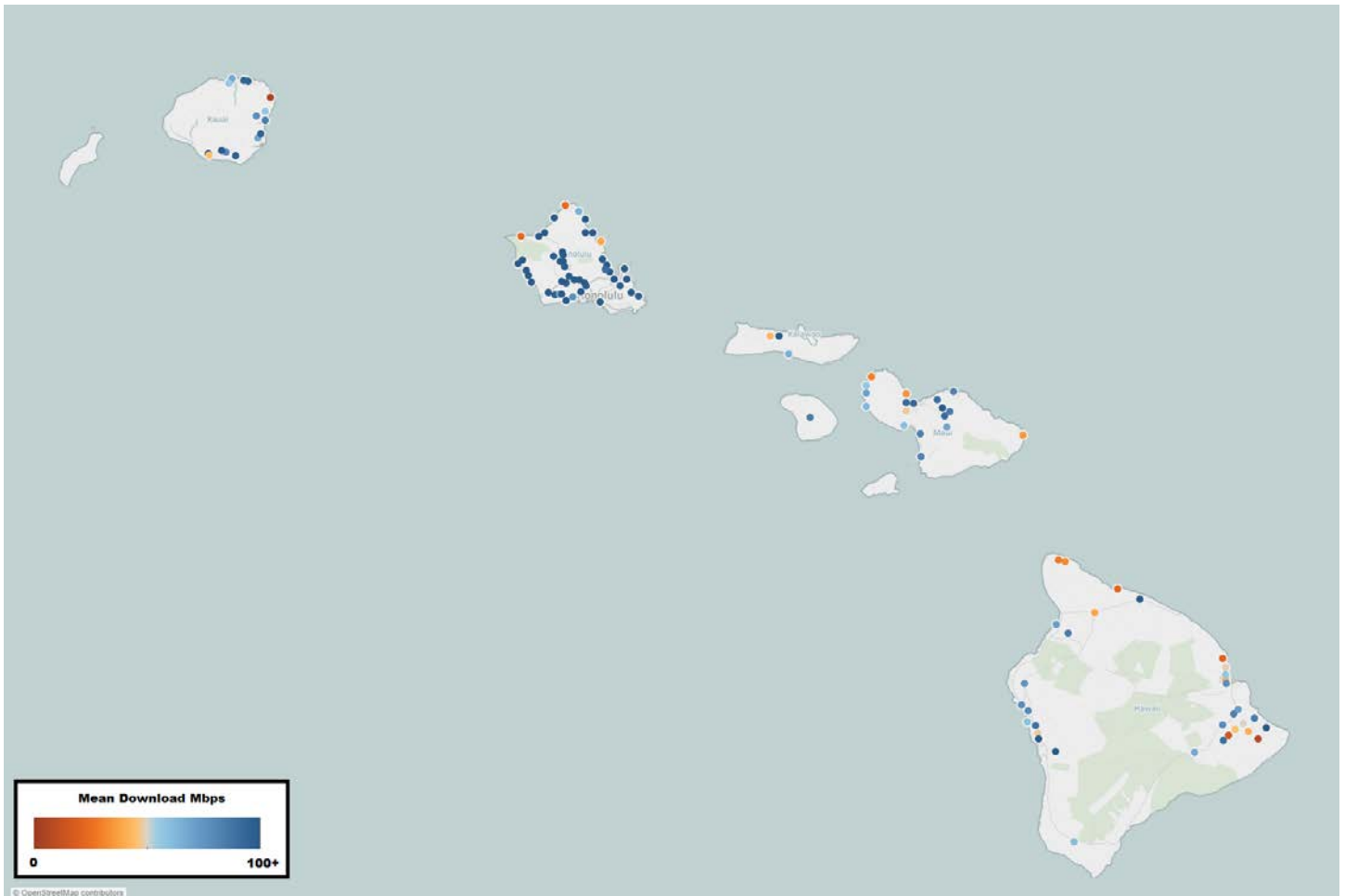
Select Cities Fixed Wireline Upload Speeds Q3 2016 - Q1 2018 Median



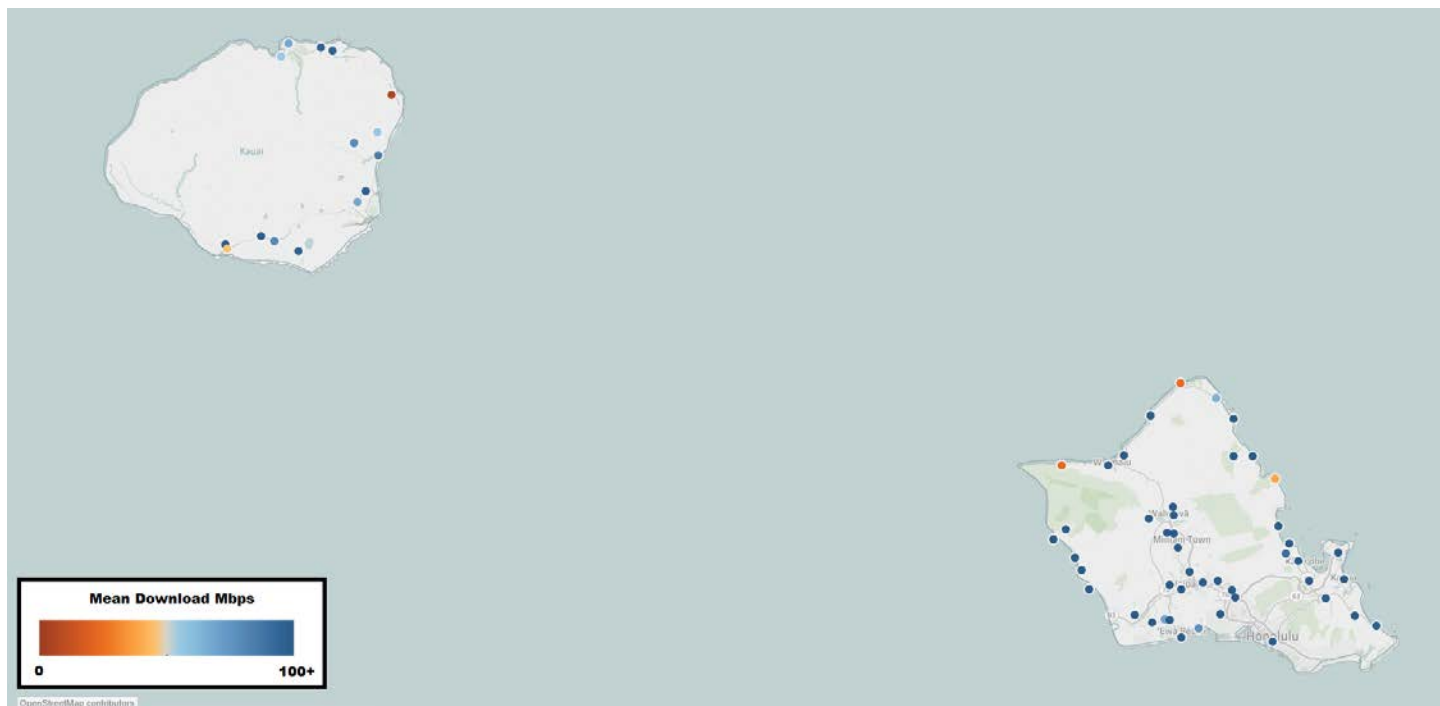
Maps of Speedtest Results

The following maps reflect aggregated mean download of Speedtest results on a per city basis for the period of January 1, 2018 to March 31, 2018.

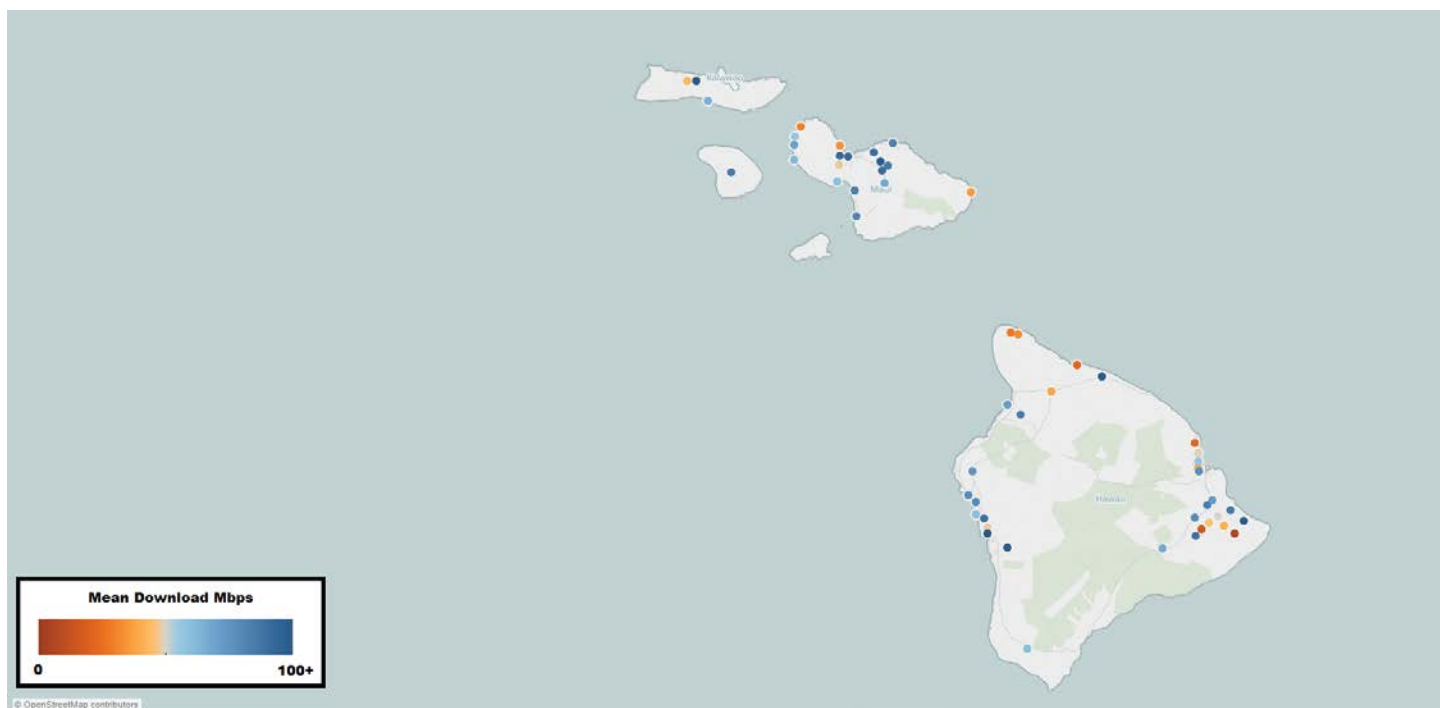
Statewide



Kauai and Oahu



Molokai, Lanai, Maui, and Hawaii Island



APPENDIX

Hawaii Cities Fixed Wireline Speeds – Quarterly

The following tables, separated by islands, show Speedtest results by quarter for all cities in Hawaii for which Speedtest Intelligence data is available.

Aggregated Speedtest Results for Cities by Quarter – Hawaii Island

Hawaii Island Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Ainaloa	2016	Q3	7.87	0.88	6.63	0.92	3**
		Q4	5.11	0.82	5.77	0.89	17**
	2017	Q1	5.14	0.92	5.14	0.92	1**
		Q2	6.04	0.65	3.32	0.71	41**
		Q3	5.10	0.83	4.65	0.96	13**
		Q4	9.99	2.69	2.42	0.86	10**
	2018	Q1	41.13	19.19	6.68	0.86	64
Captain Cook	2016	Q3	18.55	5.52	11.25	0.95	5**
		Q4	33.43	6.35	8.43	2.28	7**
	2017	Q1	5.57	0.91	5.14	0.92	3**
		Q2	18.40	1.67	8.31	0.85	6**
		Q3	12.16	2.71	4.86	0.92	22**
		Q4	369.33	54.17	95.26	79.05	20**
	2018	Q1	157.00	13.52	330.84	23.72	18**
Eden Roc	2016	Q3	5.48	0.89	6.19	0.93	6**
		Q4	7.22	0.89	7.22	0.89	1**
	2017	Q1	13.24	1.51	11.16	0.82	8**
		Q2	-	-	-	-	-
		Q3	5.48	0.60	4.25	0.59	5**
		Q4	93.28	33.55	93.28	33.55	1**
	2018	Q1	90.28	48.15	90.28	48.15	1**
Fern Acres	2016	Q3	5.18	0.81	5.18	0.81	2**
		Q4	2.24	0.77	2.24	0.77	2**
	2017	Q1	-	-	-	-	-
		Q2	5.72	0.94	5.38	0.95	3**
		Q3	6.48	0.82	6.40	0.91	55
		Q4	36.12	10.27	6.68	0.85	125
	2018	Q1	14.92	4.10	5.70	0.84	64
Fern Forest	2016	Q3	4.30	0.68	3.75	0.78	46**
		Q4	6.92	0.86	6.66	0.88	8**
	2017	Q1	8.36	0.73	6.71	0.74	11**
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Halaula	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	25.50	3.95	25.35	4.02	8**
		Q4	44.57	6.58	48.24	6.43	5**
	2018	Q1	-	-	-	-	-
Hawaiian Acres	2016	Q3	19.87	3.66	6.11	0.93	63
		Q4	5.89	0.87	5.50	0.73	91
	2017	Q1	11.81	1.54	5.05	0.68	133
		Q2	21.23	2.77	5.66	0.79	61
		Q3	20.00	3.71	5.47	0.84	166
		Q4	69.27	15.01	6.23	0.91	227
	2018	Q1	45.30	13.21	10.66	0.99	348
Hawaiian Beaches	2016	Q3	17.19	2.16	5.26	0.77	72
		Q4	7.58	2.01	4.80	0.87	71
	2017	Q1	16.14	2.77	6.03	0.80	135
		Q2	16.41	2.24	10.79	0.70	10**
		Q3	35.13	3.96	14.70	5.81	37**
		Q4	45.96	10.07	10.68	1.11	48**
	2018	Q1	116.52	14.18	72.21	11.81	75
Hawaiian Paradise Park	2016	Q3	28.49	3.65	5.21	0.78	200
		Q4	20.60	3.33	5.76	0.90	263
	2017	Q1	34.19	6.80	7.83	0.85	148
		Q2	36.88	8.04	8.53	0.94	115
		Q3	70.18	10.78	21.31	10.32	162
		Q4	42.72	9.27	12.19	5.53	79
	2018	Q1	86.73	13.22	68.74	11.94	147
Hawi	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	48.77	18.86	49.83	23.42	5**
		Q4	73.53	20.70	48.04	23.29	7**
	2018	Q1	27.88	13.88	36.54	19.34	3**
Hilo	2016	Q3	66.49	10.60	38.56	5.98	2,030
		Q4	70.54	11.21	48.69	10.18	1,786
	2017	Q1	64.07	11.78	45.96	11.12	1,828
		Q2	64.31	12.97	46.85	9.64	2,315
		Q3	79.50	12.85	55.20	11.70	2,184
		Q4	78.79	13.38	55.41	11.72	2,437
	2018	Q1	78.73	14.83	56.99	11.73	2,351
Holualoa	2016	Q3	55.22	8.85	42.13	5.97	152
		Q4	67.75	11.00	53.45	9.63	181
	2017	Q1	66.67	10.79	53.71	9.79	256
		Q2	74.66	12.50	60.08	7.98	244
		Q3	78.04	12.85	45.08	11.62	132
		Q4	84.81	13.50	67.75	11.76	113
	2018	Q1	79.90	12.04	53.27	10.34	174

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Honalo	2016	Q3	57.22	8.56	25.87	5.94	126
		Q4	72.12	10.14	46.91	5.98	198
	2017	Q1	62.90	11.34	35.00	6.04	213
		Q2	74.52	12.04	53.02	11.55	93
		Q3	78.12	12.25	55.02	10.69	106
		Q4	65.90	13.36	52.50	9.43	150
	2018	Q1	90.27	12.76	70.56	11.69	210
Honaunau-Napoopoo	2016	Q3	6.47	2.33	2.92	0.93	7**
		Q4	25.17	4.48	6.69	0.97	49**
	2017	Q1	25.59	16.45	13.93	2.91	21**
		Q2	40.07	10.33	6.29	0.72	34**
		Q3	27.46	4.01	6.55	0.90	63
		Q4	52.83	19.97	24.08	4.68	95
	2018	Q1	142.02	42.85	55.98	23.47	130
Honokaa	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	18.22	11.68	16.45	10.62	17**
		Q4	14.43	4.65	14.43	4.65	2**
	2018	Q1	135.72	9.08	54.94	7.44	5**
Honomu	2016	Q3	-	-	-	-	-
		Q4	1.91	1.44	1.91	1.44	1**
	2017	Q1	-	-	-	-	-
		Q2	13.97	2.88	13.97	2.88	1**
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-
Kahaluu-Keauhou	2016	Q3	73.50	9.59	30.50	5.50	55
		Q4	44.68	10.16	15.60	4.50	57
	2017	Q1	43.01	9.78	23.07	5.91	134
		Q2	55.73	17.08	45.12	5.98	202
		Q3	54.68	7.62	38.96	5.77	82
		Q4	50.03	11.26	18.93	5.99	81
	2018	Q1	60.00	14.14	35.72	5.94	102
Kailua-Kona	2016	Q3	75.46	11.83	58.18	10.24	511
		Q4	81.58	12.90	57.99	11.72	630
	2017	Q1	83.60	14.93	66.31	11.87	550
		Q2	79.84	13.46	60.91	11.90	230
		Q3	87.75	13.93	61.84	11.86	421
		Q4	73.02	11.97	50.90	11.44	441
	2018	Q1	78.66	13.56	57.23	11.73	601
Kalaoa	2016	Q3	112.41	12.81	59.06	11.87	32**
		Q4	89.62	10.93	49.73	7.70	16**
	2017	Q1	41.05	7.01	49.30	5.90	8**
		Q2	62.22	13.14	50.92	11.75	25**
		Q3	68.58	10.74	26.20	6.31	82
		Q4	66.22	12.43	48.10	11.85	35**
	2018	Q1	75.64	15.07	116.53	23.23	165

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Kapaau	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	315.31	23.42	315.31	23.42	1**
		Q4	74.65	18.77	66.30	23.70	16**
	2018	Q1	31.90	23.52	43.97	23.72	7**
Keaau	2016	Q3	70.69	11.00	52.66	11.47	124
		Q4	91.00	13.11	57.61	9.26	55
	2017	Q1	70.25	10.52	47.34	6.49	48**
		Q2	50.54	11.29	15.54	5.87	45**
		Q3	63.99	7.04	28.24	5.55	74
		Q4	76.32	12.12	61.04	10.35	44**
	2018	Q1	72.39	13.67	37.71	7.92	65
Kealahou	2016	Q3	13.27	3.75	6.65	1.16	17**
		Q4	39.61	11.02	14.62	1.97	46**
	2017	Q1	43.86	17.97	34.86	8.89	33**
		Q2	50.71	18.04	11.91	4.13	41**
		Q3	42.98	8.25	30.36	5.83	54
		Q4	38.29	8.01	15.55	5.82	35**
	2018	Q1	48.07	6.81	53.89	5.69	35**
Kukuihaele	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	25.38	3.20	13.81	3.16	4**
	2018	Q1	21.77	5.94	21.77	5.94	1**
Kurtistown	2016	Q3	49.14	10.68	57.21	11.77	36**
		Q4	19.65	6.54	11.36	0.92	26**
	2017	Q1	61.73	10.33	54.77	5.96	59
		Q2	72.04	10.47	62.67	10.64	35**
		Q3	96.88	13.12	70.37	11.78	50
		Q4	59.13	7.88	15.59	5.72	54
	2018	Q1	84.92	14.37	20.15	2.54	28**
Mountain View	2016	Q3	62.40	11.37	47.87	10.85	68
		Q4	64.81	12.17	49.64	11.80	40**
	2017	Q1	57.17	9.64	43.86	6.04	80
		Q2	94.24	13.12	70.89	11.97	41**
		Q3	25.42	3.30	6.78	0.96	101
		Q4	39.10	5.69	14.24	2.14	31**
	2018	Q1	79.24	11.46	68.55	11.79	53
Naalehu	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	12.69	41.11	7.93	52.82	9**
		Q2	69.49	11.07	29.71	7.02	23**
		Q3	48.10	2.13	70.61	0.53	3**
		Q4	194.89	18.10	299.26	27.66	5**
	2018	Q1	-	-	-	-	-

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Nanawale Estates	2016	Q3	-	-	-	-	-
		Q4	39.31	12.46	34.80	14.20	5**
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-
Ocean View	2016	Q3	5.81	1.53	2.43	0.46	310
		Q4	5.48	2.52	3.53	0.66	314
	2017	Q1	6.34	4.02	3.21	0.67	256
		Q2	18.75	15.24	5.11	0.88	228
		Q3	9.05	3.70	4.41	0.73	179
		Q4	10.46	2.24	4.66	0.97	333
	2018	Q1	60.94	32.17	5.46	1.24	166
Orchidlands Estates	2016	Q3	21.72	3.08	6.62	0.92	208
		Q4	9.43	1.43	4.29	0.76	220
	2017	Q1	14.59	2.06	6.21	0.77	70
		Q2	28.86	5.16	3.93	0.70	71
		Q3	21.09	4.09	6.80	0.93	72
		Q4	58.28	15.50	7.48	1.02	218
	2018	Q1	50.04	11.07	7.75	0.90	243
Pahoa	2016	Q3	5.03	0.71	5.53	0.74	41**
		Q4	6.11	0.75	5.16	0.79	16**
	2017	Q1	7.52	2.39	8.91	0.94	5**
		Q2	12.34	2.58	8.51	1.34	14**
		Q3	5.26	0.87	3.82	0.83	8**
		Q4	19.45	8.23	6.40	0.81	40**
	2018	Q1	6.73	1.14	4.79	0.92	12**
Papaikou	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	3.36	0.67	3.36	0.67	2**
		Q2	27.66	6.06	6.71	1.10	11**
		Q3	191.87	20.20	191.87	20.20	1**
		Q4	120.39	28.81	120.39	28.81	2**
	2018	Q1	48.98	9.36	50.53	11.52	5**
Paukaa	2016	Q3	24.75	6.48	18.85	5.93	4**
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	4.94	0.85	5.26	0.81	4**
		Q3	-	-	-	-	-
		Q4	8.88	1.58	6.37	0.93	23**
	2018	Q1	57.13	7.94	24.16	5.81	19**
Pepeekeo	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	46.76	8.59	46.76	8.59	1**
	2018	Q1	21.23	12.64	11.75	0.88	8**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Puako	2016	Q3	89.85	12.92	72.10	11.86	40**
		Q4	59.87	10.73	42.20	11.61	21**
	2017	Q1	59.23	7.79	66.93	5.73	16**
		Q2	147.45	19.75	148.90	23.38	6**
		Q3	91.90	12.65	70.37	11.69	50
		Q4	67.82	19.16	65.99	11.88	76
	2018	Q1	71.82	11.45	29.62	10.16	69
Volcano	2016	Q3	22.39	2.39	13.94	1.56	4**
		Q4	30.79	13.05	25.80	14.59	15**
	2017	Q1	33.66	11.45	32.35	14.05	11**
		Q2	23.62	13.60	18.79	14.29	14**
		Q3	37.77	19.36	41.25	22.50	35**
		Q4	49.02	18.74	44.52	16.89	18**
	2018	Q1	68.13	21.24	47.72	23.68	34**
Waikoloa Village	2016	Q3	64.06	12.30	58.12	11.32	141
		Q4	67.33	10.14	47.09	8.89	136
	2017	Q1	58.07	12.18	31.75	5.91	211
		Q2	63.60	19.63	35.60	9.96	155
		Q3	64.61	13.76	41.76	10.79	119
		Q4	85.03	12.61	66.18	11.72	172
	2018	Q1	86.32	13.77	68.68	10.91	156
Waimea	2016	Q3	14.97	1.91	7.96	0.92	30**
		Q4	7.09	0.87	6.14	0.81	42**
	2017	Q1	10.11	2.45	6.45	0.93	37**
		Q2	102.78	21.85	76.23	15.98	32**
		Q3	54.76	16.75	21.20	2.86	139
		Q4	42.65	12.92	10.98	2.59	104
	2018	Q1	38.41	11.07	14.17	2.65	158
Wainaku	2016	Q3	120.12	15.57	92.93	23.80	7**
		Q4	7.05	1.30	6.66	0.93	56
	2017	Q1	-	-	-	-	-
		Q2	69.56	12.21	29.36	11.80	10**
		Q3	82.09	10.58	70.52	11.24	32**
		Q4	34.96	7.77	6.81	1.07	43**
	2018	Q1	39.75	15.42	4.47	0.70	107

** Directional due to low sample count.

Aggregated Speedtest Results for Cities by Quarter – Oahu

Oahu Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Ahuimanu	2016	Q3	41.28	12.07	10.17	11.93	23**
		Q4	69.59	10.82	46.09	5.94	12**
	2017	Q1	100.08	13.97	54.64	16.65	22**
		Q2	101.81	14.52	70.36	12.21	59
		Q3	102.50	13.04	54.18	11.85	186
		Q4	84.12	16.15	39.96	11.75	130
	2018	Q1	90.54	19.80	45.21	14.51	143
Aiea	2016	Q3	74.24	17.72	26.67	5.95	327
		Q4	80.33	21.06	37.34	13.66	474
	2017	Q1	83.48	17.79	54.95	11.94	629
		Q2	92.63	30.71	57.74	15.82	434
		Q3	101.07	22.10	47.00	17.21	675
		Q4	121.90	26.86	66.44	19.70	591
	2018	Q1	181.29	53.02	83.84	21.62	558
Barbers Point Housing	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	73.34	51.41	73.34	51.41	1**
	2018	Q1	-	-	-	-	-
Ewa Beach	2016	Q3	110.43	17.29	75.76	20.70	2,686
		Q4	105.07	17.67	67.68	19.15	2,745
	2017	Q1	101.36	19.80	70.36	20.31	2,531
		Q2	131.37	38.24	80.08	21.46	3,061
		Q3	136.60	25.88	91.41	21.41	3,312
		Q4	128.68	22.74	82.73	21.07	3,039
	2018	Q1	122.28	29.97	86.46	20.22	2,954
Ewa Gentry	2016	Q3	82.67	14.72	51.22	11.87	283
		Q4	102.91	19.35	66.16	17.75	424
	2017	Q1	96.57	17.78	64.31	20.83	467
		Q2	86.08	17.03	52.41	20.51	191
		Q3	135.11	18.30	99.75	19.26	311
		Q4	127.48	16.69	74.23	19.95	259
	2018	Q1	132.55	19.84	101.17	17.33	272
Ewa Villages	2016	Q3	91.17	24.10	46.00	20.99	95
		Q4	139.55	29.92	39.39	19.58	51
	2017	Q1	85.02	21.90	64.51	22.84	60
		Q2	101.24	17.66	52.89	11.90	75
		Q3	213.43	29.18	69.43	23.58	103
		Q4	113.43	37.38	78.14	47.12	182
	2018	Q1	70.49	18.02	22.37	5.78	290

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Halawa	2016	Q3	53.81	13.96	22.69	8.60	299
		Q4	56.84	14.02	25.51	7.74	237
	2017	Q1	76.82	19.38	38.61	11.60	236
		Q2	78.02	24.19	46.37	14.08	142
		Q3	100.46	24.92	59.18	17.58	247
		Q4	67.56	17.88	42.11	11.16	242
	2018	Q1	132.93	39.38	78.31	19.78	90
Haleiwa	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	74.61	16.57	70.27	19.27	7**
		Q4	114.65	15.37	105.60	14.10	34**
	2018	Q1	109.41	14.25	81.42	11.88	67
Hauula	2016	Q3	79.86	12.35	58.38	11.34	142
		Q4	88.42	15.29	61.47	12.02	194
	2017	Q1	69.71	13.86	42.12	11.97	154
		Q2	96.31	16.90	61.22	15.36	247
		Q3	89.74	14.94	50.22	11.83	384
		Q4	67.61	12.86	37.73	11.26	190
	2018	Q1	105.82	19.92	44.70	22.89	261
Heeia	2016	Q3	80.65	13.72	55.46	11.83	479
		Q4	88.17	21.01	53.25	15.48	439
	2017	Q1	88.99	19.38	54.70	19.37	255
		Q2	113.11	19.64	70.88	19.75	283
		Q3	107.32	18.46	70.09	18.34	358
		Q4	87.73	18.69	46.86	14.87	443
	2018	Q1	118.39	25.20	74.72	19.38	524
Honolulu	2016	Q3	72.96	15.05	44.83	10.60	31,139
		Q4	76.48	15.95	48.75	11.47	30,141
	2017	Q1	78.10	17.27	52.79	11.75	31,358
		Q2	81.87	18.28	54.31	11.86	29,535
		Q3	95.00	19.42	59.27	11.89	32,004
		Q4	93.10	20.76	56.50	11.88	31,337
	2018	Q1	100.61	22.75	67.87	11.88	32,056
Iroquois Point	2016	Q3	23.60	8.22	20.64	5.47	4**
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	61.20	26.85	61.20	26.85	2**
		Q3	44.07	12.84	15.65	2.90	9**
		Q4	57.77	21.42	29.50	14.77	26**
	2018	Q1	77.63	16.29	22.47	13.76	18**
Joint Base Pearl Harbor-Hickam	2016	Q3	93.38	15.71	58.93	11.90	1,433
		Q4	104.46	19.80	75.62	16.38	1,692
	2017	Q1	85.72	15.60	63.83	17.52	1,703
		Q2	92.94	16.43	69.74	13.40	1,818
		Q3	119.59	19.80	85.03	18.07	1,454
		Q4	120.98	18.10	80.70	14.93	1,760
	2018	Q1	124.50	28.27	77.53	12.02	1,809

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Kaaawa	2016	Q3	1.33	0.48	0.97	0.38	7**
		Q4	1.30	0.38	1.30	0.38	1**
	2017	Q1	101.31	13.18	39.88	11.92	29**
		Q2	47.08	22.09	32.58	6.13	21**
		Q3	29.31	5.43	24.24	6.03	24**
		Q4	42.73	8.24	46.09	6.61	12**
	2018	Q1	38.50	11.00	41.85	11.92	8**
Kahaluu	2016	Q3	59.25	16.19	39.93	9.45	498
		Q4	73.42	14.77	42.11	11.29	353
	2017	Q1	69.18	13.41	42.37	11.70	818
		Q2	88.48	16.73	56.30	11.90	1,377
		Q3	92.13	13.29	50.84	11.69	663
		Q4	92.42	15.97	53.25	11.84	688
	2018	Q1	101.16	18.00	70.37	12.06	389
Kahuku	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	31.83	18.50	21.42	23.28	7**
		Q3	73.06	17.41	78.18	18.73	10**
		Q4	77.43	19.63	88.83	20.74	10**
	2018	Q1	64.92	18.73	54.55	18.98	9**
Kailua	2016	Q3	92.86	18.53	58.17	12.05	2,370
		Q4	100.45	23.99	65.78	18.34	2,624
	2017	Q1	104.31	21.94	70.99	20.54	2,488
		Q2	103.35	22.07	72.39	20.74	2,549
		Q3	110.04	22.83	71.46	20.16	2,609
		Q4	102.09	22.94	70.53	19.95	2,454
	2018	Q1	112.51	29.13	73.31	20.80	2,479
Kaneohe	2016	Q3	90.34	15.92	55.72	11.94	2,000
		Q4	97.38	18.38	65.28	14.24	2,058
	2017	Q1	94.72	19.33	61.08	18.44	1,725
		Q2	110.75	20.18	72.09	19.78	1,115
		Q3	108.11	20.97	70.05	19.46	1,997
		Q4	102.22	19.97	67.46	19.63	1,903
	2018	Q1	110.96	22.30	72.21	16.44	1,932
Kapolei	2016	Q3	77.63	13.83	39.44	9.19	763
		Q4	81.48	16.41	50.43	11.74	694
	2017	Q1	90.71	16.60	57.95	18.80	603
		Q2	121.71	26.05	74.16	20.85	437
		Q3	120.62	30.55	75.58	20.05	833
		Q4	118.43	24.57	83.84	20.06	698
	2018	Q1	127.37	29.56	79.22	18.95	723
Kawela Bay	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	27.90	11.60	27.90	11.60	2**
		Q4	15.10	5.63	15.10	5.63	2**
	2018	Q1	24.10	2.76	34.52	3.32	6**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Laie	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	79.74	20.89	46.99	20.36	6**
		Q3	123.37	46.33	92.79	51.29	3**
		Q4	-	-	-	-	-
	2018	Q1	155.37	47.45	155.37	47.45	1**
Mali	2016	Q3	91.32	14.68	59.07	12.02	112
		Q4	77.72	13.50	49.42	12.01	130
	2017	Q1	81.67	14.22	60.79	12.44	148
		Q2	98.08	14.01	61.28	11.92	154
		Q3	94.58	13.52	53.43	11.95	261
		Q4	99.51	16.08	68.03	16.46	240
	2018	Q1	147.34	17.18	83.85	17.93	265
Makaha	2016	Q3	65.46	10.89	57.25	11.86	18**
		Q4	90.35	13.88	46.40	11.94	22**
	2017	Q1	68.09	16.03	43.90	20.71	80
		Q2	92.83	20.99	74.81	23.54	79
		Q3	117.20	18.97	85.28	23.35	72
		Q4	207.13	18.82	202.21	23.13	6**
	2018	Q1	168.60	18.15	164.40	23.70	12**
Makaha Valley	2016	Q3	89.61	30.45	75.82	10.70	3**
		Q4	94.63	17.71	73.85	22.30	14**
	2017	Q1	-	-	-	-	-
		Q2	71.38	23.34	71.38	23.34	2**
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	164.92	21.11	104.86	20.59	17**
Makakilo	2016	Q3	100.56	16.19	62.32	17.08	1,400
		Q4	97.50	15.43	62.92	12.02	1,250
	2017	Q1	102.25	17.45	73.48	18.94	1,201
		Q2	127.86	19.23	91.19	22.08	906
		Q3	116.05	17.97	76.54	18.81	1,695
		Q4	120.94	20.34	73.36	18.99	1,566
	2018	Q1	135.28	24.29	93.84	19.34	1,428
Marine Corps Base Hawaii	2016	Q3	99.18	16.34	59.72	16.96	370
		Q4	110.61	20.12	70.90	15.99	213
	2017	Q1	97.87	17.60	71.33	21.36	376
		Q2	129.79	18.16	94.18	21.42	361
		Q3	123.25	20.66	79.47	20.72	321
		Q4	131.08	29.15	93.45	23.02	357
	2018	Q1	138.67	39.16	94.65	21.93	190
Maunawili	2016	Q3	56.54	16.24	55.39	19.14	97
		Q4	3.64	0.66	3.64	0.66	2**
	2017	Q1	126.77	31.24	73.45	21.30	44**
		Q2	132.39	41.94	87.72	49.85	60
		Q3	130.16	22.92	49.61	21.07	21**
		Q4	112.13	17.51	85.37	20.93	75
	2018	Q1	97.13	19.37	36.74	22.30	11**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Mililani	2016	Q3	82.06	13.20	41.20	10.10	842
		Q4	86.54	13.84	33.78	10.47	945
	2017	Q1	62.14	11.53	21.80	2.94	780
		Q2	101.61	22.93	60.62	20.75	509
		Q3	100.14	20.70	53.87	12.47	1,156
		Q4	102.81	19.18	64.78	12.80	1,054
	2018	Q1	108.24	19.78	72.54	11.85	813
Mokuleia	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	5.75	5.94	5.75	5.94	1**
		Q2	20.60	6.82	14.10	5.94	5**
		Q3	16.30	12.31	16.30	12.31	2**
		Q4	16.55	6.70	16.55	6.70	2**
	2018	Q1	23.28	7.35	16.99	10.50	21**
Nanakuli	2016	Q3	62.22	8.55	19.68	2.83	26**
		Q4	15.51	3.88	6.61	0.86	10**
	2017	Q1	46.35	16.52	28.86	1.83	13**
		Q2	52.56	7.66	15.61	4.52	10**
		Q3	74.62	12.45	45.08	9.61	36**
		Q4	106.03	15.58	74.37	19.58	30**
	2018	Q1	282.06	21.81	226.74	23.89	11**
Pearl City	2016	Q3	84.54	13.08	55.18	11.71	2,005
		Q4	95.84	15.07	58.89	11.96	1,356
	2017	Q1	88.14	14.66	65.60	11.84	1,138
		Q2	95.09	16.63	63.23	16.04	1,240
		Q3	112.68	29.83	66.84	13.21	1,819
		Q4	109.22	21.24	70.43	15.15	1,676
	2018	Q1	126.00	22.61	80.86	18.30	1,278
Punaluu	2016	Q3	82.15	12.34	39.77	8.85	22**
		Q4	69.48	14.71	91.46	16.52	6**
	2017	Q1	69.20	15.68	70.94	23.27	11**
		Q2	47.25	12.61	35.84	11.10	10**
		Q3	149.70	15.41	119.28	11.79	5**
		Q4	-	-	-	-	-
	2018	Q1	204.91	11.96	204.91	11.96	1**
Pupukea	2016	Q3	55.18	10.82	27.60	10.24	85
		Q4	109.00	18.69	78.07	21.23	8**
	2017	Q1	77.59	13.90	73.04	11.87	20**
		Q2	105.17	16.95	67.14	21.28	37**
		Q3	95.73	14.42	70.32	11.83	23**
		Q4	91.38	15.89	64.20	18.66	60
	2018	Q1	113.90	15.62	54.79	19.28	59
Schofield Barracks	2016	Q3	101.61	15.29	67.74	12.04	450
		Q4	113.08	16.72	88.47	20.02	447
	2017	Q1	111.55	17.94	91.62	21.47	296
		Q2	102.17	16.76	74.56	20.74	421
		Q3	131.68	17.54	95.59	20.18	565
		Q4	136.04	16.40	105.29	14.51	565
	2018	Q1	141.68	15.20	112.76	11.98	427

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Village Park	2016	Q3	92.46	14.27	59.05	11.92	280
		Q4	107.49	15.65	79.15	11.92	291
	2017	Q1	90.51	14.36	70.09	11.97	247
		Q2	89.93	15.14	59.60	15.78	216
		Q3	112.12	15.64	71.38	14.10	266
		Q4	109.80	14.32	71.24	11.86	283
	2018	Q1	125.80	22.61	88.27	11.85	282
Wahiawa	2016	Q3	89.49	21.02	62.97	18.13	430
		Q4	114.77	26.10	83.24	22.50	426
	2017	Q1	96.91	21.74	70.75	20.65	441
		Q2	93.42	19.19	69.88	20.16	334
		Q3	100.33	20.97	66.59	20.36	418
		Q4	126.36	28.28	86.78	22.72	460
	2018	Q1	121.70	29.87	78.83	19.73	599
Waialua	2016	Q3	-	-	-	-	-
		Q4	60.13	18.73	52.07	22.11	3**
	2017	Q1	61.83	6.01	61.83	6.01	1**
		Q2	62.81	9.53	27.13	5.34	12**
		Q3	57.79	8.06	6.33	3.34	8**
		Q4	-	-	-	-	-
	2018	Q1	139.86	16.46	118.21	21.38	30**
Waianae	2016	Q3	104.53	16.34	59.06	16.11	357
		Q4	102.86	14.47	66.59	11.98	380
	2017	Q1	91.72	16.16	70.14	19.30	529
		Q2	92.99	15.38	70.63	15.67	362
		Q3	112.38	15.29	71.93	16.27	318
		Q4	127.13	16.01	94.38	12.17	420
	2018	Q1	115.57	13.91	80.11	11.88	493
Waikane	2016	Q3	86.52	14.46	58.41	12.92	102
		Q4	104.48	12.08	111.18	11.45	15**
	2017	Q1	69.24	12.14	60.58	11.52	49**
		Q2	77.09	20.35	47.12	22.03	36**
		Q3	64.29	10.77	56.26	11.71	13**
		Q4	96.20	15.93	66.45	17.51	40**
	2018	Q1	126.09	16.15	107.52	22.54	31**
Waimalu	2016	Q3	102.58	16.78	59.03	11.96	2,254
		Q4	99.06	20.07	59.09	11.97	2,005
	2017	Q1	97.35	19.69	63.78	11.95	1,802
		Q2	99.26	25.12	61.92	16.98	1,489
		Q3	135.49	41.32	70.98	15.44	1,909
		Q4	123.25	56.05	70.08	12.50	2,069
	2018	Q1	125.90	31.14	76.04	11.98	2,320
Waimanalo	2016	Q3	48.30	11.93	58.93	6.06	7**
		Q4	-	-	-	-	-
	2017	Q1	93.86	24.01	93.86	24.01	1**
		Q2	3.72	16.09	2.27	15.55	4**
		Q3	26.97	14.24	25.14	14.21	5**
		Q4	-	-	-	-	-
	2018	Q1	106.94	29.14	1.86	2.50	19**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Waimanalo Beach	2016	Q3	14.87	1.79	14.87	1.79	1**
		Q4	70.21	5.88	70.21	5.88	1**
	2017	Q1	-	-	-	-	-
		Q2	174.53	71.68	91.52	78.94	9**
		Q3	86.25	71.89	84.39	73.81	18**
		Q4	65.79	23.45	56.57	13.89	19**
	2018	Q1	97.09	21.06	98.93	22.42	24**
Waipahu	2016	Q3	97.46	14.34	59.01	11.94	923
		Q4	91.62	14.15	58.56	11.90	919
	2017	Q1	100.14	15.13	66.20	11.97	730
		Q2	85.55	15.10	60.93	11.95	765
		Q3	92.07	12.63	57.25	11.52	1,052
		Q4	100.53	14.40	67.75	11.82	996
	2018	Q1	112.24	18.39	70.66	11.78	1,016
Waipio	2016	Q3	7.46	5.06	5.75	0.69	6**
		Q4	89.21	13.09	57.44	11.72	45**
	2017	Q1	92.79	14.33	65.13	11.92	196
		Q2	107.48	14.82	72.94	18.12	118
		Q3	133.84	35.21	93.77	16.36	176
		Q4	85.61	71.70	48.92	23.43	128
	2018	Q1	98.42	12.61	115.53	12.05	41**
Waipio Acres	2016	Q3	106.14	14.96	67.33	12.10	975
		Q4	116.26	15.51	83.56	18.46	850
	2017	Q1	107.40	15.92	76.14	19.30	652
		Q2	122.82	19.19	94.82	22.70	352
		Q3	131.32	24.93	91.74	20.87	947
		Q4	122.92	20.17	98.43	11.93	547
	2018	Q1	121.64	17.36	79.26	12.04	553
Wheeler Army Airfield	2016	Q3	99.54	15.35	71.66	14.61	563
		Q4	110.89	15.51	84.15	16.66	515
	2017	Q1	101.71	15.99	77.89	12.13	448
		Q2	110.02	15.86	93.80	11.93	530
		Q3	115.83	15.96	84.88	16.02	456
		Q4	156.89	18.84	92.97	17.69	307
	2018	Q1	158.25	30.38	92.77	20.81	403
Whitmore Village	2016	Q3	124.05	19.32	94.39	23.52	29**
		Q4	181.95	29.62	172.58	24.00	21**
	2017	Q1	111.17	15.43	93.06	15.58	21**
		Q2	141.35	22.73	83.38	19.12	32**
		Q3	73.93	27.65	51.55	11.93	13**
		Q4	178.03	19.50	119.91	20.99	83
	2018	Q1	181.31	41.83	117.62	23.49	146

** Directional due to low sample count.

Aggregated Speedtest Results for Cities by Quarter – Kauai

Kauai Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Anahola	2016	Q3	-	-	-	-	-
		Q4	34.87	3.69	34.87	3.69	2**
	2017	Q1	71.23	11.13	71.23	11.13	2**
		Q2	55.07	14.80	44.59	14.87	4**
		Q3	20.66	7.38	17.55	1.97	7**
		Q4	-	-	-	-	-
	2018	Q1	4.70	0.72	4.70	0.72	2**
Eleele	2016	Q3	31.53	6.77	24.80	5.74	8**
		Q4	56.77	7.64	53.74	6.77	4**
	2017	Q1	80.94	17.93	51.29	22.52	5**
		Q2	11.27	1.15	11.37	0.99	13**
		Q3	75.69	9.19	59.82	5.94	10**
		Q4	10.50	1.48	1.94	0.17	9**
	2018	Q1	45.39	13.93	25.50	15.88	7**
Hanalei	2016	Q3	4.56	0.58	5.86	0.65	3**
		Q4	5.79	0.71	5.79	0.71	2**
	2017	Q1	5.96	1.67	6.18	2.10	7**
		Q2	89.61	12.08	31.47	10.33	18**
		Q3	47.22	9.07	4.25	3.29	3**
		Q4	222.85	15.97	310.90	23.44	3**
	2018	Q1	55.35	8.06	60.51	9.75	7**
Hanamaulu	2016	Q3	69.99	10.52	58.51	5.99	44**
		Q4	87.03	14.15	70.68	11.91	127
	2017	Q1	97.10	13.61	67.41	11.42	67
		Q2	76.43	11.85	69.27	11.70	23**
		Q3	97.58	12.77	49.02	11.82	77
		Q4	80.41	12.34	58.03	11.36	118
	2018	Q1	96.18	12.73	70.78	11.80	187
Hanapepe	2016	Q3	96.07	11.91	68.81	11.83	16**
		Q4	100.38	11.31	63.99	8.63	8**
	2017	Q1	3.92	1.20	2.47	0.72	8**
		Q2	13.67	1.62	13.67	1.62	2**
		Q3	-	-	-	-	-
		Q4	79.27	7.31	70.89	5.83	4**
	2018	Q1	122.00	12.19	87.07	11.47	8**
Kalaheo	2016	Q3	83.56	11.83	58.54	11.62	232
		Q4	76.56	10.55	57.83	6.06	256
	2017	Q1	74.34	11.58	66.20	6.13	280
		Q2	73.26	12.41	65.47	11.41	216
		Q3	92.96	12.72	67.74	11.72	228
		Q4	74.65	10.51	53.03	6.07	217
	2018	Q1	100.40	16.66	70.39	9.68	168

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Kalihiwai	2016	Q3	88.33	14.99	82.24	12.03	63
		Q4	101.56	13.98	66.38	17.52	84
	2017	Q1	99.62	14.49	70.07	16.40	61
		Q2	118.88	17.32	88.61	19.10	28**
		Q3	74.09	12.08	55.63	11.73	115
		Q4	45.26	11.28	25.13	11.23	34**
	2018	Q1	95.95	10.73	70.53	9.02	42**
Kapaa	2016	Q3	18.92	8.49	2.67	0.68	140
		Q4	52.06	9.28	26.74	5.89	173
	2017	Q1	53.60	9.10	23.38	5.80	232
		Q2	55.52	9.24	22.13	5.91	241
		Q3	39.99	6.45	6.59	0.96	180
		Q4	38.16	5.66	6.76	0.96	104
	2018	Q1	56.16	9.16	34.70	5.84	191
Kaumakani	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	6.17	8.14	6.17	8.14	1**
	2018	Q1	-	-	-	-	-
Kekaha	2016	Q3	2.59	0.73	2.59	0.73	1**
		Q4	-	-	-	-	-
	2017	Q1	2.56	0.73	2.56	0.73	1**
		Q2	-	-	-	-	-
		Q3	10.20	6.91	10.20	6.91	1**
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-
Kilauea	2016	Q3	46.29	13.31	29.73	6.81	22**
		Q4	81.39	11.29	43.73	9.79	25**
	2017	Q1	79.63	15.29	69.29	12.01	45**
		Q2	61.13	14.39	53.02	11.97	45**
		Q3	36.88	5.26	36.88	5.26	2**
		Q4	7.55	0.82	6.66	0.89	4**
	2018	Q1	96.06	12.97	60.63	11.39	36**
Koloa	2016	Q3	78.28	17.90	55.66	11.20	101
		Q4	80.34	12.87	57.35	6.19	124
	2017	Q1	60.23	13.48	38.95	6.01	120
		Q2	68.57	12.52	50.79	8.28	191
		Q3	82.27	12.73	70.76	11.73	163
		Q4	90.20	11.62	66.70	9.66	100
	2018	Q1	97.43	21.22	87.58	16.34	184
Lawai	2016	Q3	75.05	10.84	44.84	6.02	68
		Q4	53.62	8.36	29.42	5.93	88
	2017	Q1	42.22	7.59	13.86	4.65	76
		Q2	89.11	12.09	70.18	9.88	103
		Q3	99.41	11.91	69.38	11.64	150
		Q4	65.74	9.66	42.22	5.98	201
	2018	Q1	80.55	14.24	57.12	9.21	148

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Lihue	2016	Q3	75.54	12.32	58.54	11.86	110
		Q4	94.09	14.15	62.44	11.97	135
	2017	Q1	73.60	13.22	68.81	11.88	70
		Q2	71.25	10.99	40.79	8.94	86
		Q3	80.81	10.22	66.43	5.97	38**
		Q4	86.28	12.81	47.42	11.76	126
	2018	Q1	68.70	11.64	45.81	11.48	66
Pakala Village	2016	Q3	77.70	11.97	57.93	10.94	26**
		Q4	52.49	6.02	52.49	6.02	2**
	2017	Q1	71.91	11.27	71.16	8.88	8**
		Q2	112.01	13.66	86.82	11.77	15**
		Q3	120.85	13.64	76.30	14.88	9**
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-
Princeville	2016	Q3	27.06	9.33	14.28	6.65	25**
		Q4	10.04	7.48	6.65	6.67	12**
	2017	Q1	105.20	13.21	75.61	11.61	15**
		Q2	55.98	11.13	25.09	9.47	125
		Q3	37.48	7.43	27.18	5.49	13**
		Q4	54.42	10.64	17.62	6.75	32**
	2018	Q1	68.08	7.71	8.75	7.13	18**
Puhi	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	8.03	1.66	8.66	1.62	4**
		Q3	14.20	1.47	16.12	1.76	3**
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-
Wailua	2016	Q3	94.41	12.52	58.81	11.87	70
		Q4	70.12	12.23	47.93	11.42	102
	2017	Q1	84.36	12.42	64.35	11.79	151
		Q2	69.66	12.96	52.08	11.67	96
		Q3	86.64	11.72	57.34	11.65	102
		Q4	92.35	12.70	70.76	11.61	75
	2018	Q1	85.14	11.39	70.32	11.70	31**
Wailua Homesteads	2016	Q3	99.55	13.55	58.16	12.30	119
		Q4	60.28	9.83	43.97	6.07	140
	2017	Q1	97.33	13.77	66.22	11.94	70
		Q2	111.40	16.09	70.57	19.07	80
		Q3	131.41	15.36	93.55	12.02	63
		Q4	93.05	14.53	68.30	11.94	66
	2018	Q1	79.21	11.98	70.79	11.69	34**
Waimea	2016	Q3	3.15	0.53	2.53	0.53	4**
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-

** Directional due to low sample count.

Aggregated Speedtest Results for Cities by Quarter – Maui

Maui Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Haiku-Pauwela	2016	Q3	34.13	4.25	4.33	0.78	212
		Q4	38.81	6.85	11.34	0.98	244
	2017	Q1	65.37	10.01	18.71	5.87	65
		Q2	78.78	13.45	48.57	11.89	146
		Q3	116.67	14.98	81.04	12.06	185
		Q4	97.60	13.17	70.86	11.82	199
	2018	Q1	82.74	13.04	54.39	11.67	289
Haliimaile	2016	Q3	70.58	10.61	37.12	6.06	60
		Q4	52.96	9.78	57.31	6.12	21**
	2017	Q1	59.29	12.49	49.63	9.84	90
		Q2	72.10	12.76	77.00	9.98	14**
		Q3	97.08	13.34	70.68	11.77	70
		Q4	68.17	13.12	70.65	11.92	17**
	2018	Q1	122.24	13.99	82.14	11.87	4**
Hana	2016	Q3	32.73	3.87	25.86	5.31	9**
		Q4	32.48	3.88	32.96	5.55	55
	2017	Q1	24.93	4.04	15.87	5.83	20**
		Q2	30.91	4.22	20.19	4.91	28**
		Q3	30.04	4.45	13.76	5.62	49**
		Q4	34.68	4.67	20.10	5.76	51
	2018	Q1	35.26	5.26	30.63	5.66	73
Kaanapali	2016	Q3	67.66	10.65	50.77	6.07	560
		Q4	65.10	12.29	52.42	6.04	718
	2017	Q1	63.16	11.00	51.66	6.09	727
		Q2	58.87	11.38	47.81	10.04	508
		Q3	84.61	11.98	62.27	10.30	604
		Q4	79.22	11.18	54.38	8.46	707
	2018	Q1	70.53	13.09	54.54	10.05	853
Kahului	2016	Q3	76.48	12.29	43.59	10.29	1,466
		Q4	82.19	13.20	49.95	11.43	1,150
	2017	Q1	70.85	12.62	55.00	11.69	1,556
		Q2	80.99	14.11	61.99	11.86	1,331
		Q3	97.12	13.02	68.59	11.79	1,382
		Q4	87.12	13.20	59.39	11.72	1,426
	2018	Q1	93.41	12.58	66.52	11.41	1,354
Kapalua	2016	Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	19.13	15.75	20.74	16.05	8**
		Q3	2.24	5.80	2.24	5.80	2**
		Q4	19.47	18.11	17.66	17.99	8**
	2018	Q1	29.88	12.26	17.18	16.97	9**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Kihei	2016	Q3	76.35	11.59	49.62	11.05	1,471
		Q4	69.10	10.97	48.84	7.77	1,503
	2017	Q1	67.20	11.00	52.01	7.64	1,530
		Q2	71.96	12.43	56.33	11.53	1,191
		Q3	86.63	12.93	65.28	11.44	1,363
		Q4	88.13	12.50	67.02	11.64	1,449
	2018	Q1	84.06	11.98	64.69	11.49	1,471
Kula	2016	Q3	24.15	3.73	2.66	0.75	14**
		Q4	76.30	10.62	58.43	6.05	33**
	2017	Q1	91.44	18.06	77.25	21.59	21**
		Q2	61.38	14.61	61.11	12.54	78
		Q3	83.47	12.93	49.83	11.84	32**
		Q4	81.38	13.45	68.38	11.74	151
	2018	Q1	68.80	10.73	52.38	10.56	156
Lahaina	2016	Q3	36.39	6.52	9.37	1.02	401
		Q4	51.59	14.34	30.44	5.88	283
	2017	Q1	46.41	8.95	20.54	5.71	305
		Q2	62.32	13.22	36.21	5.97	315
		Q3	70.12	9.32	34.93	5.87	249
		Q4	72.63	10.57	39.12	7.55	358
	2018	Q1	62.52	11.98	41.69	5.94	335
Maalaea	2016	Q3	-	-	-	-	-
		Q4	12.78	5.18	12.78	5.18	2**
	2017	Q1	-	-	-	-	-
		Q2	47.00	10.51	31.61	6.43	8**
		Q3	0.77	1.65	0.77	1.65	1**
		Q4	107.09	11.69	48.66	5.90	9**
	2018	Q1	59.48	7.12	2.16	5.66	3**
Makawao	2016	Q3	73.02	12.33	52.14	11.73	773
		Q4	78.15	13.43	59.04	11.83	672
	2017	Q1	83.45	15.63	69.54	19.00	497
		Q2	80.48	15.41	58.95	16.37	424
		Q3	97.87	13.99	70.35	11.86	638
		Q4	98.60	13.71	68.97	11.85	839
	2018	Q1	86.74	12.68	65.90	11.74	912
Napili-Honokowai	2016	Q3	81.73	11.88	52.55	6.18	241
		Q4	60.80	10.00	45.62	6.00	273
	2017	Q1	61.58	11.46	54.26	9.81	243
		Q2	64.97	11.94	52.51	11.20	259
		Q3	71.97	10.02	57.28	6.01	242
		Q4	67.89	10.13	49.31	6.00	250
	2018	Q1	56.48	8.58	41.94	5.82	255
Paia	2016	Q3	13.71	15.16	14.98	18.73	3**
		Q4	18.53	3.13	12.26	2.86	6**
	2017	Q1	68.74	12.85	39.94	10.63	17**
		Q2	97.80	14.30	68.72	11.88	41**
		Q3	51.65	8.15	34.69	5.86	38**
		Q4	72.94	10.86	52.56	11.78	60
	2018	Q1	90.56	11.17	35.12	12.76	33**

(continued)

Location	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Pukalani	2016	Q3	67.79	12.37	56.78	11.67	255
		Q4	83.50	13.26	59.00	11.82	353
	2017	Q1	70.47	14.39	62.73	12.12	310
		Q2	81.44	15.02	69.70	13.80	153
		Q3	115.50	15.35	75.15	14.04	303
		Q4	92.51	18.48	70.22	11.80	301
	2018	Q1	92.46	12.83	70.83	11.72	332
Waihee-Waiehu	2016	Q3	71.02	10.94	59.01	8.37	17**
		Q4	29.46	8.29	6.64	0.89	14**
	2017	Q1	16.00	2.78	6.36	0.77	25**
		Q2	54.92	9.53	42.80	5.98	21**
		Q3	33.55	5.80	5.95	1.94	39**
		Q4	71.80	43.62	60.34	43.79	19**
	2018	Q1	34.19	12.89	14.32	2.08	33**
Waikapu	2016	Q3	6.42	0.76	6.44	0.77	9**
		Q4	4.81	0.73	4.81	0.73	2**
	2017	Q1	51.68	6.44	13.16	2.54	20**
		Q2	61.89	13.69	51.94	12.17	37**
		Q3	13.33	10.98	13.33	10.98	2**
		Q4	14.06	1.21	4.60	0.75	4**
	2018	Q1	47.72	31.68	6.57	2.52	21**
Wailea-Makena	2016	Q3	50.48	9.53	26.83	6.01	545
		Q4	57.62	10.45	38.90	5.98	597
	2017	Q1	52.84	10.07	37.34	6.01	641
		Q2	62.09	11.17	38.93	7.46	686
		Q3	76.73	14.45	57.73	11.52	413
		Q4	93.73	18.87	65.79	11.75	731
	2018	Q1	82.63	16.03	67.20	11.77	649
Wailuku	2016	Q3	62.63	14.46	43.83	10.17	410
		Q4	76.37	13.71	55.17	11.76	613
	2017	Q1	81.13	13.07	58.11	11.85	358
		Q2	81.76	16.54	56.11	11.75	534
		Q3	92.68	13.81	69.92	11.84	485
		Q4	112.74	14.02	71.08	11.88	342
	2018	Q1	92.90	15.45	70.77	11.84	414

** Directional due to low sample count.

Aggregated Speedtest Results for Cities by Quarter – Lanai and Molokai

Lanai & Molokai Cities Fixed Wireline Speeds – Quarterly (Mbps)							
Location City/Island	Year	Quarter	Mean		Median		Sample Count
			Download	Upload	Download	Upload	
Lanai City Lanai	2016	Q3	48.24	5.97	55.84	6.01	8**
		Q4	89.72	9.82	58.50	5.97	20**
	2017	Q1	60.09	5.57	59.53	5.74	3**
		Q2	50.47	5.14	65.29	5.80	8**
		Q3	44.55	8.93	27.25	11.05	6**
		Q4	48.96	6.54	49.28	5.91	40**
	2018	Q1	86.26	8.99	73.41	9.41	21**
Hoolehua Molokai	2016	Q3	12.44	3.10	13.68	2.74	6**
		Q4	56.99	19.04	56.99	19.04	1**
	2017	Q1	8.91	1.52	10.71	1.43	6**
		Q2	24.35	25.89	12.73	4.98	15**
		Q3	21.76	6.32	15.80	3.49	15**
		Q4	22.94	8.19	16.04	1.80	21**
	2018	Q1	105.10	81.07	156.13	106.73	23**
Kaunakakai Molokai	2016	Q3	43.04	4.99	53.49	5.86	14**
		Q4	41.54	5.45	46.55	5.89	29**
	2017	Q1	49.49	5.63	53.60	5.92	39**
		Q2	38.55	5.31	47.69	5.91	9**
		Q3	33.09	5.28	33.31	5.93	17**
		Q4	45.52	5.28	49.19	5.86	24**
	2018	Q1	65.26	21.29	56.02	5.87	42**
Kualapuu Molokai	2016	Q3	14.91	3.23	11.32	1.61	50
		Q4	32.24	7.86	23.47	5.73	110
	2017	Q1	33.78	3.83	16.09	2.25	75
		Q2	35.24	5.25	34.04	5.74	17**
		Q3	42.54	23.74	27.47	5.86	10**
		Q4	35.29	5.17	27.02	4.66	68
	2018	Q1	43.27	13.47	16.54	2.76	74
Maunaloa Molokai	2016	Q3	4.67	5.23	4.89	4.15	6**
		Q4	-	-	-	-	-
	2017	Q1	-	-	-	-	-
		Q2	-	-	-	-	-
		Q3	-	-	-	-	-
		Q4	-	-	-	-	-
	2018	Q1	-	-	-	-	-

** Directional due to low sample count.

