

Technical Appendix: Estimating End-User Telecommunication Revenue by State in 2019

The methodology described below is used in estimating contributions in Table 1.9 of the 2021 *Monitoring Report*. Providers do not report end-user telecommunication revenue information on a state-by-state basis. Therefore, it is necessary to estimate revenues per state in order to derive contributions made per state.

The nationwide sum of contributions to support universal service is equal to the payments made from USAC to recipients of funds from the universal service mechanisms plus administration costs. Contributions on a per-state basis are computed by multiplying nationwide contributions by the ratio of interstate end-user revenues in each state to nationwide interstate end-user revenues. Estimates of interstate end-user revenues by state are reported in Table 1. These estimates of end-user interstate revenues are used as a basis for estimating contributions in Table 1.9 of the *Monitoring Report*.¹

The remainder of this appendix provides a detailed description on how we allocate revenues to the states. First, we divide end-user telecommunications revenues on a nationwide basis, into the following service type categories: wireless, private line, local exchange, VoIP, and switched toll. We derive these data from information filed on Form 499-A Telecommunications Reporting Worksheets. On Form 499-A, filers indicate their revenue information by service type, which we use to place revenues into these categories. Table 2 presents end-user intrastate and interstate/international telecommunication revenues for each of these provider type categories at the nationwide level.

As set forth below, once the revenues are divided into categories, we use data from several sources to estimate each state's end-user telecommunications revenues. Data from FCC Form 477 are used to estimate the following on a state-by-state basis: intrastate and international wireless revenues, intrastate and international VoIP revenues, intrastate local exchange revenues, and intrastate switched toll revenues. Intrastate and international private line revenues are estimated using annual payroll data from the U.S. Census Bureau's County Business Patterns survey for organizations with ten or more employees. Data from tariff access filings with the FCC along with Form 477 data are used to estimate on a state-by-state basis interstate local exchange revenues. Interstate switched access toll revenues are estimated using data from the National Exchange Carrier Association (NECA) minutes of use data.

Table 3 shows intrastate end-user telecommunications revenues by category for wireless, private line, local exchange, VoIP, and switched toll revenues. Similarly, components of interstate end-user telecommunications revenues are presented in Table 4.

Table 5 provides most of the underlying data that we use to allocate nationwide revenues to the individual states. We also report each state's percentage of the nationwide total. Mobile wireless subscribers, local exchange connections, and VoIP subscribers are taken from data reported in FCC Form 477.² Data on interstate access minutes of use are taken from the supplemental material of the 2020 Monitoring report. Payroll data for each state is taken from the County Business Patterns Survey administered annually by the

1. Each state's share of interstate end-user revenues and contributions are reported under the heading "estimated contributions percent of total."

2. *Voice Telephone Service: Status as of June 30, 2019 for June 30, 2019 data*, at <https://www.fcc.gov/wireline-competition/voice-telephone-services-report>.

U.S. Census Bureau.³ For each metric, we report each state's percentage of the nationwide total. We then use these percentages to allocate nationwide revenue data in Table 2 to individual states in Tables 3 and 4.

In Table 3 we allocate intrastate wireless end-user revenues on a state-by-state basis by multiplying nationwide intrastate wireless revenues (see Table 2) and mobile wireless subscriptions in a state. Similarly, local exchange and VoIP revenues are allocated on a state-by-state basis by multiplying intrastate local exchange and VoIP provider revenues by the percentage of switched access lines and interconnected VoIP subscribers in a state. Intrastate switched toll revenues are allocated on a state-by-state basis by multiplying nationwide intrastate toll revenues by local exchange end-user switched access lines in a state. Intrastate private line revenues are allocated on a state-by-state basis by multiplying nationwide intrastate private line revenues by the percentage of the total annual payroll amount in a state for organizations with ten or more employees.

In Table 4, we allocate end-user interstate wireless, private line, and VoIP revenues to analogously to how we allocated their respective intrastate revenues. That is, we allocate interstate wireless and VoIP revenues on a state-by-state basis by multiplying nationwide interstate wireless and VoIP revenues by the percentage of mobile wireless subscribers and VoIP subscribers in a state. Interstate private line revenues are allocated on a state-by-state basis by multiplying nationwide interstate private line revenues by the percentage of the total annual payroll amount in a state for organizations with ten or more employees relative to the nationwide total.

In contrast, interstate local exchange revenues and switched toll revenues are allocated differently than intrastate revenues. In Table 4, interstate switched toll revenues are allocated on a state-by-state basis by multiplying nationwide interstate switched toll revenues by the percentage of interstate access minutes in the state. Further, interstate local exchange revenues are allocated to states by multiplying interstate local exchange revenues and the percentage of estimated subscriber line charge (SLC) and access recovery charge (ARC) revenue reported in the last column of Table 6.

We estimate SLC and ARC revenue by state in Table 6.⁴ Our estimate for SLC and ARC revenues by state are calculated by the following formula: $12 * (\text{residential lines subject to the SLC and ARC}) * (\text{primary residential SLC rate per line per month} + \text{residential ARC rate per line per month}) + 12 * (\text{business lines}) * (\text{multiline business SLC rate per line per month} + \text{multiline business ARC rate per month})$.

We use data from Form 477 to estimate residential and business lines. The first and fourth column of Table 6 has data on the number of residential and business ILEC end-user switched access lines by state from FCC Form 477.⁵ Our estimate of residential customers subject to the SLCs and ARCs (Column 3) excludes customers that are in the Lifeline program. Our estimate of ILEC Lifeline customers (Column 2) is based on subscribership data provided to the FCC by USAC.

3. *County Business Patterns: 2019 Tables*, for businesses with 10 or more employees at <https://www.census.gov/programs-surveys/cbp/data/tables.html>

4. ARMIS forbearance reduced the amount of data collected by the FCC. Hence, we simplified our estimation process for SLC revenues, beginning with the 2009 revenue data, and base it on residential lines and business lines. We no longer separate non-primary residential and single-line business from the totals and apply different rates to them.

5. *Voice Telephone Service: Status as of June 30, 2019 for June 30, 2019 data*, at <https://www.fcc.gov/wireline-competition/voice-telephone-services-report>.

Residential SLC rates per month for 2016, shown in Column 5, are the rates filed for primary residential lines in the Tariff Review Plan (TRP) for price-cap carriers, National Exchange Carrier Association (NECA) pool rate-of-return carriers and for non-NECA pool rate-of-return carriers from June 2016 filings.⁶ Multiline business SLC rates per line per month in each state, shown in Column 7, are estimated based on the rates in the June 2016 TRP filings for price-cap companies, NECA pool and rate-of-return carriers. ARC rates for 2016 are the average of the current rate and the proposed rate from the June 2016 TRP filings for price caps carriers, NECA pool carriers and the other rate-of-return carriers. Residential ARC rate is reported in Column 6 and multiline business ARC rate is reported in Column 8.⁷

6. Residential and Business lines from Form 477 are used as weights. We assume that the residential SLC for NECA pool and rate-of-return carriers during the relevant time period was \$6.50.

7. Multiline business ARC rate is the weighted average of the centrex ARC rate and non-centrex rate in each state.

Table 1
End-User Telecommunications Revenues by State: 2019
(Dollar Amounts Shown in Millions)

	Intrastate	Interstate and International	Total	% of Total
Alabama	\$796	\$568	\$1,364	1.25 %
Alaska	118	113	232	0.21
American Samoa	6	3	9	0.01
Arizona	1,143	949	2,092	1.92
Arkansas	503	382	885	0.81
California	7,567	5,648	13,215	12.15
Colorado	1,074	926	2,000	1.84
Connecticut	755	625	1,380	1.27
Delaware	201	181	382	0.35
District of Columbia	345	308	652	0.60
Florida	3,518	2,716	6,235	5.73
Georgia	1,877	1,334	3,212	2.95
Guam	32	23	55	0.05
Hawaii	266	212	478	0.44
Idaho	272	237	510	0.47
Illinois	2,397	1,931	4,328	3.98
Indiana	1,093	900	1,993	1.83
Iowa	620	465	1,086	1.00
Kansas	517	379	897	0.82
Kentucky	785	545	1,331	1.22
Louisiana	830	555	1,385	1.27
Maine	267	200	467	0.43
Maryland	1,258	1,122	2,380	2.19
Massachusetts	1,589	1,216	2,806	2.58
Michigan	1,664	1,264	2,928	2.69
Minnesota	1,163	922	2,085	1.92
Mississippi	430	294	725	0.67
Missouri	1,064	870	1,934	1.78
Montana	197	160	357	0.33
Nebraska	391	291	682	0.63
Nevada	518	412	931	0.86
New Hampshire	276	240	516	0.47
New Jersey	2,050	1,647	3,697	3.40
New Mexico	351	277	628	0.58
New York	4,413	3,224	7,637	7.02
North Carolina	1,778	1,331	3,109	2.86
North Dakota	161	128	289	0.27
N. Mariana Islands	10	6	16	0.01
Ohio	2,124	1,604	3,727	3.43
Oklahoma	621	458	1,079	0.99
Oregon	727	588	1,314	1.21
Pennsylvania	2,661	2,078	4,738	4.36
Puerto Rico	524	403	927	0.85
Rhode Island	208	147	354	0.33
South Carolina	865	632	1,497	1.38
South Dakota	192	129	321	0.29
Tennessee	1,192	852	2,044	1.88
Texas	4,682	3,600	8,282	7.62
Utah	485	413	897	0.83
Vermont	148	127	275	0.25
Virgin Islands	20	20	41	0.04
Virginia	1,701	1,427	3,128	2.88
Washington	1,349	1,099	2,448	2.25
West Virginia	350	314	663	0.61
Wisconsin	1,043	871	1,914	1.76
Wyoming	109	96	205	0.19
Total	\$61,296	\$47,464	\$108,760	100.00 %

Table 2
End-User Telecommunication Revenue by Service: 2019
(In Millions)

	Intrastate	Interstate and International	Total
Wireless	\$25,681	\$12,753	\$38,434
Private Line	5,091	13,045	18,135
Local Exchange	16,439	4,807	21,245
VoIP	11,162	8,172	19,334
Switched Toll	2,924	8,688	11,612
Total	\$61,296	\$47,464	\$108,760

Source: Form 499 data from Monitoring Supplemental Material Table S.1.2. Revenue Details - Historical

Table 3
Intrastate End-User Telecommunications Revenues by Provider: 2019
(Dollar Amounts Shown in Millions)

	Wireless	Private Line	Local Exchange	VoIP	Switched Toll	Total	% of Total
Alabama	\$367	\$54	\$209	\$129	\$37	\$796	1.30 %
Alaska	52	11	41	8	7	118	0.19
American Samoa	2	0	3	0	0	6	0.01
Arizona	516	89	272	218	48	1,143	1.87
Arkansas	228	31	159	58	28	503	0.82
California	3,203	739	1,909	1,377	339	7,567	12.35
Colorado	441	95	290	197	52	1,074	1.75
Connecticut	274	69	193	184	34	755	1.23
Delaware	71	16	53	51	9	201	0.33
District of Columbia	114	31	127	50	23	345	0.56
Florida	1,613	287	712	780	127	3,518	5.74
Georgia	813	145	496	335	88	1,877	3.06
Guam	14	1	13	1	2	32	0.05
Hawaii	117	17	85	32	15	266	0.43
Idaho	125	17	91	23	16	272	0.44
Illinois	1,028	224	582	460	103	2,397	3.91
Indiana	482	91	288	180	51	1,093	1.78
Iowa	230	43	239	65	43	620	1.01
Kansas	235	39	140	79	25	517	0.84
Kentucky	313	51	273	100	49	785	1.28
Louisiana	396	55	201	141	36	830	1.35
Maine	96	16	101	37	18	267	0.44
Maryland	494	93	335	275	60	1,258	2.05
Massachusetts	578	166	363	417	65	1,589	2.59
Michigan	777	139	359	325	64	1,664	2.71
Minnesota	432	107	375	182	67	1,163	1.90
Mississippi	204	25	118	62	21	430	0.70
Missouri	463	86	302	160	54	1,064	1.74
Montana	76	10	75	23	13	197	0.32
Nebraska	146	26	139	55	25	391	0.64
Nevada	227	39	130	99	23	518	0.85
New Hampshire	98	22	79	62	14	276	0.45
New Jersey	739	165	535	516	95	2,050	3.34
New Mexico	151	19	123	36	22	351	0.57
New York	1,762	418	1,121	913	199	4,413	7.20
North Carolina	752	132	496	309	88	1,778	2.90
North Dakota	57	12	69	11	12	161	0.26
N. Mariana Islands	3	0	6	0	1	10	0.02
Ohio	920	169	578	354	103	2,124	3.46
Oklahoma	278	44	171	98	30	621	1.01
Oregon	315	58	196	122	35	727	1.19
Pennsylvania	1,004	203	798	514	142	2,661	4.34
Puerto Rico	224	12	209	40	37	524	0.85
Rhode Island	76	15	50	58	9	208	0.34
South Carolina	358	56	276	126	49	865	1.41
South Dakota	62	10	90	14	16	192	0.31
Tennessee	532	89	317	197	56	1,192	1.94
Texas	2,176	420	1,128	758	201	4,682	7.64
Utah	218	46	116	83	21	485	0.79
Vermont	43	8	63	23	11	148	0.24
Virgin Islands	11	1	6	1	1	20	0.03
Virginia	631	135	490	357	87	1,701	2.77
Washington	564	131	352	239	63	1,349	2.20
West Virginia	118	16	144	46	26	350	0.57
Wisconsin	418	90	314	165	56	1,043	1.70
Wyoming	44	6	39	12	7	109	0.18
Total	\$25,681	\$5,091	\$16,439	\$11,162	\$2,924	\$61,296	100.00 %

Note: Figures may not add to totals due to rounding.

Table 4
Interstate and International End-User Telecommunications Revenues by Provider: 2019
(Dollar Amounts Shown in Millions)

	Wireless	Private Line	Local Exchange	VoIP	Switched Toll	Total	% of Total
Alabama	\$182	\$138	\$70	\$95	\$84	\$568	1.20 %
Alaska	26	27	29	6	26	113	0.24
American Samoa	1	0	1	0	1	3	0.01
Arizona	256	227	92	160	214	949	2.00
Arkansas	113	78	51	42	97	382	0.80
California	1,591	1,894	444	1,008	712	5,648	11.90
Colorado	219	245	111	144	208	926	1.95
Connecticut	136	176	51	135	126	625	1.32
Delaware	35	41	15	37	53	181	0.38
District of Columbia	56	79	26	37	109	308	0.65
Florida	801	735	229	571	380	2,716	5.72
Georgia	404	372	161	245	152	1,334	2.81
Guam	7	3	7	1	6	23	0.05
Hawaii	58	44	29	23	57	212	0.45
Idaho	62	44	33	17	81	237	0.50
Illinois	510	575	153	337	355	1,931	4.07
Indiana	240	234	92	132	203	900	1.90
Iowa	114	111	77	48	115	465	0.98
Kansas	117	99	38	58	67	379	0.80
Kentucky	155	131	98	73	88	545	1.15
Louisiana	197	142	60	103	54	555	1.17
Maine	48	40	32	27	54	200	0.42
Maryland	245	239	93	202	343	1,122	2.36
Massachusetts	287	426	98	306	99	1,216	2.56
Michigan	386	357	92	238	192	1,264	2.66
Minnesota	215	273	120	134	182	922	1.94
Mississippi	101	64	39	46	44	294	0.62
Missouri	230	220	96	117	207	870	1.83
Montana	38	25	30	17	51	160	0.34
Nebraska	12	00	44	40	07	271	0.01
Nevada	113	100	32	72	94	412	0.87
New Hampshire	49	56	26	45	64	240	0.51
New Jersey	367	422	129	378	351	1,647	3.47
New Mexico	75	48	55	26	73	277	0.58
New York	875	1,070	282	668	329	3,224	6.79
North Carolina	373	339	165	226	228	1,331	2.80
North Dakota	28	31	26	8	35	128	0.27
N. Mariana Islands	1	0	2	0	1	6	0.01
Ohio	457	432	138	259	318	1,604	3.38
Oklahoma	138	112	54	72	82	458	0.96
Oregon	157	150	68	90	124	588	1.24
Pennsylvania	499	521	237	376	445	2,078	4.38
Puerto Rico	111	31	53	30	178	403	0.85
Rhode Island	38	39	12	43	16	147	0.31
South Carolina	178	144	88	92	130	632	1.33
South Dakota	31	26	27	11	35	129	0.27
Tennessee	264	228	91	145	124	852	1.80
Texas	1,081	1,075	312	555	577	3,600	7.58
Utah	108	119	42	61	83	413	0.87
Vermont	21	19	22	17	47	127	0.27
Virgin Islands	5	2	4	1	8	20	0.04
Virginia	313	347	142	261	365	1,427	3.01
Washington	280	336	122	175	186	1,099	2.31
West Virginia	58	41	53	34	128	314	0.66
Wisconsin	207	231	101	121	210	871	1.84
Wyoming	22	16	17	9	32	96	0.20
Total	\$12,753	\$13,045	\$4,807	\$8,172	\$8,688	\$47,464	100.00 %

Note: Figures may not add to totals due to rounding.

