Table V-5
Determination of Cell Site Requirements
Areas with Non-Wireless Presence in Alaska

Borough / Census Area	Locations with Non-Wireless Presence	Locations with Overlap	Total Sites Required
Aleutians East	2	0	2
Aleutians West	6	0	6
Anchorage	0	0	0
Bethel	10	4	6
Bristol Bay	4	3	1
Denali	6	1	5
Dillingham	5	3	2
Fairbanks North Star	7	3	4
Haines	5	0	5
Hoonah-Angoon	5	0	5
Juneau	0	0	0
Kenai Peninsula	19	5	14
Ketchikan Gateway	2	0	2
Kodiak Island	9	2	7
Lake and Peninsula	7	1	6
Matanuska-Susitna	13	5	8
Nome	2	0	2
North Slope	1	0	1
Northwest Arctic	1	0	1
Petersburg	2	0	2
Prince of Wales-Hyder	14	0	14
Sitka	0	0	0
Skagway	0	0	0
Southeast Fairbanks	9	0	9
Valdez-Cordova	13	2	11
Wade Hampton	2	0	2
Wrangell	1	0	1
Yakutat	5	0	5
Yukon-Koyukuk	35	3	32
Total	185	32	153

Source U.S Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis.

Table V-6
Additional Cell Sites Required
to Complete 3G/4G Build-Out in Alaska

Borough / Census Area	Additional Sites to Serve FCC Eligible Areas	Additional Sites to Serve Non-Wireless Presence	Total Sites
Aleutians East	3	2	5
Aleutians West	4	6	10
Anchorage	1	0	1
Bethel	13	6	19
Bristol Bay	1	1	2
Denali	4	5	9
Dillingham	3	2	5
Fairbanks North Star	5	4	9
Haines	1	5	6
Hoonah-Angoon	3	5	8
Juneau	1	0	1
Kenai Peninsula	5	14	19
Ketchikan Gateway	13	2	15
Kodiak Island	2	7	9
Lake and Peninsula	6	6	12
Matanuska-Susitna	3	8	11
Nome	14	2	16
North Slope	26	1	27
Northwest Arctic	7	1	8
Petersburg	1	2	3
Prince of Wales-Hyder	1	14	15
Sitka	1	0	1
Skagway	1	0	1
Southeast Fairbanks	11	9	20
Valdez-Cordova	20	11	31
Wade Hampton	8	2	10
Wrangell	1	1	2
Yakutat	0	5	5
Yukon-Koyukuk	9	32	41
Total	168	153	321

Source: U S Census Bureau 2010 Census, GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table V-7
Summary of Cell Site Requirements
to Complete 3G/4G Build-Out in Alaska

Borough / Census Area	FCC Eligible Served Sites	FCC Eligible Unserved Sites	Additional Area Currently Served 2G Sites	Areas with GCI Non-Wireless Presence	Total Sites
Aleutians East	5	3	6	2	16
Aleutians West	4	4	6	6	20
Anchorage	13	1	8	0	22
Bethel	22	13	13	6	54
Bristol Bay	4	1	0	1	6
Denali	6	4	6	5	21
Dillingham	10	3	8	2	23
Fairbanks North Star	5	5	6	4	20
Haines	2	1	5	5	13
Hoonah-Angoon	3	3	12	5	23
Juneau	3	1	15	0	19
Kenai Peninsula	9	5	27	14	55
Ketchikan Gateway	1	13	18	2	34
Kodiak Island	1	2	4	7	14
Lake and Peninsula	10	6	12	6	34
Matanuska-Susitna	0	3	35	8	46
Nome	17	14	12	2	45
North Slope	16	26	13	1	56
Northwest Arctic	13	7	4	1	25
Petersburg	3	1	3	2	9
Prince of Wales-Hyder	6	1	1	14	22
Sitka	0	1	1	0	2
Skagway	2	1	2	0	5
Southeast Fairbanks	10	11	11	9	41
Valdez-Cordova	33	20	51	11	115
Wade Hampton	11	8	6	2	27
Wrangell	0	1	5	1	7
Yakutat	0	0	0	5	5
Yukon-Koyukuk	11	9	1	32	53
Total	220	168	291	153	832

Source: U S Census Bureau 2010 Census, GCI Cell Site Data; Carrier Cell Sites from FCC ULS database. Brattle Analysis

Figure VI-1
Summary of Cost Areas For
Upgrading / Building-Out A
3G/4G Mobile Wireless Network in Alaska

	Network Element	Comment	Capital Costs	O&M Expenses
Cell Sites	Existing 2G Cell Site	Upgrade To 3G	Equipment and other upgrade costs	Electric power, leases and maintenance
	New 3G Cell Site	Build For 3G Requirements	Facilities, equipment, electrical and labor related costs	Electric power, leases and maintenance
	Central Network Controls	Located at Network Control Area	MSC server	Electric power, leases and maintenance
Backhaul	Satellite Backhaul	Transport leased on Satellite	Upgrade Remote VSAT Ground Station from 2G to 3G Site or New Remote VSAT Ground Station for New 3G Site Also, cost of materials, equipment, installation and labor of HUB iDirect for satellite	Cost of leasing satellite transponders
Backhaul	Terrestrial Backhaul	Leasing of terrestrial based (microwave or fiber) transport	None, leasing arrangement on microwave and	Cost of leasing ethernet capacity

Table VI-1
Capital Costs to
Upgrade Existing Cell Sites to 3G
and Build-Out New 3G/4G Cell Sites
(Cost per Cell Site)

	New Construction of 3G/4G Site	Upgrade non-Wireless Site to 3G/4G Site	Upgrade Wireless 2G Site to 3G/4G Site	MSC Server in Anchorage for Wireless 3G/4G Sites
Facility Materials, Equipment and Electrical	[redacted]	[redacted]	[redacted]	[redacted]
Labor for Installation				
Other Construction Costs (Contracting, etc)				
Travel and Shipping				
Regulatory Costs (FCC Permits, Site Tests, etc)				
Total	[redacted]	[redacted]	[redacted]	[redacted]

Table VI-2
Capital Costs
Satellite Backhaul

	Remote VSAT Ground Station (Cost per Site)	HUB 1Direct Satellite (Cost for Central Hub)
Facility Materials, Equipment and Electrical	[redacted]	[redacted]
Labor for Installation		
Other Construction Costs (Contracting, etc)		
Travel and Shipping		
Regulatory Costs (FCC Permits, Site Tests, etc)		
Total	[redacted]	[redacted]

Table VI-3
Present Value of 3G/4G Cell Site
O&M Expenses
(PV per Cell Site)

	New Construction of 3G/4G Site	Upgrade non-Wireless Site to 3G/4G Site	Upgrade Wireless 2G Site to 3G/4G Site	MSC Server in Anchorage for Wireless 3G/4G Sites
Power, Lease, Other Recurring Costs	[redacted]	[redacted]	[redacted]	[redacted]
Contracted Maintenance				
GCI Labor				
Total	[redacted]	[redacted]	[redacted]	[redacted]

Table VI-4
Present Value of O&M Expenses of
Upgraded to 3G/4G or New 3G
VSAT Ground Stations
(PV per Station)

	New Remote VSAT Ground Station for New 3G/4G Site	Upgrade Remote VSAT Ground Station from 2G Site to 3G/4G Site
Power, Lease, Other Recurring Costs	[redacted]	[redacted]
Contracted Maintenance		
GCI Labor		
Total	[redacted]	[redacted]

Table VI-5
Present Value of O&M Expenses Of
HUB iDirect Satellite For 3G/4G Cell Sites
(PV for Central Hub)

Population at Non-Terrestrial Locations		3,000
Population Peneration Rate		50%
Population Served (using penetration rate)		1,500
User Traffic Rate		50%
Downstream Data Rate (per user)	*kbps*	768
Upstream Data Rate (per user)	*kbps*	256
Downstream Oversubscription Rate		[redacted]
Upstream Oversubscription Rate		
Upstream Throughput Required	*Gbps*	
Downstream Throughput Required	*Gbps*	
Downstream Spectral Efficiency	*bits/Hz*	
Upstream Spectral Efficiency	*bits/Hz*	
Downstream Bandwidth Required	*MHz*	
Upstream Bandwidth Required	*MHz*	
Transponder Monthly Cost (per MHz)	*$*	
Cost (per month for space segment)	*$*	[redacted]
Annual Cost (for space segment)	*$*	
Present Value (5 Years) of Bandwidth Co	*$*	5,230,343

Table VI-6
Present Value of O&M Expenses
for Terrestrial Backhaul
(PV for Fiber, Microwave and per Mbps Leases)

		Microwave T1	Microwave T3	Fiber T1	Fiber T3	Terra 1Mbps	Fiber 1Mbps
Population at Non-Terrestrial Locations	*pops*	500	500	500	500	500	500
Population Peneration Rate		50%	50%	50%	50%	50%	50%
Population Served (using penetration rate)	*pops*	250	250	250	250	250	250
User Traffic Rate		50%	50%	50%	50%	50%	50%
Downstream Data Rate (per user)	*kbps*	768	768	768	768	768	768
Upstream Data Rate (per user)	*kbps*	256	256	256	256	256	256
Downstream Oversubscription Rate		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Upstream Oversubscription Rate							
Downstream Throughput Required	*Gbps*						
Upstream Throughput Required	*Gbps*						
Usable Bandwidth per Unit	*Gbps*						
Bits per Pop	*bits/pop*						
Units Required							
Cost per Unit per Month at 50 Miles	*$*						
Cost (per month)	*$*	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Annual Cost	*$*						
Present Value (5 Years) of Bandwidth Co	*$*	618,195	906,197	363,134	359,760	1,942,025	48,551

Table VI-7
Undersea Cable Lease Rate per Month
and Present Value of 5 Years

	Monthly Cost per T3	5 Year Present Value - T3
Usable Bandwidth per Unit (Gbps)	[redacted]	[redacted]
Lena Pt (Juneau) - Seattle or Portland		
Anchorage - Seattle or Portland		
Anchorage - Fairbanks		
Fairbanks - Seattle or Portland		

Table VII-1
Alaska Mobile Wireless Backhaul 2012
by Census Block

Borough / Census Area	Fiber Backhaul	Remote Terrestrial Backhaul	Satellite Backhaul	Total Census Blocks	Total Currently Served CB	Total Currently Served Area	Total Currently Served Population
Aleutians East	0	0	275	275	275	367	3,136
Aleutians West	0	0	267	267	267	276	5,181
Anchorage	4,281	0	0	4,281	4,281	920	291,652
Bethel	0	1,025	24	1,049	1,049	2,573	16,667
Bristol Bay	0	167	0	167	167	263	949
Denali	414	0	0	414	414	531	770
Dillingham	0	437	0	437	437	2,344	4,838
Fairbanks North Star	3,917	0	0	3,917	3,917	1,645	96,699
Haines	0	210	0	210	210	37	1,982
Hoonah-Angoon	0	274	0	274	274	1,473	1,363
Juneau	758	0	0	758	758	1,330	31,210
Kenai Peninsula	2,488	0	84	2,572	2,572	3,708	52,602
Ketchikan Gateway	443	0	0	443	443	430	13,443
Kodiak Island	423	0	0	423	423	265	12,585
Lake and Peninsula	0	167	207	374	374	5,553	1,383
Matanuska-Susitna	3,124	0	0	3,124	3,124	4,105	87,513
Nome	0	0	811	811	811	1,896	9,446
North Slope	34	0	492	526	526	1,133	8,796
Northwest Arctic	0	0	443	443	443	1,902	7,158
Petersburg	184	0	0	184	184	372	3,105
Prince of Wales-Hyder	0	166	0	166	166	366	1,872
Sitka	0	429	0	429	429	226	8,822
Skagway	0	187	0	187	187	159	957
Southeast Fairbanks	662	0	15	677	677	2,137	5,969
Valdez-Cordova	1,059	0	0	1,059	1,059	6,243	9,165
Wade Hampton	0	404	65	469	469	1,006	7,431
Wrangell	132	0	0	132	132	38	1,726
Yakutat	0	0	0	0	0	0	0
Yukon-Koyukuk	0	152	416	568	568	859	2,558
Total	17,919	3,618	3,100	24,636	24,636	42,154	688,978

Source: U.S. Census Bureau 2010 Census, GCI Cell Site Data, Carrier Cell Sites from FCC ULS database, Brattle Analysis.

Table VII-2
Breakdown of Backhaul per Borough

	Fiber					Remote Terrestrial				
Borough / Census Area	FCC Eligible Served Sites	FCC Eligible Unserved Sites	Additional Area Currently Served 2G Sites	Areas with Non-Wireless Presence	Total Fiber Terrestrial Sites	FCC Eligible Served Sites	FCC Eligible Unserved Sites	Additional Area Currently Served 2G Sites	Areas with Non-Wireless Presence	Total Remote Terrestrial Sites
Aleutians East	0	0	0	0	0	0	0	0	0	0
Aleutians West	0	0	0	0	0	0	0	0	0	0
Anchorage	13	1	8	0	22	0	0	0	0	0
Bethel	0	0	0	0	0	20	13	13	6	52
Bristol Bay	0	0	0	0	0	4	1	0	1	6
Denali	6	4	6	5	21	0	0	0	0	0
Dillingham	0	0	0	0	0	10	3	8	2	23
Fairbanks North Star	5	5	6	4	20	0	0	0	0	0
Haines	0	0	0	0	0	2	1	5	5	13
Hoonah-Angoon	0	0	0	0	0	3	3	12	5	23
Juneau	3	1	15	0	19	0	0	0	0	0
Kenai Peninsula	8	4	27	14	53	0	0	0	0	0
Ketchikan Gateway	1	13	18	2	34	0	0	0	0	0
Kodiak Island	1	2	4	7	14	0	0	0	0	0
Lake and Peninsula	0	0	0	0	0	4	4	8	5	21
Matanuska-Susitna	0	3	35	8	46	0	0	0	0	0
Nome	0	0	0	0	0	0	0	0	0	0
North Slope	2	4	3	1	10	0	0	0	0	0
Northwest Arctic	0	0	0	0	0	0	0	0	0	0
Petersburg	3	1	3	2	9	0	0	0	0	0
Prince of Wales-Hyder	0	0	0	0	0	6	1	1	14	22
Sitka	0	0	0	0	0	0	1	1	0	2
Skagway	0	0	0	0	0	2	1	2	0	5
Southeast Fairbanks	8	9	10	8	35	0	0	0	0	0
Valdez-Cordova	33	20	51	11	115	0	0	0	0	0
Wade Hampton	0	0	0	0	0	10	7	6	2	25
Wrangell	0	1	5	1	7	0	0	0	0	0
Yakutat	0	0	0	0	0	0	0	0	0	0
Yukon-Koyukuk	0	0	0	0	0	2	3	1	11	17
Total	83	68	191	63	405	63	38	57	51	209

Source. U.S. Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table VII-2 cont.
Breakdown of Backhaul per Borough

Borough / Census Area	FCC Eligible Served Sites	FCC Eligible Unserved Sites	Satellite Additional Area Currently Served 2G Sites	Areas with Non-Wireless Presence	Total Satellite Sites	Total Total Sites
Aleutians East	5	3	6	2	16	16
Aleutians West	4	4	6	6	20	20
Anchorage	0	0	0	0	0	22
Bethel	2	0	0	0	2	54
Bristol Bay	0	0	0	0	0	6
Denali	0	0	0	0	0	21
Dillingham	0	0	0	0	0	23
Fairbanks North Star	0	0	0	0	0	20
Haines	0	0	0	0	0	13
Hoonah-Angoon	0	0	0	0	0	23
Juneau	0	0	0	0	0	19
Kenai Peninsula	1	1	0	0	2	55
Ketchikan Gateway	0	0	0	0	0	34
Kodiak Island	0	0	0	0	0	14
Lake and Peninsula	6	2	4	1	13	34
Matanuska-Susitna	0	0	0	0	0	46
Nome	17	14	12	2	45	45
North Slope	14	22	10	0	46	56
Northwest Arctic	13	7	4	1	25	25
Petersburg	0	0	0	0	0	9
Prince of Wales-Hyder	0	0	0	0	0	22
Sitka	0	0	0	0	0	2
Skagway	0	0	0	0	0	5
Southeast Fairbanks	2	2	1	1	6	41
Valdez-Cordova	0	0	0	0	0	115
Wade Hampton	1	1	0	0	2	27
Wrangell	0	0	0	0	0	7
Yakutat	0	0	0	5	5	5
Yukon-Koyukuk	9	6	0	21	36	53
Total	74	62	43	39	218	832

Source: U S Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table VIII-1
Present Value of Undersea Transport Costs
FCC Eligible Areas

		Satellite (Anchorage)	Anchorage	Fairbanks	Juneau	Total
Downstream Throughput	*Gbps*	[redacted]				
Upstream Throughput	*Gbps*					
Lines Required	*Units*					
Monthly Underwater Transport Cost	*$/Unit*					
Total Cost per Month	*$*	$289,000	$272,000	$32,000	$48,000	$641,000
PV (5 Years)		$14,031,129	$13,205,768	$1,553,620	$2,330,430	$31,120,947
Population Served	*Pops*	19,306	18,077	806	2,950	41,139
Throughput per User	*Kbps/Pop*	40	40	56	46	

Table VIII-2
Present Value of Undersea Transport Costs
FCC Eligible Areas + Additional Currently Served Areas

		Satellite (Anchorage)	Anchorage	Fairbanks	Juneau	Total
Downstream Throughput	*Gbps*	[redacted]				
Upstream Throughput	*Gbps*					
Lines Required	*Units*					
Monthly Underwater Transport Cost	*$/Unit*					
Total Cost per Month	*$*	$306,000	$408,000	$128,000	$96,000	$938,000
PV (5 Years)		$14,856,489	$19,808,652	$6,214,479	$4,660,859	$45,540,480
Population Served	*Pops*	20,685	27,610	3,816	6,122	58,233
Throughput per User	*Kbps/Pop*	39	39	47	44	

Table VIII-3
Present Value of Undersea Transport Costs
FCC Eligible Areas + Additional Currently Served Areas + Other Areas with Presence

		Satellite (Anchorage)	Anchorage	Fairbanks	Juneau	Total
Downstream Throughput	*Gbps*	[redacted]	[redacted]	[redacted]	[redacted]	
Upstream Throughput	*Gbps*	[redacted]	[redacted]	[redacted]	[redacted]	
Lines Required	*Units*	[redacted]	[redacted]	[redacted]	[redacted]	
Monthly Underwater Transport Cost	*$/Unit*	[redacted]	[redacted]	[redacted]	[redacted]	
Total Cost per Month	*$*	$306,000	$425,000	$128,000	$112,000	$971,000
PV (5 Years)		$14,856,489	$20,634,013	$6,214,479	$5,437,669	$47,142,651
Population Served	*Pops.*	20,881	28,902	4,000	7,256	61,038
Throughput per User	*Kbps/Pop.*	39	39	45	43	

Table IX-1
Estimated Marginal Revenue

Annual Revenue Increase	**$**	**15,699,312**					
PV of Revenue Increase (5 Years)	**$**	**63,517,609**					
Population currently served with wireless 2G		Annual Revenue Increase	PV of Revenue (5 Years)	Subscribers	Population	Ann Rev / Pop	Ann. Rev / Sub
FCC Eligible Areas		$4,110,120	$16,629,072	[redacted]	68,502	$60	[redacted]
Additional Areas Currently Covered		$2,051,280	$8,299,243	[redacted]	34,188	$60	[redacted]
Other Areas with Some Presence		$0	$0	[redacted]	0	-	[redacted]
Areas currently served with wireless 2G		**$6,161,400**	**$24,928,315**	[redacted]	**102,690**	$60	[redacted]
Population currently unserved with wireless 2G				[redacted]			[redacted]
FCC Eligible Areas		$6,777,300	$27,420,176	[redacted]	13,775	$492	[redacted]
Additional Areas Currently Covered		$0	$0	[redacted]	0	-	[redacted]
Other Areas with Some Presence		$2,760,612	$11,169,118	[redacted]	5,611	$492	[redacted]
Areas currently unserved with wireless 2G		**$9,537,912**	**$38,589,294**	[redacted]	**19,386**	$492	[redacted]

Figure X-1
Model Architecture

Input	
Mapping	Census Block/ Borough/Census Area mapping
Auction_901	FCC Mobility Fund Phase I Eligibility List for the State of Alaska
Backhaul	Backhaul data by Borough/Census Area
CB	Population/Road Miles/Area data by Census Block
Sites	Existing Sites and non-wireless Presence
CB_COV	Coverage data by Census Block
Overlap Analysis	
Overlap GCI_NFCC	Overlap Analysis (GCI and Other Non-FCC Eligible Census Blocks)
Overlap GCI_FCC	Overlap Analysis (GCI and Other FCC Eligible Census Blocks)
Overlap Plan_NFCC	Overlap Analysis (Planned and GCI/Other Non-FCC Eligible Census Blocks)
Overlap Plan_FCC	Overlap Analysis (Planned and GCI/Other FCC Eligible Census blocks)
Coverage Analysis	
Summary_FCC	Coverage Analysis (FCC Eligible Census Blocks)
Summary_All	Coverage Analysis (FCC and Non-FCC Eligible Census Blocks)
Summary_NFCC	Coverage Analysis (Non-FCC Eligible Census Blocks)
FOR_COST	Coverage Analysis Output for Cost Analysis
Cost Assumptions	
Facility_Cost	Circuit Charges
Opex_TEP.	Bandwidth Cost of Operating Terrestrial Backhaul
Opex_Hub iDirect	Bandwidth Cost of Operating the Hub iDirect Satellite
Backhaul_Opex_SAT	Satellite Backhaul Operations and Maintenance
Backhaul_Capex_SAT	Satellite Backhaul Capital Expenditures
Network_Opex	Network Operations and Maintenance
Network_Capex	Network Capital Expenditures
Revenue	Marginal Revenue Calculations
Cost Summary	
II_1	Summary of Capital Costs and Present Value of O&M Costs
II_2	Cost Metrics For 3G/4G Service In Targeted Area by Network and Backhaul Costs
II_3	Summary of Transportation Costs by Hub
Summ_PV_Capital_Cost	Summary of Present Value of Capital Costs
Summ_Incr_Rev	Summary of Present Value of Incremental Revenue
Summ_PV_OandM	Summary of Present Value of O&M Costs
Summ_PV_Backhaul	Summary of Present Value of Backhaul
Summ_TOTAL	Summary of Present Value of Total Costs
Coverage Summary	
III_1	State of Alaska Demographics Data by Census Block
III_2	Alaska 3G/4G Mobile Wireless Service Coverage 2012 By Census Block
IV_1	FCC Potentially Eligible Areas in Alaska by Census Block
IV_2	Additional Areas Currently Served In Alaska not Included As FCC Potentially Eligible Areas By Census Block
IV_3	Areas Not Currently Receiving Mobile Wireless Services In Alaska but Covered By Other Telecom by Census Block
IV_4	Scope of 3G/4G Mobile Wireless Services In Alaska by Census Block
IV_5	Areas In Alaska Excluded From 3G/4G Build-Out Scope by Census Block
V_1	Analysis of Current Cell Sites In Alaska by Sites In Place In 2012
V_2	Determination of Cell Site Requirements for Areas Currently Covered by Wireless Service
V_3	Alaska Road Miles 2010 U.S. Census
V_4	Summary of Cell Site Required for Un-served Areas Within FCC Potentially Eligible Areas
V_5	Summary of Cell Sites required for Areas with Non-Wireless Presence in Alaska
V_6	Additional Cell Sites Required to Complete 3G/4G Build-Out In Alaska
V_7	Summary of Cell Site Required to Complete 3G/4G Build-Out In Alaska
VII-1	Alaska Mobile Wireless Backhaul 2012 by Census Block
VII-2	Breakdown of Backhaul per Borough
Summ_CB	Summary of Census Blocks
Summ_Pop	Summary of Population
Detailed Output	
A_1	Capital Costs and Present Value of O&M Costs for FCC Eligible Areas
A_2	Capital Costs and Present Value of O&M Costs for FCC Eligible Areas Currently With 2G Service
A_3	Capital Costs and Present Value of O&M Costs for FCC Eligible Areas Currently With Non-Wireless Presence
A_4	Capital Costs and Present Value of O&M Costs for FCC Eligible Areas Currently Unserved
A_5	Capital Costs and Present Value of O&M Costs for Additional Areas Currently Served (2G)
A_6	Capital Costs and Present Value of O&M Costs for Areas With Non-Wireless Presence
FCC_TER_2G	Present Value of Terrestrial Backhaul Cost for FCC Eligible 2G Served Areas
FCC_TER_2G_Plan	Present Value of Terrestrial Backhaul Cost for FCC Eligible 2G Served Areas + FCC Eligible Areas With Non-Wireless Presence
A_7	Present Value of Terrestrial Backhaul Cost for FCC Eligible Areas
A_8	Present Value of Terrestrial Backhaul Cost for FCC Eligible + Additional Currently Served Areas
A_9	Present Value of Terrestrial Backhaul Cost for FCC Eligible + Additional Currently Served Areas + Other Areas with Presence
FCC_SAT_2G	Present Value of Satellite Backhaul Cost for FCC Eligible 2G Served Areas
FCC_SAT_2G_Plan	Present Value of Satellite Backhaul Cost for FCC Eligible 2G Served Areas + FCC Eligible Areas With Non-Wireless Presence
A_10	Present Value of Satellite Backhaul Cost for FCC Eligible Areas
A_11	Present Value of Satellite Backhaul Cost for FCC Eligible + Additional Currently Served Areas
A_12	Present Value of Satellite Backhaul Cost for FCC Eligible + Additional Currently Served Areas + Other Areas with Presence
VIII_1	Present Value of Undersea Transport Costs for FCC Eligible Areas
VIII_2	Present Value of Undersea Transport Costs for FCC Eligible Areas + Additional Currently Served Areas
VIII_3	Present Value of Undersea Transport Costs for FCC Eligible Areas + Additional Currently Served Areas + Other Areas with Presence

APPENDIX: DETAILED OUTPUT

Following is a list of the detailed borough / census area output contained in the model and included below.

A. FCC ELIGIBLE AREAS

- Capital Costs and Present Value of O&M Costs For FCC Eligible Areas (Excluding Backhaul Costs) – **Table A-1**;

- Capital Costs and Present Value of O&M Costs For FCC Eligible Areas Currently With 2G Service (Excluding Backhaul Costs) – **Table A-2**;

- Capital Costs and Present Value of O&M Costs For FCC Eligible Areas Currently With Non-Wireless Presence (Excluding Backhaul Costs) – **Table A-3**;

- Capital Costs and Present Value of O&M Costs For FCC Eligible Areas Currently Unserved (Excluding Backhaul Costs) – **Table A-4**.

B. AREAS OTHER THAN FCC ELIGIBLE AREAS

- Capital Costs and Present Value of O&M Costs Additional Areas Currently Served (2G) (Excluding Backhaul Costs) – **Table A-5**;

- Capital Costs and Present Value of O&M Costs Areas With Non-Wireless Presence (Excluding Backhaul Costs) – **Table A-6**.

Cost details concerning the derivation of terrestrial and satellite backhaul costs by borough / census area are also available.

C. TERRESTRIAL BACKHAUL

- Present Value of Terrestrial Backhaul Cost FCC Eligible Areas – **Table A-7**;

- Present Value of Terrestrial Backhaul Cost FCC Eligible + Additional Currently Served Areas – **Table A-8**;

- Present Value of Terrestrial Backhaul Costs FCC Eligible + Additional Currently Served Areas + Other Areas with Presence – **Table A-9**.

D. SATELLITE BACKHAUL

- Present Value of Satellite Backhaul Cost FCC Eligible Areas – **Table A-10**;

- Present Value of Satellite Backhaul Cost FCC Eligible + Additional Currently Served Areas – **Table A-11**;

- Present Value of Satellite Backhaul Cost FCC Eligible + Additional Currently Served Areas + Other Areas with Presence – **Table A-12**.

Table A-1
Capital Costs and Present Value of O&M Costs
for FCC Eligible Areas
(Excluding Backhaul Costs)

	Total FCC Eligible Sites									
	Terrestrial Sites		Satellite Sites		Capital			Present Value (5 years) of O&M		
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	8	3,089	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	11	5,556	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Anchorage	14	455	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bethel	37	15748	2	226	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bristol Bay	5	997	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Denali	13	903	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dillingham	14	4814	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fairbanks North Star	13	523	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haines	6	1338	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hoonah-Angoon	10	776	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Juneau	4	106	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kenai Peninsula	18	1745	2	516	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ketchikan Gateway	14	30	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kodiak Island	5	864	0	88	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lake and Peninsula	11	861	9	680	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Matanuska-Susitna	4	868	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Nome	0	0	32	9,471	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
North Slope	7	51	36	6,703	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Northwest Arctic	0	0	20	6,881	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Petersburg	5	717	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Prince of Wales-Hyder	15	2253	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sitka	1	56	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Skagway	3	31	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Southeast Fairbanks	24	1038	5	258	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Valdez-Cordova	55	738	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wade Hampton	19	6817	2	513	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wrangell	1	592	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yakutat	0	0	3	661	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yukon-Koyukuk	14	1345	34	3,970	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	312	43,664	164	38,613	145,379,720	7,406,240	152,785,960	71,468,716	8,656,308	80,125,024

Source: U.S Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis.

Table A-2

Capital Costs and Present Value of O&M Costs

for FCC Eligible Areas Currently with 2G Service

(Excluding Backhaul Costs)

	FCC Eligible Areas with Existing 2G Sites									
	Terrestrial Sites		Satellite Sites		Capital			Present Value (5 Years) of O&M		
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	5	3,089	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	4	5,181						
Anchorage	13	415	0	0						
Bethel	20	15,443	2	210						
Bristol Bay	4	949	0	0						
Denali	6	713	0	0						
Dillingham	10	4,807	0	0						
Fairbanks North Star	5	0	0	0						
Haines	2	848	0	0						
Hoonah-Angoon	3	456	0	0						
Juneau	3	87	0	0						
Kenai Peninsula	8	379	1	475						
Ketchikan Gateway	1	5	0	0						
Kodiak Island	1	68	0	0						
Lake and Peninsula	4	736	6	572						
Matanuska-Susitna	0	344	0	0						
Nome	0	0	17	9,425						
North Slope	2	0	14	6,427						
Northwest Arctic	0	0	13	6,827						
Petersburg	3	18	0	0						
Prince of Wales-Hyder	6	377	0	0						
Sitka	0	0	0	0						
Skagway	2	21	0	0						
Southeast Fairbanks	8	315	2	77						
Valdez-Cordova	33	595	0	0						
Wade Hampton	10	6,796	1	512						
Wrangell	0	0	0	0						
Yakutat	0	0	0	0						
Yukon-Koyukuk	2	414	9	1,921						
Total	146	33,785	74	34,717	39,190,371	3,341,840	42,532,211	23,347,060	697,029	24,044,089

Source: U.S Census Bureau 2010 Census, GCI Cell Site Data; Carrier Cell Sites from FCC ULS database, Brattle Analysis

Table A-3

Capital Costs and Present Value of O&M Costs

for FCC Eligible Areas Currently with Non-Wireless Presence

(Excluding Backhaul Costs)

	FCC Eligible Areas with Non-Wireless Presence									
	Terrestrial Sites		Satellite Sites		Capital					
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	3	74						
Anchorage	0	0	0	0						
Bethel	4	276	0	15						
Bristol Bay	0	0	0	0						
Denali	3	32	0	0						
Dillingham	1	2	0	0						
Fairbanks North Star	3	313	0	0						
Haines	3	444	0	0						
Hoonah-Angoon	4	311	0	0						
Juneau	0	0	0	0						
Kenai Peninsula	6	1,314	0	40						
Ketchikan Gateway	0	0	0	0						
Kodiak Island	2	409	0	45						
Lake and Peninsula	3	122	1	106						
Matanuska-Susitna	1	9	0	0						
Nome	0	0	1	0						
North Slope	1	0	0	0						
Northwest Arctic	0	0	0	0						
Petersburg	1	609	0	0						
Prince of Wales-Hyder	8	1,755	0	0						
Sitka	0	0	0	0						
Skagway	0	0	0	0						
Southeast Fairbanks	7	527	1	132						
Valdez-Cordova	2	5	0	0						
Wade Hampton	2	0	0	0						
Wrangell	0	0	0	0						
Yakutat	0	0	3	661						
Yukon-Koyukuk	9	785	19	1,728						
Total	60	6,912	28	2,801	28,722,566	1,264,480	29,987,046	11,736,384	2,476,220	14,212,604

Source. U.S. Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table A-4

Capital Costs and Present Value of O&M Costs

for FCC Eligible Areas Currently Unserved

(Excluding Backhaul Costs)

	FCC Eligible Areas that are Unserved									
	Terrestrial Sites		Satellite Sites		Capital			Present Value (5 Years) of O&M		
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	3	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	4	301						
Anchorage	1	40	0	0						
Bethel	13	29	0	1						
Bristol Bay	1	48	0	0						
Denali	4	158	0	0						
Dillingham	3	5	0	0						
Fairbanks North Star	5	210	0	0						
Haines	1	46	0	0						
Hoonah-Angoon	3	9	0	0						
Juneau	1	19	0	0						
Kenai Peninsula	4	52	1	1						
Ketchikan Gateway	13	25	0	0						
Kodiak Island	2	387	0	43						
Lake and Peninsula	4	3	2	2						
Matanuska-Susitna	3	515	0	0						
Nome	0	0	14	46						
North Slope	4	51	22	276						
Northwest Arctic	0	0	7	54						
Petersburg	1	90	0	0						
Prince of Wales-Hyder	1	121	0	0						
Sitka	1	56	0	0						
Skagway	1	10	0	0						
Southeast Fairbanks	9	196	2	49						
Valdez-Cordova	20	138	0	0						
Wade Hampton	7	21	1	1						
Wrangell	1	592	0	0						
Yakutat	0	0	0	0						
Yukon-Koyukuk	3	146	6	321						
Total	106	2,967	62	1,095	77,466,782	2,799,920	80,266,702	36,385,272	5,483,059	41,868,331

Source: U.S. Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table A-5

Capital Costs and Present Value of O&M Costs

Additional Areas Currently Served (2G)

(Excluding Backhaul Costs)

	Additonal Areas Currently Served									
	Terrestrial Sites		Satellite Sites		Capital					
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	6	47	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	6	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Anchorage	8	303	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bethel	13	1014	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bristol Bay	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Denali	6	57	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dillingham	8	31	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fairbanks North Star	6	148	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haines	5	1134	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hoonah-Angoon	12	907	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Juneau	15	62	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kenai Peninsula	27	5030	0	156	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ketchikan Gateway	18	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kodiak Island	4	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lake and Peninsula	8	12	4	63	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Matanuska-Susitna	35	3770	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Nome	0	0	12	21	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
North Slope	3	295	10	2,072	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Northwest Arctic	0	0	4	331	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Petersburg	3	85	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Prince of Wales-Hyder	1	1495	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sitka	1	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Skagway	2	936	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Southeast Fairbanks	10	5577	1	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Valdez-Cordova	51	8570	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wade Hampton	6	58	0	65	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wrangell	5	1726	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yakutat	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yukon-Koyukuk	1	221	0	2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	248	31,430	43	2,758	51,838,173	1,941,880	53,780,053	30,881,793	405,030	31,286,823

Source: U S Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis

Table A-6

Capital Costs and Present Value of O&M Costs

Areas with Non-Wireless Presence

(Excluding Backhaul Costs)

	Areas with a Non-Wireless Presence									
	Terrestrial Sites		Satellite Sites		Capital			Present Value (5 Years) of O&M		
Borough / Census Area	Sites	Population Covered	Sites	Population Covered	All Cell Sites Cost $	Satellite VSAT Cost $	Total $	All Cell Sites Cost $	Satellite VSAT Cost $	Total $
Aleutians East	0	0	2	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aleutians West	0	0	3	5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Anchorage	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bethel	2	9	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bristol Bay	1	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Denali	2	795	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dillingham	1	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fairbanks North Star	1	268	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haines	2	29	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hoonah-Angoon	1	463	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Juneau	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kenai Peninsula	8	1125	0	34	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ketchikan Gateway	2	4	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Kodiak Island	5	58	0	6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lake and Peninsula	2	4	0	2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Matanuska-Susitna	7	339	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Nome	0	0	1	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
North Slope	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Northwest Arctic	0	0	1	309	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Petersburg	1	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Prince of Wales-Hyder	6	1751	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sitka	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Skagway	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Southeast Fairbanks	1	100	0	24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Valdez-Cordova	9	249	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wade Hampton	0	0	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wrangell	1	20	0	0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yakutat	0	0	2	1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Yukon-Koyukuk	2	5	2	11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	54	5,219	11	392	21,215,532	496,760	21,712,292	8,668,920	972,801	9,641,721

Source: U.S. Census Bureau 2010 Census; GCI Cell Site Data; Carrier Cell Sites from FCC ULS database; Brattle Analysis.

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Table A-7
Present Value of Terrestrial Backhaul Cost
FCC Eligible Areas

Burrough:		Total	Anchorage	Bethel	Bristol Bay	Denali	Dillingham	Fairbanks North Star	Haines	Hoonah-Angoon (Excludes Angoon Village)	Angoon Village (Hoonah-Angoon)	Juneau	Kenai Peninsula	Ketchikan Gateway	Kodiak Island
Terrestrial Backhaul Type:			Fiber 1Mbps	Terra 1Mbps	Terra 1Mbps	Fiber 1Mbps	Terra 1Mbps	Fiber 1Mbps	Microwave T1	Microwave T1	Fiber T3	Fiber T3	Fiber 1Mbps	Fiber T3	Fiber 1Mbps
Average Miles:			10	80	80	120	80	2	100	50	80	8	160	300	400
Population at Terrestrial Locations	*pops*	**43,664**	455	15,748	997	903	4,814	523	1,338	716	60	106	1,745	30	864
Population Penetration Rate		**50%**	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Population Served (using penetration rate)	*pops*	**21,832**	228	7,874	499	452	2,407	262	669	358	30	53	872	15	432
User Traffic Rate		**50%**	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Downstream Data Rate (per user)	*kbps*	**768**	768	768	768	768	768	768	768	768	768	768	768	768	768
Upstream Data Rate (per user)	*kbps*	**256**	256	256	256	256	256	256	256	256	256	256	256	256	256
Downstream Oversubscription Rate		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Upstream Oversubscription Rate															
Downstream Throughput Required	*Gbps*														
Upstream Throughput Required	*Gbps*														
Usable Bandwidth per Unit	*Gbps*														
Bits per Pop	*bits/pop*														
Units Required		**768**													
Cost per Unit per Month	*$*														
Cost (per month)	*$*	**2,678,504**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Annual Cost	*$*	**32,142,046**													
Present Value (5 Years) of Bandwidth Cost	*$*	**130,043,017**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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Table A-7 Cont.

Present Value of Terrestrial Backhaul Cost

FCC Eligible Areas

Burrough.		Total	Lake and Peninsula	Matanuska-Susitna	North Slope	Petersburg	Prince of Wales-Hyder	Sitka	Skagway	Southeast Fairbanks (excludes Tok)	Tok (Southeast Fairbanks	Valdez-Cordova	Wade Hampton	Wrangell	Yukon-Koyukuk
Terrestrial Backhaul Type			Terra 1Mbps	Fiber 1Mbps	Fiber T3	Fiber T3	Microwave T1	Microwave T1	Microwave T1	Fiber 1Mbps	Microwave T1	Fiber 1Mbps	Terra 1Mbps	Fiber T3	Microwave T3
Average Miles:			80	80	500	120	200	120	120	150	200	150	80	200	80
Population at Terrestrial Locations	*pops*	**43,664**	861	868	51	717	2,253	56	31	697	341	738	6,817	592	1,345
Population Penetration Rate		**50%**	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Population Served (using penetration rate)	*pops*	**21,832**	430	434	26	359	1,127	28	16	348	171	369	3409	296	672
User Traffic Rate		**50%**	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Downstream Data Rate (per user)	*kbps*	**768**	768	768	768	768	768	768	768	768	768	768	768	768	768
Upstream Data Rate (per user)	*kbps*	**256**	256	256	256	256	256	256	256	256	256	256	256	256	256
Downstream Oversubscription Rate		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Upstream Oversubscription Rate			[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Downstream Throughput Required	*Gbps*		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Upstream Throughput Required	*Gbps*		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Usable Bandwidth per Unit	*Gbps*		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bits per Pop	*bits/pop*		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Units Required		**768**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cost per Unit per Month	*$*		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cost (per month)	*$*	**2,678,504**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Annual Cost	*$*	**32,142,046**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Present Value (5 Years) of Bandwidth Cost	*$*	**130,043,017**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]