

Libraries and Private Schools Summary

Annual OpEx (2018)

	Internet Access	System WAN	Total	Discount %	E-rate cost
Private Schools	\$381,076,754	\$64,444,759	\$445,521,514	54%	\$241,032,451
Libraries	\$235,262,585	\$63,512,073	\$298,774,658	73%	\$218,105,500
Total	\$616,339,339	\$127,956,832	\$744,296,171		\$459,137,951

Internet Access

Service Type	Monthly Pricing (2018)	OpEx for Private Schools	OpEx for Libraries
100Mbps Lit Fiber DIA	\$1,549	\$16,075,311	\$37,607,242
100Mbps Cable	\$194	\$1,006,653	\$2,355,004.80
100Mbps Fixed Wireless	\$2,500	\$4,324,110	\$10,116,000
1Gbps Lit Fiber DIA	\$4,370	\$301,331,331	\$108,637,326
10Gbps Lit Fiber DIA	\$23,181	\$37,579,591	\$62,232,640
10Gbps Transport to POP + ISP	\$16,936	\$6,863,897	\$11,366,766
2x10Gbps Lit Fiber DIA	\$46,361	\$11,749,732	\$2,492,367
2x10Gbps Transport to POP + ISP	\$33,872	\$2,146,130	\$455,240
100Gbps Transport to POP + ISP	\$106,489	\$0	\$0

District WAN

Service Type	Monthly Pricing (2018)	OpEx for Private Schools	OpEx for Libraries
100 Mbps Leased Lit Fiber WAN	\$736	\$27,090,865	\$19,714,199
100 Mbps Fixed Wireless	\$1,784	\$4,106,093	\$2,988,030
1 Gbps Leased Lit Fiber WAN	\$963	\$22,368,575	\$31,614,740
1 Gbps Fixed Wireless	\$1,784	\$2,763,176	\$3,905,349
10 Gbps Leased Lit Fiber WAN	\$2,001	\$2,748,821	\$0
2x10 Gbps Leased Lit Fiber WAN	\$4,001	\$338,033	\$0
100Gbps Leased Lit Fiber WAN	\$23,960	\$0	\$0
Leased Dark Fiber WAN	\$619	\$3,452,878	\$3,744,491
Owned Dark Fiber WAN	\$200	\$1,576,320	\$1,545,264
Site-to-Site VPN WAN	\$0	\$0	\$0

Private Schools Analysis

Base Information - private schools that apply for E-rate

	# of districts	# of schools	# of students	% of schools	Avg. E-rate Discount %	
Private School Systems	176	6,392	1,781,478	47%	70%	54%
Independent Private Schools	7207	7207	1,851,099	53%	40%	

Bandwidth Needs - Internet Access

	100 Mbps	1 Gbps	10 Gbps	20 Gbps	100 Gbps	Total
% Private School Systems	0%	30%	55%	15%	0%	100%
% Independent Private Schools	20%	79%	1%	0%	0%	100%
# Private School Systems	0	53	97	26	0	176
# Independent Private Schools	1441	5693	72	0	0	7,207

Bandwidth Needs - District Aggregation Points

	100 Mbps	1 Gbps	10 Gbps	20 Gbps	100 Gbps	Total
% Private School Systems	0%	50%	45%	5%	0%	100%
% Independent Private Schools	0%	0%	0%	0%	0%	0%
# Private School Systems	0	88	79	9	0	176
# Independent Private Schools	0	0	0	0	0	0

Bandwidth Needs - District WAN

	100 Mbps	1 Gbps	10 Gbps	20 Gbps	100 Gbps	Total
% Private School Systems	60%	39%	1%	0%	0%	100%
% Independent Private Schools	0%	0%	0%	0%	0%	0%
# Private School Systems	3835	2493	64	0	0	6,392
# Independent Private Schools	0	0	0	0	0	0

Libraries Analysis

Base Information - All libraries

Libraries	# standalone 7713	# of systems 1573	# libraries in systems 9198	Total libraries 16911
	% not applying due to CIPA			
# Standalone Libraries	40%			
# Library Systems	30%			

Bandwidth Needs - Internet Access

	100 Mbps	1 Gbps	10 Gbps	20 Gbps	100 Gbps	Total
Total # Independent Libraries	5620	2093	0	0	0	7713
Total # Library Systems	0	1166	400	8	0	1573
# Independent Libraries	3372	1256	0	0	0	4628
# Library Systems	0	816	280	6	0	1101

Bandwidth Needs - District WAN

	100 Mbps	1 Gbps	10 Gbps	20 Gbps	100 Gbps	Total
# Independent Libraries	0	0	0	0	0	0
# Library Systems	3987	5211	0	0	0	9198
# Independent Libraries	0	0	0	0	0	0
# Library Systems	2791	3648	0	0	0	6439

Backup: Service Mix for Private Schools and Libraries

Connection Type	Speed Category	# of Connections (per scenario)		Connection Type	% of Connections by Service Type		# of Connections by Service Type (per scenario)									
		Private Schools	Libraries		Private Schools	Libraries	Private Schools	Libraries								
Internet Access	100 Mbps	1,441	3,372	Lit Fiber DIA Consumer Small Business DIA (DOCSIS, PON) Fixed Wireless DIA (incl. LTE-A)	60%	865	2,023	30%	432	1,012	10%	144	337			
	1 Gbps	5,746	2,072	Lit Fiber DIA	100%	5,746	2,072									
	10 Gbps	169	280	Lit Fiber DIA Transport to POP + ISP	80%	135	224	20%	34	56						
	2x10 Gbps	26	6	Lit Fiber DIA Transport to POP + ISP	80%	21	4	20%	5	1						
	100 Gbps	-	-	Transport to POP + ISP	100%	0	0									
	100 Mbps	3,835	2,791	Leased Lit Fiber Fixed Wireless Leased Dark Fiber + Electronics Owned Dark Fiber WAN + Electronics	80%	3,068	2,233	5%	192	140	5%	192	140	10%	384	279
District WAN	1 Gbps	2,581	3,648	Leased Lit Fiber Fixed Wireless Leased Dark Fiber + Electronics Owned Dark Fiber WAN + Electronics	75%	1,936	2,736	5%	129	182	10%	258	365	10%	258	365
	10 Gbps	143	-	Leased Lit Fiber Leased Dark Fiber + Electronics Owned Dark Fiber WAN + Electronics	80%	114	0	10%	14	0	10%	14	0			
	2x10 Gbps	9	-	Leased Lit Fiber Leased Dark Fiber + Electronics Owned Dark Fiber WAN + Electronics	80%	7	0	10%	1	0	10%	1	0			
	100 Gbps	-	-	Leased Lit Fiber Leased Dark Fiber + Electronics Owned Dark Fiber WAN + Electronics	80%	0	0	10%	0	0	10%	0	0			
	VPN			Site-to-site VPN	100%	0	0									

Backup: Libraries Internet Access and WAN Need

Internet Access Need (Mbps)	Column Labels		
	Standalone	Library System	Grand Total
100	5620		5620
1000	2093	972	3065
2000		387	387
3000		102	102
4000		48	48
5000		20	20
6000		20	20
7000		8	8
8000		3	3
9000		3	3
10000		2	2
11000		2	2
13000		2	2
15000		1	1
17000		2	2
19000		1	1
Grand Total	7713	1573	9286

	Standalone	Library System
# 100Mbps	5620	0
# 1Gbps	2093	1166
# 10Gbps	0	400
# 20Gbps	0	8

WAN Need	
Sum of 1 Gbps WAN	5211
Sum of 100 Mbps WAN	3987