AT&T Impairment Tools

Explanation and

Documentation

of Input Values

December 19, 2003

1. OVERVIEW

This document contains descriptions of the user-adjustable inputs to the AT&T Impairment tools, the default values assigned to the inputs, and the rationales and references to supporting evidence for these default values. The inputs and assumptions in the tools are based on information in publicly available documents, expert engineering judgment, price quotes from suppliers and contractors, and materials received during discovery processes.

2. GLOBAL INPUTS

The following group of inputs are used in the *Facility Ring Processor*.

2.1. Maximum Nodes per Ring (Facility Ring Processor)

Definition:

The maximum number of CLEC Network Nodes that will be placed on a Synchronous Optical Network ("SONET") ring in the *Facility Ring Processor*.

Default Value:

Maximum Nodes per Ring (Facility Ring Processor)
6

Support:

The maximum recommended number of Add/Drop multiplexers that will be placed on a SONET ring connecting CLEC Network Nodes is based on generally accepted engineering practice and on the expert opinions of engineers at AT&T and consultants to AT&T that have designed SONET rings for ILECs, CLECs, and long distance carriers.

2.2. Regenerator Spacing in Miles (Facility Ring Processor)

Definition:

The maximum distance, in miles, between SONET Add/Drop multiplexers before requiring an optical regenerator. Used in the *Facility Ring Processor*.

Default Value:

Regenerator Spacing in Miles (Facility Ring Processor)
57

Support:

The maximum distance between SONET Add/Drop multiplexers used between CLEC Network Nodes in the *Facility Ring Processor* is based on vendor technical specifications. This a conservative value based on the technical specifications of commonly-available optical fiber and SONET optical transmitters and receivers. A very conservative estimate for maximum span loss accommodated by current long-reach optical interfaces operating at 1550 nm is 22 dB (including consideration for end-of-life deterioration and splicing).[1] A conservative estimate for non-zero-dispersion-shifted fiber attenuation is 0.24 dB/km.[2] The

[1] Long-reach optical modules can readily accommodate span losses of greater than 25 dB at 1550 nm. See, e.g., http://www.cisco.com/en/US/products/hw/mo dules/ps2831/products_data_sheet09186a0080088774.html

maximum regenerator spacing, using these values, is 20 dB/ 0.24 db/km, or 91 km, which is about 57 miles..

2.3. CLLI Rejection Threshold in Miles (Facility Ring Processor)

Definition:

The maximum distance between two Common Language Location Identifier ("CLLI") CLEC Network Nodes before the *Facility Ring Processor* will not include the location as a part of the network.

Default Value:

CLLI Rejection Threshold in Miles (Facility Ring Processor)
50

Support:

This value is based on the study-area geography. It reflects the apparent greatest airline distance, adjusted with an average route-to-air multiplier of 1.27, between the major population center in each study area (typically a LATA) and the most remote population center of interest in that study area..

[2] See, *e.g.*, *Corning® LEAF® Optical Fiber Product Guide*, PI1107, March, 2003, Corning Incorporated. The 0.24 dB/km value applies over the range 1525-1575 nm.

3. FINANCIAL INPUTS

The inputs discussed in this section include cost of capital-related parameters, labor rates, depreciation, and maintenance expense used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

3.1. Cost of Capital and Taxes

Definition:

State-specific values for 1) Cost of Debt; 2) Cost of Equity; 3) Percent Debt; 4) Income Tax Rate; and, 5) Other Taxes. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Cost of Capital and Taxes	
Cost of Debt	State Required Input – 9.27%
Cost of Equity	State Required Input -13.80%
Percent Debt	State Required Input – 78.00%
Income Tax Rate	State Required Input -35.00%
Other Taxes	State Required Input -4.77%

Support:

The Cost of Debt and the Cost of Equity are per state-ordered values in UT-950200, 4/11/96 rate case, plus 200 basis points. The Percent Debt is per the state ordered value in UT-950200, 4/11/96 rate case. The Income Tax Rate is based on the Federal tax rate; state income tax rate is 0%. Other Taxes are based on percent of total revenue (530), other tax (7240) 2001 ARMIS 43-03 report. 2002 data is not available for Qwest.

3.2. Labor Rates

Definition:

Inputs are required for appropriate types of direct labor used within the Impairment Tools. Five types of labor have been made available for use. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Labor Rates	
Labor Type	**Default Rate**
Labor Rate for Type 1 – Engineer	$50
Labor Rate for Type 2 – Outside Technician	$50
Labor Rate for Type 3 – Inside Technician	$50
Labor Rate for Type 4	Not Used
Labor Rate for Type 5	Not Used

Support:

Default values are based on a national average labor rate. Those rates may be adjusted by a state-specific labor factor. The labor rate is indexed for Washington by the labor factor populated in the tools.

3.3. Depreciation

Definition:

Depreciation method and state-specific depreciation rates as established by existing regulatory findings.

Default Values:

Depreciation	
Depreciation Type	**Input**
Accelerated Depreciation	TRUE
Regulatory Depreciation Method	ELG

Depreciation Rates			
Asset Type	**Economic Lives in Years**	**Net Salvage Percent**	**Used in Tool**
Digital Circuit Equipment	12.0	0.01	DS0 & Transport
Aerial Cable, Non-metallic	25.0	-0.24	Transport
Buried Cable, Non-metallic	28.0	-0.22	Transport
Underground Cable, Non-metallic	28.0	-0.07	Transport
Poles	55.0	-0.75	Transport
Conduit Systems	17.0	-0.10	Transport
Switching	25.0	0.00	DS0

Support:

Default values are based on a national average. State-specific approved economic lives in years and net salvage percentages are based on the latest state regulated values.

3.4. Collocation Study Period (Years)

Definition:

The study period in months for the CLEC collocation arrangement. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Collocation Study Period (Years)
11.5

Support:

The study period for the collocation arrangement is based on expert opinion and observation of collocation arrangements in ILEC wire centers.

3.5. Hot Cut Study Period (Months)

Definition:

The study period in months for a CLEC hot cut of a new customer. Used in the *DS0 Impairment Tool.*

Default Value:

Hot Cut Study Period (months)
25

Support:

The study period for the hot cut of a new CLEC customer is based on expert opinion and observation of hot cuts in ILEC wire centers.

3.6. Annual Maintenance

Definition:

Annual maintenance expense as a percent of investment.

Default Values:

Annual Maintenance Rates		
Asset Type	**Maintenance Percent**	**Used in Tool**
Circuit Equipment	0.0200	Transport
Aerial Cable, Non-metallic	0.0073	Transport
Buried Cable, Non-metallic	0.0084	Transport
Underground Cable, Non-metallic	0.0061	Transport
Equipment Maintenance Factor	0.0200	DS0

Support:

Default values are based on the FCC's determination for appropriate inputs to the FCC Synthesis Model. The *Equipment Maintenance Factor* was based on the maintenance rate for Circuit Equipment.

4. RAMP-UP INPUTS

The inputs included in this section are used in the *DS0 Impairment Tool.* They represent the effect of a ramp-up in growth over a period of time.

4.1. Market Share

Definition:

Inputs that describe the ramp-up of market share in each of the ILECs wire centers over a period of time. Used in the *DS0 Impairment Tool.*

Default Values:

Market Share	
Parameter	**Input Value**
Starting Share Achieved	0%
Period 1 Ends at Beginning of Year number ...	2
Share at End of Period 1	40%
Period 2 Ends at Beginning of Year number ...	3
Share at End of Period 2	60%
End of Ramp-Up at Beginning of Year number ...	5

Support:

These input parameters are deemed by AT&T to be conservatively high market share assumptions that are reasonable to use in the impairment analysis at this time.

4.2. Churn

Definition:

The fraction of business and residential lines that will be lost and replaced by other sales gains on an annual basis. Used in the *DS0 Impairment Tool.*

Default Values:

Churn	
Line Type	**Churn Factor**
Business	0.046
Residence	0.046

Support:

These input parameters are deemed by AT&T to be conservatively low assumptions that are reasonable to use in the impairment analysis at this time.

5. GENERAL INPUTS

The inputs in this section are used in the *Transport Impairment Tool* to determine CLEC investment required to enter the market.

5.1. Installed Fiber Optic Cable Costs

Definition:

The installed per-foot cost of fiber optic cable, including material, engineering, and installation. Used in the *Transport Impairment Tool.*

Default Values:

Installed Fiber Optic Cable Costs Per Foot	
Component	**Cost**
Fixed Component of Fiber Cost (per sheath-foot)	$0.3799
Aerial Incremental Cost (per fiber-foot)	$0.0294
Buried Incremental Cost (per fiber-foot)	$0.0294
Underground Incremental Cost (per fiber-foot)	$0.0299

Support:

The source for non-proprietary fiber optic cable material costs is Florida PSC Order No. PSC-99-0068-FOF, pages 147-149. Engineering, Placing, and Splicing costs are based on the opinion of expert outside plant consultants. Details of the assumptions and calculations leading to the fixed plus variable cost per foot components listed above are included below. Assumptions include the use of well trained technicians using state-of-the-art high production engineering, placing, and splicing tools.

Installed Fiber Cable Costs

OSP Engineering Labor Rate & Productivity - Fiber Cable		
Function	Parameter	
Length of OSP engineer work day (hrs.)	8.0	Source: Common knowledge.
OSP engineering labor rate ($/hr.)	**$50.00**	Source: National average - expert opinion & review of UNE dockets.
OSP engineering cable productivity (ft./day)	10,000	Source: Expert opinion.
Minutes per splice engineered	10.0	Source: Expert opinion.
Minutes per 12 fibers engineered	3.0	Source: Expert opinion.

OSP Technician Labor Rate & Productivity - Fiber Cable		
Function	Parameter	
Length of OSP technician work day (hrs.)	8.0	Source: Common knowledge.
OSP technician labor rate ($/hr.)	**$50.00**	Source: National average - expert opinion & review of UNE dockets.
Splicing set up and closure time (hrs.)	2.0	Source: Expert opinion.
Splicing rate (min/fiber)	5.0	Source: Expert opinion.

OSP Technician Labor Rate & Productivity - Fiber Cable				
Function	Aerial	Buried	Underground	
Distance between Splices (ft.)	8,000	8,000	8,000	Source: Expert opinion.
Cable Placing Rates (ft./day)	6,000	6,000	6,000	Source: Expert opinion.
Cable Placing Crew size	2.0	2.0	2.0	Source: Expert opinion.
Cable Splicing Crew size	1.0	1.0	2.0	Source: Expert opinion.

Cable Size	***Installed Cost/foot - Aerial Fiber Cable***					
	Material	Engrg	Placing	Splicing	Labor	Total
288	$8.51	$0.05	$0.13	$0.16	$0.34	$8.85
216	$6.42	$0.05	$0.13	$0.13	$0.31	$6.73
144	$4.30	$0.04	$0.13	$0.09	$0.27	$4.57
96	$2.97	$0.04	$0.13	$0.06	$0.24	$3.21
72	$2.30	$0.04	$0.13	$0.05	$0.23	$2.53
48	$1.60	$0.04	$0.13	$0.04	$0.21	$1.81
36	$1.12	$0.04	$0.13	$0.03	$0.21	$1.33
24	$0.89	$0.04	$0.13	$0.03	$0.20	$1.09
12	$0.59	$0.04	$0.13	$0.02	$0.19	$0.78
6	$0.36	$0.04	$0.13	$0.02	$0.19	$0.55
	0.028844138	**Aerial incremental fiber cost (per foot)**			**0.000546875**	**$0.0294**

Cable Size	Installed Cost/foot - Buried Fiber Cable					
	Material	Engrg	Placing	Splicing	Labor	Total
288	$8.51	$0.05	$0.13	$0.16	$0.34	$8.85
216	$6.42	$0.05	$0.13	$0.13	$0.31	$6.73
144	$4.30	$0.04	$0.13	$0.09	$0.27	$4.57
96	$2.97	$0.04	$0.13	$0.06	$0.24	$3.21
72	$2.30	$0.04	$0.13	$0.05	$0.23	$2.53
48	$1.60	$0.04	$0.13	$0.04	$0.21	$1.81
36	$1.12	$0.04	$0.13	$0.03	$0.21	$1.33
24	$0.89	$0.04	$0.13	$0.03	$0.20	$1.09
12	$0.59	$0.04	$0.13	$0.02	$0.19	$0.78
6	$0.36	$0.04	$0.13	$0.02	$0.19	$0.55
	0.028844138	**Aerial incremental fiber cost (per foot)**			**0.000546875**	**$0.0294**

Cable Size	Installed Cost/foot - Underground Fiber Cable					
	Material	Engrg	Placing	Splicing	Labor	Total
288	$8.51	$0.05	$0.13	$0.33	$0.51	$9.02
216	$6.42	$0.05	$0.13	$0.25	$0.43	$6.85
144	$4.30	$0.04	$0.13	$0.18	$0.35	$4.65
96	$2.97	$0.04	$0.13	$0.13	$0.30	$3.27
72	$2.30	$0.04	$0.13	$0.10	$0.28	$2.58
48	$1.60	$0.04	$0.13	$0.08	$0.25	$1.85
36	$1.12	$0.04	$0.13	$0.06	$0.24	$1.36
24	$0.89	$0.04	$0.13	$0.05	$0.23	$1.12
12	$0.59	$0.04	$0.13	$0.04	$0.21	$0.80
6	$0.36	$0.04	$0.13	$0.03	$0.21	$0.57
	0.028844138	**Aerial incremental fiber cost (per foot)**			**0.001067708**	**$0.0299**

Install Cost/foot – Fixed Component			
0.188882219	**Average fixed component of fiber cost (per foot)**	**0.191041667**	**$0.3799**

5.2. Average Number of OC-48s per Node

Definition:

The average number of OC-48 multiplexers placed at a CLEC Network Node. Used in the *Transport Impairment Tool.*

Default Value:

Average Number of OC-48s per Node
1.5

Support:

AT&T assumes, based on its experience that approximately half of its CLEC Network Nodes will involve the deployment of one OC-48 multiplexer, and half will involve the deployment of two OC-48 multiplexers. These multiplexers are used for transport to serve mass market local loop as well as enterprise (business) customers.

5.3. Business Case Option

Definition:

An indicator as to whether the *Business Case Option* is being used in the filing. Used in the *Transport Impairment Tool.*

Default Value:

Business Case Option
No

Support:

The *Business Case Option* was not filed in this case.

6. COLLOCATION INPUTS

The inputs in this section generally involve the costs associated with collocation cages in ILEC wire centers for CLEC Network Nodes and for CLEC Satellite Offices. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

6.1. Breakage Allowed for Satellite Collocation

Definition:

This parameter indicates whether Satellite collocation costs will be calculated by the model on a per square footage basis (e.g., partial collocation space increments), or whether collocation cost will be based on discrete incremental sizes of collocation space, even if only a portion of the space is required. 'Yes' means that more expensive increments of collocation space will be used by the tools; 'No' means that partial collocation space increments will be used by the tools. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Breakage Allowed for Collocation
No

Support:

AT&T conservatively assumes that partial collocation space increments can be utilized.

6.2. Power Feed Requirements

Definition:

Power feed requirements are identified to determine the cost of power supplied by the ILEC in collocation arrangements. Used in the *DS0 Impairment Tool,* and the *Transport Impairment Tool.*

Default Value:

Power Feed Requirements	
Item	**Input Value**
AC Power per Feed (Amps)	20
AC Power Feeds Required (ea.)	1
DC Power Feeds Required (ea.)	1
DC Load Amp to Fuse Amp Conversion Factor	1.00
DC Average Load to Peak Load Conversion Factor	1.00
Minimum DC Power Requirement – Node (Amps)	200

Support:

The default inputs in this section are based on AT&T's experience in performing installations in a large number of locations. AC power is normally used for ancillary power requirements such as for test equipment, lighting and tools. A minimum capacity of 20 amps is typical. Two AC power feeds are normally ordered for flexibility and redundancy. Two DC power feeds provide the operational current to operate all transmission equipment within a collocation arrangement. Two DC power feeds are required for redundancy. A DC Load Amp to Fuse Amp Conversion Factor of 1.00 is an optional input if load

amps and fuse amps inputs elsewhere are different. The DC Average Load to Peak Load Conversion Factor of 1.00 is an optional input if average load and peak load power consumption input elsewhere are different. Since a CLEC Network Node involves an aggregation point for all CLEC services in a large ILEC wire center location, the minimum power requirement for such a collocation is for 200 amps.

6.3. Number of Fibers in DS0 Entrance Facility

Definition:

The number of fibers assumed in the DS0 entrance facility. Used in the *DS0 Impairment Tool.*

Default Value:

Number of Fibers in DS0 Entrance Facility
12

Support:

This is a conservative assumption that the number of fibers in the DS0 entrance facility is only 12 fibers.

6.4. Fiber Transport Cable Size

Definition:

The average cable size assumed for fiber transport. Used in the *Transport Impairment Tool.*

Default Value:

Fiber Transport Cable Size
48

Support:

This is a conservative assumption that the number of fibers in fiber transport cables is only 48 fibers.

6.5. Collocation Cable Inputs

Definition:

Copper cable and coax cable requirements are identified to determine the cost of tie cables in collocation arrangements. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Collocation Cable Inputs	
Item	Input Value
Maximum 2-Wire Tie Cable Size (pairs)	600
Maximum DS-1 Tie Cable Size (pairs)	56
Maximum DS-3 Tie Cable Size (coax cables)	48

Support:

Cable sizes for 2-wire, DS-1, and DS-3 tie cables are based on typical collocation arrangements.

6.6. Minimum Square Footage Requirement (Node)

Definition:

The minimum square footage in caged collocation assumed to be required for all CLEC needs at a CLEC Network Node. Used in the *DS0 Impairment Tool.*

Default Value:

Minimum Square Footage Requirement (Node)
300

Support:

AT&T assumes that a minimum of 300 square feet will be required at a CLEC Network Node to be used for all CLEC types of service needs.

6.7. Minimum Collocation Space (Node)

Definition:

The minimum collocation cage space assumed to be leased at a CLEC Network Node. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Minimum Collocation Space in Square Feet (Node)
300

Support:

AT&T assumes that a minimum of 300 square feet of collocation space will be required at a CLEC Network Node to be used for all CLEC types of service needs.

6.8. Frame Space Requirements

Definition:

Frame space parameters used by the AT&T Impairment Tools to determine space requirements in ILEC wire centers. Used in the *DS0 Impairment Tool,* and the *Transport Impairment Tool,* as indicated below.

Default Value:

Frame Space Requirements		
Item	**Floor Space (sq. ft.)**	**Used in Tool**
Square Feet per Frame (Node)	11.5	DS0 & Transport
Number of Frames for Initial 100 Square Feet (Satellite)	6	DS0
Number of Frames for 100 – 200 Square Feet (Satellite)	10	DS0
Number of Frames for 200 – 300 Square Feet (Satellite)	10	DS0

Support:

Square footage per frame is based on vendor documentation. The maximum number of 23-inch, unequal flange, 7-foot seismic frames that can typically be installed in the three incremental sizes of collocation cages based on experience in a large number of locations. The numbers are cumulative, i.e., 300 square feet can very conservatively accommodate 26 frames.

7. CUSTOMER TRANSFER COSTS

This section describes inputs associated with the costs of transferring a customer loop from an ILEC to a CLEC. Used in the *DS0 Impairment Tool.*

7.1. CLEC Customer Transfer Costs

Definition:

The external cost to the CLEC for transferring a new CLEC customer line or lines onto the CLEC network. Used in the *DS0 Impairment Tool.*

Default Value:

CLEC Customer Transfer Costs
$16.61

Support:

This input captures the state-specific charges imposed on the CLEC by the ILEC for the transfer of one or more lines from the ILEC network to the CLEC network.

7.2. CLEC Customer Transfer Cost Forward Looking Adjustment

Definition:

A forward looking adjustment that reflects reductions in CLEC customer transfer costs in the future. Used in the *DS0 Impairment Tool.*

Default Value:

CLEC Customer Transfer Cost Forward Looking Adjustment
$8.61

Support:

This input captures a process improvement reduction in the state-specific charges imposed on the CLEC by the ILEC for the transfer of one or more lines from the ILEC network to the CLEC network.

8. GENERAL DLC INPUTS

The input values in this section represent the costs associated with deploying DLC equipment to transform analog voice-grade lines to DS0 digital lines, and to multiplex them for transport to the CLEC Local Switching Office. Used in the *DS0 Impairment Tool.*

8.1. DLC Line Capacities – Type 1

Definition:

The line capacities for components associated with DLC Type 1. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Line Capacities – Type 1	
DLC Type 1 Parameter	**Input Value**
Maximum Lines per DLC	2,016
Maximum Lines per Base Unit Frame	672
Maximum Lines per Subsequent Frames (to max capacity of base)	896
Minimum Lines per Sub-module Within Frame	224
Maximum Lines per Card	4

Support:

DLC Type 1 is a system capable of serving up to 2,016 lines. The inputs are based on Alcatel Litespan equipment that consists of a Common Control Assembly, and one or more Channel Bank Assemblies. The design is based on 100% Integrated Digital Loop Carrier ("IDLC"). At the collocation arrangement, sufficient Channel Bank Assemblies are installed to house line cards for all lines terminated. At the CLEC switch location, since the tools assume IDLC, one Common Control Assembly and one Channel Bank Assembly is required to provide DS-1 outputs from the IDLC Central Office Terminal ("COT") to the digital switch ports.

The frame layout has a capacity for 4 shelf units. In the collocation arrangement, the first frame bay contains one Common Control Assembly and up to three 224-line Channel Bank Assemblies (672 lines). The second frame bay contains up to four 224-line Channel Bank Assemblies (896 lines). The third frame bay contains up to two 224-line Channel Bank Assemblies, with two spare shelf spaces for additional DLC systems or other equipment.

Each individual line card can handle up to four POTS lines.

The DLC specifications are per vendor technical documentation.

8.2. DLC Line Capacities – Type 2

Definition:

The line capacities for components associated with DLC Type 2. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Line Capacities – Type 2	
DLC Type 1 Parameter	**Input Value**
Maximum Lines per DLC	120
Maximum Lines per Base Unit Frame	600
Maximum Lines per Subsequent Frames (to max capacity of base)	0
Minimum Lines per Sub-module Within Frame	120
Maximum Lines per Card	6

Support:

DLC Type 2 is a system capable of serving up to 120 lines. The inputs are based on Advanced Fibre Communications ("AFC") equipment that consists of a complete shelf assembly that can be used at either the RT or the COT. The design is based on 100% Integrated Digital Loop Carrier ("IDLC").

The frame layout has a capacity for 5 shelf units. Additional frames are not necessary because the 120-line capacity is provided via a single shelf in a frame bay.

Each individual line card can handle up to six POTS lines.

The DLC specifications are per vendor technical documentation.

8.3. DLC Line Capacities – Type 3

Definition:

The line capacities for components associated with DLC Type 3. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Line Capacities – Type 3	
DLC Type 1 Parameter	**Input Value**
Maximum Lines per DLC	24
Maximum Lines per Base Unit Frame	600
Maximum Lines per Subsequent Frames (to max capacity of base)	0
Minimum Lines per Sub-module Within Frame	24
Maximum Lines per Card	6

Support:

DLC Type 3 is a system capable of serving 24 lines. The inputs are based on Advanced Fibre Communications ("AFC") equipment that consists of a complete shelf assembly that can be used at either the RT or the COT. The design is based on 100% Integrated Digital Loop Carrier ("IDLC").

The frame layout has a capacity for 5 shelf units. Additional frames are not necessary because a single shelf in a frame bay can provide for up to 120 lines.

The minimum lines per sub-module within a frame is 24 lines, since DLC Type 3 deals with provisioning small increments of 24 lines each.

Each individual line card can handle up to six POTS lines.

The DLC specifications are per vendor technical documentation.

8.4. Engineered DLC Capacity

Definition:

The line requirements are divided by the Engineered DLC Line Capacity factor to determine the number of lines, and hence the number of line cards installed. Used in the *DS0 Impairment Tool.*

Default Values:

Engineered DLC Capacity		
Type 1	Type 2	Type 3
90%	90%	90%

Support:

AT&T conservatively assumes that line cards will be engineered at a 90% sizing factor that provides 10% spare for growth and administrative spare.

8.5. Type of Transport Interface (DS-3 or DS-1)

Definition:

The type of transport utilized for DLC Types 1, 2 and 3. Used in the *DS0 Impairment Tool.*

Default Values:

Type of Transport Interface		
Type 1	Type 2	Type 3
DS-3	DS-1	DS-1

Support:

The type of transport is associated with the line capacity of the DLC.

8.6. Designated Terminated Lines/Active Line (Concentration)

Definition:

The engineered concentration ratio for DLC Types 1, 2 and 3 configured for IDLC use. Used in the *DS0 Impairment Tool.*

Default Values:

Designated Terminated Lines/Active Line (Concentration)		
Type 1	Type 2	Type 3
4.0	4.0	4.0

Support:

Per vendor documentation, the DLC can be traffic engineered to support a concentration ratio of 4:1.

8.7. Number of RTs per COT (do not exceed 5)

Definition:

The maximum number of Remote Terminals ("RTs") in collocation arrangements that can be served by one Central Office Terminal ("COT") at the CLEC switch location. Used in the *DS0 Impairment Tool.*

Default Values:

Number of RTs per COT		
Type 1	Type 2	Type 3
5.0	5.0	5.0

Support:

Per vendor documentation.

8.8. DLC Channel Unit Card Investments

Definition:

The investment in channel unit cards for DLC Type 1, 2, and 3. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Channel Unit Card Investments			
Card Type	Type 1	Type 2	Type 3
Traditional POTS Line Card Cost	$180	$270	$270
Range Extended Line Card Cost	$276	$414	$414
DS1/U Interface Card	$288	$288	$288

Support:

Channel unit investments were determined via expert opinion for large-scale purchase of line cards by members of the development team.

8.9. DLC Channel Unit Card Power Consumption

Definition:

The power consumption in Watts, and the operating voltage, for various channel unit cards for DLC Type 1. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Channel Unit Card Power Consumption			
Card Type	Type 1	Type 2	Type 3
POTS Line Card Power Consumption (Watts)	1.98	2.90	2.90
Range Extended Line Card Power Consumption (Watts)	4.59	3.20	3.20
Line Power (Volts)	48	48	48

Support:

Power consumption and operating voltage is based on vendor documentation.

9. DLC COMMON EQUIPMENT INVESTMENTS

9.1. DLC Common Equipment Investment

Definition:

The investment for DLC common equipment components. Used in the *DS0 Impairment Tool.*

Default Values:

DLC Common Equipment Investment			
Component	**Type 1**	**Type 2**	**Type 3**
Firmware & Common Plug Ins	$12,600	$4,200	$4,200
Electrical Transceiver	$800	$288	$288
Channel Bank Assembly & Commons	$2,166	$0	$0
DSX-1 and Cabling	$800	$800	$800
Test Access System & Equipment	$0	$0	$0
Time Slot Interchangers	$2,200	-	-
M1/3 Multiplexer	-	$3,000	$3,000
Engineering Labor Type	1	1	1
Engineering Hours	12.0	12.0	12.0
Place, Wire, Turn Up & Test Equipment Labor Type	2	2	2
Place, Wire, Turn Up & Test Equipment – Hours	7.5	7.5	7.5
Install & Cross Connect DSX Labor Type	2	2	2
Install & Cross Connect DSX – Hours	1.75	1.5	1.5
Channel Bank Assembly, Commons & Cables	$2,166	-	-
Place CBA, Place and Terminate DS0 Cabling Labor Type	2	2	2
Place CBA, Place and Terminate DS0 Cabling – Hours	6	3.0	3.0
Place, Wire, Turn Up & Test M1/3 Multiplexer Equipment Labor Type	-	2	2
Place, Wire, Turn Up & Test M1/3 Multiplexer Equipment – Hours	-	1	1
Transport Directionality (1 = one direction, 2 = two directions)	1	-	-
Transport Protection (1 = unprotected, 2 = protected)	1	-	-

Support:

DLC common equipment investments were determined via expert opinion for large-scale purchases of such equipment by members of the development team.

10. MARKET SHARE

10.1. Percent Addressable Line Share

Definition:

The maximum percent of POTS lines anticipated to be served by a CLEC in an ILEC wire center, by density zone. Used in the *DS0 Impairment Tool.*

Default Values:

Percent Addressable Line Share		
Office Size (Lines)	Business Line Share	Residential Line Share
0	5%	5%
5,000	5%	5%
10,000	5%	5%
25,000	5%	5%
50,000	5%	5%
60,000	5%	5%
70,000	5%	5%
80,000	5%	5%
90,000	5%	5%
100,000	5%	5%

Support:

This is an estimate of eventual POTS line share.

11. LOOP LENGTH & IDLC PERCENTAGE

11.1. Percent of Loops Longer Than 18,000 Feet

Definition:

The percent of loops longer than 18,000 feet by density zone in lines per square mile. Used in the *DS0 Impairment Tool.*

Default Values:

Percent of Loops Longer Than 18,000 Feet	
Lines per Square Mile	**% > 18,000 Feet**
<5	50%
5 – 100	45%
100 – 200	40%
200 – 650	35%
650 – 850	30%
850 – 2,550	25%
2,550 – 5,000	20%
5,000 – 10,000	15%
>10,000	10%

Support:

This estimate of percent of loops longer than 18,000 feet is based on the expert opinion of the model developers.

11.2. Percent of Loops Longer Than 18,000 Feet Which Require Range Extension

Definition:

The percent of loops longer than 18,000 feet which require DLC extended range line cards. Used in the *DS0 Impairment Tool.*

Default Values:

Percent of Loops Longer Than 18,000 Which Require Range Extension	
Lines per Square Mile	**% > 18,000 Feet Requiring Extended Range Line Cards**
<5	20%
5 – 100	20%
100 – 200	20%
200 – 650	10%
650 – 850	10%
850 – 2,550	10%
2,550 – 5,000	0%
5,000 – 10,000	0%
>10,000	0%

Support:

This percentage of the percentage of voice-grade lines longer than 18,000 feet represents those long loops that are not already served by ILEC DLC equipment (i.e., copper loops) which will therefore require the use of extended range line cards in the CLEC's DLC RT equipment.

11.3. IDLC Loops as Percent of DLC Loops

Definition:

The percent of DLC-served loops that are served by IDLC which the ILEC refuses to offer to CLECs in an IDLC manner. Used in the *DS0 Impairment Tool.*

Default Values:

IDLC Loops as Percent of DLC Loops	
Lines per Square Mile	**% of DLC Loops On IDLC**
<5	50%
5 – 100	50%
100 – 200	50%
200 – 650	50%
650 – 850	50%
850 – 2,550	50%
2,550 – 5,000	50%
5,000 – 10,000	50%
>10,000	50%

Support:

This is the percentage of loops served by DLC equipment that are not IDLC, based on Telcordia/Bellcore "DLC Trends", 1998. Such loops will result in the ILEC transferring the working lines to Universal Digital Loop Carrier ("UDLC") or copper pairs, or if the ILEC is unable to do so, then the CLEC will have to deny service..

11.4. Percent IDLC Loops Transferable to UDLC or Copper

Definition:

The percent of IDLC-served loops that are transferable to UDLC or copper pairs. Used in the *DS0 Impairment Tool.*

Default Values:

Percent IDLC Loops Transferable to UDLC or Copper	
Lines per Square Mile	**% of IDLC Loops Transferable to UDLC or Copper**
<5	95%
5 – 100	95%
100 – 200	95%
200 – 650	95%
650 – 850	95%
850 – 2,550	95%
2,550 – 5,000	95%
5,000 – 10,000	95%
>10,000	95%

Support:

This is the percentage of loops served by IDLC equipment that are transferable to UDLC or copper pairs. Those that cannot be transferred will not be able to be served by the CLEC because the ILEC refuses to offer unbundled IDLC loops.

12. TERMINATION PANEL INVESTMENTS

12.1. Panel Installation Cost – DS0

Definition:

The installed cost of DS0 copper terminations in a collocation arrangement. Used in the *DS0 Impairment Tool.*

Default Values:

Panel Installation Cost – DS0	
Parameter	**Input Value**
Material	$160
Maximum Fill	100%
Labor Type – Engineering	1
Labor Hours – Engineering	0.5
Labor Type – Installation	3
Labor Hours – Installation	0.5
Labor Type	Not Used
Labor Hours	Not Used

Support:

This estimate of material, engineering, and installation of DS0 copper terminations is based on the expert opinion of the model developers.

12.2. Panel Installation Specifications – DS0

Definition:

The specifications for DS0 copper terminations in a collocation arrangement. Used in the *DS0 Impairment Tool.*

Default Values:

Panel Installation Specifications – DS0	
Parameter	**Input Value**
Termination Capacity/Panel (Lines)	200
Panel Height (inches)	6
Terminations Required per Active Line	2

Support:

Based on vendor documentation. The two terminations required per active line is based on one input termination cross connected to one output termination.

12.3. Panel Installation Cost – DS-1

Definition:

The installed cost of DS-1 copper terminations in a collocation arrangement. Used in the *DS0 Impairment Tool.*

Default Values:

Panel Installation Cost – DS-1	
Parameter	**Input Value**
Material	$1,600
Maximum Fill	100%
Labor Type – Engineering	1
Labor Hours – Engineering	0.5
Labor Type – Installation	3
Labor Hours – Installation	3.0
Labor Type	Not Used
Labor Hours	Not Used

Support:

This estimate of material, engineering, and installation of DS-1 copper terminations is based on the expert opinion of the model developers.

12.4. Panel Installation Specifications – DS-1

Definition:

The specifications for DS-1 copper terminations in a collocation arrangement. Used in the *DS0 Impairment Tool.*

Default Values:

Panel Installation Specifications – DS-1	
Parameter	**Input Value**
Termination Capacity/Panel (Lines)	28
Panel Height (inches)	4
Terminations Required per Active Line	2

Support:

Based on vendor documentation. The two terminations required per DS-1 is based on one input termination cross connected to one output termination.

12.5. Panel Installation Cost – DS-3

Definition:

The installed cost of DS-3 coax terminations in a collocation arrangement. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Panel Installation Cost – DS-3	
Parameter	**Input Value**
Material	$8,500
Maximum Fill	100%
Labor Type – Engineering	1
Labor Hours – Engineering	0.5
Labor Type – Installation	3
Labor Hours – Installation	2.0
Labor Type	Not Used
Labor Hours	Not Used

Support:

This estimate of material, engineering, and installation of DS-3 coax terminations is based on the expert opinion of the model developers.

12.6. Panel Installation Specifications – DS-3

Definition:

The specifications for DS-3 coax terminations in a collocation arrangement. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Panel Installation Specifications – DS-3	
Parameter	**Input Value**
Termination Capacity/Panel (Lines)	24
Panel Height (inches)	7.5
Terminations Required per Active Line	2

Support:

Based on vendor documentation. The two terminations required per active line is based on one input termination cross connected to one output termination.

13. RACK INVESTMENT

13.1. Rack Installed Cost – Standard Rack

Definition:

The installed cost of standard rack (iron work only). Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Standard Rack Installed Cost	
Parameter	**Input Value**
Material	$350
Labor Type – Engineering	1
Labor Hours – Engineering	0.5
Labor Type – Installation	3
Labor Hours – Installation	2.0
Labor Type	Not Used
Labor Hours	Not Used

Support:

This estimate of material, engineering, and installation of a standard rack (iron work only) in collocation arrangements is based on the expert opinion of the model developers.

13.2. Standard Rack Vertical Height (Inches)

Definition:

The usable vertical height of a standard rack in inches. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Standard Rack Vertical Height (Inches)
78

Support:

Based on vendor documentation.

14. BATTERY DISTRIBUTION FUSE BAY (BDFB) INVESTMENTS

14.1. Battery Distribution Fuse Bay (BDFB) Investments

Definition:

The investments required for various sizes of Battery Distribution Fuse Bays (BDFBs). Used in the *DS0 Impairment Tool,* except for the 300 Amp BDFB which is used in both the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Values:

Battery Distribution Fuse Bay (BDFB) Investments					
Parameter	**20 Amp**	**50 Amp**	**100 Amp**	**200 Amp**	**300 Amp**
Material	$200	$500	$800	$1,000	$5,500
Maximum Fill	100%	100%	100%	100%	100%
Labor Type – Engineering	3	3	3	3	3
Labor Hours – Engineering	14.0	16.5	19.0	21.5	24.0
Labor Type	Not Used	Not Used	Not Used	Not Used	Not Used
Labor Hours	Not Used	Not Used	Not Used	Not Used	Not Used
Labor Type	Not Used	Not Used	Not Used	Not Used	Not Used
Labor Hours	Not Used	Not Used	Not Used	Not Used	Not Used

Support:

The estimate of material, engineering, and installation of BDFBs is based on the expert opinion of the model developers.

14.2. Minimum DC Current Purchase Requirement for Collocation

Definition:

The minimum DC current purchase requirement for collocation. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Minimum DC Current Purchase Requirement for Collocation
0

Support:

State specific value. Used to determine minimum power requirements, but will be affected by the BDFB (minimum) size chosen in the tool.

14.3. Includes BDFB?

Definition:

An indicator as to whether a CLEC deployed BDFB is used, rather than accepting power straight from the ILEC. Used in the *DS0 Impairment Tool* and the *Transport Impairment Tool.*

Default Value:

Includes BDFB?
No

Support:

State specific value.

15. OC-48 ADD/DROP MULTIPLEXERS

15.1. Installed Cost of OC-48 Add/Drop Multiplexer

Definition:

The installed cost of an OC-48 Add/Drop Multiplexer. Used in the *Transport Impairment Tool.*

Default Values:

Installed Cost of OC-48 Add/Drop Multiplexer	
Parameter	**Input Value**
Material – Base Unit	$28,632
Material – Per Added Module	$12,600
Capacity per Modules (DS-3s)	12
Labor Type – Engineering	1
Labor Hours – Engineering	21.0
Labor Type – Installation	2
Labor Hours – Installation	18.0
Labor Type	Not Used
Labor Hours	Not Used

Support:

Material cost is based on vendor quotes. The estimate of engineering and installation is based on the expert opinion of the model developers.

15.2. Engineered DS-3 Fill

Definition:

The DS-3 requirements are divided by the Engineered DS-3 fill factor to determine the multiplexer capacity installed. Used in the *Transport Impairment Tool.*

Default Values:

Engineered DS-3 Fill
80%

Support:

A conservative assumption that DS-3 capacity will be engineered at an 80% sizing factor that provides 20% spare for growth.

15.3. Frames Required per Base Module

Definition:

The frame space required per OC-48 base module and up to 48 DS-3s worth of capacity. Used in the *Transport Impairment Tool.*

Default Values:

Frames Required per Base Module
0.5

Support:

Based on vendor documentation.

15.4. OC-48 Current Drain (Amps)

Definition:

The current drain in amps for each OC-48 base module and each OC-12 sub-module. Used in the *Transport Impairment Tool.*

Default Values:

OC-48 Current Drain (Amps)	
Module	**Current Drain (Amps)**
OC-48 Base Module	10.0
OC-12 Sub-Module	2.5

Support:

Based on vendor documentation.

16. FIBER DISTRIBUTION PANELS

16.1. Installed Cost of Fiber Distribution Panels

Definition:

The installed cost of fiber distribution panels. Used in the *Transport Impairment Tool.*

Default Values:

Installed Cost of Fiber Distribution Panels	
Parameter	**Input Value**
Material	$200
Labor Type – Engineering	1
Labor Hours – Engineering	0.5
Labor Type – Installation	2
Labor Hours – Installation	5.0
Labor Type	Not Used
Labor Hours	Not Used

Support:

Material cost is based on information available from a variety of distributor sources. The estimate of engineering and installation is based on the expert opinion of the model developers.

16.2. Specifications of Fiber Distribution Panels

Definition:

The specifications of fiber distribution panels. Used in the *Transport Impairment Tool.*

Default Values:

Specifications of Fiber Distribution Panels	
Parameter	**Input Value**
Capacity (Fiber Strands)	24
Cost to Connect a Strand	$60
Panels per Frame	5
Practical Fill	100%

Support:

The capacity, cost to connect a strand, panels per frame, and practical fill inputs are based on the expert opinion of the model developers.

17. FIBER CABLE INVESTMENTS

17.1. Installed Cost of Fiber Cable (Per Foot)

Definition:

The installed cost of a 24-fiber cable, by structure type. Used in the *Transport Impairment Tool.*

Default Values:

Installed Cost of Fiber Cable (Per Foot)			
Parameter	**Aerial**	**Buried**	**Underground**
Material (24-fiber cable) per foot	$0.89	$0.89	$0.89
Engineering and Installation per foot	$0.20	$0.20	$0.23

Support:

The source for non-proprietary fiber optic cable material costs is Florida PSC Order No. PSC-99-0068-FOF, pages 147-149. Engineering, Placing, and Splicing costs are based on the opinion of expert outside plant consultants. Details of the assumptions and calculations leading to the fixed plus variable cost per foot components listed above are included as an attachment to this document. Assumptions include the use of well trained technicians using state-of-the-art high production engineering, placing, and splicing tools.

18. OUTSIDE PLANT STRUCTURE COSTS

18.1. Underground Conduit (Per Foot)

Definition:

The cost of 4" PVC conduit material, per foot. Used in the *Transport Impairment Tool.*

Default Values:

Underground Conduit (Per Foot)
$0.60

Support:

The source for the material cost of 4" PVC conduit is a number of distributor and manufacturer price quotes.

18.2. Underground Pull Box (Per Foot)

Definition:

The cost per foot for underground fiber pull boxes, spaced at 2,000-foot intervals. Used in the *Transport Impairment Tool.*

Default Values:

Underground Pull Box (Per Foot)
$0.25

Support:

The source for the material cost of a fiber optic pull box is based on manufacturer price quotes. Installation is based on the expert opinion of model developers. The cost per foot was determined by dividing the installed cost of pull boxes by 2,000 feet between pull boxes. The distance between pull boxes is based on the expert opinion of model developers.

18.3. Pole Cost

Definition:

The cost per pole including material and labor. Used in the *Transport Impairment Tool.*

Default Values:

Pole Cost
$417

Support:

The source for the material cost of a 40-foot Class 4 pole is based on a number of distributor, manufacturer, and ILEC prices. Installation is based on the expert opinion of model developers.

18.4. Buried Excavation, Installation, and Restoration (Per Foot)

Definition:

The costs per foot for buried excavation, installation, and restoration. Used in the *Transport Impairment Tool.*

Default Values:

Buried Excavation, Installation and Restoration (Per Foot)	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	$1.77
5 – 100	$1.77
100 – 200	$1.77
200 – 650	$1.93
650 – 850	$2.17
850 – 2,550	$3.54
2,550 – 5,000	$4.27
5,000 – 10,000	$13.00
> 10,000	$40.14

Support:

The costs per foot for buried excavation, installation, and restoration by density zone are based on the expert opinion of the model developers.

18.5. Underground Excavation, Installation, and Restoration (Per Foot)

Definition:

The costs per foot for underground excavation, installation, and restoration. Used in the *Transport Impairment Tool.*

Default Values:

Underground Excavation, Installation and Restoration (Per Foot)	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	$10.29
5 – 100	$10.29
100 – 200	$10.29
200 – 650	$11.35
650 – 850	$11.88
850 – 2,550	$16.40
2,550 – 5,000	$21.60
5,000 – 10,000	$50.10
> 10,000	$75.00

Support:

The costs per foot for underground excavation, installation, and restoration by density zone are based on the expert opinion of the model developers.

18.6. Percent Leased Underground Structures

Definition:

The percentages of underground structure requirements that can be leased rather than constructed by the CLEC. Used in the *Transport Impairment Tool.*

Default Values:

Percent Leased Underground Structures	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	0%
5 – 100	5%
100 – 200	10%
200 – 650	15%
650 – 850	20%
850 – 2,550	25%
2,550 – 5,000	30%
5,000 – 10,000	35%
> 10,000	40%

Support:

The percentages of underground structure requirements that can be leased rather than constructed by the CLEC are based on the expert opinion of the model developers. It is assumed that lower density zones will have fewer spare ducts constructed by the ILEC, thereby reducing the opportunity for CLECs to lease conduit.

18.7. Cost Per Foot For Leased Underground Structures

Definition:

The cost per foot for underground structures leased from the ILEC. Used in the *Transport Impairment Tool.*

Default Values:

Cost Per Foot For Leased Underground Structures	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	$0.04
5 – 100	$0.04
100 – 200	$0.04
200 – 650	$0.04
650 – 850	$0.04
850 – 2,550	$0.04
2,550 – 5,000	$0.04
5,000 – 10,000	$0.04
> 10,000	$0.04

Support:

State specific input based on tariff.

18.8. Percent Leased Aerial Structures

Definition:

The percentages of Aerial structure requirements that can be leased rather than constructed by the CLEC. Used in the *Transport Impairment Tool.*

Default Values:

Percent Leased Aerial Structures	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	0%
5 – 100	5%
100 – 200	10%
200 – 650	15%
650 – 850	20%
850 – 2,550	25%
2,550 – 5,000	30%
5,000 – 10,000	35%
> 10,000	40%

Support:

The percentages of aerial structure requirements that can be leased rather than constructed by the CLEC are based on the expert opinion of the model developers. It is assumed that lower density zones will have fewer pole attachment spaces available, thereby reducing the opportunity for CLECs to lease pole attachment space.

18.9. Cost Per Foot For Leased Aerial Structures

Definition:

The cost per foot for aerial structures leased from the ILEC. Used in the *Transport Impairment Tool.*

Default Values:

Cost Per Foot For Leased Aerial Structures	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	$0.19
5 – 100	$0.19
100 – 200	$0.19
200 – 650	$0.19
650 – 850	$0.19
850 – 2,550	$0.19
2,550 – 5,000	$0.19
5,000 – 10,000	$0.19
> 10,000	$0.19

Support:

State specific input based on tariff for pole attachments.

18.10. Aerial Structure Spacing (Feet Between Poles)

Definition:

The average number of feet between poles by density zone. Used in the *Transport Impairment Tool.*

Default Values:

Aerial Structure Spacing (Feet Between Poles)	
Density Zone (Lines/sq. mi.)	**Input Value**
0 – 5	250
5 – 100	250
100 – 200	200
200 – 650	200
650 – 850	175
850 – 2,550	150
2,550 – 5,000	150
5,000 – 10,000	150
> 10,000	150

Support:

The average number of feet between poles by density zone is based on the expert opinion of the model developers.

18.11. Fiber Structure Proportions

Definition:

The percentage of aerial, buried, and underground structure by density zone. Used in the *Transport Impairment Tool.*

Default Values:

Fiber Structure Proportions			
Density Zone (Lines/sq. mi.)	Aerial	Buried	Underground
0 – 5	35%	60%	5%
5 – 100	35%	60%	5%
100 – 200	35%	60%	5%
200 – 650	30%	60%	10%
650 – 850	30%	30%	40%
850 – 2,550	20%	20%	60%
2,550 – 5,000	15%	10%	75%
5,000 – 10,000	10%	5%	85%
> 10,000	5%	5%	90%

Support:

Fiber structure proportions are based on the opinion of expert outside plant consultants.

18.12. Fiber Structure Sharing

Definition:

The percentage of cost for aerial, buried, and underground structure, by density zone, attributed to any one CLEC that constructs new structure, while sharing the remainder of structure costs with others. Used in the *Transport Impairment Tool.*

Default Values:

Fiber Structure Sharing			
Density Zone (Lines/sq. mi.)	Aerial	Buried	Underground
0 – 5	63%	88%	88%
5 – 100	63%	88%	88%
100 – 200	63%	88%	88%
200 – 650	50%	68%	63%
650 – 850	50%	68%	63%
850 – 2,550	50%	68%	63%
2,550 – 5,000	35%	55%	63%
5,000 – 10,000	35%	55%	63%
> 10,000	35%	55%	63%

Support:

Fiber structure cost shares are based on the opinion of expert outside plant consultants.