Network Size

As telecom markets become more competitive, it becomes increasingly important to consider how costs are affected by the market share and geographic scope of a carrier's network. The model will build a network sized to optimally serve whatever portion of the market you specify. Thus, for example, if you specify 100% market share, the model will build a network optimally sized to serve all the (business and/or residence) customers in the specified geographic area. In contrast, if you select a lower percentage, the model will build a smaller network, one just large enough to serve the specified share of the total market.

Estimating the Total Cost Curve

In the Telecom Economic Cost Model, marginal cost is estimated by computing the slope of the total cost curve in the vicinity of the specified network size (market share). Once the study parameters have been established, push the "Run LRMC" button. This causes the model to repetitively build a network of varying size, and to estimate the corresponding total cost for each size, thereby estimating the total cost curve for a broad range above and below the volume of output (market share) specified by the user. This process can be quite time consuming, depending upon the user's computer hardware configuration.

Estimation Interval

Because telecom cost are inherently lumpy and non-linear, the slope of the total cost curve can vary depending upon the portion being considered. Accordingly, it is necessary to select the range within which marginal cost is computed. A narrow portion of the total cost curve can be selected, in order to focus the marginal cost estimate within the most immediately relevant range of output. If too narrow a range is selected, the

marginal cost estimates may be quite volatile, fluctuating between relatively low and relatively high values, depending upon the size of the carrier and other factors. To increase the stability of the marginal cost estimates, you can select a relatively broad range of output. However, an extremely broad range may not be desirable, since this may result in an estimate of marginal cost which is influenced by data well beyond the relevant range of output. You select the portion of the total cost curve to be evaluated by setting the range in the list box found in the "Smoothing" field on the *LRMCS* and *LRMCE* pages.

Once you have run the model for a specific set of assumptions and wire center, this process need not be repeated to change the specific range within which the slope of the total cost curve (marginal cost) is estimated. Hence, you can quickly evaluate the sensitivity of marginal cost to the specified output (smoothing) range. The resulting cost estimates are shown on the bottom of the *LRMCS* or *LRMCE* page.

Financial and Technical Assumptions

The model includes default values for the cost of materials, labor time requirements, and other underlying relationships and factors. It uses these input values to develop the cost estimates, unless the user substitutes alternative inputs. The default values reflect our general knowledge of the industry, gained over many years of experience working in this field. Since much of this knowledge has been obtained from our review of allegedly proprietary data, it isn't feasible to provide source documents to support these different input assumptions. However, the user can easily verify or modify any of these figures, by referring to a variety of different sources, including invoices, purchase contracts, and special studies, where available.

If you believe an input value is inappropriate or should be modified to improve the accuracy of the cost estimates in a particular context, you can easily change it.. Similarly, if you wish to test the impact of differing assumptions, you can do so by changing the inputs and comparing the results.

Technical Assumptions

To access the technical/engineering assumptions, push the button labeled "Technical Assumptions," which takes you to the *Technical* page. The following is a brief description of key inputs on this page. You can change the cells with blue shaded backgrounds.

Utilization Factors

Separate utilization factors for Customer Premises Facilities, Copper and Fiber Cable, Fiber Electronics, and Switching equipment are used by the model in sizing facilities, both to ensure that an adequate amount of spare capacity is available for administrative purposes, and to allow for changes in customer location and mix. A long-run study would normally be run with relatively high (idealized, or optimum) utilization rates, consistent with the underlying concept of a long-run planning horizon, in which factory size is adjusted to accommodate the anticipated volume of production.

Note that the effective fill factor (actual ratio of working facilities as a percentage of total installed capacity) as developed within the model takes into account the lumpiness of specific facilities. Thus the fill factor will generally exceed the utilization rate that you input. You can conveniently observe the effective cable fill factor by pushing the button labeled "Wire Center Characteristics" at the top of the screen. This takes you to the *Wire Center Characteristics* page, where this information is displayed.

Sharing Factors

These variables specify the extent to which the carrier is assumed to share structure costs (e.g., poles, conduit, and trenches). If the carrier will not install all its own poles but will rent space from another firm (e.g., an electric utility), a factor below 100% would be appropriately selected. Similarly, if the

carrier can rent pole attachment space to others (e.g., to a cable TV carrier), this variable can be used to recognize this source of revenue as an offset to the cost of the pole. In most cases, only a fraction of the full cost of poles should be included in the cost study--particularly in the case of smaller entrants, which should often be able to attach their facilities to the incumbent's poles.

Calling Volume

These variables allow you to specify the number of calls per month and the average call duration. These data are input separately for local calls and switched access calls. Toll calling volumes are included in the switched access category. The numbers of calls per month and the average duration will typically vary with the type of customer (e.g., residence, single line business, and multiline business).

Loop Network Technology

These variables determine the mix of fiber optic and copper cable in the modeled network. You can specify an all-copper network, an all-fiber/digital network, or a combination. These assumptions can be selected for each wire center, based upon the minimum cost configuration, an engineering convention, marketing considerations, or any other basis. Thus, for example, an all-fiber network could be selected if the subject carrier is positioned in the market as an all-digital carrier, even if this configuration does not yield minimum cost.

In a long-run study, most production factors are variable, and the optimal, most cost-effective options would normally be assumed--those options that result in the lowest total cost for the relevant level of output. The choice of technology, however, will not necessarily result in the lowest marginal or incremental cost for every service. For example, fiber optics may be

selected, if this technology sufficiently reduces the cost of providing video services or broadband data services, even if it increases the cost of other services.

In practice, technology decisions are often driven by marketing and other considerations, in addition to cost minimization in the purest sense. Accordingly, you can adjust the model to simulate a variety of different copper/fiber plant configurations and observe the resulting impact on the average cost and total service incremental cost of serving both residence customers and business customers.

The model can be used to prepare cost estimates using three distinct sets of assumptions regarding loop technology. The first (all copper) builds a network composed entirely of traditional analog copper cable. The second builds a loop network almost entirely composed of fiber cable, with copper in the final segment of distribution cable and the drop wire/building cable at the customer's premises. The third option builds a mixed copper and fiber network, with the precise mix varying by wire center, based upon the minimum loop length and loops per segment criteria explained below.

When you choose a network configuration using both fiber and copper technology, you should specify the mix in keeping with the economic factors that control this technology choice. In general, copper cable is more cost effective where the number of loops is relatively low or loop lengths are relatively short, and in the final segment of distribution cable (connecting to the drop wire/building cable at the customer's premises). With the exception of this final segment, fiber optic cable will be deployed wherever two criteria are met: a minimum fiber

distance and a minimum number of lines served by the remote terminal. Both criteria can be controlled by the user. Lower values in these input cells tend to increase the frequency and extent of fiber deployment by the model.

Customer Dispersion Factors

The model takes into account at least one important complication often overlooked in other models: it recognizes that systematic differences in population density may lead to cream-skimming by new entrants. It does this by incorporating a two-zone density taper (zones 1 and 2). The inner zone would normally contain a higher density of loops per square mile, based upon the assumption that the most efficient plant configuration will site the central office as close as possible to the population center, in order to minimize the average loop length. You can control this aspect of the model using two customer dispersion factors.

The first input controls the percentage of wire center loops that terminate in zone one. Since zone 1 contains 25% of the geographic area served by the wire center, an input value above 25% specifies higher than average loop density in this zone. For example, with an input value of 33%, the model builds a network in which one-third of the loops are located in one-fourth of the geographic area. In contrast, a setting of 25% specifies that the loops are equally distributed (i.e., one-fourth of the loops within one-fourth of the area).

The second customer dispersion factor controls the extent to which business loops are more heavily concentrated than residential loops in zone 1. This factor is additive to the first input, thereby controlling the fraction of business loops within each of the two zones. Thus, for example, if this factor is set at

10% while the first factor is set at 33%, the model places 43% of the business loops in zone 1 (one fourth the geographic area) and the remainder in zone two. Because zone 1 locations are closer to the wire center and have shorter loop lengths, this variable controls the average length of business loops, relative to the average length of residence loops.

Residence Line Ratios

You can specify the percent of households with phone service (penetration rate), and the average number of single-line residence loops as a percentage of total residence loops. You would normally use census or other data concerning typical penetration rates to set the first of these blue input cells. You can use the second blue cell to specify the ratio of single lines to total residence lines (including lines going to households with two or more lines). You can use the two blue cells in tandem to adjust the non-blue cells. The first of these cells reports the ratio of residence loops to the total number of households in the geographic area served by the wire center. The second reports the ratio of residence loops to the total number of households with phone service. The model uses the first non-blue cell (labeled "Residence loops per household") to establish the total number of residence lines served by the wire center, based upon data concerning the number of households, imported into the model from a separate data file.

You can learn more about the loop characteristics developed by the model by pushing the button labeled "Wire Center Characteristics" at the top of the screen. This takes you to the *Wire Center Characteristics* page, where data is displayed concerning the number of business and residence loops.

Business Line Ratios

You can specify the percent of single-line business lines relative to the total number of business lines. You can vary these input cells based upon the specific characteristics of the wire center (where known), or use an average value from an general data source such as ARMIS.

Miscellaneous Switching Characteristics

These input cells allow you to specify the proportion of calls placed to other end offices (interoffice calls) relative to the number of calls that originate and terminate in the same end office (intraoffice calls). Similarly, you can specify the fraction of calls handled by a tandem switch, and the average monthly minutes of use handled by each interoffice trunk. You can vary these input cells based upon the specific characteristics of the wire center (where known), or use a generic or average value.

Fiber Design Characteristics

These cells allow you to specify the degree of lumpiness associated with the fiber electronics deployed at the wire center and at the remote location. You can also specify the fiber safety reserve percentage and the minimum number of extra pairs per segment. The model uses these inputs, along with the utilization rate, in determining the effective fill factor for fiber cable.

Splicing

You can specify the number of minutes required for splicing of copper and fiber cable, stated in minutes per segment, minutes per pair, and minutes per pair per kilofoot. All three variables are used by the model in determining the total splicing labor requirements.

Placement Efficiency and Difficulty Factor

The time and effort required for trenching and installation of poles and conduit can vary widely, depending upon numerous different factors. Each of these labor inputs can be individually

adjusted, as described below. For convenience, you can also simultaneously adjust the time required for all such activities by adjusting the placement efficiency/difficulty factor. These input cells provide a convenient way to uniformly modify these time requirements to reflect carrier specific or local conditions. For example, if these cells are set at 120%, all the applicable labor time requirements are increased by 20% to reflect carrier specific or local conditions. This can be useful, for example, if you are modeling a geographic area with rocky soil or other conditions which make poles, conduit and trenches difficult to install. The individual factors can also be adjusted in the "Structures" section, which is the recommended approach where greater precision is desired.

Structures

The engineering and labor hours for aerial (per pole), underground (per mile) and buried (per mile) structures are set in this section. Also the distance (in feet) between poles can be adjusted in this section. The aerial and underground percent of structures are input by the user in the appropriate blue input cells. In selecting these percentages, you can use generic values taken from an external data source such as ARMIS, or you can develop specific percentages for each wire center, based on local conditions in the area served by each wire center, or you can select percentages that minimize cost, given local conditions.

Since underground placement tends to be costly, this option is generally avoided. However, underground structures are desirable or mandatory in at least three types of locations: highly urbanized areas (due to the presence of concrete sidewalks and busy city streets), in areas where aerial installation is not feasible, and in areas where a high water

table makes direct burial impractical or trenching costs are high. In the locations where trenching is costly but aerial installation isn't a viable option, the additional cost of placing conduit may be justified in order to facilitate future growth and expansion of the network (since additional cable can be pulled through spare conduit in future years without the necessity of digging another trench). Hence, the percentage of underground structures should be higher in relatively dense, more urbanized wire centers, and in those non-urban locations where aerial placement is prohibited and direct burial is unusually costly (e.g., due to rocky conditions).

You determine the percentage of underground structures by selecting appropriate numeric factors to input into the two blue cells in this section. The first cell can be thought of as a "slope" variable related to density. The second cell determines the minimum fraction of underground placement in each wire center.

In mathematical terms, the percentage of underground structures can be thought of as a function of a proxy variable representing degree of urban density (the first blue cell) and a constant (the second blue cell).The model uses the first blue cell in conjunction with the number of residence and business lines in the market area served by the wire center, to determine the net percentage of underground placement in the wire center.

Cable Sheaths

Designing or placing two or more sheaths of cable at the same time can create cost savings relative to the requirements when designing or placing the same number of sheaths at different times or along different routes. These input cells allow you to specify the magnitude of the cost savings when multiple

sheaths are simultaneously designed and placed along a single route. For example, if the number of engineering hours required for two cable sheaths is the same as for one sheath, the engineering variable would be set at -100 %. Similarly, if second and subsequent sheaths can be placed with 70% less labor than required for a single sheath, the placement cell would be set at -70%. The model uses these inputs only on routes where multiple sheaths are required by the network design.

Cable Design and Placement

You can input the design and engineering hours per kilofoot for aerial, underground, and buried copper and fiber cable. You can also specify the labor requirements per kilofoot for placement of aerial, underground, and buried copper and fiber cable.

Customer Premises Termination

You can specify the drop wire/building cable average length and installation time per pair and per foot. You can set different values for these inputs for residence and business premises.

Financial Assumptions

Access the financial assumptions by pushing the button so labeled, which takes you to the *Financial* page. Here you have the option of reviewing or changing the financial assumptions used by the model. The blue cells on this page can be varied at your discretion.

Annual Cost Factors

You can control the annual cost factors by adjusting the cost of debt and equity, the equity ratio, and the federal and state income tax rates. You can also specify the economic lives and plant specific charge for various categories of investment. The

latter factors are used by the model to estimate the annual cost of maintaining and operating the network.

Loaded Labor Cost per Hour

In this section you can specify the loaded labor cost per hour for engineers and technicians. You should use rates that include wages or salaries, employee benefits and taxes, and other costs that are a directly related to the number of labor hours.

Fiber Electronics

For both the Central Office and Remote locations, you can specify the fiber electronics investment per channel for two levels of lumpiness: DS1 and DS3. You can also specify the magnitude of other trunking investments (which are not modeled in detail.)

Billing and Collecting

Billing and Collecting costs are segmented into direct costs and joint costs. Joint billing and collection costs include bill handling, envelopes, and minimum postage. Direct billing and collection costs include centralized mail remittance, customer service, bill inquiry, and data processing.

Outside Plant Structures

In this section you input the loaded investment in materials required for aerial and underground structures. The former amount is specified on a "per pole" basis; the latter amount is specified on a per route mile basis.

Switching

In this section you control the investment in switching facilities. These investment amounts are specified on an engineered, furnished, and installed (EF & I) basis, and the total investment is built up through a series of subcategories. These include building and other miscellaneous investments, as well as distinctions between traffic-sensitive and non- traffic-sensitive facilities.

The traffic sensitive investments are specified as a function of call setup (per hundred calls/day) and as a function of minutes of use (per hundred minutes/day). You can also provide an allowance for right to use fees and other costs of providing switching features such as custom calling, rotary, caller ID, voice mail, and the like. The model does not estimate these costs in detail; they are simply input on a per line per month basis.

Feeder and Distribution Investment

You can specify the delivered material cost per sheath foot for investments in both copper and fiber cable. Separate inputs are available for aerial, underground, and buried cable. You can also provide an allowance for additional cable related investments that are not incurred on a per foot basis.

For instance, you can include a portion of the investment in the wire center Building and the Main Distributing Frame as loop related, taking care to ensure that the same costs are not included in the switching investment inputs. Similarly, these inputs provide an additional allowance for the material cost of Cross Connects, in line pedestals, load coils and other miscellaneous items, to the extent these costs are not included in the material cost inputs for the cable itself.

Customer Premises Termination

You can specify the E F & I investment in Drop Wire/Building Cable, as well as the Remote Terminal and the Network Interface Device (NID).

Algorithms

The Telecom Economic Cost Model is an "open" model that allows you to review and study all assumptions and algorithms used in developing the cost estimates. The algorithms have been logically grouped into sections you can access by selecting the appropriate button on the *Algorithms* page, which functions like a table of contents. You can jump to the *Algorithms* page by pushing the button labeled, "Algorithms" at the top of various pages of the model, including the *Financial, and Technical* pages. From the *Algorithms* page, you can move directly to the algorithms used by the model in developing the cost estimates. To move to a different group of algorithms, return to the *Algorithms* page, then jump to the desired section.

Customer Premises Termination Costs

This section of the model estimates the cost of facilities at or adjacent to the customer's premises. These are the network interface device (NID) which separates the drop wire/building cable from the customer's inside wiring and premises equipment (telephone set or phone system); the drop wire and/or building cable running between the NID and the

network terminal, and the network terminal where the drop wire/building cable is connected to the distribution cable.

The model determines the appropriate investment amounts using the inputs on the *Financial* and *Technical* pages. Annual cost factors are then applied to the total investments, which are converted to annual and monthly costs. The algorithms are found on the *Termination* page, which is accessed by pressing the "Go To Customer Premises Termination Algorithms" button.

Switching and Trunking Costs

This section estimates costs of the end office switching equipment located at the wire center. It also estimates the cost of tandem switching and interoffice trunking that is associated with the wire center. It develops the latter estimates on a simplified basis, thereby providing an estimate of the cost of the interoffice trunks leaving the wire center, and a fractional share of the tandem switching equipment used in routing some calls to and from the wire center. However, it does not model in detail the interoffice trunking network and tandem switching investment for the entire exchange or LATA.

The inputs on the *Technical* and *Financial* pages are used by the model to develop the investment in end office switching, tandem switching, and interoffice trunking. Cost factors are then used to convert these amounts to annual and monthly costs. These calculations are found on the page *SwitchTrunk*, which you access by pressing the button labeled, "Go To Switching and Trunking Algorithms."

Billing and Collection Costs

This section compiles an estimate of the cost of billing and collection for typical retail customers, segregated into joint and direct cost items.

Joint billing and collection costs include preparing and handling a bill of minimum size, the envelope, and the minimum amount of postage. Direct billing and collection costs (attributable to individual services) include all other costs. These include the data processing required to compute the billing amount for each service, the additional costs associated with rendering bills of greater than minimum length, centralized mail remittance, customer service, and bill inquiry.

These costs are determined by the user-selected inputs on the *Financial* inputs page, stated on a per loop per month basis and then computed for various combinations of lines per retail customer. These calculations are found on the page *BillColl*, which you access by pressing the button labeled, "Go To Billing and Collection Algorithms."

Wire Center Data

The button labeled "Go to Wire Center Data" will take you to the *WireCenters* page. This section contains detailed information about the underlying characteristics of each wire center's serving area. In it, data concerning the number of households, the number of business loops, and loop lengths are imported into the model for each geographic quadrant of each wire center. The household data are converted into an estimate of the total number of residence loops, using a multiplier which you input on the *Technical* page.

You may adjust or modify wire center data in developing a particular study. For example, the market share percentages

you select will control the actual number of loops included in the network being modeled. To compare the underlying wire center data with summary characteristics of the network as modeled, push the button labeled "Wire Center Characteristics" at the top of the screen. This takes you to the *Wire Center Characteristics* page, where descriptive data from the model is displayed.

Network Characteristics

The button labeled, "Go to Network Characteristics Algorithms" will take you to the *NetChar* page. This section takes your assumptions and builds a telecom network (or two networks, in the case of a TSLRIC study) that matches your specifications. The user inputs, such as the study type, customer type, cable technology and market share, all influence the optimum design of the network(s). Given the underlying characteristics of the area served by the wire center, and the user specified inputs, the model determines the number of loops in each segment and the loop lengths of each segment.

Using a simplified approach, the model sizes the facilities for each geographic quadrant and for each zone within each quadrant. For simplicity, the model assumes that the area served by each quadrant is square, with the wire center at the exact center of up to four quadrants. However, the quadrants need not be of identical size. The model also assumes that the area designated as "zone one" is one quarter of each quadrant, and is located adjacent to the wire center. The area designated as "zone two" contains the remaining three quarters of each quadrant and surrounds zone one.

Consistent with typical industry practice, the cable connecting the wire center with the individual end-user premises is

modeled as a tapering tree/branches configuration, with the sheath size of the branches diminishing (and the number of branches expanding) as one moves away from the wire center and toward the customers. The model selects the minimum cable size to accommodate the number of loops served by each cable without exceeding the specified utilization factor. When this is accomplished, the model often "rounds up," which provides additional spare capacity beyond the minimum mandated by the utilization factor.

Segment A contains feeder cable leaving the wire center. The B Segment connects with segment A, and serve zone 1. The C segments connect with the B segments, and provide the final leg of distribution cable to customers in zone 1. Segment D is connected to Segment A, and contains feeder cable serving zone 2. The E Segments connect with segment D, and serves zone 2. The F segments connect with the E segments, and provide the final leg of distribution cable to customers located in zone 1.

Loop Cost

The Loop Cost section accumulates most of the cost calculations related to the loop portion of the model. In this section the investments associated with the network(s) defined in the "Network Characteristics" section are calculated by quadrant and by zone. Annual cost factors are applied to convert these investments into annual and monthly cost estimates for zone 1, zone 2, and the network as a whole. You can reach the *LoopCost* page, by pressing the "Go to Feeder and Distribution Algorithms" button.

Copper Cost

The Copper Cost section develops the investment in copper cable, including the loaded material costs of the various cable segments and the cost of engineering, placement and splicing. These investment amounts are controlled by your inputs on the *Financial* and *Technical* pages. You reach the *CopperCost* page by pushing the "Go to Copper Cost Algorithms" button.

Fiber Cost

The Fiber Cost section develops the investment in fiber cable and electronics, including the loaded material costs of the various cable segments and the cost of engineering, placement, and splicing. These investment amounts are controlled by your inputs on the *Financial* and *Technical* pages. This page is directly analogous to the *CopperCost* part of the model; it is used only if your study includes fiber optic technology. The *FiberCost* page is reached by pushing the "Go to Fiber Cost Algorithms" button.

Structures Cost

This section estimates the investment in poles, conduit, and trenching. The page *StructCost* is reached by selecting the "Go to Outside Plant Structures Algorithms" button.

Miscellaneous Data

This page includes certain miscellaneous data and calculations used by the model. The *MiscData* page is reached by selecting the "Go to Miscellaneous Data" button.

Annual Cost Factors

This section calculates the annual cost factors used in converting the investment amounts into annual (and thence monthly) costs. A levelizing process spreads the investment over the entire economic life of the item. The calculations rely upon debt/equity ratios, capital cost rates and income tax rates input by the user on the *Financial* inputs page.

You can access the *AnnCost* page by pushing the "Go to Annual Cost Factors" button. Additional algorithms used in developing the annual cost factors are contained in a series of pages associated with different economic lives (in five-year increments). Access these additional calculations by pressing the appropriate buttons at the top of the *AnnCost* page: "AnnCost 5," "AnnCost 10," ... "AnnCost 50."

Ben Johnson Associates, Inc
Telecom Economic Cost Model

Control

Estimate LRAC-Long Run Average Cost

Identify the type of service to be studied and set key assumptions, then examine the results.

Establish Parameters and View Results

○ Study a hypothetical wire center with typical characteristics.

Average
Rural Area
Small Town

◉ Study a wire center by company in the database. Select the CLLI code.

Company	Wire Center
US WEST	AMFLIDMAR
	BLFTIDMAH
	BLSSIDMAR

Wire Center Location AMERICAN FALLS

○ Study a hypothetical wire center with characteristics established by the user.

Establish characteristics

Establish or modify key input values and assumptions.

Financial Assumptions

Technical Assumptions

Control | LRAC Results | Financial Assumptions | Technical Assumptions | Wire Center Characteristics | Algorithms

Total Service Long Run Average Cost

Study Type:

Analyze single & multi line residence and business customers on a composite basis, considering direct, joint and common costs.

Joint Costs

Select the percentage allocation factor.

80%
90%
100%

Common Costs

Select the allowance for common costs (as a percent of direct/joint costs)

8%
9%
10%

Size of carrier:

% share of total lines

	Residence	Business
Zone 1 (closer to wire center)	[redacted]	[redacted]
Zone 2 (farther from wire center)	[redacted]	[redacted]

AMFLIDMAR
CLLI code for Wire Center

Total Cost per Line		**40.60**
Local Exchange		
Switching & Trunking	$	1.25
Billing and Collection	$	0.30
Total Local Costs	**$**	**1.55**
Joint		
End Office	$	3.17
Loop	$	30.12
Termination	$	1.87
Billing and Collection	$	0.20
Total Joint Costs	**$**	**35.36**
Subtotal	$	36.91
Common Costs	**$**	**3.69**

View Detailed Cost Results

Control | TSLRIC Results | Financial Assumptions | Technical Assumptions | Wire Center Characteristics | Algorithms

Total Service Long Run Incremental Cost

Study Type:

Add an increment of single & multi line residence service

to a network serving single & multi line business

customer locations considering direct, joint and common costs.

Joint Cost Allocation

Select the percentage allocation factor for joint costs.

80%
90%
100%

Common Cost Allocation

Select the allowance for common costs (as a percent of direct/joint costs)

8%
9%
10%

Size of carrier including incremental volume:

% share of total lines

	Residence	Business
Zone 1 (closer to wire center)	[redacted]	
Zone 2 (farther from wire center)		

Size of increment:

% of total lines to add to	Residence	Business
Zone 1 (closer to wire center)	[redacted]	
Zone 2 (farther from wire center)		