Exhibit No. ___ (RP-5)
VzLoop Cost Manual
Docket No. UT-023003

VzLoop Cost Manual

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1.0 Introduction

VzLoop is the portion of the VzCost system that models the local loop network and calculates the associated investments. The existing local loop network is the starting point for VzLoop's modeled network: customer demand and location data used by VzLoop correspond to existing distribution (serving) terminal locations. Additionally, VzLoop utilizes information on existing feeder route locations, digital loop carrier (DLC) systems and Serving Area Interfaces (SAIs).[1] In conjunction with the calculations and algorithms described below, VzLoop uses this information to determine the fundamental characteristics of the modeled network, such as the number and locations of DLCs; the quantities of poles, cables and other network components needed to provide telecommunication service to each customer location; and the forward-looking material and placement cost of each outside plant component. The investments and demand quantities for VzLoop's modeled network are passed to VzCost and converted to the forward-looking, per-unit, recurring costs of the UNEs and other services provisioned out of Verizon's network.

The ground-up network modeled by VzLoop identifies both the physical quantities and the investment dollars associated with each of the following loop components:

(1) copper and fiber cables;

(2) structure facilities such as poles and conduit that physically support the cable;

(3) electronic equipment needed to convert and combine signals;

(4) terminals, including serving area interfaces and distribution terminals;

(5) drop wire that connects the distribution terminal to the network interface device (NID) located at the end-user premises; and

(6) the NID that serves as the interconnection point between the drop wire and the end user's inside wiring.

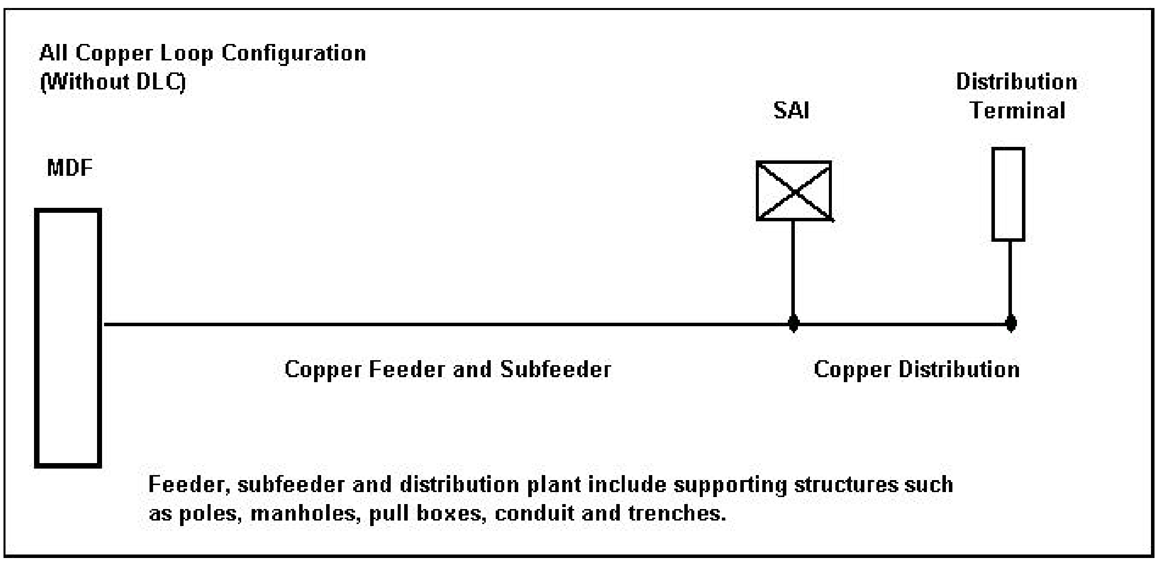
VzLoop provides considerable flexibility for users to vary many of the characteristics of the modeled network. For example, VzLoop allows the user to specify the criteria used to determine whether to model fiber facilities to a particular customer location, or to restrict the length of the copper portion of the loop. This copper loop length restriction is met by modeling fiber-fed DLCs in addition to those already existing in the network. Alternatively, the user can set VzLoop to model only the DLC configuration in the existing network, including copper-fed DLCs if desired. Similarly, the size and cost of the copper and fiber cables used by VzLoop, as well as the size and cost of poles and DLCs, are all specified by user-adjustable inputs.

[1] SAIs are also commonly referred to as "cross-boxes", "cross-connects" or "Feeder/Distribution Interfaces (FDIs)".

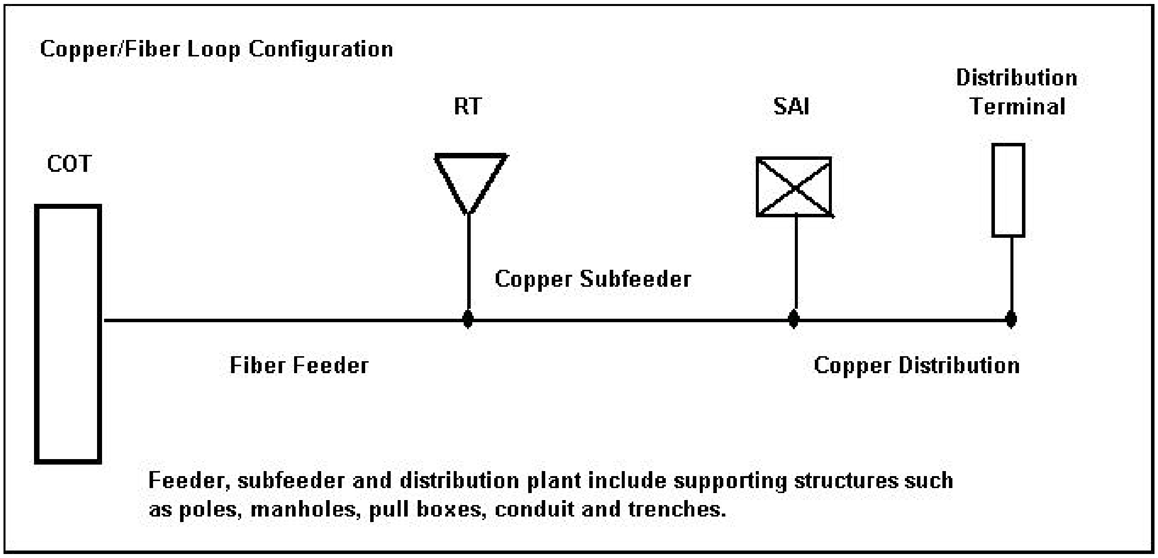
2.0 Overview

VzLoop employs three major loop configurations in modeling the physical characteristics of the local loop network: (1) all-copper construction; (2) copper distribution with fiber-fed DLC; and (3) fiber to the premises. As explained in more detail below, VzLoop is capable of modeling two different local network designs. The first is a baseline network in which the all-copper construction may include copper-fed DLCs. The second design makes further adjustments, such as assuming that all DLCs are fiber-fed and that the placement of the first DLC along a route is determined by factors such as the distance from the wire center and by the relative cost of copper and fiber feeder. Under this design, the fiber-to-the premises configuration is also modeled when the number of working lines at a location exceeds a user-specified level regardless of the distance from the central office.

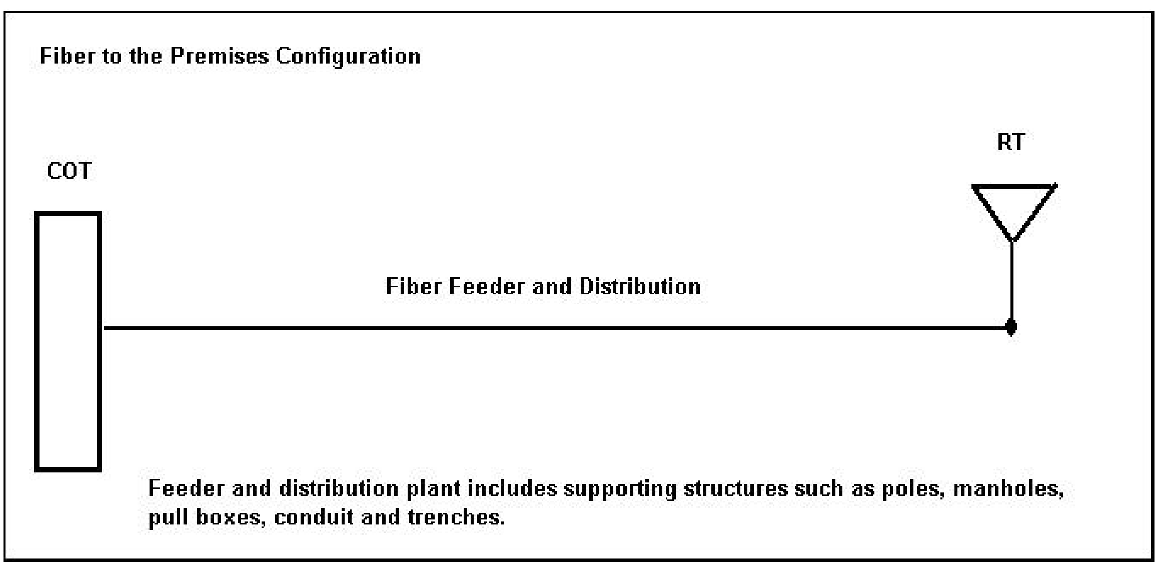
The all-copper loop configuration consists of the main distribution frame (MDF) at the central office, copper feeder and subfeeder, SAIs and/or DLCs, copper distribution cable, and the distribution terminal. Included with the copper feeder, subfeeder and distribution cables are the supporting structures such as poles, manholes, pull boxes, conduit and trenches. The all-copper loop configuration (without a DLC) is diagrammed below:



The copper/fiber configuration includes electronic equipment consisting of a central office terminal (COT) and a remote terminal (RT). As their names imply, the COT is located in the central office, and the RT is located in the field. The COT and the RT are connected by fiber feeder. Behind the RT (moving away from the central office) the loop is made up of copper subfeeder, SAIs, copper distribution cable, and the distribution terminal. Again, the feeder, subfeeder and distribution cables include the supporting structures such as poles, manholes, pull boxes, conduit and trenches. The copper/fiber loop configuration is pictured below:



The fiber-to-the-premises configuration consists of a COT connected with fiber feeder and distribution to an RT located inside a building. Under VzLoop's baseline network design, fiber to the premises is modeled only when it already exists in the network. As explained below, fiber to the premises is modeled in the second network design whenever the demand at a distribution terminal exceeds a user-specified threshold. In both instances, the fiber route includes the other supporting structures and shares the fiber sheath needed to connect other RTs along the same route to the central office. This configuration is diagrammed below:



VzLoop also models the drop and the NID associated with the unbundled loop or with basic exchange service. For each of the three configurations above, the following table shows the primary network components for the 2-wire loop:

Investment Components Two-Wire Loop	All Copper	Copper/Fiber	Fiber to the Premises
Copper Distribution	X	X	
Fiber Distribution			X
Copper Feeder and Subfeeder	X	X	
Fiber Feeder		X	X
COTs and RTs	X	X	X
SAIs	X	X	
Distribution Terminal	X	X	
Drop	X	X	
NID	X	X	

Note: Under VzLoop's baseline network design, the all-copper configuration may include COTs and RTs.

In addition to these primary network components, the following items are modeled in sizes and quantities consistent with the components shown above:

- Poles, including strand, anchors and guys, based on aerial cable lengths;
- Conduit, including manholes and pull boxes, based on underground cable lengths.

VzLoop starts with a baseline network design that reflects the existing feeder routes, distribution areas (DAs), DLC and SAI locations, and the existing mix of copper and fiber feeder. Even though the modeled network is based on the existing network, the resulting cost estimates are forward-looking because the modeled investments are based on the forward-looking prices for material and investment, and because the technology modeled is what would be placed today. For example, due to size limitations of traditional pair-gain devices such as the SLC-96, the existing network may have multiple pair-gains at a single location or may serve that location via a remote line unit that is not a wire center. Under VzLoop's baseline network, these locations are served by currently available DLCs specified in the MATERIAL table. Additionally, unless the maximum size limitation is exceeded, there is only one DLC modeled per location. Finally, the baseline network is forward-looking because the modeled structure type for copper feeder cable will change from aerial or buried to underground if user-specified thresholds for the maximum cable size or number of cables are exceeded.[2] The second network uses the same input tables and modifies the baseline network by adding DLCs when an economic breakpoint between copper feeder and fiber-fed DLCs is exceeded or to meet a user-specified restriction on the

[2] The baseline network design can be made more forward-looking by designating all feeder routes from a DLC to the central office as fiber, eliminating the DLC / copper feeder configuration.

length of the copper portion of the loop. Additionally, this modeled network converts large copper terminals to the fiber-to-the-premises configuration whenever the demand exceeds the threshold specified by the NUM_LP_TERM variable in the OPTIONS table. These DLCs are in addition to those described above.

In both modeled networks, demand is accumulated for each route moving from the end-users towards the wire center. The accumulated demand is used to size the cables along each route, along with the size of cross-connect boxes, conduit systems etc., as explained below. Copper cables are sized based on the accumulated demand, on sizing and administrative fill factors contained in the OPTIONS table, and on the discrete sizes of cable that are available. VzLoop models a fixed number of fibers per DLC, with this number specified by the user in the OPTIONS table. The modeled fiber sheaths reflect the available sizes and the cumulative number of required fibers along each route. The number of required poles for aerial cable is based on an input in the OPTIONS table for pole spacing; adjustments to investment that reflect the sharing of poles are explained below.

The modeled investment for the poles, cables and other network components include both material and installation costs. These costs reflect the prices for equipment and labor that Verizon is able to obtain for each component and installation activity, and are found in the MATERIAL and PLACEMENT tables, respectively. Except for the DLCs, the material portion of the investment for items classified as minor or exempt material (e.g., cable strand) are explicitly modeled. Note that not all minor material items are modeled so that resulting cost estimates are consequently biased downward. For the DLCs, minor materials are modeled using VzCost's Engineering, Furnished and Installed ("EF&I") factor for digital circuit equipment, account number 2232.

3.0 VzLoop Input Tables

There are ten input tables utilized by VzLoop:

- The LOOP_DEMAND table contains customer demand data for each wire center. Each individual table entry corresponds to a working telephone number or service, and contains information relating to the serving terminal where the customer is located.
- The NETWORK table contains the basic network data used to model local loop network. The table is populated with data such as the terminal name; the geographic location of the terminal using an X-Y coordinate system; the connection relationships between terminals; the terminal type (aerial, buried, underground or building); business and residence demand at the terminal; the type of structure between terminals; bedrock depth; and water table depth.[3]
- The MATERIAL table contains the cost of the material used in modeling the network, such as aerial, buried and underground copper and fiber cables.
- The PLACEMENT table contains inputs related to the cost of placing various facilities, such as the cost of placing a pole or digging a trench.
- The OPTIONS table gives the user the flexibility to modify the study to make it state specific, to follow current engineering guidelines for the study, and to meet the requirements of compliance filings.
- The MASTER table contains inputs, such as the CLLI code or density zone, that apply to an entire wire center.
- The DEMAND_VALUE table is used in VzCost for unit weighting. The values are summed to the wire-center level and will include all services. The demand totals in this table match the total of the demand in the LOOP_DEMAND table.
- The DEMAND_ITEM table is the look up table for the descriptions of the services in the DEMAND_VALUE table.
- The BASE_ELEMENT table defines the list of loop element names with a description of the element including its associated account number.
- The LOOPSS_BASE_ELEMENT table defines a list of miscellaneous element names, which are available for use by other VzCost modules.

VzLoop's modeled network is based on the information contained in the above input tables and on the calculations and algorithms described below. The MATERIAL and PLACEMENT tables

[3] The bedrock and water table information is obtained from the US Department of Agriculture's State Soil Geographic database.

are used in the calculation of the investment associated with the modeled network. For example, if a particular portion of the modeled network consisted of 1,000 feet of buried, 400-pair copper cable, the investment associated with the material cost of that cable would equal 1,000 times the cost per foot for 400-pair copper cable from the MATERIAL table. The values in this table are based on the prices Verizon actually pays, and reflect the costs associated with freight, provisioning and applicable sales tax. The investment associated with burying the 400-pair cable is calculated as 1,000 times the cost per foot for trenching or plowing from the PLACEMENT table, depending on the values set for certain variables described below. The values found in the PLACEMENT table are based on what Verizon actually pays for labor in a given jurisdiction, and reflect the cost of engineering.[4]

See Appendix A for more detailed information on the items contained in each of the above tables.

[4] Note that the material inputs for DLCs do not include freight, sales tax or provisioning expense, and that there are no DLC-related inputs in the PLACEMENT table. These costs are modeled using VzCost's EF&I factor for digital circuit equipment, account number 2232.

4.0 Modeled Network Design

As explained earlier, VzLoop starts with a baseline network design and modifies it by adding DLCs based on a user-specified input for copper loop length and on the economic breakpoint between copper feeder and fiber-fed DLCs. Both modeled networks utilize the ten input tables described above and are based on the existing serving terminal locations and the demand at these terminal locations. In both networks, cables are sized based on cumulative demand along each cable route and on the available discrete sizes of cable. Finally, both networks utilize the same material and placement costs, the same cable sizing factors, administrative fill factors, etc. that are specified by the user in the OPTIONS table, and both networks produce the same set of output tables. (See Appendix B and the discussion below.)

The baseline network is selected by setting the variable AFH in the OPTIONS table to "A". Under this design, VzLoop:

- Maintains the existing facilities type, i.e. aerial, buried or underground where known and derives the remainder, unless the number of sheaths exceeds the specified maximum for aerial or buried;
- Maintains the existing terminal, DLC and cross-connect locations;
- Maintains the working line count at the terminals;
- Maintains the facilities type (fiber or copper) feeding the DLC as specified in the NETWORK table; and,
- Combines copper feeder and distribution along the same route into one cable.

The second network is selected by setting the variable AFH in the OPTIONS table to "F". This design starts with the baseline network and modifies it so that the provision of advanced services is not impeded.[5] This is accomplished by serving all DLCs with fiber and by restricting length of the copper portion of the loop to a user-specified maximum.[6] On each feeder route leaving the wire center, the first DLC is modeled at the nearest of (1) the existing DLC that is closest to the wire center on that route, (2) the first SAI at which it is cheaper to place a fiber-fed DLC (including the cost of fiber cable) than copper feeder cable, or (3) the first SAI location beyond a user-specified threshold for the first DLC.[7] After the first DLC on each route is modeled, lines whose total copper loop length would otherwise exceed the copper loop length restriction are served with a fiber-fed DLC. Compliance with this copper loop length restriction is determined by the distance from the most distant terminal served by an existing cross connect to the DLC

[5] With a copper-loop length restriction of 12,000 feet, the modeled network allows for transmission speeds of 6.14 megabits per second for most customer locations and, consequently does not impede the provision of advanced services. However, the equipment and investment needed to provide advanced services are not modeled by VzLoop.

[6] This value is specified with the OMD variable in the OPTIONS table.

[7] This threshold is specified by the CU_FI_CROSSOVER variable in the MASTER table.

that serves the cross connect. If the restriction is exceeded, an additional DLC is placed at the cross connect location. Additional DLCs required to model a fiber-to-the-premises application are placed at large distribution terminal locations, where "large" is determined by the NUM_LP_TERM variable in the OPTIONS table, and by the number of lines served at a single customer location. Fiber-to-the-premises is modeled when the number of lines exceeds the value specified for this input variable.

Because it may not be possible to identify the location of every serving terminal in the existing network, the total demand in the NETWORK table may be less than the demand in the LOOP_DEMAND table. Rather than arbitrarily include these terminals in the NETWORK table, VzLoop's modeled investments are adjusted by multiplying them by the ratio of the demand from the LOOP_DEMAND table to the demand from the NETWORK table. For example, if the LOOP_DEMAND table had a total of 1,010 business lines for a given wire center and the NETWORK table had only 1,000 business lines, the total modeled business-related investment for the wire center would be multiplied by 1.01 (1,010 divided by 1,000). This adjustment occurs after the wire center override discussed below, and leaves the unit investments modeled by VzLoop unchanged.

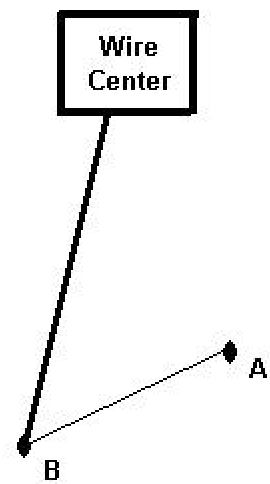
Terminal Types Identified in the ARC table

Terminal Type	Table Value
Copper-fed DLC	P
Copper-fed DLC with a cross-connect	p
Fiber-fed DLC	F
Fiber-fed DLC with a cross connect	f
Fiber-fed DLC located in a building	L
Cross connect or Serving Area Interface (SAI)	X
Distribution terminal, connected directly to mainframe	1
Distribution terminal, not connected directly to mainframe	2
Control point	I
Theoretical point of interconnection (TPOI)	T

The ARC table is the VzLoop output file that contains information about the terminals in the modeled network and the cable spans between them. There are ten types of terminals identified in this table:

A control point is a location on a feeder route where facility quantities or types change – for example, where the cable size changes or where a cable branches. Control points were used in the development of the NETWORK table to identify the routing of feeder routes. A TPOI designates the closest terminal to a wire center in areas that do not contain an SAI. Under the second network design, they are treated as a cross-connect location and may also be a DLC location as described above. Consequently, the table value for these locations will be "X" when this network is modeled.

A cable span is a segment of copper or fiber cable between two terminals. In the ARC table, the beginning of each cable span is identified by the location of the terminal that is farther from the wire center and the end of the cable span is determined by the location of the terminal closer to the wire center. Note that the relationships "farther from" and "closer to" are defined not in terms of airline distance but in terms of the distance traveled as one follows the cable route. For example, in the diagram below, point "B" is the terminal closer to the wire center for the cable span defined by points "A" and "B":



See Appendix B for more detail on the information contained in the ARC table.

5.0 Network Characteristics and Sizing Calculations

5.1 Structure Type

VzLoop models four structure types for local loops: aerial, buried, underground and block. Aerial facilities are placed on poles. Buried facilities are placed in a trench and covered with soil, or are plowed directly into the ground. Underground facilities are placed in underground conduit systems made up of ducts, manholes and pull boxes. Block cable is aerial cable that is attached to the outside of buildings in very dense urban areas. Philadelphia is an example of such an area where, in some neighborhoods, the buildings are row houses that are extremely close together, sometimes with abutting walls. Besides being close together, the buildings must be tall enough so that clearance requirements are met.

For each cable span, the structure type is identified in the NETWORK table with the variable UBA, based on the structure type in the existing network. If the structure type is not identified in the NETWORK table, then it is derived on the basis of the type of terminals defining the span, according to the decision rule contained in the mapping below:

In the NETWORK Table Terminal Closest to Wire Center	In the NETWORK Table Next Terminal Moving Away from Wire Center	Span's Structure Type
Aerial	Aerial	Aerial
Aerial	Buried	Buried
Aerial	Building	Aerial
Aerial	Block	Aerial
Aerial	Underground	Underground
Buried	Buried	Buried
Buried	Aerial	Buried
Buried	Building	Buried
Buried	Block	Buried
Buried	Underground	Buried
Building	Building	Buried
Building	Aerial	Aerial
Building	Buried	Buried
Building	Block	Block
Building	Underground	Underground
Block	Block	Block
Block	Aerial	Aerial
Block	Buried	Buried
Block	Building	Block
Block	Underground	Underground
Underground	Underground	Underground
Underground	Aerial	Aerial
Underground	Buried	Buried
Underground	Building	Buried
Underground	Block	Block

The structure type specified by UBA for copper feeder spans may be overridden depending on the number of cables required. For copper feeder spans whose UBA value specifies aerial cable, but whose required number of cables exceeds the user-specified value for the MAX_NUM_ACABLES_WC variable in the MASTER table, the modeled structure type is underground. Likewise, if the UBA value specifies buried cable, but the required number of cables exceeds the user-specified value for MAX_NUM_BCABLES_WC in the MASTER table, the modeled structure type is underground.

In general, feeder and distribution cables along the same cable segment are combined into a single cable, subject to limitations on the maximum size of cable placed. The investment calculated for each cable segment is assigned to feeder and distribution based on the relative share of demand required for distribution and for feeder. The distribution and feeder investments for each cable segment are assigned to business or residential service based on each classification's share of total demand. For example, suppose that a particular copper cable served both residence and business customers and contained feeder and distribution pairs as indicated in the table below:

	Residence	Business	Total
Distribution	55	15	70
Feeder	150	30	180
Total	205	45	250

The proportion of the total investment assigned to distribution equals 28.0 percent (70/250). Of this amount, 78.6 percent (55/70) is assigned to residence and 21.4 percent (15/70) is assigned to business. Similarly, 72 percent (180/250) of the total investment is assigned to feeder. Of this amount, 83.3 percent (150/180) is assigned to residence and 16.7 percent (30/180) is assigned to business.

5.2 Sizing of Copper and Fiber Cables

Sizing of copper distribution and feeder cables is based on cumulative demand and discrete cable sizes, and on the basis of user-specified factors for sizing and for administrative spare.[8] The total required number of pairs is calculated as the product of the cumulative demand, the sizing factor and one plus the administrative spare factor. Assume, for example, that for a given aerial distribution cable segment, the accumulated demand equaled 140 pairs, the sizing factor equaled 2.5, and that the administrative spare factor equaled 0.02. The total required number of pairs would be 357 (140 x 2.5 x 1.02 = 357), and the smallest sized aerial cable (400 pairs) that accommodates this number of pairs would be modeled.

[8] The sizing factor inputs for distribution and feeder are found in the OPTIONS table and are named DIST_CA_FILL and FEED_CA_FILL, respectively. The distribution and feeder inputs for administrative spare are found in the same table and are named DIST_ADMIN_FILL and FEED_ADMIN_FILL, respectively.

The sizing of fiber cables is based on the cumulative number of fibers needed on each route, and on the available discrete sizes of fiber cables. As explained earlier, VzLoop models a fixed number of fibers per fiber-fed DLC – this value is specified by the NUM_FIB variable in the OPTIONS table. For example, if this variable were set to 12, and if a particular route served two DLCs, the DLC farther from the wire center would require 12 fibers. For the portion of the route serving this DLC (i.e., the portion from the first DLC to the second DLC), a 12-fiber sheath would be modeled. For the remainder of the route (i.e., from the second DLC back to the central office), 24 fibers would be required and the modeled sheath size would increase to 24 fibers.

Because VzLoop models additional fibers that would be used for non-loop services such as interoffice transport, only a fraction of the fiber route investment is included in costs for the loop portion of the network. This allows VzCost to reflect sharing of structure and facilities with the transport network and with high-capacity circuits. This fraction is specified in the Basic Components mapping in VzCost. Fiber facility costs for transport and high-capacity circuits are based on the per-fiber, per-mile, costs modeled by VzLoop. These per-fiber costs reflect the material and placement investment of the installed fibers and the corresponding structure. In the example above, the total fiber investment, including support structures and placement costs, would be divided by total fiber feet. Total fiber feet in this example equals 12 times the length of the first part of the route, plus 24 times the length of the second part of the route. If the structure type varies between aerial, buried and underground, then the per-fiber, per-foot, investment is calculated for each structure type.

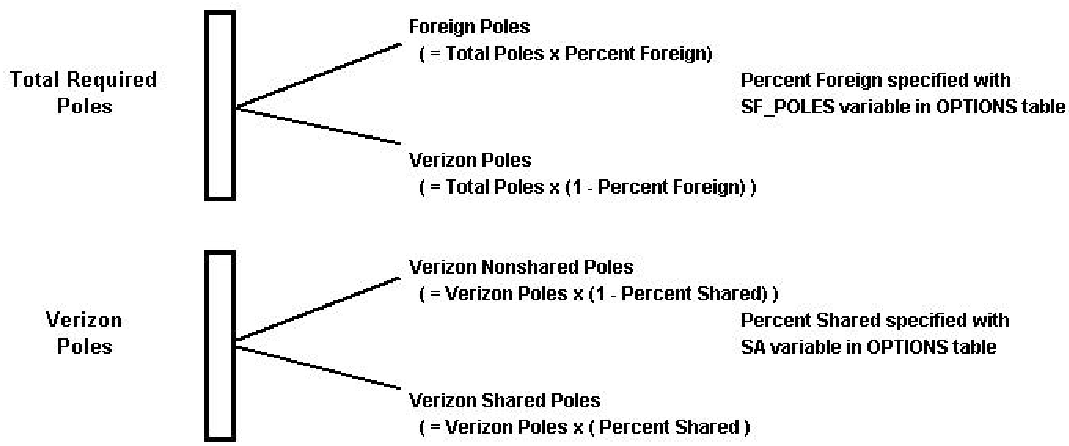
5.3 Aerial and Block Cables

Installation costs of aerial and block cables are based on the size and type of cable, and include the cost of the strand wire. Modeled aerial investment includes the costs of anchors and guys, and of Verizon-owned poles as discussed below. Block cables are only modeled where they are found in the existing network since they require buildings that are of sufficient height and are sufficiently close together. Additionally, in some jurisdictions this construction is not found because of local practices or zoning regulations. Block cables do not require poles or anchors and guys.

5.4 Poles

For each aerial cable segment, the number of poles is determined by the value set for POLE_SPACING in the OPTIONS table. The number of required poles equals one plus the length of the cable segment minus the POLE_SPACING input, divided by the POLE_SPACING input, rounded to the nearest integer. For example, if the POLE_SPACING input is 165 feet, and the length of the aerial cable segment is 1,335 feet, the number of required poles is 8 (1 + Round((1335-165)/165) = 1 + 7 = 8). Along with the number of poles, VzLoop calculates the number of anchors and guys and the amount of strand required. The number of anchors and guys is based on the total number of required poles and the value assigned to the PER_GUYWIRE variable in the OPTIONS table. The amount of strand is based on the amount of aerial cable required, including block cable.

The amount of pole investment modeled by VzLoop reflects the sharing of poles with other carriers. As shown in the figure below, the total number of required poles is divided between foreign and Verizon-owned poles, and the Verizon-owned poles are divided between shared and nonshared poles. Only Verizon-owned poles are included in modeled investment – the cost of shared and nonshared poles included in the modeled investment is determined by the POLESH and POLE variables, respectively, in the MATERIAL table.



The costs and revenues associated with pole attachments are reflected in the calculation of VzCost's expense factors. Because anchors and guys are provided by Verizon even when attaching to a foreign pole, the cost of the anchors and guys included in the modeled investment is based on the total number of required poles.

5.5 Buried Fiber and Copper Cables

Installation costs of buried fiber and copper cables are based on the number and type of cables, and on the placement method – either plowing or trenching. As explained below, VzLoop assumes plowing for both distribution and feeder cable if certain soil characteristics and user settings are met, and if certain demand levels are not exceeded. Otherwise, VzLoop assumes that buried cable is placed in a trench and covered. When trenching is assumed, VzLoop accounts for other costs such as hand digging, boring, and cutting and restoration of concrete. These costs are set through the PER_HAND, PER_BORING, PER_CONCRETE and TRENCH_DENSITY variables in the OPTIONS table. Additionally, the cost of pre-ripping, an activity used in conjunction with cable plowing to loosen up very hard soil conditions, is added to the cost of plowing fiber cable in the model at a 10 percent rate. For example, if 1000' of fiber cable is plowed, 100' is assumed to require pre-ripping. VzLoop does not include pre-ripping costs in copper cable placement.

In non-sharing scenarios, copper cables are plowed or trenched at a depth of 30 inches, and fiber cables are plowed or trenched at a depth of 48 inches. (As explained below, fiber cable may be plowed at a 30-inch depth if it is placed in a protective subduct.) Cables in a shared trench are placed at a depth of 42 inches to reflect the separation requirements of shared placement.

VzLoop assumes plowing only when three conditions are met. First, each wire center is evaluated to determine whether plowing is feasible based on population density and local regulations. If it is feasible, the PLOWFLG variable in the MASTER table is set to "P" for the given wire center. Second, the buried placement must not be shared with more than one other company, since it is not possible to plow more than two cables at a time, because the equipment used to plow cables is capable of plowing only two cables at a time. When sharing occurs, and if the total number of users exceeds two, trenching is assumed. Third, the bedrock must be below the surface far enough to allow sufficient cover -- 30 inches for copper cable and 48 inches for fiber cable. In order to avoid the additional expense of trenching and rock sawing for fiber placement when bedrock is between 30 inches and 48 inches, VzLoop allows fiber cable to be plowed at 30 inches within a protective subduct.

If VzLoop determines that cable cannot be plowed, placement costs reflect the use of a trencher plus the additional activities related to hand digging, boring and concrete removal. Additionally, costs associated with rock sawing are modeled when the bedrock is close to the surface -- this can occur in rural as well as urban areas. In non-sharing scenarios, rock sawing is added to the cost of trenching if bedrock is within 30 inches of the surface. If sharing occurs, rock sawing is added to the cost for the trench if bedrock is within 42 inches of the surface. This greater depth reflects the requirements of placing facilities in a shared trench.

The amount of trenching that is shared is determined by two variables in the OPTIONS table. The variable SB represents the proportion of trench feet that is shared with at least one other company. For example, a value of 5 percent would mean that 50 feet of a 1000 foot trench would be modeled as shared. The variable STU represents the number of users in a shared trench, including Verizon. For the proportion of the trench that is shared, the placement cost is divided by STU and the resulting investment is assigned to Verizon. In this example, if STU equaled 2, then the trenching cost assigned to Verizon would equal 950 feet of a non-shared trench plus one-half of the cost of 50 feet of shared trench. Note that 100 percent of the Verizon-owned cable in a shared trench is assigned to Verizon.

5.6 Underground Fiber and Copper Cables

Underground structure consists of ducts, subducts, manholes, and pull boxes. Underground cable is always placed inside ducts or subducts. Installation costs reflect the cost of the underground structure as well as the placement of the cable in the ducts and subducts. If the water table level is within 48 inches of the surface, manhole placement costs include the addition of well points.

In the feeder and distribution networks, the number of manholes and pull boxes is determined by the user-adjustable spacing variables (MANHOLE_SPACING and PULLBOX_SPACING) found in the OPTIONS table. The number of manholes and pull boxes is determined by dividing the required length by the corresponding spacing variable.

Manholes are placed if the number of modeled ducts exceeds two, or if the copper cable size exceeds the value of MANHOLE_CA_SIZE in the MASTER table. (The number of modeled ducts is determined by the number of cables as explained below.) If none of these conditions are met, then pull boxes are placed for underground cable sections.

VzLoop places a minimum of two ducts for underground facilities using a trencher to provide a 30-inch cover. If the cable demand or sharing requires more than two ducts, use of a backhoe is modeled. The initial depth setting for a backhoe is for a 36-inch deep trench, which provides the necessary 30-inch cover for 2 ducts. When 3 to 12 ducts are required, VzLoop models the required additional 12 inches of trench depth; if more than 12 ducts are required, a second additional 12 inches of trench depth is modeled. If the depth to bedrock is less than these thresholds, the modeled investment reflects the cost of rock sawing. In addition, modeled investment reflects the cost of concrete removal and replacement based on the PER_CONCRETE variable in the OPTIONS table.

The standard duct formation sizes are 1, 2, 4, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, and 48. The number of required ducts is based on the number of copper and fiber cables to be placed, and also includes the ducts needed for other users in a sharing scenario. One duct is required for each copper cable placed. Fiber cables are placed in subducts inside of ducts. The number of subducts per duct is specified by the SUBDUCT variable in the OPTIONS table. The number of ducts required for fiber cable is determined by the standard duct formations and the number of fiber cables divided by the value specified by SUBDUCTS, with fractional quotients increased to the next largest integer value. For example, if SUBDUCTS equals 3, then 7 fiber cables would require 3 ducts: 7 divided by 3 equals 2 1/3, which is increased to 3. The total number of ducts modeled is determined by dividing required number of ducts by the conduit sizing factor, represented by the COND_FILL variable in the OPTIONS table, and by selecting the standard duct formation that meets this need. For example, if COND_FILL equaled 0.5, and the required number of ducts was 7, then a 15-duct formation would be modeled (7 divided by 0.5 equals 14, which requires a 15-duct formation). Conduit investment includes both material and installation costs, and is based on the formation size and length.

Sharing of conduit systems is modeled based on the variables SC and SCU in the OPTIONS table. SC is the percent of conduit systems that is shared and SCU is the number of additional ducts to be added in a sharing scenario. VzLoop models the costs of two systems for the entire length of the given underground cable span. The cost of the shared system reflects the ducts required by Verizon, plus the additional ducts specified by SCU. The cost of the nonshared system reflects just the ducts required by Verizon. The investment assigned to Verizon equals a weighted average of the portion of the shared system assigned to Verizon and the total cost of the nonshared system. The proportion of the shared system assigned to Verizon equals total modeled ducts minus the shared ducts, divided by total modeled ducts. The weights used in the average are SC and one minus SC.

5.7 Serving Area Interfaces (SAIs)

Serving area interfaces are modeled whenever the terminal type is a cross connect, i.e., whenever the variable TERMTYPE in the NETWORK table equals "X". Under the second network design, TPOIs are treated as a cross-connect location. Additionally, the SAI may be located with a DLC placed to meet the copper loop length restrictions as explained above. The SAI is sized by multiplying the accumulated distribution demand by the sizing factor for feeder cable (the variable FEED_CA_FILL in the OPTIONS table) times one plus the administrative fill input for feeder. (This is the variable FEED_ADMIN_FILL in the options table.) This product is multiplied by the variable XCONN in the OPTIONS table, and the smallest SAI whose size is greater than or equal to this result is modeled. The value of XCONN reflects the total number of pairs accommodated on both sides of the SAI for each feeder pair coming in. For example, a value of 3 would indicate the SAI is sized to accommodate 2 distribution pairs leaving the SAI for each feeder pair coming in.

An aerial SAI is placed if the terminal structure type specified by the variable TERMUBA in the NETWORK table is aerial, block or underground. Otherwise, a buried SAI is placed. If the aerial pair requirement exceeds the largest available pole-mounted SAI, then a cross-connect on a concrete pad is modeled.

5.8 Digital Loop Carriers (DLCs)

The sizing of the COTs and RTs is based on total timeslot demand – the sum of residential and business lines, plus 24 times the number of DS1s. COT and RT investment is assigned to residence, business and DS1s based on their relative share of total timeslot demand. The modeled COT and RT investment are stored in the ELEMENTS table. Line-card (or channel plug-in) investment is stated on a per-loop basis by service type, e.g., POTS or coin. DLC installation and the associated land and building investment are calculated by using loading factors in VzCost's element loading run.

The COT and RT investments are further divided between shared and direct, based on the per-line capacity cost (total investment divided by the COT or RT size). The capacity cost times the number of working lines is designated as direct cost, and the remainder is designated as shared. (In this calculation, end-user DS1s are treated as 24 voice-grade channels.) For example, for a total investment of $43,000, if the required size equaled 96 lines and there were 72 working lines, direct investment would equal $32,250 (72x$43,000/96). The remaining investment ($10,750) is assigned to the shared category. Line-card investment is treated as direct and is modeled in the Basic Component mapping of VzCost.

Under the baseline network design, VzLoop will model copper-fed DLCs only where they are identified in the NETWORK table. The variable TSPAN_FACTOR in the OPTIONS table specifies the number of equivalent voice-grade circuits used to size the copper span line from the DLC to the wire center. For example, if there were 80 working lines and the value of TSPAN_FACTOR equaled 24, then 4 T1 span lines would be needed (80 divided by 24, increased to the next highest integer equals 4). Since each span line requires 2 pairs, a total of 8 pairs are required to serve the 80 working lines.

5.9 Distribution Terminals

Distribution terminals are identified by the variable TERMTYPE in the NETWORK table. For distribution terminals, the variable TERMUBA in the same table identifies the type as aerial, buried, building, block or underground, and the variable TERMSIZE identifies the size.

The material and installation cost of aerial, buried and building distribution terminals is determined by the terminal type and size. Network interface devices (NIDs) are modeled for aerial and buried terminals only. The number of NIDs is the same as the number of drops and the size is based on the demand at each end-user location. (See the discussion of drops below.) If the terminal type is underground, a building terminal is placed.

5.10 Drop Investment and Installation

No drops are placed for building or underground terminals. For aerial and buried terminals, the drop type corresponds to the terminal type and the length is determined by the variables DROPLENGTH_A (aerial) and DROPLENGTH_B (buried) in the MASTER table. The number of drops for each aerial or buried terminal is determined by the number of end-user locations. Each location is identified by the variable LUID in the LOOP_DEMAND table. Total demand at each location determines the required drop size; if the required size exceeds the maximum size in the MATERIAL table, then additional drops are placed.

The variable F_DROP in the OPTIONS table specifies the proportion of residential drops that are placed at no cost to Verizon by the developer. The number of residential drops for which investment is modeled is determined by multiplying the required number of residential drops by one minus F_DROP.

6.0 Direct and Shared Costs

As explained above, the COT and RT investments are assigned to the shared and direct categories based on the per-line capacity cost and the number of working lines. Additionally, the costs associated with the line cards are treated as direct. The other loop investments are divided between shared and direct by assigning the material and labor cost of conduit and poles, including the anchors and guys, to the shared category -- everything else is treated as direct.

7.0 Distribution and Feeder Fill Calculations

Except for the user-specified fill discussed below, fill factors are not inputs in VzLoop, but are outputs that result from VzLoop's sizing calculations and the available discrete cable sizes. As in the real network, the fill in the modeled network is dependent on the point at which the measurement is made. VzLoop measures fill at two locations corresponding to the head-end of feeder and distribution routes.[9]

Additionally, VzLoop calculates two distance-weighted fill measures for distribution and feeder, respectively. The measures are based on the ratio of working to installed capacity, where capacity is measured in pair-feet for copper cables and in fiber-feet for fiber cables. For example, suppose the network consisted of a 500 foot, 50-pair cable with 30 working pairs, and a 1,000 foot, 100-pair cable with 75 working pairs. The installed capacity would be calculated as 125,000 pair feet (50 x 500 + 100 x 1,000 = 25,000 + 100,000 = 125,000). The working capacity would be calculated as 90,000 pair feet (30 x 500 + 75 x 1,000 = 15,000 + 75,000 = 90,000). The distance-weighted fill measure for this example equals 72 percent (90,000 divided by 125,000). For fiber routes, the fill measure is based on the installed and working fiber feet.

[9] Currently, VzLoop is unable to recognize the head-end of routes starting at the main distribution frame unless an SAI is modeled. As a result, for some wire centers, the head-end feeder fill is reported as zero. Consequently, the head-end feeder fill is not reported in the current filing. *This does not affect the estimated costs in any way whatsoever.*

8.0 User-Specified Fill

Although Verizon does not support or endorse the imposition of user-specified fills when modeling the network from the ground up, VzLoop does allow the user to adjust the local loop investment to conform to a different level of utilization than is implicit in the modeled network. This is accomplished by setting the USER_FILL variable in the OPTIONS table to "Y" and by specifying target fills for feeder and distribution plant.[10] VzLoop adjusts the modeled investments by multiplying them by the ratio of the modeled fill to the target fill. For example, if the user-specified target fill was 40 percent, and the fill produced in the modeled network was 30 percent, the modeled investment would be multiplied by 0.75 (30/40 = 0.75).

[10] The feeder and distribution fills are specified in the OPTIONS table by the DIST_FILL and FEED_FILL variables, respectively. The adjustment described above is applied to the material and placement costs associated with DLC, copper cable and fiber cable investment only.

9.0 Override of Modeled Investment

A network is not modeled for the wire centers that have “Y” specified for the WC_OVER variable in the MASTER table. Instead, the investments for these wire centers are based on the average unit investments for the wire centers for which a network is modeled and that are in the same grouping or zone. The grouping is determined by the ZONE_W variable in the MASTER table.

10.0 VzLoop Output Tables

VzLoop produces the following six output tables:

- The ARC table contains information about the terminals in the modeled network and the cable spans between them.
- The FILL table contains model output related to fill-factor and loop lengths for each wire center.
- The INVENTORY table contains information on the quantities of modeled network components, such as poles, by wire center and by feeder route.
- The ELEMENTS table contains the non-loaded loop investments for the loop network components. Note that portions of this table are also populated by other VzCost modules.
- The LOOPSS_ELMNTS table contains miscellaneous data used by VzCost.

These tables contain information at the wire-center level for all wire centers listed in the MASTER table. Wire centers that have "Y" specified for the WC_OVER variable in the MASTER table do not have records in the ARC, FILL and INVENTORY tables because no network is modeled for these wire centers. As explained above, the investment for these wire centers are based on the weighted average investments of the other wire centers.

See Appendix B for a description of the variables in each of the output tables.

Appendix A – Input Tables

LOOP_DEMAND

The LOOP_DEMAND table contains customer location data for each wire center. Each individual table entry corresponds to an individual terminal, and contains information relating to the location of the terminal and the number of lines served.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number assigned by the VzCost system.
2	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
3	**CLLI**	The eight character Common Language Location Identifier for the corresponding wire center.
4	**TERM**	Terminal address.
5	**LUID**	Living unit id.
6	**TERMUBA**	Distribution terminal structure type: B (buried), A(aerial), R(Building terminal), K(Block) or U(underground).
7	**TOTALRES**	Total residential demand.
8	**TOTALBUS**	Total business demand.
9	**VINTAGE**	Date of table development.
10	**TOTALDS1**	Total DS1 demand.

NETWORK

The NETWORK table contains the basic network data used to model local loop network. The table is populated with data such as the terminal name; the latitude and longitude of the terminal; the connection relationships between terminals; the terminal type (aerial, buried, underground or building); business and residence demand at the terminal; the type of structure between terminals; bedrock depth; and water table depth.

Line #	Variable	Description
1	**CLLI**	The 8-character CLLI code of the wire center.
2	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
3	**TAPERCODE**	When populated, this code identifies groups of terminals below the Distribution area.
4	**RTE**	A number associated with a route. Can be multiple numbers or only 1 number. These routes indicate how many points of connection entering the wire center.
5	**DA**	Distribution Area.
6	**CA**	When populated, this identifies cable name.
7	**TERMID**	Numeric ID for each terminal.
8	**TERM**	Terminal address.
9	**X**	Relative X distance from wire center to the terminal in feet. Based on the terminal's longitude and latitude converted to relative X and Y coordinates.
10	**Y**	Relative Y distance from the wire center to the terminal in feet. Based on the terminal's longitude and latitude converted to relative X and Y coordinates.
11	**TERM1** (**TERM2, TERM3, TERM4**)	These values identify the next terminal or terminals from the terminal identified by TERMID.
12	**AIRDIST**	Air distance from the terminal to wire center.
13	**LEN**	Distance in feet from the terminal to the previous terminal.

NETWORK (Continued)

Line #	Variable	Description
14	**DISTOCO**	Accumulated **LEN** back to wire center.
15	**TERMUBA**	Distribution terminal structure type: B (buried), A(aerial), R(Building terminal), K(Block) or U(underground).
16	**UBA**	Structure type of the cable span leaving the terminal towards the wire center: B (buried), A(aerial), K(Block) or U(underground).
17	**BEDROCK**	Depth in inches of bedrock.
18	**WATERTABLE**	Depth in inches of water table.
19	**TERMSIZE**	When populated, the size of the terminal. (Null or zero designates unpopulated.)
20	**TERMTYPE**	Designates the terminal type: SEE NEXT TAB "TERMTYPE".
21	**TOTBUS**	Total number of business lines at terminal. Populated from LOOP_DEMAND table's TOTALBUS field.
22	**RES**	Total number of residence lines at terminal. Populated from LOOP_DEMAND table's TOTALRES field.
23	**CSA**	For reference only, carrier serving area.
24	**VINTAGE**	Date of table creation.
25	**VERSION_ID**	Sequential number assigned by the VzCost system.
26	**DS1**	Total DS1 demand from the LOOP_DEMAND table's TOTALDS1 field.
27	**ADDDROPBI**	Not used at this time.

MATERIAL

The MATERIAL table contains the cost of the material used in modeling the network, such as aerial, buried and underground copper and fiber cables.

Line #	Variable	Description
1	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
2	**MATERIAL_TYPE**	Variable name the VZLoop code uses to extract material costs when calculating the dollar value of modeled investments. (For example, CUBUR is used to identify copper buried cable.)
3	**SIZE_PR_UNIT**	The size (e.g., number of cable pairs) of the specific material component.
4	**DESCRIPTION**	A brief description of the material component.
5	**UNIT_PRICE**	Price per unit used to calculate the investment, including freight, supply and applicable sales tax.
6	**MINOR-MATERIAL**	Not currently used. Populate with 'N'.
7	**VINTAGE**	Date of table development.
8	**VERSION_ID**	Sequential number generated by the model.

MATERIAL (Continued)

Values for "MATERIAL_TYPE"

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES	DESCRIPTION	UNIT
ANCHOR	Anchor	1	10" Anchor/Guy/Guy Guard: The hardware used to balance the strain on poles caused by cable and/or wire tension and to hold or counter unbalanced stress that usually occurs at corner and dead-end poles.	Per pole
CONCRETE	Concrete	1	Ready mixed concrete for replacing concrete removed in the trenching process.	Linear foot, 27 Cubic Feet
COND	Conduit	1 24 2 27 4 30 6 33 9 36 12 39 15 42 18 45 21 48	4" PVC pipes that are placed underground and used to pass telephone cables through.	Linear foo
CUAER24	24 Gauge Copper Pair Aerial	25 400 50 600 100 900 200 1200 300	24 gauge copper cables strung outside on telephone poles. Includes the copper pairs encased in protective sheathing.	Sheath foo
CUBUR24	24 Gauge Copper Pair Buried	25 400 50 600 100 900 200 1200 300	24 gauge copper cables plowed, bored, or placed in a trench and then covered. Cables are protected against water and sharp rock damage with protective sheathing.	Sheath foo
CUUND24	24 Gauge Copper Pair Underground	50 900 100 1200 200 1500 300 1800 400 2100 600	24 gauge copper cables pulled through conduit.	Sheath foo

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
DWIREACU	Aerial Drop Wire	3 Pair 5 Pair 25 Pair 50 Pair		A copper service wire that is the loop component used to transport service from the distribution terminal to the customer's NID.	Sheath foo
DWIREBCU	Buried Drop Wire	3 Pair 5 Pair 25 Pair 50 Pair		A copper service wire that is the loop component used to transport service from the distribution terminal to the customer's NID.	Sheath foo
DWIREAFI	Aerial Fiber Drop Wire	4		A fiber service wire that is the loop component used to transport service from the distribution terminal to the customer's OEC.	Sheath foo
DWIREBFI	Buried Fiber Drop Wire	4		A fiber service wire that is the loop component used to transport service from the distribution terminal to the customer's OEC.	Sheath foo
FIAER	Fiber Strand Aerial	6 12 24 48 72	96 144 216 432	Fiber cable enclosed in protective sheathing that is strung on telephone poles.	Sheath foo
FIBUR	Fiber Strand Buried	6 12 24 48 72	96 144 216 432	Fiber cable, including protective sheathing and waterproofing, plowed, bored, or laid directly in a trench in the earth and then covered.	Sheath foo
FIUND	Fiber Strand Underground	6 12 24 48 72	96 144 216 432	Fiber cable that is placed in the underground conduit system.	Sheath foo
LC4COTUCARD	Digital Loop Carrier 4 wire COT Universal Line card	1		The 4-Wire COT equipment investment for the Digital Loop Carrier Universal Line card.	Per Line
LC4RTCARD	Digital Loop Carrier 4 wire RT Line card	1		Plug-in investment for the 4-wire line card in RT.	Per Line
LC4EXTCARD	Digital Loop Carrier 4 wire extended Line card	1		Plug-in investment for the 4-wire Extended line card. As there exists no 4-wire extended line card, this material type is a placeholder only.	Per Line

Values for "MATERIAL_TYPE" (Continued)

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
LC2COT08	Digital Loop Carrier POTS COT TR08	24 48 96 192 224 448	672 896 1120 1344 1568 2016	The 2-wire COT equipment investment for the Digital Loop Carrier TR08. This equipment is a per DLC investment.	Per DLC
LC2COT08PLUG	Digital Loop Carrier POTS COT TR08 DS1 cards per DLC	24		The 2-wire COT equipment investment for the Digital Loop Carrier TR08 DS1 cards per DLC.	Per DS1
LC2COT303	Digital Loop Carrier POTS COT TR303	24 48 96 192 224 448	672 896 1120 1344 1568 2016	The 2-wire COT equipment investment for the Digital Loop Carrier TR303. This equipment is a per DLC investment.	Per DLC
LC2COT303PLUG	Digital Loop Carrier POTS COT TR303 Line card	96		The 2 wire COT equipment investment for the Digital Loop Carrier TR303 line card	Per DS1
LC2COTU	Digital Loop Carrier POTS COT Universal	24 48 96 192 224 448	672 896 1120 1344 1568 2016	The 2-wire COT equipment investment for the Digital Loop Carrier Universal. This equipment is a per DLC investment.	Per DLC
LC2COTUCARD	Digital Loop Carrier POTS COT Universal Line card	1		The 2-wire COT equipment investment for the Digital Loop Carrier Universal line card.	Per Line

Values for "MATERIAL_TYPE" (Continued)

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
LC2RT	Digital Loop Carrier POTS RT	24	672	The 2-wire RT equipment investment for the Digital Loop Carrier TR08, TR303 and Universal. This equipment is a per DLC investment.	Per DLC
		48	896		
		96	1120		
		192	1344		
		224	1568		
		448	2016		
LC2RTCARD	Digital Loop Carrier POTS RT Line card	1		Plug-in investment for the 2-wire RT line card.	Per Line
LC2EXTCARD	Digital Loop Carrier POTS Extended Line card	1		Plug-in investment for the 2 wire extended line card. This DLC Line Card is utilized to serve Basic POTS customers beyond the 12 Kft serving area up to a maximum distance of 18 Kft.	Per Line
LCCCOTUCARD	Digital Loop Carrier Coin COT Universal line card	1		The Coin COT equipment investment for the Digital Loop Carrier Universal line card.	Per Line
LCCRTCARD	Digital Loop Carrier Coin RT Line card	1		Plug-in investment for the Coin line card.	Per Line
LCCEXTCARD	Digital Loop Carrier Coin Extended Line Card	1		Plug-in investment for the Coin Extended line. As there exists no coin extended line card, this material type is a placeholder only.	Per Line
LCDCOTUCARD	Digital Loop Carrier Digital Data Services COT Universal Line card	1		The DDS COT equipment investment for the Digital Loop Carrier Universal line card.	Per Line
LCDRTCARD	Digital Loop Carrier Digital Data Services RT Line card	1		Plug-in investment for the DDS RT line card.	Per Line
LCDEXTCARD	Digital Loop Carrier Digital Data Services Extended Line	1		Plug-in investment for the DDS Extended line card. As there exists no DDS extended line card, this material type is a placeholder only.	Per Line
LCICOTUCARD	Digital Loop Carrier (ISDN) Line COT Universal Line card	1		The ISDN COT equipment investment for the Digital Loop Carrier Universal line card.	Per Line

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES	DESCRIPTION	UNIT
LCIRTCARD	Digital Loop Carrier ISDN RT Line card	1	Plug-in investment for the ISDN RT line card.	Per Line

Values for "MATERIAL_TYPE" (Continued)

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES	DESCRIPTION	UNIT
LCIEXTCARD	Digital Loop Carrier ISDN Extended Line card	1	Plug-in investment for the ISDN Extended line card. As there exists no ISDN extended line card, this material type is a placeholder only.	Per Line
LCHCOTUCARD	Digital Loop Carrier (DS1) card COT	1	Plug-in investment for the DS1 COT card.	Per Line
LCHRTCARD	Digital Loop Carrier (DS1) card RT	1	Plug-in investment for the DS1 RT card.	Per Line
LCPCOTUCARD	Digital Loop Carrier (2 W Private 1ine) card COT	1	Plug-in investment for the COT 2 wire private line card.	Per Line
LCPRTCARD	Digital Loop Carrier (2 W Private 1ine) card RT	1	Plug-in investment for the RT 2 wire private line card.	Per Line
MNHOLE	Manhole	1	A prefabricated 5'10"x10'6"x6'6" concrete manhole.	Per manhole
NID	Network Interface Device Housing	6 12 25 50	NID housing: A network interface device housing used to terminate the telephone company's facilities (drop wire) at the customer's location. This is also the interface device between the customer's inside wiring and the telephone network.	Per NID
NIDPROT	Network Interface Device Protector Module	6 12 25 50	NID protector modules for use in 6, 12, 25, and 50 pair NID housings. Each protector unit provides protection for one pair from hazardous voltages and currents and separates the customer's equipment from the rest of the local network.	Per protector module
POLE	Telephone Pole	1	The material cost (not including labor) of a 30' Class 5 treated wood utility pole.	Per pole
POLESH	Telephone Pole	1	The material cost (not including labor) of a 40' Class 4 treated wood utility pole.	Per pole
PULLBOX	Pull box	1	4'x4'x4' Handhole:A pre-fabricated 4'x4'x4' small concrete handhole.	Per pull box

Values for "MATERIAL_TYPE" (Continued)

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
STRAND	10m Strand	1		The steel suspension strand, also referred to as a "messenger", that provides structural support to aerial cable between the poles. The aerial cable is usually attached to the strand by wire wrapped around the cable and strand. The strand also provides el	Linear foo
SUBDUC	Subduct	1		A 1" or 1 ¼ " PVC pipe through which fiber cables can be passed. Two or three subducts are usually placed in a 4" conduit to allow 2 or 3 fiber cables to be placed in one 4" duct. The subduct can also be buried directly in a trench to facilitate fiber cab	Linear foo
TERMB	Pedestal Terminal Buried	25 50		The loop component that serves as the access point between the distribution cable and the drop wire. The distribution terminal, in this case, is located in a pedestal and is spliced to pairs in the distribution cable to make them available for use to serve the customer.	Per terminal
TERMA	Terminal Aerial	25 50		The loop component that serves as the access point between the distribution cable and the drop wire. The distribution terminal, in this case, is an aerial case and is spliced to pairs in the distribution cable to make them available for use to serve the customer.	Per terminal
TERMR	Building terminal	25 50 100 200 300	400 600 900 1500	The loop component that serves as the access point between the distribution cable and the end user's inside wire. The terminal, in this case, is located in the building at the customer premises.	Per terminal
XCONNA	Aerial Cross-Connect	100 200 400 600 900 1200		A cabinet containing termination blocks on which the feeder and distribution cable pairs are both terminated. Each type of cable is usually terminated in a designated area. Jumper wires are used to connect the assigned feeder pair to the appropriate distr	Unit

Values for “MATERIAL_TYPE” (Continued)

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
XCONNB	Buried Cross-Connect	600 900 1800	2700 3600 5400	A cabinet containing termination blocks on which the feeder and distribution cable pairs are both terminated. Each type of cable is usually terminated in a designated area. Jumper wires are used to connect the assigned feeder pair to the appropriate distr	Unit
LOADCOIL	Load coil	1		Load coil.	Per unit
LOADCOILHSE	Load Coil housing	1		Load coil housing.	Per Housing
RPTR	Repeater	1		T-span repeater.	Per Repeater
RTROW	R-O-W	1 2 3		Remote Terminal Right-of-Way 1= small, 2= medium and 3 = large.	Per Remote Terminal

PLACEMENT

The PLACEMENT table contains inputs related to the cost of placing various facilities, such as the cost of placing a pole or digging a trench for buried cable.

Line #	Variable	Description
1	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
2	**LABOR_TYPE**	Variable name the VzLoop code uses to extract labor costs when calculating the dollar value of modeled investments.
3	**DESCRIPTION**	Brief descriptions of labor to be perfomed. (For example, "place cable in trench").
4	**LR1**, **LR2, LR3, LR4, LR5, LR6, LR7, LR8, LR9, LR10, LR11, LR12, LR13, LR14, LR15, LR16, LR17, LR18, LR19** and **LR20**	The LR1 through LR20 inputs correspond to LR field populated with 1 through 20 in the master table.
5	**VINTAGE**	Date of creation.
6	**VERSION_ID**	Sequential number generated by the model.

PLACEMENT (Continued)

Values for "LABOR_TYPE"

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LP01A	Placing Pole	Includes transporting and setting pole at the proper location, depth, and alignment, compacting distributed soil (tamping), and tagging (pole number). Also includes stepping pole and disposing of surplus dirt or rock where required, and placing a butt gr	Per pole
LP03A	Replaces LP0lA for shared pole	This unit applies if a pole is placed, removed, straightened, or reset in a power line when either a safety blanket or the presence of the power company is required. This unit includes all of the operations described in placing, removing, and straighteni	Per pole
LP07A	Place anchor & guy	Includes installing the anchor and rod(s) to the proper depth, placing and tensioning down guy and sidewalk guy, and installing guy guards. Removal of rock is included where necessary.	Per anchor
LP18A	Place strand	This covers the placement of strand, hardware, down guys, tensioning of strand, and placing ground rods and wires as required.	Linear Foot
LP22AS	Place aerial cable small less than or equal to 600 pairs	This covers all handling associated with placing aerial cable/sub-duct/cable in sub-duct on existing strand or overlashing with existing cable. Includes double lashing or delash/relash (where required), placing wire clamps, spacers, straps, cable dampers	Per foot
LP22AL	Place aerial cable large greater than 600 pairs	This covers all handling associated with placing aerial cable/sub-duct/cable in sub-duct on existing strand or overlashing with existing cable. Includes double lashing or delash/relash (where required), placing wire clamps, spacers, straps, cable dampers	Per foot

Values for "LABOR_TYPE" (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LP28A	Place cross-connect	This covers placement of all cross-connects, either pad or pole mounted. It includes forming the stub of a pre-stubbed cabinet, placing U-guard, supports, and spacers as required, up the pole or through conduit to a remote switch unit in close proximity.	Per cross-connect
LP28D	Place cross-connect pad	This covers the installation of a preformed pad (furnished by Verizon). Includes preparing the base, placing grounding materials and may include placement of up to 20 feet of conduit with up to 6 bends as required.	Per pad
LP29B	Install load coil/repeater housing	This unit covers the installation of load coil/repeater housing.	Per unit
LP36A	Install aerial drop	This unit covers installation of aerial drop.	Per foot
LP43A	Place copper cable in conduit	This includes transportation and placement of metallic cable in conduit (including direct-buried conduit without both ends exposed) and into or through manholes, vaults, or riser locations when pull line is in place. It includes manhole set-up, placing t	Per cable foot
LP43C	Place fiber cable in conduit	This covers placement of fiber optic cable in duct, and includes all handling of the cable to avoid cutting of the cable except as specified by Verizon engineering, proper racking, and placing split sub-duct over the cable in manholes or vaults. Manhole	Per cable foot
LP49A	Place cable/duct direct	Includes all transportation, handling, and installation of one or more cables and/or a single duct in an open trench provided by Verizon. Placing riser, U-guards, cable marker stakes/posts, and ID tape/locating conductors.	Per trench foot
LP49B	Place add cable/duct	Includes transportation, handling, and installation of an additional cable/duct or sub-duct in an open trench provided by the Contractor, including placement of risers and/or U-guards.	Per trench foot

Values for "LABOR_TYPE"   (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LP50A	Place buried drop	Covers all work, including trenching, required to place one or more direct buried service wires, or service wires in duct, or the duct itself. The unit includes placement of the service wire or duct at the appropriate depth (a minimum of 12 inches), prop	Per trench foot
LP51A	Plow cable-jobs < 1000 feet	This applies to plowing all types and sizes of buried cable and/or sub-duct at a depth of 30". Also includes incidental hand digging and backhoeing to expose existing substructures, or to extend trench to a pedestal or pole or any other necessary digging	Per linear foot
LP51B	Plow cable-jobs > 1000 feet	Same as LP51A above, for segments of 1000' or more.	Per linear foot
LP51C	Plow Additional 6"	This should be used in conjunction with LP51A or LP51B when additional depth is required.	Per plowed foot
LP52A	Pre-ripping	This includes preripping with a cable plow when required by adverse soil conditions to allow plowing in of buried cable and/or sub-duct.	Per linear foot
LP54A	Trench @ 30"- JOB <1000	This includes all labor and equipment required to open a trench with a trenching machine and placement of a buried cable or single conduit at a depth of 30". Also included is incidental hand digging/ backhoeing to expose existing substructures, or to ext	Per linear foot
LP54B	Trench @ 30"- Job >1000	Same as LP54A above, for segments of 1000' or more.	Per linear foot
LP54C	Increase trench depth by 6"	This is to be used in conjunction with LP54A or LP54B when additional depth is required.	Per trench foot

Values for "LABOR_TYPE" (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LP55A	Backhoe @36" & place cable/con	This unit includes all labor and equipment required to open a trench with a backhoe and placement of a cable or single conduit/multi-cell. Also included is incidental hand digging/trenching to expose existing substructures, or to extend trench to a pedes	Per trench foot
LP55B	Increase backhoe depth by 12"	Provides for an increased depth of 12", to be used in conjunction with LP55A.	Per trench foot
LP57A	Hand dig trench	Includes manual removal of soil when common machinery is not the most efficient or effective method of digging a trench.	Per trench foot
LP59A	Initial bore	This applies to a successful bore or pipe push. Incidental is any associated digging, pulling through cable(s)/sub-duct, locating the end of the pipe and marking the ends (if required), backfilling, compacting, and restoring the property to its original	Per linear foot
LP61A	Place pedestal	This includes the placement of an above ground pedestal. It includes placing a stake/pole mounted CAD pedestal, bringing new cable(s) into the unit, placing gravel, ground wire, attaching the ground wire to an existing MGN or placing ground rod as requir	Per pedestal
LP70A	Cut solid rock - per hole	This covers the cutting of solid rock during a placing operation. It includes backfilling the trench with packed soil and disposing of excess rock.	Per hole
LP70B	Rock saw	This covers the cutting of solid rock during a placing operation. It includes backfilling the trench with packed soil and disposing of excess rock.	Per linear foot
LP70C	Plow additional cable	This applies during the plowing of two cables or if a split duct is to provide additional protection to the cable (e.g., fiber optic cable placed in rocky soil).	Per linear foot

Values for "LABOR_TYPE" (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LP73A	Splice Pit	This covers digging of a splice pit, by hand or machine. A standard splice pit is approximately 4'x8'x1' below the cable. This includes getting all utility locates, digging the pit, providing a safety perimeter around the pit if required, backfilling, c	Per pit
LP73B	Well Point	This will apply when well pointing is authorized due to high water table conditions. This will apply when digging a splice pit, or when providing well point(s) at 50-foot intervals for trench line. It includes any additional necessary digging as well as	Per location per day
LP87A	Rod and mandrel duct	This is used for the combination activity of rodding, mandrelling, placement of pull line and verifying end to end measurements in preparation for placement of underground cable in an existing conduit. Includes manhole set-up.	Per duct, per foot
LP88A	Place sub-duct or air tube in conduit	This unit covers the placement of sub-duct/air tube in a conduit, connecting the sections together, and properly forming and securing the sub-duct/air tube to manhole walls and/or racks in manhole or cable vaults.	Per duct foot
LP93C	Cut and remove concrete	This includes all labor and equipment required to cut and remove concrete by any method and haul it from the job site. It also includes backfilling the excavation with dirt, compaction of the dirt and smoothing of the surface.	Per square foot of surface
LP93D	Place concrete	This includes all labor, equipment and delivery of materials required to place concrete to required thickness. Also included is preparation and compaction of the appropriate base material (sand, gravel, limestone rock, etc) prior to placing concrete as r	Per square foot of surface
LS02A	Straight splice, 1-50 pairs	Includes the permanent connecting of individual wires of a pair to those of another pair at the junction of two or more cables. Includes set-up and closure of cable. Also includes forming/racking of cables, manhole setup, tagging and pair identification	Per pair

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LS02B	Straight splice, 51-300 pairs	See LS02A above.	Per pair

Values for "LABOR_TYPE" (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LS02C	Straight splice, more than 300 pairs	See LS02A above.	Per pair
LTERMSPLICE1	Splicing	Fixed cost per splice for a terminal 1 – 50 pairs.	1-50 pairs
LTERMSPLICE2	Splicing	Fixed cost per splice for a terminal 51-300 pairs.	51-300 pairs
LTERMSPLICE3	Splicing	Fixed cost per splice for a terminal 300 pairs and above.	300 pairs and above
LS13A	Place fixed counted terminal	This covers the placement of any fixed count terminal (pedestal mounted, aerial, building, NID, etc.). Included is all set-up, associated splicing (straight/branch, etc.), placing seals and static stoppers, bonding and grounding as required, placing clos	Per closure/ housing
LS14B	Place NID	This covers the placement of demarcation hardware (up to and including 6 pair) at a building or junction of aerial and buried plant, placement of static stoppers, and proper bonding and grounding according to Verizon practices. If placing the interface d	Per NID
LS19A	Setup pedestal	This includes opening/closing the sheath in a cable, which is looped through a pedestal. It includes sheath removal, bonding and grounding of cable to the pedestal, placing binder group identification markers, ped caps, pea gravel/pest control (if not al	Per pedestal
LS20A	Run jumpers at any cross connect	This covers placing, removing, or rearranging jumpers at any cross-connect location, including the central office.	Per jumper
LS22A	Load cable	This unit covers loading the cable. (LS11A)	Per pair

Values for "LABOR_TYPE" (Continued)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
LS26A	Conduit acceptance testing	This includes acceptance testing per Verizon Practice and providing the necessary documentation of the results. It also includes Contractor provided equipment, set-up and testing.	Per pair
LS50A	Splice Fiber (48 fibers or less)	This covers the permanent connection of pigtails to a fiber of a cable or splicing a fiber of one cable to a fiber of another cable (mechanical or fusion) and associated testing. It includes sheath preparation and labeling, as required. Testing includes	Per fiber
LS50B	Splice Fiber (more than 48)	This covers the permanent connection of pigtails to a fiber of a cable or splicing a fiber of one cable to a fiber of another cable (mechanical or fusion) and associated testing. It includes sheath preparation and labeling, as required. Testing includes	Per fiber
LS72A	Manhole setup for use	Included is all associated labor, material, and equipment required for preparing a manhole for entry, including but not limited to generator, water pump, blower, gas detector, manhole guard, truck and tools, and standard traffic control devices (signs and	Per manhole
MNHOLE	Manhole install	This unit involves all work necessary for the installation and placement of a manhole. This unit includes the restoration of the surface in the immediate vicinity of the manhole with the appropriate material. If major restoration is required by local go	Per manhole
PULLBOX	Pull box installation	This unit involves all work necessary for the installation and placement of a pull box. This unit includes the restoration of the surface in the immediate vicinity of the manhole with the appropriate material. Restoration is limited to an area within fi	Per box

Values for "LABOR_TYPE"   (Concluded)

LABOR TYPE CODE	LABOR TYPE	DESCRIPTION	UNIT
ECFCU	Install Copper for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFFI	Install Fiber for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFDLC	Install DLC for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per RT
ECFCUA	Install Aerial Copper for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFCUB	Install Buried Copper for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFCUU	Install Underground Copper for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFFIA	Install Aerial Fiber for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFFIB	Install Buried Fiber for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot
ECFFIU	Install Underground Fiber for Fiber/Copper Crossover	Installation for calculating the placement for the Fiber/Copper Crossover.	Per foot

OPTIONS

The OPTIONS table gives the user the flexibility to modify the study to make it state specific, to follow current engineering guidelines for the study, and to meet the requirements of compliance filings.

Line #	Variable	Description
1	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
2	**PLOW_DENSITY**	This variable is used to over ride the PLOWFLAG in the master table. If the wire center density in lines per square mile is greater than the value for PLOW_DENSITY, then plowing will not occur regardless of the value of PLOWFLAG.
3	**TRENCH_DENSITY**	This variable is used to override the percents for hand dig, boring and concrete replacement when trenching occurs. If the wire center's density is below the TRENCH_DENSITY, then hand digging, boring or concrete replacement will not occur.
4	**DIST_ADMIN_FILL**	This input is a decimal representing the percentage administrative pairs for copper distribution cable.
5	**FEED_ADMIN_FILL**	This input is a decimal representing the percentage administrative pairs for copper feeder cable and cross connect in the design stage.
6	**STU**	This input represents the number of users in a trench, including Verizon, when sharing occurs. It is always greater than or equal to one and, if the input SB is greater than zero, the STU is greater than one.
7	**SCU**	This input is the number of additional ducts placed in shared conduits for companies other than Verizon.
8	**POLE_SPACING**	This input determines the number of feet between poles.
9	**LNFT_MANHOLE**	This input is the number of pole holes that are required to remove the bedrock in an area approximating the size of a manhole.
10	**LNFT_PULLBOX**	This input is the number of pole holes that are required to remove the bedrock in an area approximating the size of a pullbox.

OPTIONS (Continued)

Line #	Variable	Description
11	**WELL_POINT_DAYS**	This input is the number of days that well points are required to remove ground water in the area excavated for manhole placement.
12	**PER_BORING**	This input is the percent of the buried trench that requires boring (tunneling) under pavement or other obstructions.
13	**PER_HAND**	This input is the percent of trench that requires hand digging in lieu of mechanized trenching. This hand digging is in addition to the incidental hand digging included in the trenching costs.
14	**PER_CONCRETE**	This input is the percent of buried trench that requires removing and replacing concrete or asphalt.
15	**PER_GUYWIRE**	This input is the percent of poles that require anchors and guy wires.
16	**USER_FILL**	This input allows the user to input utilization factors for distribution and feeder. The model adjusts cable investments to reflect the specified fill levels. If USER_FILL ='Y' the percents in the DIST_FILL and FEED_FILL will override the calculated fil
17	**DIST_FILL**	This is the distribution fill used in place of the calculated fill if USER_FILL equals "Y".
18	**FEED_FILL**	This is the feeder fill used in place of the calculated fill if USER_FILL equals "Y".
19	**SF_POLES**	This input represents the proportion of poles that are not owned by Verizon, and that Verizon attaches to through lease arrangements.
20	**SA**	This input represents the percent of poles owned by Verizon that are shared with electric companies.
21	**SB**	This input represents the percent of trench owned by Verizon that is shared with other companies. Note, if SB is greater than zero, then STU must be greater than 1.
22	**SC**	This input represents the percent of conduit owned by Verizon that is shared with other companies.

Line #	Variable	Description
11	**WELL_POINT_DAYS**	This input is the number of days that well points are required to remove ground water in the area excavated for manhole placement.
12	**PER_BORING**	This input is the percent of the buried trench that requires boring (tunneling) under pavement or other obstructions.
13	**PER_HAND**	This input is the percent of trench that requires hand digging in lieu of mechanized trenching. This hand digging is in addition to the incidental hand digging included in the trenching costs.
14	**PER_CONCRETE**	This input is the percent of buried trench that requires removing and replacing concrete or asphalt.
15	**PER_GUYWIRE**	This input is the percent of poles that require anchors and guy wires.
16	**USER_FILL**	This input allows the user to input utilization factors for distribution and feeder. The model adjusts cable investments to reflect the specified fill levels. If USER_FILL =‘Y’ the percents in the DIST_FILL and FEED_FILL will override the calculated fil
17	**DIST_FILL**	This is the distribution fill used in place of the calculated fill if USER_FILL equals “Y”.
18	**FEED_FILL**	This is the feeder fill used in place of the calculated fill if USER_FILL equals “Y”.
19	**SF_POLES**	This input represents the proportion of poles that are not owned by Verizon, and that Verizon attaches to through lease arrangements.
20	**SA**	This input represents the percent of poles owned by Verizon that are shared with electric companies.
21	**SB**	This input represents the percent of trench owned by Verizon that is shared with other companies. Note, if SB is greater than zero, then STU must be greater than 1.
22	**SC**	This input represents the percent of conduit owned by Verizon that is shared with other companies.

OPTIONS (Continued)

Line #	Variable	Description
23	**F_DROP**	This input represents the percent of residential drops installed by developers at no cost to Verizon (in states where applicable).
24	**PER_TRENCH**	This input represents the percent of distribution cable trenching provided by developers at no cost to Verizon (in states where applicable).
25	**XCONN**	This value is applied to the number of lines in the feeder cable to determine the size of the cross box. For example a value of 3 indicates 1 feeder pair for every 2 distribution in the cross connect box.
26	**NUM_LP_TERM**	The number where a DLC will be placed when demand at the terminal exceeds this number for fiber to the premise.
27	**TSPAN_FACTOR**	When a DLC is on copper feeder this input is used to determine the number of required t-spans.
28	**NUM_FIBER**	This input is the number of fiber strands per optical DLC system.
29	**DIST_CA_FILL**	This input is a sizing factor used to determine the number of installed pairs in copper distribution cable. The number of required installed lines for the cable equals total demand times this factor. The modeled cable is the smallest cable that has at l
30	**FEED_CA_FILL**	This input is used to determine the size of the modeled cross connects and copper feeder cable. The number of required installed lines equals total demand times this factor. The modeled cross connects and cable correspond to the smallest cross connect o
31	**OMD**	This input specifies the maximum length of the copper distribution portion of the loop in feet. Only applicable when the variable AFH equals “F”.
32	**AFH**	Indicator for type of alternative to be run. A=baseline option or F = second network option.

OPTIONS (Continued)

Line #	Variable	Description
33	**FEED_MIN_A_SIZE**	This input will override the minimum size for aerial copper feeder cable appearing in the MATERIAL table. For example, if 25 pair is the smallest size appearing in the MATERIAL table, and this input takes a value of 50, no aerial copper feeder smaller t
34	**FEED_MIN_B_SIZE**	Same as FEED_MIN_A_SIZE, except that it applies to buried copper feeder.
35	**FEED_MIN_U_SIZE**	Same as FEED_MIN_A_SIZE, except that it applies to underground copper feeder.
36	**FEED_MAX_A_SIZE**	This input will override the maximum size for aerial copper feeder cable appearing in the MATERIAL table. For example, if 900 pair is the largest size appearing in the MATERIAL table, and this input takes a value of 600, no aerial copper feeder larger t
37	**FEED_MAX_B_SIZE**	Same as FEED_MAX_A_SIZE, except that it applies to buried copper feeder.
38	**FEED_MAX_U_SIZE**	Same as FEED_MAX_A_SIZE, except that it applies to underground copper feeder.
39	**DIST_MIN_A_SIZE**	This input will override the minimum size for aerial copper distribution cable appearing in the MATERIAL table. For example, if 25 pair is the smallest size appearing in the MATERIAL table, and this input takes a value of 50, no aerial copper distributio
40	**DIST_MIN_B_SIZE**	Same as FEED_MIN_A_SIZE, except that it applies to buried copper distribution cable.
41	**DIST_MIN_U_SIZE**	Same as FEED_MIN_A_SIZE, except that it applies to underground copper distribution cable.
42	**DIST_MAX_A_SIZE**	This input will override the maximum size for aerial copper distribution cable appearing in the MATERIAL table. For example, if 900 pair is the largest size appearing in the MATERIAL table, and this input takes a value of 600, no aerial copper distributi

OPTIONS (Concluded)

Line #	Variable	Description
43	**DIST_MAX_B_SIZE**	Same as FEED_MAX_A_SIZE, except that it applies to buried copper distribution cable.
44	**DIST_MAX_U_SIZE**	Same as FEED_MAX_A_SIZE, except that it applies to underground copper distribution cable.
45	**RPT_SPACE**	This input represents the number of feet between repeaters for T-span.
46	**VINTAGE**	Date of table creation.
47	**VERSION_ID**	Sequential number generated by the model.
48	**RAF_VALUE_D**	This input represents the percent of adjustment to apply to distribution arclength if the arclength exceeds the RAF_LEN_D. (A 10% increase would be represented as 1.10).
49	**COND_FILL**	This input is the fill for conduit.
50	**SUBDUCT**	This input is the number of subducts.
51	**SPU**	Not Used. Set to zero.
52	**HORIZON**	This input is not used.
53	**GROWTH**	This input is not used.
54	**AER_XBOX_SIZE**	Not used.
55	**TAPER_LENGTH**	Not currently used.
56	**TEST_RUN**	Not used. Populate with "N" .
57	**MAX_NUM_ACABLES**	Not Used. Leave blank.
58	**MAX_NUM_BCABLES**	Not Used. Leave blank.

MASTER

The MASTER table contains inputs, such as the CLLI code or density zone, that apply to an entire wire center.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number generated by the model.
2	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
3	**CLLI**	The eight character Common Language Location Identifier for the corresponding wire center.
4	**EXCHANGE_NAME**	The English name for the wire center.
5	**ZONE_R**	A user-defined grouping for the wire center. It is expected that this grouping will be used to designate to exchange groupings in retail tariffs.
6	**ZONE_W**	A user-defined grouping for the wire center used when WC_OVER equals "Y" (See below) .
7	**LATITUDE**	Latitude of the wire center in decimal format.
8	**LONGITUDE**	Longitude of the wire center in decimal format.
9	**LR**	This field specifies the labor rate for placement to be taken from the PLACEMENT table for a particular activity (e.g., trenching or pole placement). A valid entry for this field is a number from 1 through 20.
10	**CU_FI_CROSSOVER**	The distance (in feet) from the wire center for the first DLC along each feeder route. A shorter distance will be used if it is economicly rational to do so. Only applies when the variable AFH in the OPTIONS table equals "F".
11	**SQMILE**	The area of the wire center in square miles.
12	**ACCT_AREA**	Accounting area, for New York only. Ties to cable investment by accounting area. Can be 1 through 8 or A through H.

MASTER (Continued)

Line #	Variable	Description
13	**MANHOLE_SPACING**	The typical number of feet between manholes for the wire center.
14	**PULLBOX_SPACING**	The typical number of feet between pull boxes for the wire center.
15	**DROPLENGTH_A**	Average Aerial drop length for wire center.
16	**DROPLENGTH_B**	Average Buried drop length for wire center.
17	**AERCU_SPAN**	The number of feet between aerial splices in copper cables. Used by fGTE only.
18	**BURCU_SPAN**	The number of feet between buried splices in copper cables. Used by fGTE only.
19	**SMALL_SPAN**	The number of feet between splices for copper cable sizes less than or equal to 400 pairs, used for former BA only.
20	**LARGE_SPAN**	The number of feet between splices for copper cable sizes greater than 400 pairs, used for former BA only.
21	**AERFI_SPAN**	The number of feet between aerial splices in fiber cables for fGTE. For fBA this value plus either SMALL_SPAN or LARGE_SPAN equals the number of feet between aerial splices.
22	**BURFI_SPAN**	The number of feet between buried splices in fiber cables for fGTE. For fBA this value plus either SMALL_SPAN or LARGE_SPAN equals the number of feet between aerial splices.
23	**PLWFLG**	A value of "P" indicates that plowing allowed provided the number of trench users or the depth to bedrock would not prevent plowing. A value of "NP" indicates that plowing is not allowed within the wire center.

MASTER (Concluded)

Line #	Variable	Description
24	**MANHOLE_CA_SIZE**	The cable size, which is too large to be placed and spliced in a pullbox.
25	**BEDROCK**	Average bedrock depth of wire center. If BEDROCK in NETWORK table is not populated this value is used for depth to bedrock.
26	**WATERTABLE**	Average water depth of wire center. If WATERTABLE in NETWORK table is not populated this value is used for depth of water.
27	**U**	RFPC C00257 If field is blank or 0 then perform continuity on Underground. UBA will be changed to U back to the wire center from the furthest U UBA from the wire center.
28	**WC_OVER**	A value of "Y" indicates that the investment for the wire center is based on the weighted average of the modeled investment from in the grouping designated ZONE_W.
29	**VINTAGE**	Date of preprocessing run.
30	**MAX_NUM_ACABLES_WC**	This input specifies the maximum number of aerial cables installed on a single pole line. If the number of cables exceeds this maximum number then the facilities will be changed to underground.
31	**MAX_NUM_BCABLES_WC**	This input specifies the maximum number of buried cables in a single trench. If the number of cables exceeds this maximu m number then the facilities will be changed to underground.
32	**MANHOLE_DENSITY**	Not currently used. Populate with 0.
33	**B**	Not currently used.
34	**A**	Not currently used.
35	**K**	Not currently used.
36	**BLOCK**	Not currently used.
37	**I_OVER**	Not currently used. Always populated with "T".
38	**PULLBOX_DENSITY**	Not currently used. Populate with 0.

DEMAND_VALUE

The DEMAND_VALUE table is used in VzCost for unit weighting. The values are summed to the wire-center level and will include all services. The demand totals in this table match the total of the demand in the LOOP_DEMAND table.

Line #	Variable	Description
1	**ITEM_KEY**	This field designates the different types of services as specified in the DEMAND_ITEM table.
2	**GEOGRAPHY_KEY**	The eight character Common Language Location Identifier for the corresponding wire center.
3	**VALUE**	The number of lines for the service listed in the **ITEM_KEY**.
4	**VERSION_ID**	Sequential number generated by the model.

See the section for the DEMAND_ITEM table for a listing of the values for ITEM_KEY and the corresponding service descriptions.

DEMAND_ITEM

The DEMAND_ITEM table is the look up table for the descriptions of the services in the DEMAND_VALUE table.

Line #	Variable	Description
1	**ITEM_KEY**	Designates the type of service that the demand value in the DEMAND_VALUE table corresponds to.
2	**ITEM_NAME**	Description of the various services.

The values for ITEM_KEY and the corresponding service descriptions are given below:

ITEM_KEY Value	Service Description
TOTALRES	TOTAL RESIDENTIAL
TOTALBUS	TOTAL BUSINESS
RES	RESIDENTIAL
BUS	BUSINESS
RES_DSL	RESIDENTIAL DSL
WATS	WATS
PBX	PBX
CNTRX	CENTREX
COIN	COIN
BRI	BASIC ISDN
DSL	DIGITAL SUBSCRIBER LINE
DDS	DIGITAL DATA SERVICE
SW56	SWITCHED 56 KBPS
NSW_PL	NON SWITCHED PRIVATE LINE
SW_PL	SWITCHED PRIVATE LINE
DS1	DIGITAL SERVICE 1544 KBPS
PRI	PRIMARY ISDN
OTH	OTHER
NWKG	NON WORKING

BASE_ELEMENT

The BASE_ELEMENT table defines the list of loop element names with a description of the element and indicates treatment of the element by the VzCost loader.

Line #	Variable	Description
1	**VERSION_ID**	System generated number.
2	**ELEMENT**	Name of each investment element.
3	**DIR_SHR**	Direct and Shared indicator. D = Direct, S=Shared.
4	**LVL**	Level of table's data. W= wire center or J = Jurisdiction.
5	**ACCT**	Account number associated with the element.
6	**DESCRIPTION**	Description of the element.
7	**E**	Engineering, X= factor from EFI load table applied or blank = do not apply.
8	**Fr**	Freight, X = factor from EFI load table applied or blank = do not apply.
9	**S**	Sales tax, X = factor from EFI load table applied or blank = do not apply.
10	**P**	Provisioning, X = factor from EFI load table applied or blank = do not apply.
11	**MM**	Minor material, X = factor from EFI load table applied or blank = do not apply.
12	**I**	Installation, X = factor from EFI load table applied or blank = do not apply.
13	**PWR**	Power factor, X = factor from EFI load table applied or blank = do not apply.
14	**LAND**	Land, X = factor from EFI load table applied or blank = do not apply.
15	**BLDG**	Building, X = factor from EFI load table applied or blank = do not apply.
16	**COLOPWR**	Colocation power, X = factor from EFI load table applied or blank = do not apply.
17	**TLOAD**	Total, X = factor from EFI load table applied or blank = do not apply.

LOOPSS_BASE_ELEMENT

The LOOPSS_BASE_ELEMENT table defines a list of miscellaneous element names, which are available for use by other VzCost modules. The table structure is identical to the BASE_ELEMENT table.

Appendix B – Output Tables

ARC

The ARC table contains information about the terminals in the modeled network and the cable spans between them.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number assigned by the VzCost system.
2	**CLLI**	The 8-character Common Language Location Identifier for the corresponding wire center.
3	**ROUTE**	Designates the route number the arc is part of.
4	**TAPERCODE**	When populated, this code identifies groups of terminals below the Distribution area.
5	**DA**	Distribution Area.
6	**X**	Relative X distance from the terminal to wire center in feet. Based on the terminal's longitude and latitude converted to relative X and Y coordinates.
7	**Y**	Relative Y distance from the terminal to wire center in feet. Based on the terminal's longitude and latitude converted to relative X and Y coordinates.
8	**TERM**	Terminal address.
9	**TOX**	The X coordinate of the next terminal on the ARC, moving towards the wire center.
10	**TOY**	The Y coordinate of the next terminal on the ARC, moving towards the wire center.
11	**TOTERM**	The address of the next terminal on the ARC, moving towards the wire center.
12	**ARCLENGTH**	The length of the ARC, in feet.
13	**EQUIVPAIRFEET**	Equivalent pair feet of the ARC. Equals total demand times length of the arc.
14	**TERMINALUBA**	Structure type of distribution terminal: B (buried), A (aerial), R (Building terminal), K (Block) or U (underground).

ARC (Continued)

Line #	Variable	Description
15	**UBA**	Structure type of the cable span leaving the terminal towards the wire center: B (buried), A (aerial), K (Block) or U (underground).
16	**TERMTYPE**	Designates the terminal type -- see the VxLoop Manual.
17	**BUSCOPDIST**	Total business copper distribution demand.
18	**BUSCOPFEED**	Total business copper feeder demand.
19	**BUSDCPFEED**	Total business DLC on copper demand.
20	**BUSFIBDIST**	Total business fiber distribution demand.
21	**BUSFIBFEED**	Total business fiber feeder demand.
22	**RESCOPDIST**	Total residential copper distribution demand.
23	**RESCOPFEED**	Total residential copper feeder demand.
24	**RESDCPFEED**	Total residential DLC on copper demand.
25	**RESFIBDIST**	Total residential fiber distribution demand.
26	**RESFIBFEED**	Total business fiber feeder demand.
27	**TOTCOPDIST**	Total copper distribution demand.
28	**TOTCOPFEED**	Total copper feeder demand.
29	**TOTDCPFEED**	Total DLC on copper demand.
30	**TOTFIBDIST**	Total fiber distribution demand.
31	**TOTFIBFEED**	Total fiber feeder demand.
32	**INVESTMENT**	Cable investment for arc.

ARC (Concluded)

Line #	Variable	Description
33	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
34	**FBRSTR**	Number of fiber strands.
35	**DS1COPDIST**	Total distribution DS1 demand on copper.
36	**DS1COPFEED**	Total feeder DS1 demand on copper.
37	**DS1FIBDIST**	Total distribution DS1 demand on fiber.
38	**DS1FIBFEED**	Total feeder DS1 demand on fiber.
39	**BACK**	Not populated.

FILL

The FILL table contains model output related to fill-factor and loop-length calculations for each wire center.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number assigned by the VzCost system.
2	**CLLI**	The 8-character Common Language Location Identifier for the corresponding wire center.
3	**FDRCAP**	Sum of the Total Copper Feeder and Copper Span Line Feeder pairs multiplied by the arc length reported as accumulated pair feet.
4	**FDRUTL**	Sum of the demand on Total Copper Feeder and Copper Span Line Feeder multiplied by the arc length reported as accumulated pair feet.
5	**DISTCAP**	Sum of the Total Copper Distribution pairs multiplied by the arc length reported as accumulated pair feet.
6	**DISTUTL**	Sum of the demand on Total Copper Distribution multiplied by the arc length reported as accumulated pair feet.
7	**BUSPF**	Sum of Business demand multiplied by Arc Length from the ARC table for business loops.
8	**RESPF**	Sum of Residence demand multiplied by Arc Length from the ARC table for residential loops.
9	**BUSLPS**	Total business loops.
10	**RESLPS**	Total residential loops.
11	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
12	**PER_SQMILE**	The area of the wire center in square miles.

FILL (Concluded)

Line #	Variable	Description
13	**FILL_FDR_C**	Copper Feeder and Copper DCP Feeder pairs at the wire center.
14	**FILL_FDR_U**	Copper Feeder and Copper DCP demand at the wire center.
15	**FILL_DIST_C**	Copper Distribution pairs on the field side of the cross connects.
16	**FILL_DIST_U**	Copper Distribution demand on the field side of the cross connects.
17	**FDRDLCCAP**	Capacity of all DLC systems, both field and fiber to premises.
18	**FDRDLCUTL**	Demand of all DLC systems (fiber feeder and distribution demand).
19	**FDRFICAP**	Sum of the fiber feeder cable size multiplied by the arc length; reported as accumulated pair feet.
20	**FDRFIUTL**	Sum of the fiber feeder cable working strands multiplied by the arc length; reported as accumulated pair feet.
21	**CONDCAP**	Sum of the number of ducts including sharing, multiplied by the arc length; reported as accumulated pair feet.
22	**CONDUTL**	Sum of the number of Verizon cables in route plus number of shared ducts multiplied by the arc length; reported as accumulated pair feet.
23	**FILL_FDR_FI_C**	Fiber feeder cable size at the wire center.
24	**FILL_FDR_FI_U**	Fiber feeder required strands at the wire center.
25	**DIST_FDR_DA_C**	Copper distribution cable size on the field side of the cross connects.
26	**DIST_FDR_DA_U**	Copper distribution demand on the field side of the cross connects.
27	**FILL_COND_CAP**	Number of ducts including sharing at the wire center.
28	**FILL_COND_UTL**	Number of Verizon cables in route plus number of shared ducts at the wire center.
29	**FEEDPF**	Sum of the arc length multiplied by the feeder demand.
30	**DISTPF**	Sum of the arc length multiplied by the distribution demand.
31	**DLCLOOPS**	Number of loops on DLC/Fiber.
32	**CULOOPS**	Number of loops on copper.

INVENTORY

The INVENTORY table contains information on the quantities of modeled network components, such as poles, by wire center and by feeder route.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number assigned by the VzCost system.
2	**CLLI**	The 8-character Common Language Location Identifier for the corresponding wire center.
3	**ROUTE**	Route number. Same as ARC table.
4	**TAPERCODE**	When populated, this code identifies groups of terminals below the Distribution area. Same as ARC table.
5	**DA**	Distribution Area. Same as ARC table.
6	**COMPONENT**	Abbreviated name for network component.
7	**COMPSIZE**	Size of component.
8	**UNITS**	Number of components.
9	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
10	**OSPTYPE**	Outside plant type: F for feeder or D for distribution.
11	**LOOPS**	Demand for the component; not listed for cables.

INVENTORY (Concluded)

The values for the COMPONENT field are shown below with their descriptions:

Field Value	Description
CUAER24	Copper aerial cable
CUBUR24	Copper buried cable
CUUND24	Copper underground cable
DUCT	Conduit
DWIREACU	Aerial drop wire
DWIREBCU	Buried drop wire
FIAER	Fiber aerial cable
FIBUR	Fiber buried cable
FIUND	Fiber underground cable
LC2COT08	2 Wire DLC TR08 Central Office Terminal
LC2COT08_FP	2 Wire DLC TR08 Fiber To Premises Central Office Terminal
LC2COT303	2 Wire DLC GR303 Central Office Terminal
LC2COT303_FP	2 Wire DLC GR303 Central Office Terminal
LC2RT	2 Wire Remote Terminal
LC2RT_FP	2 Wire Remoter Terminal Fiber to the Premises
LC2RTCARD	2 Wire DLC line
LC2EXT_CARD	2 Wire DLC extended line
LC4COTUCARD	4 Wire DLC line
LC4EXT_CARD	4 Wire DLC extended line
LC4RTCARD	4 Wire DLC line
LCCCOTUCARD	Coin DLC line
LCCEXT_CARD	Coin DLC extended line
LCCRTCARD	Coin DLC line
LCHCOTUCARD	DS1 line
LCHRTCARD	DS1 line
LCICOTUCARD	ISDN line
LCIEXT_CARD	ISDN extended line
LCIRTCARD	ISDN line
LCPOTUCARD	Voice Grade Private Line
MANHOLE	Manholes
NID	Network Interface Device
POLES	Poles
SHAREDPOLES	Poles shared with another utility
STRANDCU	Strand used with copper
STRANDFI	Strand used with fiber
SUBDUCT	Subduct
TERMA	Aerial terminal
TERMB	Buried terminal
TERMR	Building terminal
TRENCHED	Trenching
XCONNA	Aerial Cross Connect
XCONNB	Buried Cross Connect

ELEMENTS

The ELEMENTS table contains the nonloaded loop investments for the loop network components. Note that portions of this table are also populated by other VzCost modules.

Line #	Variable	Description
1	**VERSION_ID**	Sequential number assigned by the VzCost system.
2	**AFH**	Indicator for type of alternative to be run. A=baseline option or F = second network option.
3	**JURISDICTION**	The state's two-letter postal abbreviation. The District of Columbia is designated as "DC". The former GTE properties in Virginia and Pennsylvania are designated as "VAW" and "PAW", respectively. The former Bell Atlantic properties are similarly design
4	**LVL**	This entry specifies the level at which elements/components are assembled: W= wire center or J= jurisdiction.
5	**LEVEL_INFO**	Identifies what level the elements were assembled at. For example, if the data correspond to wire center, this value specifies the identity of the wire center's eight character Common Language Location Identifier.
6	**TECHNOLOGY**	The type of Technology. This field is left blank for Loop.
7	**ELEMENT**	Name of each investment Element.
8	**DIR_SHR**	Designates whether the element is direct or shared: D = Direct, S=Shared N= None, B =Both.
9	**TYPE**	Identifies the variable type the INVESTMENT item is populated with: Investment = I, Constant = C.
10	**INVESTMENT**	Investment value for ELEMENT.
11	**INSTALLATION**	Installation value for ELEMENT.

LOOPSS_ELMNTS

The LOOPSS_ELMNTS table contains miscellaneous data such as average loop length and the number of remote terminals. This table has the same structure as the ELEMENTS table.