

Verizon – Illinois Unbundled Network Element (UNE) Non-Recurring Cost Study

Introduction

The Unbundled Network Element (UNE) Non-recurring Cost (NRC) Study is filed in compliance with the Illinois Commerce Commission's (ICC) order 98-0866 proceeding for Joint application for the approval of a corporate reorganization involving a merger of GTE Corporation and Bell Atlantic Corporation dated October 29, 1999. The UNE NRC Study is a study that accounts for the activities required to pre-order, order, provision and install products and services for Competitive Local Exchange Carriers (CLECs.)

This Wholesale UNE Non-recurring Cost (NRC) Study utilizes an ICC Compliance Rate of Return of 10.2% for any capital related cost calculations.

The cost team consisting of Verizon's cost managers and Subject Matter Experts (SMEs) worked in conjunction with a team of Arthur Andersen LLP professionals to develop the NRC Study template, to identify the process flows for ordering, provisioning and installation, and to gather cost data. This cost study is a Verizon work product.

UNE NRC Study Relationship to Other Cost Studies

The UNE NRC Study is one of Verizon's Wholesale Costs Study modules. There are four other modules: Resale NRC, Recurring Costs of Resale, Recurring Costs of UNEs, and the Expanded Interconnection Services (EIS) (collocation recurring and non-recurring) Costs. Though these costs are interrelated, they are not duplicative. Verizon has diligently reviewed all inputs to each of these modules to insure there is no incident of double-counting costs.

Verizon has recurring and non-recurring cost study modules for its Retail and Access products and services. To determine costs for certain UNEs where no ordering, provisioning or installation data were available, the cost team used analogous retail or access services as proxies for the UNEs.

Cost Study Methodology

For the purpose of this study, the non-recurring cost of a service is the cost of a set of activities that is completed by the company in response to a specific Local Service Request (LSR) or Access Service Request (ASR) placed by a CLEC. These activities are non-recurring in that they are typically undertaken once at the time a service is activated, modified, or discontinued per a CLEC request. Verizon's UNE NRC study is a study that:

- Assumes enhancements to Verizon's systems and databases resulting in increased mechanization;
- And, details employee activities required to pre-order, order, provision, and install a service.

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Process Flows

Verizon’s cost team charted the process flows for each of the following UNE order types:

- New order
- Change order
- Disconnect order
- Record order
- UNE Platform (UNE-P) New order
- UNE-P Migration orders (Migration As Is; Migration As Is + or –; and Migration As Specified)

These flowcharts identify the activities of Verizon’s workgroups involved in the pre-ordering, ordering, provisioning, and installation of the CLEC’s UNE order. The processes vary not only by order type, but also by the type of product/service requested. (See Appendix Tab 1 for Process Flows.)

Infrastructure Enhancements

The SMEs and cost team identified changes in Operations Support Systems (OSS) that would impact the way work was handled in each of Verizon’s workgroups. OSS enhancements increase mechanization/ flow through thus reducing the level of manual activity associated with certain types of orders.

Depending on the CLEC’s systems, processes, and level of mechanization, the CLEC will transmit the UNE/UNE Platform LSR to Verizon in one of the following modes:

- Manual Order – CLEC faxes a UNE LSR to Verizon. The Verizon service representative reviews the fax to ensure all information is complete and accurate. If there is an error, or missing information, the representative calls the CLEC for the correction. The service representative then inputs all LSR information into the Secured Integrated Gateway System (SIGS), provides Firm Order Completion (FOC) to the CLEC, and completes the order.
- Semi-mechanized Order – CLEC transmits the UNE LSR electronically. Verizon’s Front-end edits will identify errors and return error information electronically to the CLEC. Once through the front-end edits, the order is distributed to a VERIZON service representative who inputs the order into the National Order Collection Vehicle (NOCV.)

Other enhancements to Verizon’s OSS result in flow-through for the provisioning of UNE Platform Exchange – Basic services (these are the Plain Old Telephone Services – “POTS.”) Also, facility assignment and switch recent changes are mechanized for these services.

Cost Data

UNE NRCs were developed using the following methods of data collection:

- Work sampling and SME estimates for the National Open Market Center (NOMC) ordering activities;

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- Activity Based Management (ABM) studies for the National Accounts Customer Center (NACC;)
- Time and motion studies, SME inputs and database reports for the provisioning activities;
- Time and motion studies for Central Office Installation activities;
- Database reports and time and motion studies for Field Installation activities.

The SMEs and cost team collected activity times and determined task probabilities. The cost team then calculated the costs for each type of UNE order using the standard non-recurring cost calculation –

$$\text{Activity Time} \times \text{Probability} \times \text{Labor Rate} = \text{Cost}$$

The cost team used the most current loaded labor rates for each of the workgroups. (See Appendix Tab 6 for Loaded Labor Rates.)

UNE Order Types

There are six UNE order types. Following are descriptions of each order type:

1. New – a New order for Local Wholesale Service establishes a service for the first time or adds additional lines at an existing CLEC customer’s location.
2. Change – a Change order applies when the CLEC requests changes in central office switch features for an existing local wholesale service; this can be either a “Change Feature” or a “Change Switch Feature Group” type order. A Change order also applies when the CLEC requests a change in Central Office Connection – the cross-connect between the CLEC’s cage terminal block and Verizon’s terminal block(s) on the Main Distributing Frame (MDF.)
3. Disconnect – a Disconnect order for Local Wholesale Service applies when the CLEC requests that all or a portion of a local wholesale service be removed.
4. Record – a Record order applies when the CLEC changes existing service records without changing the service itself. An example of a Record order is a change of the billing address.
5. UNE-P Migration – an UNE-P Migration order applies when the CLEC requests conversion of existing services: Retail to UNE-P and Resale to UNE-P. When the service is migrated from Retail or Resale to the UNE-P, Verizon must change the switch translations to measured service.

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- **Migration As Is:** this order type occurs when an existing end user customer changes service from Verizon to a CLEC, or from a CLEC to another CLEC, **and** the end user keeps the same service. This type order requires only the ordering function and FAC provisioning; it does not require central office, or field installation activities. “Migration As Is” is applicable to Exchange Basic and Exchange Complex products.
 - **Migration As Is + or –:** this order type differs from a “Migration As Is” order only in that the end-user wants to add or delete a vertical feature from his existing service. The central office switch must be updated for the requested feature change, and this is accomplished electronically.
 - **Migration As Specified:** this order type occurs when the end-user converts a portion of his Verizon retail services (at a single location) or another CLEC’s services to UNEs provided by a CLEC. The CLEC specifies the services and service arrangements to be migrated.
6. **New UNE-P** – this order establishes a service for the first time. Verizon will combine the loops and port, or otherwise finish a working service, on behalf of the CLEC. UNE-P is a measured service.

The cost team and SMEs determined the UNE process flows for each of these order types for each category of UNE products and services. Then they gathered the non-recurring cost data for the study.

Cost Categories

UNE Provisioning

Verizon’s UNEs fall into four categories: Exchange – Basic, Exchange – Complex, Advanced/Special – Basic, and Advanced/Special – Complex. Each of these groupings has a distinct provisioning process and associated non-recurring costs. For each category, Verizon has costed the activities required to pre-order, order, provision, and install the UNEs. (Descriptions of the UNEs are in the next section.)

There are two fundamental distinctions between the UNE categories. The first distinction is whether or not a service requires design/engineering. The Exchange services do not require design or engineering, whereas the Special/Advanced services are designed/engineered services with variables specific to the order placed by the CLEC. The Special/Advanced services require Circuit /Design Layout Records (CLR/DLR).

The second distinction is between Basic and Complex services. Basic services can be provisioned using standard network components maintained in inventory without specialized instructions for switch translations, routing, and service arrangements. The Complex services require special instructions for the provisioning of the service to meet the customer’s needs.

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Verizon uses a Data Gathering Form (DGF) to record and organize these instructions for translations and service arrangements.

The matrix below shows each category and its associated UNEs:

Exchange – Basic	Exchange – Complex	Special/Advanced – Basic	Special/Advanced – Complex
<ul style="list-style-type: none"> ◆ 2-Wire Analog Loop ◆ 4-Wire Analog Loop ◆ Basic Analog Line Side Port ◆ Vertical Features ◆ Interim Number Portability (INP) ◆ C.O. Connection ◆ Subloop Distribution 2-Wire Standard ◆ Subloop Distribution 4-Wire Standard ◆ Subloop Feeder 2-Wire Standard ◆ Subloop Feeder 4-Wire Standard ◆ Subloop Unbundled Customer Serving Terminal (Drop) ◆ Network Interface Device (NID) 	<ul style="list-style-type: none"> ◆ Complex Non-Digital Loop ◆ Subloop Distribution 2-Wire Non-loaded ◆ Subloop Distribution 4-Wire Non-loaded ◆ Subloop Feeder 2-Wire Non-loaded ◆ Subloop Feeder 4-Wire Non-loaded ◆ Loop Conditioning ◆ CentraNet Port ◆ ISDN BRI Digital Line Side Port ◆ Vertical Features ◆ Switch Feature Group ◆ Customized Routing OA/DA ◆ Line-sharing 	<ul style="list-style-type: none"> ◆ 2-Wire Digital Loop ◆ 4-Wire Digital Loop ◆ Entrance Facilities 	<ul style="list-style-type: none"> ◆ DS1 Loop ◆ DS3 Loop ◆ Dedicated Switched Access Line ◆ ISDN PRI Digital Trunk Side Port ◆ DS1 Digital Trunk Side Port ◆ Dedicated Switched Access Transport ◆ Dedicated Non-switched Transport ◆ SS7 Links ◆ STP Ports ◆ Dark Fiber ◆ Enhanced Extended Links (EELs) ◆ Entrance Facilities

UNE-Platform

In this NRC study, Verizon also provides costs for the UNE-P. The platform is described in the following section.

OSS UNE

In this NRC study, Verizon provides costs for access to OSS. Verizon has identified two types of costs associated with OSS – Transition Costs and Transaction-specific Costs. Transition costs are the costs to upgrade existing OSS and the start-up costs to establish mechanized systems. These infrastructure changes were required to make Verizon’s OSS accessible to the CLECs. The transition costs include the one-time expenses to upgrade the five categories of OSS: pre-order, order, provisioning, repair/maintenance, and billing.

Transaction-specific costs are the costs incurred each time a CLEC places an order; these are the on-going OSS costs to process an LSR or ASR. These costs pertain to the non-recurring systems for pre-order, ordering, and provisioning.

The OSS UNE costs are contained in a separate module of this NRC study.

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Other Services

In addition to the UNE costs, Verizon provides costs for other services the CLEC may need in the provisioning of its LSR. These services are:

- CLEC Account Establishment – Verizon establishes the CLEC account in each state that the CLEC requests. The NOMC receives the CLEC profile from the CLEC’s account manager, reviews it for completeness, and then enters the CLEC profile information and creates summary bill masters in NOCV. Once the CLEC account has been established for a state, the CLEC may submit an LSR for processing.
- Customer Service Record Search – A CLEC may request Verizon to perform a manual Customer Service Record (CSR) to obtain information about a potential customer’s existing Verizon services. The NOMC processes the request and returns the information to the CLEC. (If the CLEC performs a CSR search electronically via the Web-based Interactive Service Environment (WISE), there is no non-recurring cost.)
- Coordinated Conversion – A Coordinated Conversion may be requested by the CLEC for Exchange – Basic and Complex UNEs if it wants to establish a specific appointment for the completion of the service order. Verizon contacts the CLEC for authorization to proceed prior to beginning work on the order, and contacts it after work is complete. This service includes only the additional costs caused by Coordinated Conversion and is in addition to the cost of the underlying LSR. The cost is per occurrence.

The NRC study develops costs for three steps required for a coordinated conversion:

Process 1 – identifies the costs for the NOMC service representative’s call to provisioning to establish the time of the conversion and to set the appointment.

Process 2 – identifies the incremental costs of the Facility Assignment Center (FAC) personnel and Central Office Technician(s) to coordinate and cut the ordered UNEs in conjunction with any outside plant work at the scheduled appointment time. There is an “Additional Cost” that applies for each delay of 15 minutes caused by the CLEC, e.g., if the start of the conversion is delayed beyond the end of the scheduled time or if the CLEC delays the conversion once it is underway.

Process 3 – identifies the costs of the field technician to coordinate and cut the ordered UNEs in conjunction with the central office and FAC personnel at the scheduled appointment time. There is an “Additional Cost” that applies for each delay of 15 minutes caused by the CLEC.

- Hot Cut Coordinated Conversion – This service is the Coordinated Conversion mentioned above with the added feature that the CLEC, the Verizon coordinator and the Verizon technicians remain on a conference call for the duration of the service order completion process. Each step of the process is completed sequentially following authorization from the

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CLEC. Because there is no way for Verizon to estimate or control the amount of time required for a Hot Cut Coordinated Conversion, the cost developed is for a conversion lasting up to one hour. Additional costs will be incurred for each quarter hour thereafter at Verizon's Loaded Labor Rates for the Verizon employees involved.

- Expedite – An Expedite refers to a request by a CLEC to advance the completion of the service order earlier than the next standard Due Date that is normally available. Instead of relying on the automated system for work schedule, an Expedite requires a manual appointment setting process in which NOMC personnel must contact the Division Resource Management group to determine if the earlier completion interval is feasible. In addition to the costs shown in this study, overtime charges may apply if the work is done outside of normal installation work time periods as authorized by the CLEC.

Description of the UNEs

Following is a description of each UNE included in this NRC study.

Unbundled Loops

Unbundled loops extend from a Verizon central office up to the demarcation point at an end user's premises.

2-wire Analog Loop is a voice frequency transmission facility suitable for the transport of analog voice signals between approximately 300 Hz to 3000 Hz, with line loss levels not to exceed 8.5 dB. A 2-wire Analog Loop may include load coils and bridged tap, as well as carrier derived facility components such as pair gain applications and loop concentrators/multiplexers. The 2-wire Analog Loop is an Exchange – Basic UNE.

4-wire Analog Loop is a voice frequency transmission facility suitable for the transport of analog voice signals between approximately 300 Hz to 3000 Hz, with line loss levels not to exceed 8.5 dB. A 4-wire Analog Loop may include load coils and bridged tap, as well as carrier derived facility components such as pair gain applications and loop concentrators/multiplexers. The 4-wire Analog Loop is an Exchange – Basic UNE.

Note: Verizon does not guarantee data modem speeds on either 2-wire or 4-wire Analog Loops.

2-wire Digital Loop is a 2-wire transmission facility capable of transmitting digital signals up to 160 Kbps with no greater line loss than 38 dB end-to-end measured at 40 kHz without loop repeaters. Dependent upon loop make-up and length, midspan repeaters may be required; in which case line loss levels will be no greater than 76 dB at 40 kHz. In addition, a 2-wire Unbundled Digital Loop, dependent upon loop make-up, may be configured to support Enhanced Copper Technologies (ECTs) such as ADSL. When configured in this fashion, these loops must be provisioned over copper facilities that contain no load coils and minimum allowable bridged tap. The 2-wire Digital Loop is an Advanced/Special – Basic UNE.

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4-wire Digital Loop is a 4-wire copper facility suitable for the transport of digital signaling. This loop type will contain no load coils and minimum allowable bridged tap. A 4-wire Digital Loop may be used by a CLEC to provision services such as ISDN- PRI or HDSL. The 4-wire digital UNE is not available where Verizon has provisioned its local network utilizing Digital Line Concentrators (DLCs). Verizon does not supply the electronics associated with these service types. The 4-wire Digital Loop is an Advanced/Special – Basic UNE.

DS1 Loop is a transmission facility that provides connectivity from the serving central office termination point to the network interface device located at the end user's premises. A DS1 Loop will support a digital transmission rate of 1.544 MBPS and contains no load coils and minimum allowable bridged tap. A DS1 Unbundled Loop includes the necessary electronics to provide the DS1 transmission rate. DS1 Unbundled Loops will be provided only when the electronics necessary to provide the DS1 functionality are currently available for the specific loop being requested. The DS1 Loop is an Advanced/Special – Complex UNE.

DS3 Loop is a transmission facility that provides connectivity from the serving central office DS3 termination point (typically a DS3 patch panel) to the network interface device located at the end user's premises. A DS3 will provide for 45 MBPS digital transmission channels. A DS3 Unbundled Loop offers a CLEC the ability to provision the equivalent of 28 DS1s or 672 DS0s (basic 64 KBPS digital channels). A DS3 Unbundled Loop includes the necessary electronics to provide the DS3 transmission rate. DS3 Unbundled Loops will be provided only when the electronics necessary to provide the DS3 functionality are currently available for the specific loop being requested. The DS3 Loop is an Advanced/Special – Complex UNE.

Subloop Unbundling

Unbundled Subloop Distribution is a transmission path that extends from the Feeder Distribution Interface (FDI), or its functional equivalent, at a Verizon cross-connect box, to an end user customer premises. The NID at the end user premises is included with this subloop element. Subloop Distribution is an Exchange – Basic UNE. Unbundled Subloop distribution can be configured as:

- ◆ *2 -Wire Standard Distribution* is a 2-wire transmission path that may include load coils, bridged tap, etc. This transmission path may include carrier derived facility components (i.e. pair gain applications, loop concentrators/multiplexers).
- ◆ *4-Wire Standard Distribution* is a 4-wire transmission path that may include load coils, bridged tap, etc. This transmission path may include carrier derived facility components (i.e. pair gain applications, loop concentrators/multiplexers).
- ◆ *2-Wire Non-Loaded Distribution* is a 2-wire transmission path without load coils or bridged tap. Dependent upon service technology, loop make-up, and length this facility may require line repeaters.

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- ◆ *4-Wire Non-Loaded Distribution* is a 4-wire transmission without load coils or bridged tap. Dependent upon service technology, loop make-up, and length this facility may require line repeaters.

Unbundled Subloop Feeder is a transmission path that extends from the MDF located in a Verizon central office to the FDI, or its functional equivalent, at a Verizon cross-connect box. Unbundled subloop feeder is an Exchange – Basic UNE. Unbundled subloop feeder can be configured as:

- ◆ *2-Wire Standard Feeder* is a 2-wire transmission path that may include load coils, bridged tap, etc.
- ◆ *4-Wire Standard Feeder* is a 4-wire transmission path that may include load coils, bridged tap, etc.
- ◆ *2-Wire Non-loaded Feeder* is a 2-wire transmission path without load coils or bridged tap. Dependent upon service technology, loop make-up, and length this facility may require line repeaters.
- ◆ *4-Wire Non-loaded Feeder* is a 4-wire transmission path without load coils or bridged tap. Dependent upon service technology, loop make-up, and length this facility may require line repeaters.

Unbundled Customer Serving Terminal (drop) extends from a terminal, such as a pole or pedestal, to the end user premises and includes the NID. The unbundled drop is an Exchange – Basic UNE.

Dark Fiber

Dark Fiber is unused fiber optic cable connecting two points within Verizon’s network. It is considered “dark” because it does not have electronics (i.e., terminating multiplexing equipment, electronic-to-optic conversion equipment, etc.) on either end of the fiber segment. The CLEC provides electronics equipment and signals on the fiber to make it “lit.” Dark Fiber is an Advanced/Special – Complex UNE.

In addition to ordering, provisioning and installation costs, Verizon developed costs for pre-ordering activity for Dark Fiber. Pre-ordering activities are the assessment and evaluation of Dark Fiber availability on a specific network segment. Verizon’s Network Design group determines Dark Fiber availability for interoffice facilities, while the Access Design group determines it for the local loop.

Dark Fiber – Interoffice Facilities (IOF): An unused fiber strand that exists at the fiber splice box, or functional equivalent, located within the central office. Unbundled Dark Fiber – IOF is ordered by CLECs via the ASR process. The service order intervals mirror those for the Dedicated Non-switched Transport UNE. Billing is processed by Carrier Access Billing System (CABS).

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Dark Fiber – Local Loop: An unused fiber strand that exists between the fiber splice box, or functional equivalent, located within the central office, and the fiber splice box or patch panel located within a customer's premises. Unbundled Dark Fiber – Local Loop is ordered by CLECs via the ASR process. The service order intervals mirror those for existing UNE Loop products, and billing is processed by Carrier Access Billing System (CABS).

Dark Fiber – Subloop Feeder: An unused fiber strand that exists between the fiber splice box, or functional equivalent, located within the central office, and the fiber splice box or patch panel at the Verizon Remote Hut/DLC/CEV or accessible terminal. Unbundled Dark Fiber – Subloop Feeder will be ordered by CLECs via the ASR process. The service order intervals mirror those for existing UNE subloop products, and billing is processed by Carrier Access Billing System (CABS).

Dark Fiber – Subloop Distribution: An unused fiber strand that exists between the fiber splice box or patch panel located at the Verizon Remote Hut/DLC, and the fiber splice box or patch panel located at the customer's premises. Unbundled Dark Fiber – Subloop Distribution will be ordered by CLECs via the ASR process. The service order intervals mirror those for existing UNE subloop products, and billing is processed by Carrier Access Billing System (CABS).

Unbundled Ports

A port provides for the Connection of individual loops or trunks to the switching components of Verizon's network. In general, a port is a line or trunk card (and associated peripheral equipment) in a Verizon end office switch which serves as the hardware termination for the end-user's Exchange Service on that switch, generates dial tone, and provides the end-user access to the public switched telecommunications network. Each line-side port is typically associated with one (or more) telephone number(s), which serves as the end-user's network address.

- Basic Analog Line Side Port is a line side switch connection employed to provide basic residential and business type Exchange Service. This port is an Exchange – Basic UNE.
- CentraNet Line Side Port is a line side switch connection employed to provide CentraNet type services. The CentraNet port is an Exchange – Complex UNE.
- ISDN BRI Digital Line Side Port is a Basic Rate Interface (BRI) line side switch connection employed to provide ISDN BRI Exchange service. The ISDN BRI port is an Exchange – Complex UNE.
- ISDN PRI Digital Trunk Side Port is a Primary Rate Interface (PRI) trunk side switch connection employed to provide ISDN PRI services. The ISDN PRI Trunk Side Port is an Advanced/Special – Complex UNE.
- DS1 Digital Trunk Side Port is a trunk side switch connection employed to provide the equivalent of 24 analog ports. The DS1 Digital Trunk Port is an advance/Special – Complex UNE.

A Port includes local switching which provides the basic switching functions to originate, route and terminate traffic, and any signaling required to complete a call.

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Vertical features are optional services provided through software programming in the switch, which can be added on a per-feature basis with applicable costs.

Loop Conditioning

Loop Conditioning is the process of removing Load Coil(s) and/or Bridged Tap(s) from an existing or vacant analog service or pair in order to make the facility capable for use as a line carrying analog and digital transmission signals. The need for the digital transmission signal is due to Line Sharing service that the CLEC will offer to the end user for higher speed connection to the Internet.

Verizon has determined the costs to remove single or multiple Load Coil(s) and/or Bridged Tap(s). Costs are reflected on per cable pair basis as an Initial and Additional Loop Conditioning request on the same LSR and in the same cable.

Line Sharing

Line Sharing is the ability of two different service providers to offer two services over the same physical line, with each provider employing different frequencies to transport voice or data of their respective service. Line sharing consists of an xDSL-based service provisioned by a CLEC and the voiceband service provisioned by the Verizon. Line sharing is an Exchange – Basic UNE.

Network Interface Device (NID)

The NID is the point of demarcation between Verizon's network and the customer's inside wiring. The NID is available to CLECs on an unbundled basis; the NID provides the CLEC a point of connection to the customer's wiring. The NID is an Exchange – Basic UNE.

Interoffice Dedicated Transport (IDT)

Unbundled IDT is the transport facility associated with point-to-point dedicated circuits (special circuits) between Verizon service wire centers (SWC). UNE IDT includes facilities to transport the circuit between the two Verizon SWCs and the equipment required to terminate the inter-office facility (IOF) within each of these Verizon SWCs. IDT is an Advanced/Special – Complex UNE.

CLEC Dedicated Transport (CDT)

CDT is the dedicated transport facility connecting the Verizon SWC to the CLEC's central office location. UNE CDT includes the equipment required to terminate the transport within the CLEC's central office location and within the Verizon SWC. UNE CDT also includes the transport facility between the two locations, but extends no further into Verizon's network than the SWC. The termination of the service at the Verizon SWC is at a DSX (DS3, DS1) or term block (DS0). CDT is an Advanced/Special – Complex UNE.

Signaling System 7 (SS7)

Verizon's SS7 network uses signaling links to transmit routing messages between switches, and between switches and call-related databases. The signaling network includes a link that

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transmits signaling information in packets from the local switch to a signaling transfer point (STP). The link terminates on an STP port. The STP processes information contained in the packets and will:

- Route the call to the terminating end office and establish a call path on the voice network between the switches;
- Or will query a call-related database which returns customer information or call routing instructions to the switch.

Verizon has unbundled its signaling network. The following elements are costed in this study:

- SS7 Links: A Links from end offices to STPs; B Links between STPs; and D Links between STPs.
- STP Port Termination.

The signaling link provides a dedicated transmission path to connect the CLEC location to Verizon's STP. The links are provided in:

- 56 Kbps digital by Dedicated Switched Access Lines (DSALs)
- or DS1 formats by Dedicated Switched Access Transport (DSAT).

The 56 Kbps format provides connection to one port at the STP; the DS1 format provides an equivalence of 24 56 Kbps facilities for connection of up to 24 ports at the STP.

Both the SS7 Links and the STP Port Termination are Advanced/Special – Complex UNEs. The NRCs for the DS1 format and the 56 Kbps SS7 link are identified in the “Trunk Port” section of Network Wholesale Products in the cost worksheets.

Call-related Databases

Call-related databases are used in the signaling network for billing and collection, or for the transmission, routing, or other provision of telecommunications service. Access to Verizon's call-related databases, such as Line Information Database (LIDB) and Toll-free Calling Database, is provided through the physical Connection at the STP.

Advanced Intelligent Network (AIN) Platform and Architecture

Unbundled AIN is a product offering that allows the CLEC to take advantage of Verizon's AIN infrastructure so that it may provide AIN services to its end users. Due to the complexity and number of options for AIN platform, the CLEC must submit a bona fide request (BFR) for unbundled AIN elements; there are no NRCs for AIN platform in this study.

Entrance Facilities

Entrance facilities provide a dedicated facility between a CLEC's POP and one or more end user locations. Entrance Facilities may be HiCap (DS1 or DS3) or lower capacity facilities (DS0). The DS1 and DS3 entrance facilities are Advanced/Special – Complex UNEs. The DS0 level entrance facility is an Advanced/Special – Basic UNE. The NRCs for entrance facilities are in the Network Wholesale Products section of the cost worksheets.

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Enhanced Extended Link (EEL)

The combined elements that make up EELs are unbundled dedicated transport, multiplexing (if required), and unbundled loops. EELs do not require a collocation arrangement at each end office. The Enhanced Extended Link is an Advanced/Special – Complex UNE. The NRCs for EELs are in the Network Wholesale Products section of the cost worksheets.

UNE-P

Unbundled Network Element Platforms are combinations of unbundled ports, unbundled shared transport, and unbundled loops. These platforms will provide CLECs with residential and business local exchange service capability.

UNE Basic Analog Voice Grade Platform is an Exchange – Basic UNE that consists of the following components:

- 2-Wire Analog Loop or Complex Non-digital Loop
- Basic Analog Line Side Port
- Shared Transport

UNE ISDN BRI Platform is an Exchange – Complex Digital UNE that consists of the following components:

- 2-Wire Digital Loop
- ISDN BRI Digital Line Side Port
- Shared Transport

ISDN PRI Platform is an Advanced/Special – Complex UNE that consists of the following components:

- DS1 Loop
- ISDN PRI Digital Trunk Side Port
- Shared Transport

DS1 Platform is an Advanced/Special – Complex UNE that consists of the following components:

- DS1 Loop
- DS1 Digital Trunk Side Port
- Shared Transport

Custom Routing of Operator and Directory Assistance Service

Custom Routing provides the capability for routing of calls originating from CLEC lines to dedicated operator assisted or directory assisted trunk groups and the operator platform designated by the CLEC. A bona fide request (BFR) submitted after completion of an Connection Agreement is required for ordering of Custom Routing Service. NRCs for Custom Routing are for systems modifications, additional switch memory and labor costs for switch programming.

UNE NRC Study Organization

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The UNE NRC study is organized into the following sections – 1) Summary of Costs, 2) Work Group Costs, and 3) OSS, 4) Customized Routing, and 5) Appendices of Data Inputs and supporting workpapers.

Following is the Summary of Costs.