# 3.0 Technical Response

In Volume 1, "Technical," Level 3 is pleased to present our approach to meeting service and equipment requirements specified in the GSA WITS 3 Request for Proposal (RFP), Sections C.1.3.3, C.2, C.4, C.6 and C.7, as well as Sections D, and E. Items within this response are aligned with the instructions in RFP Section L.30.1.3 and evaluation criteria in Section M.2.1 and detail the Level 3 our approach to support the mandatory and optional service and equipment requirements for the GSA WITS 3 Program.

As required by RFP Section L.30.1.3, we framed our description of WITS 3 services within the overall architecture of our solution (Section 3.1). Therefore, our service offerings can be found as follows:

- Voice Services (Section 3.1.1.1.2)
  - WITS 3 Lines
  - WITS 3 Trunks

[redacted]

- Supporting Services
  - WITS 3 Technical Support Services (Section 3.2)
  - WITS 3 Customer Premise Equipment (Section 3.3)

Level 3 is a global provider of telecommunication services and the largest Competitive Local Exchange Carrier (CLEC) operating in the United States. Level 3 built its business principally as a wholesale carrier that provides bandwidth to:

[redacted]

Through organic growth and acquisition, we have greatly expanded our intercity network and significantly deepened our reach into numerous metropolitan markets, especially within the National Capital Region. Additionally, we have expanded our product offering and we now focus on service delivery directly to Enterprise customers as well as continuing to be a leading Wholesale provider of network services.

## 3.1 WITS 3 Architecture and Services (L.30.1.3.1, M.2.1.1, C.2.1.11, Req_ID 867)

Level 3 is primarily known throughout the industry as a premier provider of high capacity transport services, IP, and Voice over IP (VoIP) [redacted] In addition to our CONUS fiber network we have substantial network capacity on redundant, high-speed submarine systems (both owned and leased) connecting Europe to North America. Level 3 leads the industry in Dense Wavelength Division Multiplexing (DWDM), wavelength-based transport services; we are a Tier 1 Internet Service Provider; a leader in the deployment of Multi-

protocol Label Switching (MPLS) services; provider of the highest availability SONET private line services in the industry (consistently more than 99.999%); an innovator in the use of IP technologies for the transport of voice, video, and dial access; and the world's largest provider of carrier-neutral colocation space.

The Level 3 network is designed to achieve maximum network reliability. Each city along the network is served by at least two diverse paths so that a fiber cut along any one route will not isolate any city (or building) from the network. Geographic route diversity is carefully engineered in the long-haul network, metro networks, and to all Gateway entry vaults to ensure maximum separation, with no spurs or crossings [redacted]

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[redacted]

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{this figure has been redacted}

[redacted]

[redacted] will leverage this infrastructure and experience to provide the required WITS 3 lines and trucks as described within Section 3.1.1.1 below.

## 3.1.1 Approach to Ensure the Delivery of High Quality, Secure, and Reliable WITS 3 Services (L.30.1.3.1.1, M.2.1.1.a-c))

As discussed in section 3.1.1.1.1, Level 3's state-of-the-art network architecture ensures that we are able to deliver high quality, secure, and reliable services and equipment to agencies under the WITS 3 contract.

Level 3 proposes to provide the mandatory local voice services as described in the RFP (Section 3.1.1.1.2 of this proposal) and the following optional services:

- Dedicated Transmission Services (DTS) (Section 3.1.1.1.3.1)
- Dark Fiber Services (DFS) (Section 3.1.1.1.3.2)

In addition Level 3 is offering additional services, including advanced Voice over Internet Protocol (VoIP) Services, Network Voice Services (NVS), and Enterprise IP Trunking which are discussed in Section 3.1.1.1.4.

### 3.1.1.1 Level 3 Approach to Providing WITS 3 Services

The following subsections describe our WITS 3 architecture, as well as provide a description of each service and our approach to providing services.

#### 3.1.1.1.1 Description of Level 3 Architecture to Support WITS 3 (C.2.1)

- Level 3 owns and operates a large scale metro network within the NCR. The high level architecture of our network is illustrated in ***Figure 3.1-2.***

**{This figure has been redacted}**

Level 3's metro fiber plant includes over 1,200 route miles of fiber buried in multiple conduits. We own and operate this fiber which enables direct control of our end-to-end network quality. Level 3 is unparalleled in its use of geographically diverse facilities at all levels. We provide diverse entrances into each gateway, diverse laterals in over 95 percent of our on-net buildings, and electronic-diversity in every design. Further, Level 3 does not have any collapsed metro network or rings. Our multiple conduit system allows Level 3 to have empty ducts for future growth, technology insertions, maintenance, and repair. Our diligent engineering, design, and installation processes and procedures have resulted in Level 3 having

significantly fewer service-affecting events – 1/7 the industrial average for metro dark fiber.

Level 3's metro fiber plant is terminated in over 150 "on ramp" point facilities throughout the NCR. A number of these facilities are points of presence (POPs) in Verizon serving wire centers (SWCs) within the NCR that reach a majority of high density Federal locations in Washington DC, Virginia, and Maryland.

We will provide type 2 access from these facilities, i.e., we procure "last mile" connections from the Incumbent Local Exchange Carrier (ILEC) or alternative access providers operating in the same SWC. [redacted]

Our DWDM services provide cost effective, unprotected, high capacity transport to support specific agency applications. For example, agencies can choose to implement private SONET rings over wavelength services because they feature complete protocol transparency including the SONET overhead bytes used in protection switching.

At the next layer in our architecture, metro SONET rings, which employ either Bi-directional Line Switched Ring (BLSR) or Unidirectional Path Switched Ring (UPSR) technology, support a wide range of high availability, protected dedicated transport services:

- DS-1 and DS-3
- OC-3 to OC-192 SONET private lines
- Ethernet private line services

Level 3 will leverage our metro access infrastructure to deliver WITS 3 voice services to agency locations throughout the NCR. Our switching infrastructure includes:

[redacted]

The switching infrastructure proposed will deliver fully compliant and backward compatible WITS 3 voice services to GSA's clients while also providing a clear evolution path to converged IP voice services where and when required by agency needs and objectives.

#### 3.1.1.1.2 Approach to Providing Local Voice Services (C.2.2, Req_ID 874, 875)

Level 3's proposed WITS 3 lines and trunks will be provided through our Lucent 5ESS digital switches, which are among the most reliable switches in the world. The Lucent 5ESS provides critical component redundancy so that no single component failure will cause loss of service. This switching infrastructure has been successfully demonstrated to support Federal customers, and is connected via diverse access paths over Level 3's metro and regional SONET rings, as shown in ***Figure 3.1-3.*** This architecture eliminates single points of failure in the network, with the exception of last mile access circuits. This architecture will meet and exceed the .998 service availability requirements specified in the RFP.

We have several regional 5ESS switching offices that could be used as call servers supporting the NCR. For our initial turn up of service, we will use the three offices identified in ***Figure 3.1-4***. This architecture is robust and geographically distributed to provide redundancy, and resiliency required to deliver high availability voice services. Level 3 has developed an innovative approach to "trunking" these

{This Figure has been redacted}

. {This Figure has been redacted)

[redacted]

**Basic Service Capabilities (C.2.2.1, Req_ID 876, 881)**

Level 3 will provide and comply with all basic service capability requirements, and will deliver and support connections for voice and analog data applications, providing analog data at the highest commercially-available data rates over the life of the contract, while complying with all appropriate standards. This includes all ANSI, IEEE, IETF, Telcordia, and ITU standards.

Level 3 will provide basic capabilities, including access to 311/911; Call Detailed Records (CDRs); Caller ID; intercepts and recorded announcements; line hunting; off-hook time out; operator assistance; primary directory listings; Local Number Portability (LNP), and capabilities listed in ***Table 3.1-1*** (C.2-2 and C.2-3 in the WITS 3 RFP).

### Features (C.2.2.2, Req_ID 882)

Level 3 will support and provide all voice services features required by the RFP under the WITS 3 contract, which will ensure full service continuity during and after transition of the WITS 3 contract. Table 3.1-2 provides a list of all voice service capabilities and features offered by Level 3 under the WITS 3 contract.

| Capability (C)/Feature (F) | WITS Line | WITS Trunk | Notes |
|---|---|---|---|
| Additional Directory Number | F | | [redacted] |
| Automatic Call Back | F | | |
| Automatic Route Selection | C | | |
| Backup of ISDN PRI Shared D Channel | | F | |
| Billing Account Codes | C | | |
| Blocked Exchanges | C | C | [redacted] |
| Blocking of Caller Paid Information Phone Numbers | | F | [redacted] |
| Blocking of Selected Numbers | C | | |
| Call Consultation | C | | |
| Call Forward – Busy | C | | |
| Call Forward – Don't Answer | C | | |
| Call Forward – Variable | C | | |
| Call Forwarding – Off-Net | C | | |
| Call Hold | C | | |
| Call Hunting | C | | |
| Call Pick-Up | C | | |
| Call Trace | C | | |
| Call Transfer | C | | |
| Call Waiting | F | | |
| Calling Number Suppression | C | | |
| Class of Service (COS) | C | | |
| Computer Security Access (USA) | | F | |

| Capability (C)/Feature (F) | WITS Line | WITS Trunk | Notes |
|---|---|---|---|
| Customized Group Dialing Plan | C | | |
| Customized Intercept and Recorded Announcement | C | | |
| Data Call Setup | C | C | [redacted] |
| Data Hot Line | | C | |
| Data Line Privacy | | C | |
| Dial Tone Denial | C | | |
| DID Number Block Assignment and Maintenance | | F | |
| DID/DOD two-way | | F | |
| DID | | F | |
| DOD | | F | |
| Directory Assistance | F | F | |
| Distinctive Ringing | F | C | |
| Dual Service | F | | |
| Flexible Disconnect, Both/Either Party | | C | |
| Foreign Central Office Service | F | F | |
| Foreign Exchange Service | | C | |

| Capability (C)/Feature (F) | WITS Line | WITS Trunk | Notes |
|---|---|---|---|
| | | | [redacted] |
| Hot Line | C | | |
| Intercom Dial | C | | |
| Message Waiting Indication | C | | |
| Multiple Appearance Directory Number | F | | [redacted] |
| Multi-Appearance Pre-selection and Preference | C | | |
| Outgoing Trunk Group Access Denial | C | | |
| Privacy | C | | |
| Retention of Current Telephone Number | C | C | |
| Shared ISDN PRI D Channel | | F | |
| Six-Way Conference Call | F | C | [redacted] |
| Software Reconfiguration by Customer | C | | |
| Speed Calling, One Digit | C | | |
| Speed Calling, Two Digit | C | | |
| Three-Way Conference Calling | C | | |
| Tie Trunk | | F | |

| Capability (C)/Feature (F) | WITS Line | WITS Trunk | Notes |
|---|---|---|---|
| Trunk Group Denial | | C | |
| User Security Access | C | | [redacted] |
| Vanity Number | | F | |
| Voice Mail | F | | |

**Table 3.1-1 (C.2-3): VS Basic Capabilities and Features**

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**Performance (C.2.1.9, C.2.2.3, Req_ID 850)**

Level 3 will be responsible for all aspects of the QoS, security, interconnectivity, and interoperability of services between WITS 3 SDPs, and will deliver services at a performance level equal to or greater than what is available commercially. Level 3 will also meet all performance goals, and will monitor our service performance through Level 3's Network Operations Center (NOC) using the following tools to maintain contractual performance:

[redacted]

**Interfaces (C.2.2.4, Req_ID 889)**

Level 3 will support and provide all User-to-Network Interfaces (UNI) as required by the RFP and as listed below. The WITS 3 interfaces for each service are consistent with current commercial standards, as already implemented within the Government.

[redacted]

[redacted]

#### 3.1.1.1.3 Approach to Providing Optional Services

Within this section Level 3 provides our approach to offering optional DTS and DFS services as described in Sections C.2.4 and C.2.8 of the WITS 3 RFP.

##### *3.1.1.1.3.1 Dedicated Transmission Services (DTS) (C.2.4)*

[redacted]

[redacted]

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***Basic Service Capabilities (C.2.4.1, Req_ID 911, 913)***

Level 3 will offer the DTS services as required in Section 2.4.1 of the WITS 3 RFP. Our metro private line service provides a point-to-point, dedicated connection between service delivery points (SDPs) within the NCR. "Dedicated" means that a customer can use the entire useable bandwidth for their exclusive use (24X7). Level 3 metro private line service is protocol-agnostic and can support voice, data, video imaging, and any related applications [redacted]

The Level 3 OWS (DWDM) is a bi-directional, point-to-point offering that will provide Government agencies the capability to interconnect their offices with dedicated DWDM channels [redacted]

**DTS Architecture**

[redacted]

[redacted]

| Data Rate | How Supported |
|---|---|
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |

| Data Rate | How Supported |
|---|---|
| [redacted] | [redacted] |
| [redacted] | [redacted] |

**Table 3.1-2: DTS Interface Rates**

## Optical Wavelength Service (DWDM)

Level 3's has delivered DWDM [redacted]

The Level 3 DWDM is a bi-directional, point-to-point offering that will provide Government agencies the capability to interconnect their offices with wavelength-based channels at speeds of 2.5 Gbps and 10 Gbps of fully dedicated bandwidth. [redacted] In addition, GSA and their client agencies can enjoy a seamless transition of DWDM from metro to intercity services since Level 3 operates one of the largest combined Intercity and Metro backbones in US. Some of the additional features of Level 3's DWDM offering are:

[redacted]

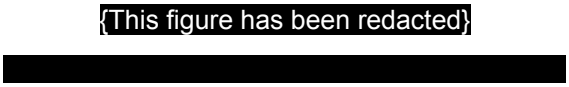
- Our network is future proof: With extra conduits in place to house the next generation of fiber, and ownership of the necessary real estate and power to accommodate the next generation of optical equipment, we offer a compelling migration path for future services.

**Access Agreements.** If the Government is colocated in Level 3 Gateway facilities, then Level 3 DWDM is just a cross connect away. Level 3 can provide the Government with a mission critical data center facility with easy access to DWDM on the Network, and on other carriers' networks as well since most major carriers have fiber connections to Level 3 Gateways. In nearly all cases the customer will be connected via a cross connect. The connections differ by:

(1) Where the cross connect is located; and

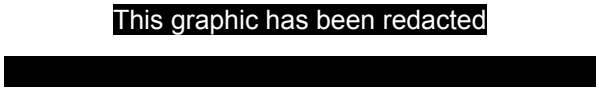
(2) The demarcation point

[redacted]




[redacted]

**Determining Access for Off Net Government Buildings.** To provide DWDM, end-to-end fiber connectivity is required. In many cases the Government agency buildings are not currently fiber-connected to the Level 3 Network. As part of our WITS 3 offering, Level 3 will conduct preliminary engineering analysis and cost estimating for these buildings, per agency request. As a standard process, Level 3 investigates multiple options including: new construction, purchasing third party dark fiber, leased wavelengths from a third party, and combinations thereof.




**Determining Access for Off Net Government Buildings.** To provide DWDM, end-to-end fiber connectivity is required. [redacted] As part of our [redacted]

[redacted]

**Technical Capabilities.** [redacted]

the exception of the framing bytes A1, A2, B1 and J0. Protected wavelength services, if required, can be supported on an individual case basis.

**Geographic Diversity.** Full geographic diversity is maintained in both intercity and metro networks. The intercity and metro networks also support geographic diversity in a dual-site delivery and single metro hub delivery in accordance with RFP. Protected CONUS and metro wavelengths are also supported.

***Features (C.2.4.2, Req_ID 921)***

**Multipoint Connection Capabilities**. Multi-point connection is not a commercially available service as defined by GSA in Section J.2 Glossary of Terms. This service is only available to Government customers through the FTS2001 or WITS2001 contract. Level 3 will provide multi-point connection capabilities on an individual case basis as negotiated in the WITS 3 contract or per subsequent task order. .

**Service Assurance.**

Level 3 will provide service assurance at the following bandwidth rates: DS-0, DS-1, DS-3, STS-1, OC-3/3c, OC-12/12c, OC-48, and OC-192 when commercially available. Level 3 will use this feature to improve the availability of DTS circuits as specified below by using SONET's inherent capabilities (see Figure 3.1.6) such as automatic restoration and reconfiguration.

{This figure has been redacted}

The automatic restoration/protection switching occurs within 50 ms of failure detection.

- Availability: Level 3 will provide at least 99.98 percent availability
- Trouble identification: Level 3 will provide trouble identification in less than 20 minutes
- Time to restore: Level 3 will have a time to restore of less than 2 hours in 99.95 percent of the cases.

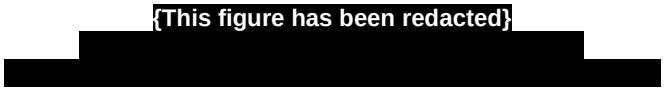
**Transport Route Diversity / Avoidance.** Level 3's current commercial private line offerings include developing special routing considerations on an individual case basis with our customers. Our network was built using physically diverse paths. By choosing diverse routes, circuits are protected against any single failure of equipment and/or against a fiber cut. This initial network design enables Level 3 to support transport diversity for the Government. Two resources that reinforce our ability to maintain diversity are:

- Our Customer Network Planning (CNP) team works daily to design diverse paths for highly reliable networks for our customers. CNP designs with The Level 3 Network as well as third party paths and new fiber path construction in order to meet customer requirements for route diversity and route avoidance.
- [redacted] allows us to demonstrate the level of diversity achievable for any given set of circuits. This tool shows all the fiber paths throughout The Level 3 Network with GPS measured accuracy.

**Transport Diversity.** Diversity is a constant consideration in design of customer networks. Level 3 will purchase dark fiber, build new fiber paths and laterals, splice into existing fiber paths and purchase circuits from third parties to provide additional diversity options for the agency.

Level 3 DTS are routed on rings that have complete path diversity, far exceeding the minimum separation of 30 feet for both the Intercity and Metro Network. When the working path fails, the signal is then routed on the protect path (a physically diverse path with equipment diversity as well). Generally, these rings do terminate in a single Level 3 Gateway.

However, Level 3 has implemented gateway diversity for commercial customers, and will do so for the Government when requested. If the Government wishes to order two diverse DTS circuits to one site, then the working path of circuit 1 will be diverse from the working path of circuit 2. Also, the working path of circuit 1 will be the same as the protect path of circuit 2, and vice versa; see ***Figure 3.1-7*** below. This will be true for both the intercity and metro networks.




If the Government requires more than two diverse paths, we will negotiate such a request on an individual case basis.

**Transport Avoidance** [redacted]

***Performance (C.2.4.3, Req_ID 922)***

Level 3 will support the DTS performance parameters for originating and terminating connections per GSA specifications in the RFP. All commercial standards are already met in all Level 3 installations.

***Interfaces (C.2.4.4)***

Level 3 already supports all of the UTN interfaces specified in the WITS 3 RFP. **Private Line DTS Interfaces.** [redacted] A wide range of speeds are offered: [redacted] These interface connections are primarily standard four-wire Telco handoffs for DS-1, electrical coaxial cable for DS-3, and optical SC fiber connectors for OC-3, OC-12, OC-48, and OC-192. Special Government-specified terminations (e.g., SDPs such as PBXs, Multiplexers, Routers, Video codecs, and Group 4 FAXs) will be served in the same manner, as long as they employ one of the standards-defined interfaces referenced in the RFP.

[redacted]

[redacted]

| [redacted] | [redacted] | [redacted] | [redacted] |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
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| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |

[redacted]

### OWS (DWDM) DTS Interfaces (C.2.4.4)

| Rate | Framing |
|---|---|
| | |
| | |
| | |
| | |

Table 3.1-4: OWS Types Interface Handoff

#### 3.1.1.1.3.2 Dark Fiber Services (C.2.8)

Level 3 offers DFS as the raw, unlit fiber controlled by and connected to the Level 3 network only in that it is part of the conduit and cable system along our routes.

[redacted]

***Basic Service Capabilities (C.2.8.1, Req_ID 977, 979)***

Level 3 has constructed an extensive metropolitan fiber optic network within the [redacted]

Level 3 provides all of the configuration options required by GSA, including point-to-point, route diversity ring/single drops, and optionally star and hybrid configurations. The fiber for these configurations will be terminated at either a Government location Fiber Service Delivery Point (FSDP) or at a Level 3 colocation facility.

When delivering DFS to the Government, Level 3 will use the SMF-28 fiber, which meets all industrial and GSA standards, and with the required number of fiber strands and ducts,negotiated in the contract or as specified in the task order. For example, in all Level 3 installations, we provide additional ducts for future growth, repair, and maintenance. Our SMF-28 fiber supports GSA's required channel count, and is capable of supporting a minimum of 80 DWDM wavelengths or user data with spacing as specified in ITU-TG.6941. The SMF-28 Corning Fiber that Level 3 employs is capable of operating in the "C", "L" and "S" bands, as specified. Level 3's gateway locations provide the ability to add or drop traffic, backup power, lock cabinets, 24x7 highly secure access, and remotely monitor operations, environmental conditions, and security surveillance. In short, all of GSA's DFS requirements and standards are met by using Level 3 as a DFS provider.

## Dark Fiber Routes in the NCR

[redacted]

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{This figure has been redacted}

[redacted]

{This figure has been redacted}

{This figure has been redacted}

**{This figure has been redacted}**

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[redacted]

consult with the Government to determine its specific needs and discuss the viable options and associated costs and risks.

**Fiber Service Delivery Points.** Level 3 DFS meets all applicable standards. Level 3 has high fiber count cables available to provide fibers. We can terminate the dark fibers at fiber distribution panels where the Government directs. If there is new construction required, extra ducts can be installed to enable quick and inexpensive new fiber installations. Any construction efforts required will be negotiated after contract award to meet the unique requirements of the Government agency.

Level 3 will provide the fiber count that is specified by the agency. If the network design involves a Level 3 lateral pull or new construction, we will install a larger count cable than what is required (typically, 24 or more fibers). This enables us to quickly provide additional fibers to the Government, if required.

**Channel Count.** Level 3 has deployed Corning SMF-28 fiber which is capable of [redacted] by the equipment vendor the Government selects to light the dark fiber. Corning SMF-28 both supports C, L, and S bands.

**Gateway and Colocation Facilities.** Level 3 employs [redacted]

[redacted]

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[redacted]

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[redacted]

[redacted]

[redacted]

**Amplification.** [redacted]

**Fiber Deployed.** [redacted]

[redacted]

**Optical Characteristics.** Level 3 will meet the optical characteristics required to support agency metro applications as identified in C.2.8.5.

**Attenuation Coefficient.** For metro networks, 0.30 dB/km is the maximum attenuation, as specified by the fiber manufacturer, for standard-grade fiber. The newer metro fibers will meet the <0.25 dB/km specification. For the intercity network, based on measurements for over 400 spans, <0.235 dB/km is achievable.

Level 3 does not currently use multi-mode fiber (MMF) in our metro networks. We will purchase the appropriate fiber that meets this specification, when requested by the Government at additional cost. However typically, for MMF, the maximum distances (<1km) are so short that dispersion is far, far more important than optical loss.

**Polarization mode dispersion intra-city network:** [redacted]

We meet the reflectance event. Typically, in the fiber, reflectance events are greater than 60dB. Measurements of approximately 5000 splices on Level 3 intercity LEAF fiber yielded only one splice whose reflectance was less than 70dB, and its value was 69.9dB. All other splices had reflectance of greater than 70dB.

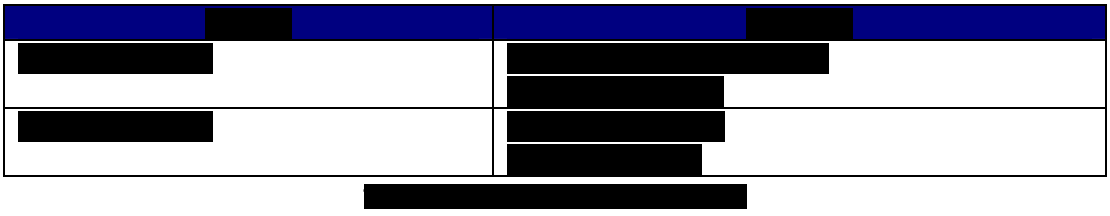
***Features (C.2.8.2, Req_ID 980)***

Level 3 will deliver all GSA's DFS features per GSA specifications.

**Colocation.** Colocation is a standard service provided by Level 3. We operate 70 data centers in Continental U.S. (CONUS), totaling nearly 6.7 million square feet of space. Level 3 gateways provide a choice of cabinets or suites, custom or pre-built configurations, and AC or DC power with access to the full suite of Level 3 services and interconnection to scores of different service providers. Our "Synergy" sites offer carrier-grade DC power, private line, Ethernet, dark fiber, and wavelength services. As a dark fiber customer, the Government will also benefit from colocation services at each of the running line huts along the long-haul network. These offer locked cabinets, suites, and electrical power.

In addition, Level 3 has a standard product offering for remote field services. Our technician services can be purchased by agencies to support "remote hands" requirements.

The colocation facilities are provided as part of our on-net facilities. In addition to the colocation facilities listed in the ***Table 3.1-5*** below, Level 3 will also provide the Government with colocation space in our running line huts along the Level 3 long-haul fiber network (also as part of our on-net facilities). Level 3 will update this list as necessary.



**Dark Fiber Local Loop.** Level 3 can provide a dark fiber connection between GSA, or GSA customer locations and Level 3's SWC or outside plant. Any DFS loop configuration can be designed, planned, implemented, on an individual case basis (ICB).

**Diverse Route Single and Dual Drop** [redacted] There are no collapsed intercity or metro rings or single points of failure in the Level 3 Network. To ensure diversity, the network offers two or three separate entrances into each [redacted] and a multi-conduit system that allows Level 3 to have an empty duct for maintenance and repair. Single and dual drop designs will be supported on the Level 3 route-diverse network. On an individual case basis Level 3 can construct additional laterals to specified Government locations.

**Off-net Laterals (Optional).** A Level 3 core competency is network construction. Level 3 built its own intercity and metro networks from inception, which included burying the conduits and blowing the fiber. Building laterals, therefore, is also a Level 3 core competency, which we perform nearly every day. Level 3 will provide off-net laterals to the Government (as required):

- Between our own existing fiber and an agency's premises to the nearest splice point
- On our own newly built lateral between an agency's premises to the nearest splice point
- From the agency to third-party fiber

If it becomes necessary to procure the fiber from a third party to reach a certain Government location, Level 3 will procure the fiber on the Government's behalf.

**Ducts.** Level 3 will support any specified number of duct conduits on an individual case basis, or as negotiated in the WITS 3 contract, or subsequent task order.

**Intercity Connectivity.** Level 3 will support DFS connections between any specified Agency or Agencies location(s) in the Metro area(s)

[redacted]

### *Performance (C.2.8.3)*

[redacted]

### *Interfaces (C.2.8.4, Req_ID 981, 982)*

[redacted]

[redacted]