VOLUME 1, SECTION 3.14:

PRIVATE LINE SERVICE

3.14 PRIVATE LINE SERVICE (PLS) [C.2.5.1, M.6.1]

This section of our proposal addresses the Level 3 Team's offering to provide Private Line Services (PLS) to Government agency customers through the Networx program. Our service meets the requirements for PLS as defined in Section C.2.5.1 of the RFP.

As described in later sections of this proposal, Level 3's PLS are fully protected point-to-point services built on SONETS Self-Healing Rings (SHRs). Highlights of our PLS offering are provided below and illustrated in Figure 3.14-1, followed by responses to the requirements in RFP Section L.34.1.4.6 as they apply to this service.

Level 3 offers the Government a high quality PLS that includes metro PLS and intercity PLS. The intercity PLS is supported with 4-fiber bi-directional line switched ring (4FBLSR) protection technology, which provides excellent protection for long rings. Metro PLS is supported with 1+1, 2 fiber-BLSR and Unidirectional Path Switched Ring (UPSR) protection, depending on the customer requirements and the number of nodes on the ring. Multiple Digital

Cross Connect Systems (DCS) are used for aggregation and protection of low rate (OC-3 and below) signals. The network is diverse, which improves reliability. All Level 3 private lines are full-duplex, with standards-compliant interfaces at each endpoint. A wide range of speeds are offered: Speeds up to OC-192 are offered today.

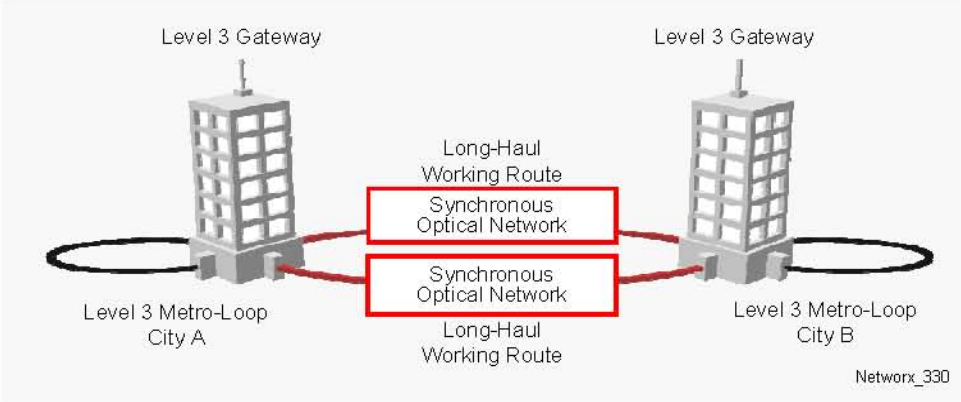

Figure 3.14-1: Level 3's private line services can seamlessly connect points in the same city across the country or around the globe.

3.14.1 Technical Description of Private Line Services

Level 3's Private Line Service offering fulfills the mandatory service requirements for PLS contained in RFP Section C.2.5.1.1. This section demonstrates our capabilities in the following areas:

- Standards
- Connectivity
- Technical capabilities
- Features
- Interfaces

3.14.1.1 STANDARDS [C.2.5.1.1.2]

The Level 3 PLS is compliant with the standards listed in RFP Section C.2.5.1.1.2. The members of our team are active in a variety of industry forums and working groups, such as Internet Engineering Task Force (IETF), the North American Network Operators Group (NANOG) and the American Institute of Electrical Engineers (IEEE) and committed to implementing future standards as technologies are developed and standards are defined and become commercially available.

3.14.1.2 CONNECTIVITY [C.2.5.1.1.3]

Level 3 interoperates with many Local Exchange Carriers (LECs), whether incumbent (ILEC) or competitive (CLEC), and interexchange, or long distance carriers (IXCs). Usually interoperability is uncomplicated because the industry, national and international standards, some of which are cited in RFP Section C.2.5.1.1.2, are rigidly enforced within the industry. Level 3 interconnects with other carriers at standard rates such as T1, T3, OC-3, OC-12, OC-48 and OC-192. SONET interconnects between carriers provide the industry standard optical connection for PLS.

The connections provided for private lines 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 RFP Section C.2.5.1.1.2. In that case, the type of device is irrelevant.

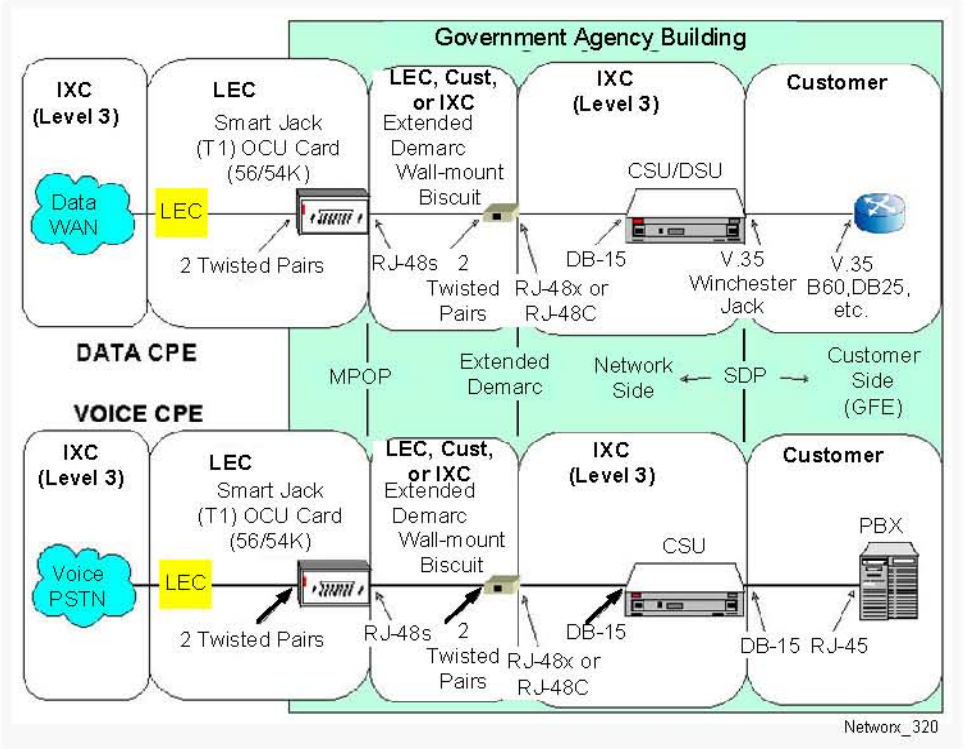

Figure 3.14-2: Typical CPE arrangement for connectivity into The Level 3 Network. (using DS-1 as an example – higher data rates require different equipment)

As illustrated in Figure 3.14-2, inside wiring involves an extended demarcation – the LEC demarcation is referred to as the Metro Point of Presence (MPOP) and is also the default demarcation; the IXC demarcation is the Service Delivery Point (SDP).

This demarcation extension can be done by the LEC, the customer, or Level 3. These extensions can range from several feet to several hundred feet. In actuality, as little as one foot of cable between the SDP and the customer's equipment is an extended demarc. Beyond the SDP, all cables are supplied by the customer. This includes V.35 cables for router connections, as well as CSU-to-PBX cables.

3.14.1.3 TECHNICAL CAPABILITIES [C.2.5.1.1.4]

Level 3's PLS offering to the Government is a fully-mature commercial product. No modifications will be required to meet the RFP requirements.

Our service, illustrated in Figure 3.14-3 uses standard industry Add/Drop Multiplexers (ADM) and wavelength division multiplexing (WDM) equipment, with the appropriate interfaces (DS-3, OC-3, OC-12, etc.). To extend the reach of the Level 3 optical network, Level 3 has deployed metropolitan area fiber networks (MANs) near customer sites. To complete physical connection to the customer site, Level 3 will deploy a metro ADM at the customer site with the appropriate interface card(s) to support the service(s). The metro ADM is connected to the long-haul ADM, if it is an intercity circuit or to another metro ADM if it is a metro area circuit.

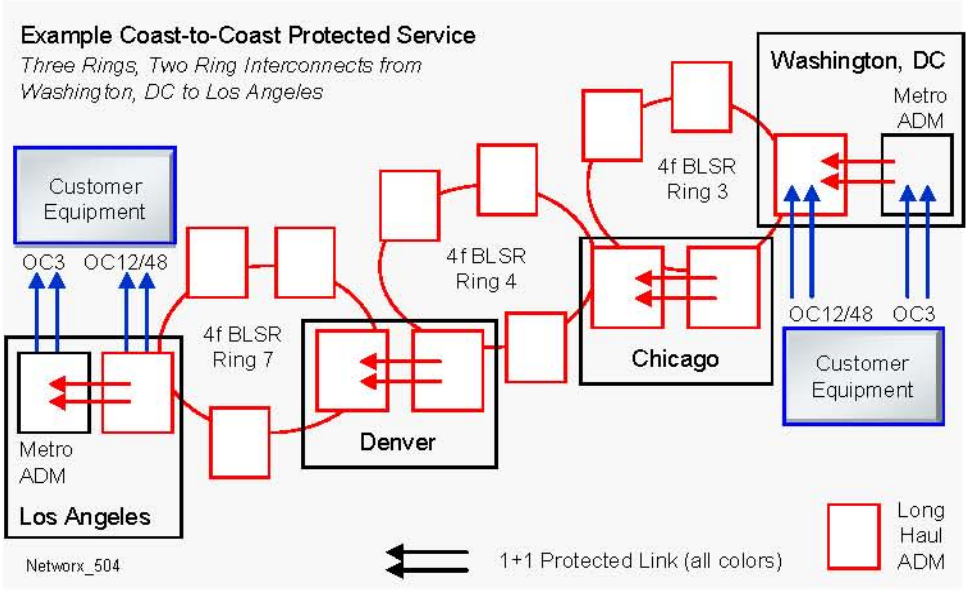

Figure 3.14-3: Example coast-to-coast protected service

A typical intercity PLS circuit will be built using a metro ADM loop to the Government building, then interconnected from the metro ADM to the intercity ADM in the Level 3 POP, travel over the intercity WDM network traversing

multiple ADMs, interconnect to a metro ADM at the far end city, and traverse a local fiber loop ending in another metro ADM at the second Government building. Each of the rings traversed along the route will have automatic protection switching for fault recovery in ms.

After equipment installation at the Government building, the circuit is provisioned as per the Government order, e.g., DS-3 or OC-12 or OC-12c. The customer connection is either protected or unprotected as per the customer order. However, in all cases the circuit is protected from the ADM at the A end to the ADM at the Z end by the Level 3 core network.

3.14.1.3.1 TRANSPARENCY

Transparency is supported by the equipment used for PLS. Any standard interface, as per standards cited in RFP Section C.2.5.1.1.2, can carry any data or any protocol, as long as the interface meets the required standards. The standard transmission protocols, that Level 3 adheres to, assure the transparency of user data and signaling by encapsulating the user's data. Thus the transmission equipment is unaware of the user data and protocols, providing the required transparency to all bit sequences transmitted by the GFP. This is the normal operational mode for commercial ADMs industrywide.

3.14.1.3.2 DATA RATES

Table 3.14-1 lists the mandatory and several of the optional data rates specified for PLS in RFP Section C.2.5.1.1.4 (2), and how Level 3 supports them.

PLS Data Rate	How Supported
DS0 (56 or 64Kbps)	Level 3 will supply network element equipment that supports sub DS-1 speeds facing the Government customer, while using a DS-1 on the line side of the equipment. Level 3 will

PLS Data Rate	How Supported
	provide a DS1 circuit for connectivity to the nearest Level 3 POP. The sub-DS-1 service will be provided through the DS-1.
Fract T1 (2, 4, 6, 8, or 12 adjacent DS0 clear channels over an interface of T1)	Level 3 will supply network element equipment that supports fractional T-1 speeds facing the Government customer, while using a DS-1 on the line side of the equipment. Level 3 will provide a DS1 circuit for connectivity to the nearest Level 3 POP. The sub-DS-1 service will be provided through the DS-1.
T1 (channelized 24 – 56/64kbps or unchannelized 1.536Mbps)	This will be supported by providing the customer with a full rate T1 circuit, provisioned as 24 clear channel DS0s, or unchannelized.
Fract DS-3 (3, 4, 5, or 7 adjacent DS-1's)	Level 3 will supply network element equipment that supports fractional DS-3 speeds facing the Government customer, while using a DS3 on the line side of the equipment. Level 3 will provide a DS-3 circuit for connectivity to the nearest Level 3 POP. The sub-DS-3 service will be provided through the DS-3.
T3 (channelized 28 - 1.536Mbps or unchannelized 43.008 Mbps)	This will be supported by providing the customer with a full rate DS-3 circuit, provisioned as 28 clear channel T1's, or unchannelized, as requested.
OC-3 SONETS (channelized)– 3 OC1 49.536Mbps channels Line Rate 155.52 Mbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-3.
OC-3c SONETS (concatenated) – 148.606 Mbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-3c.
OC-12 SONETS (channelized) – 4 OC-3's at	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to

PLS Data Rate	How Supported
148.608Mbps each - line rate 622.08 Mbps	an ADM port provisioned as OC-12.
OC-12c SONETS (concatenated) – 594.432 Mbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-12c.
OC48 SONETS (channelized) – 4 OC-12's each at 594.432Mbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-48.
OC48c SONETS (concatenated) – 2.377728 Gbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-48c.
OC192 SONETS (channelized) – 4 OC-48's each at 2.488Gbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-192.
OC192c SONETS (concatenated) – 9.510912 Gbps	This optional data rate is supported by providing the customer a fiber pair (or two pairs for protected handoff), connected to an ADM port provisioned as OC-192c.
Subrate DS0 – 4.8, 9.6 and 19.2 kbps	Level 3 will supply network element equipment that supports sub DS0 and DS-1 speeds facing the Government customer, while using a DS-1 on the line side of the equipment. Level 3 will provide a DS1 circuit for connectivity to the nearest Level 3 POP. The sub-DS-1 service will be provided through the DS-1.
Analog – 4 kHz	Level 3 will supply network element equipment that supports a 4 kHz analog interface facing the Government customer, while using a DS-1 on the line side of the equipment. Level 3 will provide a DS1 circuit for connectivity to the nearest Level 3 POP. The sub-DS-1 service will be provided through the DS-1.

Table 3.14-1: Level 3 will support the mandatory and several of the optional

PLS Data Rate	How Supported

data rates specified for PLS.

3.14.1.4 FEATURES [C.2.5.1.2]

The discussion below addresses the requirements of Special Routing, as described in RFP Section C.2.5.1.2.1. Level 3 will deliver all mandatory services listed.

Special Routing

The Level 3 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 described below.

- Our Customer Network Planning team (CNP) works diligently to design highly reliable networks for our customers using diverse paths. CNP designs employ 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] Route avoidance and diversity are both considered simultaneously during the route design

process. Route diversity and route avoidance are typical features of many networks Level 3 has designed for customers. Additional levels of diversity include Point of Presence (POP) diversity and equipment diversity. Diagrams and circuit provisioning records can be provided upon request to illustrate compliance with the diversity or avoidance

[FIGURE 3.4-4 REDACTED IN ITS ENTIRETY]

Transport Diversity: Level 3 PLS are routed on rings that have complete path diversity, far exceeding the minimum separation of 30 feet for both the Intercity and Metro networks. When the working path fails, the signal is then routed on the protect path, a path with physical and equipment diversity. Level 3 will assure the desired level of diversity and avoidance is maintained across the entire network connection. If the Government wishes to order two

PLS circuits to one site that are diverse, 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 3.4-5 below. This will be true for both the Intercity and Metro networks.

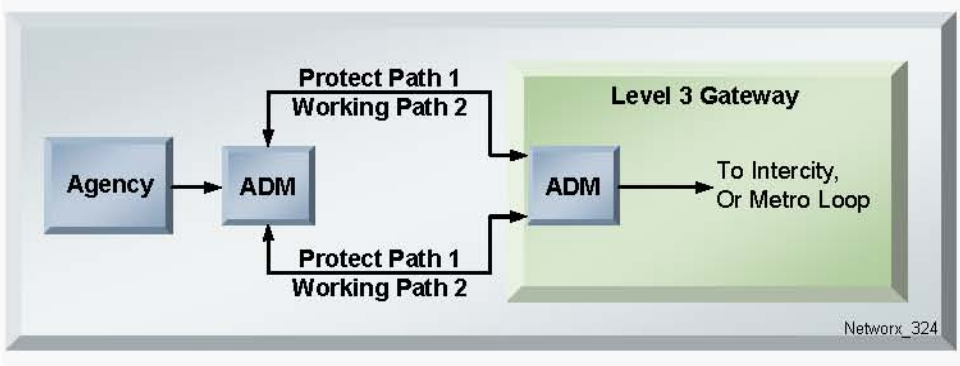

Figure 3.4-5: Diversity of working paths for 2 circuits on the same ring.

More complex diversity and avoidance scenarios - more than two diverse paths – are possible and will be considered on an individual case basis.

Transport Avoidance: The physical routes of The Level 3 Network are illustrated in Appendix A. The agency may order a circuit along any of the paths available, thus avoiding any area or route they wish to avoid. Our provisioning system will then assign a "do not change route" flag to the route selection, which will be used to control any route modifications. A Technical Customer Account Manager will be involved with any proposed modifications to the route to ensure that avoidance is fulfilled.

Route Maps: Level 3 will provide circuit route maps and other relevant information within 30 calendar days of the implementation of Transport diversity/avoidance using the output of our geocoded mapping tool.

3.14.1.5 INTERFACES [C.2.5.1.3]

The Level 3 Private Line Service supports most of the mandatory interfaces specified for PLS in RFP Section C.2.5.1.3.1.

UNI Type	Interface Type and Standard	Data Rate	How Supported
1	ITU-TSS V.35	1.92 Mbps	Level 3 will support these interfaces by providing network element equipment with appropriate interface cards.
2	EIA RS-449	1.92 Mbps	Level 3 will support these interfaces by providing network element equipment with appropriate interface cards.
3	EIA RS-232	19.2 Kbps	Level 3 will support these interfaces by providing network element equipment with appropriate interface cards.
4	EIA RS-530	1.92 Mbps	Level 3 will support these interfaces by providing network element equipment with appropriate interface cards.
5	T1 (with ESF) (Std: Telcordia SR-TSV-002275; ANSI T1.403	1.536 Mbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice.
6	T3 (Std: Telcordia GR-499-CORE; ANSI T1.102)	43.008 Mbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice.
11	SONET OC-3 (Std: ANSI T1.105 and 106)	148.608 Mbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
12	SONET OC-3c	148.608 Mbps	Standard port interface available on

UNI Type	Interface Type and Standard	Data Rate	How Supported
	(Std: ANSI T1.105 and 106)		Level 3 commercial transport equipment, as is standard industry practice
13	SONET OC-12 (Std: ANSI T1.105 and 106)	594.432 Mbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
14	SONET OC-12c (Std: ANSI T1.105 and 106)	594.432 Mbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
15	SONET OC-48 (Std: ANSI T1.105 and 106)	2.377728 Gbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
16	SONET OC-48c (Std: ANSI T1.105 and 106)	2.377728 Gbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
17	SONET OC-192 (Std: ANSI T1.105 and 106)	9.510912 Gbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
18	SONET OC-192c (Std: ANSI T1.105 and 106)	9.510912 Gbps	Standard port interface available on Level 3 commercial transport equipment, as is standard industry practice
19	RJ-x (e.g., RJ-11/45)	4/7.5 kHz	Level 3 will support these interfaces by providing network element equipment

UNI Type	Interface Type and Standard	Data Rate	How Supported
			with appropriate interface cards.

Table 3.14.-2: Private Line Service Interfaces

Level 3 delivers PLS UNI interfaces by purchasing commercially available interface cards from our equipment vendors, and installing them into the ADMs at the customer site. Then, the circuits are provisioned as per the Government order, e.g., as a DS-3, an OC-12, or as an OC-12c. Low rate circuits are multiplexed together inside the ADM, and perhaps further groomed in a DCS. The ADMs are line side protected as for all PLS. The circuits are provisioned from end to end through the appropriate metro and intercity equipment, and the ordered interface is provided to the agency at both ends.

3.14.2 Required Performance Metrics [C.2.5.1.4]

In accordance with RFP Section C.2.5.1.4.1, Level 3 will deliver performance meeting the metrics (as clarified in this proposal) shown in Table 3.14-3 for our PLS offering.

Key Performance Indicator (KPI)	Service Level	Performance Standard (Threshold)	Acceptable Quality Level (AQL)
Availability (POP-to POP) [optional]	Routine	99.8%	≥ 99.8%
	Critical (Optional)	99.98%	≥ 99.98%
Availability (SDP-to-SDP)	Routine	99.4%	≥ 99.4%
	Critical (Optional)	99.98%	≥ 99.98%
Time to Restore	With Dispatch	8 hours	≤ 8 hours
	Without Dispatch	4 hours	≤ 4 hours

Table 3.14-3: PLS performance metrics

3.14.2.1 AVAILABILITY

Network reliability was a key consideration in the design and construction of The Level 3 Network. It uses mostly rail right-of-ways (ROW) and is buried, wherever possible, to a minimum of 42 inches to reduce fiber cuts. This has resulted in a low cut rate and, thus, high service availability for our customers. In addition, our PLS equipment employs SONETS 4FBLSR on the long-haul network and other SONETS standard protection schemes in the metro network, as appropriate, for highly reliable protected services with <100ms restoration times in the event of any failures, equipment or fiber. Thus, for CONUS services The Level 3 Network will meet the Acceptable Quality Level (AQL) objective cited in C.2.5.1.4.1 for both routine and critical users of PLS, POP-to-POP and SDP-to-SDP.

[redacted]

[FIGURE 3.14-7 REDACTED IN ITS ENTIRETY.]

Because Level 3 owns and operates one of the largest facilities-based telecommunications networks, we have direct control over performance and quality. The diversity of our underlying physical network, as well as our fully mirrored 24x7x365 NOCs, enables us to deliver consistently high availability.

3.14.2.2 TIME TO RESTORE

The first level of PLS service restoral – to the backup path – takes less than 100ms. Restoral of failed equipment to normal operations depends on equipment sparing, supplies and field staffing. Level 3 has contracts with all its suppliers for 24-hour Return Material Authorization (RMA) and local sparing for all service critical components to speed repairs of failed cards. Level 3 has technicians strategically positioned throughout the country, on call 24x7 to repair equipment and fiber at remote sites and along remote

routes. Likewise, spare components are distributed throughout the network in Level 3 POPs. In the event of an equipment issue at an un-manned, remote facility, the technicians pick up the equipment in the POP, or an equipment depot, and drive it to the site. This enables Level 3 to provide short time to restore and to improve customer network availability.

3.14.3 Proposed Service Enhancements

Level 3 does not intend to exceed the AQLs in the KPIs at this time but would like to reserve the ability to do so with performance improvements that may be attained through the introduction of new technology. Level 3 believes in continuous improvement and will always strive to provide the highest quality, available services.

3.14.4 Experience Delivering Private Line Service

The agencies will benefit from having the (3)Enterprise team as their partner for PLS in the same way many of the top companies in the US and Europe have benefited from their choice of Level 3 as their partner:

[redacted]

[redacted]

Individual agencies using Networx will need a partner that understands their challenges and can help solve these issues in creative ways. Level 3 has a strong history of solving such challenges:

- Supported the launch of a next-generation data service and met aggressive growth forecasts for a large wireless operator
- Planned a migration plan for a major global carrier's live traffic from its own dark fiber-based network to Level 3's lit service
- Deployed lower-cost transport design supporting rapidly growing voice, data, and mobile services for a leading wireless provider
- Designed an out-of-region solutions for a European PTT's MPLS-based service expansion into the United States

- Designed a network with a systems integrator for the financial industry that supports highly mission-critical financial transactions nationwide

3.14.5 Access Arrangements

Access arrangements will vary depending on the agency site. On-net sites will have fiber connecting to a Level 3 POP, with ADMs at each end. To provide access between the agency site and The Level 3 Network, we will investigate constructing new fiber routes, purchasing third party dark fiber and leasing off-net PLS from another service provider. In those cases where third party fiber is employed, industry-standard KPIs/AQLs will be required from the supplier so that industry best practices are supported.

Where fiber connectivity is not a viable option, Level 3 can lease private line services from another service provider and incorporate them into the Level 3 solution. These services would terminate with Level 3-owned ADMs to deliver the PLS. Figure 3.14-8 shows the flexibility Level 3 has in providing access arrangements.

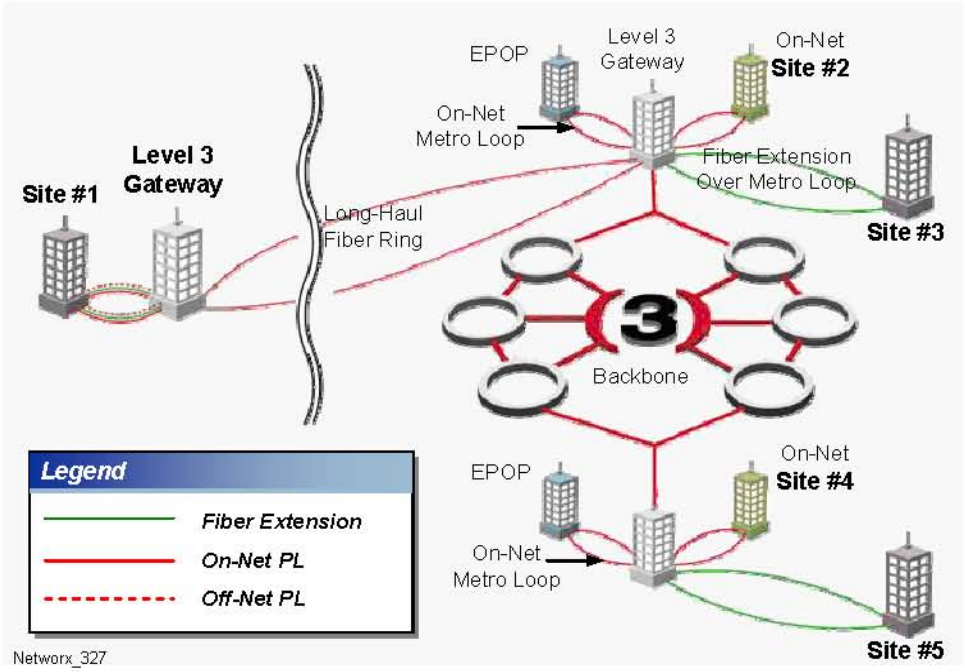

Figure 3.14-8: Level 3 access arrangements are very flexible numerous sites can be connected in numerous ways

3.14.6 Monitoring and Measuring KPIs and AQLs

This section describes the Level 3 approach to ensuring compliance with the Government-specified KPIs and AQLs for PLS as defined in Table C.2.5.1.4.1, Private Line Services. In addition to collecting performance data, Level 3 must demonstrate to the Government that we are, in fact, performing within the specified KPIs/AQLs.

For the initial turn up of the circuit, a bit error rate (BER) test is performed end-to-end. If the test results are satisfactory, then the circuit is turned over to the Government. The KPIs for PLS are measured over time in service of the circuit: availability and TTR.

Section 2.2.3 of this proposal describes the Level 3 Transport Management Infrastructure and operations team, which is responsible for

monitoring and managing our PLS offering. Below is a summary of the specific tools used by our NOC for comprehensive visibility of numerous network elements associated with PLS and the ability to accurately measure AQLs for the applicable KPIs.

- **Clarify:** Trouble ticketing system. All relevant alarm data including diagnostic network information is included in the body of the trouble ticket. The trouble ticket data is updated throughout the lifecycle of the event by the Level 3 Service Management Staff. Details, including all alarms and staff notes, are available for view on-line via our (3)Enterprise portal.
- **TrailBlazer:** The Level 3 user interface for service activation and for troubleshooting transport services.
- **Ops Automation (OA):** A custom built application developed and used by Level 3 to automate network monitoring and management. The system monitors and manages all alarms received across the network through the Network Topology Viewer database (NTV). Ops automation evaluates the alarms and correlates them to a customer's service using the object models created and maintained in TrailBlazer.
- **Network Topological Viewer (NTV):** The single interface where all transport faults are aggregated and correlated to customer services. NTV shares information with our network configuration (TrailBlazer), Trouble-Ticketing (Clarify) and Ops Automation systems.

The KPIs measured for PLS are described below.

- **Availability:** The percentage of minutes a customer's physical access port is able to send and/or receive traffic in a given month. Availability is calculated in the following manner:

$$\text{Availability} = \frac{\text{RI(HR)} - \text{COT(HR)}}{\text{RI(HR)}} \text{ X } 100$$

Unavailability is calculated by the total number of minutes an access port is unable to send and/or receive traffic over the course of a month. Unavailable minutes are determined via trouble tickets submitted by the customer.

- **Time to Restore:** Level 3 measures the Time to Restore (TTR) as the customer-facing time to restore service to the customer. Our metric represents the gross internal performance of our service management teams. Specifically, the duration of an unexcused outage on a service port would be measured from the time a trouble ticket is opened to the time that service is restored.

  Level 3 provides the Government an insight into the performance of Level 3's proposed (3)Enterprise services using the Level 3 Networx web portal.

3.14.7 Handling Time-Sensitive Traffic

Handling time-sensitive traffic as specified in RFP Section L.34.1.4.6.(i) is not applicable to PLS. PLS is supported through the use of dedicated bandwidth services with fixed delay and bit rate. The customer has full access to the entire bit rate at all times, with a fixed latency. Traffic loading on The Level 3 Network has no impact on a PLS circuit.

3.14.8 Integrated Access for Different Performance Requirements

Our approach for providing integrated access to locations that support customer applications with different performance requirements is described below.

Level 3 network access is provided through ADMs, over Level 3 dedicated fiber links. Additional services can be provided over the same fibers that are supporting PLS, by deploying additional equipment. ADMs with appropriate interfaces for the different services required by the Government will be deployed as necessary for the services ordered. They will use different fibers or different wavelengths on the same fibers, going to the site. They will not interfere with each other in any way. The ADM bandwidth will be designed to enable the various services required for the site.

Level 3's services are based on delivery over the same network – sharing physical infrastructure, but not sharing network bandwidth. The Level 3 system supports various classes of service to assure all traffic is handled as required for high bandwidth services. Later sections of this proposal discuss this topic in detail.

3.14.9 Infrastructure Enhancements and Emerging Services

This section describes the approach for incorporating infrastructure enhancements and emerging services that Level 3 believes are likely to become commercially available in the timeframe covered by this acquisition, including a discussion of potential problems and solutions.

Level 3 is committed to providing all customers with access to the latest technology development and enhancements for both hardware and software. Changes to systems on The Level 3 Network are not entered into lightly. The permanently established architecture teams (Optical Transport, Data and IP,

Voice) are constantly evaluating new hardware, new software, and new network designs for new features and economic advantage. Once something new demonstrates the potential for significant new capabilities, performance improvements or major cost reductions, it is tested our evaluation laboratory.

We perform rigorous testing and qualifying of both our new offerings and those of our partners. Level 3 has established an elaborate test facility at our corporate headquarters in Colorado. Sections 2.3.3 and 2.3.4 discuss Level 3's testing process prior to deploying new services and enhancements and development process in detail.

Any new deployment parallels existing systems so that no service is impacted by new deployments prior to a significant field trial to iron out any bugs. After this, deployment and service activation on the new hardware/software begins. The previous versions are always available for backup in the event of a significant failure of the new approach.

3.14.10 Network Convergence

Level 3 maintains high traffic flow and quality over our network while handling multiple types of service including data, voice, and video. This is possible because of the underlying architecture of The Level 3 Network and the various labeling, switching, and routing protocols used in the network. Later sections of this proposal discuss network convergence from a Level 3 perspective in detail. However, we do not foresee providing PLS over a converged network. It is far more cost effective to provide high bandwidth PLS point-to-point services over dedicated facilities, as opposed to over an IP pseudowire.

For low speed PLS, this will be an option to consider. Service quality will be guaranteed by following the equipment vendor recommendations for

network configuration based on the loading anticipated for the network, and using the appropriate protocols for the service, with the appropriate priority ranking. The margin of safety for load factor will constantly be monitored to ensure proper operation for all users.

3.14.11 IP and PSTN Interoperability

IP and PSTN Interoperability are not applicable to our PLS offering.

3.14.12 IPv4-to-IPv6 Migration

IPv4-to-IPv6 migration is not applicable to our PLS offering.

3.14.13 NS/EP Functional Requirements

Level 3's approach to satisfying the NS/EP basic functional requirements listed in RFP Section C.5.2.2.1.1 is described in Section 2.5 of this proposal.

3.14.14 Protection of SS7 Signaling

Section C.5.2.4 of the RFP with respect to protection of SS7 signaling systems is not relevant to PLS.

Security of our network and data is significant to both Level 3 and our customers. Section 2.1.2 of this proposal discusses protection of SS7 signaling systems in detail.

3.14.15 National Capital Region Service

Section 2.5.3 of this proposal discusses in detail how the network architecture will satisfy the requirements in RFP Section C.5.2.7 for all of Level 3's proposed services.

3.14.16 Meeting Section 508 Provisions

Meeting Section 508 Provisions as specified in Section C.6.4 of the RFP is not applicable to PLS.

3.14.17 Optional Service Impact on Network Architecture

Private line services are part of Level 3's standard commercial offerings. Providing PLS to the Government under Networx will have no adverse impacts on network architecture or performance.

3.14.18 Optimizing Engineering

Section 3.1.5.1 of this proposal discusses in detail the Level 3 approach for optimizing the engineering of IP-based and optical services.

3.14.19 Service Internetworking

Level 3's vision for implementing service internetworking over a common infrastructure is not relevant to PLS. This topic is discussed in Section 3.1.5.4 of this proposal.

3.14.20 Traffic Model

All Level 3 services use a common network. Therefore, traffic on Level 3's network considers all our proposed services. Traffic related to the Government traffic model and Level 3 is discussed in detail in Section 3.1.4.1 of this proposal.