4.1.7 ASYNCHRONOUS TRANSFER MODE SERVICE (L.34.1.4)

> *Qwest's Networx Asynchronous Transfer Mode Service leverages our converged IP core network to ensure service continuity and a path to next generation services for Agencies.*

Qwest's Asynchronous Transfer Mode Service (ATMS) meets the Networx program's current networking requirements and provides a flexible suite of service offerings for future needs. Qwest's ATMS is fully integrated with our Frame Relay (FR) platform, providing access to our Multi-Protocol Label Switched (MPLS) core network. This architecture makes the Qwest ATMS ideal for seamless integration of customer sites with a broad range of bandwidth requirements and a wide variety of access architectures.

Qwest's ATMS features Virtual Circuit (VC) configurations up to Optical Carrier Level 12 (OC-12) and four Quality of Service (QoS) levels: Constant Bit Rate (CBR), Variable Bit Rate real time (VBRrt), Variable Bit Rate non-real-time (VBRnrt), and Unspecified Bit Rate (UBR). Access is offered over a wide range of bandwidths, from Digital Signal Level 1 (DS-1) through OC-12 including 2xDS-1 up to 8xDS-1.

Qwest's ATMS is global in reach extending directly to Asia and Europe via our multiple international alliances. We already provide service to Government customers and commercial customers throughout the world.

Qwest ATMS is proactively monitored 24x7x365 with the additional capability of reporting statistical and alarm information directly to customers via Qwest's customer-facing Web-based reporting service Qwest Control Networx portal.

Our current Government customers, ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ are equipped to internetwork their Frame Relay Service (FRS) and ATMS because of our converged network

architecture. Our network design allows ATM customer site connectivity to FRS or Internet Protocol (IP) customer sites with access up to OC-12. This "any-to-any" approach and worldwide reach allows our Government customers flexibility and reliability now and the confidence that Qwest can address their needs in the future.

Figure 4.1.7-1 provides an easy reference to correlate the narrative requirement to our proposal response.

Figure 4.1.7-1. Table of ATMS Narrative Requirements

Req_ID	RFP Section	RFP Requirement	Proposal Response
8318	C.2.3.2.4	The performance levels and acceptable quality level (AQL) of key performance indicators (KPIs) for ATMS in Section C.2.3.2.4.1 below are mandatory unless marked optional. The CBR performance metrics in Section C.2.3.2.4.1 are a mandatory requirement for native ATMS. The CBR performance metrics in Section C.2.3.2.4.1 are only mandatory for emulated ATMS if CBR is provided by the contractor.	4.1.7.2

4.1.7.1 Qwest's Technical Approach to ATMS Delivery (L.34.1.4.1)

The Qwest technical approach to providing a fully compliant ATM Service is based on our well established, highly reliable, and secure fiber optic infrastructure, our commitment to our customers by our Operations and Engineering personnel, and our adherence to proven engineering practices. Qwest has fine-tuned processes to research, evaluate, engineer, deploy, and operate new ATM features and functionality.

The sections that follow describe our approach to service delivery and how our approach benefits the Government. We'll also describe how Qwest ATMS will facilitate the Federal Enterprise Architecture (FEA) objectives, how Qwest proposes to address problems that may be encountered in providing ATMS, and how our synchronization network architecture supports ATMS.

4.1.7.1.1 Approach to ATMS Delivery (L.34.1.4.1(a))

Qwest's approach to ATMS delivery is already proven in the successful delivery of ATMS to several Government Agencies. Our ATMS offers a variety of benefits, including high reliability, internetworking with FR and IP-based services, and a broad set of technical capabilities that ensure service continuity for Agencies. Qwest's ATMS supports gateway connectivity to the Qwest IP network and supports federal Agency migrations toward a converged services infrastructure.

Standards-Based, Global Network

In the United States, Qwest ATMS is deployed over Qwest's high speed ATM/FR Network, as shown in ████████████ Qwest's ATM/Frame Relay network comprises a single-tiered architecture based on our installed infrastructure of ████████████████ multi-service switches.
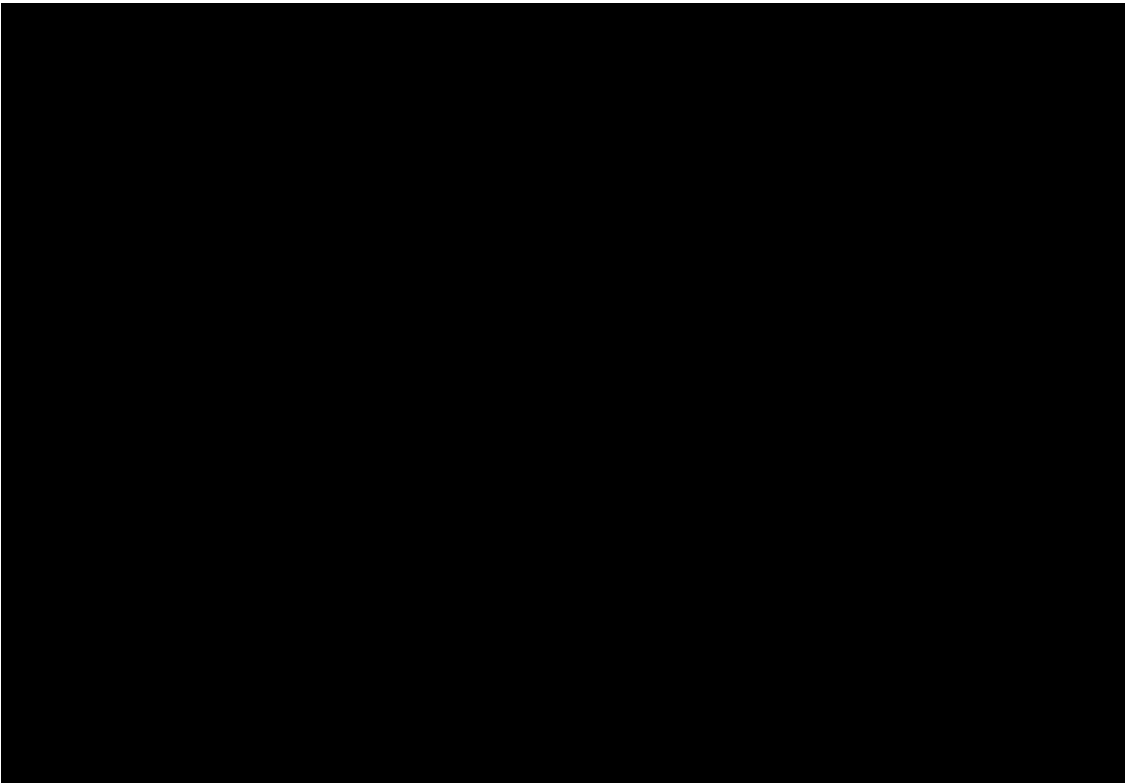
International ATMS uses ████████████████████████ ██████ to provide the global reach for the Networx required jurisdictions and ███████████████████████████ from Qwest's Integrated ATM/FR Network platform. Qwest's leading edge ATM/FR Network comprises a single-tiered architecture, based on our installed base of multi-service switches. The integrated broadband network allows Government customers to integrate FR and ATM networks using a single provider on a reliable backbone infrastructure. Qwest will arrange with the serving Local Exchange Carrier (LEC)/Competitive Exchange Carrier (CLEC) to provide access. Qwest's Operations Group works as a team and has a long-standing relationship with our carrier alliances.

Proven Engineering Practices

Qwest built the network to provide high availability to our customers, and Qwest's performance measures and engineering practices are designed to ensure Key Performance Indicator (KPI) fulfillment and manage growth. Our design procedures, network modeling, and circuit route checks provide a high level of network availability. Other aspects of solid ATMS delivery are Qwest's network design and engineering for edge aggregation devices and Points of Presence (POPs). Multiple links are built to ensure diversity and redundancy. Network modeling and utilization reports are tools used regularly in our engineering practice to ensure reliable ATMS delivery. Additional information on how Qwest Operations and Engineering support the delivery of ATMS can be found in section 4.1.7.4.2, ATMS Measures and Engineering Practices.

Commitment to Customers

Qwest has a long history of supporting ATMS using highly qualified pre-sales engineering, network planning, provisioning, and operations organizations. Our Network Planning Design and Implementation Engineers

adhere to all standards, and they ensure compliance to standards by our network equipment vendors. Qwest has built our network using the precepts of the Telecommunication Management Network Model. Fault-Configuration-Accounting/Administration–Performance-Security testing requirements for all Network Elements (NEs) are based on applicable standards. Qwest's principal engineers are frequent contributors to the standards bodies responsible for FR, ATM, and IP. Qwest currently holds patents for FR, ATM, and IP, with others pending for inventions that improve our customers' experience and streamline our operations. Our engineering staff performs detailed compliance tests on all new equipment or software we deploy in our network, contributing to the outstanding reliability and interoperability of our ATM network.

Qwest's network operations' repair centers are located in ███████████ ███████████████ Provisioning is performed from Qwest facilities in ███ fully test and certify all products, ensuring standards compliance.

4.1.7.1.2 Benefits of ATMS Technical Approach (L.34.1.4.1(b))

Figure 4.1.7-3 presents the features and benefits of Qwest's ATM/FR Network.

Figure 4.1.7-3. Qwest's Approach to Common ATMS Delivery Challenges

Feature	Benefit			
Full internetworking and interoperability between FRS, ATM, and IP services	• Reduced complexity • Greater flexibility for traffic exchange between Agency locations • Ease of migration between services	████████████		
Access to multiple Qwest IP services	Combined access to IPS, MPLS, and Voice over Internet Protocol (VoIP) facilitates migration toward more efficient converged Agency architectures.	████████████		
Multiple International Alliances	More than one service offering in each region means more provisioning choices to improve service delivery.	████████████		

Feature	Benefit			
Qwest's ATMS is highly reliable because we use industry leading, state-of-the-art carrier quality integrated ATM/FR devices	Qwest's Agencies benefit from high quality services derived from a stable, proven network platform.			
Enhanced Integrated Provisioning and Carrier Management business processes	Fast provisioning of services delivers reliable, consistent, on-time service to customers.			

Figure 4.1.7-4 provides Qwest's approach to common ATM service delivery challenges.

Figure 4.1.7-4. Qwest's Approach to Common ATMS Delivery Challenges. *Qwest's total capability ATMS enables Agencies to fully realize Federal Enterprise Architecture objectives.*

FEA Objectives			
Improve utilization of Government information resources			
Enhance cost savings and avoidance			
Increase cross-Agency and inter-Government Collaboration			

4.1.7.1.3 Solutions to ATMS Problems (L.34.1.4.1(c))

Qwest has extensive experience in the evolution and delivery of ATMS. Over the last 11 years, we have encountered and resolved a broad range of problems and have used this experience both to evolve our ATM infrastructure and to establish the customer support and operational capability necessary to address known problems and react to new issues. ▮ summarizes our approach to three key challenges that we often encounter when we deliver ATMS to Government Agencies.

Figure 4.1.7-5. Qwest's Approach to Common ATM Service Delivery Challenges

4.1.7.2 Satisfaction of ATMS Performance Requirements (L.34.1.4.2)

Qwest complies with all of the Networx program's performance requirements for ATMS. Qwest's Network Management System (NMS) collects data from ATMS nodes, including Local Management Interface interaction with ATMS Service Enabling Devices (SEDs). This information is transferred to internal databases, where it is distributed to Qwest's Web-based customer portal, Qwest Control Networx. The Qwest Control Networx Portal will provide our customers with regularly reported performance statistics that will confirm Networx ATM/FRS performance requirements. The same system auto-generates trouble tickets to Qwest's Integrated Alarm Notification Center, ensuring excellent response time and event notification.

Qwest ███████ all of the Networx program's performance requirements for ATMS providers, including those for monitoring and measurement systems, procedures, and evaluation methods.

Performance Levels and AQLs (Req_ID 8318; C.2.3.2.4)

Qwest has responded in the following section to all of the mandatory AQLs of KPIs shown in RFP C.2.3.2.4.1. Qwest is providing a native ATM service and, as described in the section below, fully supports the CBR performance requirements specified in RFP C.2.3.2.4.1.

4.1.7.2.1 ATMS Quality of Service (L.34.1.4.2(a))

Figure 4.1.7-8. Qwest Compliance with Government ATMS Performance Metrics

Key Performance Indicator (KPI)		Service Level	Performance Standard (Threshold)	Acceptable Quality Level (AQL)		
Av (PVC)		Routine	99.925%	≥ 99.925%		
GoS (MAX Cell Transfer Delay Continental United States (CONUS)	CBR	Routine	50 ms	≤ 50 ms		
	VBRrt	Routine	55 ms	≤ 55 ms		
	VBRnrt	Routine	60 ms	≤ 60 ms		
GOS (Max Cell Loss Ratio)	CBR	Routine	1.00E-09	≤ 1.00E-09		
	VBRnrt	Routine	1.00E-06	≤ 1.00E-06		
	VBRrt	Routine	1.00E-07	≤ 1.00E-07		
GOS (Max Cell Delay Variation)	CBR	Routine	1 ms	≤ 1 ms		
	VBRrt	Routine	1.5 ms	≤ 1.5 ms		
Time to Restore		Without Dispatch	4 hours	≤ 4 hours		
		With Dispatch	8 hours	≤ 8 hours		

This is possible because Qwest ATM and FR services are deployed over a redundant, secure, and scalable fiber-optic network infrastructure that yields very high availability rates.

Qwest meets the Time to Restore (TTR) AQLs. The geographically dispersed, redundant Qwest Worldwide Data Operations Centers provide proactive monitoring and network maintenance 24x7x365. Our NMS records all ATM/FRS alarms into our central database continuously, while at the same time, triggering auto-generated trouble tickets. These alarm histories and trouble tickets are available to our operations team for troubleshooting purposes and to our customers through the Qwest Control Networx Portal. Our portal can be used by Agencies to query status, performance statistics, equipment configuration, and fault histories. Qwest also uses this operations infrastructure to provide Event Notification, where we notify our customers of network issues.

Qwest meets the Networx requirements for ATMS in terms of Grade of Service. Performance monitoring statistics are collected continuously for ATM ports and VCs/Switched Virtual Circuits (SVCs). These performance statistics are stored in Qwest's Bulk Statistics Server via Simple Network Management Protocol (SNMP). They are retrievable by both operations personnel and our ATM/FRS customers via the Qwest Control Networx Portal. Our portal can be used by Agencies for querying status, performance statistics, equipment configuration, and fault histories.

Qwest meets Networx requirements for cell transfer delay. This guarantee is based on efficiencies inherent in Qwest's SONET-based multi-service platform and network routing that reduces the chance of delay.

Qwest meets the requirements of ATM service through our ATM Class of Services (CoS). For critical applications requiring higher levels of availability, performance, or restore criteria, ATM's CBR provides the desired quality of service for applications requiring higher levels of availability, performance, or restore criteria. For applications specified as routine, ATM's UBR will satisfy the data transport requirements.

Qwest ATM/FRS provides peak performance and increases network capacity, reduces network complexity, allows for network consolidation, and improves network flexibility, reliability, and security. Qwest's Performance metrics are in alignment with the eight Networx QoS objectives.

4.1.7.2.2 Approach for Monitoring and Measuring ATMS KPIs and AQLs (L.34.1.4.2(b))

Qwest monitors and measures the KPIs and AQLs using automated processes that pull data from the root source, summarize it, and display it using Web tools. These Web tools display actual results and provide a color-coded visual indicating whether performance goals have been achieved. Our approach is to completely automate the Web display of results from data

collection. This ensures that the focus is on responding to performance issues, rather than on performance report generation. The automated reporting process eliminates any question of manipulating the performance data.

For network KPIs, we use Statistical Analysis System to display the Network Reliability Scorecard. This includes the KPIs, the objectives, and a clear graphical representation of objectives met or missed for each reporting period. The scorecard is our tool to show both upper management and network management the current health of the network. The scorecard is reviewed daily at the executive level to ensure proper attention and focus as well as by our network management teams to ensure that Service Quality Levels are consistently met.

For all services that Qwest offers, we use the ▮▮▮▮▮ trouble ticketing system. ▮▮▮▮▮ is a trouble ticketing system that is an industry-leading off-the-shelf commercial application that we have customized to make more effective for our needs. From this system, we collect many useful metrics that we use internally to evaluate and improve our processes, including TTR. The calculation for TTR uses the same business rules as the Government requires for its services.

For ATMS, all of the point-to-point Service Level Agreement (SLA) metrics listed in Figure 4.1.7-8 are assessed on an end-to-end site or site-pair basis. These data elements are used to ensure that all customer data network SLAs are systematically supported by the network. Additionally, key network infrastructure interfaces (e.g., Aggregation Ports/Network-to-Network Interfaces, ATM Trunk Ports) are monitored for Packet/Cell Loss (including errors and discards) and availability, ensuring that no customer SLA issues are traceable to key network infrastructure ports.

For ATM, Qwest ████████████████████████████████ ████████████████ obtain Permanent Virtual Circuit (PVC) Latency, Cell Loss Ratio, Cell Transfer Delay, Cell Delay Variation, Availability, PVC Level Bi-Directional Statistics per Class of Service (Transmit/Receive Bytes/Cells, Transmit Discards), and Port Level Statistics (Average and Average Peak Transmit/Receive Utilization and Discard Rates, Transmit Error Rate).

Qwest network management systems collect data directly from the ATM switches and SEDs via SNMP. This information is transferred to internal databases, where it is distributed to Qwest's Web-based customer portal, Qwest Control Networx Portal. This portal provides customers with regularly reported performance statistics to inform customers that we are meeting their performance requirements.

This information is also shared internally with Qwest's Worldwide Data Operations Center, which continuously monitors the performance of the network. ATMS network utilization is monitored by the Qwest infrastructure group, which is responsible for reporting statistics to the Data Network Planning and Design group.

The primary benefit of emulating Frame Relay and ATM over an IP network is that it provides opportunities for internetworking of Frame, ATM, IP, and Ethernet connected locations over a common transport backbone. In addition, Agencies gain added flexibility regarding access types and access speeds to their network solutions as well as the opportunity to integrate management of previously disparate networks. For example, this internetworking approach allows for phased transformations of legacy networks to more cost-effective next-generation technologies.

In order to maximize flexibility for our current customers, ▬▬▬▬▬ ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬ Qwest currently offers native FR and ATM services.

Qwest offers IP-enabled FR and ATM services by allowing Agencies to purchase a VC to any Agency IP Virtual Private Network (VPN) network or the public Internet. Qwest's next-generation MPLS core network allows Agencies to assign various levels of quality of service to such IP traffic to allow Agency applications priority over other traffic.

4.1.7.2.3 ATMS Performance Improvements (L.34.1.4.2(c))

▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬ In the event an Agency has a specific business need or application problem, Qwest will discuss service enhancements. Qwest will operate in good faith to engineer an ATMS solution to serve unique Agency needs. Qwest is able to leverage our vast ATMS product portfolio, which includes a variety of SED providers and specific ATMS solutions. Through a special combination of vendor solutions and talented engineering capabilities, Qwest will serve an Agency's business needs.

4.1.7.2.4 Additional ATMS Performance Metrics (L.34.1.4.2(d))

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4.1.7.3 Satisfaction of ATMS Specifications (L.34.1.4.3)

Section 4.1.7.3.1 describes how Qwest's ATM network infrastructure enables a broad range of technical service capabilities and supports all of the technical capabilities, features, and interfaces required for Networx ATMS.

Section 4.1.7.3.2 discusses service enhancements. Qwest's homogeneous ATM/Frame Relay network represents a major service enhancement that Qwest already delivers to all of our customers. Agencies will benefit from the ability to connect lower- and higher-volume locations cost-effectively through the already-integrated Qwest network. ███████

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Section 4.1.7.3.3 provides a discussion of Qwest's network and service delivery approach, which is already configured to support our Agencies' ATM needs, reducing the Government's risk.

Section 4.1.7.3.4 provides a discussion of Qwest's long and successful experience in offering FRS and ATMS to commercial and Government clients and provides the Government with a low-risk solution to our FRS and ATMS requirements.

4.1.7.3.1 Satisfaction of ATMS Requirements (L.34.1.4.3(a))

Qwest fully complies with all mandatory stipulated and narrative features, capabilities, and interface requirements for ATMS. The text is intended to provide the technical description required per L.34.1.4.3(a) and does not limit or caveat Qwest's compliance in any way. The following three sections describe how Qwest will satisfy the capabilities, features, and interfaces requirements of the Request for Proposal (RFP).

4.1.7.3.1.1 Satisfaction of ATMS Capabilities Requirements (L.34.1.4.3(a), C.2.3.2.1.4)

Qwest's ATM network infrastructure enables a broad range of technical service capabilities and supports all of the technical capabilities required for Networx ATMS. *Figure 4.1.7-9* summarizes our technical approach to supporting ATMS capabilities.

Figure 4.1.7-9. Qwest's Technical Approach to ATMS Capabilities

ID #	Name of Capability	
1	ATMS over PVCs and/or SVCs	
2	QoS on PVC/SVC basis	
3	Bandwidth on Demand	
4	Provisioning as Pt-Pt VC	
5	Local Access	
6	Agency NMS access to edge switch	
7	PVC/SVC Speeds and Geographic Coverage	

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ID #	Name of Capability		
8	Symmetrical or Asymmetrical PVCs		
9	VP/VC Addressing Support		

Our service approach provides significant flexibility in regard to the provisioning of VCs and in the assignment of PCR, SCR, and MCR for full capacity of the access circuit.

Qwest labs fully test and certify all new products to ensure standards compliance. Our engineering staff conducts detailed compliance testing of all new equipment or software that is deployed in our network to assure the reliability and interoperability of our ATM network.

Qwest's network infrastructure enables a broad range of service technical capabilities. Specifically, Qwest supports all technical capabilities required for Networx ATMS. Our service approach provides significant flexibility in regard to the provisioning of VCs and the assignment of PCR, SCR, and MCR for full capacity of the access circuit.

The services are comprised of local access, ATMS ports, and PVCs or SVCs. In areas where Qwest is not the Incumbent Local Exchange Carrier (ILEC), Qwest will arrange with the LEC/CLEC to provide access. Qwest's Operations Group works as a team and has a long-standing relationship with our carrier alliances.

Qwest ATMS provides Layer 2 switched, connection-oriented transmissions ████████████████████████ Qwest ATMS enables full use of the bandwidth up to the port capacity of the access circuits.

4.1.7.3.1.2 Satisfaction of ATMS Feature Requirements (L.34.1.4.3(a), C.2.3.2.2)

ATMS traffic is transported over the ATM backbone via Qwest's multi-platform switches. As a result, Qwest's ATMS solution is seamless across a reduced level of architectural tiers/hops, allowing multiple access options at a variety of speeds and guaranteed QoS, serviced by a single, integrated, end-to-end NMS.

The advantage to Agencies is the ability to deploy a mixed ATM/FR configuration to cost-effectively connect lower and higher volume locations. The Qwest switches perform the FR-to-ATM internetworking automatically with no additional customer configuration.

Qwest ATMS allows an enterprise to truly realize the power of a converged network through gateway connectivity to the Qwest IP network.

Figure 4.1.7-10 provides an overview of Qwest's technical approach in meeting the required ATMS features.

Figure 4.1.7-10. Qwest's Technical Approach to ATMS Features

ID #	Name of Feature	
1 (Opt.)	Circuit Emulation Services	
2	Disaster Recovery PVCs	
3	Port Diversity	
4	Internet-working Services	
5	Inverse Multiplexing for ATM (IMA)	
6	IP-enabled ATM	
7 (Opt.)	Point-to-Multipoint PVCs	

4.1.7.3.1.3 Satisfaction of ATMS Interface Requirements (L.34.1.4.3(a), C.2.3.2.3)

Qwest's ATMS supports UNI types that meet all the requirements of the Government. At the SDP, Qwest supports a broad range of SEDs for our ATMS to enable an extensive set of interfaces, bandwidth, and signaling capabilities. Physical access methods include copper or fiber, while services such as IP offer Ethernet over Copper, 10BaseT, 100BaseT, 1000BaseLX,

100BaseSX, and Dense Wave Division Multiplexing (DWDM). Our proposal confirms our compliance with all the interface requirements of C.2.3.2.3.1, as shown in *Figure 4.1.7-11*.

Figure 4.1.7-11 Qwest-Provided ATM Interfaces at the SDP

UNI Type	Interface Type and Standard	Payload Data Rate or Bandwidth2	Signaling or Protocol Type3	
1	ITU-TSS V.35	Up to 1.536 Mbps	AAL Type 5	
2	EIA RS-449	Up to 1.536 Mbps	AAL Type 5	
3	EIA RS-530	Up to 1.536 Mbps	AAL Type 5	
4 (Optional)	DS1	Up to 1.536 Mbps	AAL Type 1	
5 (Optional)	DS1	Up to 1.536 Mbps	AAL Type 5	
6	DS3	Up to 43.008 Mbps	AAL Type 1	
7	DS3	Up to 43.008 Mbps	AAL Type 5	
8 (Optional)	DS1	Up to 1.536 Mbps	Native Mode	
9	DS3	Up to 43.008 Mbps	Native Mode	
10 (Optional)	ITU-TSS V.35	Up to 1.536 Mbps	AAL Type 3/4	
11 (Optional)	EIA RS-449	Up to 1.536 Mbps	AAL Type 3/4	
12 (Optional)	EIA RS-530	Up to 1.536 Mbps	AAL Type 3/4	
13 (Optional)	DS1	Up to 1.536 Mbps	AAL Type 3/4	
14 (Optional)	DS3	Up to 43.008 Mbps	AAL Type 3/4	
15 (Optional)	SONET OC-3c	Up to 148.608 Mbps	AAL Type 3/4	
16 (Optional)	SONETOC-12c	Up to 594.432 Mbps	AAL Type 3/4	
17 (Optional)	SONET OC-48c	Up to 2.378 Gbps	AAL Type 5	
18 (Optional)	SONET OC-48c	Up to 2.378 Gbps	AAL Type 3/4	
19 (Optional)	E1 (Non Domestic)	Up to 30.72 Mbps	AAL Type 3/4	
20 (Optional)	E3 (Non Domestic)	Up to 30.72 Mbps	AAL Type 3/4	
21	COAX	Up to 43.008 Mbps	Native Mode	
22	OC-3C	Up to 148.608 Mbps	Native Mode	
23 (Optional)	High Speed Serial Interface (HSSI)	Up to 43.008 Mbps	HSSI	
24 (Optional)	HSSI	From 2xDS1, in multiples of DS1, up to and including 8xDS1	HSSI	
Notes 1. Payload data rates include cell overhead. 2. When AAL type is specified, the contractor shall provide the ATM adaptation function. For native mode, the user traffic type will be AAL Type 1 or AAL Type 5.				

Note that the mandatory interfaces list mandates inclusion of SEDs that exceed the scope of the mandatory SED suites. Qwest has identified potential SEDs for each required interface.

High Speed Serial Interface (REQ_ID 2129; C.2.3.2.3.1(24))

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Qwest's IMA is an excellent alternative for Agencies that require broadband applications but are in areas where DS-3 or fiber is unavailable or is depleted. With IMA, the Agency has flexibility to grow their network as their needs change by providing a natural bandwidth progression in the 3 to 12Mbps bandwidth range. An added bonus of IMA is that FR may be internetworked to IMA, enabling an Agency with FR remote locations to internetwork the remote locations to an ATM IMA host location. Further, ATM ports with IMA can be interoperate with an Internet Gateway and may be IP enabled. IMA provides an Agency with the same level of network security they are accustomed to with ATMS.

4.1.7.3.2 Proposed Enhancements for ATMS (L.34.1.4.3(b))

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4.1.7.3.3 Network Modifications Required for ATMS Delivery (L.34.1.4.3(c))

Qwest's current ATMS solutions will support all Agencies' requirements, access speeds, and feature requirements. Qwest does not need to generate network or service delivery modifications for the General Services Administration Networx program. Qwest's services management and solutions are dynamic by design and are customized for Agency needs.

4.1.7.3.4 Experience with ATMS Delivery (L.34.1.4.3(d))

Qwest has offered ATMS regionally since 1994 and nationwide since 1997. Qwest has more than ████ FRS/ATMS customers and ██████ active circuits. Qwest ATMS customers include those in financial services, medical industries, and public sector clients at the city, state, and federal levels. Qwest currently provides ATMS to ████████████████████████████████████ ███████

4.1.7.4 Robust Delivery of ATMS (L.34.1.4.4)

For each mandatory service identified in RFP Figure C.2-1 for Transport/IP/Optical Services, Qwest can easily support the Government's projected ATMS traffic load. Qwest adapts rapidly to meet customer requirements.

End-to-end service delivery is a key feature of Qwest's service. Qwest gives absolute priority to Federal Telecommunications Service Priority (TSP) circuits. TSP circuits are designated by the Government as essential to

National Security Emergency Preparedness and must receive priority handling either in installation and/or restoration of a service outage.

4.1.7.4.1 Support for Government ATMS Traffic (L.34.1.4.4(a))

Qwest has examined the ATMS traffic requirements generated by the Government's traffic model and will fully support these needs. Specifically, Qwest understands that the Government traffic model indicates a forecasted demand model of more than 1,428 CONUS ATM circuits ranging from DS-1 to OC-3 access speeds. Qwest understands that the Government's traffic model also indicates a forecasted demand model of more than five Outside Continental United States (OCONUS) ATM circuits including NxDS-1 and DS-1 access speeds.

Qwest's fundamental ATM capacity planning methodology for Networx is derived from our standard capacity planning model in use today. We analyze both actual traffic and customer/Agency forecasts to create a combined forecast. This forecast is used to drive proactive network augmentation as needed. Qwest's ATMS is delivered from the Qwest converged service data network backbone, which consists of an OC-192 MPLS-based infrastructure, engineered for minimal packet loss and network congestion. Qwest closely and continuously monitors our backbone network links and has an aggressive upgrade policy to minimize any effects of congestion on customer traffic flows. For example, current backbone use averages ▮▮▮▮▮▮▮▮▮▮ percent, and we expect to maintain similar levels of use over time.

4.1.7.4.2 ATMS Measures and Engineering Practices (L.34.1.4.4(b))

The speed and size of Agencies' telecommunications systems can grow easily and transparently on the Qwest Network. Qwest has a history of adapting rapidly to meet customer requirements. ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

Qwest's performance measures and engineering practices are designed to provide robustness of the access and backbone networks and to ensure resiliency in order to be prepared for growth.

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4.1.7.5 ATMS Optimization and Interoperability (L.34.1.4.5)

Qwest's integrated ATM/FR network provides flexible access to all of Qwest's IP services and connects to our domestic and international team members to provide domestic and worldwide access.

4.1.7.5.1 Optimizing the Engineering of ATMS (L.34.1.4.5(a))

4.1.7.5.2 Methods Applied to Optimize the Network Architecture (L.34.1.4.5(b))

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As traffic increases, Qwest adds more uplinks and backbone links to the network. Qwest engineers evaluate when higher bandwidth links are needed to replace multiple lower bandwidth links. When the network architecture is optimized, the network becomes much easier to manage.

4.1.7.5.3 Access Optimization for ATMS (L.34.1.4.5(c))

As part of the ongoing network optimization and capacity planning, Qwest Planning teams review the amount of traffic that originates from each of the LATAs. As the level of traffic increases, the planning team reviews the access facilities and decides whether Qwest should deploy new network facilities as close as possible to the customers. In some cases (i.e., for large customer campuses), Qwest will build facilities directly into the customer campus.

In order to support these projects, Qwest has designed, engineered, and deployed multi-service edge switch routers with high-port density to provide a full suite of services for diverse customer applications. These multi-service edges are connected directly to the core routers via multiple high-speed uplinks for diversity and redundancy. These intelligent edge routers allow Qwest to create new differentiated service offerings, continue support for existing services, and optimize the network infrastructure.

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████████████████████████████████████ With these multi-service edges, the network has less equipment, fewer layers, and is less complex to

operate and manage. Qwest no longer needs to add older IP routers and older L2 switches that were built with limited services and port density, which reduces costs and rack spaces.

4.1.7.5.4 Vision for ATMS Internetworking (L.34.1.4.5(d))

Converged services are available on Qwest's optimized infrastructure today.