1.7.7 Fixed Satellite Service (FSS) [C.2.15.2]

Agencies will access a complete Fixed Satellite Service (FSS) solution though our extensive subcontracts and supply agreements of leading providers of satellite bandwidth and ground segment services, consisting of AT&T, Intelsat General Corporation (Intelsat), Globecomm Systems, Inc. (Globecomm), and other FSS providers. Each organization on the team brings a critical component to the process of delivering high-quality satellite services to Agencies.

1.7.7.a Reserved [L.34.1.7.5.a]

1.7.7.b Reserved [L.34.1.7.5.b]

1.7.7.c Service Description [L.34.1.7.5.c]

(c) A technical description of how the service requirements (e.g., capabilities, features, interfaces) are satisfied.

Agencies will receive a fully compliant Fixed Satellite Service (FSS) solution through a single point-of-contact, providing satellite transmission services together with terrestrial network elements, integration services, and management services that comprise a high quality, end-to-end solution. This FSS solution will fulfill Agencies' requirements for flexible global communications by providing access to satellite transmission services backed by premium technical service and customer support (**Figure 1.7.7.c-1** and **Table 1.7.7.c-1)**.

Figure 1.7.7.c-1: Range of Services Provided by FSS. *FSS solution encompasses an array of services, ranging from simplex video (broadcast) to duplex data and voice.*

SERVICE REQUIREMENT	DESCRIPTION	BENEFIT TO AGENCIES
FSS is available where landline access is unavailable	FSS is available to nearly any location, including: • Agency facilities in remote locations not well served by wireline communications • Agency sites where terrestrial connections have been damaged or are otherwise unavailable [redacted] • International coverage is available to locations, upon Agency request	Agencies can conduct operations requiring advanced communications in areas where traditional wired communications are not offered, unreliable, or damaged
FSS offers wideband video broadcast transmission	FSS offers analog and digital video broadcast services in variety of formats and bandwidths, appropriate to range of Agency applications	Agencies can use video as communications tool throughout service area
Dedicated transmission service for voice, data, and video traffic transmission	FSS transmits and receives voice, data, and video in variety of standards and bandwidths	FSS offers appropriate combination of bandwidth, service, and coverage, regardless of Agency application
Reservation System	Agencies can contact AT&T customer service center regarding reservations for satellite broadcast transmissions for appropriate applications	Agencies are provided with single point-of-contact (POC) through which they can order ad hoc services within 45 days
Connection from satellite earth station to service delivery point (SDP) is included	FSS offering includes earth station to SDP connection. AT&T's partner, Globecomm, specializes in providing and installing satellite networking equipment, and will provide services required for end-to-end solution	FSS solution is offered as end-to-end, turnkey solution
Wideband broadcast applications, such as broadband distance learning	Wideband video and audio broadcasting is supported by FSS, including distance learning applications	Agencies can effectively train personnel over diverse geography with fewer instructors and less travel
Broadcast of data/multimedia files	FSS can be used as transmission medium for broadcasting data and multimedia files to unlimited number of sites simultaneously at variety of bandwidths	Agencies can simultaneously send very large files to many geographically diverse locations at low cost and without concern of congestion
Full-duplex, half-duplex, and simplex (i.e., broadcast)	All requested architecture schemes are supported	Agencies' needs for multiple network architectures are met by FSS
C-, Ku-, and Ka-band	FSS offers services at C-, Ku-, and Ka-band; [redacted]	Agencies are offered choices between multiple frequencies and their associated radio frequency (RF) propagation qualities
Connectivity at data rates ranging from DS0 (56 kbps) to T3 (45 Mbps)	AT&T's FSS offering provides all of circuit data rates and fractional rates listed in RFP under Section C.2.15.2.1.4 from DS0 to T3	Agencies can order bandwidths appropriate to their applications
Service Interfaces	All required services interfaces requested by Agencies are available, as applicable to each FSS solution	FSS is compatible with Agencies' required networking interfaces

Table 1.7.7.c-1: General Requirements Met by FSS. *Agencies will access an FSS solution that will meet all their critical mission requirements.*

The proposed FSS provides the basic functional capabilities described in Section C.2.15.2.1.1:

- FSS offers dedicated or ad hoc satellite transmission capacity between two or more facilities with appropriate equipment on a permanent or temporary basis.
- FSS supports voice, data, video, and multimedia and can include Government end-to-end encrypted communications.
- FSS provides reservation-based wideband satellite broadcast transmission that can be used for applications, including distance learning, broadcast quality National Television Standards Committee (NTSC) video and associated audio, and digital compressed video and associated audio, including encrypted communications.

AT&T has teamed together leading providers of satellite bandwidth and ground segment services to offer Agencies a complete FSS solution. Through AT&T's extensive partnerships with leading industry satellite providers, AT&T will deliver a package of essential components to the process of delivering high-quality satellite services to Agencies (**Figure 1.7.7.c-2)**.

Figure 1.7.7.c-2: AT&T FSS Team. *AT&T, in association with leading satellite subcontractors, and suppliers, will bring unique and complementary components together to provide Agencies a complete FSS solution.*

Agencies can use the FSS in a variety ways to meet mission requirements. Example applications optimized for use of fixed satellite technology include the following:

- Satellite systems are unaffected by the distance between SDPs within the served area and are optimized for providing communications in remote areas unserved by terrestrial communications (**Figure 1.7.7.c-3**).

Figure 1.7.7.c-3: FSS for Remote Communications. *Agencies' requirement to link to remote sites, regardless of location, is met by AT&T's FSS offering.*

- FSS is frequently unaffected by conditions that cause outages in wired networks; satellite networks provide continuity of operations (COOP) in such cases (**Figure 1.7.7.c-4**).

Figure 1.7.7.c-4: FSS Continuity of Operations. *Agencies' requirement for reliable communications when terrestrial networks are damaged or unreliable is met by AT&T's FSS offering.*

- Satellite systems are well-suited for broadcasting identical information (e.g., video, data) to an unlimited number of destinations within the satellite's served area (**Figure 1.7.7.c-5**).

1.7.7.c.1 Standards

AT&T's FSS offering complies with the required standards detailed in Section C.2.15.2.1.2 of the RFP. AT&T and its partners will continue to offer Agencies new versions, amendments, and modifications to these standards, as applicable to the service.

Figure 1.7.7.c-5: FSS Broadcast Video. *Agencies' requirements for video broadcasted simultaneously to an unlimited number of receiving sites are met by AT&T's FSS offering.*

1.7.7.c.2 Connectivity

AT&T's FSS offering connects Agency SDPs at permanent and temporary locations. At permanent sites, the Agencies' ground equipment and installation will be provided and maintained by our ground segment subcontractors and suppliers, including, for example, Globecomm. The ground segment network configurations are input into the satellite link budget that determines the required satellite bandwidth, and therefore, varies, based on the Agency requirement. An example of the outdoor equipment that enables FSS is shown in **Figure 1.7.7.c-6**.

Figure 1.7.7.c-6: Permanent Terminals for FSS. *AT&T will provide the equipment and associated support for permanent FSS installations.*

For temporary Agency FSS deployments, Globecomm provides a full line of transportable terminals with varying sizes and capabilities that can quickly be transported to a site and set up when required (**Figure 1.7.7.c-7**). Through existing supply agreements with leading satellite partners, including Intelsat, AT&T will provide a global fleet of satellites that meet Agency requirements. [redacted]

Figure 1.7.7.c-7: Transportable Terminals for FSS. *The proposed AT&T FSS can be accessed by Globecomm's transportable terminals, which can be operational in just minutes, without the need for special tools.*

AT&T's FSS offering provides all circuit data rates and fractional rates, from DS0 to T3, listed in Section C.2.15.2.1.4 of the RFP. In broadcast (simplex) configurations, higher rates are available. All requested features for FSS are designated as optional. Those offered within the service are discussed in Section 1.7.7.e.

Figure 1.7.7.c-8: [redacted] Contours [redacted]

1.7.7.d Service Quality and Performance [L.34.1.7.5.d]

(d) A description of the quality of the services with respect to the performance metrics specified in Section C.2 Technical Requirements for each proposed optional service, and other performance metrics used by the offeror.

AT&T and its partners will provide Agency-compliant fixed satellite solutions that satisfy the key performance indicators (KPIs) in the RFP (**Table1.7.7.d-1**), as listed below:

KEY PERFORMANCE INDICATOR	SERVICE LEVEL	PERFORMANCE STANDARD (THRESHOLD)	PROPOSED SERVICE QUALITY LEVEL
Availability	Routine	99.5% of time above 10^{-7} bit error rate (BER)	[redacted]
Latency (One-Way)	Routine	400 ms	[redacted]
Time to Restore (TTR)	With Dispatch	8 hr	[redacted]
	Without Dispatch	4 hr	

Table 1.7.7.d-1: Metrics Compliance. *The proposed FSS solution complies with metrics required by the Agency, delivering a highly reliable service across large geographical areas.*

- Availability of the satellite link is offered at levels exceeding [redacted], which is continuously

monitored and managed at our partners' satellite network operation centers. The satellite link is considered available when an SDP experiences a BER of [redacted]

- Latency is primarily a function of radio frequency (RF) propagation and the satellites' orbital scheme (the proposed FSS satellites orbit the earth at a distance of approximately 22,300 miles in geosynchronous orbit). For this proposal, all FSS systems deliver service in under the requested 400 milliseconds.
- The TTR metric proposed is a function of the ground solution appropriate to each Agency requirement. All provided FSS solutions are engineered to meet the required TTR in both configurations requiring dispatch (8 hours or less restore time) and those that do not (4 hours or less restore time). The TTR metric is measured by calculating the time a trouble ticket for the service remains open. A trouble ticket summary is reported to Agencies as part of the Networx program requirements.

1.7.7.e Attributes and Values of Service Enhancements [L.34.1.7.5.e]

(e) If the offeror proposes to exceed the specified service requirements (e.g., capabilities, features, interfaces), a description of the attributes and value of the proposed service enhancements.

As new FSS technologies become available, AT&T will offer them to Agencies through the Networx contract by teaming with the most innovative companies in the satellite field (**Table 1.7.7.e-1**).

SERVICE ENHANCEMENT	DESCRIPTION	BENEFIT
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

SERVICE ENHANCEMENT	DESCRIPTION	BENEFIT
[redacted]	[redacted]	[redacted]

Table 1.7.7.e-1: Service Enhancements. *AT&T and its partners are proposing several optional services that exceed the basic FSS requirements and offer Agencies more flexibility when using satellite systems to communicate.*

1.7.7.e.1 Ka-band Satellite Capacity

[redacted] **(Figure 1.7.7.e-1)** [redacted]

Figure 1.7.7.e-1: [redacted] Contours. [redacted]

[redacted]

[redacted] (Figure 1.7.7.e-2). [redacted]

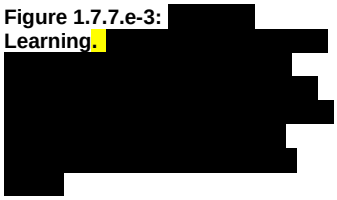
[redacted]

Figure 1.7.7.e-2: [redacted] Meter [redacted]

[redacted]

Figure 1.7.7.e-3 [redacted]

Figure 1.7.7.e-3: Learning.



1.7.7.f Service Delivery Experience [L.34.1.7.5.f]

(f) A description of the offeror's experience (including major subcontractors) with delivering each proposed optional service

Examples of fixed satellite communications contracts that AT&T successfully delivers to the Agencies are listed in **Table 1.7.7.f-1**.

Table 1.7.7.f-1: AT&T Experience in Fixed Satellite Services. *AT&T has extensive experience providing critical Government communications with fixed satellites on contract vehicles that continue through today.*

Our demonstrated ability to satisfy Government customers by delivering thousands of successful deployments of FSS lowers Agency risk when choosing AT&T.

1.7.7.g Approach to Perform Service Verification [L.34.1.7.5.g]

(g) A description of the offeror's approach to perform verification of individual services delivered under the contract, in particular the testing procedures to verify acceptable performance and Key Performance Indicator (KPI)/Acceptable Quality Level (AQL) compliance.

The first time the service is provided through the Networx contract, the service performance must be verified; KPIs will be monitored to certify that the service performance complies with the AQL. **Table 1.7.6.g-1** summarizes the verification and testing procedures for FSS.

KPI	VERIFICATION APPROACH	TESTING PROCEDURES
Availability	[redacted]	[redacted]
Latency (One Way)	[redacted]	[redacted]
Time To Restore (TTR)	[redacted]	

Table 1.7.7.g-1: System Monitoring. *FSS system performance is monitored to assess whether Agencies receive the required level of service.*

[redacted] (**Figure 1.7.7.g-1**). [redacted]

Figure 1.7.7.g-1: [redacted] **for** [redacted]

Through a comprehensive verification process, Agencies and the GSA will receive concrete data that demonstrates the readiness of FSS. AT&T and its partners follow detailed procedures to verify that FSS meets the requirement by comparing the stated KPI data against the AQLs.

1.7.7.h Optional Services Network Impact [L.34.1.7.5.h]

(h) A description of how the delivery of any optional services would impact the wireless network architecture (e.g., security, quality and reliability, performance).

Agencies receive a low-risk solution by being able to use AT&T's FSS on Day One of the contract because there are no modifications required to the satellite networks or systems to provide FSS to the Government.

1.7.7.i National Capital Region Assured Service Network Architecture [L.34.1.7.5.i]

(i) A description of how the network architecture will satisfy the requirements in Section C.5.2.7 for assured service in the National Capital Region, if applicable.

Information regarding AT&T's plan for National Capital Region service assurance is provided in Section 1.3.5.c.

1.7.7.j Section 508 Requirements [L.34.1.7.5.j]

(j) A description of the offeror's approach for providing the capabilities needed to meet Section 508 provisions identified in Section C.6.4 for the proposed optional services.

Information regarding AT&T's plan for Section 508 requirements is provided in Section 1.3.5.d.

1.7.7.k Approach to Incorporating Optional Services, Enhancements, or Improvements [L.34.1.7.5.k]

(k) A description of the approach for incorporating into the proposed optional services, technological enhancements and improvements that the offeror believes are likely to become commercially available in the timeframe covered by this acquisition, including a discussion of potential problems and solutions.

By using our extensive subcontracts and supply agreements with leading satellite industry members, AT&T offers Agencies a full suite of fixed satellite-based transmission options. As fixed satellite operators improve their services and introduce new technology, AT&T will make these services available to Agencies. For additional information on the approach to service enhancements, refer to Section 1.3.3.d.

1.7.7.1 Stipulated Requirements

AT&T takes neither deviation nor exception to the stipulated requirements.

1.7.7.2 Narrative Requirements

1.7.7.2.1 Performance Testing – Latency [C.2.15.2.4]

The Contractor shall provide either one way or roundtrip latency measurement. Latency is measured as satellite propagation and processing delays between two SDPs, including delays in the access circuits connecting to the nearest earth stations (teleports or VSATs) and shall be measured via ping test. [C.2.15.2.4]

Fixed Satellite Services will demonstrate compliance with Agency latency requirements [redacted] The testing will demonstrate that AT&T's Fixed Satellite Services are provided below the Agency's latency requirements outlined in Table C.2.15.2.4.1.