



Defining Connectivity at Sea

Shane Rossbacher
SVP Business Development, Inmarsat Maritime



A brief history

The industry leader for more than 35 years

1979 The International Maritime Satellite Organisation was formed as a not-for profit organisation.

1992 The IMO, the agency of the United Nations responsible for ship safety, introducing GMDSS.

1996 Inmarsat-3 F1 was launched, using the latest spot-beam technology to reallocate bandwidth.

2005 Inmarsat-4 launched, delivering Inmarsat's Broadband Global Area Network, the world's first global 3G network.

2015 Successful launch of Global Xpress I5 satellite constellation

The story doesn't end here. To find out what happens next, go to inmarsat.com

Our markets

The Internet of everywhere



Maritime

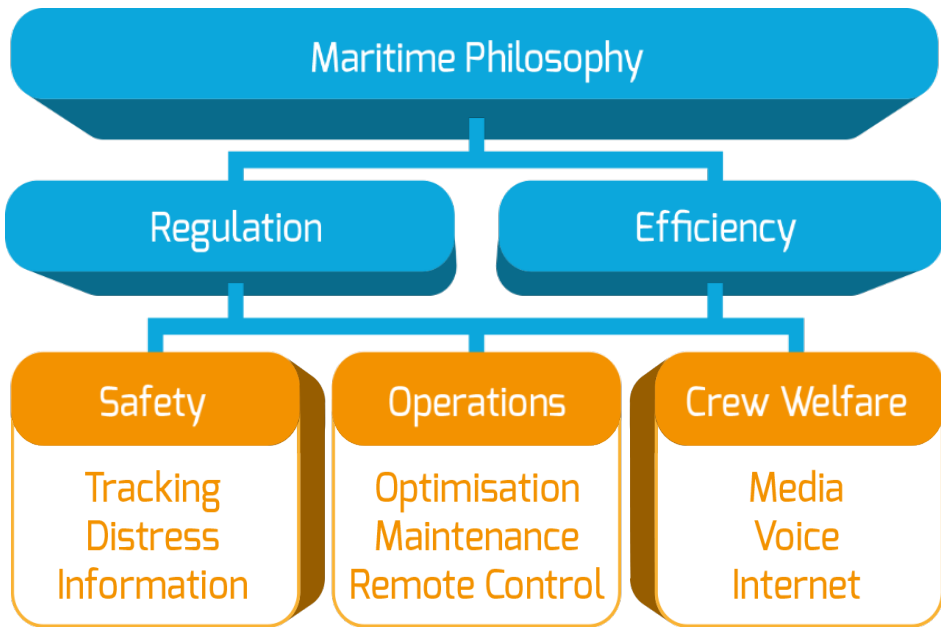
Enterprise

Aviation

US Government

**Global
Government**

Powering global connectivity for mission critical communications





Inmarsat Global Xpress



\$1.6bn

Global broadband network

2016

Commercial launch

89

Ka-band beams on each satellite

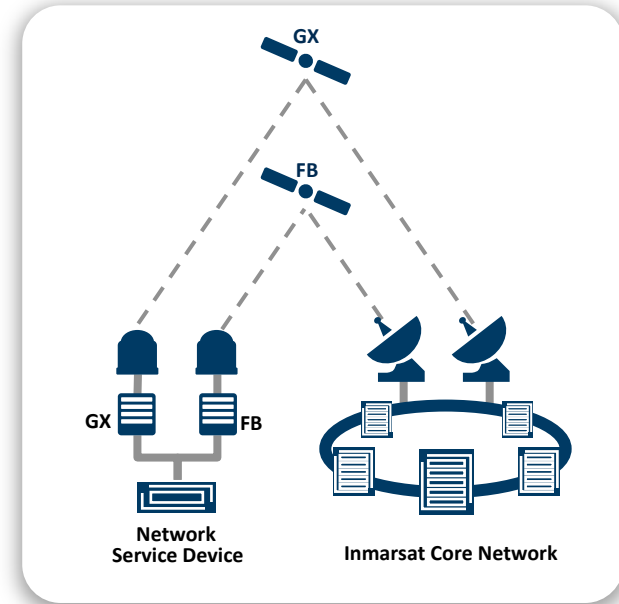
Inmarsat-5, Global Xpress

One high speed network, one trusted provider, one seamless global solution

- First global Ka-band commercial satellite service
- US\$1.6 billion investment by Inmarsat
- Single operator delivering seamless coverage, worldwide
- Powered by three Inmarsat-5 satellites built by Boeing
- Steerable beams for flexible, additional network capacity
- Each I-5 satellite has an expected lifespan of 15 years
- Wide range of terminals
- Complements our L-band services

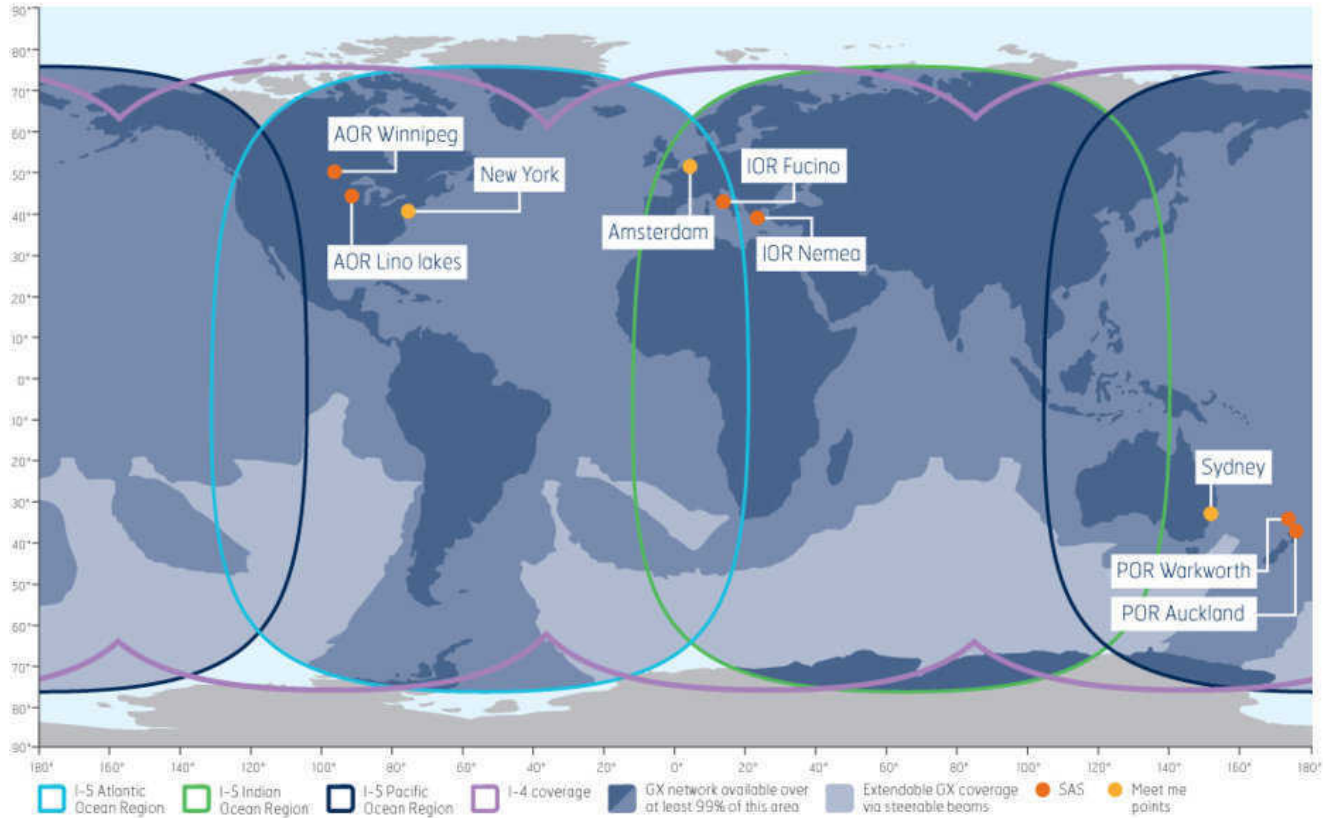
What is Fleet Xpress?

- > Fleet Xpress is the maritime service offering of GX
- > Combines GX with L-Band in a fully managed, subscription-based service
- > Provisioned, managed and billed through the Inmarsat Gateway
- > Shipboard Network Service Device (NSD) manages traffic flow and bandwidth allocation on the ship
- > Advanced capabilities enable new ways for applications to use the satellite network



Fleet Xpress

Coverage with the SAS sites and MMPs



Please note coverage is indicative as the service is not yet operational

GX Spot Beam Design Advantages

Unique spot beam design

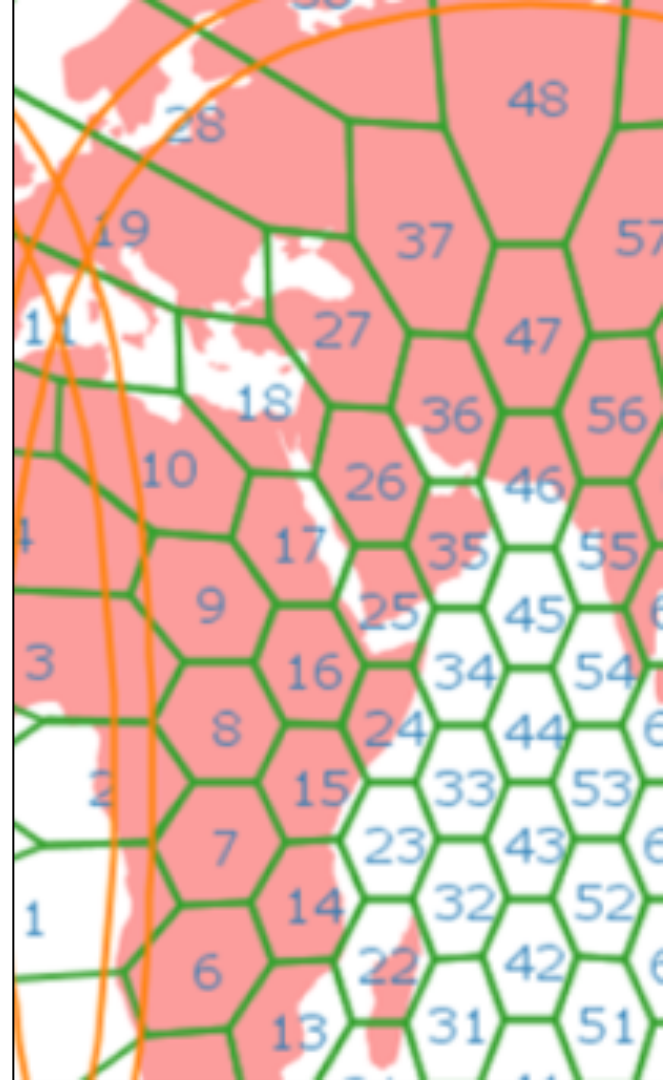
- > Global beam composed of 89 spot beams
- > Frequency reuse ensures high capacity in each individual spot beam
- > Seamless switch between spot beams

Bandwidth Sharing Capability

- > Load balancing between beam pairs
- > Dynamic re-allocation of capacity

High Capacity Overlay Beams

- > Additional steerable beams for additional capacity in high traffic areas



Fleet Xpress

Built for the Ultimate in Reliability

Redundant

- > Dual Teleport design
- > Weather, maintenance and local outages

Expandable

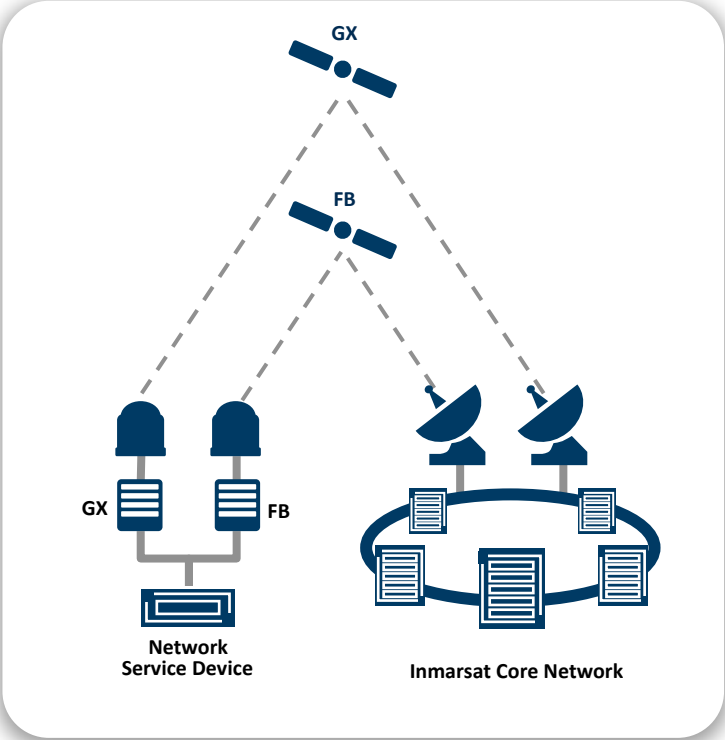
- > Additional Ka-band satellites can be added as needed

Hybrid L-band network

- > Handles any Ka-Band interruption
- > Blockage, coverage, atmospheric, regulatory and equipment
- > Maintains IP and VoIP services
- > No additional costs



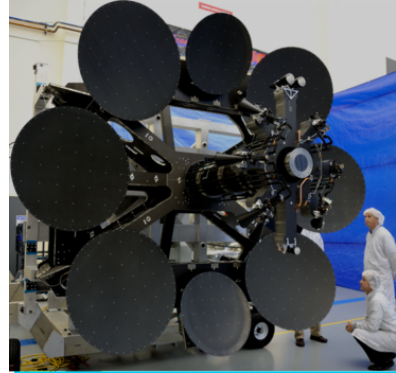
The Fleet Xpress Solution



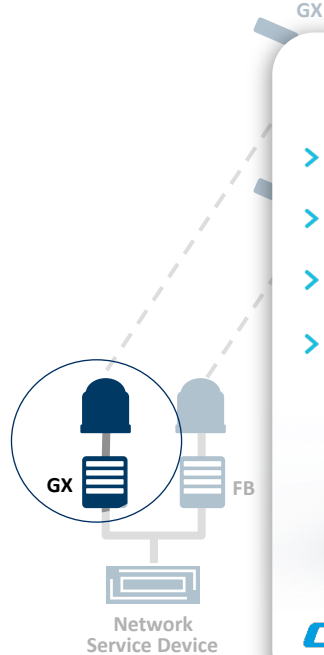
The Fleet Xpress Solution



- > Designed and built by Boeing
- > Owned and operated by Inmarsat
- > Proven, reliable platform
- > 3 satellites provide global coverage

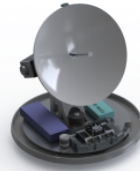


The Global Xpress Solution



Shipboard Terminals

- > High throughput performance
- > 60cm and 1m models available
- > Inmarsat Type Approval ensures quality
- > Upgradable Ku-Band terminals



COBHAM



Intellian



JRC

The Global Xpress Solution

Satellite Communications

- > Designed by iDirect specifically for GX
- > Enables advanced services to work between Cisco and iDirect platforms

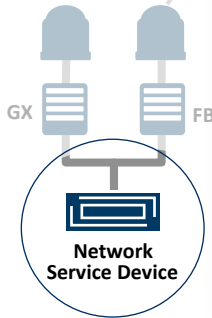
Traffic prioritisation

Bandwidth management

Multicast



The Global Xpress Solution



The Network Service Device

- > Cisco 2911 router platform
- > On-board LAN, WAN, telephone interfaces
- > Mass storage device for content hosting
- > Cisco Cloud Application Hosting platform



Fleet Xpress

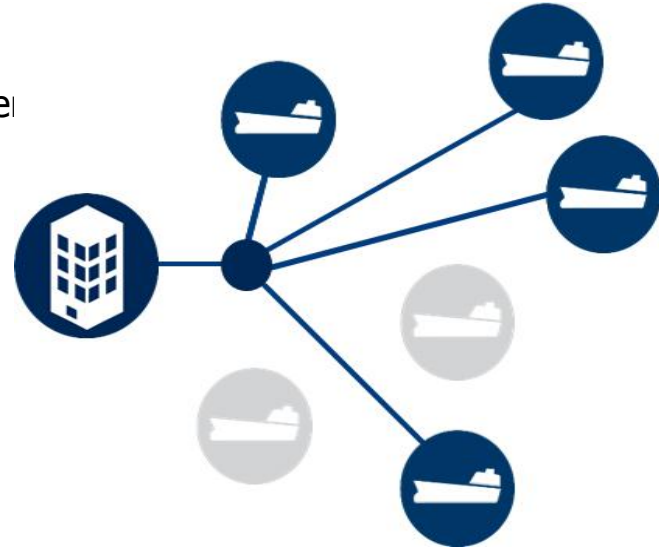
Enabling Applications and Services

Flexible, dynamic prioritisation for standard data delivery

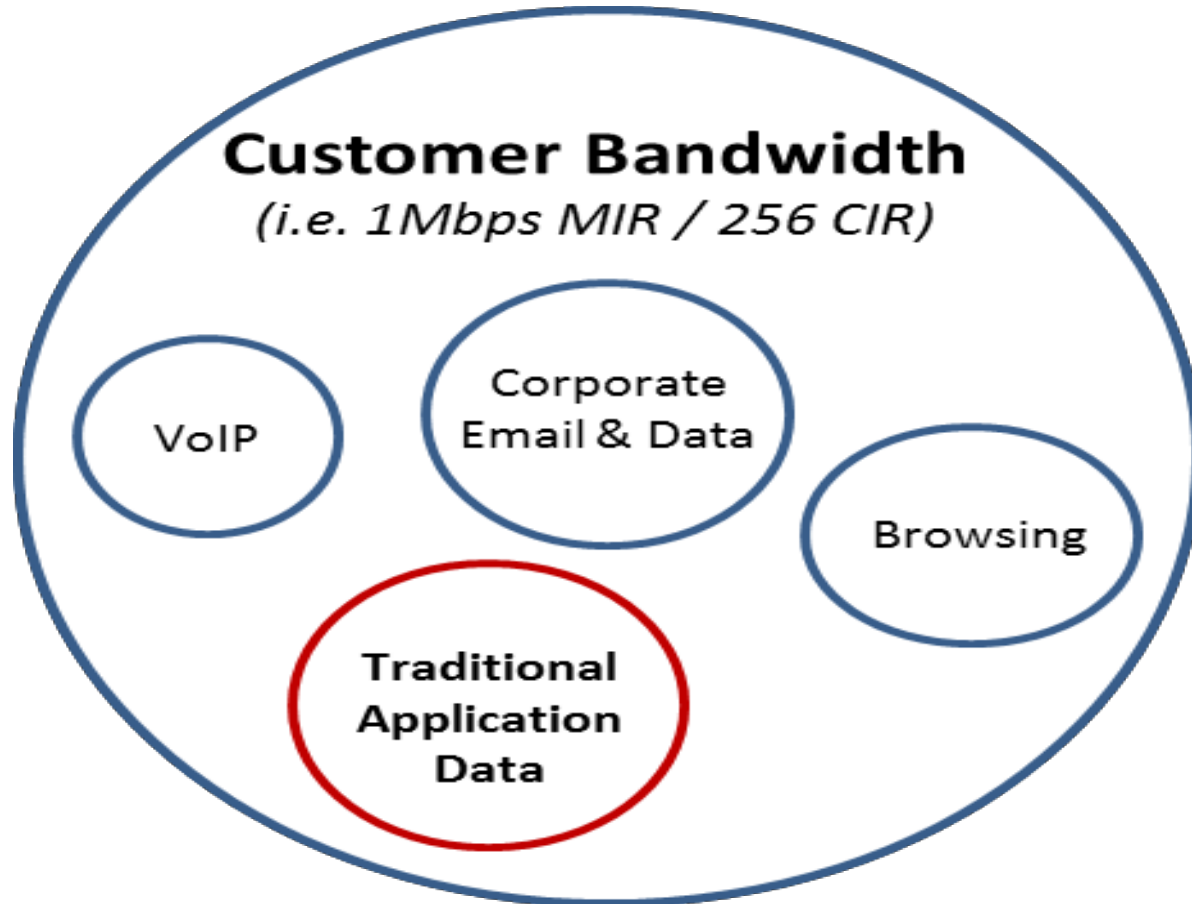
- > Prioritise by traffic type, by user, by application
- > New off-peak delivery capabilities take advantage of low usage per

GX Multicast introduces a step change in capabilities

- > Highly flexible delivery options
 - To all ships in a fleet
 - To groups of ships
 - To ships in a geographic area
 - To all ships subscribing to specific services
- > Broadcast data is stored within shipboard NSD for fast retrieval
- > Minimal impact on network



Fleet Xpress Dynamic Bandwidth



Fleet Xpress Dynamic Bandwidth

Customer Bandwidth
(i.e. 1Mbps MIR / 256 CIR)

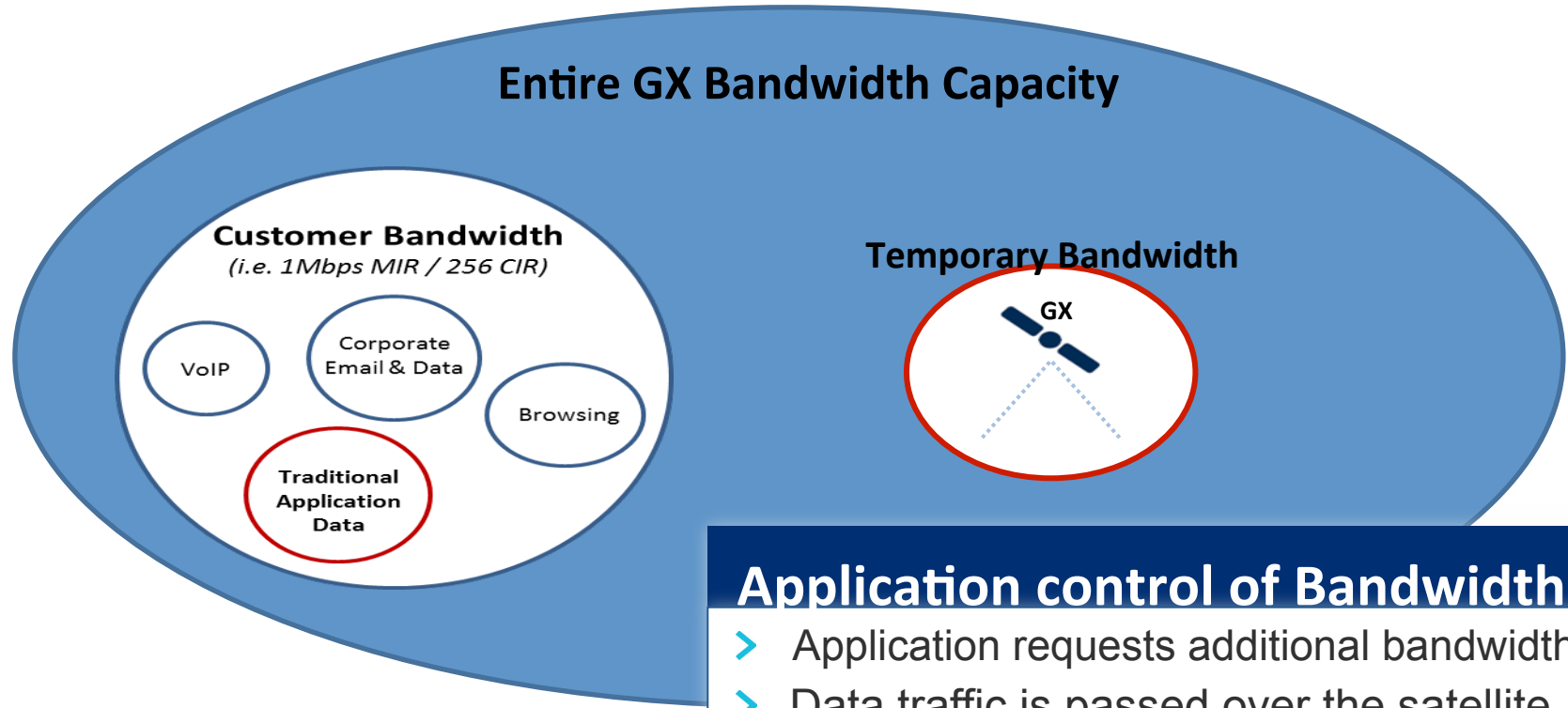
VoIP

Trad
Appl
D

FX Dynamic Bandwidth Allocation

- Certain Apps may require additional bandwidth
 - Short term, high volume data needs
 - Customer does not want business traffic negatively impacted
 - Prepaid Applications, when the crew is paying for airtime directly

Fleet Xpress Dynamic Bandwidth



Application control of Bandwidth

- > Application requests additional bandwidth
- > Data traffic is passed over the satellite
- > Application closes bandwidth



INMARSAT
gateway





Thank you!