



CONSOLIDATED SPACE OPERATIONS CONTRACT



# Commercialization of NASA's Ground Network

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February 21, 2001



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## What is CSOC?

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- Consolidated Space Operations Contract
  - Awarded to Lockheed Martin Space Operations Team in September 1997
  - Consolidates 17 contracts across 5 NASA centers
  - \$3.4 B/10 years
  - Government cost savings estimate of \$1.4 B





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## Past Commercialization Successes

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- Fully commercial WAN outsource with savings in excess of \$20M/y
  - New customer signed for use of available capacity
- Space Network (TDRSS) commercial customer - potential >\$5M/year
  - Required regulatory licensing for commercial use of government-allocated spectrum
    - \_ 18 month activity





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# Past GN Commercialization Successes

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- Three Initiatives Commenced in 1999
  - Cost avoidance (RTS development and installation) to NASA in excess of \$20 M
    - \_ Triana - awarded to USN
      - › NASA “operational readiness” to be certified prior to Triana mission
    - \_ EOS Polar Ground Network (EPGN) - awarded to HTSI DataLynx
      - › NASA EPGN “operational readiness” certified - currently taking passes
    - \_ EPGN Backup - awarded to Kongsberg/Lockheed Martin Space Data Services
      - › NASA EPGN “operational readiness” certified - currently taking passes





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## Moving to the Future GN Architecture and Operations Concept

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- GN Commercialization Lessons Learned:
  - Contracting and operational readiness very time consuming
  - Causes bottleneck for new mission support
  - NASA Policy Shift
    - \_ CSOC can market available capacity; however, NASA will not compete with commercial providers if available
  - Commercialization and operational readiness certification is driven dominantly by culture and less technical capabilities
- Result:
  - GN Commercialization Plan - Dec 1999
    - \_ Transition NASA assets to commercial sector
  - CSOC institutional organization to manage GN commercialization
    - \_ Operational readiness definitions and process being codified
  - Indefinite Delivery/Indefinite Quantity (ID/IQ) Concept Generated
    - \_ Rapid acquisition of capacity and vehicle to transition assets





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## ID/IQ Background

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- Briefing to Industry held on May 16, 2000
- RFP Released in June 2000
  - 14 Respondents
  - 7 Qualified TT&C providers
  - Next open enrollment planned for January 2002
- Ground Network Program Initiated in August 2000
  - Approved for implementation by NASA

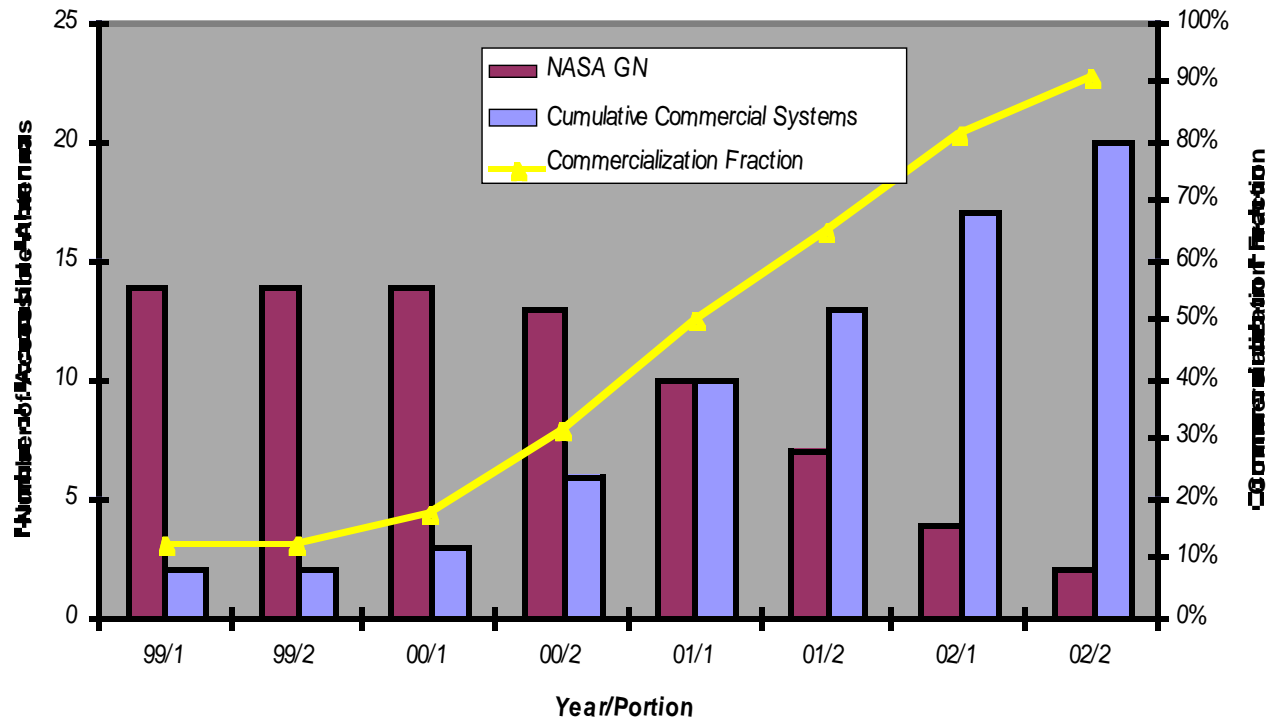




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# Potential for NASA

## Progress - Forecast



- Current NASA Annual GN Costs (inside and outside of CSOC) - approx \$30M
- Estimated Annual Costs after Full Commercialization - approx \$16M



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## ID/IQ As The Enabler

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- ID/IQ is a Flexible Contractual Mechanism Between CSOC and Commercial Providers
  - NASA and other government customers receive discounted services based on volume of purchases (NASA, other federal agencies, international, or commercial)
  - Rapid Acquisition of Data Service Support
    - \_ LEO, suborbital, STS support, labor, MUE
  - Multiple Providers for Risk Management
    - \_ Service acquisition through rapid task orders
    - \_ Ability to “load” level across providers
  - Fosters a competitive pricing environment
  - Vehicle to transition assets (GFE process)
    - \_ Companies take over total cost of ownership
    - \_ Recoup costs through price per pass/minute schema





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## Preferred Provider Classification

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- Network Provider - Offers multi-site TT&C stations, operations and wide area networks
- Resource Provider - Offer single site station and operations, may not have end-to-end TT&C
- Engineering Service Provider - Offer niche engineering services, emergency services and contingency services
- Special Hardware and Software Provider - Offers MUE and special H/W, S/W





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## Preferred Providers

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- Network Providers
  - DataLynx, Kongsberg/Lockheed Martin Space Data Services, Universal Space Network
  - Resource Providers
  - Johns Hopkins Applied Physics Lab, Satellite Applications Centre, University of Chile
- Engineering Service Providers
  - ai Solutions, RT Logic, Software Corporation of America, SpaceHab, TSI Telesys
- Special Hardware and Software Provider
  - AZ Tech, Austin Information Systems





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## CSOC Added Value

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- Why not go directly to providers?
  - Time and procurement cost savings
    - \_ CSOC is a federally competed contract vehicle
    - \_ ID/IQs are competed contract vehicles
  - Access to multiple providers
  - Load management
  - Potential reduction in costs for operational readiness through use of provider systems under current operation
  - Potential reduced communications costs through existing WAN
  - Discounted pricing based on overall purchased capacity
  - Access to NASA assets either in current GN or as they become GFEd to preferred providers





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# CSOC Plans for Commercial Providers

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- Full commercial services for LEO mission load excluding STS and Deep Space Network
  - Approximately 50 passes per day growing to approximately 75 by 02/03
  - Most are polar, some low inclination
- Also investigating potential for
  - Commercial replacement for MILA/PDL
  - Commercial architecture to replace McMurdo
  - Commercial augmentation of DSN 26 m network
- Attract new customers to commercial service providers (adds additional load to providers)
  - New missions already requesting pass/LEO support
  - Other federal, international, and commercial users





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## Architecture Issues

- Manage capacity to minimize cost/unit service and provide availability through fault tolerance
  - Optimize loading across a set of preferred provider RTSs
  - Minimize requirements for:
    - \_ New site activation and readiness certification
    - \_ Nonstandard services - minimize mission unique equipment and migrate to commercial standards and systems for communications, security, etc...
    - \_ New communications services
  - Develop and manage to RMA performance
  - Minimize interfaces to maximize scheduling flexibility
- Interleave GN reqts with commercialized WAN capability
  - Use commercial communications protocols when possible
  - Develop inverse relationships for available capacity to reduce overall cost per unit service



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## Current Ongoing Activities

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- Capacity analysis
- Mission/RTS compatibility analysis
- WAN loading assessment
- Task order development
- Operational readiness certification of other systems
- Development of RMA data for performance assessment and architecture management
- Implementation of Integrated Operational Architecture based on commercial standards and systems





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## Summary

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- CSOC commercialization is depending on the success of these commercial TT&C providers
  - We are planning on allocating NASA's entire GN load to these systems
    - \_ This should foster the development of a robust and competitive service industry
- CSOC is developing a commercial architecture to manage to customer requirements
  - Not just buying passes and WAN bandwidth--developing an integrated operational commercial architecture
- This is a pathfinder program that can provide lessons-learned to other stakeholders

