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# GSAW 99

3-5 Mar 99

## Future Visions of AFSCN

*Path to the Future*

*Maj Ray Pry  
SMC/CWX  
3 March 1999*

SATELLITE AND LAUNCH CONTROL SYSTEMS PROGRAM OFFICE



# Satellite and Launch Control Systems Program Office (SMC/CW)

**SPACELIFT RANGES**

**AFSCN**

**VIAM INVENIENS**

**SATELLITE AND LAUNCH CONTROL SPO**

**Col Barry Morgan**  
Program Director

**Col Randy Odle**  
Deputy Program Director

SATELLITE AND LAUNCH CONTROL SYSTEMS PROGRAM OFFICE



# SMC/CW Mission

*Air Force  
Satellite Control Network (SCN)*

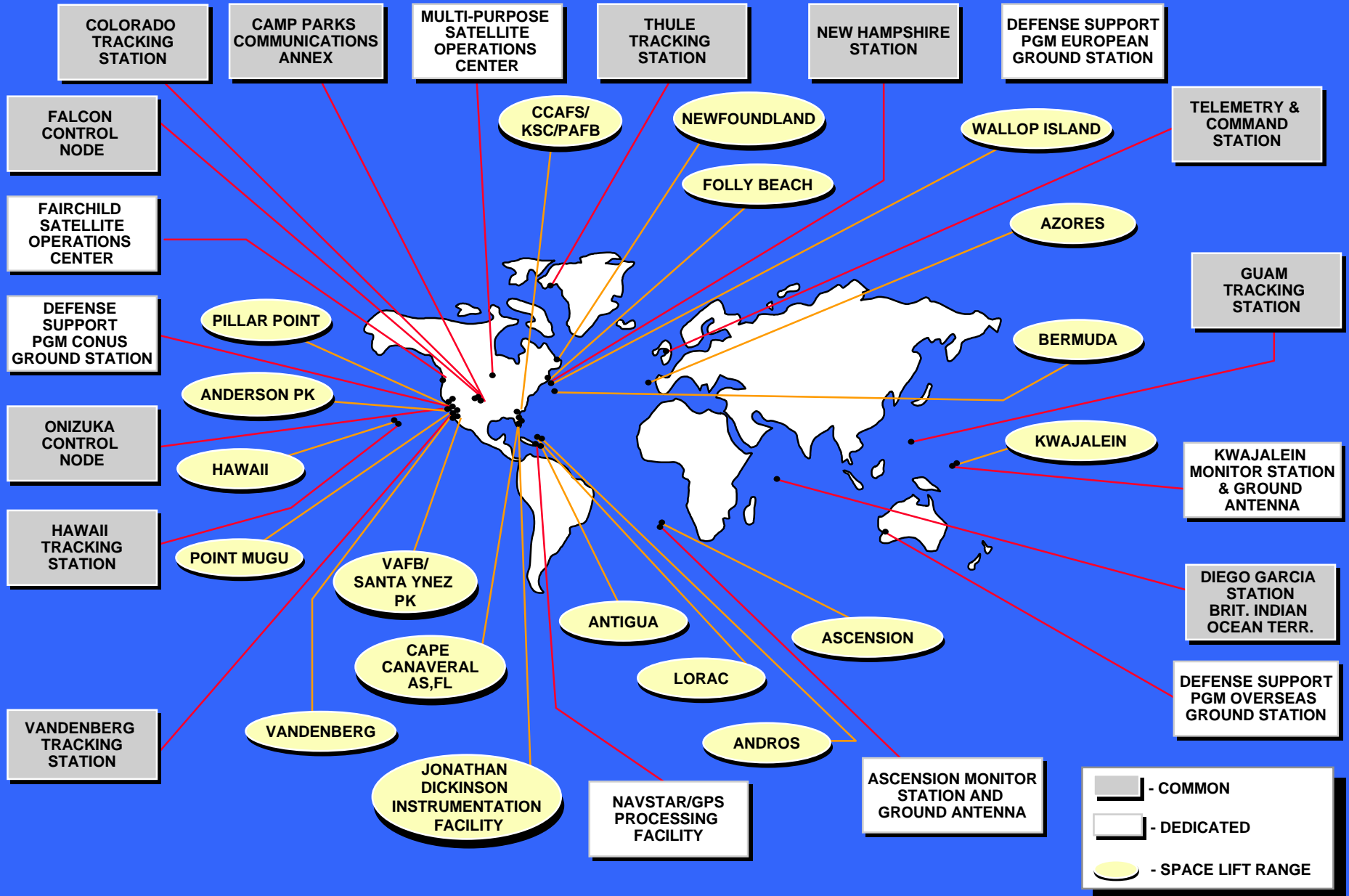


*Spacelift Range (SLR)*



**Sustain and Modernize the Worldwide Ground Systems Providing Launch Control for Space Lift Vehicles; Tracking, Telemetry and Commanding for On-Orbit Satellites and Test Support for Ballistic Missiles and Space Experiments**

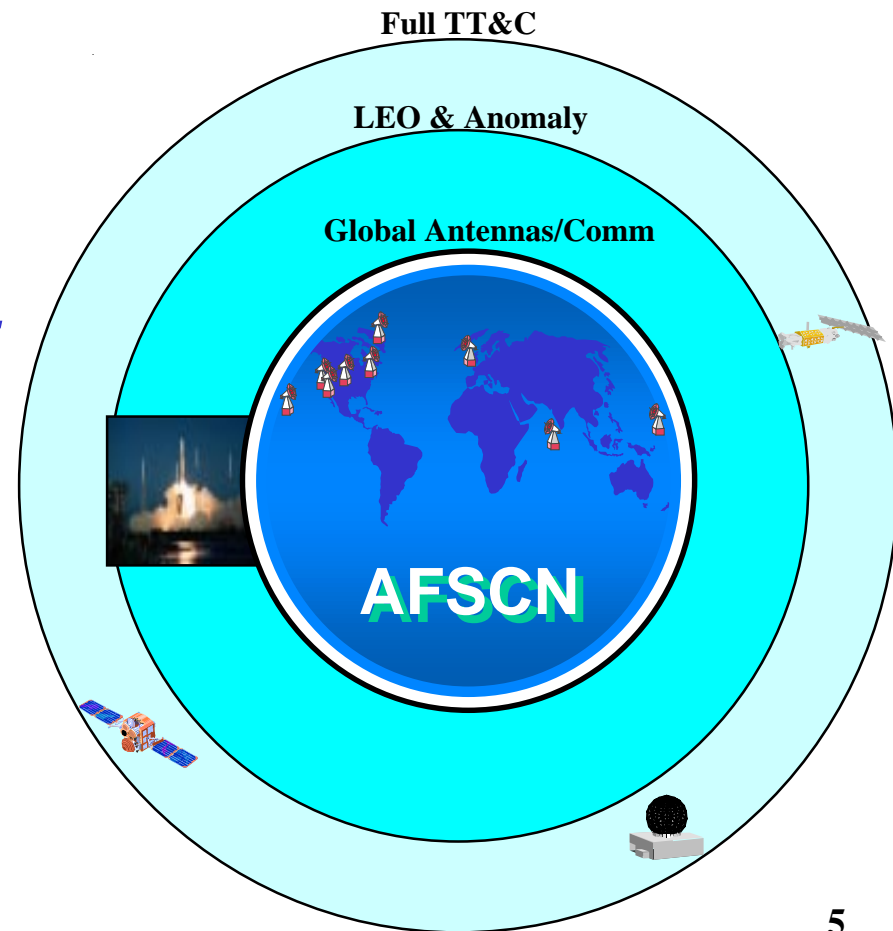
# AIR FORCE SATELLITE CONTROL NETWORK AND SPACE LIFT RANGE GROUND-BASED RESOURCES





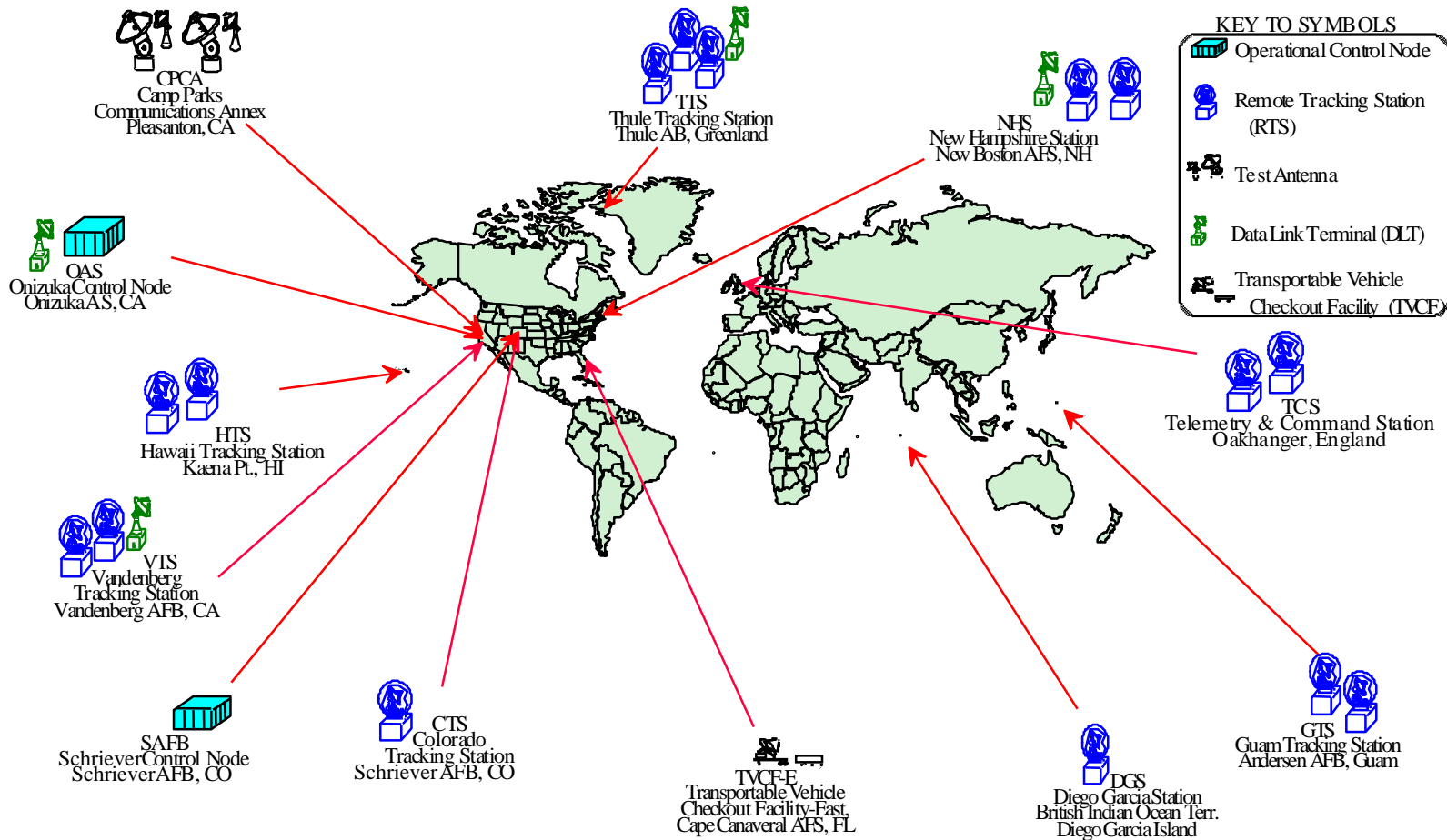
# Role of SMC in the AFSCN Mission

**DESIGN, DEVELOP, ACQUIRE,  
MODIFY AND SUSTAIN**  
*the*  
**AFSCN**  
*in support of*  
**CURRENT AND FUTURE  
SPACE SYSTEMS**





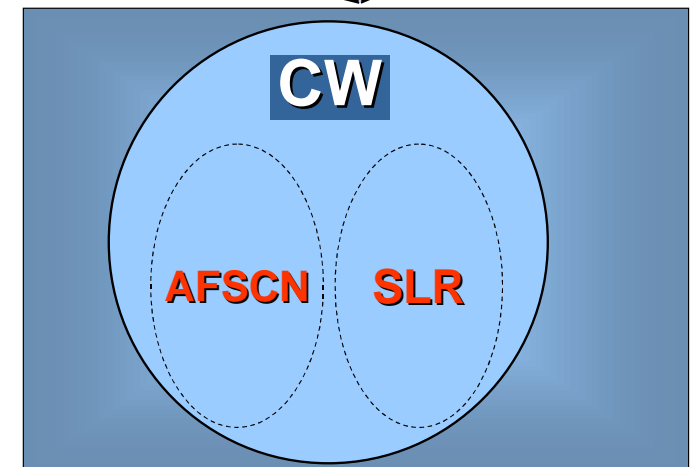
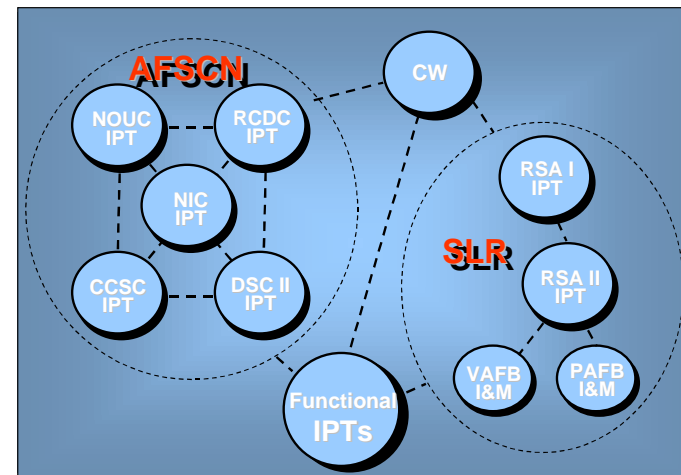
# AFSCN Common User Network





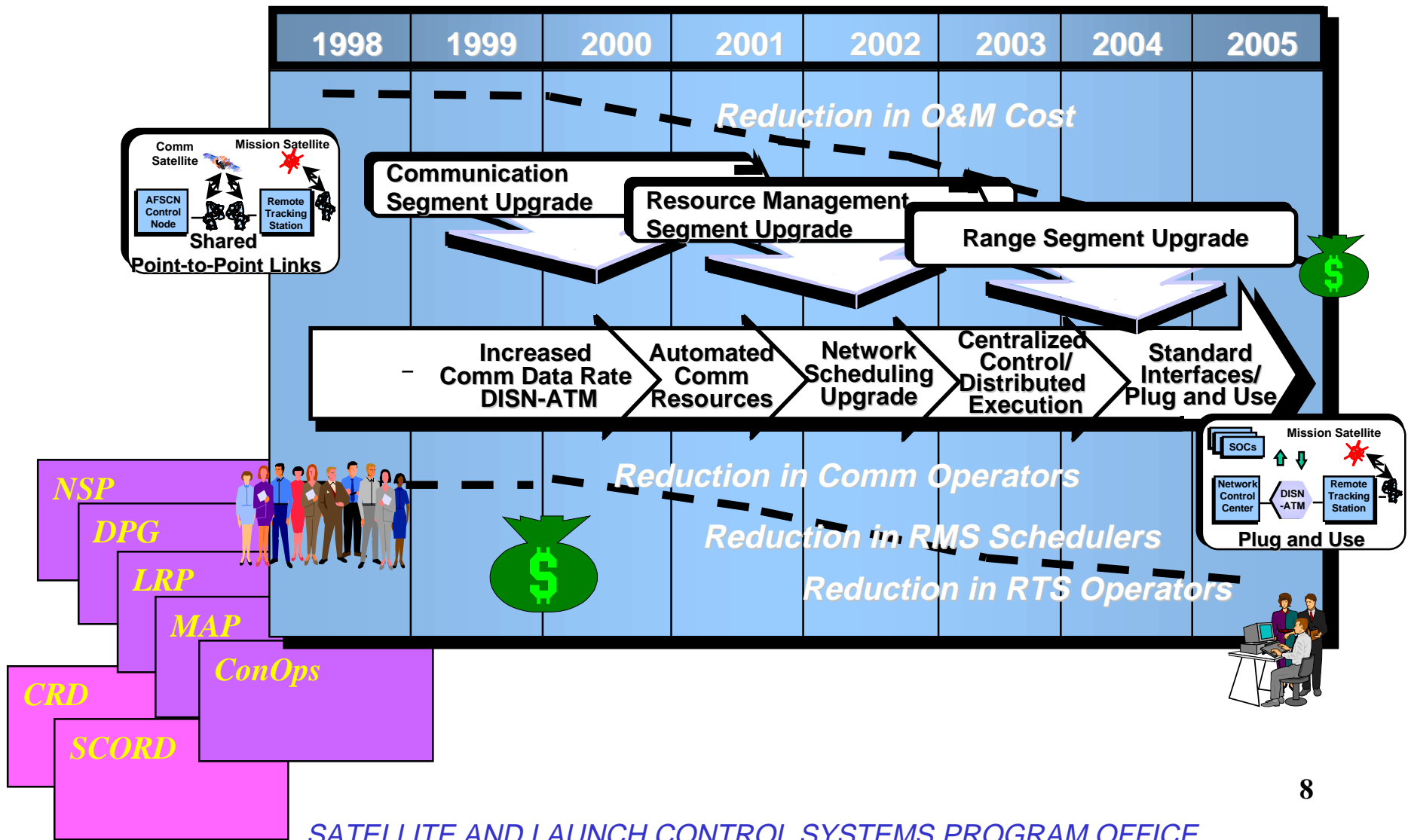
# CW Organization

- Single PM for each program
  - Align resources programmatically
  - Simplify organizational complexity
  - Merge units
- Reduce duplicate efforts
- Balance resources across two programs
- Better aligns with vertical strategy





# AFSCN Modernization





# Network Evolution Drivers

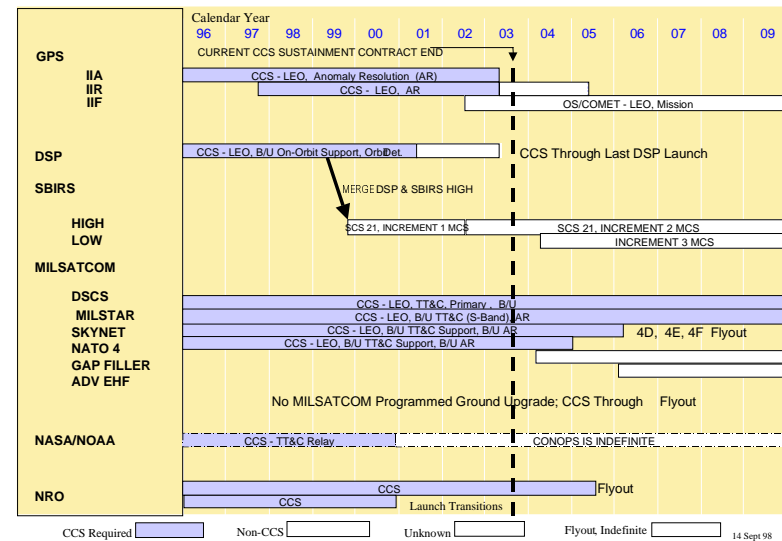
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- Command & Control Segment Sustainment
- NSSA Recommendations
- Commercialization/Privatization Opportunities
- Other Possible Influences



# CCS Sustainment

- **CCS Sustainment can't continue indefinitely**
  - Too expensive/obsolescence
  - Current sustainment contract expires in 2003
- **TT&C Mission Transition to SatSPOs**
  - Integrated mission / TT&C capability
- **SSCS Did Not Materialize**
  - Common core issues
- **“Common Look, Touch, Feel”**
  - Utilize advances in HMI





# Standard Satellite Control System (SSCS)

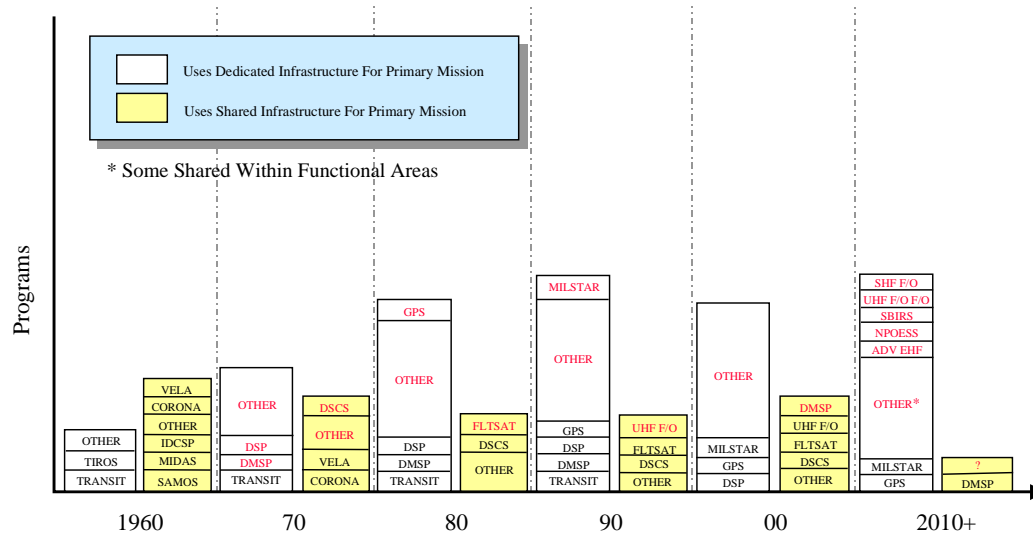
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- **SSCS Background**
  - Common core TT&C design for all satellite programs
  - Standard solution to get us off of CCS
  - Point solution selected
- **But**
  - Several programs with independent solutions
  - Common Core Issues
- **Therefore**
  - TT&C mission moved to SATSPOs
    - Could tailor solution based on mission drivers
  - Standardize thru “common look, touch, feel”



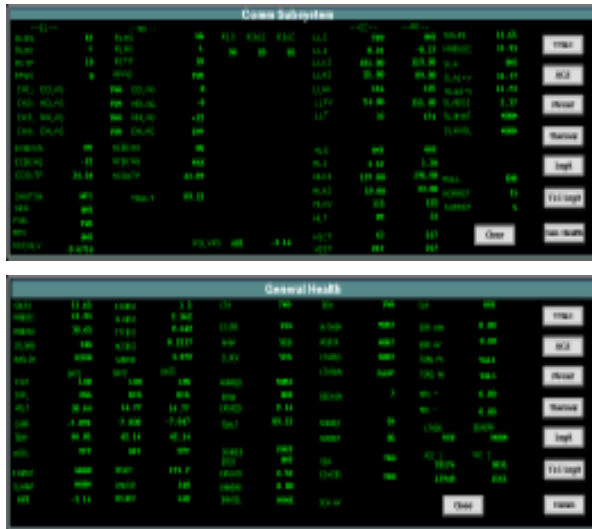
# Common Core Issues

- Mission is paramount; varies considerably
- Don't build another DSM
- Commercial space activity dominating military space activity
- Where is future taking us?
- Window of Opportunity





# Human Machine Interface

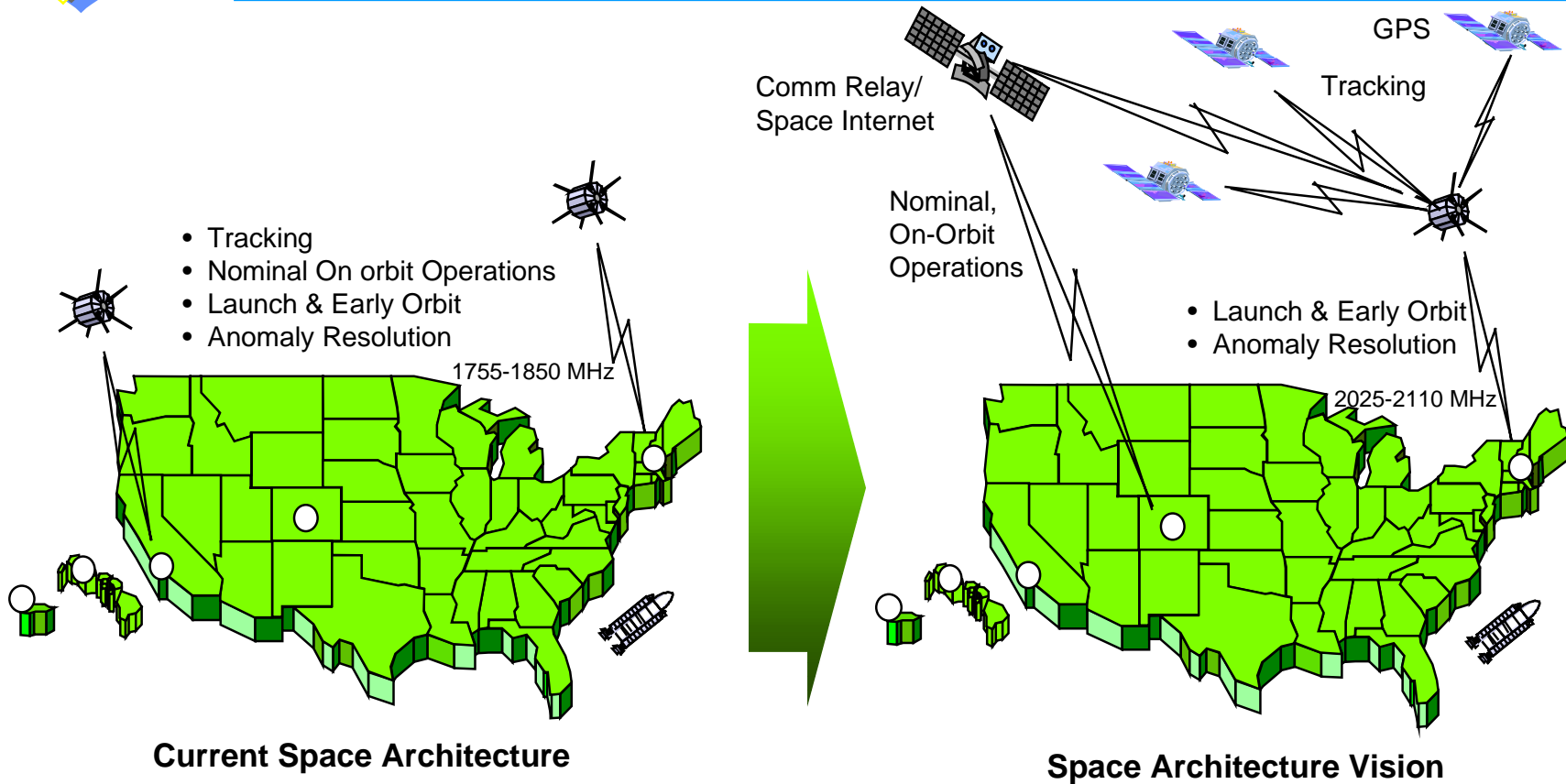


- Difficult to understand mnemonics
- Critical telemetry out-of-view
- No summary State of Health
- No commonality

- Intuitively understandable telemetry
- Easy to assess State of Health status
- Common look, touch, and feel



# National Security Space Architect Satellite Control Architecture Evolution

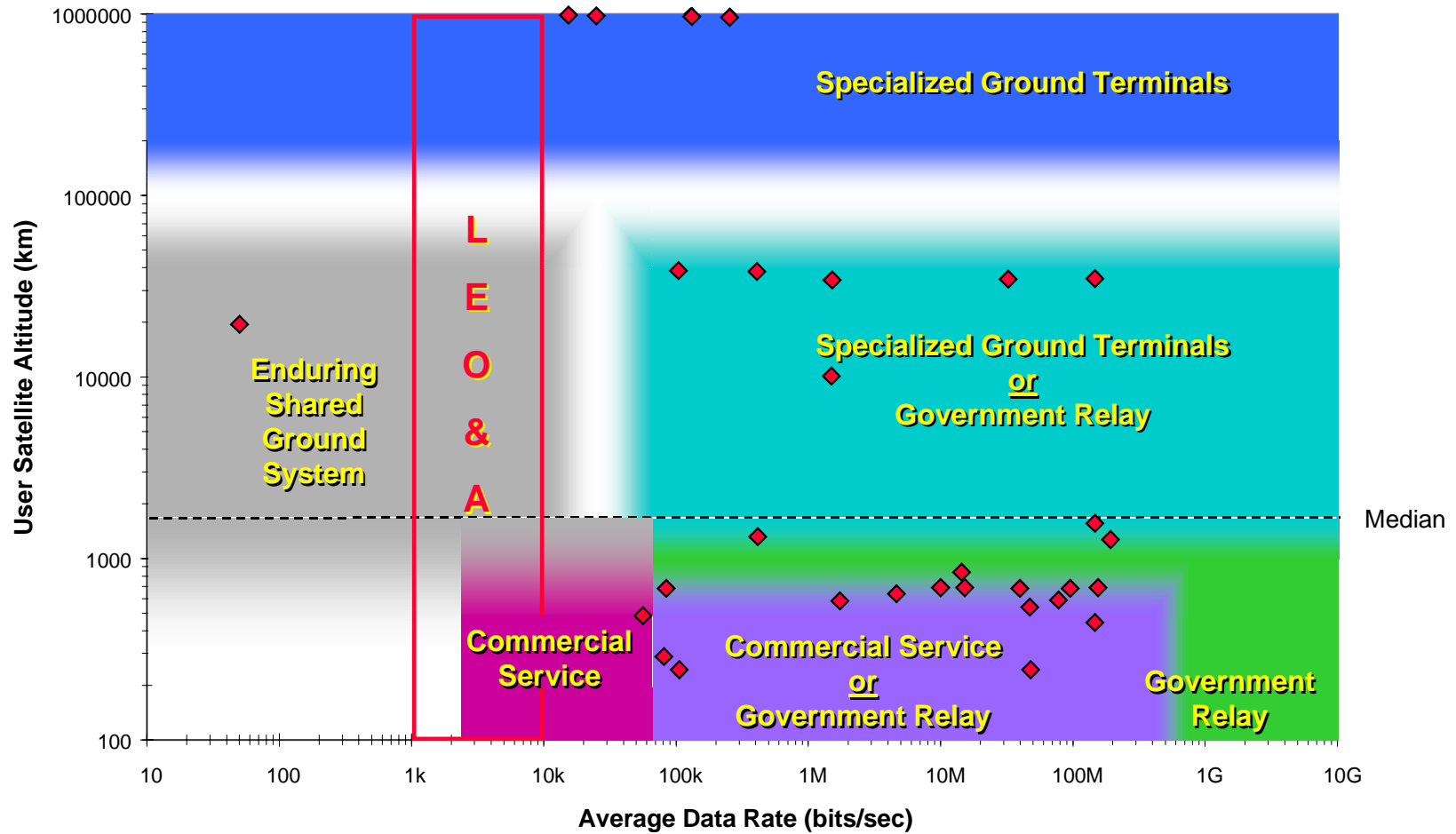


## National Space Policy

“DoD will coordinate with other departments and agencies, *as appropriate*, to foster the integration and interoperability of satellite control for all governmental space activities.”



# NSSA Vision c. 2010 - 2015



**Note: No Limitation on Crosslinks**



# NSSA Architecture Recommendation

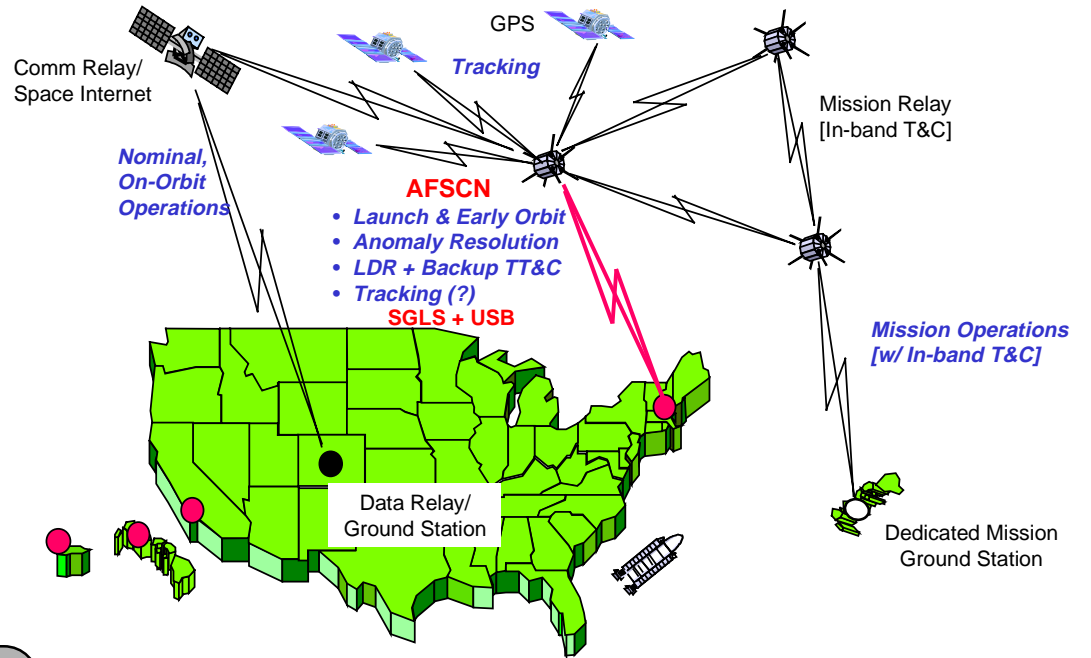
## SatOps ADT Recommendations

*Migrate Uplink to USB*

*Implement Efficient Waveform*

*Eliminate Radiometric Tracking*

*In-Band Control*

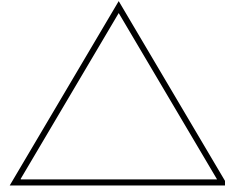


**Space Architecture Vision - Migration to Space and In-Band Nominal Operations**  
*SATELLITE AND LAUNCH CONTROL SYSTEMS PROGRAM OFFICE*



# Commercialization/Privatization

CORE  
OPERATIONS

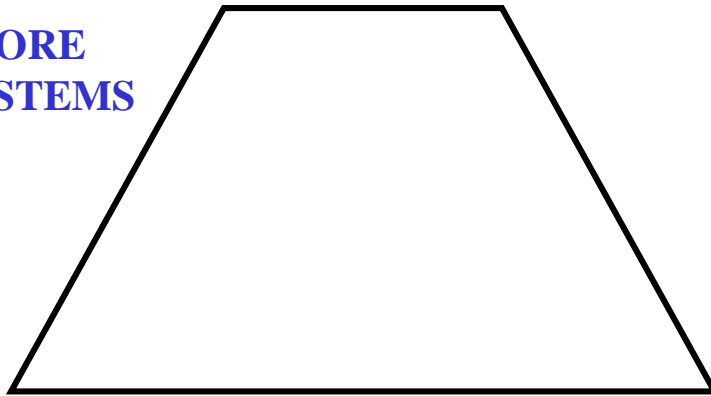


- Military-specific Operations (C2 Applications)

SYSTEMS INTEGRATION

- Hardware & Software Interfaces
- Operational Data & Information Transformation

NON-CORE  
SUBSYSTEMS



- TT&C and Busses*
- Data Handling Processes*
- Commercial Remote Sensing
- Commercial Catalogue (COTS)
- Commercial Communication

Assets

- Satellites
- Terrestrial Comm Services*
- Mobile Comm Services*

**Best  
Candidate  
Commercial  
Functions**

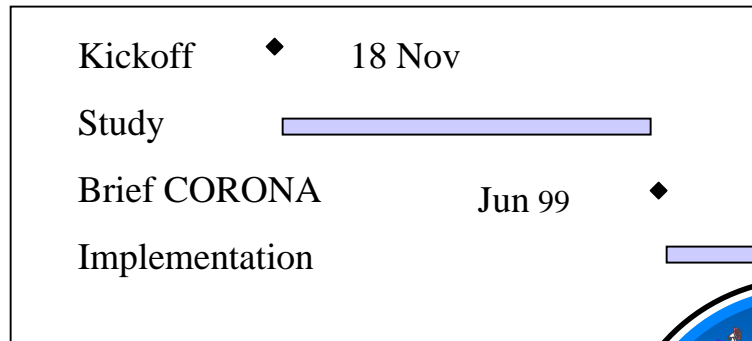
*Commercialization Initiatives  
Should Be Chosen Carefully*

Source: LRP, Page 116

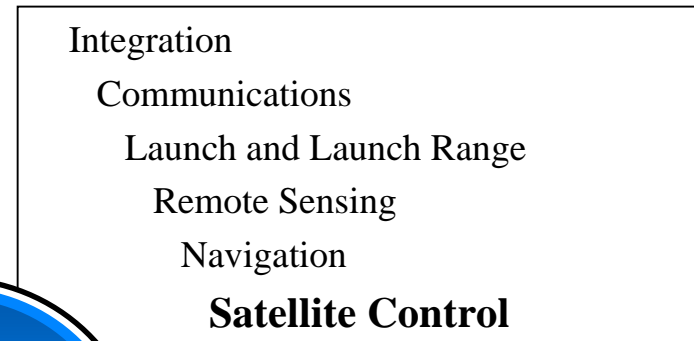


# Commercial Space Opportunities Study (CSOS)

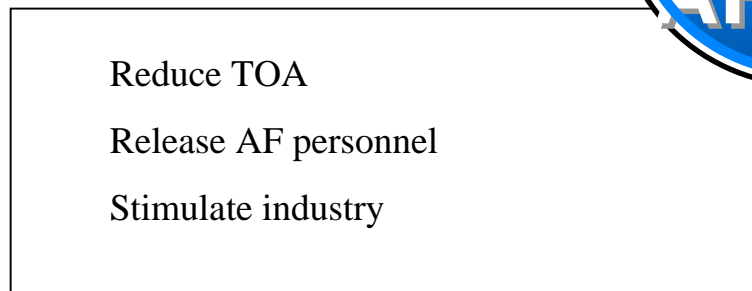
## SCHEDULE



## PANEL STRUCTURE

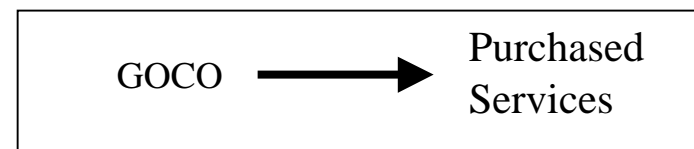


## GOALS



- Operational Control Nodes
- Command & Control
- Remote Tracking Stations
- Communication

## EXTENT OF COMMERCIALIZATION





# Other Possible Influences

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- Satellite Support Needs
- AFSCN/SSN Consolidation
- Future POM \$s
- New Acquisition Strategy
- Et al





# New AFSCN Contracts

## Yesterday's Contracts

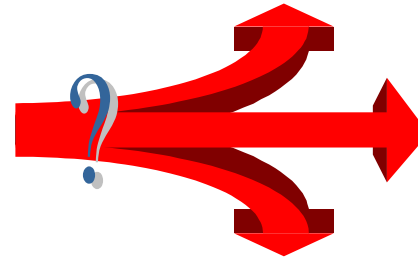
	DEVELOPMENT	SUSTAINMENT	INTEGRATION		DEVELOPMENT	SUSTAINMENT	INTEGRATION	
ESMC	X	X	X	}	RANGE/COMM SUSTAINMENT	X		
C&DP	X	X	X		CCS SUST		X	
SEIT	X	X	X		RANGE/COMM DEVELOPMENT	X		X
ODDM	X	X	X		CCS DEV	X		X
AEROSPACE	X	X	X		INTEGRATION			X
CPIC	X	X	X		AEROSPACE	X	X	X
JOVIAL	X	X	X					
STEC	X	X	X					
DSC	X	X	X					
GTE	X	X	X					
SEES	X	X	X					
SSAS	X	X	X					

## Tomorrow's Contracts?

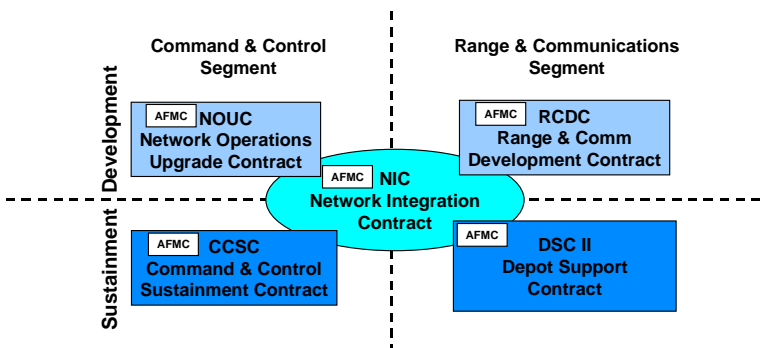
	Network	Range
Development		
Integration		
Sustainment		

	Network	Range
Development		
Integration		
Sustainment		

	Network	Range
Development		
Integration		
Sustainment		



## Today's Contracts



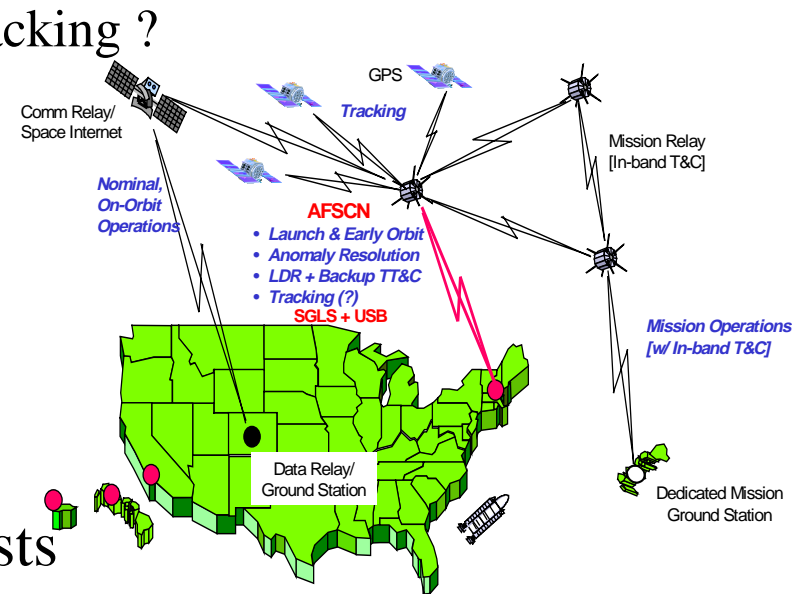
*O&M Contracts*





# What's In the Future

- In-Band TT&C
- Commercialization/Privatization
- Efficient Spectrum Use
  - Eliminate/Reduce Radiometric Tracking ?
  - Migration to USB ???
  - Efficient Modulation !
- Asset Consolidation
- Interoperability
- “Plug and Use”
- Reduce Infrastructure/O&M Costs

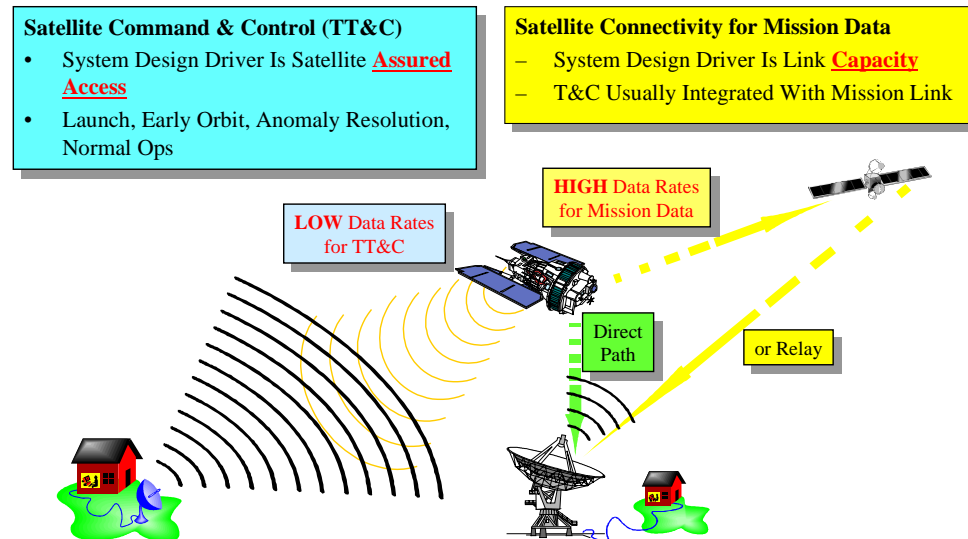


*Assured access to space*



# Future of AFSCN

- Mission Evolution
- Architecture Evolution
- Interface Evolution
- Commercialization



**Architecture Continuity**  
*AFSCN Mission/Functionality Remains*