

EELV Program Assessment

Steve Miller

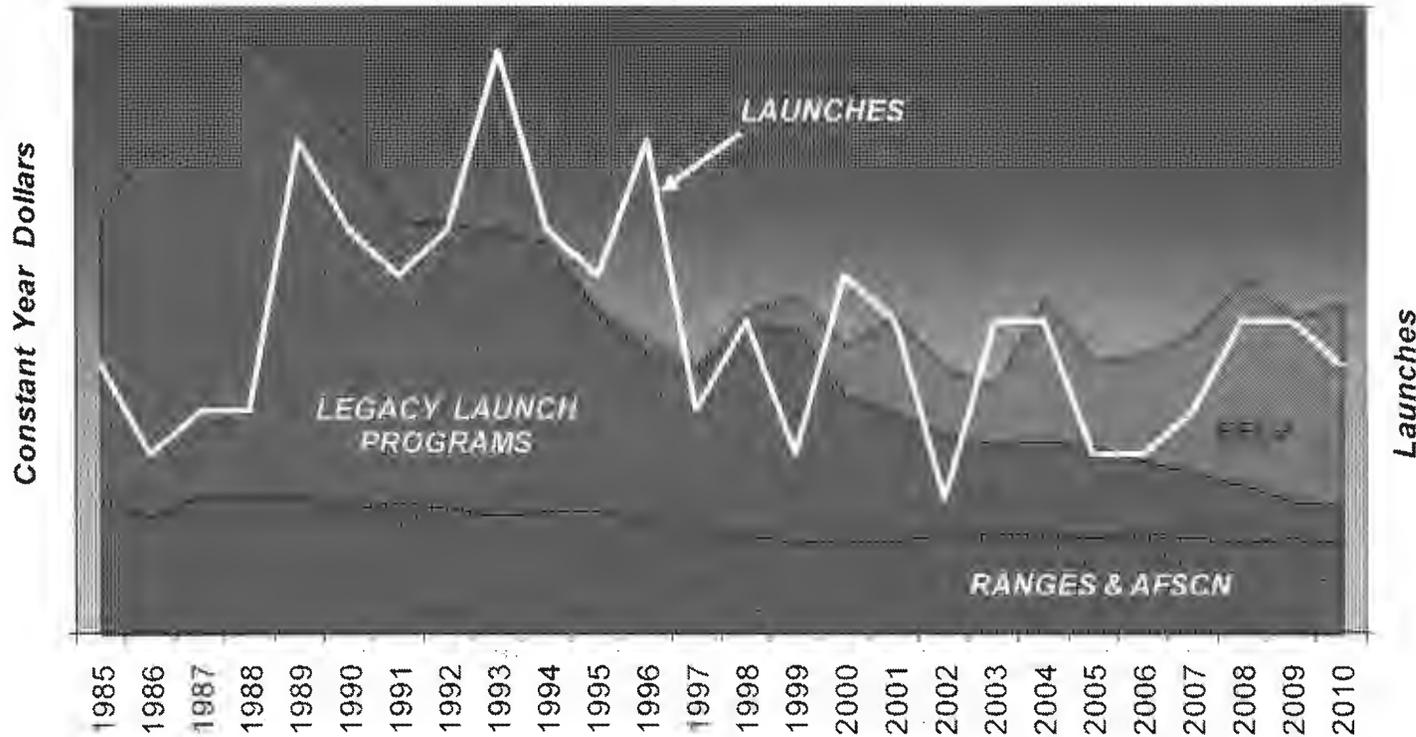
Curt Khol



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NSS Historical Launch Investment and Yield

NSS Funding of Space Launch

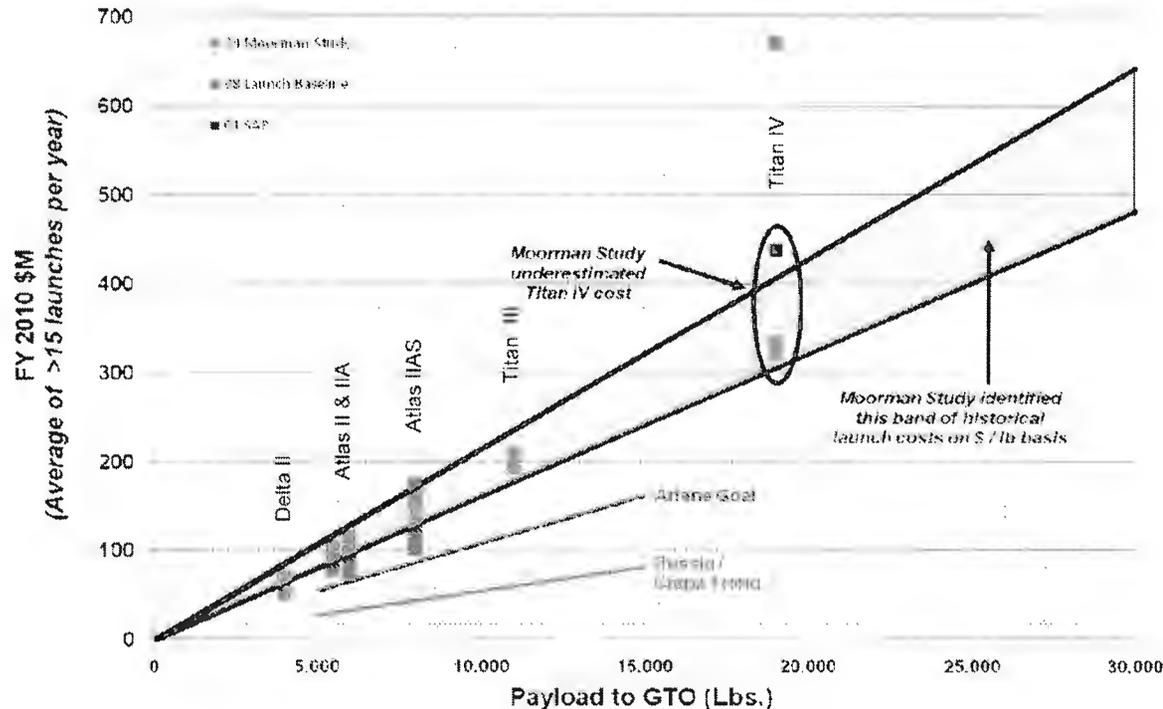


- *Current launch investment remains below legacy levels*
- *Within EELV, fixed infrastructure costs dominate*

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1994 Moorman Study To EELV

Pre-EELV Price vs. Performance Plot



This chart appeared in the 1994 Space Launch Modernization Plan (Moorman Study) and was originally from the DoD Space Launch Systems Bottoms Up Review. It has been adjusted to FY2010 constant dollars.

- 1980-1994 : NSS averaged 8 launches per year + Non-NSS averaged 7.5 per year
- 1994 SLMP: recommends a single provider based on a modular (common core) family of vehicles as the most cost effective and reliable alternative to meeting the nation's expendable launch vehicle requirements
- Dec 1996: EELV program Milestone I decision
- Nov 1997: USD(A&T) approved new acquisition strategy to allow two providers to enter EMD / Initial Launch Services phase & to maintain competition throughout life of program based on a revised forecast of a significant increase in launch demand from commercial satellite providers

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EELV Realized Business



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Major ULA Supplier Prices





OSD Cost Assessment EELV Estimate



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*OSD CA Estimate indicates prices have reverted to historical levels;
Slope has flattened and Delta IV Heavy price is considered a transient condition*

Backup

Total Program Element History

	Pre EELV Environment 1998 & Earlier	EELV Buy 1 Environment	Current EELV Environment Buy 2 and Beyond
Boosters			
Program Management, Engineering, Launch	Contracts with Industry	Fixed Price Contracts with Industry	Cost Plus EELV Contracts
Launch Pad Infrastructure	AF 45th Space Wing Responsibility		
Ranges		AF 45th Space Wing Responsibility	AF 45th Space Wing Responsibility

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EELV Buy-1 Reality

- Lot buy provided material discounts
- RFP for 34 NSS missions, revised to 30 but only 28 awarded
- Only 13 of the 28 orders placed 2000-2004 and 3 launches 2002-2006
- Only 21 of the 28 Buy 1 orders were placed in 10 years
- Large commercial demand did not materialize and neither did EELV's market share projections

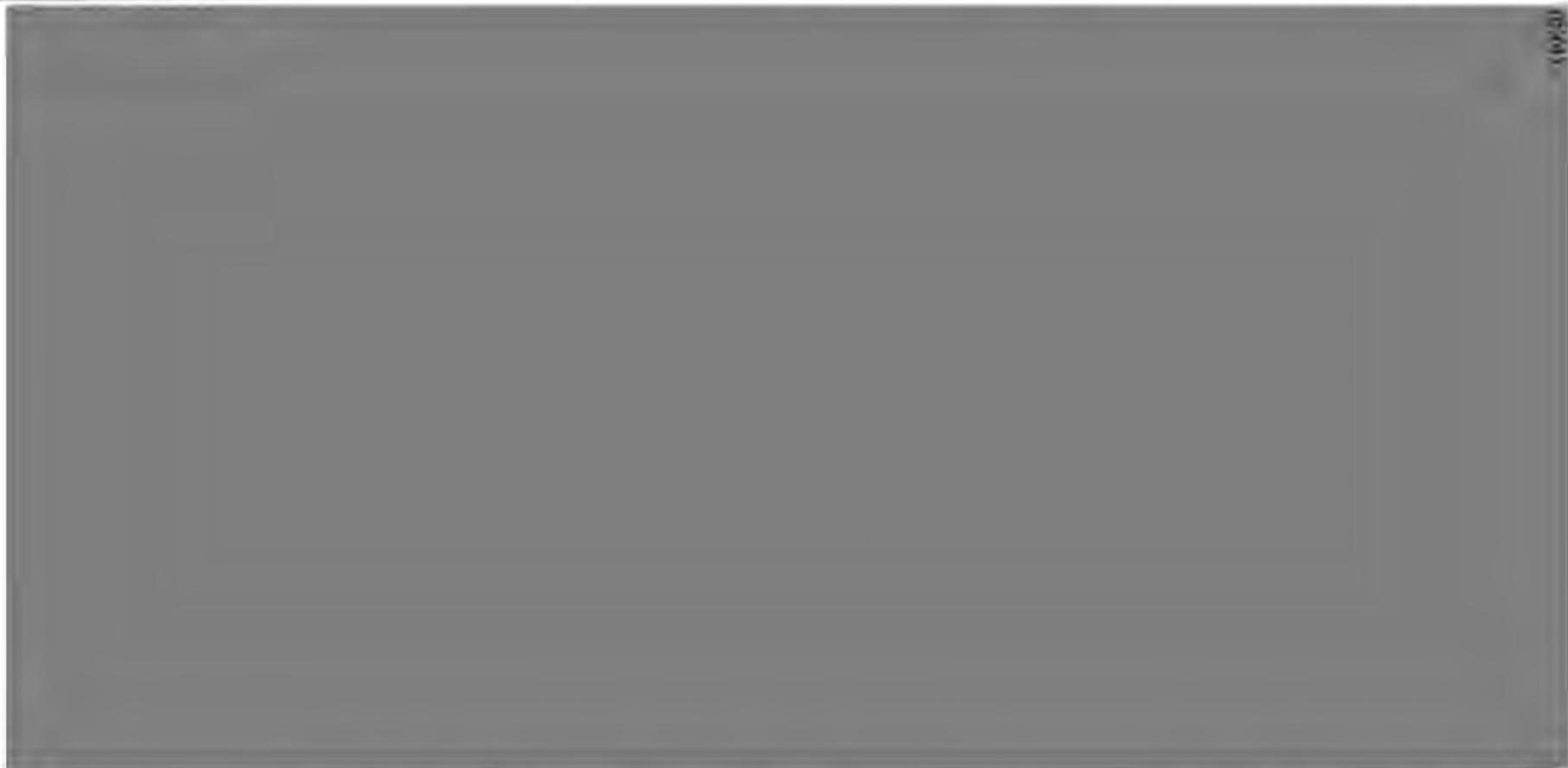


Sources: 1998 & 2009 FAA Commercial Space Transportation Forecasts

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FY2014 Business Case For Space-X



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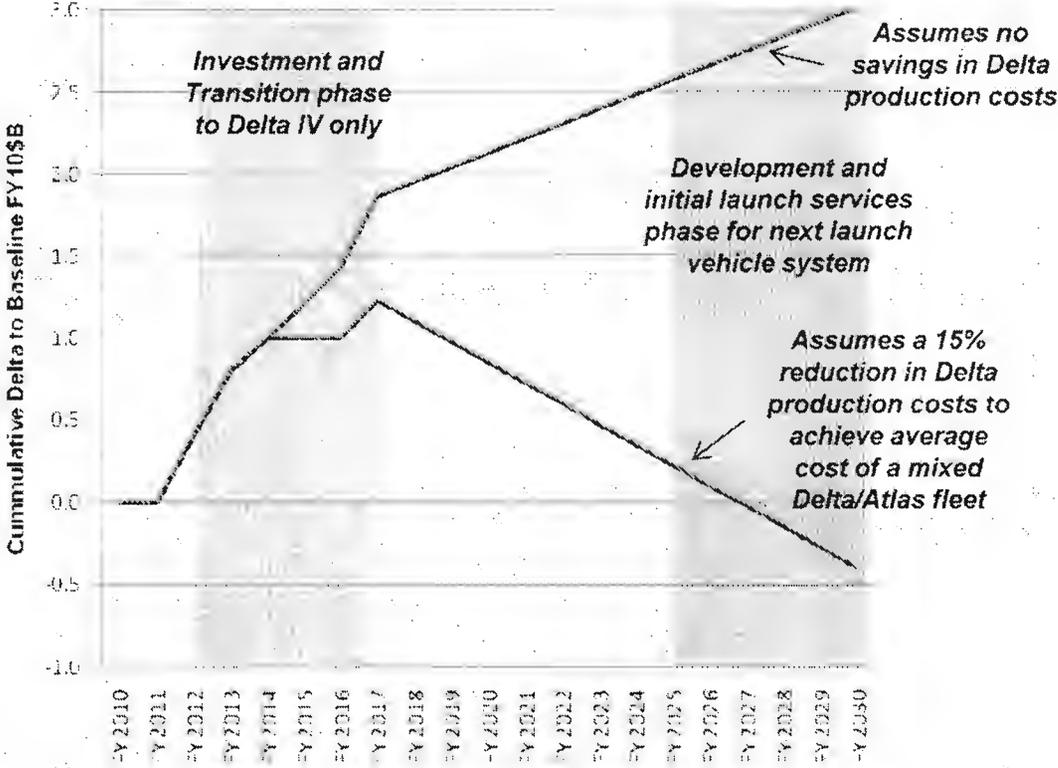
EELV program carries a significant fixed cost component, therefore only a small variable portion available to pursue other commercial avenues

Consolidate to Delta IV Only

Key Assumptions:

- \$1B total investment in FY2012-14 for Delta IV launch infrastructure (2nd pad @ CCAFS)
- Last Atlas V buy in FY14 with planned launch in FY16 (hold pad available half of FY17)
- 26% reduction in ULA ELC staffing
- 6 booster purchases per year beyond FY15

Break-Even Analysis for Delta IV Only



Not likely to reach break-even point on additional infrastructure investment before a new launch vehicle replaces Delta IV

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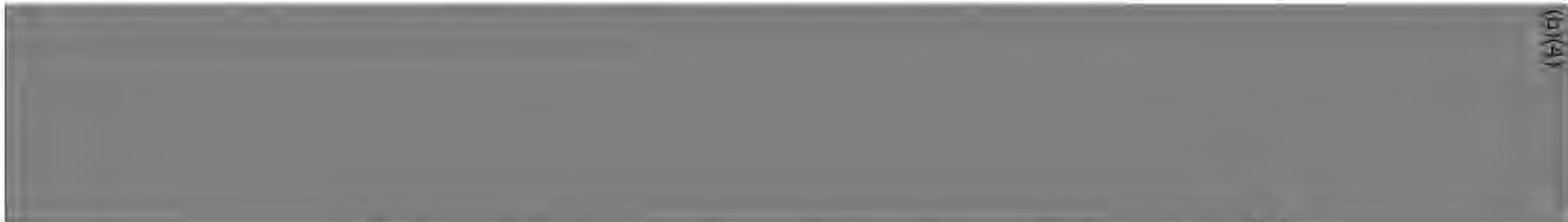


Technology Refresh

- Key components perceived to be likely costs
 - Delta IV System Integration Lab – for hardware in loop testing (\$30M)
 - Launch Infrastructure - facility and material upgrades to maintain launch system (~\$35M / yr)
 - Ordnance - obsolete, discontinued material replacement (~\$5M / yr)
 - Upper Stage Engine – rework inventory engines for mission assurance (\$20M / yr for 3 yrs) + engine shelf life extension for inventory (\$10M / yr for 2 yrs)
 - Avionics & Ground Computer System Upgrade – technology refresh of flight control system hardware at point where major upgrade to common architecture for Atlas and Delta vice piece part replacement for obsolesce is best path (\$200M)
 - Upper Stage Engine Design Effort – not required for flight operation, this would be industrial design capability effort for new engine to replace 1950's design RL-10 (\$350M) - NOT INCLUDED IN OSD CA ESTIMATE

Future Considerations

- To truly understand cost drivers, need to quantify cost of requirements
 - Allocate ULA EELV heads and equipment to specific requirements
 - Price requirements for leadership to understand and make decisions on
 - Infrastructure and Fixed Price Components
 - On-going Mission Assurance Components
- Declining demand stressing industrial base
 - Lack of clarity on NASA path forward requires PWR to quote fixed priced engine contracts assuming no NASA work
 - “Buy 1” Contract lot buy allowed contractors to manage subcontracts



- Efforts to provide realistic satellite readiness dates should improve yield

Without a significant policy change, significant cost reductions are unlikely