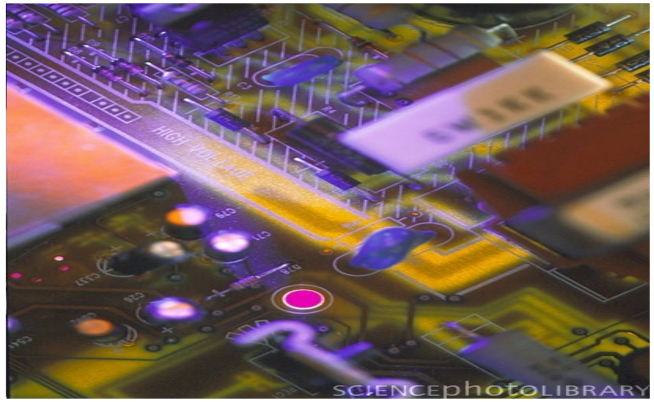
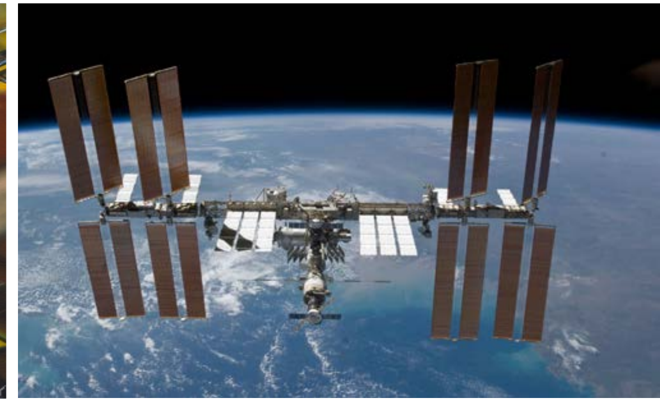
National Aeronautics and Space Administration

INDUSTRIAL BASE MANAGEMENT





The State of the Space Industrial Base: Recent Department of Commerce Surveys

JANNAF Conference

Ted Bujewski

December 6, 2012

Monterey California

Outline

- **2010 – Human Space Flight survey**
  - Impact on industry of Shuttle and Constellation
  - Survey results
- **2012 – Inter-agency "Deep Dive" survey**
  - Supply chain mapping of overall space industry
  - Preliminary results
- **Tool development**
  - Decision support tools to analyze and display industry data

2010 Human Space Flight (HSF) Survey

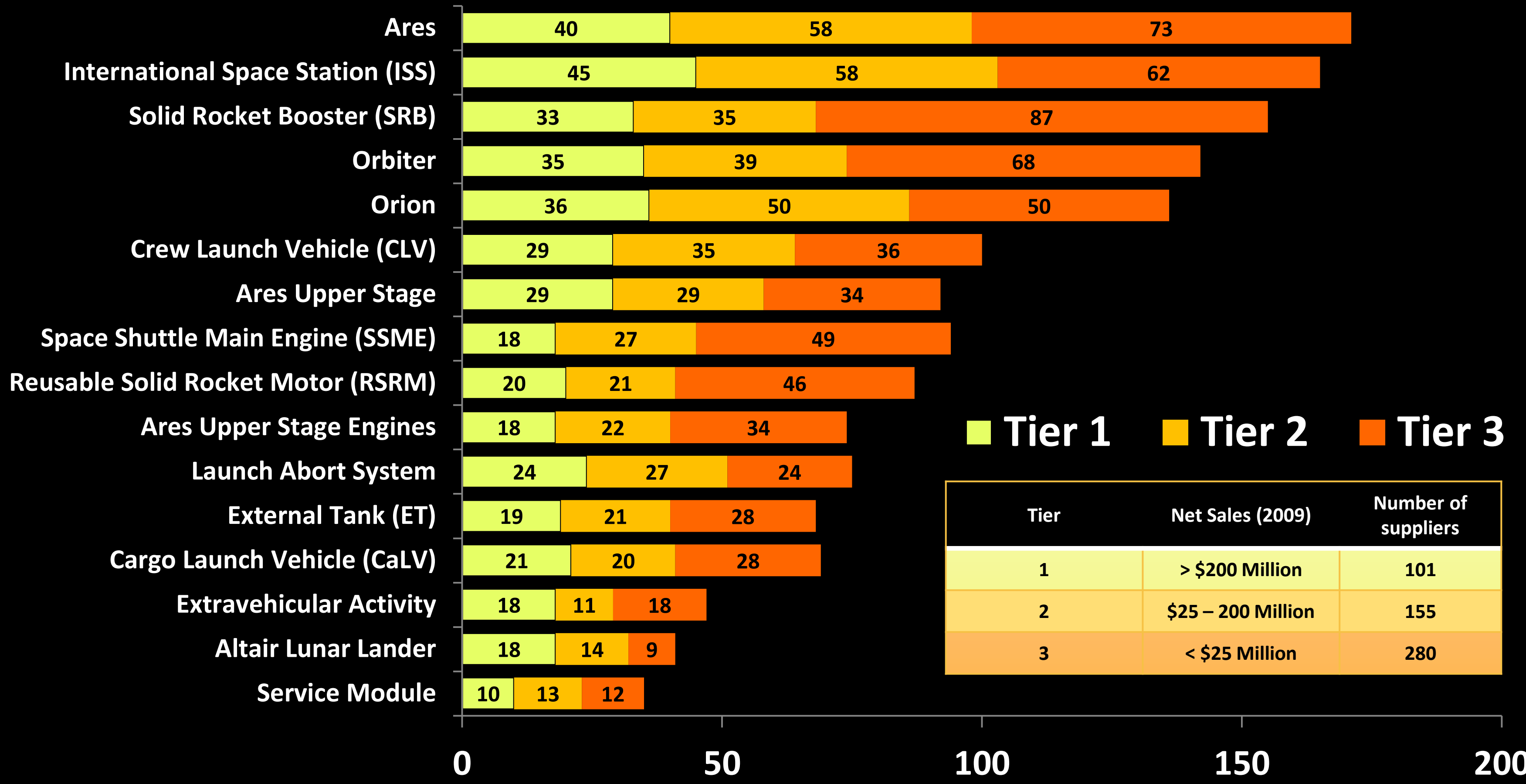
- **Department of Commerce (DoC) surveyed 536 HSF companies**
  - Defense Production Act authorizes DoC to collect proprietary info
  - Surveyed suppliers identified by NASA project managers as “critical”
- **Timeline:**
  - Released 7/10, draft report delivered 2/12, final report Nov 2012
- **Programs surveyed**
  - Constellation (CxP), Shuttle (SSP), & International Space Station (ISS)
- **Period of study:**
  - 2007-2010 (Before full impact of SSP retirement and CxP transition)
- **Data analyzed by NASA, DoC, and The Aerospace Corporation**

Survey Outline

Section Name	Type of Information Gathered
Company Information	Location, points of contact, primary business lines
Product and Service Type List	What do they sell? Extensive list provided
Future Outlook	What is their outlook for the future?
Relationships	Mergers and Acquisitions, Joint Ventures, Suppliers, NASA Customers
Operations	Production Capacity Utilization, Supply Chain Management, Machinery/Tooling/Facilities
Financial Health	Sales, Top 10 Customers, Exports, Financial Statements
Employment	Personnel numbers and description
Research and Development	R&D expenditures and funding sources
Investment	Capital expenditures

http://www.bis.doc.gov/NASA_Survey/

Supplier Program Support and Size



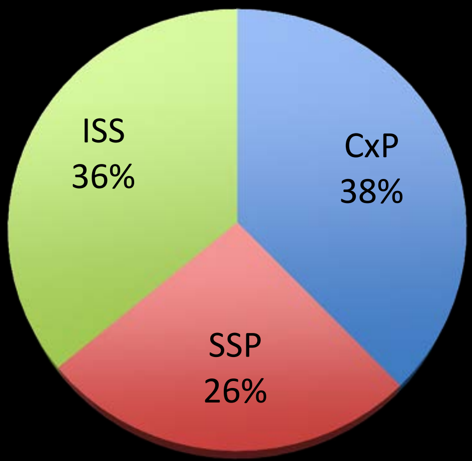
Tier	Net Sales (2009)	Number of suppliers
1	> $200 Million	101
2	$25 – 200 Million	155
3	< $25 Million	280

Suppliers represented all HSF projects and a spectrum of company sizes

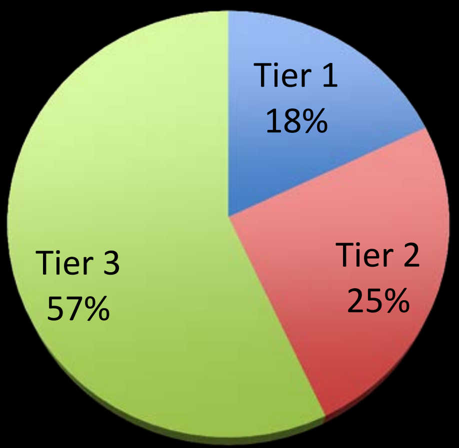
NASA Supply Chain Dependency

- 28% are "dependent" on NASA-related business
- NASA relies on these suppliers for 40% of its capabilities
- Dependent company profile
  - **Sales dependent**:
    - 28-30 % of sales are derived from NASA (compared to 2% on average)
  - **Domestically focused**:
    - (7% sold internationally vs. 25% survey average)

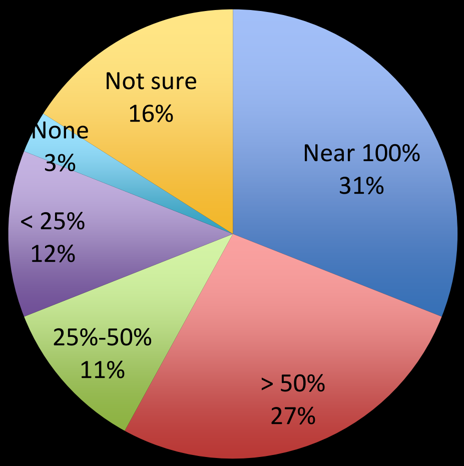
Program



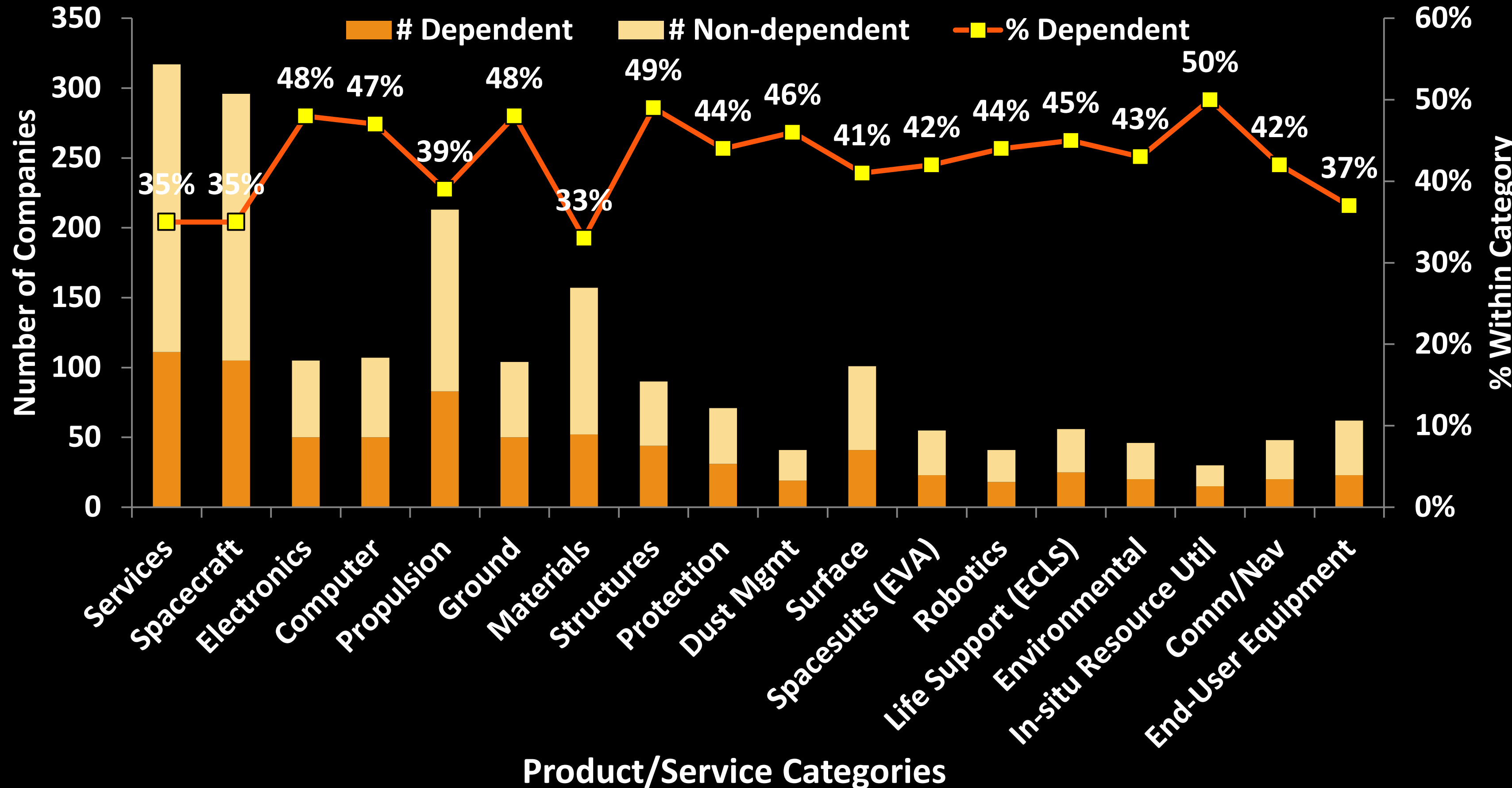
Tier



Product Compatibility

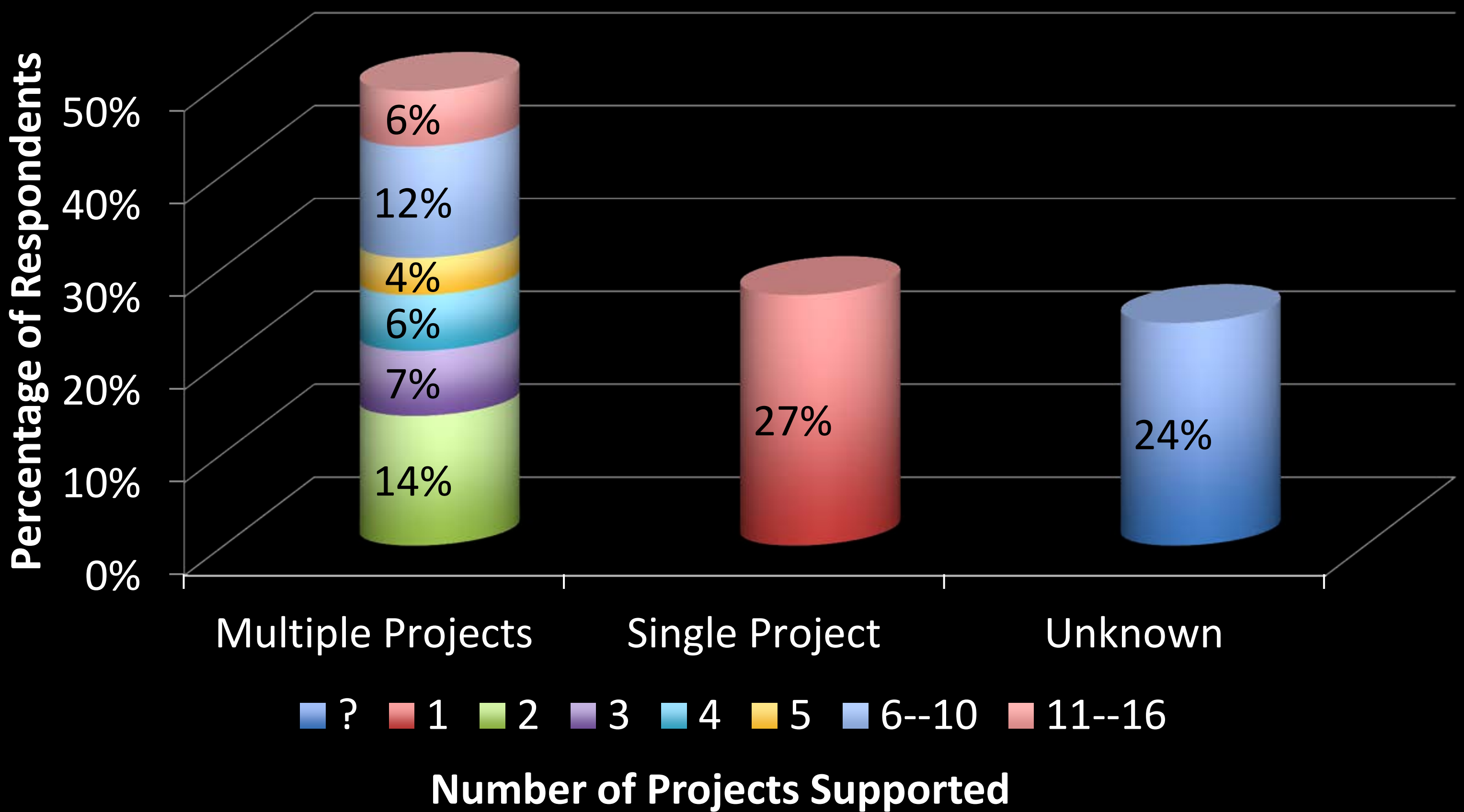


Dependency by Product/Service



A significant degree of supplier dependency exists across all product/service classes

Cross-Program Commonality



There is a significant amount of supplier commonality across HSF projects

Workforce – the loss of critical skills

- **Overall workforce decreased by less than 2 percent, however**
  - Majority of losses in Manufacturing -23,166 (6% decrease)
  - Majority of gains in Professional Services +20,188 (19% increase)
- **Industry: Loss of workforce & skills are top two impacts of loss of SSP & CxP**

Period (2007-2010)		
Employment Category	% Reporting Decline	Average Reduction
Facility Operations	38%	-69%
IT/Network Engineers	38%	-89%
Production Line Workers, Support Technicians	65%	-78%
Production Managers/Supervisors/Executives	56%	-81%
Quality Control, Test Operations	40%	-68%
R&D Staff	10%	-56%
Total Number of Engineers	33%	-76%
Total Number of Scientists	4%	-62%

Workforce: Manufacturing

- **50% of suppliers surveyed were manufacturers**
  - In 2010 this represented 378,116 workers
- **Job loss has been relatively minor compared to national numbers**
  - NASA manufacturing jobs were reduced by 5.6% from 2007-2010
  - Nationally, the manufacturing workforce was reduced by 18% from 2007-2010*
  - SSP and CxP were still active programs
- **After 2010, job losses may have been significantly worse**
  - SSP retirement, CxP transition, and projected budget cuts
  - 100 manufacturers are either dependent on NASA (37%)
    - 149,796 workers at risk (40% of the manufacturing workforce)
- **2012 DoC survey will provide additional information**

NASA manufacturers did well during the recession. Post 2010 may be worse.

* Bureau of Labor Statistics

2012 "Deep Dive" Survey

- Agencies participating: DoC, NASA, Air Force, NRO
- 10,000+ space suppliers (industry, government, and universities)
- Objectives
  - Map the space industrial base supply chain
  - Identify interdependencies
  - Strategic planning and collaborative problem solving
  - Analyze long term trends
- 9 months study (June 2012 – Mar 2013) divided into 3 parts
  - First waypoint at end of September

http://beta-www.bis.doc.gov/index.php/space-deep-dive

First Waypoint Data

Respondents by Type of Organization	
Commercial Companies	1,018
Universities	42
Non-Profit Organizations	19
U.S. Government Agencies	8
Total	1,087

64% Respondents are small businesses, as defined by the Small Business Administration

First Waypoint Respondents by Average Annual Net Sales (2009-2012)	
Very Small (Less than $5M)	433
Small ($5 – 10M)	140
Medium ($10 – 50M)	278
Large ($50 – 250 M)	151
Very Large (Greater than $250 M)	85

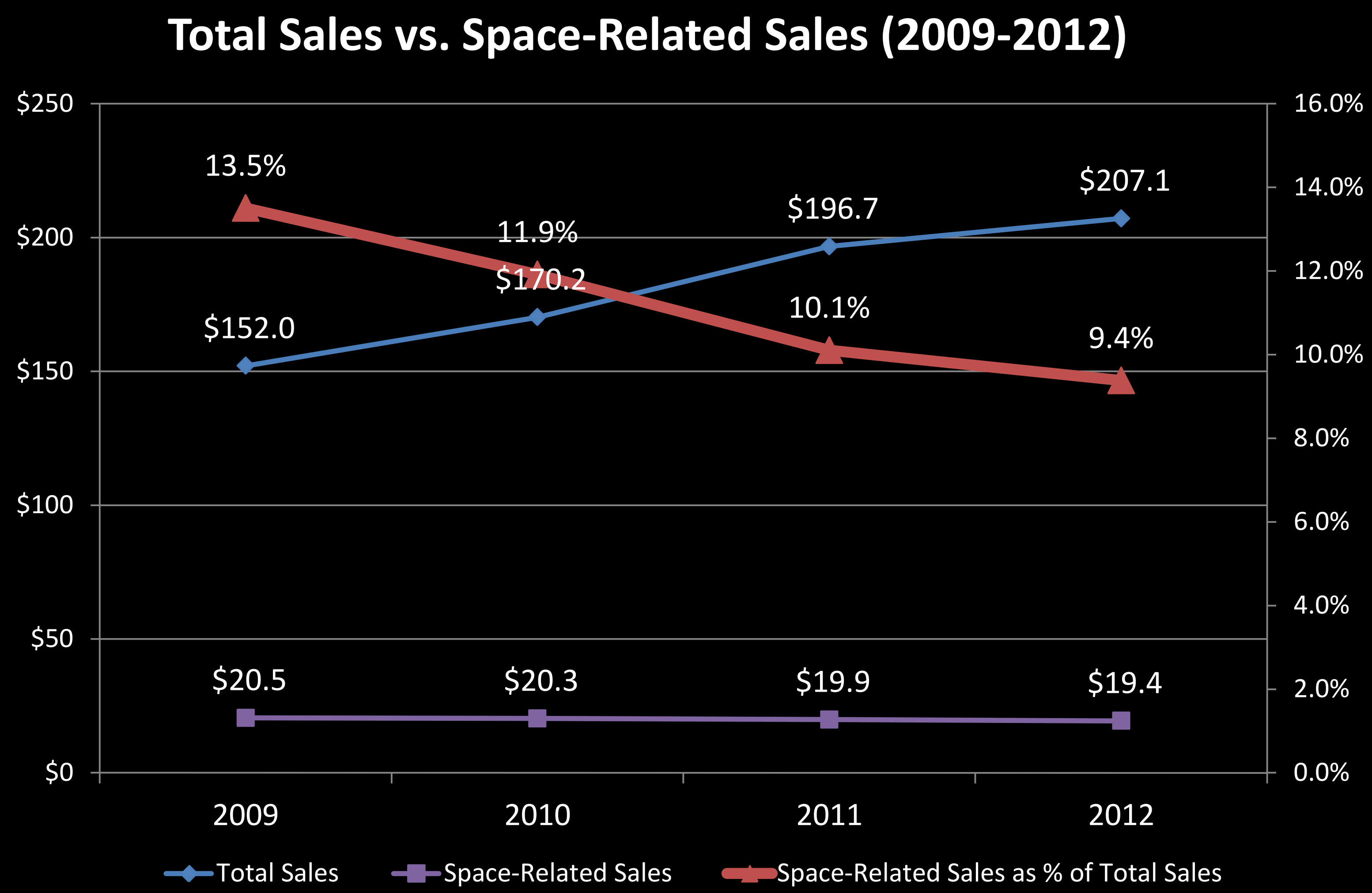
For more information go to:

http://www.bis.doc.gov/SpaceDeepDiveResults/F First_Waypoint_Findings.pdf

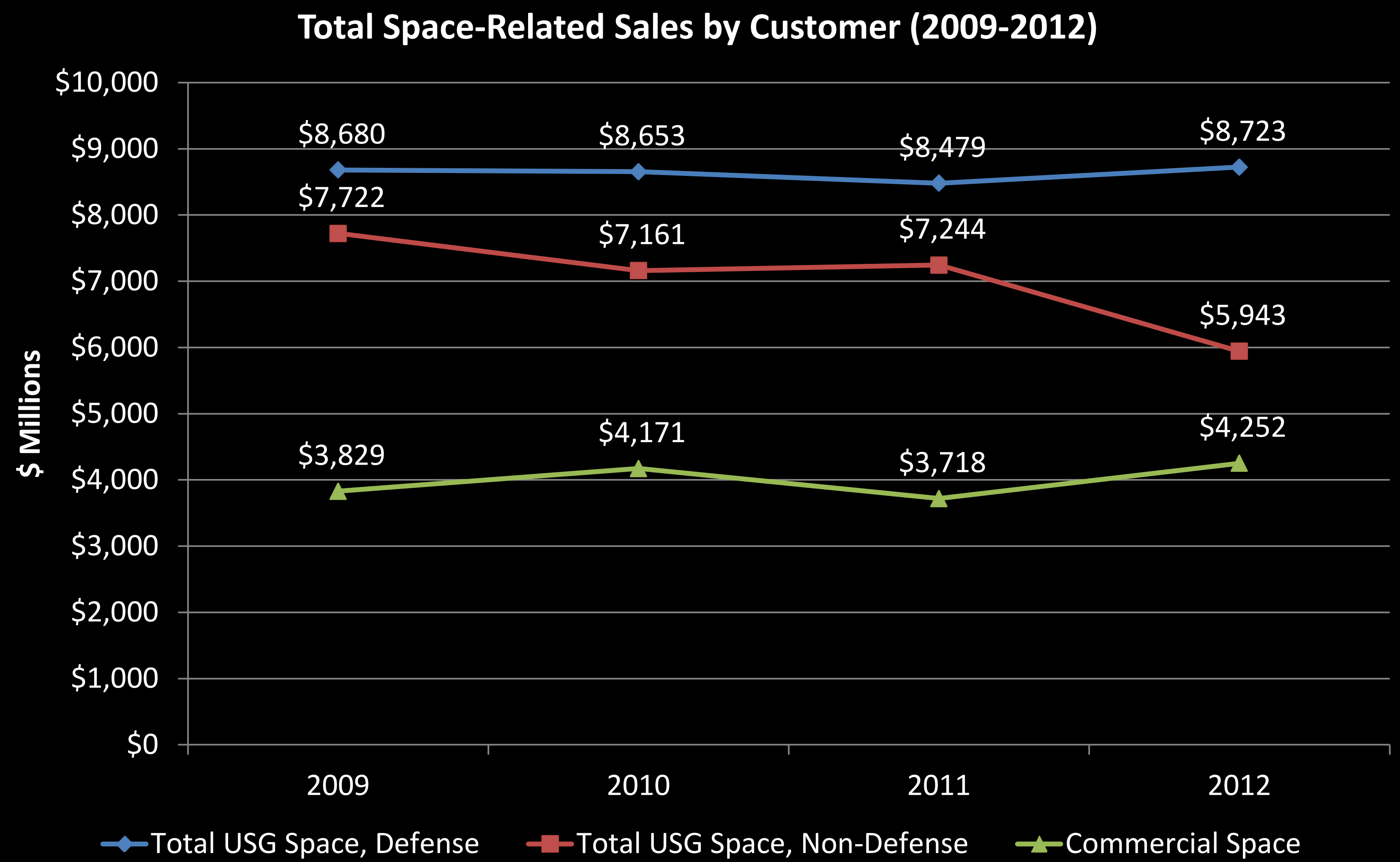
Critical Suppliers

- **2,667 unique, critical suppliers identified**
  - Suppliers provided over 6,700 products and services
- **404 sole source and 707 single source suppliers identified**
  - Sole source (only source known to exist)
    - Provided 14% of products and services
  - Single source (only accepted source used)
    - Provided 23% of products and services
- **Critical suppliers identified from 45 countries**
  - The most prominent non-US suppliers were from Japan, Canada, Germany, the United Kingdom, and China.

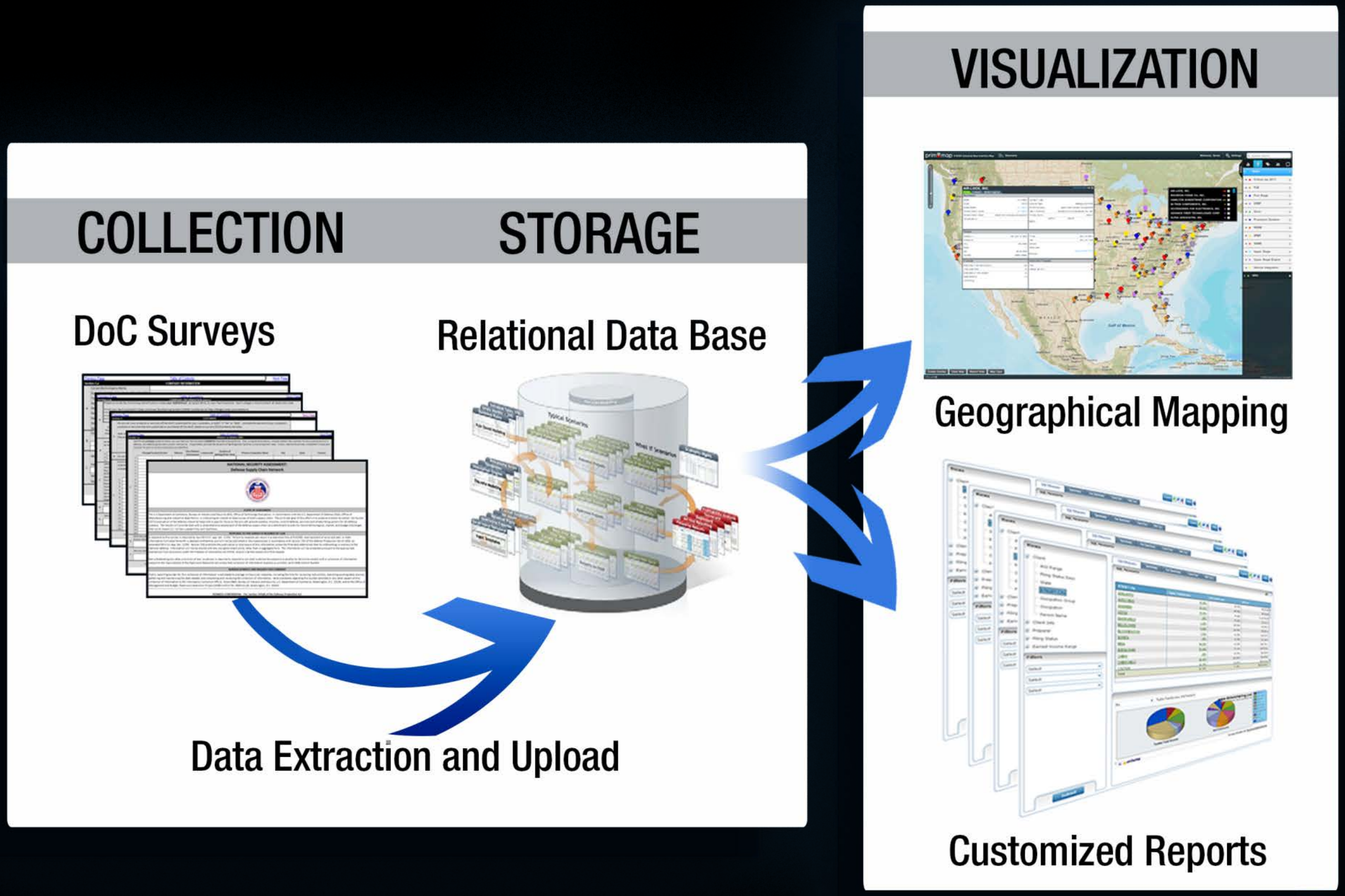
Sales Trends By Total Sales



Sales Trends By Customer



Survey Data Processing and Analysis



Questions?