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# U.S. SPACE INDUSTRY 'DEEP DIVE'

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A COLLABORATION BETWEEN THE DOC AND THE USAF, NASA, AND  
NRO

## FIRST WAYPOINT PRELIMINARY FINDINGS

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# U.S. Space Industry 'Deep Dive' Assessment - Background

- Partnership with the U.S. Air Force, National Aeronautics and Space Administration, and the National Reconnaissance Office.
- The principle goal is to gain an understanding of the intricate supply chain network supporting the development, production, and sustainment of products and services across the defense, intelligence, civil, and commercial space sectors.
- Objectives:
  - a) Map the space industrial base supply chain in unprecedented detail;
  - b) Identify interdependencies between respondents, suppliers, customers, and USG agencies;
  - c) Benchmark trends in business practices, competitiveness issues, financial health, etc. across many tiers of the industrial base; and
  - d) Share data with USG stakeholders to better inform strategic planning, targeted outreach, and collaborative problem resolution.

## U.S. Space Industry 'Deep Dive' Assessment - Background (cont.)

- All partners worked together to develop a survey that **minimized industry's burden** and met the **objectives of all stakeholders**.
  - Open and cooperative interaction between partners was critical to making this assessment as success.
  - All partners will receive the survey data – agencies know best how to use this information to support their respective missions.
- In June 2012, the 'Deep Dive' survey was distributed to approximately 9,150 organizations, including companies, universities, non-profits, and USG agencies.
- The collection is divided into three, three-month long waypoints. We have reached the first waypoint.
  - The data in this presentation is based on surveys collected in the first three months.

# Overview of First Waypoint Data

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

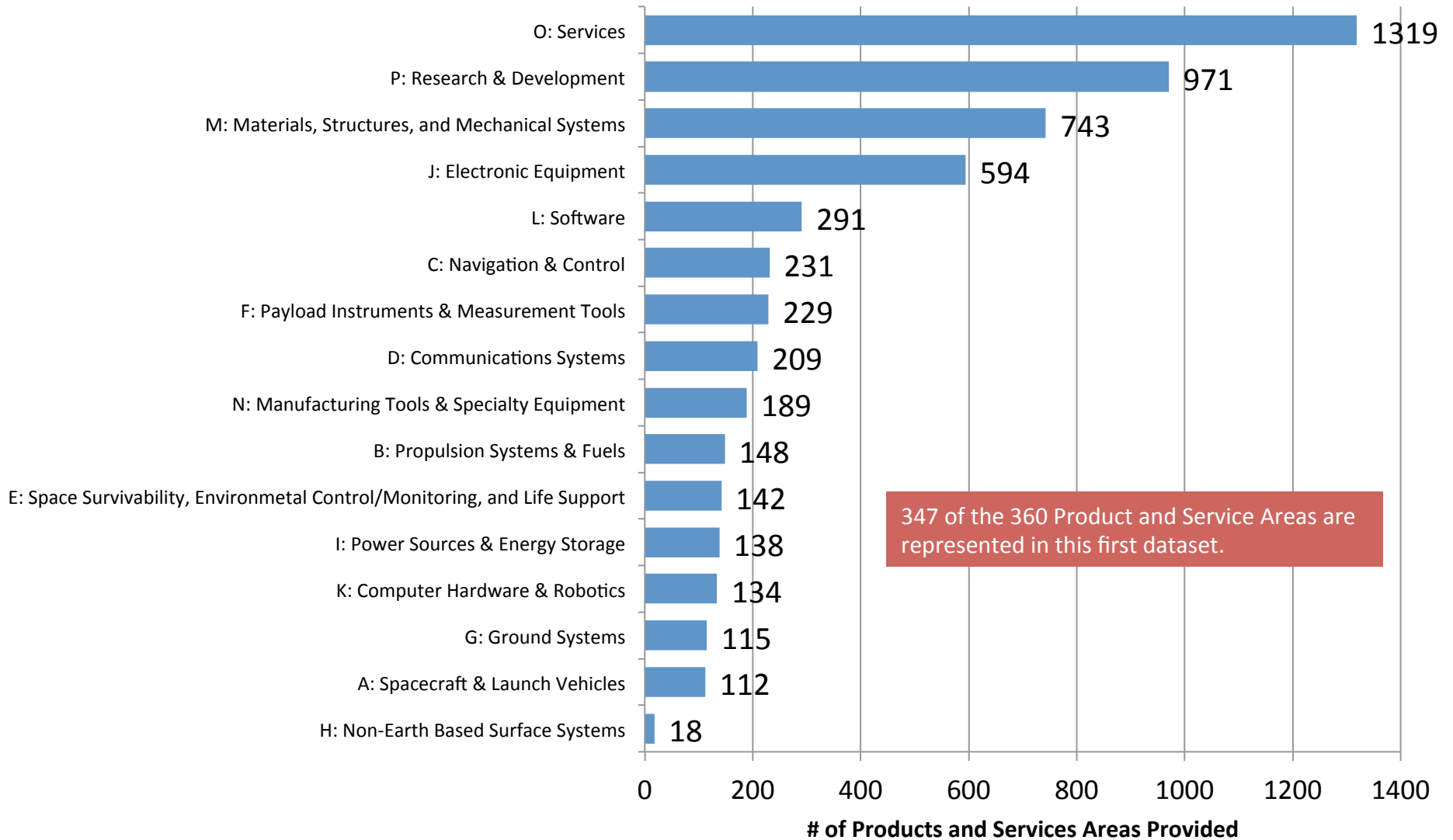
First Waypoint Respondents by Average Annual Net Sales (2009-2012)	
Very Small (Less than \$5M)	433
Small (\$5 – 10M)	140
Medium (\$10 – 50M)	278
Large (\$50 – 250 M)	151
Very Large (Greater than \$250 M)	85

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

# The Product and Service List

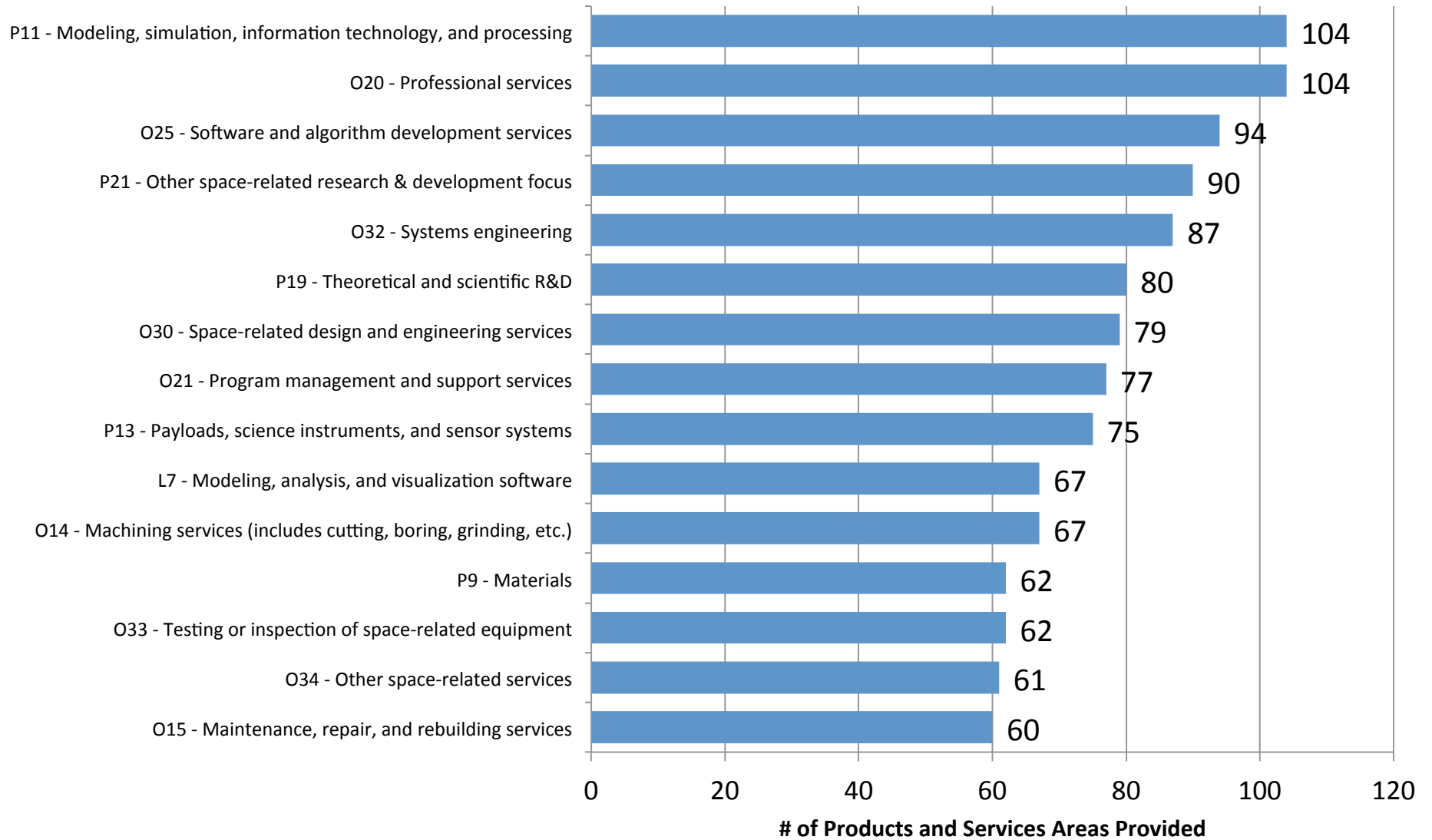
- The Product and Service List is comprised of 360 individual products and services, grouped into 16 general segments.
- The list is designed to capture how respondents fit into the space industrial base.
- Product and Service Segments:
  - A. Spacecraft & Launch Vehicles
  - B. Propulsion Systems & Fuels
  - C. Navigation & Control
  - D. Communications Systems
  - E. Space Survivability, Environmental Control/Monitoring, and Life Support
  - F. Payload Instruments & Measurement Tools
  - G. Ground Systems
  - H. Non-Earth Based Surface Systems
  - I. Power Sources & Energy Storage
  - J. Electronic Equipment
  - K. Computer Hardware & Robotics
  - L. Software
  - M. Materials, Structures, and Mechanical Systems
  - N. Manufacturing Tools & Specialty Equipment
  - O. Services
  - P. Research & Development

# Products and Services Provided by Segment



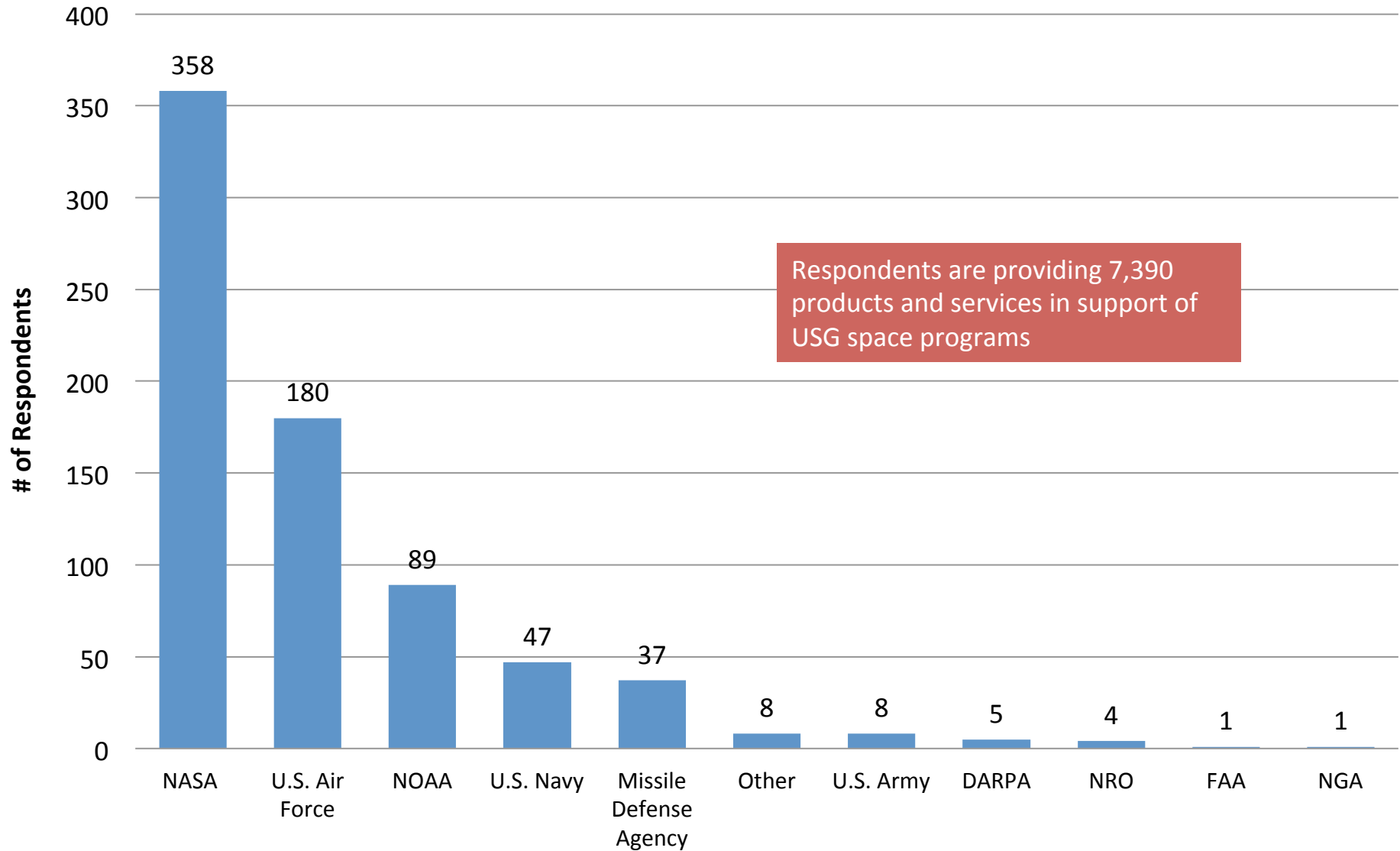
Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

## Top 15 Product/Service Areas Provided by Respondents



Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

## Support for Space Programs By USG Organization\*

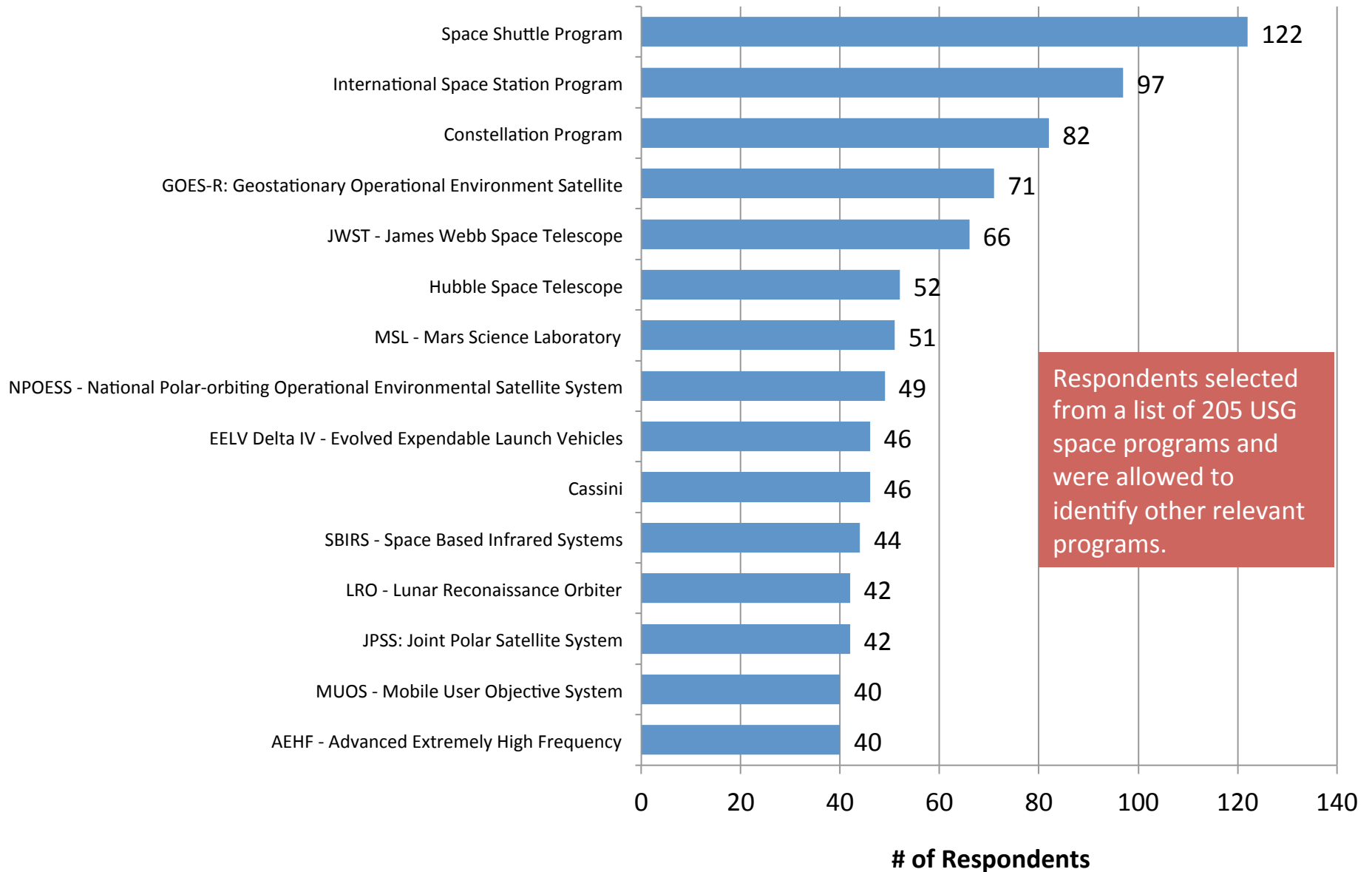


\* Unique number of respondents identifying direct support of a specific USG space program

Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.



## Support for USG Space Programs Based on Respondent Participation

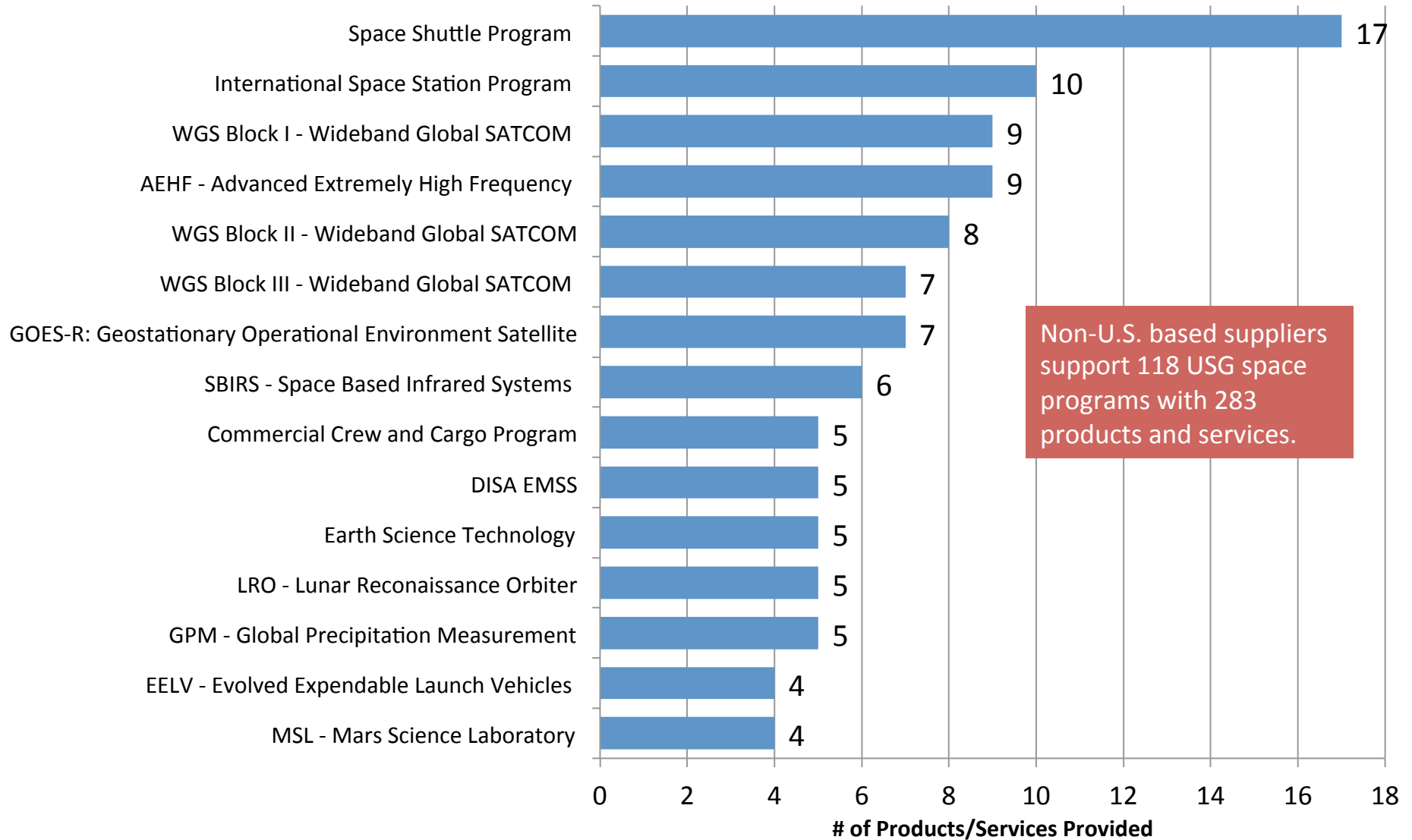


Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

# Critical Suppliers

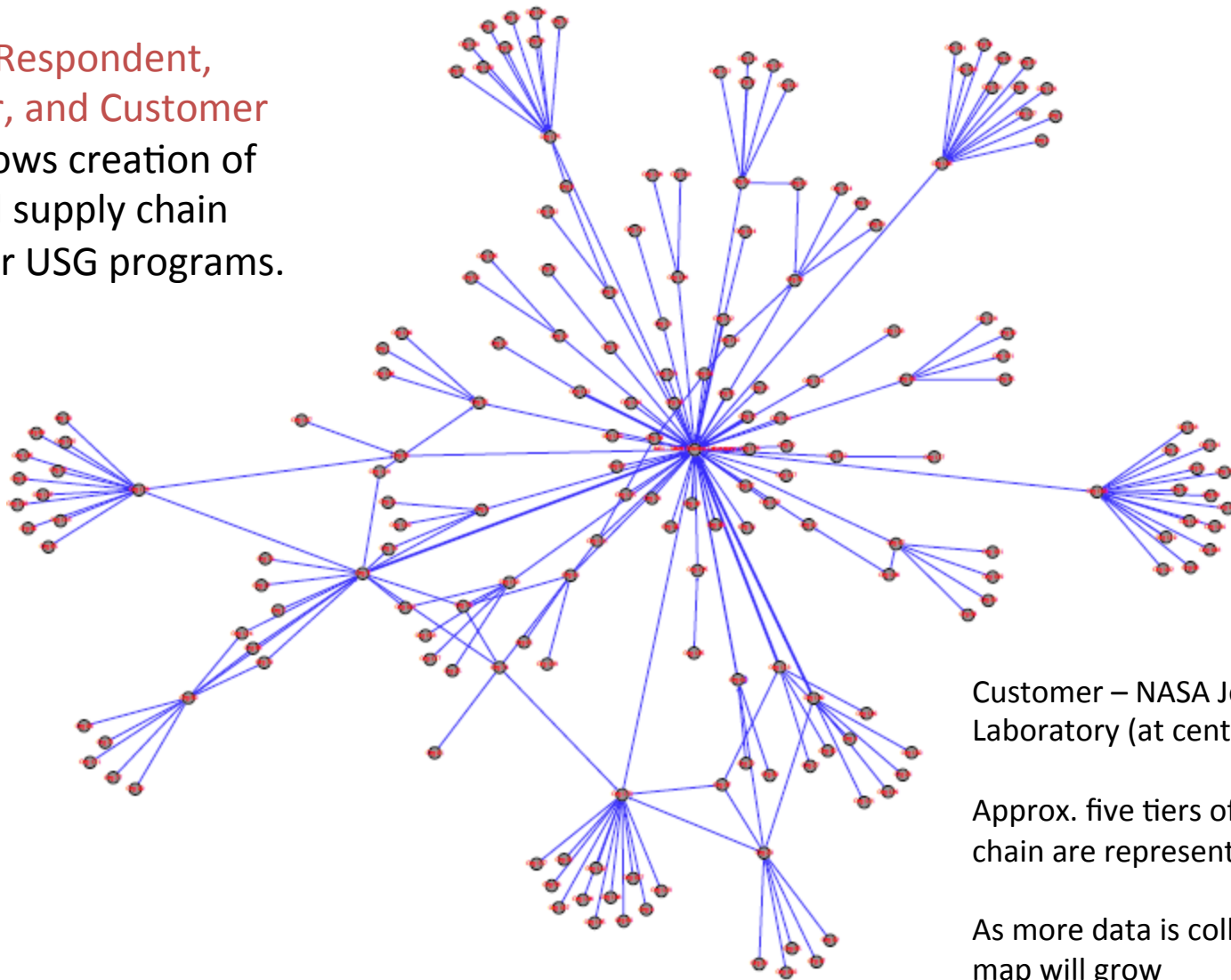
- Respondents identified 2,667 unique, “critical” suppliers that support items on the Product and Service List.
- These suppliers most commonly supported respondents with materials, structures, and mechanical systems, electronic equipment, and services.
- Fourteen percent of products and services provided to respondents were from sole source suppliers. Twenty-three percent of products and services were from single source suppliers.
- Respondents identified critical suppliers from 45 countries.
  - Based on the number of products and services provided, the most prominent non-U.S. suppliers were located in Japan, Canada, Germany, the United Kingdom, and China.
  - Non-U.S. suppliers most commonly provided respondents with materials, structures, and mechanical systems, electronic equipment, and communications systems.

# USG Space Programs with the Greatest Non-U.S. Based Supplier Support



## Utilizing the Data: Supply Chain Mapping Mars Science Laboratory (MSL) Curiosity Rover

Linking **Respondent**,  
**Supplier**, and **Customer**  
data allows creation of  
detailed supply chain  
maps for USG programs.



Customer – NASA Jet Propulsion  
Laboratory (at center)

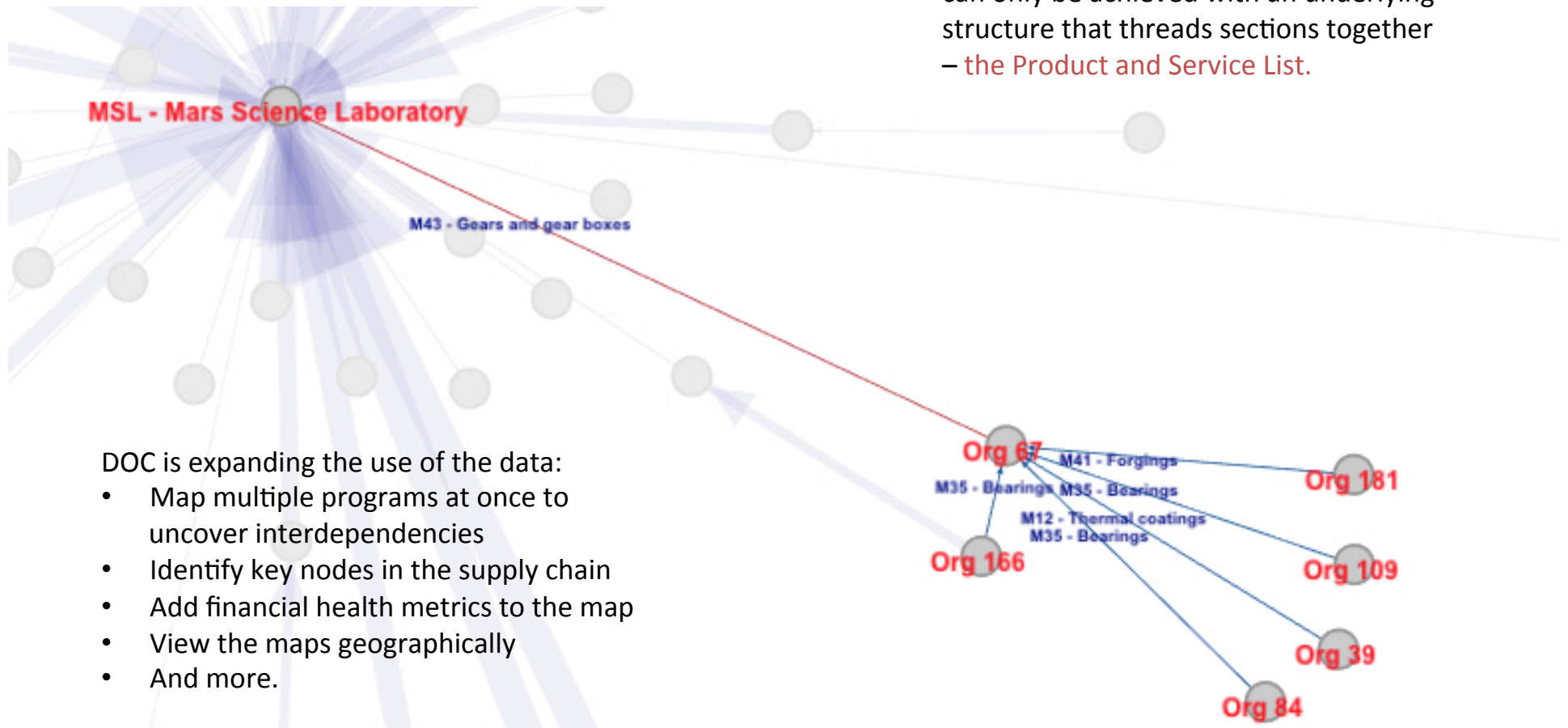
Approx. five tiers of the supply  
chain are represented

As more data is collected, the  
map will grow

Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

## Mars Science Laboratory (MSL) Curiosity Rover - Detailed View

This level of detail in supply chain mapping can only be achieved with an underlying structure that threads sections together – the **Product and Service List**.

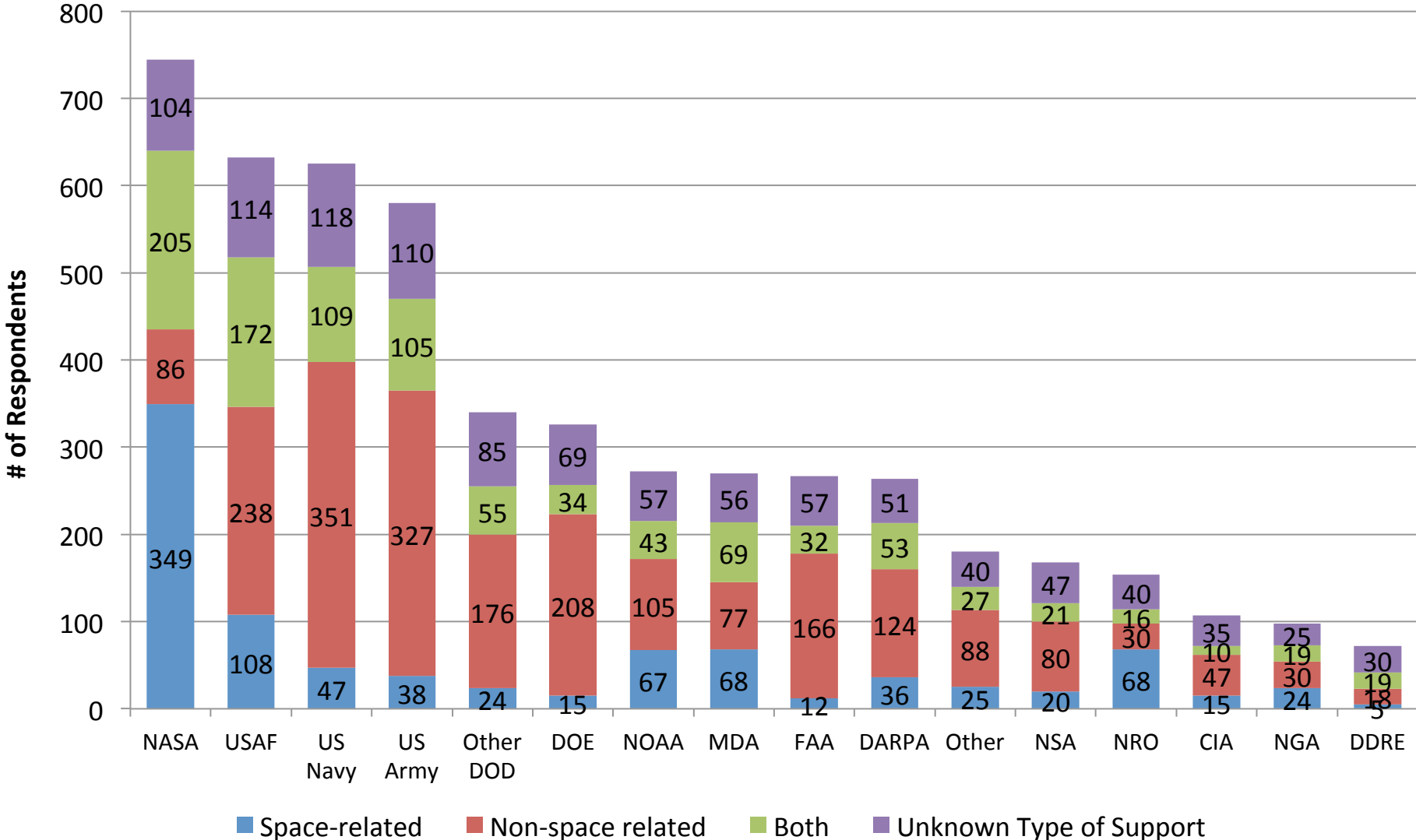


DOC is expanding the use of the data:

- Map multiple programs at once to uncover interdependencies
- Identify key nodes in the supply chain
- Add financial health metrics to the map
- View the maps geographically
- And more.

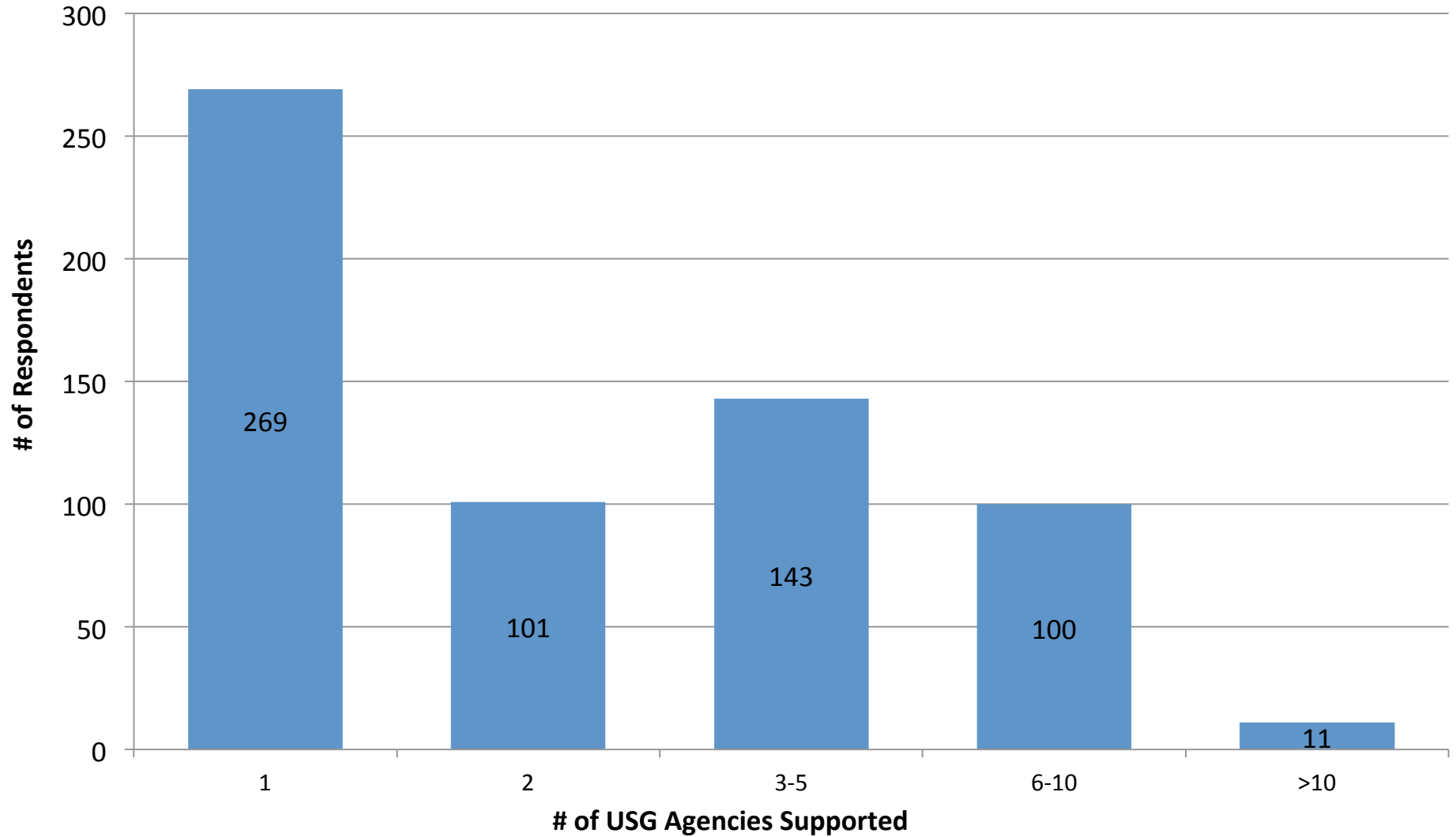
Partner organizations can tailor these maps to their specific needs.

# Support for USG Agencies\*



\* This identification of support is not tied to a specific USG program.

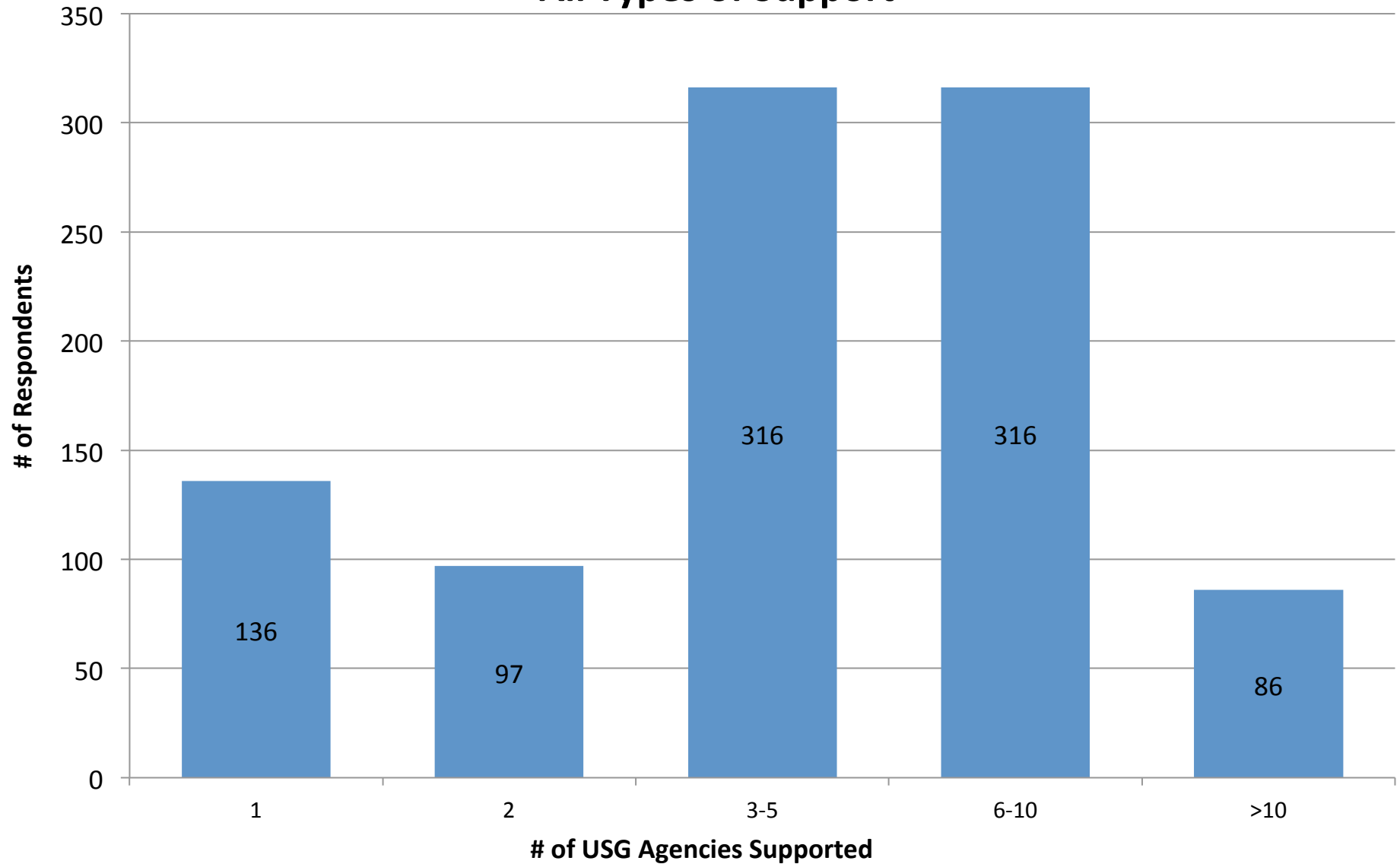
## Respondents Providing **Space-Related** Support to Multiple USG Agencies\*



\* A combination of “space-related” support and “both” responses.

Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

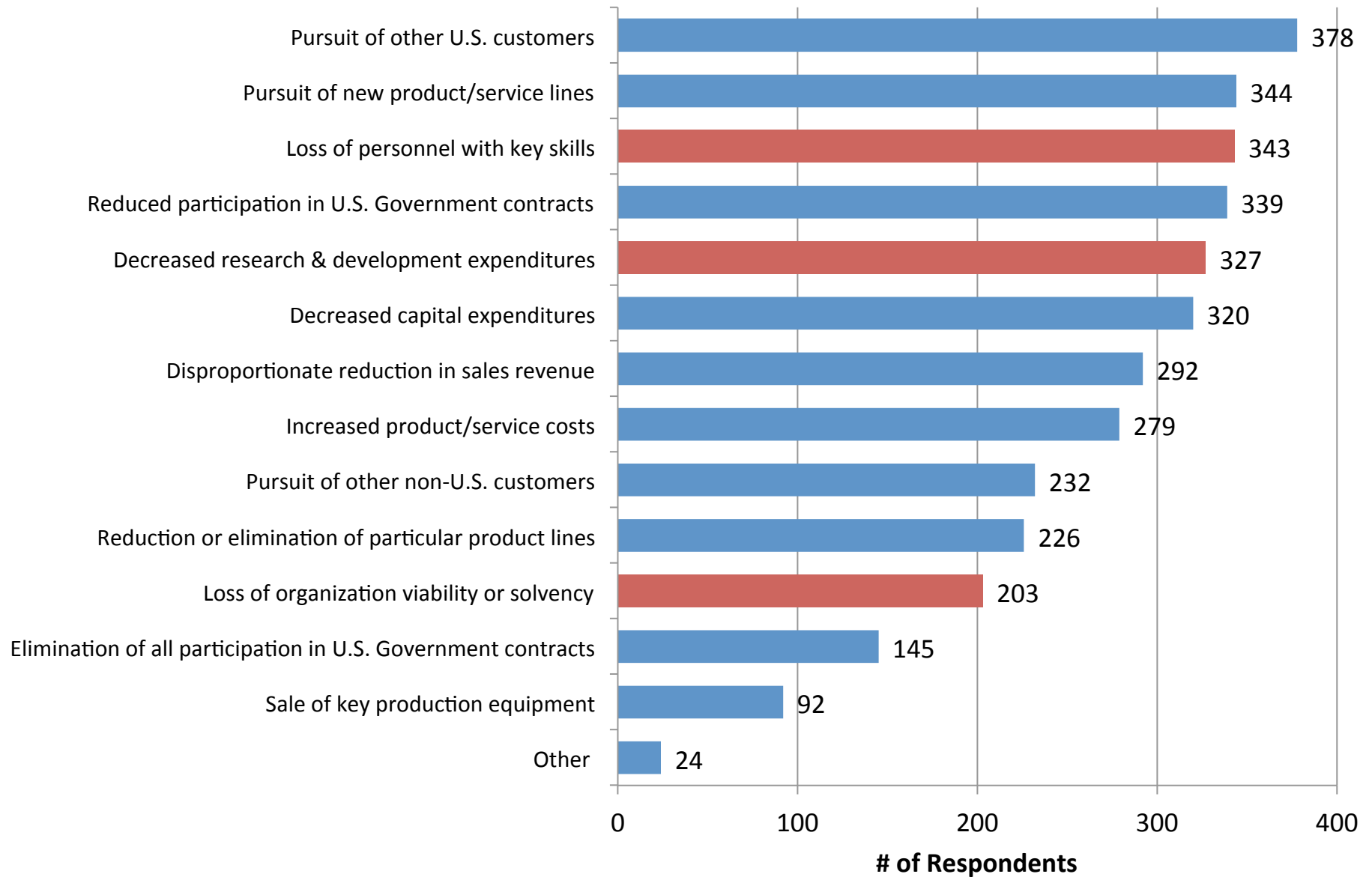
## Respondents Supporting Multiple USG Agencies - All Types of Support



Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.



## Potential Impacts of a Sudden Decrease in USG Space-Related Demand



Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

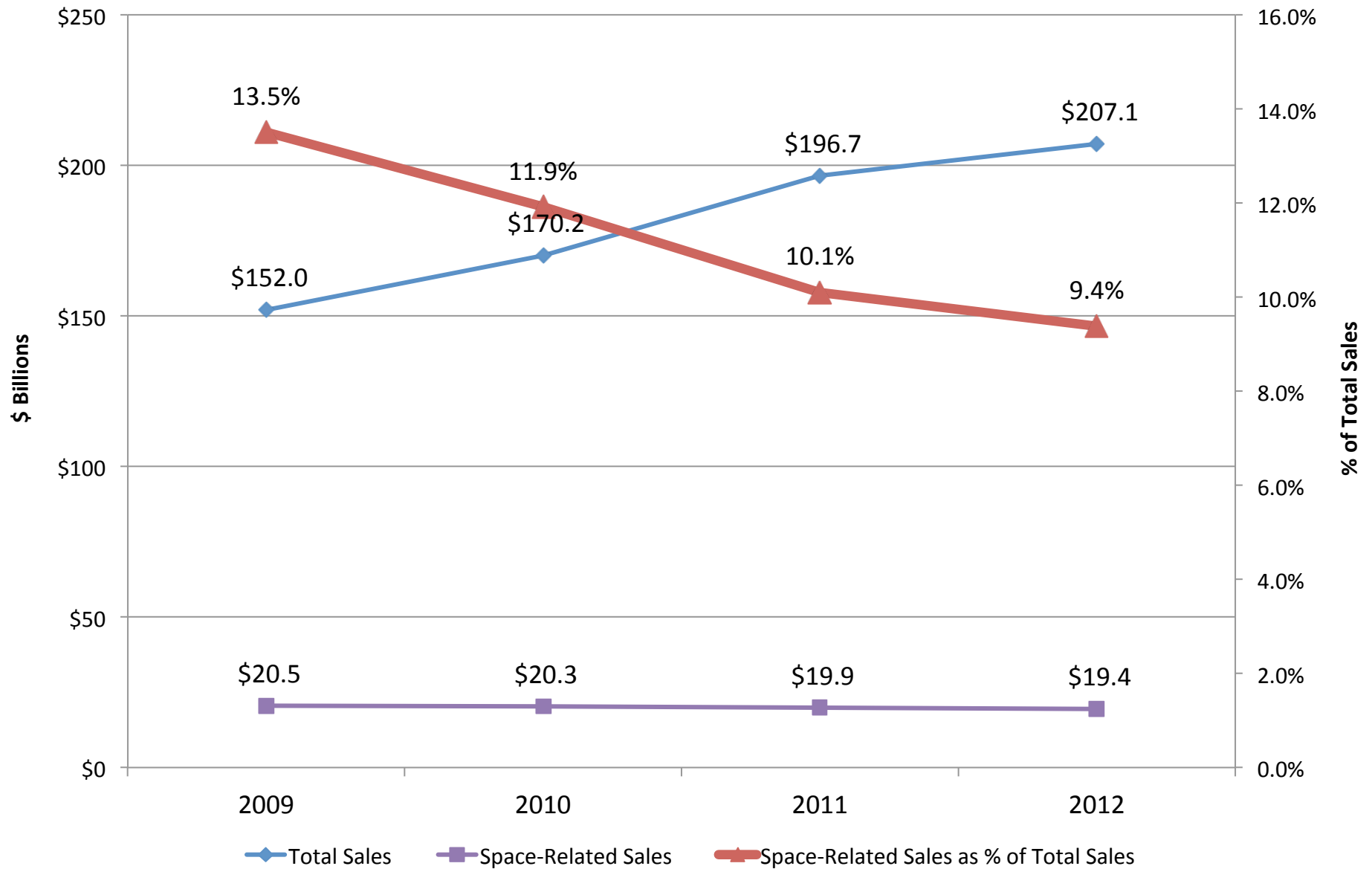
# Continued Desire to Work With the USG

Nineteen percent (206 of 1,087) of respondents have had their desire to serve USG space-related **somewhat or significantly adversely impacted** by variability in demand.

## Adverse Impacts:

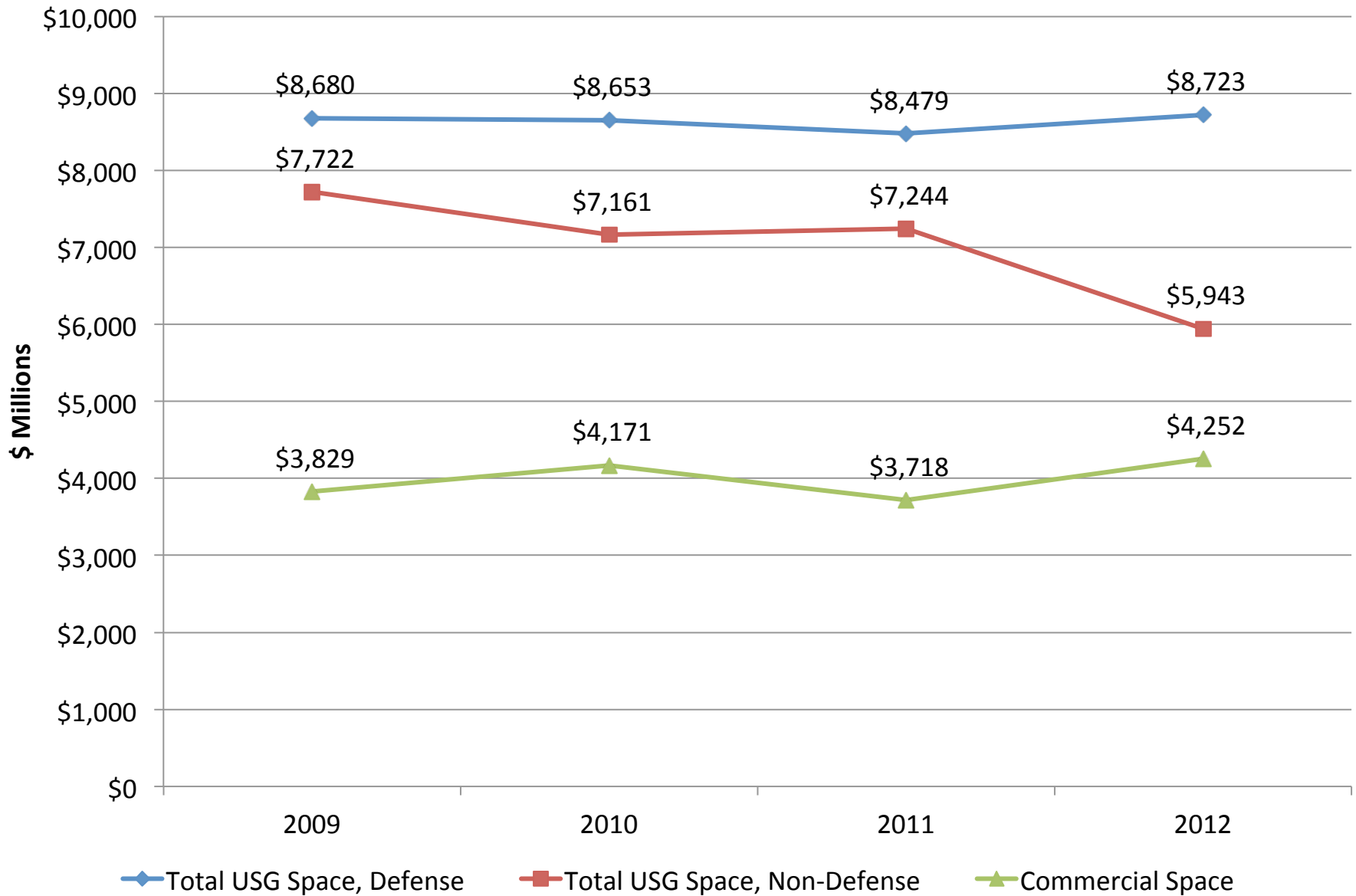
- “Variation in year-to-year R&D budgets over the last 2 - 3 years due to changes in program priorities, federal budget pressures, cancellation of key programs has had a significant negative impact on our business stability over those years. Hiring and other long range investments have been strongly affected” – Very small company, Georgia.
- “The decrease in USG space programs has fundamentally changed the outlook for several of our clients and just as importantly it has significantly impacted several potential clients resulting in a drastically reduced demand for services we provide. Consequently, while we are still interested in this segment, the market outlook is much more somber than it was just 2-3 years ago” – Very small company, Texas.
- “Desire unchanged, just fewer opportunities” – Very small company, Nevada.
- “This is the work we do and we love it. We do it by choice. We are very dependent on the US government, but we couldn't do the same work in any other context. So we just keep doing it, even if it's not always stable. A lot of great talent is leaving the industry because of this, though. The massive NASA layoffs of last year are a sad example of that” – Very small company, Texas.

## Total Sales vs. Space-Related Sales (2009-2012)



Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

## Total Space-Related Sales by Customer (2009-2012)



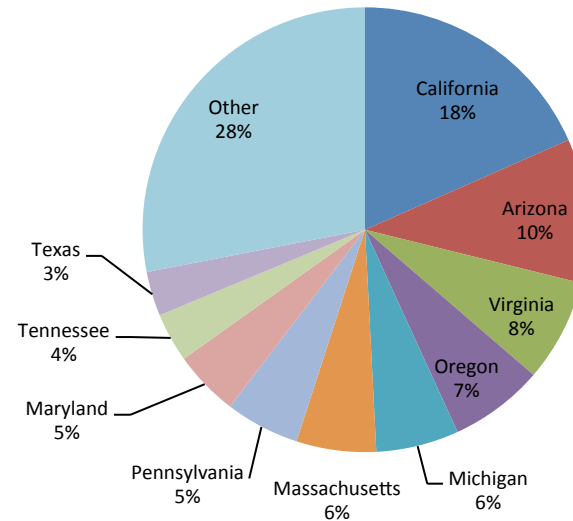
Source: U.S. Department of Commerce, Bureau of Industry and Security,  
*U.S. Space Industry Deep Dive*, Preliminary Data – October 2012.

# Unfilled Vacancies for Skill Positions

- Respondents were asked to identify how many **unfilled vacancies** they currently have for the following positions:
  - Engineers, Scientists, and R&D Staff
  - Production Line Workers
  - Testing Operators, Quality Control, & Support Technicians
- 372 respondents (34 percent) **currently have 5,796 vacancies** for these positions.

Vacancies by Organization Size/Type	
Very Small	267
Small	76
Medium	512
Large	995
Very Large	2,517
Universities	1,429

**Vacancies by State (Excluding Universities)**



## Respondents Interested in USG Assistance Programs and Services

Program	# of Respondents
Business development	219
R&D programs	168
SBIR and STTR contracts	141
Global export opportunities	126
Manufacturing technology development	122
Export licensing (ITAR/EAR)	121
Financing	107
Training Opportunities	107
Marketing assessment skills	95
Product/service development	83
Government procurement guidelines and e-commerce	82
Patents and trademarks	65
Energy and environmentally conscious manufacturing	52
Country Commercial Guides	20

**Leverage existing USG programs and resources to assist U.S. space-related companies.**

# Survey Topics

- Codes: DUNS, CAGE, NAICS, PSC
- Mergers & Acquisitions, Joint Ventures
- 205 USG Space Programs – USAF, NASA, NOAA, MDA, Army, Navy
- 16 Major Product & Service Segments including:
  - R&D and Services
  - Equipment and Materials
  - Spacecraft
- Suppliers for Respondents' selected Products & Services (U.S. and non-U.S.)
- Customers for Respondents' selected Products & Services (U.S. and non-U.S.)
- Inventory
- Rare Earth Elements and Counterfeiting Issues
- Top competitors (U.S. and non-U.S.)
- Competitive Challenges
- Impacts of decreased USG demand
- Sales
- Financials
- Research & Development
- Capital Expenditures
- Employment
- Areas of Potential USG assistance for Respondents

**This presentation only scratches the surface of our preliminary data.**

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