**Joint Space Cost
Council Update to NDIA
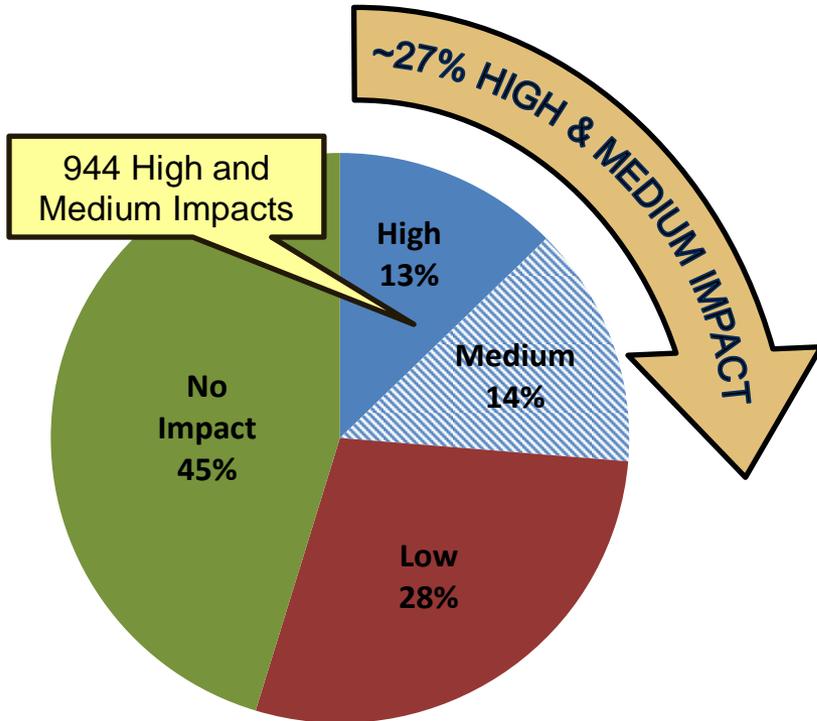IPMD**

April 2016

Topics

- ➢ Better EVM Implementation Study, Phase I Industry Cost Impact of EVMS
  - Quick Summary
  - Status of Phase I Actions

- ➢ Better EVM Implementation Study, Phase II Government Value of EVM
  - Status
  - Sample of Results

- ➢ Synthesis of Phase I and Phase II

- ➢ Status of JSCC Scheduler's Forum

Phase I

The Cost Impact of of Implementing EVM on Government Contracts

# Cost Impacts of EVM with Stakeholders Identified in Phase I

JSCC
Joint Space Cost Council

~27% HIGH & MEDIUM IMPACT

944 High and Medium Impacts

High 13%

Medium 14%

No Impact 45%

Low 28%

Stakeholders for *High and Medium Impacts*

- DCAA 0%
- NRO ECE 4%
- Not Provided 4%
- Gov Program Mgmt 40%
- PARCA 1%
- DCMA 19%
- Cost Estimators 2%
- KTR Program Mgmt 10%
- KTR EVM Process Owner 12%
- Contracting Officer 8%

~74% of all survey data points (2,644 of the 3,588 answers) had **Low to No** cost premium identified to comply with Government EVM requirements
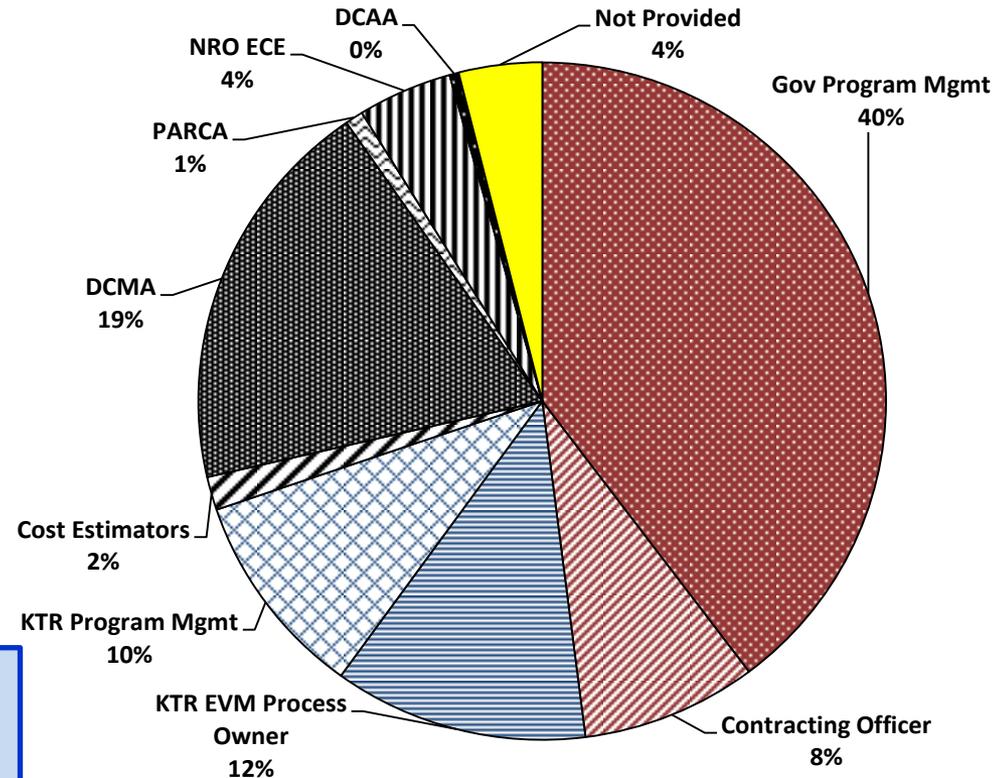
Of the ~27% identified as **High and Medium Impacts** Government Program Management was identified as Primary Stakeholder, followed by DCMA. Contractor EVM Process Owner and Contractor Program Management also identified as significant stakeholder .

Status of Phase I Actions
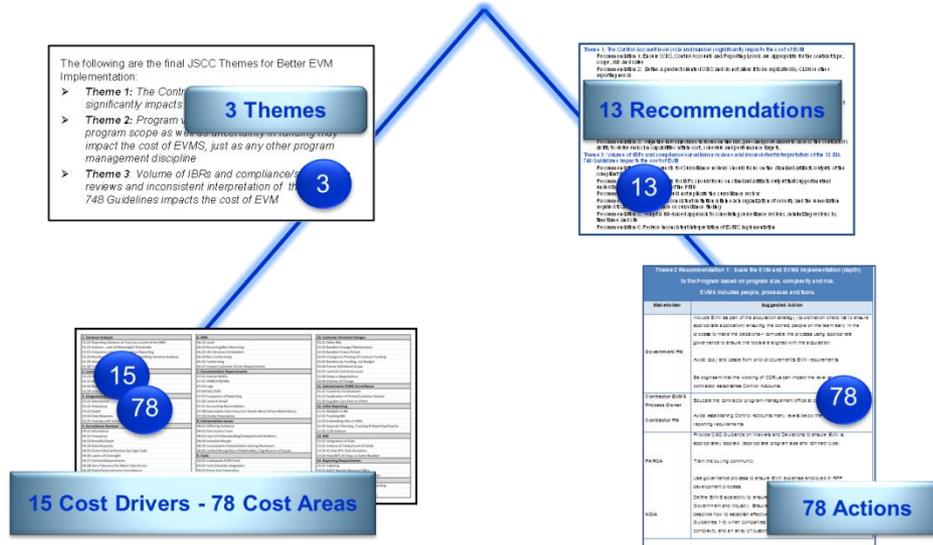
- ➢ **NRO Progress on Phase I Actions**
  - • Initiated Control Account Statistics Study on NRO data, and planning to present it at the upcoming NRO CIPT for collaboration and additional data
  - • Updated of IBR Overview Materials and Job Aids to sharpen the focus and avoid overlap with surveillance
  - • Established task plan to improve pre-RFP coordination
  - • Working with EVM Sub-Council on recommendation to Establish a consistent definition within each organization of severity and the remediation required to address a compliance or surveillance finding
  - • Engaging with other stakeholders for follow-up on their Phase I Report actions: Industry, PARCA, NRO Acquisition Center of Excellence, ACE, (for training the NRO PM Community)
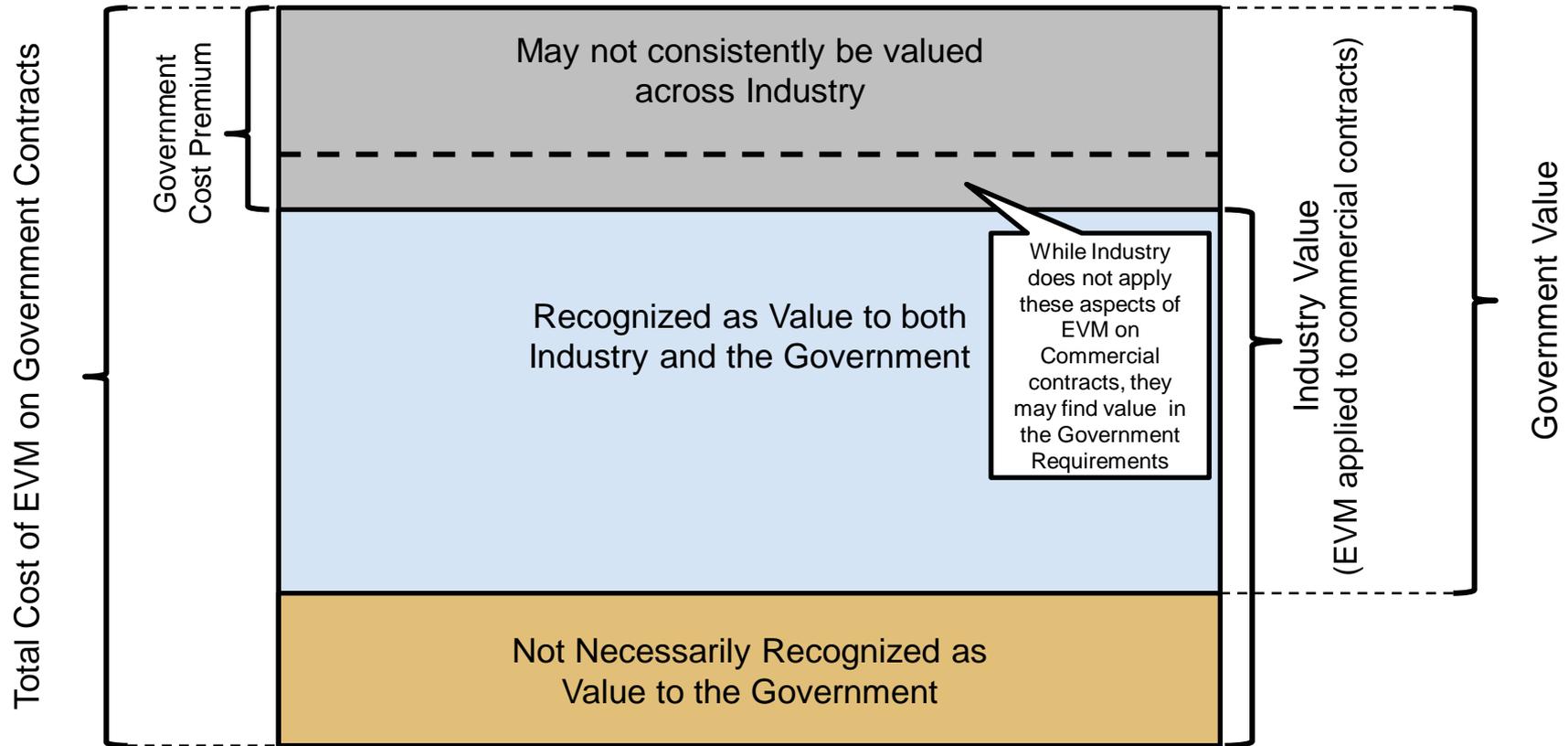
Phase II

Government Program Manager Assessment of EVM Products and Processes

Total Cost of EVM on Government Contracts

Government Cost Premium

May not consistently be valued across Industry

Recognized as Value to both Industry and the Government

While Industry does not apply these aspects of EVM on Commercial contracts, they may find value in the Government Requirements

Not Necessarily Recognized as Value to the Government

Industry Value (EVM applied to commercial contracts)

Government Value

It is important to understand that Program Management is not the only stakeholder for the Government and not all Value recognized by the Government will be recognized as Value to Program Management (the same holds true for Industry Program Management as some EVM Value is recognized only at a Corporate Level)

➢ The scope of Phase I of the study was to identify the ***Government Value*** of specific EVM Products and Processes

JSCC
Joint Space Cost Council
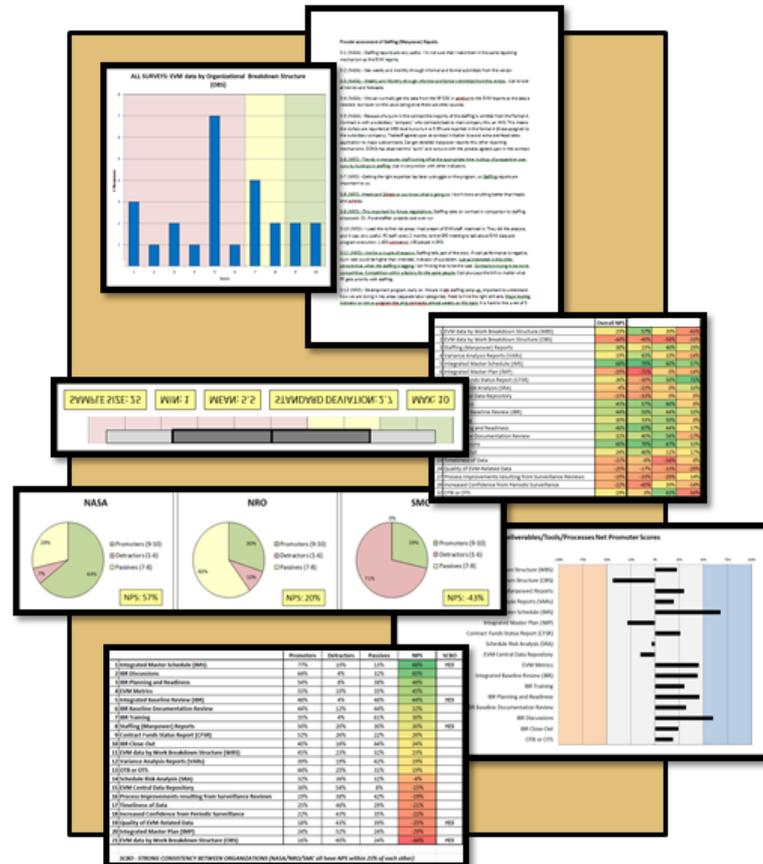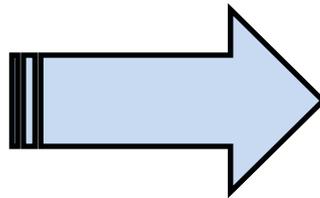
➢ The Phase II data was analyzed using:

- Raw Data Scores
- Net Promoter Scores (NPS)
- Statistical Analysis
- Survey Comments
- Commonality between organizations
- Trends in Data

JSCC
Joint Space Cost Council
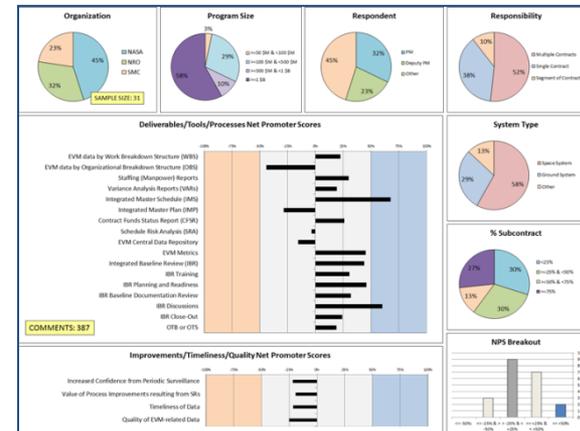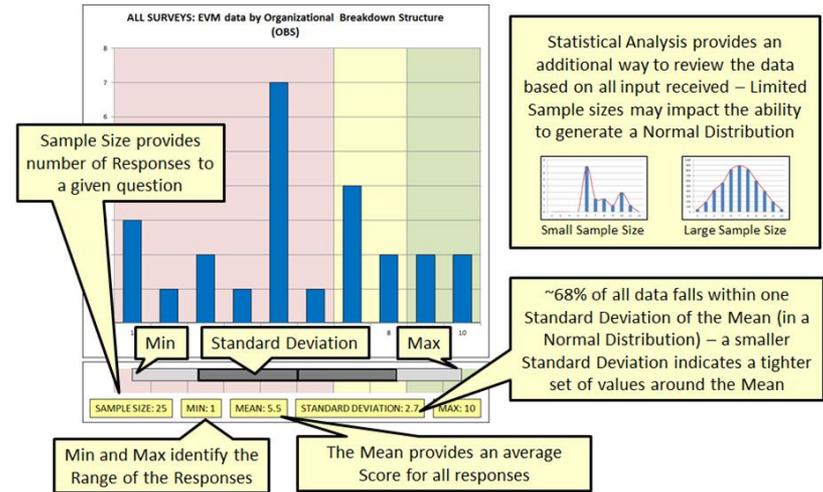
Integrated Baseline Review (IBR) – All Surveys

NPS is between 0% and +50%

ALL SURVEYS: Integrated Baseline Review (IBR)

~96% are Promotors or Passives

Government Value Net Promoter Scores

Government Assessment Net Promoter Scores

<= 10% are Detractors

ALL SURVEYS: Integrated Baseline Review

NPS: 44%

SAMPLE SIZE: 25	MIN: 5	MEAN: 8.4	STANDARD DEVIATION: 1.4	MAX: 10

Standard Deviation <= 1.5

JSCC
Joint Space Cost Council
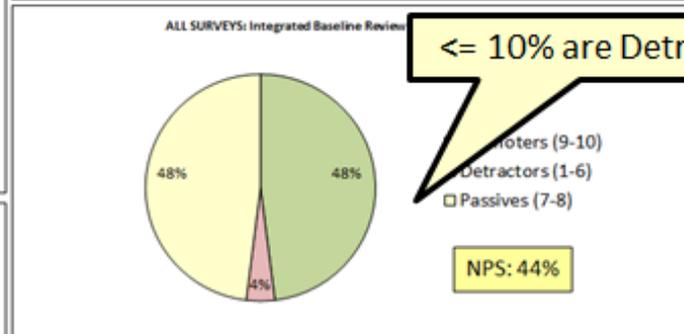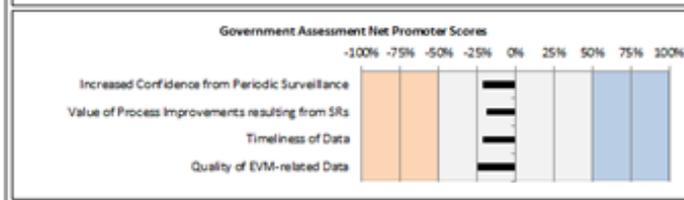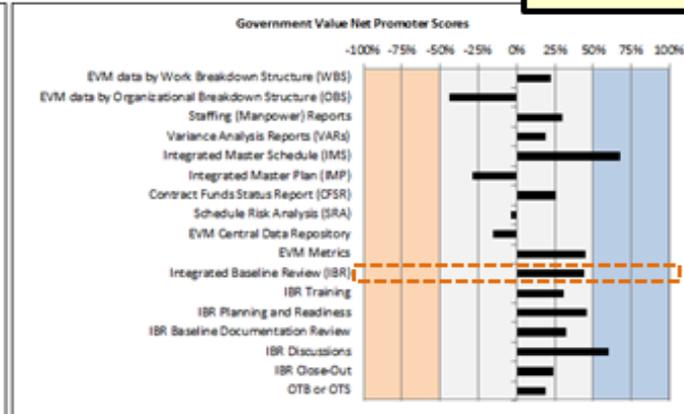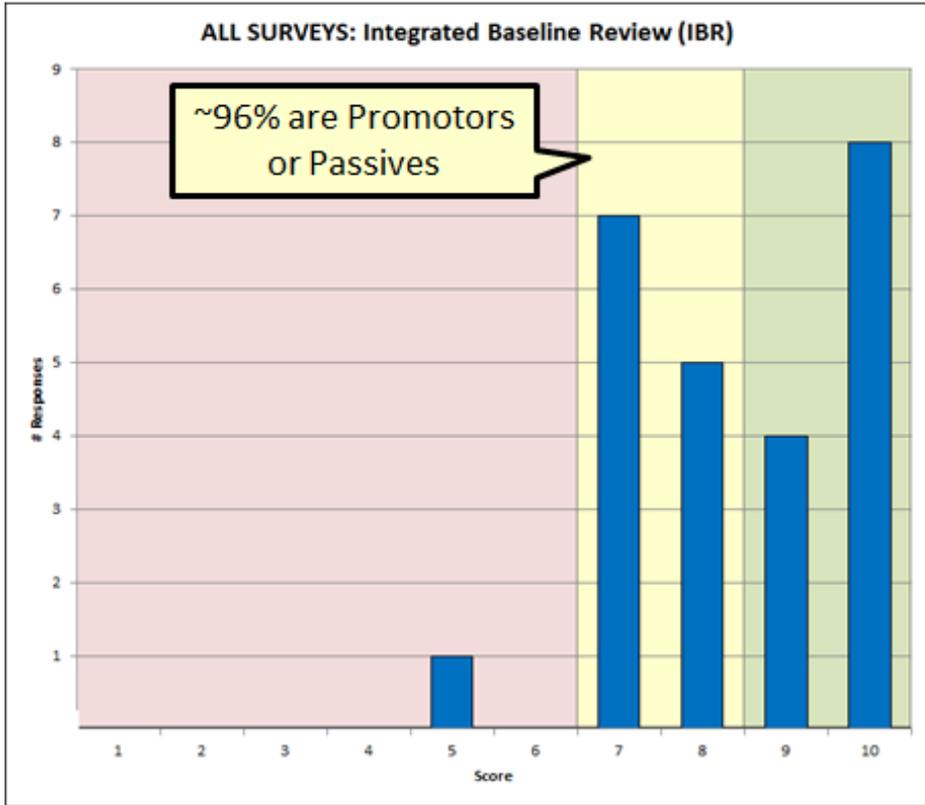
Integrated Baseline Review (IBR)

PM Comments on the Value of the IBR Process

IBR Overall:
- If the IBR is done correctly, it has extreme value.
- Done well means effective training, collaboration between government and contractor, focus on baseline executability rather than conducting an EVM compliance review, comprehensive scope, timely execution and not letting it turn into a "dog and pony" show.

IBR Training
- High value, especially for the junior staff
- Vector check each time you do it

Documentation Review
- Crux of the cost-benefit situation. High cost and high value

IBR Discussions
- Help identify risk areas and weak CAMs early in the program

IBR Close-out
- More of a formality

Recommendations for improving the value of the IBR Process

Stakeholder	Suggested Action
Government Program Manager	• Ensure that the IBR has some ability to evaluate the end-to-end plan, rather than what has recently been detail planned • Ensure that training is relevant to the program office's needs for the IBR and is timely. Consider joint government-contractor training • Keep the IBR from becoming surveillance. • Set expectations to close IBR actions quickly (in a matter of days) • Focus on timely completion of actions necessary to establish the baseline rather than formal close-out memo.

Integrated Baseline Review
Have you conducted an IBR in the last 5 years?

- 19% No
- 81% Yes
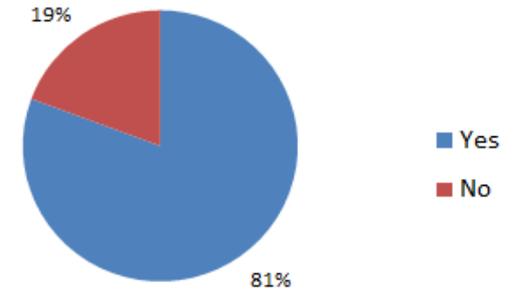
SAMPLE SIZE: 31

Integrated Baseline Review
If Using - Reason for Use

- 12% Use is mandated
- 88% Would use anyway

SAMPLE SIZE: 22

JSCC
Joint Space Cost Council

Assessment of Quality of EVM-related Data – All Surveys

NPS is between -50% and 0%

JSCC
Joint Space Cost Council
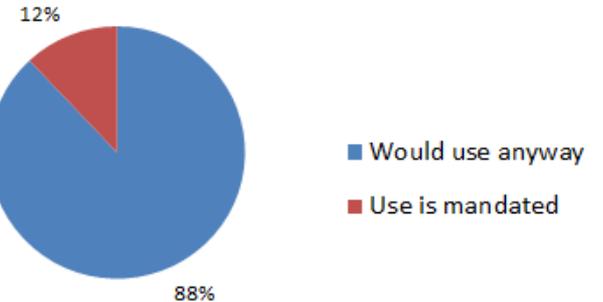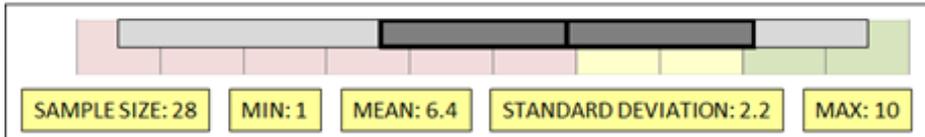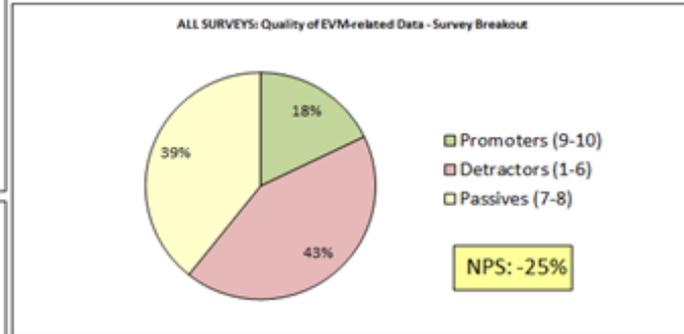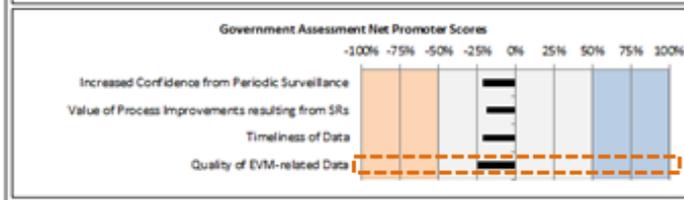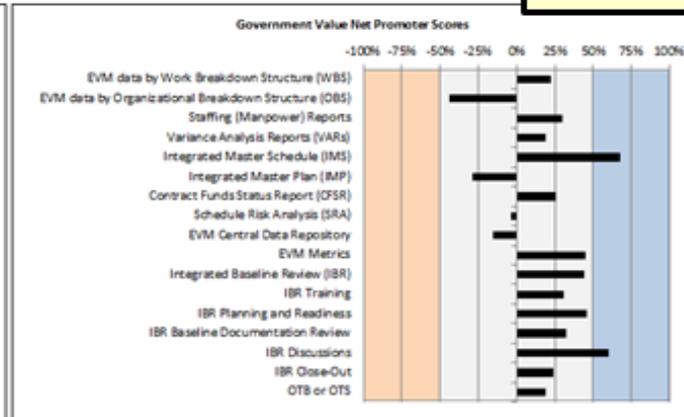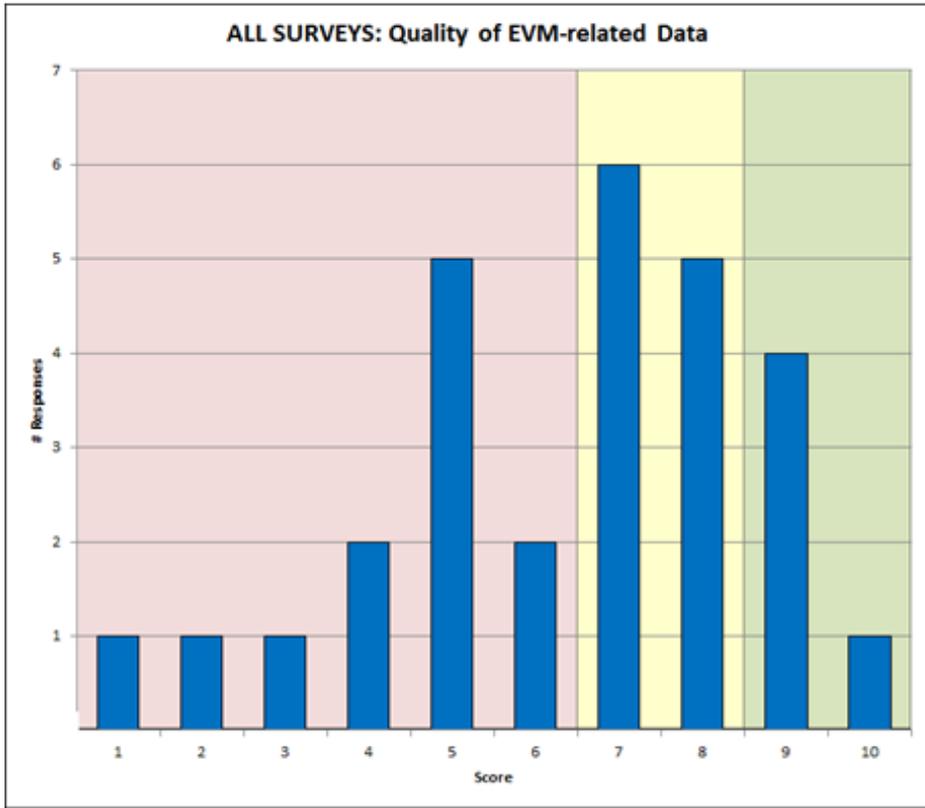
Assessment of Quality of EVM-related Data

PM Comments on the Assessment of Quality of EVM-Related Data
Data latency is an issue, but recognized as necessary for accuracy
Better quality of prime data than data from the subcontractors
Acknowledgement that maintaining data integrity takes a lot of work. Program conditions can cause data problems and data issues

Quality of Data

Do contractors need to improve the quality of data that is delivered to your program?

26%
74%
■ Yes ■ No

SAMPLE SIZE: 27

Recommendations for improving the Quality of EVM-related data	
Stakeholder	**Suggested Action**
Government Program Manager	• Make sure the government is not creating roadblocks for data timeliness such as reporting tailoring or customization
Contractor Program Manager	• Contractors and government managers should have the awareness and a capability to use the data, do ongoing trend analysis. Data quality should be a way of doing business and not driven by surveillance
Oversight	• Improve communication from oversight organizations, so the PMs know what oversight organizations are doing and why.

How often should Surveillance Reviews be Conducted (by Year)?

Every 6 Months: 2
Every Year: 5
Every 1.5 Years: 4
Every 2 Years: 9
Every 2.5 Years: 0
Every 3 Years: 2
Every 3.5 Years: 0
Every 4 Years: 0
Every 4.5 Years: 0
Every 5 Years: 1

13
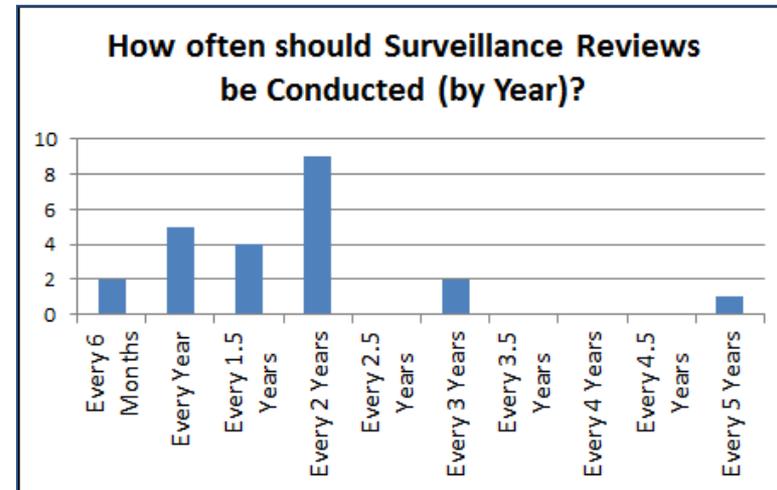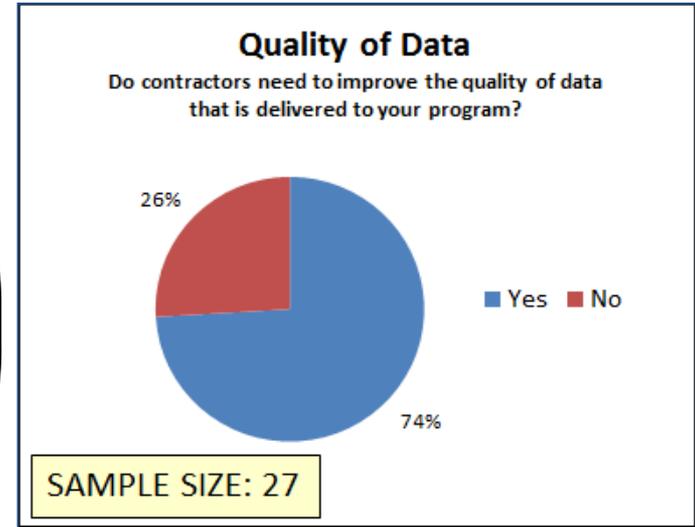
Integrating Phase I and Phase II

Understanding the Value of the Cost Impact Identified in Implementing EVM on Government Contracts

Input and output: Correlating Phase I Cost Impacts to Phase II Government Value Assessments

JSCC
Joint Space Cost Council

A cross-index that associates cost to value to create an XY Chart correlating Cost Impact to Government Value using existing Phase I and II scores

Phase I Data

Phase II Data

Correlation is Direct, Indirect or None

Deliverables, Tools, and Processes, (Values identified and scored in Phase II)

Cost Areas (Cost Area Impacts were identified and scored in Phase I)

The Cross-Index is used to:

1. Graphically illustrate the cost impact/value relationships

2. Provide a method to directly compare cost impact recommendations from Phase I to value recommendations from Phase II (see next slide)

= Input

= Output

6

What Program Managers Telling Us about the Most Significant Cost Impacts of Implementing EVM on Government Programs (as identified in Phase I of the JSCC Study)

Theme 1: The Control Account level (size and number) significantly impacts the cost of EVM → **Cost Impact IS VALIDATED by Government Value of EVM Products and Processes**

Theme 2: Program volatility and lack of clarity in program scope as well as uncertainty in funding may impact the cost of EVMS, just as any other Program Management Discipline → **Cost Impact is NOT ATTRIBUTED to EVM Products and Processes**

Theme 3: Volume of IBRs and Compliance/Surveillance reviews and inconsistent interpretation of the 32 EIA 748 Guidelines impacts the cost of EVM →
- **Cost Impact IS VALIDATED by Government Value of the Integrated Baseline Review (IBR) Process**
- **These Cost Impacts ARE VALIDATED by Government Value of the Surveillance / Compliance Review (CR/SR) Process**

JSCC Study Theme 1

Phase II Recommendations will Recommend Ways to Provide More Value

5 Specific Recommendations were made in Phase I to help Reduce these Cost Impacts

Theme 1: The Control Account level (size and number) significantly impacts the cost of EVM

These Cost Impacts ARE VALIDATED by Government Value of EVM products and Processes

Government Program Managers score EVM Data by WBS as High-to-Medium Value

Government Program Managers score Metrics as High-to-Medium Value

Government Program Managers score Associated EVM Products as High-to-Medium Value

Government Program Managers recognize the Need for Multiple CLINs

Program Managers are aware that they have an Impact on the Size and Number of Control Accounts

JSCC Study Theme 1 – Government Value vs Cost Impact

LOW GOVERNMENT VALUE

HIGH GOVERNMENT VALUE

HIGH COST IMPACT

LOW COST IMPACT

3

LOW VALUE - HIGH COST IMPACT

HIGH VALUE - HIGH COST IMPACT

Phase 2 Recommendations should help Increase the Existing Value

COST IMPACT (1=Low to 3=High)

2

Phase 1 Recommendations should help Reduce the Existing Cost Impacts

SRA   EVM by WBS

Staffing   Metrics

VARs   IMS

1

LOW VALUE - LOW COST IMPACT

HIGH VALUE - LOW COST IMPACT

1   2   3   4   5   6   7   8   9   10

VALUE AS SCORED VALUE (1=Low to 10=High)

All Associated EVM Products are Currently are Scored at High-to-Medium Value with a Medium-to-Low Cost Impact

JSCC Study Theme 2

4 Specific Recommendations were made in Phase I to help Reduce these Cost Impacts

Theme 2: Program volatility and lack of clarity in program scope as well as uncertainty in funding may impact the cost of EVMS, just as any other Program Management Discipline

Cost Impact is NOT ATTRIBUTED to EVM Products and Processes

These Cost Impacts are defined by Program Volatility, Scope Changes, and Funding Issues

These Cost Impacts are Directly Related to the Cost of doing Business with the Federal Government

JSCC Study Theme 3

Phase II Recommendations will Recommend Ways to Provide More Value

7 Specific Recommendations were made in Phase I to help Reduce these Cost Impacts

Theme 3: Volume of IBRs and Compliance/Surveillance reviews and inconsistent interpretation of the 32 EIA 748 Guidelines impacts the cost of EVM

These Cost Impacts ARE VALIDATED by Government Value of the Integrated Baseline Review (IBR) Process

These Cost Impacts ARE VALIDATED by Government Value of the Surveillance / Compliance Review (CR/SR) Process

Government Program Managers score IBR as High-to-Medium Value

Government Program Managers recognize the Need for a Good Program Measurement Baseline

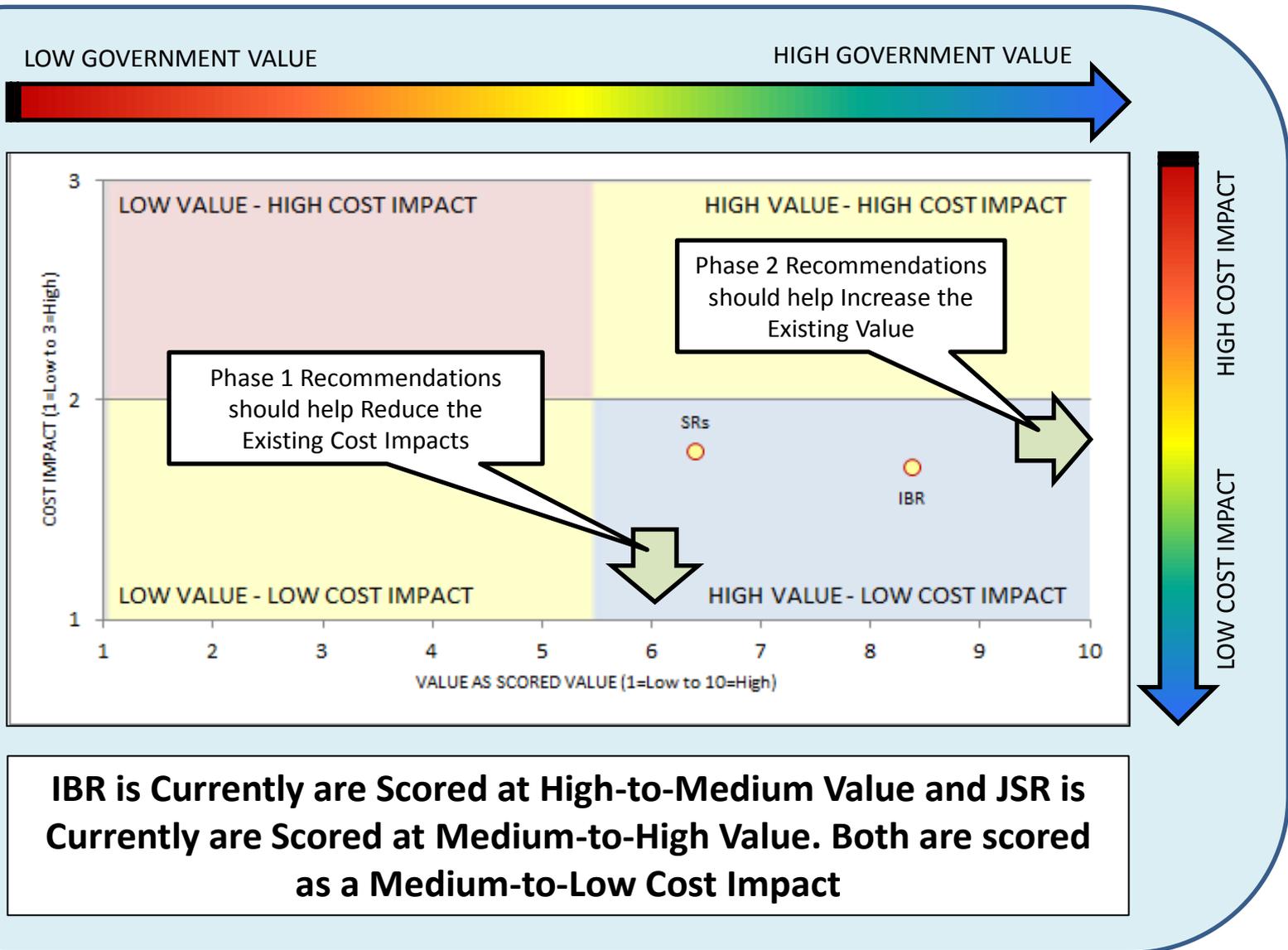**Government Program Managers recognize the Need to Understand Risk in the Baseline**

Government Program Managers score SR as Medium-to-High Value

Government Program Managers see High Value in EVM Data and Metrics

Government Program Managers identify need for Better in EVM-Related Data Quality

Government Program Managers indicate SRs should be performed every Two Years

Without a Valid Process, there can be no Valid Data

JSCC Study Theme 3 – Government Value vs Cost Impact

IBR is Currently are Scored at High-to-Medium Value and JSR is Currently are Scored at Medium-to-High Value. Both are scored as a Medium-to-Low Cost Impact

JSCC Scheduler's Forum

JSCC Scheduler's Forum Charter

The JSCC Scheduler's Forum (or JSCC Scheduling Sub-Council) is a forum dedicated to the creation and maintenance of schedule community best practices and body of knowledge in the space community to influence policy maker decisions, as well as Government/Industry improved schedule management implementation practices

The JSCC Scheduler's Forum will build on best practices such as the GAO Schedule Assessment Guide and the NDIA Planning and Scheduling Excellence Guide to continue to evolve best practices in scheduling for the space community.

JSCC Scheduler's Forum Leadership

- The scheduler's forum has joint Government-Industry Leadership
  - Ivan Bembers, NRO
  - Arnold Hill, NASA
  - Rick Price, Lockheed Martin

JSCC Scheduler's Forum Initiatives

- **Schedule Margin**, develop a matrix of practices -How (mechanically) is it reflected in the IMS (flag, standard description…) -How is the assessment for the amount of time performed? -Are resources/budget associated? -Is schedule margin distributed across milestones or at the end of the program?

- **Standard Practices for Schedule Risk Assessment**, and how to defend the SRA -Frequency -Assumptions -Pros and Cons of running an SRA on a subset of key tasks -Different methods of determining best case/worst case (mining historical data, interviews) -Is a target confidence level correlated to future program results, unrealistic expectation on confidence levels; Accuracy of the SRA

- **Documentation of Scheduling Best Practices**, Matrix of practices in use -Baseline -Statusing the Schedule -Modeling the Critical Path when the program has multiple deliveries, driving path -IMS versus off-line schedule for day to day management -Resource Loaded Schedule -Level of detail in the schedule -Status to Time Now

- **Cost Schedule Integration** -Where is Guidance, what is industry's approach to IPMR delivery -Position Paper to influence DID, IPMR Implementation Guide -Resource Loaded IMS? -Time Phasing in the Cost Tool (to the month… hours and dates…)

- **Exploring the unintended consequences of a resource loaded schedule,** added complexity, at what level

- **Collect historical schedule data** for spacecraft and hardware components

- **Collaboration on Training Materials** -Inputs for SRA Training -White papers providing content to training -Identify learning objectives, and competencies of training that could be used to build a training course

- **Scheduler Competency Model**

- **What does the IMS CDRL require in terms of data quality?** -What management value comes from the IMS that goes beyond CDRL requirements (remaining duration, etc.), dynamic schedule model

- **Metrics and Alternative Methods** in support of Critical Path Analysis -Missed Starts, Missed Finishes -Forecast Efficiency -Forecast Execution Index -ESLOC Productivity Count, DR –Work-off, Defect Density Cross Check -ELOT (Early, Late, On time Tasks) -Adjusted Duration Analysis or Duration Performance Index -Critical Path Length Index -What are the advanced analytics available -Tie to historical analysis, thresholds

- **Point Paper to Define Best Practices around Probabilistic Critical Path** to influence DoD IPMR DID, potentially re-name so as not to confuse with critical path

- **Point Paper advising auditors on how to treat margin** when validating a critical path during a review

- **Statistical Analysis to Benchmark** Do shorter tasks (4-5 days in duration) have better forecast accuracy than longer (45 day) tasks?
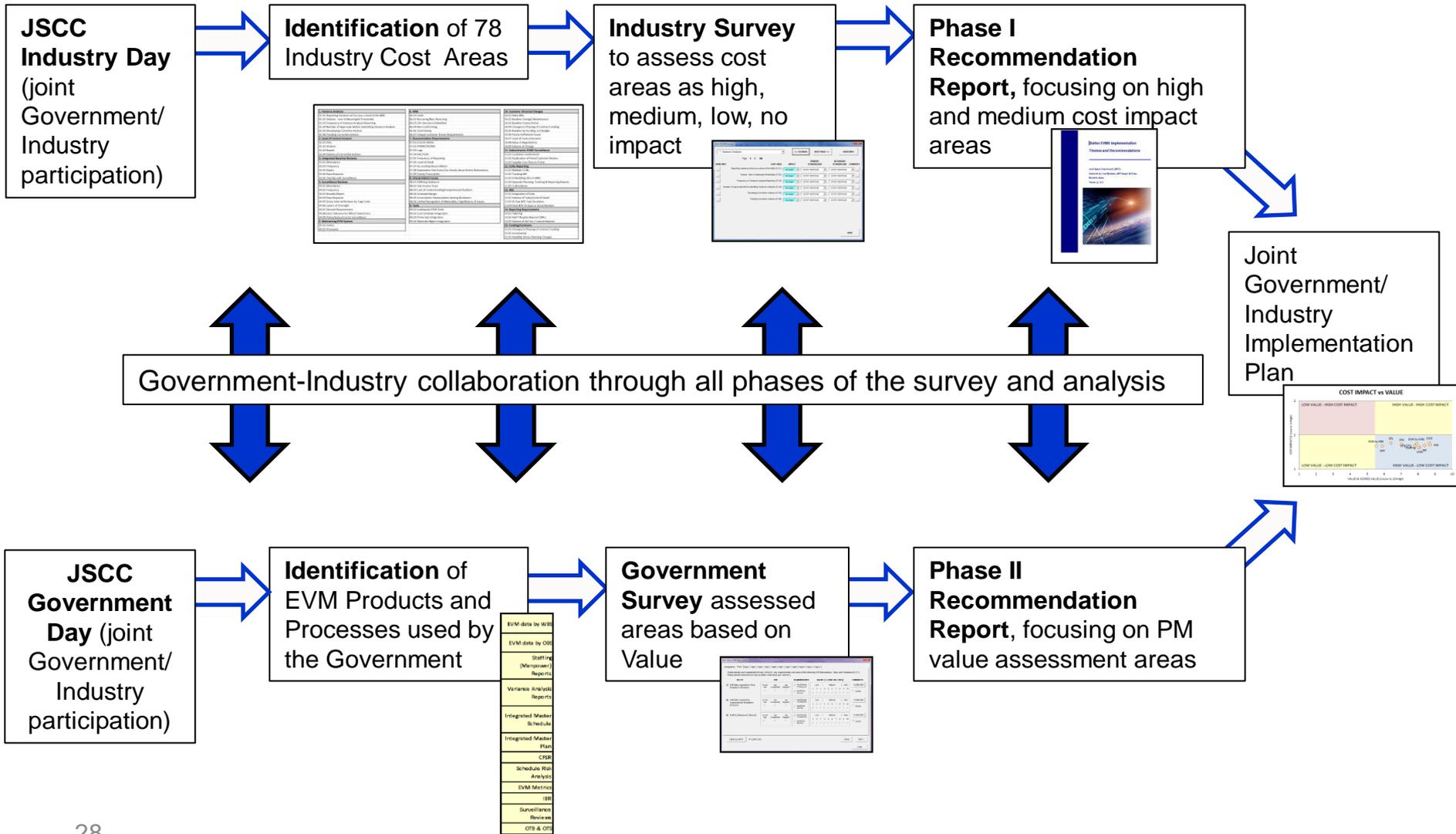
Back-up

Background: Joint Space Cost Council (JSCC)

- Established by the Undersecretary of Defense for Acquisition, Technology, and Logistics Support to improve collaboration with oversight and service/agency levels

- Focus on cost credibility and realism in estimates, budgets, schedules, data, proposals and program execution

- Broad participation across industry and government

- Initiatives consistent with government and industry focus on Affordability

JSCC is an effective forum for government and industry collaboration to improve a variety of acquisition and cost estimating issues, including EVM implementation

Industry and Government Study Phases
Include Government Value

JSCC Industry Day (joint Government/ Industry participation)

→ **Identification** of 78 Industry Cost Areas

→ **Industry Survey** to assess cost areas as high, medium, low, no impact

→ **Phase I Recommendation Report,** focusing on high and medium cost impact areas

Government-Industry collaboration through all phases of the survey and analysis

Joint Government/ Industry Implementation Plan

JSCC Government Day (joint Government/ Industry participation)

→ **Identification** of EVM Products and Processes used by the Government

→ **Government Survey** assessed areas based on Value

→ **Phase II Recommendation Report**, focusing on PM value assessment areas

Setting a Realistic Study Scope: Phase I

➢ The scope of Phase I of the study was to identify the ***Delta Implementation Cost Impact*** between EVM implemented on Government Programs and EVM implemented on Commercial, Internal or Fixed Price Programs
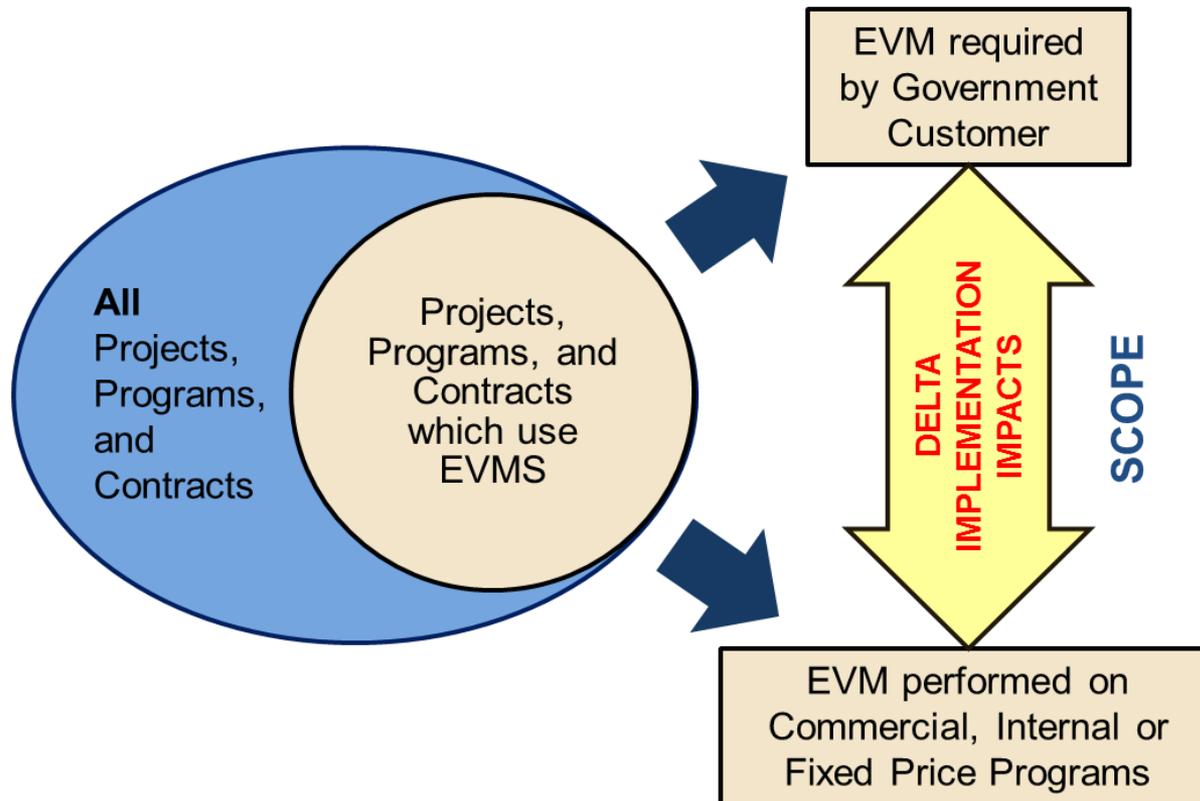
The Structure of the Phase I JSCC Survey

Similar Cost Areas were grouped into 15 **Cost Drivers** to help facilitate the survey

Survey included an assessment of 78 different **Cost Areas**

1. Variance Analysis	6. WBS	10. Customer Directed Changes
01.01 Reporting Variance at Too Low a Level of the WBS	06.01 Level	10.01 Delta IBRs
01.02 Volume - Lack of Meaningful Thresholds	06.02 Recurring/Non-Recurring	10.02 Baseline Change/ Maintenance
01.03 Frequency of Variance Analysis Reporting	06.03 Clin Structure Embedded	10.03 Baseline Freeze Period
01.04 Number of Approvals Before Submitting Variance Analysis	06.04 Non-Conforming	10.04 Changes to Phasing of Contract Funding
01.05 Developing Corrective Actions	06.05 Conforming	10.05 Baseline by Funding, not Budget
01.06 Tracking Corrective Actions	06.07 Unique Customer Driven R	10.06 Poorly Definitized Scope
2. Level of Control Account	**7. Documentation Requirement**	10.07 Level of Control Account
02.01 Plan	07.01 Interim WADs	10.08 Delay in Negotiations
02.02 Analyze	07.02 IPMR/CPR/IMS	10.09 Volume of Change
02.03 Report	07.03 Logs	**11. Subcontractor EVMS Surveillance**
02.04 Volume of Corrective Actions	07.04 EAC/CEAC	11.01 Customer Involvement
3. Integrated Baseline Reviews	07.05 Frequency of Reporting	11.02 Duplication of Prime/Customer Review
03.01 Attendance	07.06 Level of Detail	11.03 Supplier Cars Flow to Prime
03.02 Frequency	07.07 Accounting Reconciliation	**12. CLINs Reporting**
03.03 Depth	07.08 Expectation that Every Doc Stands Alone Drives Redundancy	12.01 Multiple CLINs
03.04 Data Requests	07.09 Overly Prescriptive	12.02 Tracking MR
03.05 Overlap with Surveillance	**8. Interpretation Issues**	12.03 Embedding Clins in WBS
4. Surveillance Reviews	08.01 Differing Guidance	12.04 Separate Planning, Tracking & Reporting Reqmts
04.01 Attendance	08.02 Sub Invoice Trace	12.05 CLIN Volume
04.02 Frequency	08.03 Lack of Understanding/Inexperienced Auditors	**13. IMS**
04.03 Breadth/Depth	08.04 Schedule Margin	13.01 Integration of Subs
04.04 Data Requests	08.05 Inconsistent Interpretation Among Reviewers	13.02 Volume of Tasks/Level of Detail
04.05 Dcma Internal Reviews by Cage Code	08.06 Limited Recognition of Materiality / Significance of Issues	13.03 45 Day NTE Task Durations
04.06 Layers of Oversight	**9. Tools**	13.04 Float NTE 45 Days or Some Number
04.07 Derived Requirements	09.01 Inadequate EVM Tools	**14. Reporting Requirements**
04.08 Zero Tolerance for Minor Data Errors	09.02 Cost Schedule Integration	14.01 Tailoring
04.09 Prime/Subcontractor Surveillance	09.03 Prime Sub Integration	14.02 Add'T Reqmts Beyond CDRLs
5. Maintaining EVM System	09.04 Materials Mgmt Integration	14.03 Volume of Ad Hoc / Custom Reports
05.01 Forms		**15. Funding/Contracts**
05.02 Processes		15.01 Changes to Phasing of Contract Funding
		15.02 Incremental
		15.03 Volatility Drives Planning Changes

The Survey was based on 78 Industry-Identified Cost Areas – Respondents assessed the Cost Impacts to each area as High, Medium, Low or No Impact

Phase I Overview

Programs in JSCC Survey by $ Value
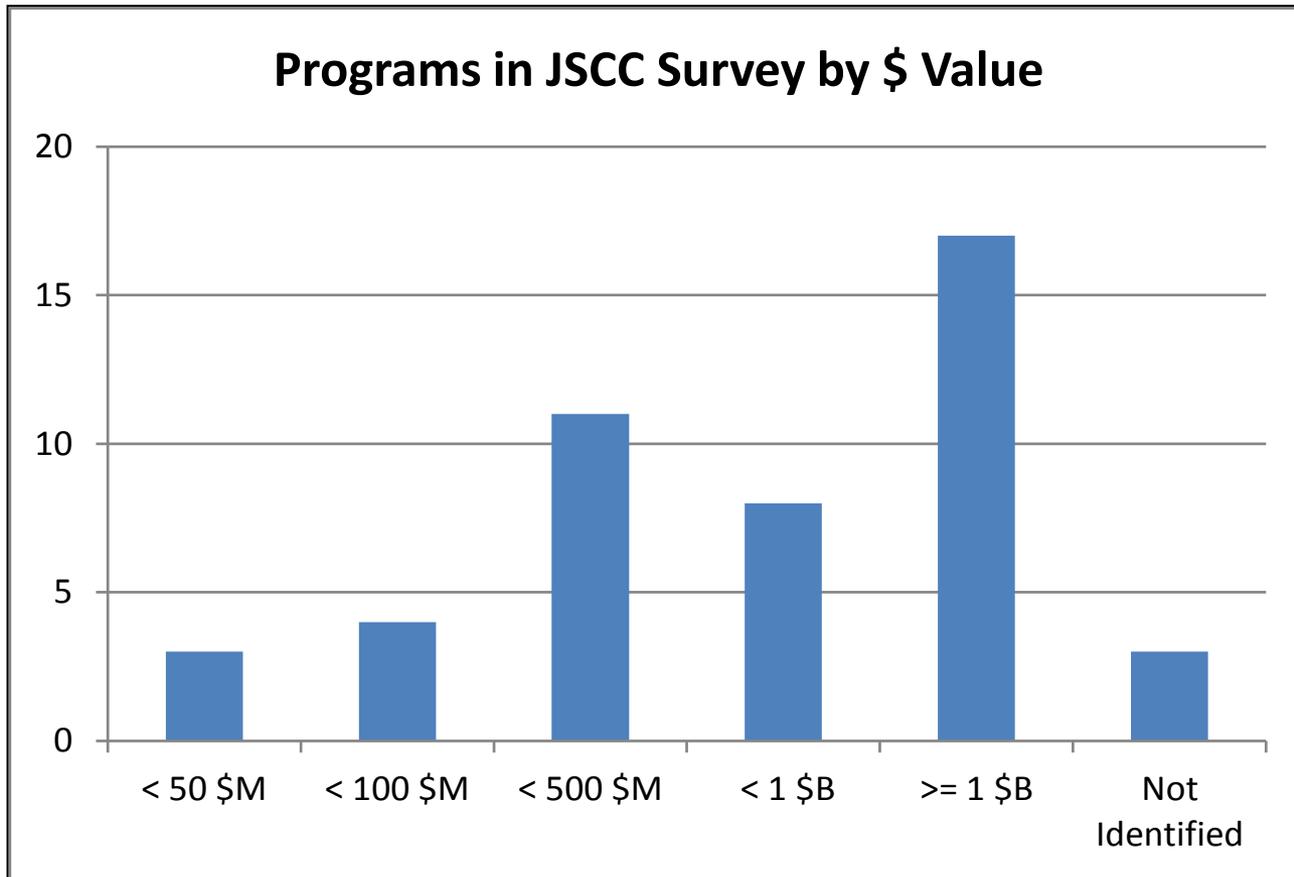
Survey responses included 46 different programs with a wide range of Values – 17 greater than or equal to 1 $B as well as 7 in the 20-100 $M range

Phase I Cost Impacts Specific to Surveillance Reviews
Average Scores of Impacts Identified as Low (1), Medium (2), or High (3)

Identified Cost Impacts Specific to Surveillance Reviews