OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE

ODNI COST RESEARCH

SYSTEMS & RESOURCE ANALYSES

LEADING INTELLIGENCE INTEGRATION

Presenter(s): Carrie Gamble and Brian Wells

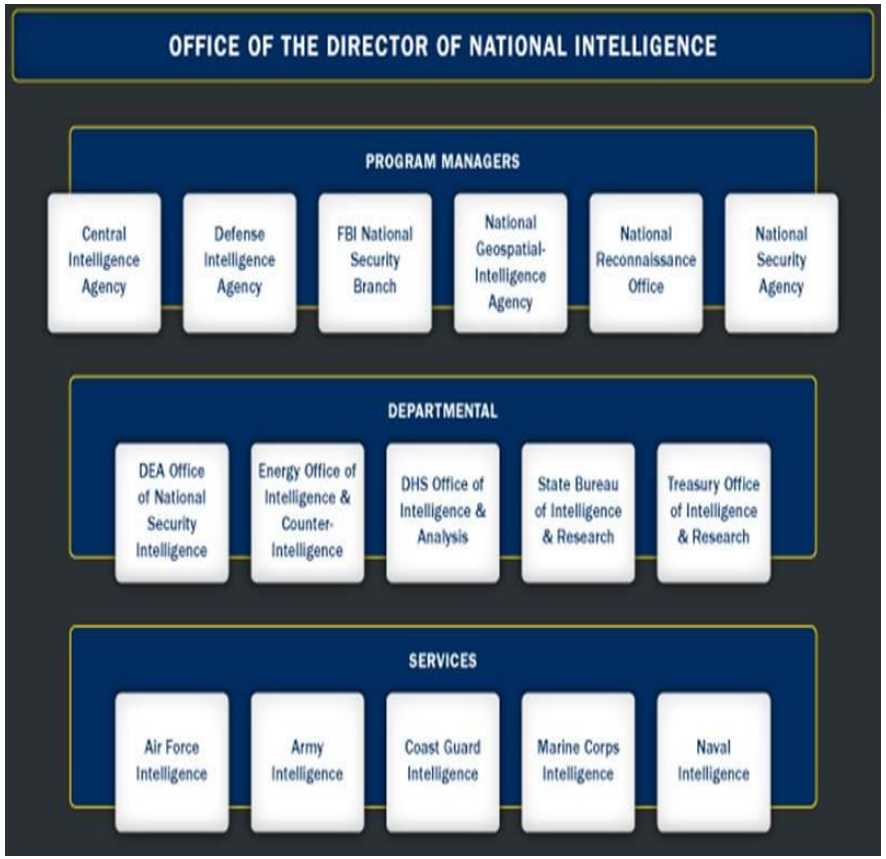
Audience: NASA Conference

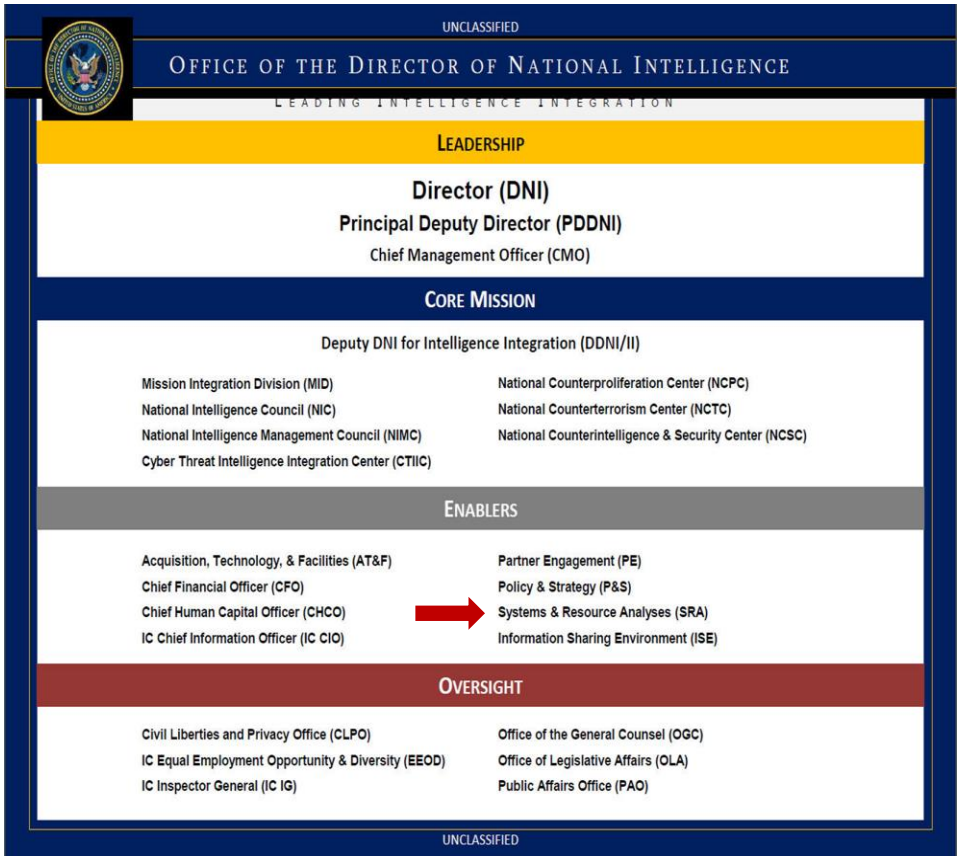
August 2015

Agenda

- **Organization & Mission**
- **Tracking Estimates Through Time**
- **Retrospectives**

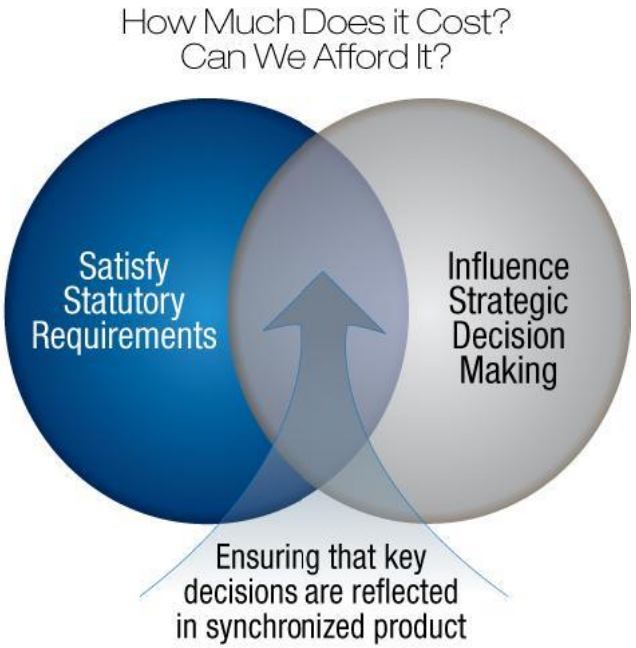
Organization





SRA/CA Mission & Principles

"Lead the Intelligence Community in independent cost analyses through consistent, defensible cost estimates supported by in-depth analysis and innovative methods that facilitate strategic-level decision making on Intelligence Community resources."



SRA/CA Principles

- **Produce high-quality analyses that provide insight into the projected costs and schedules of major system acquisitions (MSAs)**
- **Support the ability of Program Offices to execute their plans and schedules**
- **Facilitate long-term strategic planning through the development of affordability models, performance reports, and a comprehensive Track Record**
- **Advance cost estimating practices and policy in the IC by focusing on research, development, and collaboration with other cost estimating organizations**

OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE

ODNI TRACK RECORD

ODNI SRA/CA

LEADING INTELLIGENCE INTEGRATION

Presenter(s): Brian Wells

Audience: NASA Conference

August 2015

Tracking Estimates Through Time

- **Approach**
  - Developed a repository for cost estimates, actuals/budgets, program milestones, and associated metadata
    - Cost estimates include ODNI ICEs and Agency Cost Positions (ACPs)
  - Mapped Scope Estimates to “Actuals”
    - Include as much scope as possible
- **Goals**
  - Measure systematic Independent Cost Estimate (ICE) performance
  - Support analyses at multiple levels of detail
  - Generate views across time to support trend analyses
  - Examine impact of IC policies and practices
  - Make data discoverable and support queries to filter and refine data
  - Identify potential areas requiring further analyses (research or retrospective)

Track Record Performance

ODNI created the Track Record, in part, to examine estimating performance; however, similar factors are sometimes attributed to the Acquisition system[1]. In fact, performance is driven by many factors, such as:

Systemic/Primary Drivers:

Estimating Performance
- Baseline (point of measure) is established by an estimate

Policies and Practices
- ICE Process, ICBDs
- IC Cost Review Boards

Acquisition System
- Acquisition Regulations and Policies
- Acquisition Workforce and Training
- Intelligence Community Capability Requirements (ICCR) Process
- Acquisition Boards

Individual Program/Periodic Drivers:

Acquisition Team
- Government and Industry

Governance/Leadership Decision
- Prioritization of organizational resources
- Prioritization of IC resources

Congressional Actions
- Congressional cuts, marks
- Sequestration

National and International Events
- Wars and Conflicts
- Economic Conditions
- International Relations (Launch Systems, etc.)

Industrial Base
- Manufacturing/Suppliers/Parts

Systemic Track Record measures are driven by IC Estimating Capabilities, the Acquisition Environment, and Policies and Practices

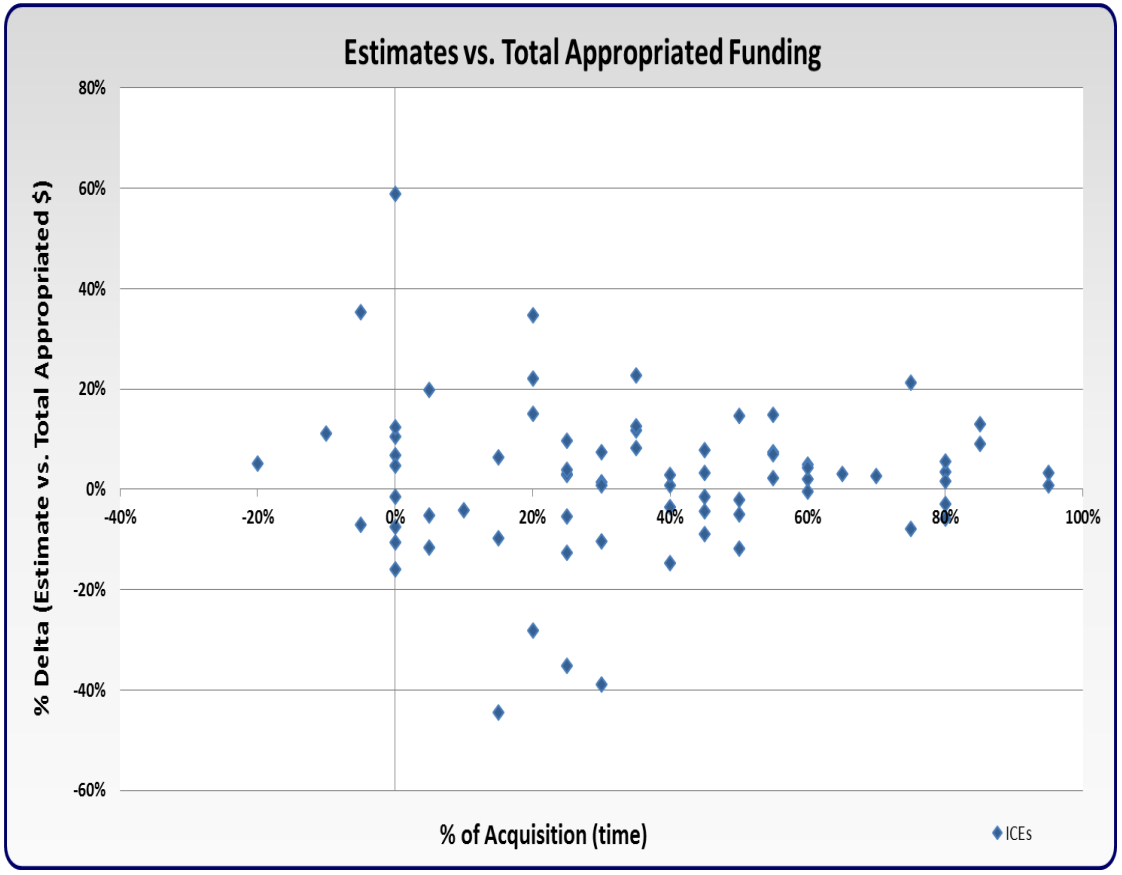
[1] *Performance of the Defense Acquisition System, 2014 Annual Report.* Washington DC: Under Secretary of Defense, Acquisition, Technology, and Logistics (USD[AT&L]), June 13, 2014

Tracking ICEs Through the Acquisition Process

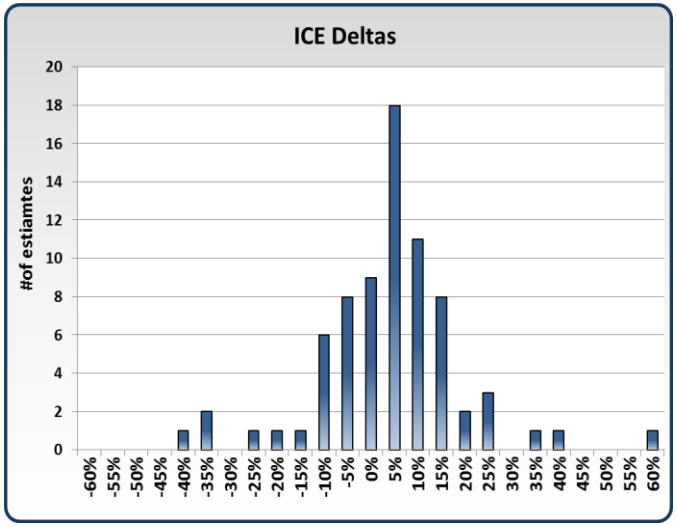
- **Data set contains 38 system acquisitions**
  - Total ICEs: 74
- **Data set is limited to programs that have reached >50% acquisition (schedule or dollars)**
  - Completed acquisitions are the best possible data points (not susceptible to fluctuations)
  - >50% acquisition points may change, but allow for early observations

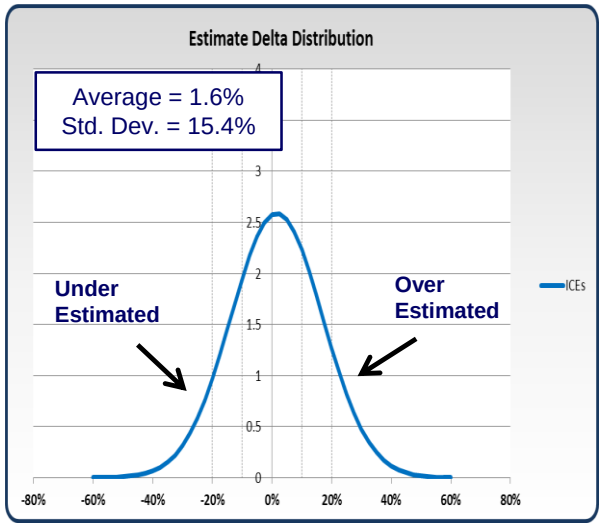
Data plots are a visualization tool, allowing for identification of potential trends, or areas of concern

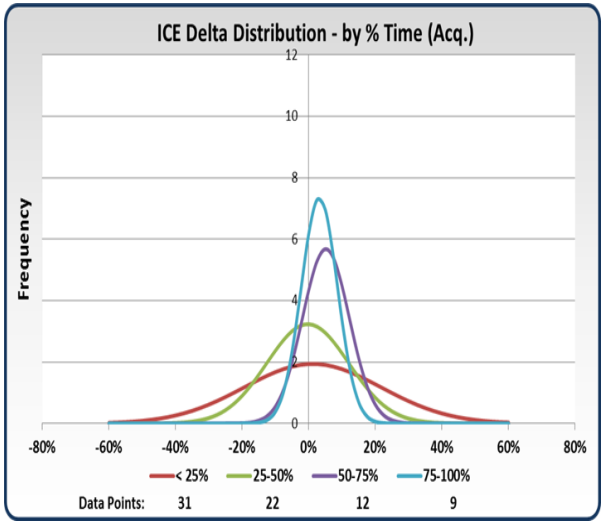
- X-Axis: Percentage of time (relative to total acquisition) at which an estimate was prepared
- Y-Axis: Delta between total acquisition estimates vs. final appropriated funding



ICEs – Distribution of % Cost Delta







Histogram to distribution curve:

- Contains all ICEs for all programs > 50% complete
  - 74 data points
  - Includes multiple ICEs for some programs
- Assumes the data is normally distributed
  - Approximately 65% of data is within 1 standard deviation for normal distributions

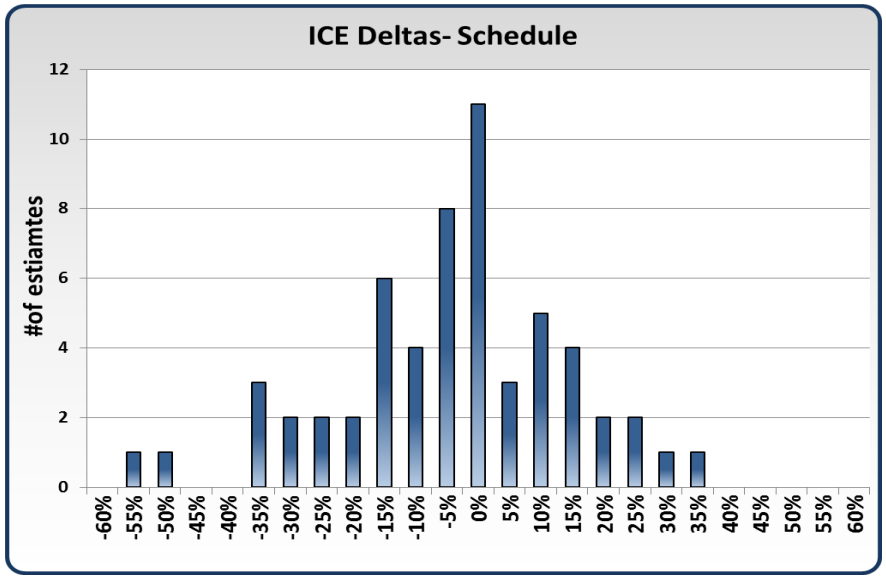
Estimate Distribution

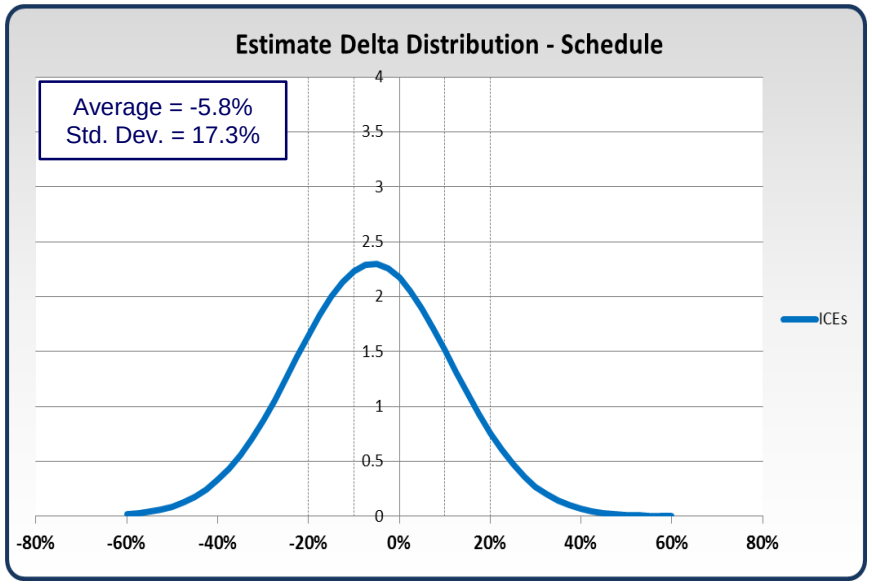
- 25% within 5%
- 48% within 10%
- 67% within 15%
- 80% within 20%
- 89% within 25%

ICEs	< 25%	25-50%	50-75%	75-100%
Average	1.2%	-0.3%	5.1%	3.2%

Two thirds of ICEs are within 15% of the final/current budget

ICEs – Distribution of % Schedule Delta





Histogram to distribution curve:

- Contains all ICEs for all programs > 50% complete
  - 74 data points
  - Includes multiple ICEs for some programs
- Assumes the data is normally distributed
  - Approximately 65% of data is within 1 standard deviation for normal distributions

Estimate Distribution

- 22% within 5%
- 41% within 10%
- 59% within 15%
- 73% within 20%
- 83% within 25%

Over half of ICEs are within 15% of the final/current schedule

OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE

PROJECT RETROSPECTIVES

ODNI SRA/CA

LEADING INTELLIGENCE INTEGRATION

Presenter(s): Carrie Gamble

Audience: NASA Conference

August 2015

Purpose of a Retrospective

Retrospectives are a formal method for evaluating project performance, extracting lessons learned and making recommendations for the future

- **SRA/CA directed to perform project retrospectives by ADNI SRA**
  - Selection of topics based on interest and estimated difficulty of collecting data
- **Retrospective Goals:**
  - Improve SRA/CA cost estimating by identifying best practices and areas for improvement
  - Gather information to improve overall understanding of the program
  - Provide lessons learned to multiple stakeholders (SRA, AT&F, CFO, CIO, agency representatives, etc.) to apply across the IC
- **Any program for which SRA/CA has developed a cost estimate is a potential topic for a retrospective, with final selection based on:**
  - ODNI level of interest
  - Ease with which data can be collected to support the retrospective

Retrospective Benefits

- **Project retrospectives have the potential to offer many benefits to a variety of groups**
  - SRA
    - Identify potential areas for research within CA, SA, and PE
    - Highlight estimating best practices and need for method improvement
    - Provide justification or explanation for variance between estimates and actual costs
    - Offer additional detail for requirements analyses and program evaluation efforts
  - AT&F
    - Indicate areas for improvement in and program management and evaluation
    - Highlight successful strategies that can be replicated in other programs
    - Modify policy to avoid repeating mistakes and enhance returns on investments in future projects
  - Intelligence Community
    - Inform decision making in CFO and CIO offices
    - Lessons learned across the community can be prioritized and turned into action
    - One agency can learn from the experiences of another agency

Retrospective Process

- **ODNI analysis primarily based on two types of information:**
  - Official Documentation
    - Includes items such as requirements documents and Intelligence Capabilities Baseline Descriptions (ICBDs), Quarterly Performance Reviews (QPRs), Capabilities Description Document (CDD), etc.
    - Documents provide valuable historical perspective of acquisition and evolution of program under review
  - Interviews/Survey Responses
    - Survey composed of questionnaire (+70 questions) and Classic Mistakes checklist
    - Interview a variety of participants, including representatives from agency staff, ODNI staff, contractors, and users
    - Results consolidated to ensure anonymity of respondents
- **Summarized information used to identify root causes of problems and successes, which in turn leads to lessons learned and recommendations**
- **Scope of analysis limited execution of program under consideration**
  - ODNI does not review events that occurred during source selection
  - ODNI analysis does not trace to root causes that extend into programs other than the program under consideration

Criteria for Consideration

	Criteria	Description	Assessment (1-10)
Difficulty	Quality/accessibility of data	Estimated ability to acquire high-quality data	1= Extremely unlikely; 5= Able to acquire some data; 10 = Able to acquire all necessary data
Difficulty	Years since completion of program	Time since completion of program (more recent completion will make data collection more feasible)	1= >12 yrs 3= 9-10 yrs 5= 5-6 yrs 7= 1-2 yrs 9= Just completed 10= Scheduled for completion in next 6 months (1 also = More than a year from completion)
Difficulty	Scope/size of program	Larger/longer programs may make data collection more difficult	1= Large program 10= Small program
Interest	% cost delta	% difference in estimated vs. appropriated dollars (highest delta per Track Record)	1= < 2% 3= 5%-8% 5= 10%-13% 7= 16%-18% 9= 21%-30% 10= 31%-40%
Interest	Changes in requirements	Fluctuation in requirements may lead to less noticeable cost differences	1= No req. change 5= Multiple req. shifts 10= Program re-baselined multiple times
Interest	Schedule Changes	Deviation from the program's original schedule (negatively or positively)	1= Completed within +/-10% of schedule 5= +/-50% of schedule 10= +/-100% of schedule
	AVERAGE		**Assessed Topic Score**

Criteria fall into two categories

Each program will receive a score

Retrospectives to Date

- **As of March 2015, one retrospective is complete and a second one is in progress**
  - Identified root causes of problems and successes in first retrospective led to five primary lessons learned with multiple associated recommendations for the future
  - Many findings are already being implemented/addressed
    - ICE updates upon contract award
    - Expanded discussion and investigation into agile development practices
    - Initiation of new agency data collection effort
    - Leadership conversation on tracking level of detail
- **In the future, we will be able to trace patterns and trends between retrospectives**
- **Each new retrospective leads to improvements in the total process**
  - Complete a “Retrospective on the Retrospective” after each effort is complete to continuously improve the final product