TASC

# CAST

**Presented by**
**Eric Lumsden**
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# Introduction

- This presentation will outline why we created the Cost Analysis Support Tool (CAST) and its functions, followed by a demonstration of its capabilities.
- CAST supports the cost modeling process in a manner that makes the estimator more efficient and creates rapid, quality deliverables for the client.
- We will discuss:
  - The rationale behind CAST
  - The CAST architecture
  - And its components and functions

# "Good" Models are Key to Successful Estimates

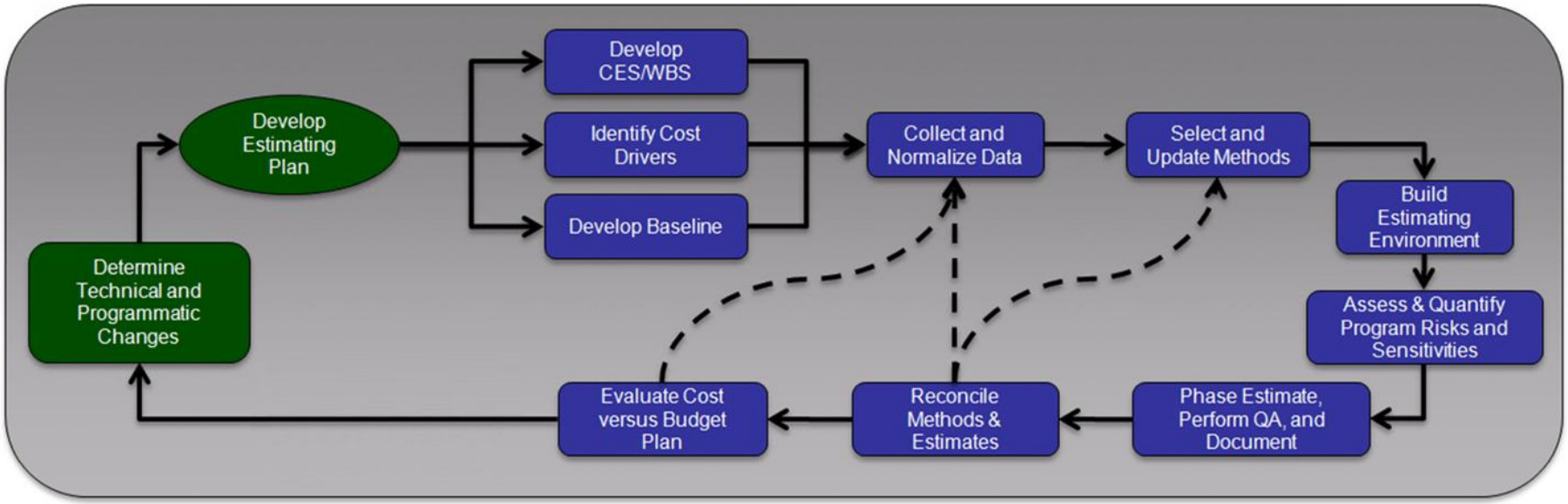
- The Estimator's Options
  1. Build a new model/spreadsheet
     - \+ Can be tailored specifically for the estimate at hand
     - – Can be time consuming (may require many iterations)
     - – Sloppy coding can introduce errors
     - – May be difficult for outsiders to understand
     - – Can become a configuration control nightmare
  2. Tailor an existing model/spreadsheet
     - \+ May save time
     - – May not be ideally suited to the estimate at hand
     - – Hidden linkages or formulas could introduce errors
     - – May be difficult for outsiders and insiders to understand
     - – Can become a configuration control nightmare
  3. Use a pre-existing general purpose model (CAST)
     - \+ Will save time
     - \+ Eliminates coding errors
     - \+ May be used for multiple estimates
     - \+ Easily configured with program specific data, CERs, WBS
     - – Not developed specifically for the estimate at hand

# The Solution

**C**ost
**A**nalysis
**S**upport
**T**ool

*A tool we can deploy to supplement or create new cost models in Microsoft Excel to automate and standardize processes, increasing both efficiency and quality.*

# The Cost Estimating and Risk Analysis Process




- CERA is TASC's internal cost estimation process that creates defensible estimates through a scientific approach
- CERA is a standardized process, with no standardized implementation, until CAST

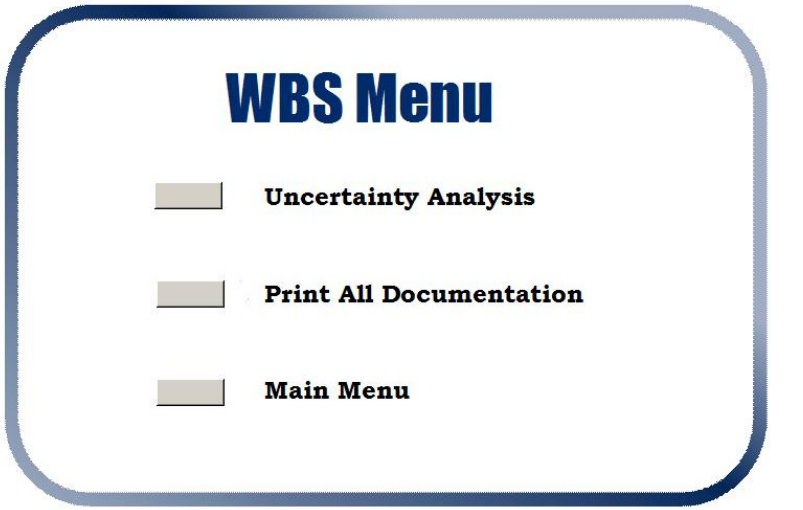
# CAST Helps Users …..

# Select a Standard WBS/CES or Build a New One

- WBS Library
  - WBS's can be stored as templates, and recalled from a central library
  - WBS framework is based on MIL-STD-881C
- Customizable Templates

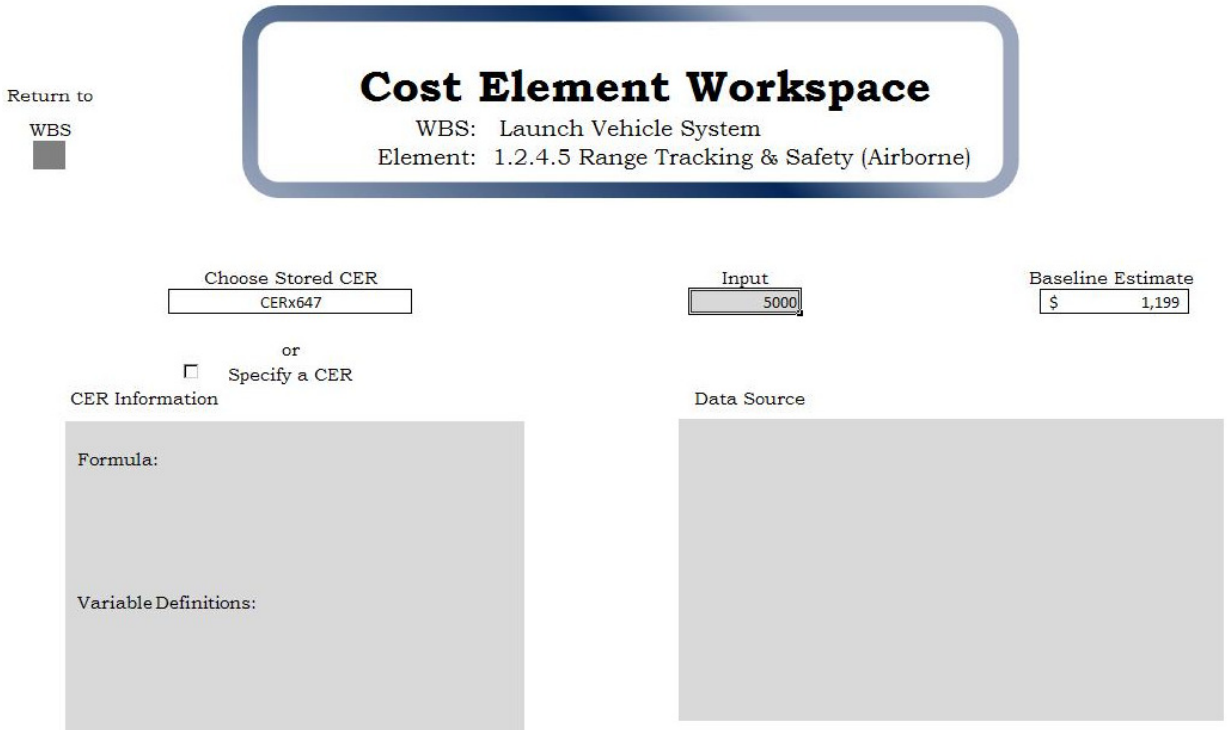
CAST-v2.xlsm - Microsoft Excel

| Level | Description | Total I-LCCE | Risk |
|---|---|---|---|
| 1.0 | Launch Vehicle System | $ - | |
| 1.1 | System Engineering, Integration, Test, Program Management (SEIT/PM) | $ - | |
| 1.1.1 | System Engineering (SE) | | |
| 1.1.2 | Integration and Test | | |
| 1.1.3 | Program Management | | |
| 1.2 | Launch Vehicle | $ - | |
| 1.2.1 | SEIT/PM | | |
| 1.2.2 | Stages (Specify) | $ - | |
| 1.2.2.1 | SEIT/PM | | |
| 1.2.2.2 | Structures and Mechanisms | | |
| 1.2.2.3 | Propulsions System | | |
| 1.2.2.4 | Reaction Control System | | |
| 1.2.2.5 | Recovery System | | |
| 1.2.2.6 | Environmental Control System | | |
| 1.2.2.7 | Stage Peculiar Avionics | | |
| 1.2.2.8 | Other Systems (Specify) | | |
| 1.2.3 | Payload Accommodations (Specify) | $ - | |
| 1.2.3.1 | SEIT/PM | | |
| 1.2.3.2 | Payload Fairing | | |
| 1.2.3.3 | Payload Adapter (Pedestals) | | |
| 1.2.3.4 | Mission Unique Hardware (Launch Vehicle) (Specify) | | |
| 1.2.4 | Avionics | $ - | |
| 1.2.4.1 | SEIT/PM | | |
| 1.2.4.2 | Guidance Navigation and Control | | |
| 1.2.4.3 | Power | | |
| 1.2.4.4 | Data Acquisition and Telemetry | | |
| 1.2.4.5 | Range Tracking & Safety (Airborne) | | |
| 1.2.4.6 | Other Avionics (Specify) | | |
| 1.2.4.7 | Flight Software | | |
| 1.3 | Mission Integration and Analysis | $ - | |
| 1.3.1 | Mission Standard Integration & Analysis | | |
| 1.3.2 | Mission Unique Integration & Analysis (Specify) | | |
| 1.4 | Launch Operations Site (Specify) | $ - | |
| 1.4.1 | SEIT/PM | | |
| 1.4.2 | Vehicle Processing and Checkout | | |
| 1.4.3 | Mission Services | $ - | |
| 1.4.3.1 | Mission Unique Hardware (Launch Operations) (Specify) | | |
| 1.4.3.2 | Space Vehicle Processing | | |
| 1.4.4 | Launch | | |
| 1.4.5 | Flight Operations | | |
| 1.4.6 | Post Launch | $ - | |
| 1.4.6.1 | Recovery Operations and Services | | |



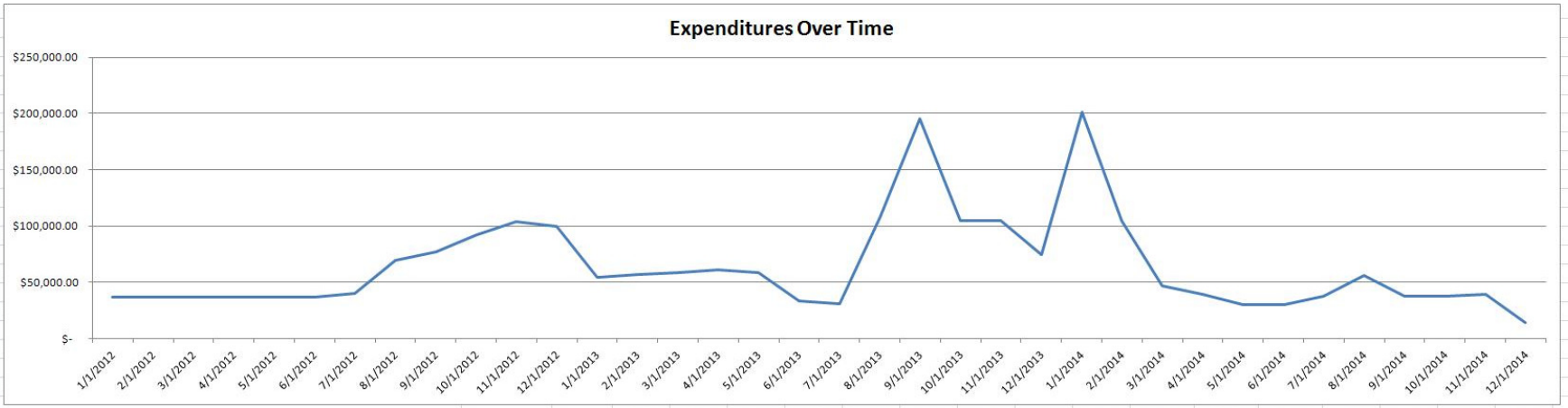
# Develop Parametric Estimates

- Based on historical or newly created CER'S
  - CER's can be stored in a central library
  - Create CER from historical data
- Document the estimate as you go using the integrated documentation space



# Time-Phase Estimates

- View timeline of expenditures at a glance
  - Phasing space offers a quick visualization to guide the estimator
- Phasing functions
  - Quickly phase a cost over time using pre-selected functions




| | | | 1/1/2012 | 2/1/2012 | 3/1/2012 | 4/1/2012 | 5/1/2012 | 6/1/2012 | 7/1/2012 | 8/1/2012 | 9/1/2012 | 10/1/2012 | 11/1/2012 | 12/1/2012 | 1/1/2013 | 2/1/2013 | 3/1/2013 | 4/1/2013 | 5/1/2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Automated Information System (AIS) | $ 512,235 | 100% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| Automated Information System Prime Mission Product Release/Increment X | $ 316,421 | 100% | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 8% | 10% | 14% | 17% | 15% | 0% | 0% | 0% | 0% | 0% |
| Custom Application Software (Specify) | $ 109,470 | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 3% | 5% | 7% | 9% | 11% | 13% | 15% | 13% |
| Subsystem Hardware | $ 268,912 | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Subsystem Software CSCI (Specify) | $ 185,623 | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Subsystem Software Integration, Assembly, Test and Checkout | $ 696,781 | 100% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Enterprise Service Element (Specify) | $ 235,104 | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |

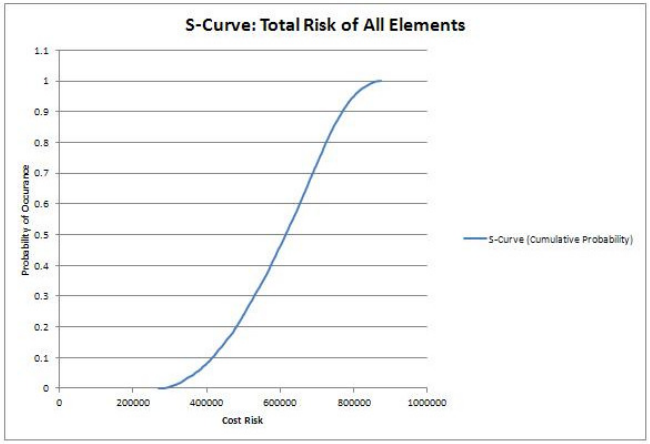
# Develop a Risk Adjusted Estimates

- Fast monte-carlo based risk analysis
  - Easily access a variety of distributions
  - Generates S-curve and confidence intervals

| Risk Simulation Tool & S-Curve Builder | |
|---|---|
| Project / Cost Estimate Name: | Launch Vehicle System |
| Rollup Cost (Not Including Elements Listed Below): | |

Return to WBS

| | | | | Normal | | Triangular | | | Bernoulli | | Categorical | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WBS # | Description | WBS Value | Distribution | Mean | Standard Deviation | Min | Mode | Max | Lower 50th | Upper 50th | Value 1 | Percentile 1 | Value 2 | Percentile 2 | Random | Distribution |
| 1.2.4.2 | Guidance Navigation and Control | $ 256,735.00 | Triangular | | | $ 250,000.00 | $ 256,735.00 | $ 341,635.00 | | | | | | | 0.71066 | $ 294,189.82 |
| 1.2.4.3 | Power | $ 400,375.00 | Triangular | | | $ 1,150.00 | $ 400,375.00 | $ 512,345.00 | | | | | | | 0.23025 | $ 217,919.20 |
| 1.2.4.5 | Range Tracking & Safety (Airborne) | $ 1,199.42 | Normal | $ 15,000.00 | 2600 | | | | | | | | | | 0.16529 | $ 12,470.36 |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |
| | | | N/A | | | | | | | | | | | | | $ - |




Run Risk Simulation (approx. 2 minutes)

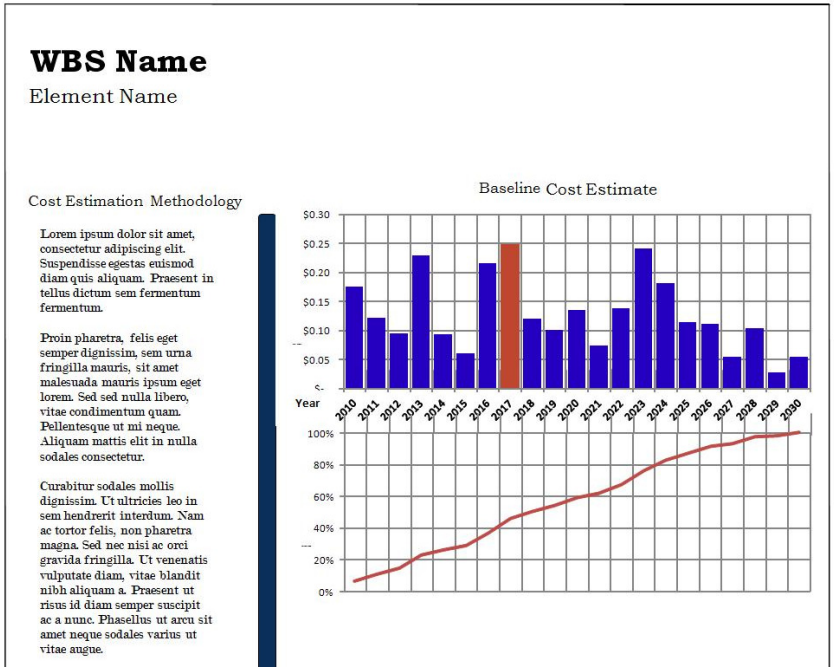
Create "Total" Graph

Clear Results

| Summary | |
|---|---|
| Percentile | Value |
| 10th | $ 415,836.87 |
| 20th | $ 480,483.34 |
| 30th | $ 528,894.67 |
| 40th | $ 574,140.10 |
| **50th** | **$ 614,607.56** |
| 60th | $ 652,591.92 |
| 70th | $ 688,417.51 |
| 80th | $ 723,964.57 |
| 90th | $ 768,451.22 |

# Produce Documentation

- Standardized documentation
  - Reports automatically generated for hard copy and power point slides.
- Outputs an estimate that is easy to navigate and share
  - Documentation reduces relearning and mitigates chances for errors



# Moving Forward

- CAST standardizes cost estimates and creates a knowledge database of prior estimates and their components that estimators can draw from in their future work.

# Questions & Demonstration