Aerospace Viewer of NASA Project Staffing Data (aView)

A Practical Tool for Analyzing Staffing Levels and Cost Across Missions

S. Lang, A. Zarate Garcia, J. McNeill,
J. A. Rice, T. Tran, C. J. Zhang
The Aerospace Corporation

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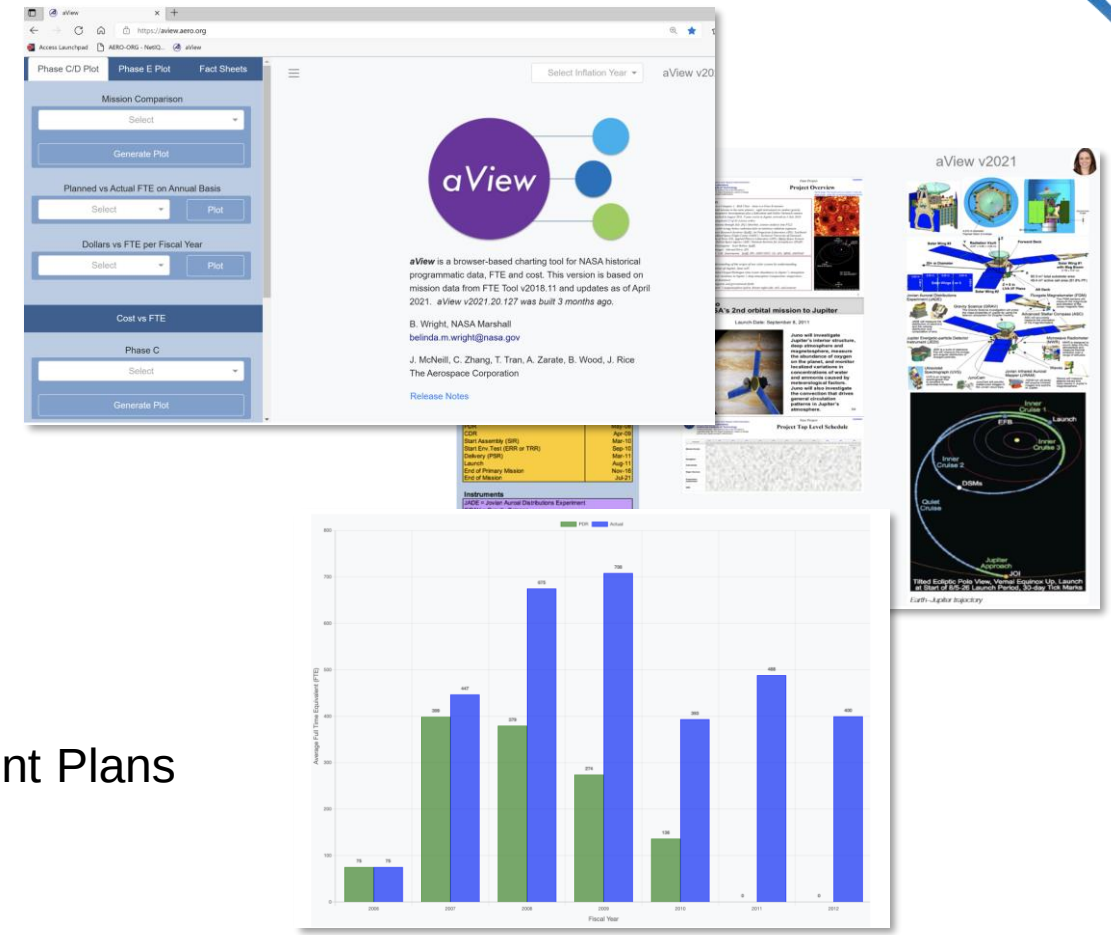
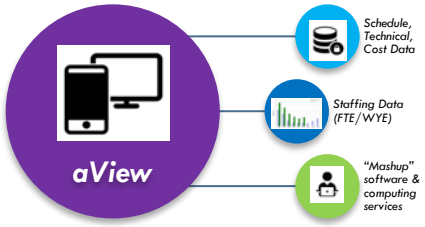
- Its Utility and Capabilities
  - *Why aView?*
  - *Plot Types*
  - *Capabilities*
  - *Mission Fact Sheets*
- Architecture and Deployment Plans
- Summary



aView – the Aerospace Viewer of historical staffing profiles of NASA science missions



Introduction

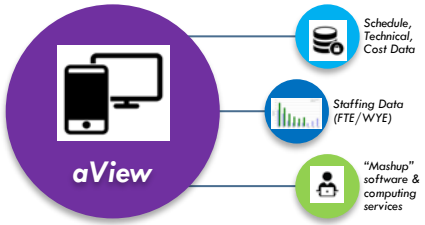
Purpose

aView, the Aerospace Viewer of archive of missions' staffing profiles, provides

- *A curated, validated archive of FTE/WYE data for 28 science missions*
- *Comparative analysis of mission programmatic data (FTE/WYE) from PDR through operations (Phases C, D, E)*
- *Illustrations of how well projects keep to staffing plans at PDR and highlights excursions*
- *Quick reference pages for missions' technical parameters and related information*

Cassini	**Dawn**	**Deep Impact**	**Europa Clipper**	**Genesis**
GRAIL	**InSight**	**Juno**	**Kepler**	**LADEE**
LCROSS	**LRO**	**LUCY**	**MAVEN**	**MESSENGER**
MER	**MRO**	**MSL**	**New Horizons**	**NuSTAR**
OCO	**OSIRIS-REx**	**Phoenix**	**Psyche**	**Spitzer**
Stardust	**STEREO**	**WISE**	**Mission List**	

aView is underwritten by the NASA Planetary Missions Program Office



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Timeline

2009
thru
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- Grew to contain historical staffing data for 24 science missions, mostly planetary
- Various features added to aid cost analysts within the NASA PMPO
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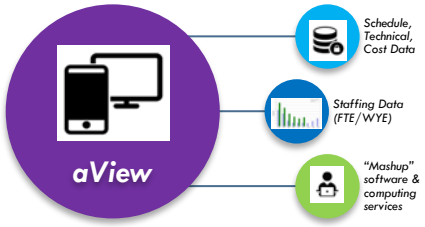

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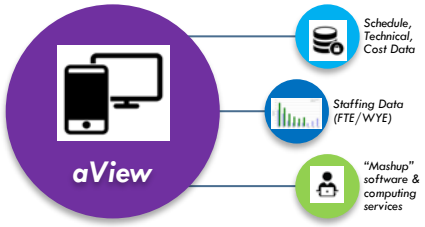

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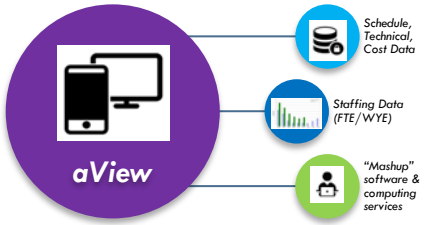
- Detailed reference information for each data point is recorded in the tool's DB



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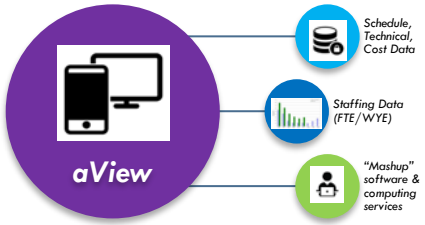
- Previous year's **aView 2021** made available via NASA ONCE's development server
- Addition of LUCY and Psyche mission data



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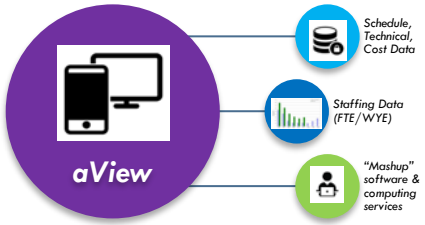
2023

- **aView 2023** to be available on NASA ONCE portal this year
- Development includes 508 compliance and NASA IT testing
- Adding missions DAVINCI*, DragonFly and NEO Surveyor

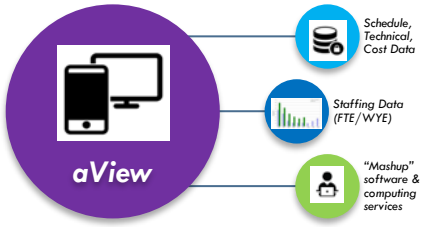
* As applicable given project schedule



Introduction

Data Sources

- **aView** is a repository of validated staffing and mission data
  - *Aerospace collects and validates the data in the aView DB*
  - *The sources of data and information for aView are*
    - Formally approved reports at major mission milestones from the NASA Cost Analysis Data Requirement (CADRe)
    - Monthly Status Reports (MSRs)
    - Project and mission websites
    - Our customer at the NASA Planetary Missions Program Office



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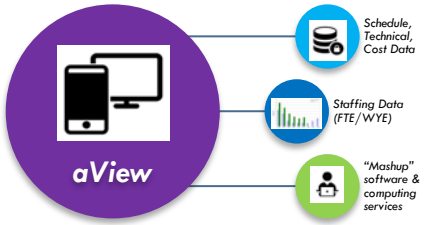


Its Utility and Capabilities

Why aView?

The **aView** tool has a number of utilities that are not currently readily available through any other source. It allows the user to

- *Visualize staffing profiles for Phases C, D and E (FTE and WYE) at the granularity of monthly data*
- *Display annual project cost data along side the annual staffing totals for Phases C, D and E*
- *Understand how the labor basis of estimate compares with past NASA science missions with similar characteristics*
- *Examine how well a project performs to its staffing plans from PDR through operations*
- *Reference technical and programmatic data of a mission, like spacecraft mass, mission schedule, launch vehicle, launch date, etc.*

Its Utility and Capabilities

Charting Capabilities and Fact Sheets

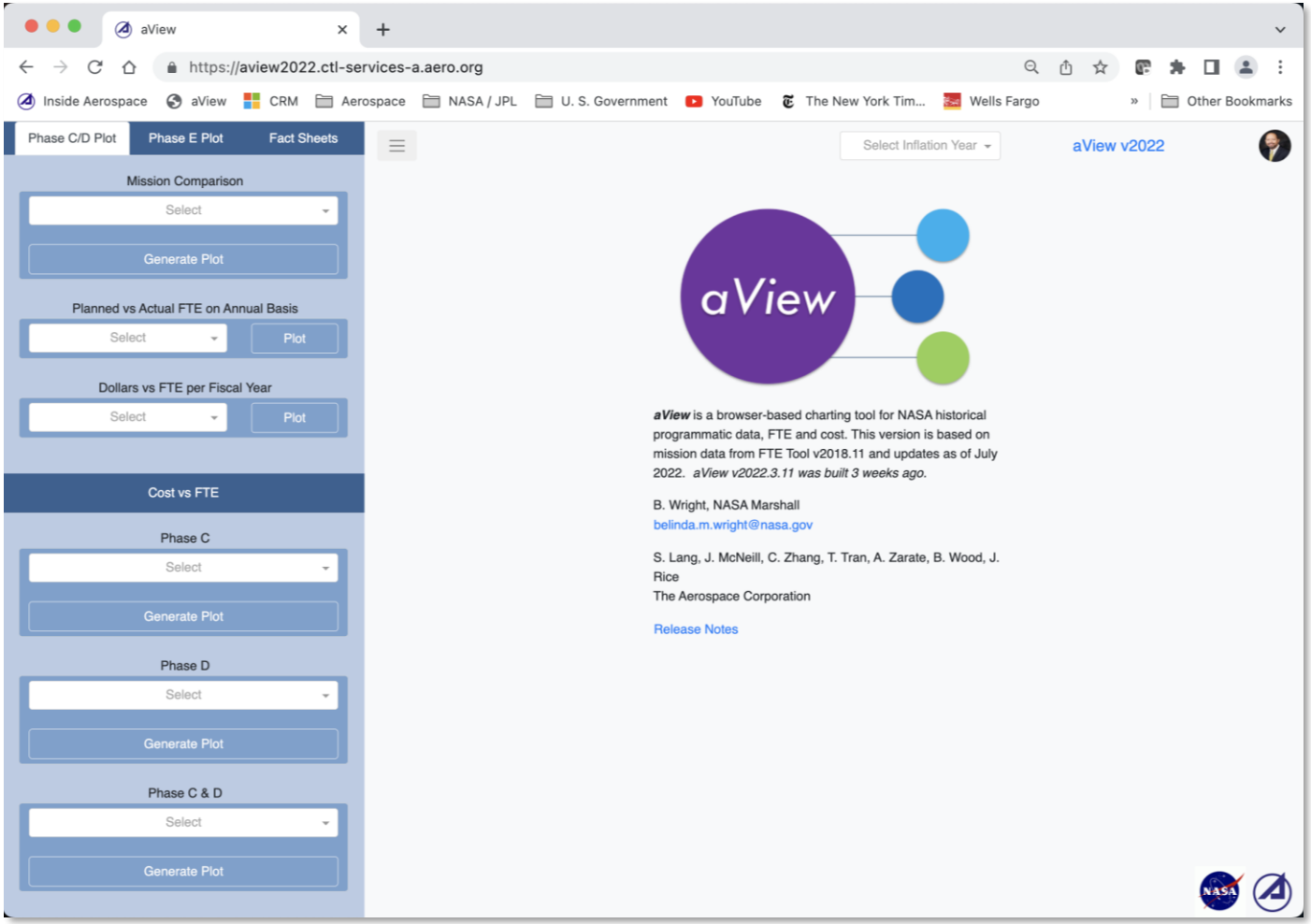


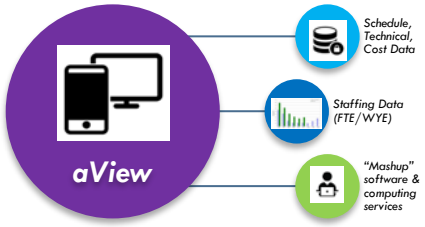
Figure A, "Front page" of aView via Google Chrome web browser

Its Utility and Capabilities

Chart Types

- A variety of chart types are available in aView and enable the user to examine programmatic data in different dimensions and ways. Currently, there are four chart types:
  - *FTE Comparison Plots for defined Periods*
  - *Planned and Actual FTE by Mission*
  - *Annual Cost and FTE by Mission*
  - *FTE vs. Cost*

- Each plot can be generated from mission data for Phases C and D or operations Phase E. The user can select the year for inflation to apply to the data



Its Utility and Capabilities

FTE/WYE Comparison Plot for Defined Periods

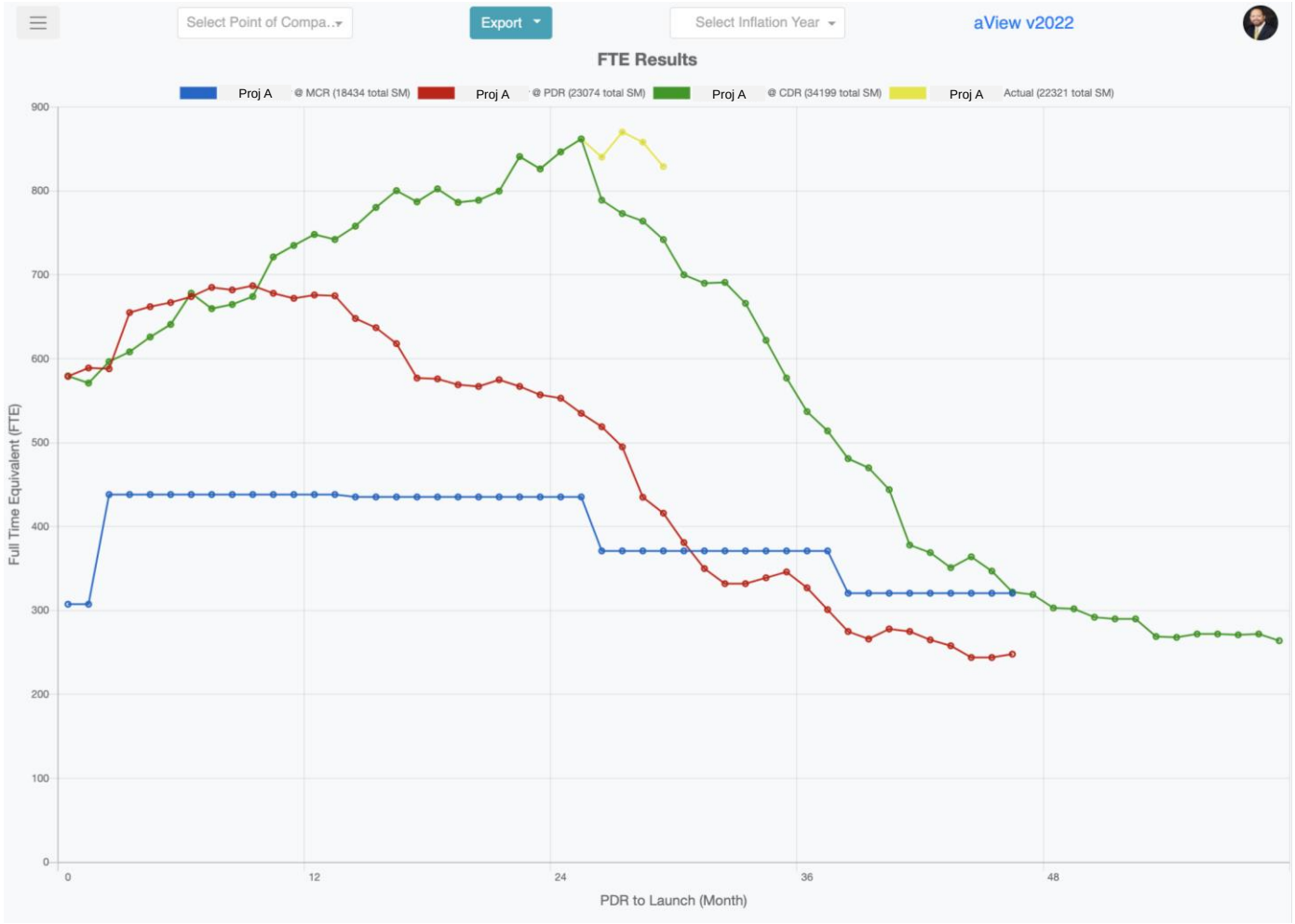
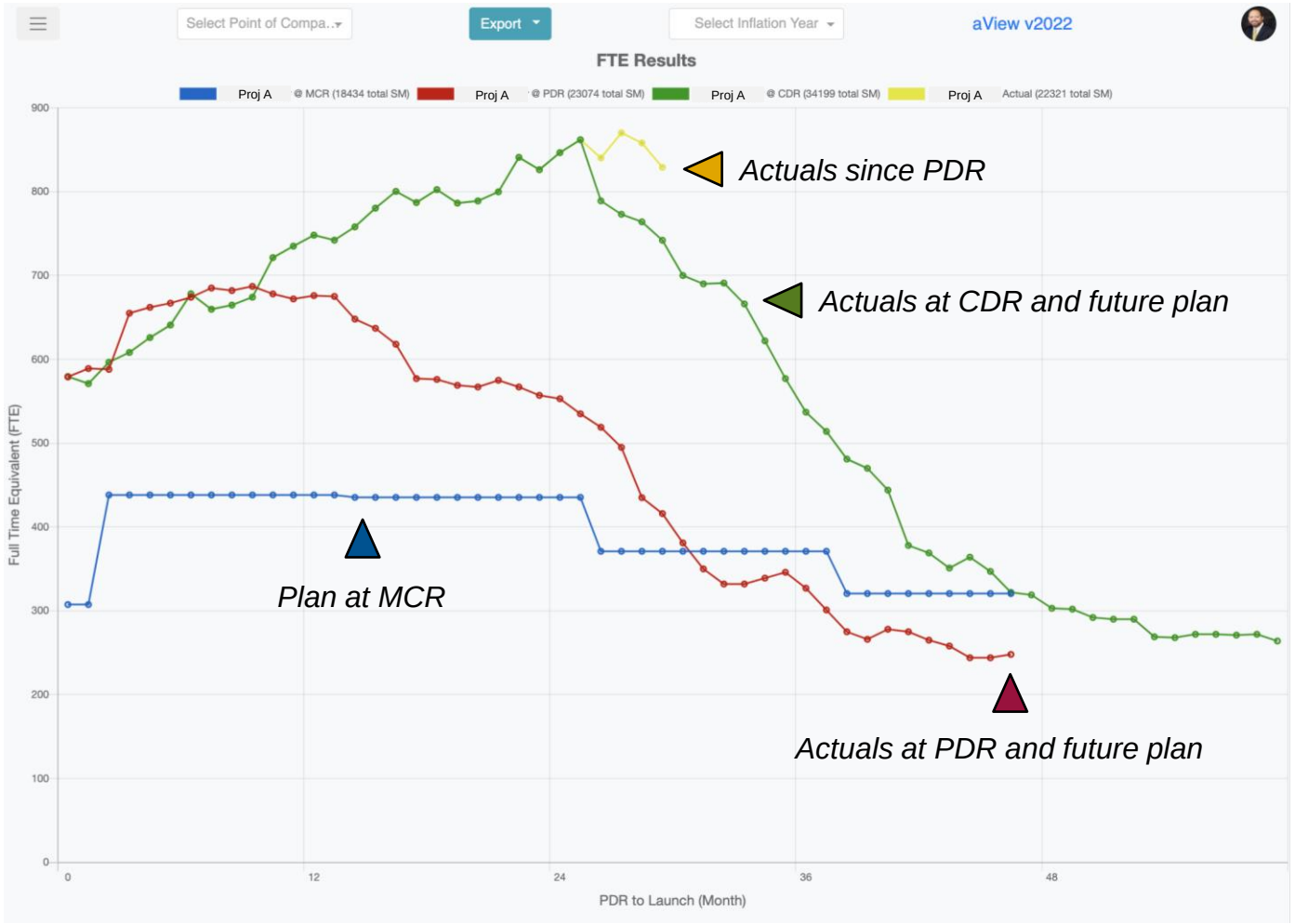


Figure B, Project A staffing actuals and plans crafted at MCR, PDR and CDR

Its Utility and Capabilities

FTE/WYE Comparison Plot for Defined Periods



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Its Utility and Capabilities

FTE/WYE Comparison Plot across Projects

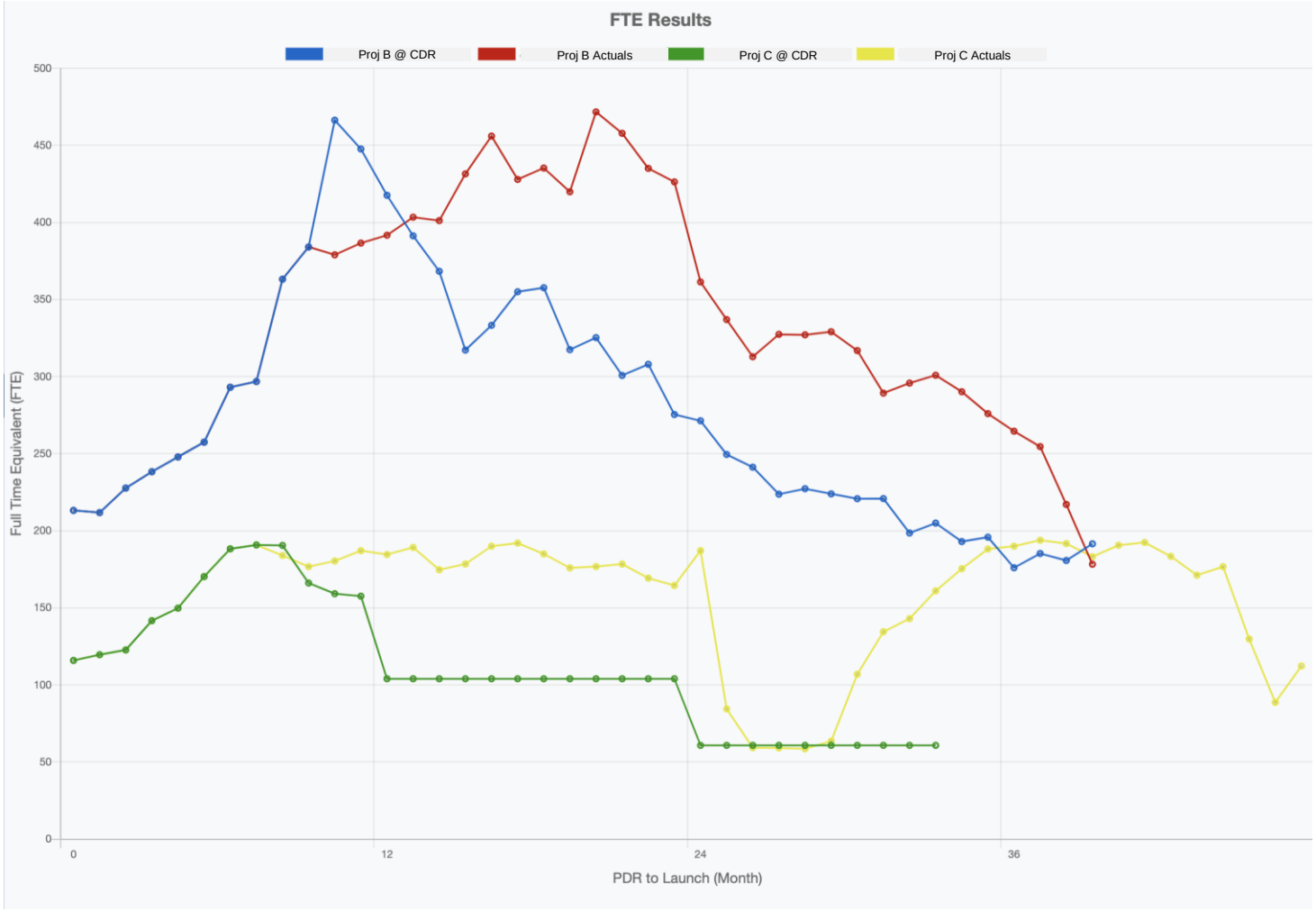
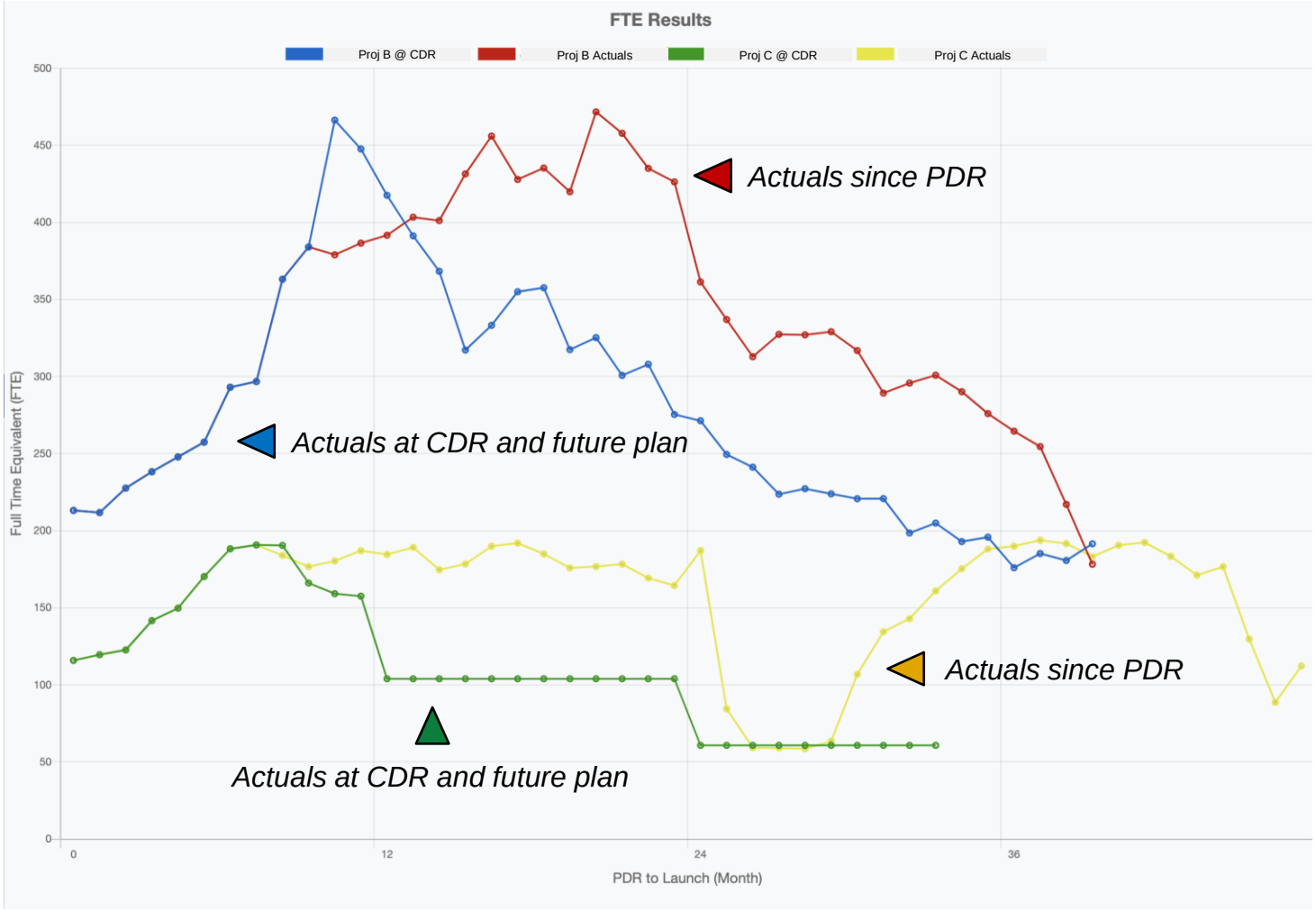


Figure C, Projects B and C staffing plans crafted at CDR and final actuals

Its Utility and Capabilities

FTE/WYE Comparison Plot across Projects



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Its Utility and Capabilities

Planned and Actual FTE/WYE by Project

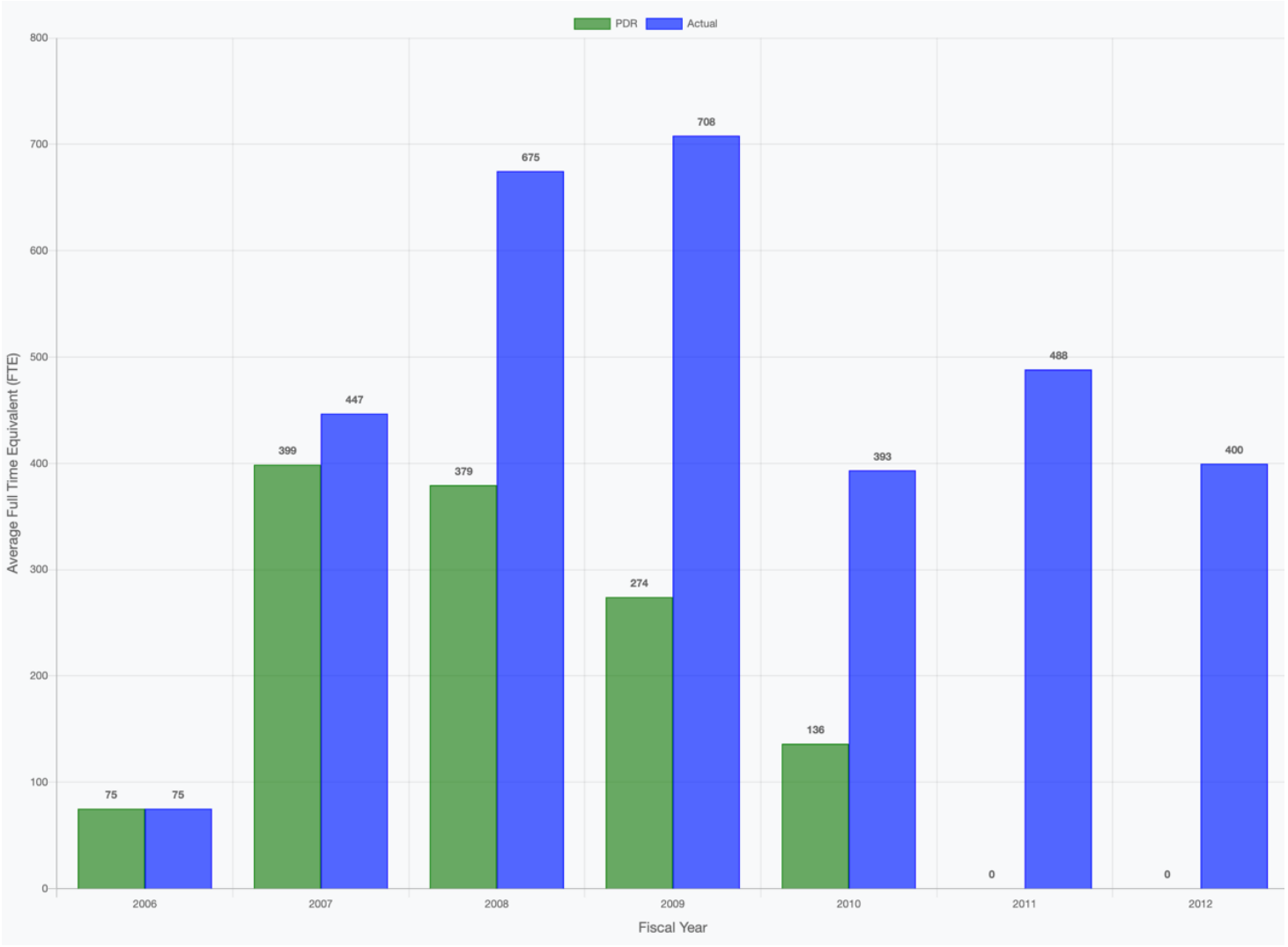


Figure D, Planned at PDR (green) and actuals (blue) at end of Phase D

Its Utility and Capabilities

Planned and Actual FTE/WYE by Project

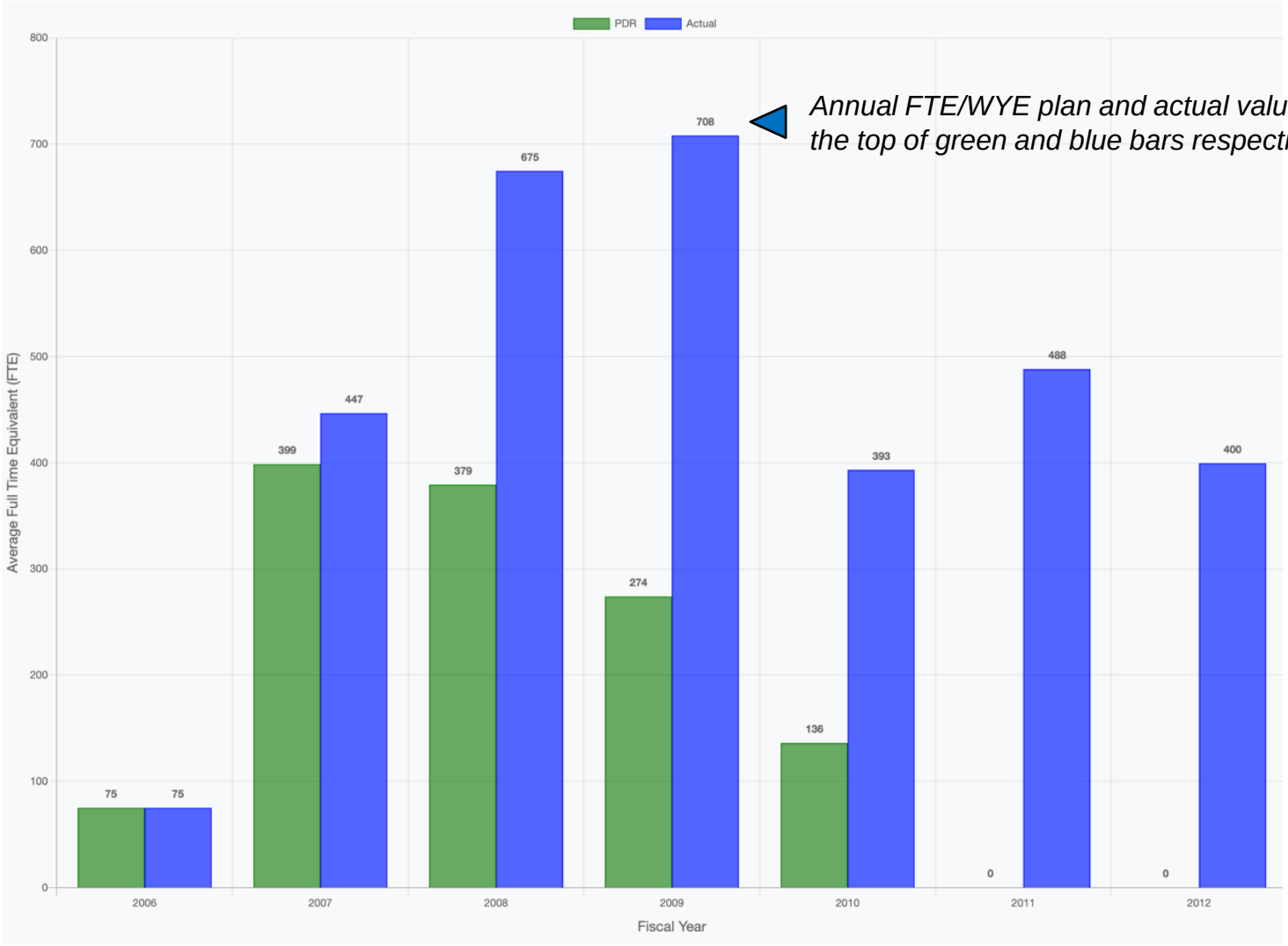


Figure D, Planned at PDR and actuals at end of Phase D

Its Utility and Capabilities

Annual Cost and FTE/WYE by Project

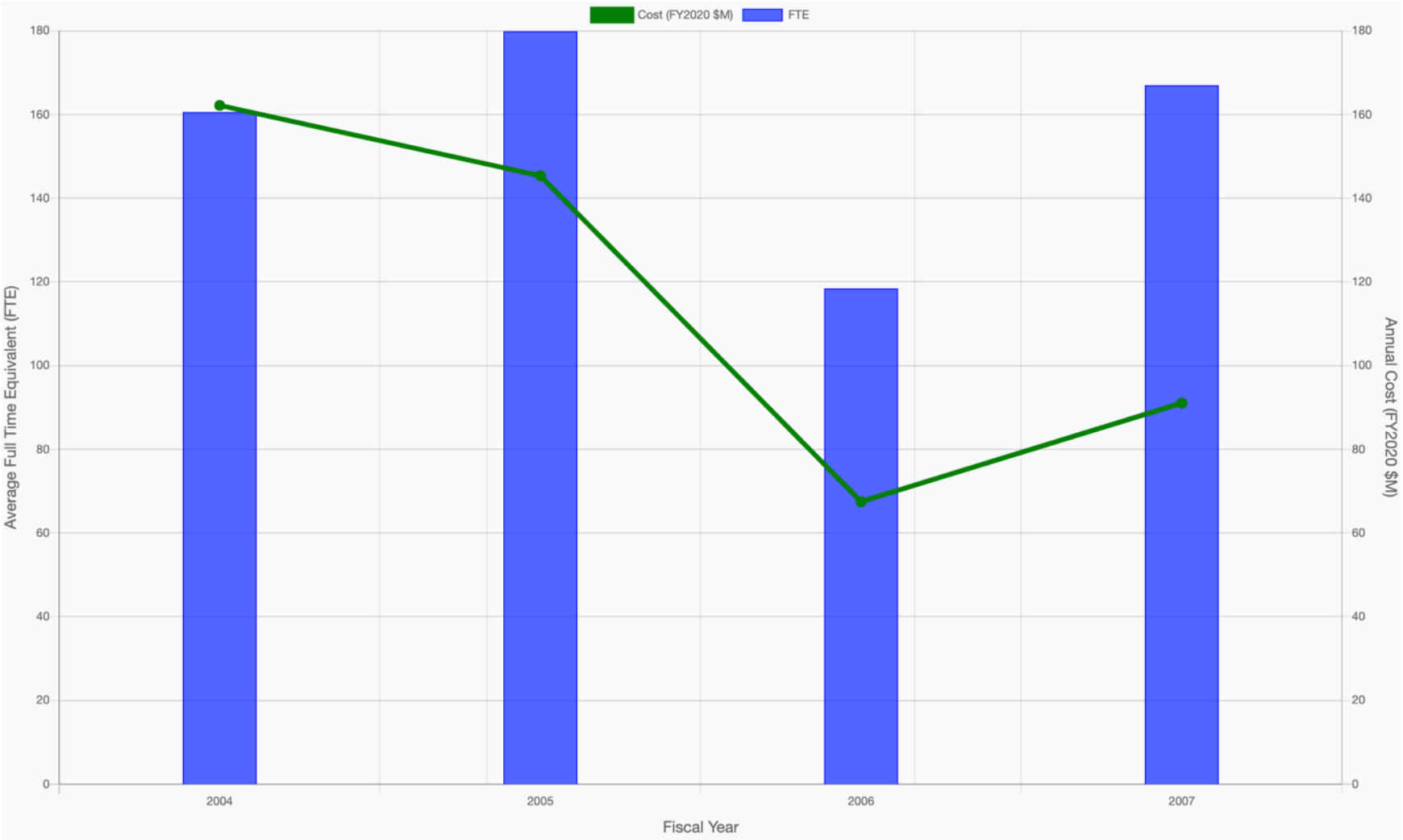
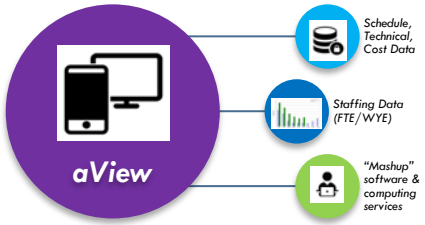


Figure E, Annual FTE/WYE and cost actuals by Fiscal Year

Its Utility and Capabilities

Mission Fact Sheets

- Provide a capsule summary of the mission and project, providing some or all of these items
  - *Overview of the science objectives*
  - *Hosted payloads – instruments, sensors*
  - *Mission plan and characteristics*
  - *Project development milestone dates*
  - *Technical performance metrics*
  - *Basic concept-of-operation*
  - *Diagrams depicting the physical layout of components*
- NASA CADRe is the primary source for information given in these fact sheets
- As missions progress, fact sheets are updated with new, pertinent information



Its Utility and Capabilities

Mission Fact Sheets

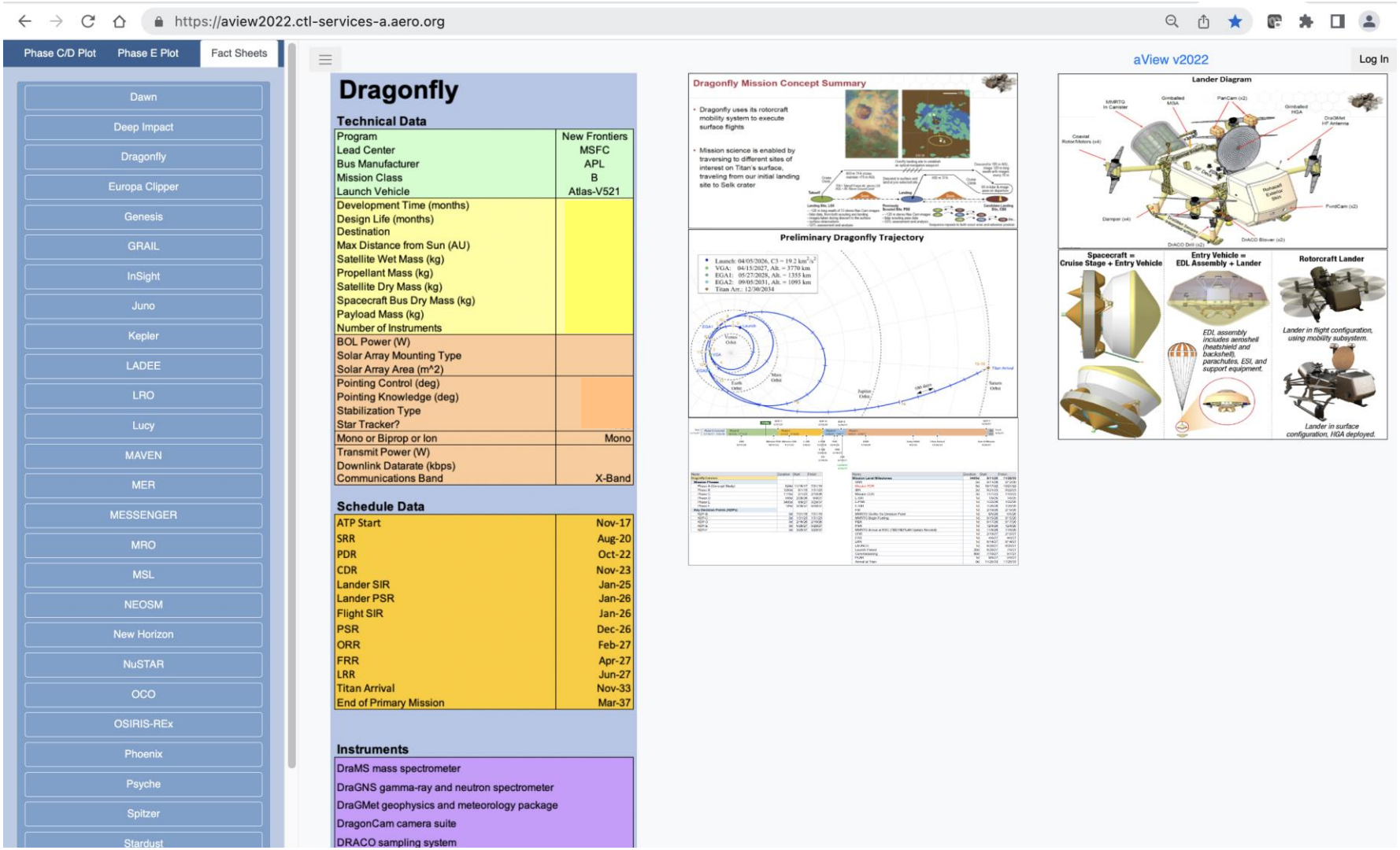


Figure F, Fact sheet for Dragonfly

Its Utility and Capabilities

Mission Fact Sheets – selective pop-up, zoom feature

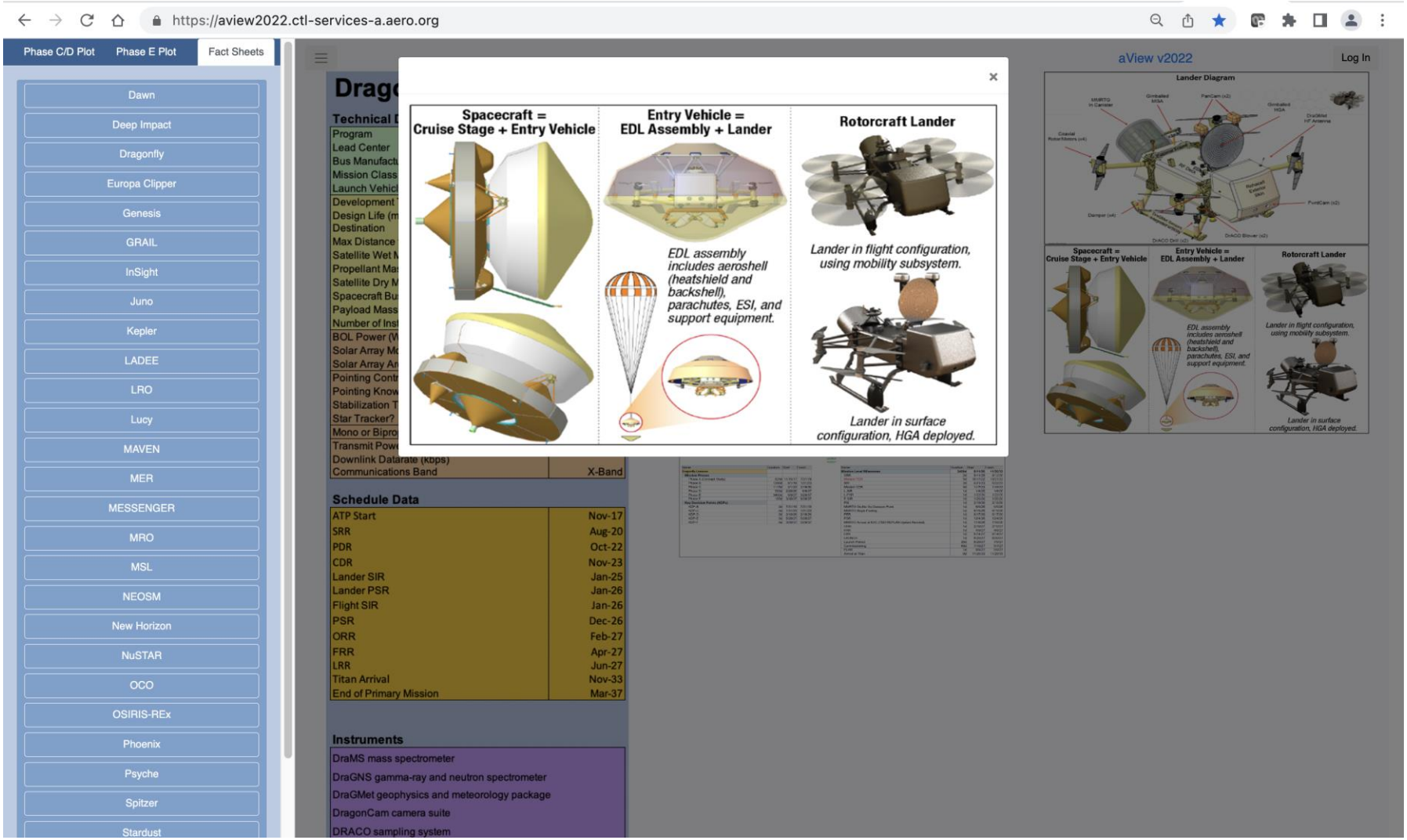
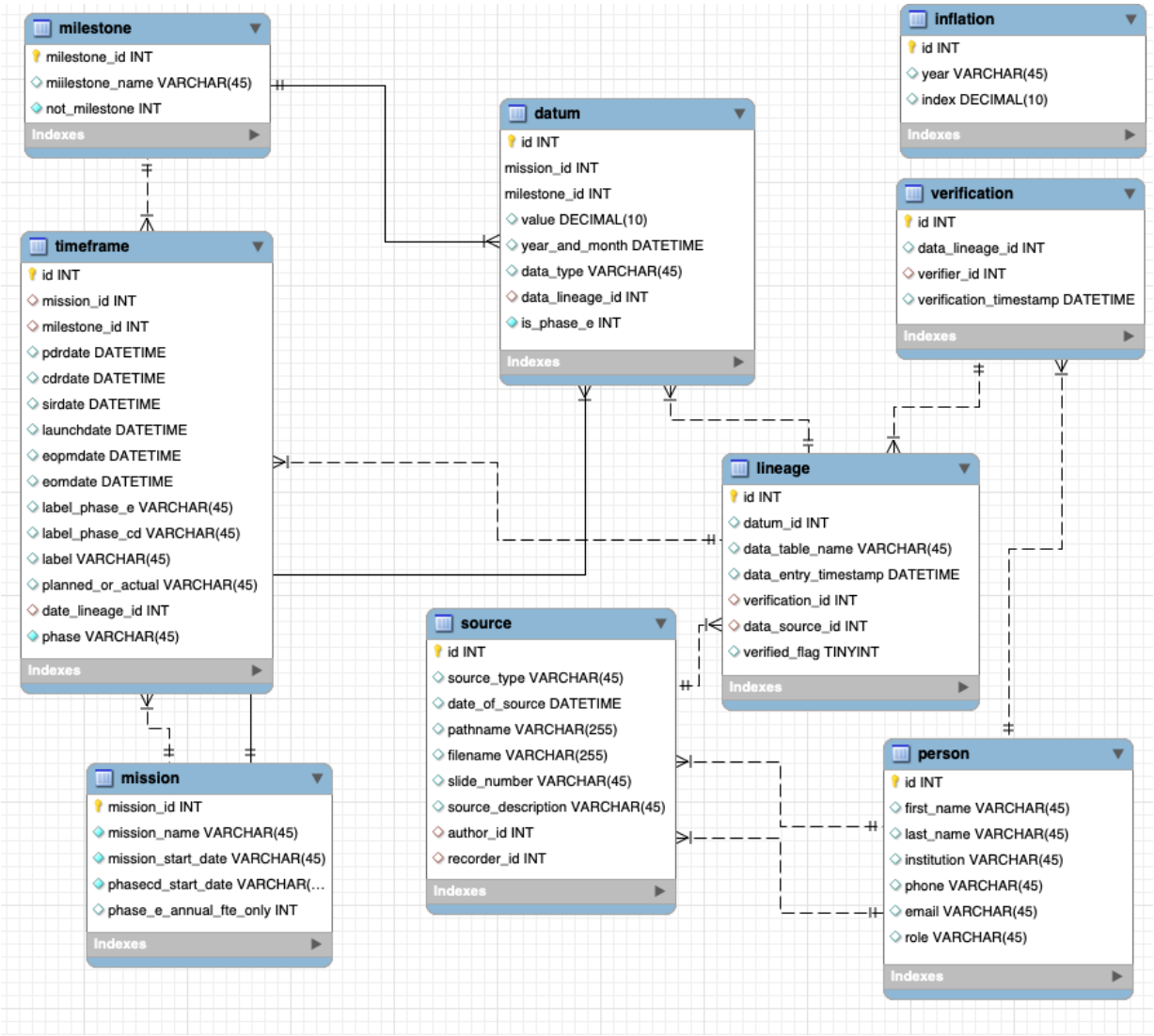


Figure F, Fact sheet for Dragonfly

Tool Construction

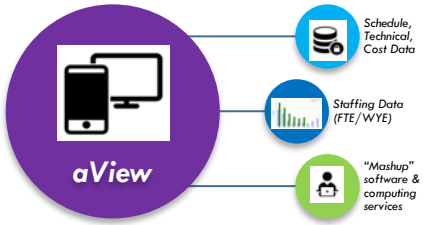
- aView uses open-source *chart.js,* a JavaScript tool suite on the frontend, and a SQLite database (DB) on the backend
  - *DB is designed to allow for complete traceability for every data point (datum) that is plotted*
  - *aView leverages aspects of Aerospace's infrastructure developed for detailed mission assurance of the nation's launch program for national space assets*



Summary

- aView developed to assist users in conducting comparative analysis
- Built on a detailed repository of mission programmatic data, it provides high-level views of the historical data for 28 NASA missions for development Phases C and D as well as the operations Phase E
- Given the wealth of mission and project information available in aView, both programmatic and technical, cost analysts can leverage the its capabilities to answer a variety of questions
  - *Understand what development costs and staffing during Phases C and D for a proposed interplanetary mission based on similar historical missions*
  - *Understand how a proposed operations budget for Phase E compares to previous missions managed by the same Center*
  - *Understand how staffing levels track to development costs between PDR and ARR for a particular project*
- Aerospace seeks to broaden the aView DB to include more Earth Science, Astrophysics, and Heliophysics missions

Welcome support from other customers to expand the mission set



Acknowledgments

- Customer
  - *Bradley Zavodsky, NASA Planetary Missions Program Office*
- Aerospace
  - *Sarah Lang, Lead*
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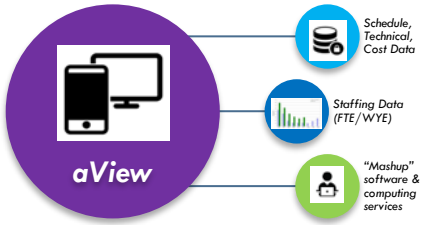
- NASA OCFO & HQ IT
  - *James Johnson*
  - *Julie McAfee*
  - *Michael Blanford*
  - *Amanda Dawson*
  - *Ashley Mooney*