Office of Inspector General, Cost & Schedule Analytics Initiative

Presented By:
NASA OIG Office of Data Analytics
April 23, 2024
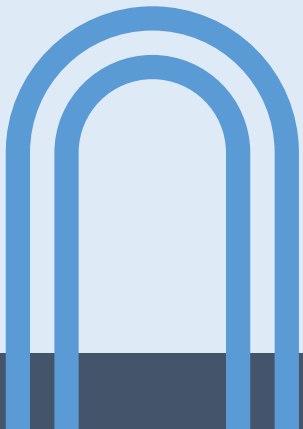
AGENDA

BACKGROUND

CHALLENGE & APPROACH

DEMO

NEXT STEPS

Background

NASA Office Of Inspector General

NASA Mission

Explore the unknown in air and space, innovate for the benefit of humanity, and inspire the world through discovery.
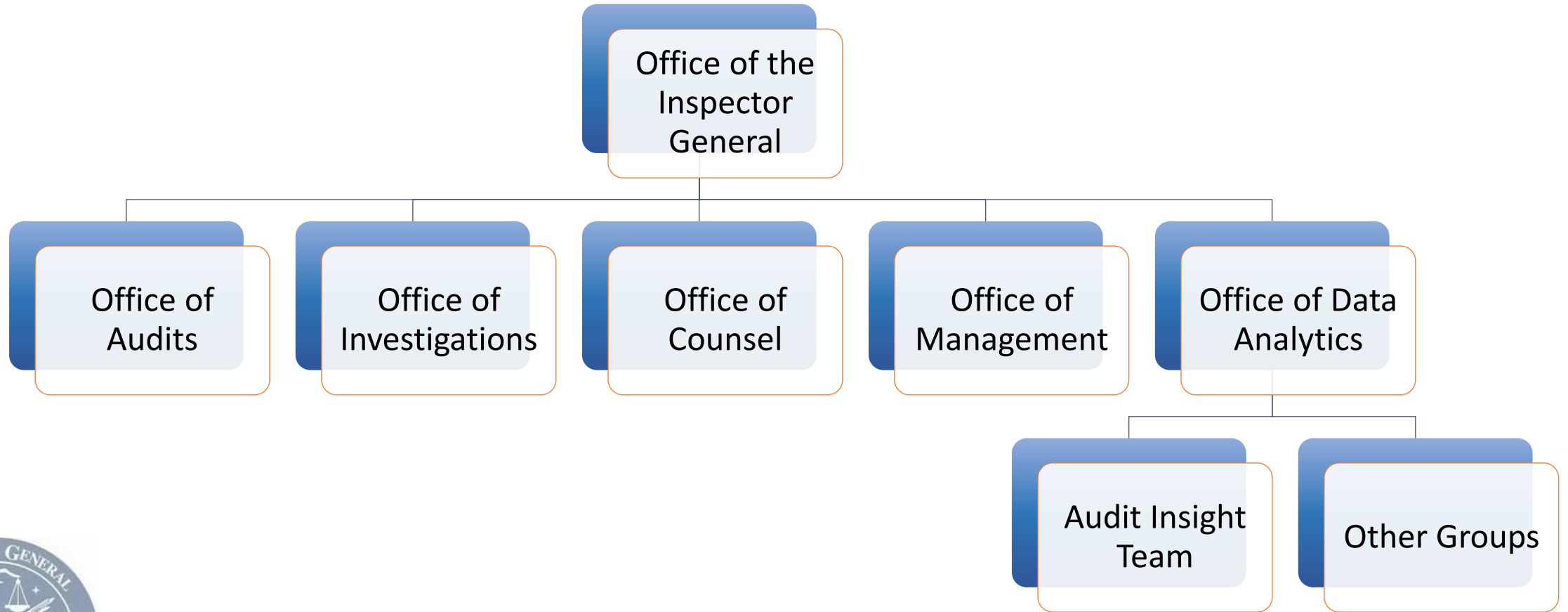
OIG Mission

Prevent and detect crime, fraud, waste, abuse, mismanagement and **promote efficiency, effectiveness, and economy** throughout NASA.

Reference: Inspector General Act of 1978

OIG Organization Layout

Audit Insight Team (AIT)

We provide **embedded support to** audit projects.

We work with to outline analytic possibilities (**analytic consultation**); based on the objectives of an audit and the available data sources.

We collaborate with OA to brainstorm and scope analytic ideas for audit project, throughout the life of the project – **Research to Report Publication**

We build **data visualizations** to help understand and **explore** the data as well as **support** the audit findings

We facilitate the **data reliability** statement development

We provide referrals and support for **Survey, Statistical Analysis & Infographic** needs

Assist with **documentation** & **indexing** analytic results and AIT **product development** support

We identify and grow **capabilities** that OA can benefit from

SETTING THE STAGE:

- NASA OIG
- Office of Audits
- Audit Spectrum
- Audit Director's Concern
- Data Dependency
- Inefficiencies in Data Analysis
- Timeliness as a Priority
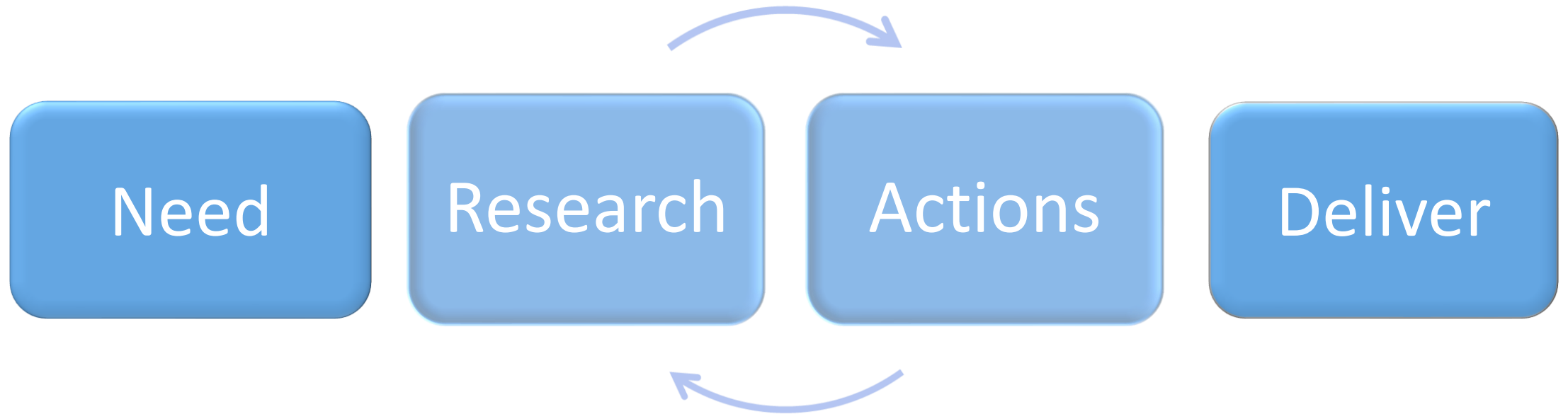- Initiative Comes Alive

The Challenge
&
Approach

Root Problem:
A Need for Timely Cost & Schedule Information

Address the Root Problem

Research & Action

Phase 1

PHASE 1

Dec 2022 – Jul 2023

1 RESEARCH

2 DEFINE REQUIREMENTS

3 DEVELOP CASA TIGER TEAM

Research
(Phase 1)

Attend 2023 Cost & Schedule Symposium

Explore the Problem

Requirements Gathering
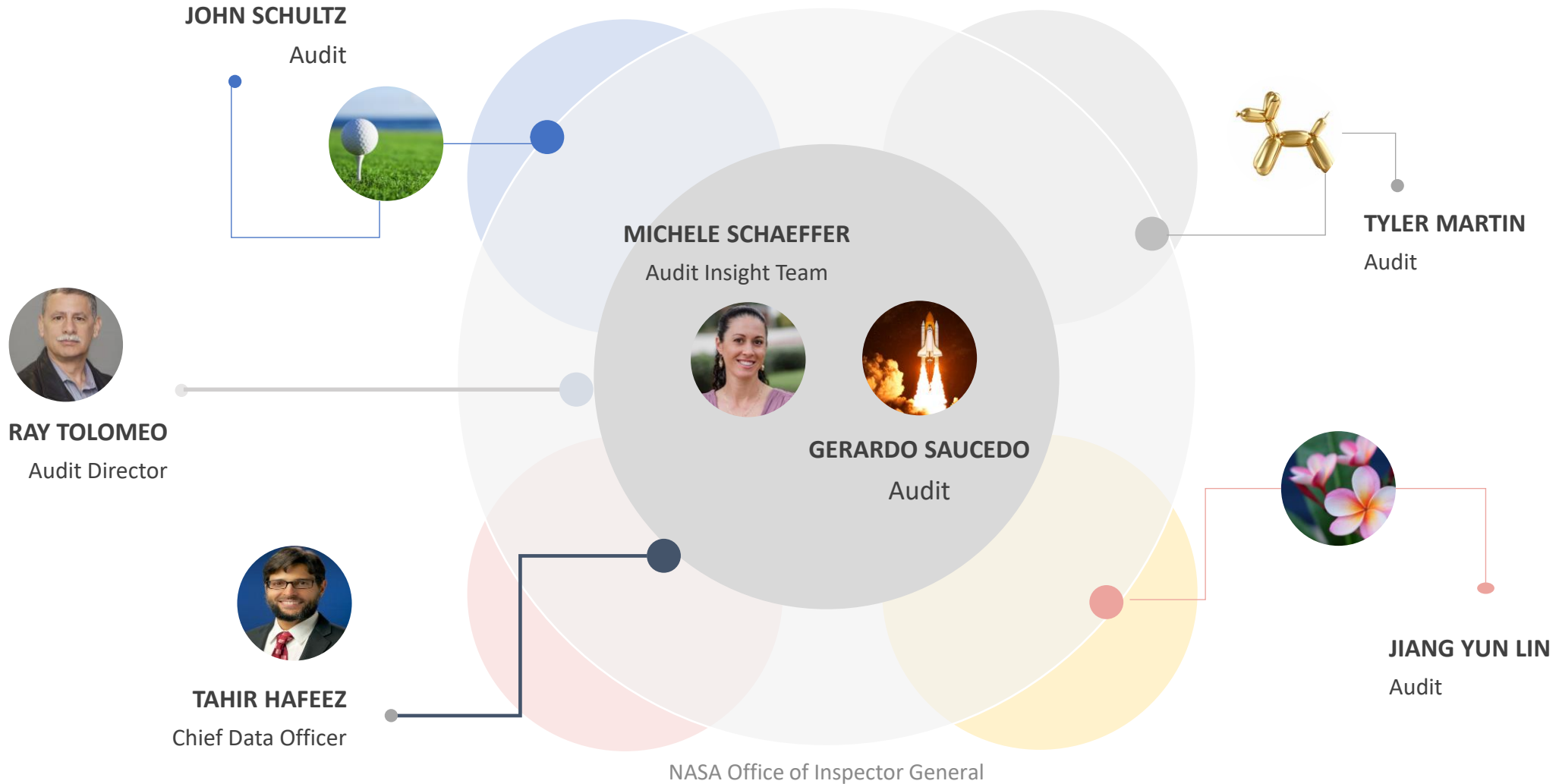
Research EVM & Status Reports

Define Requirements

- Cross Functional Team: OA & ODA

- Identify Audit Subject Matter Experts

- Translate Requirements for Dedicated
  Data Analyst

- Establish CASA Tiger Team

CASA Transition from
Tiger Team to Working Group

JOHN SCHULTZ
Audit

TYLER MARTIN
Audit

MICHELE SCHAEFFER
Audit Insight Team

RAY TOLOMEO
Audit Director

GERARDO SAUCEDO
Audit

JIANG YUN LIN
Audit

TAHIR HAFEEZ
Chief Data Officer

Research & Action

Phase 2

PHASE 2

Aug 2023 – Dec 2023

1 RESEARCH

2 EXPLORATORY ANALYSIS

3 OBJECTIVES

4 ROADMAP

Research (Phase 2)

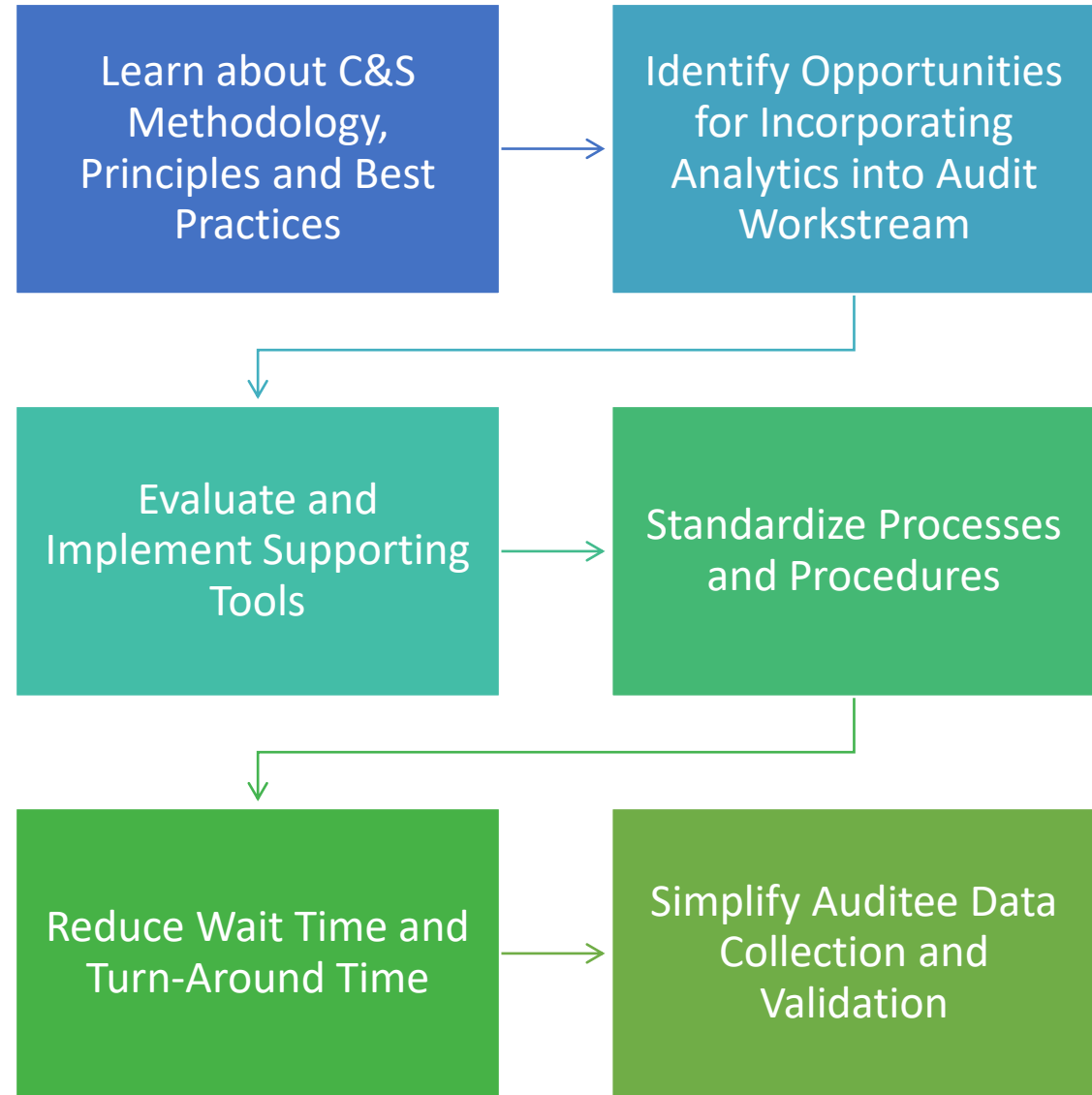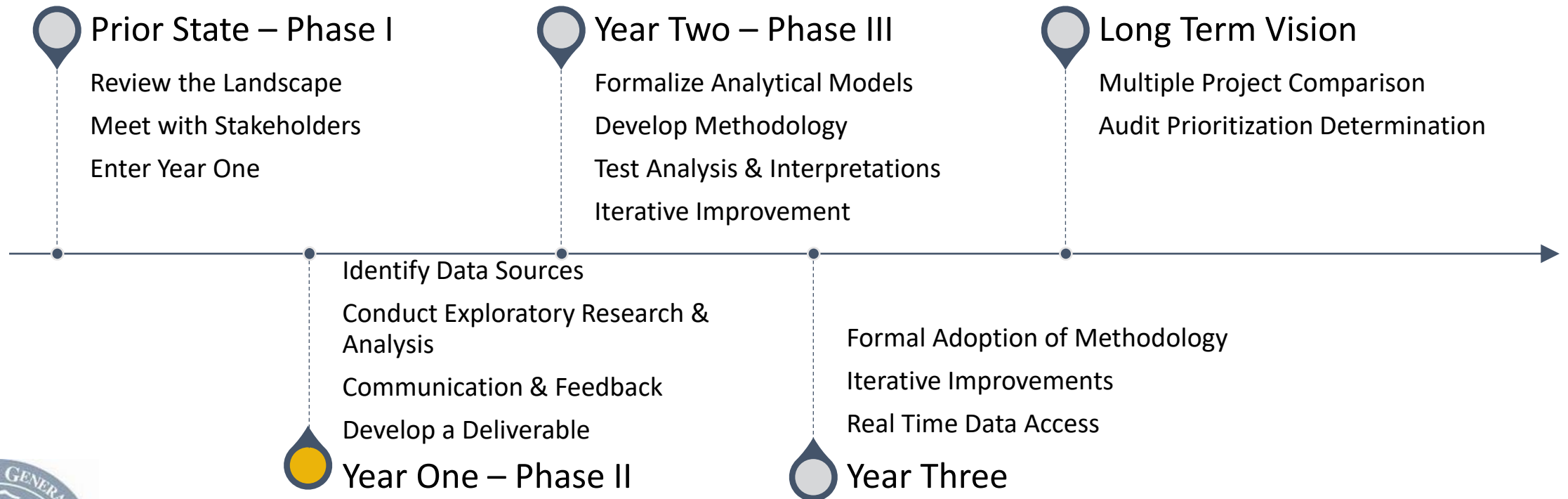|	
Investigate	Explore multiple paths and contacts
Inform	Identify the relevant data sources and subject matter experts
Involve	Attend relevant trainings, work groups and information sessions
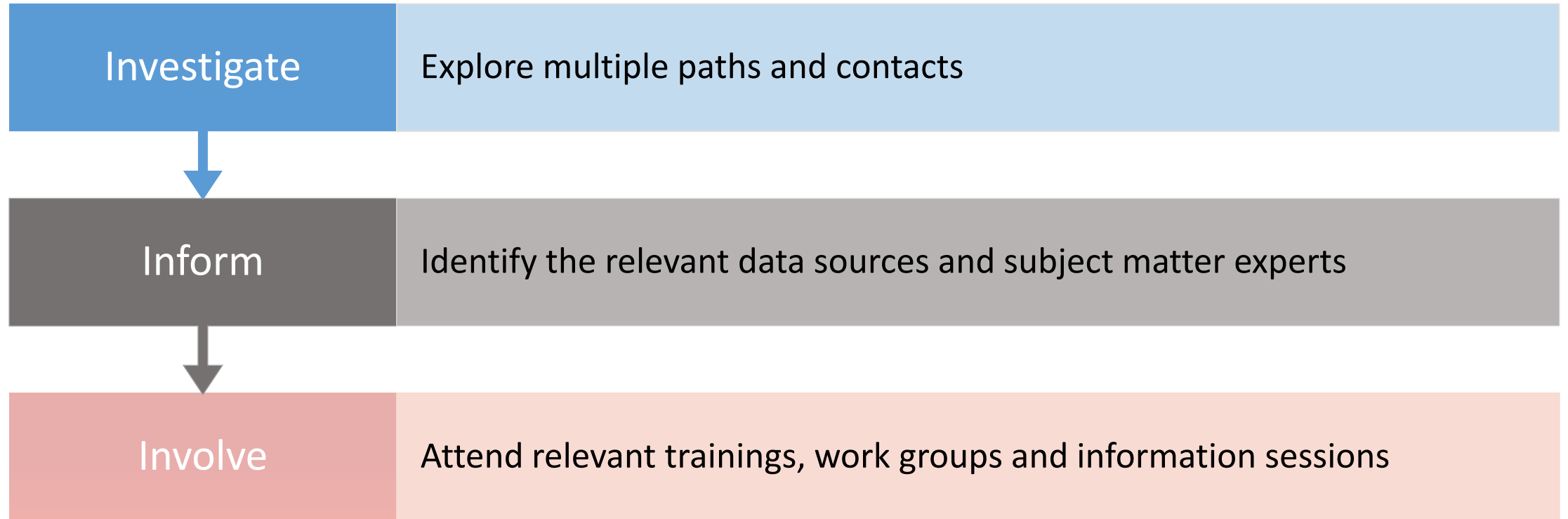
Exploratory Analysis

- Monthly & Quarterly Status Report Reviews
- Earned Value Management Documentation
- Cost & Schedule Training, Tutorials & Documentation
- Workgroup Gatherings
- Empower
- ONCE

CASA Working Group Objectives

Learn about C&S Methodology, Principles and Best Practices	Identify Opportunities for Incorporating Analytics into Audit Workstream
Evaluate and Implement Supporting Tools	Standardize Processes and Procedures
Reduce Wait Time and Turn-Around Time	Simplify Auditee Data Collection and Validation

CASA Roadmap

Prior State – Phase I

Review the Landscape

Meet with Stakeholders

Enter Year One

Year Two – Phase III

Formalize Analytical Models

Develop Methodology

Test Analysis & Interpretations

Iterative Improvement

Long Term Vision

Multiple Project Comparison

Audit Prioritization Determination

Identify Data Sources

Conduct Exploratory Research & Analysis

Communication & Feedback

Develop a Deliverable

Year One – Phase II

Formal Adoption of Methodology

Iterative Improvements

Real Time Data Access

Year Three

Research & Action

Phase 3

PHASE 3

Jan 2024 – Present

1 RESEARCH

2 VALIDATE & VERIFY

3 SOLUTION DELIVERY

Researching the Audit Lifecycle

Audit Planning

Cost & Schedule Performance Audits

- Budget
- Project Codes
- Contractor Detail

Data Sources

- Presidential Budget Request
- Annual Report
- Tripwire
- Supply Chain Insight Central
- Decadal Reports
- Oversight.Gov
- Financial Statements
- News/Google

Research

Data Sources

- Prior Recommendations
- Prior Reports/Audits

Survey

Data Sources

- MSR's & QSR's
- Gate Documents
- Mission Concept Review
- KDP-A, B, C
- System Requirements Review
- ONCE Database
- 533's Monthly Cost Reports
- Annual Planning Budget Est.
- CPAR's
- ICE (Empower)

Metrics

- Cost to Date
- Margin to Date
- Schedule Performance Index
- Cost Performance Index

Validate & Verify

- Inform Peers

- Meet with Audit Teams

- Consult with Subject Matter Experts

- Alignment and Consistency

- Commitment to Data Integrity
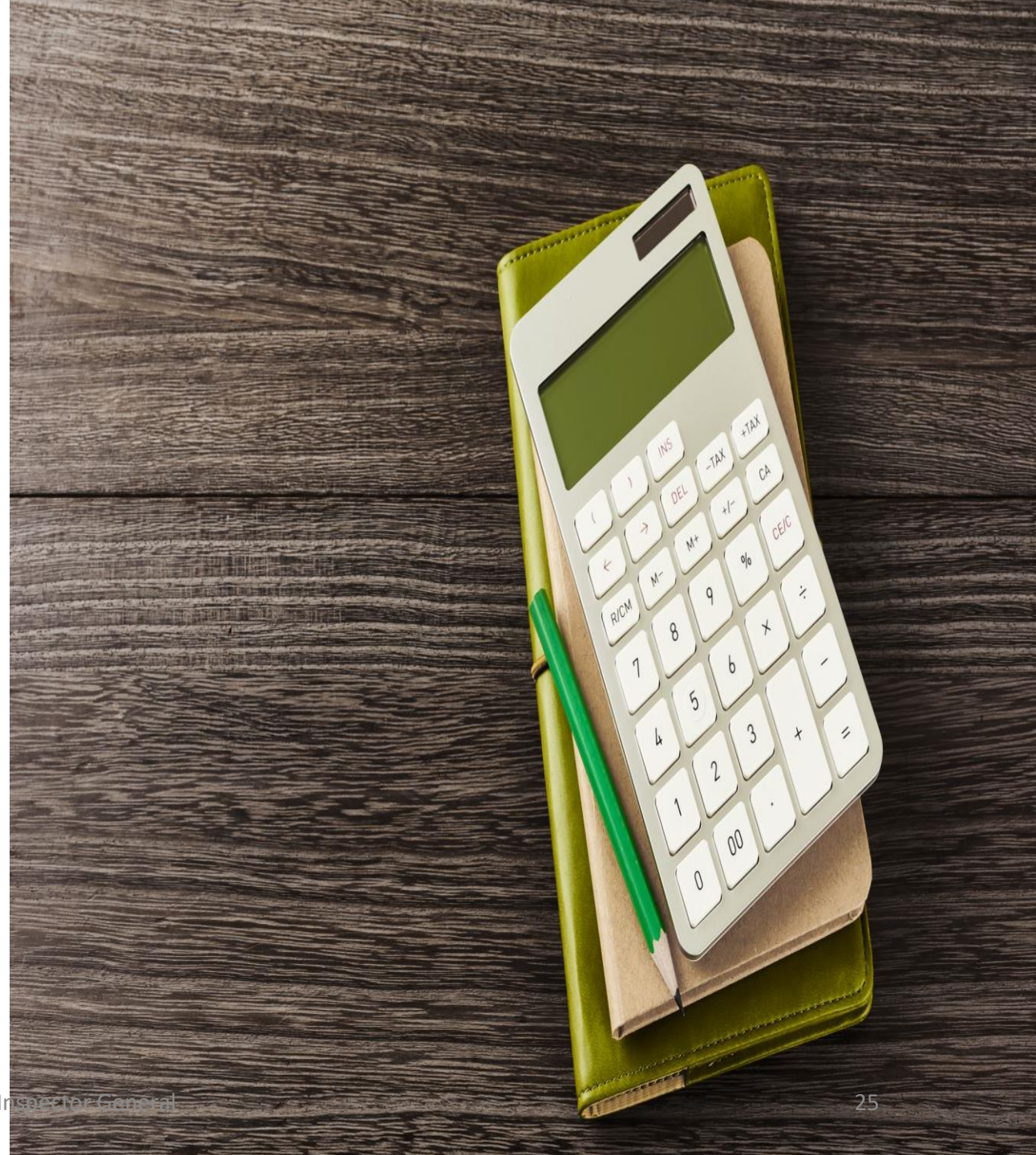
Solution Delivery

NASA PROJECT COST DASHBOARD

Click Anywhere To Proceed

A powerful tool developed to provide auditors with a comprehensive overview of project-related cost metrics.

Recap &
Next Steps

CASA Information Journey
Phase 1

Symposium Presentations

Trainings

Audit Insight Team

MSR's & QSR's

OFFICE OF AUDITS

Office of Data Analytics

CASA Tiger Team

CASA Information Journey

Phase 2

Project Managers

Symposium Presentations

Trainings

Audit Insight Team

HQ SME's

MSR's & QSR's

EVM HAPPY HOUR

OFFICE OF AUDITS

Office of Data Analytics

OCFO

CASA Tiger Team

OIG

EVM Analysts

CASA Information Journey

Phase 3
Project Managers

Symposium Presentations

Trainings

Audit Insight Team

HQ SME's

MSR's & QSR's

Empower

EVM HAPPY HOUR

Business Analysts

Schedule Owners

ONCE

Contract Officers

Access Requests

OFFICE OF AUDITS

Office of Data Analytics

OCFO

CASA Tiger Team

OIG

EVM Analysts

Homegrown Applications

CASA Information Journey

Symposium Presentations

Trainings

Audit Insight Team

Project Managers

HQ SME's

MSR's & QSR's

Empower

EVM HAPPY HOUR

Community

Business Analysts

Schedule Owners

Access Requests

ONCE

Contract Officers

Input

OFFICE OF AUDITS

Office of Data Analytics

OCFO

CASA Tiger Team

OIG

EVM Analysts

Homegrown Applications

Next Steps

- Community Engagement

- Develop Schedule Analytics

- Develop Cost Analysis Tools

- Improve the Timeliness of Data

- Streamline Information Access

Thank You

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Audit Insight Team

Data Analyst

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NASA Office of Inspector General

Solution Demo

Cost & Schedule Analytics Dashboard

Screenshots

Vendor Cost Breakdown Summary
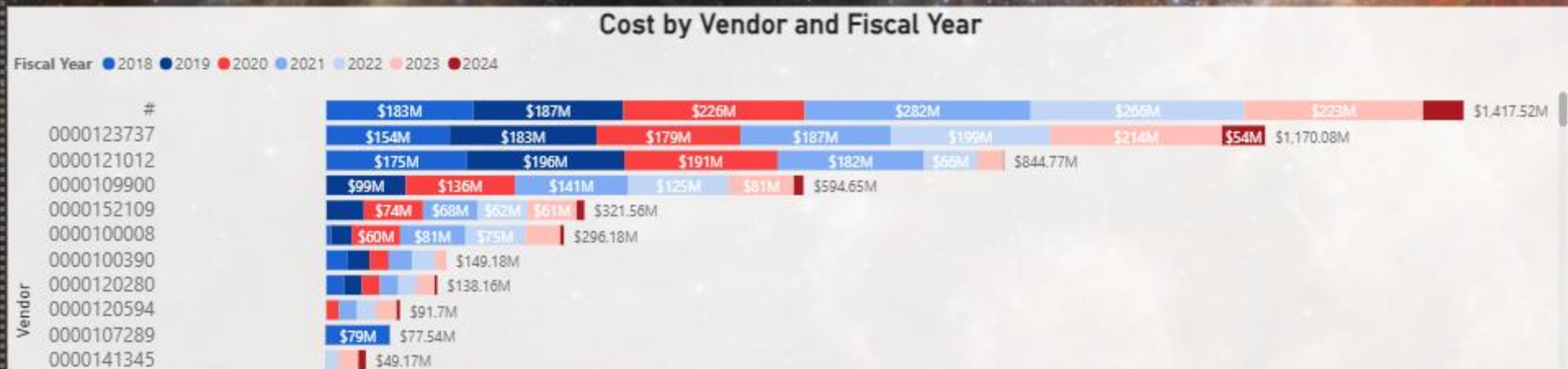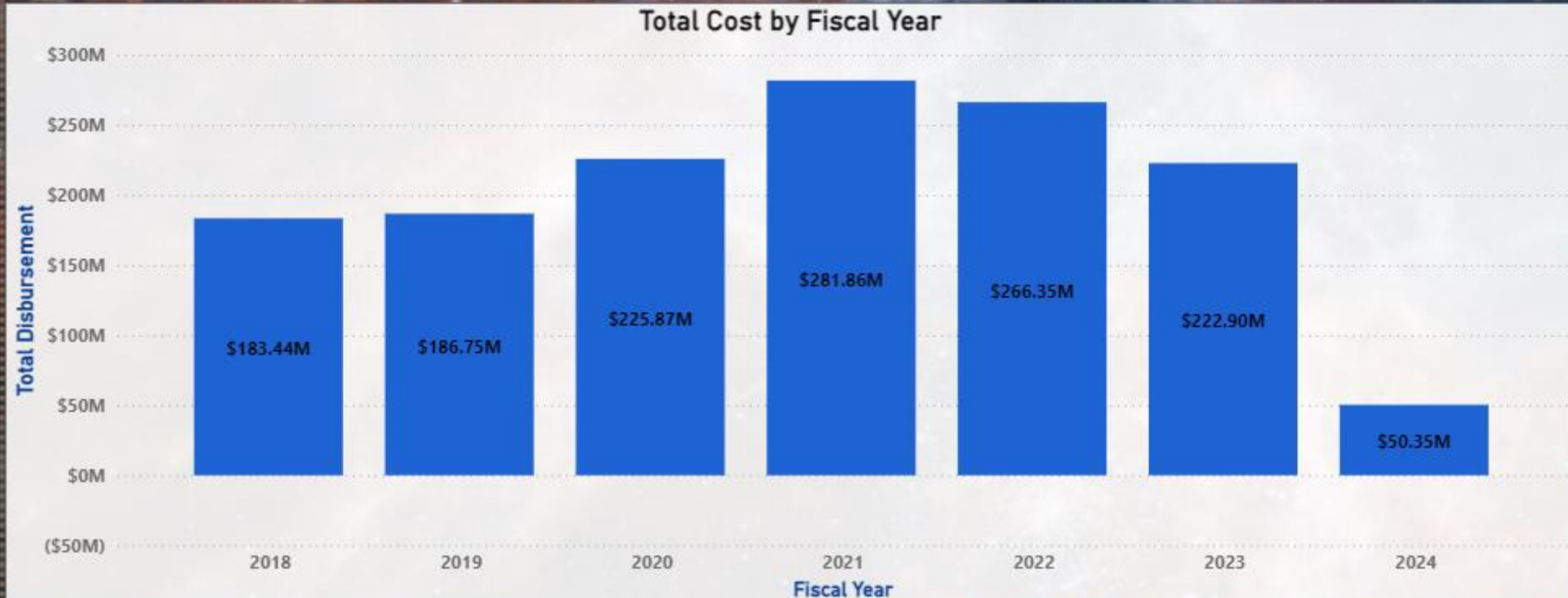
Disbursement Breakdown

| ARC | GRC | HQ | JSC | LaRC |
| Corporate/Agency | GSFC | JPL | KSC | MSFC |

Disbursement by Fiscal Year

Total Disbursement

- $519.26M (2021)
- $483.15M (2023)
- $405.84M (2020)
- $226.2M (2019)
- $214.59M (2024)
- $117.01M (2018)
- $102.51M (2017)
- $66.95M (2016)
- $63.63M (2015)
- $19.45M (2014)

Fiscal Year
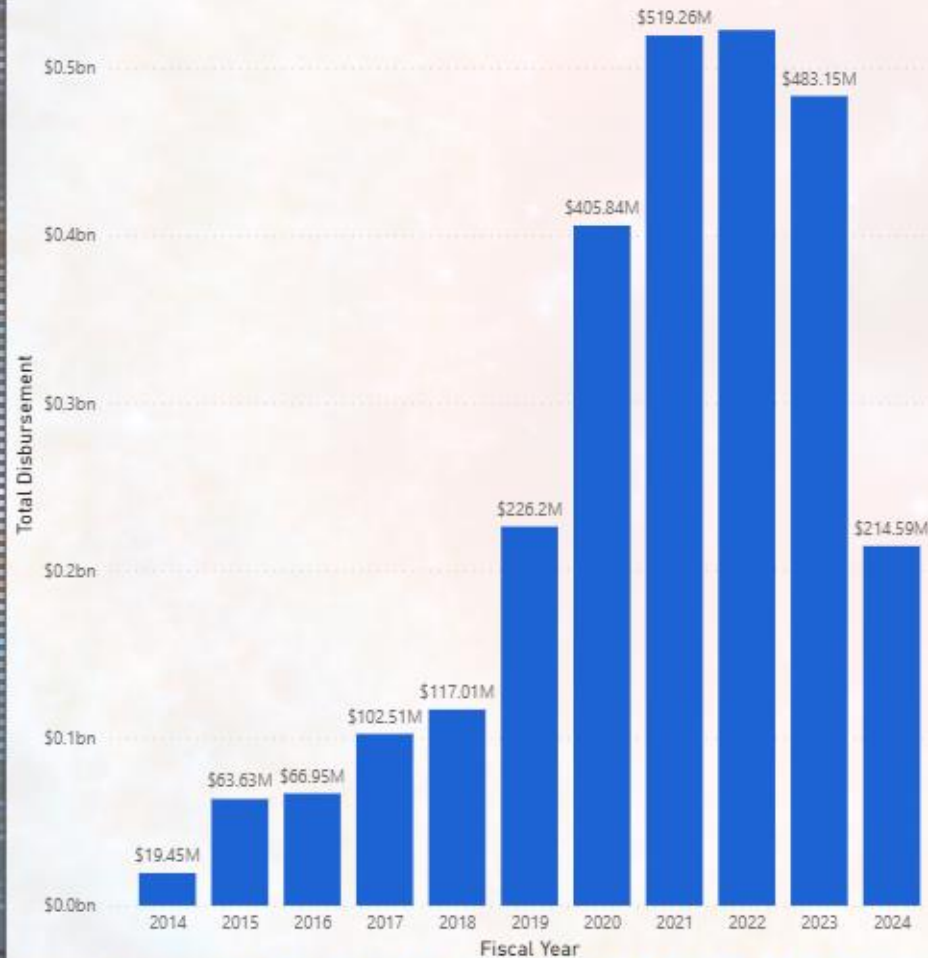
Disbursement by Funds Center

- $0.04bn (1.56%)
- $0.45bn (16.43%)
- $2.24bn (81.85%)

Funds Center
- GSFC
- JPL
- KSC
- HQ
- ARC
- LaRC
- GRC
- MSFC
- JSC
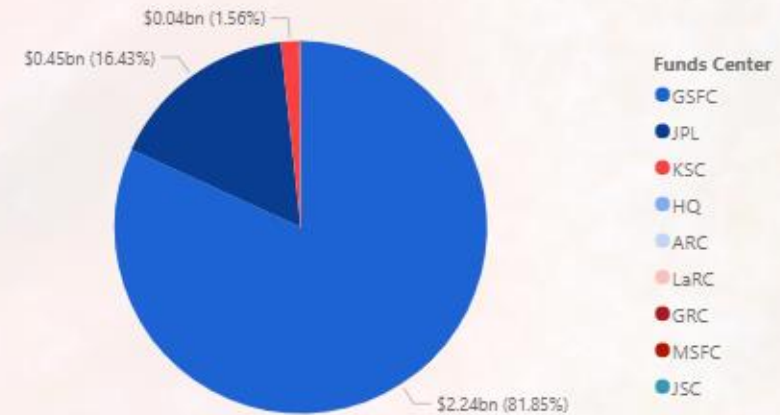
Disbursement by Work Breakdown Structure

Work Breakdown Structure

JPL-RST Coronagraph	$360.46M
GSFC-RST OTA Harris	$332.27M
GSFC-RST WOMA Phase	$287.98M
GSFC-RST STScI Scien	$92.13M
GSFC-RST Instrument	$80.93M
GSFC-RST Primary Str	$75.9M
GSFC-RST Spacecraft	$44.26M
KSC-RST LV Contract	$41.34M
JPL-Coronagraph Desi	$40.74M
GSFC-RST WFI Wide Fi	$38.77M
GSFC-WFIRST OTA Supp	$34.57M

Total Disbursement

39
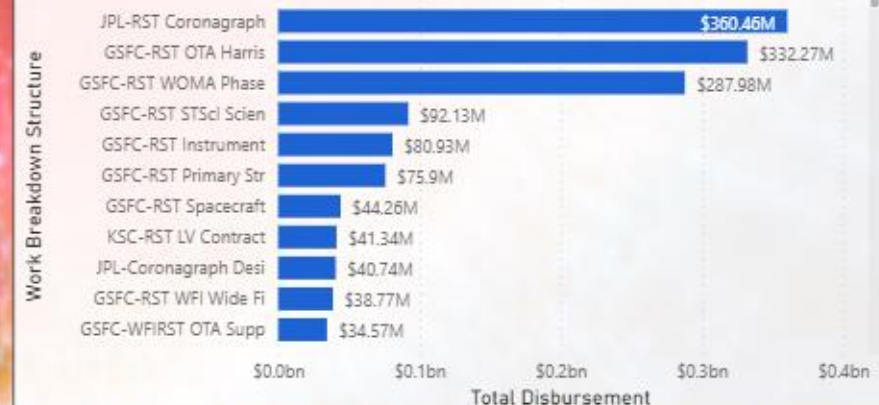
Cost & Disbursement Comparison
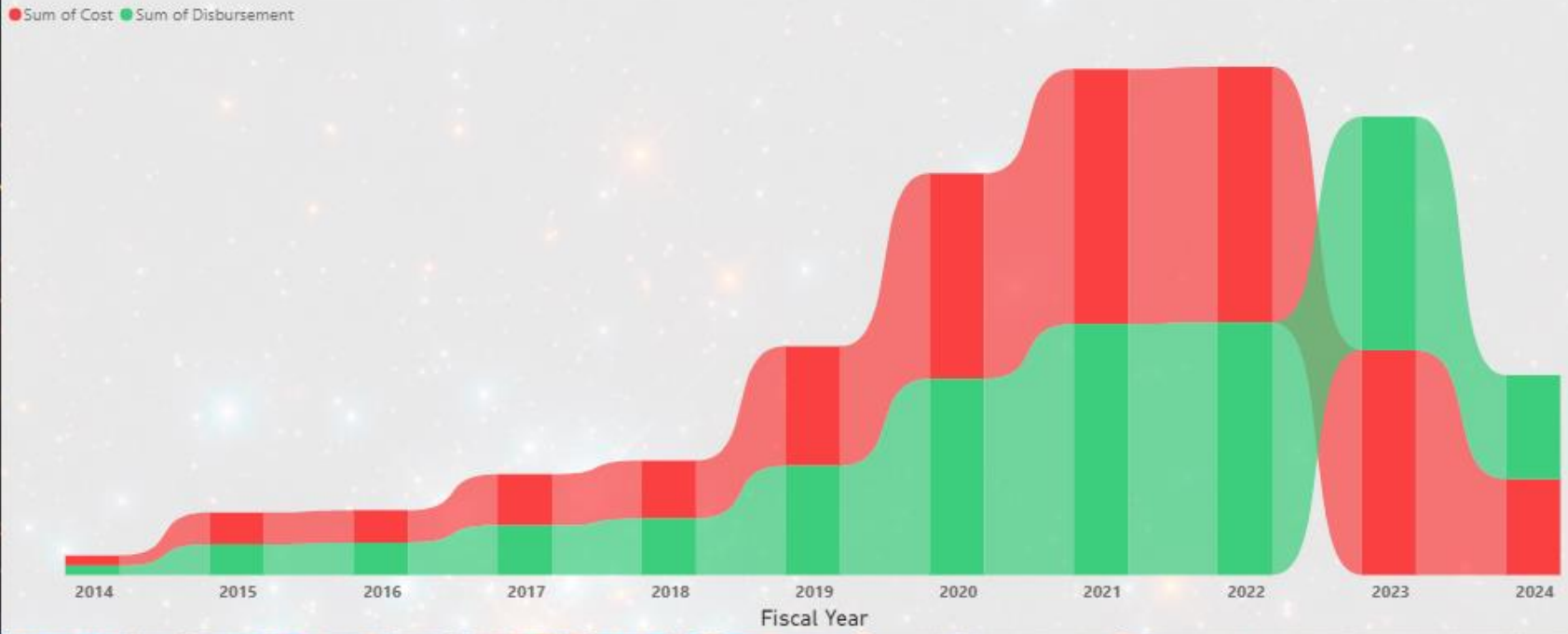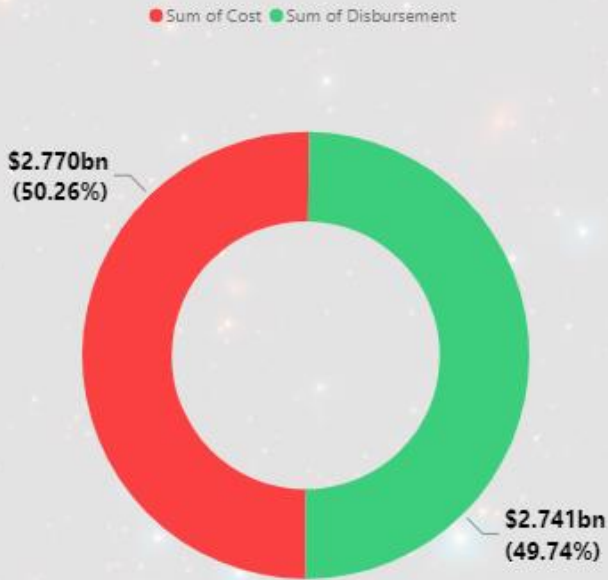
Behind the Numbers:

The goal of these charts is to try to gain a quick understanding about the health of the project. Generally, Cost & Disbursement should trend together.
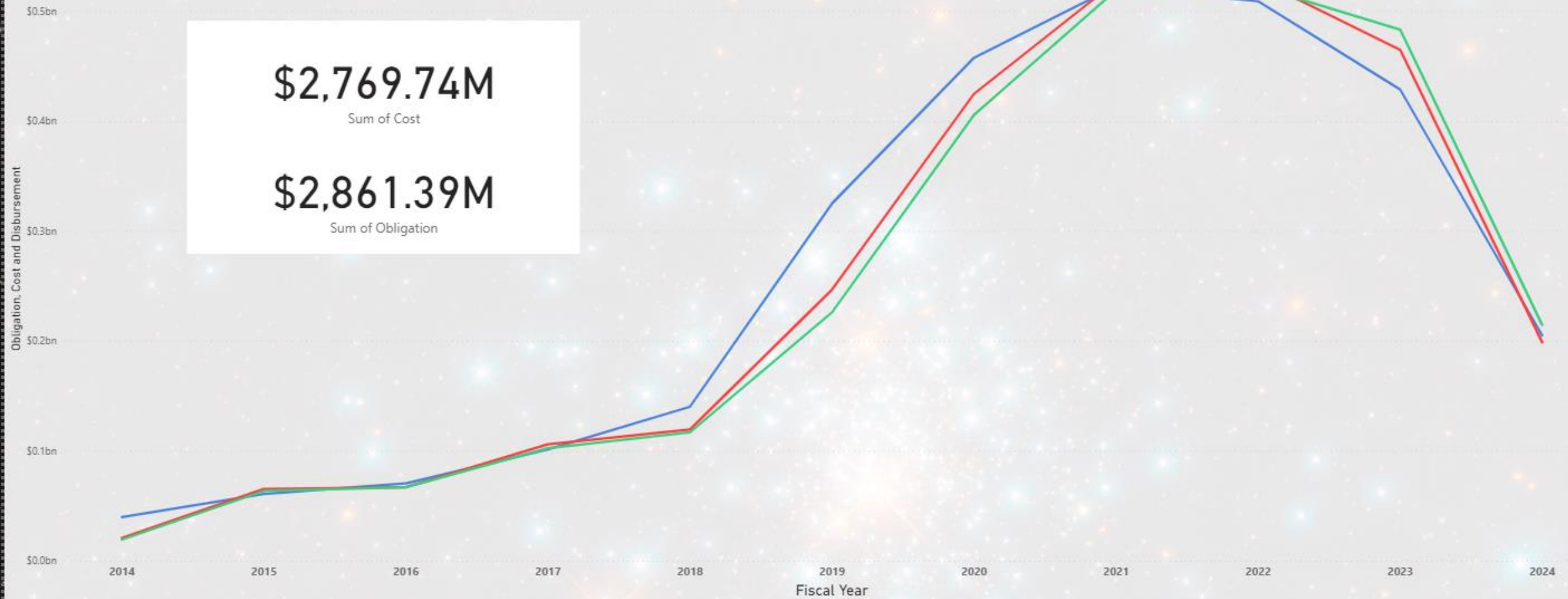
The *Gauge Chart* On the left of the page shows a quick comparison of cost v disbursement in totality. Generally, Costs should match Disbursements. Any variances should be reviewed.

The *Ribbon Chart* on the right of the page is used to indicate which data category has the highest rank (largest value). A ribbon illustrates how the value of a data category changes over a visualized time period. The ribbon connects the category values across the time continuum so you can easily see when there's an increase or decrease. When the ribbon is large, it means the category value is larger at that time than at other periods within the continuum. Generally would expect that cost would trend over disbursements for the entirety of the project. When there are variances in the chart the auditor should review the activity that occurred during the noted timeframe to better understand what happened. Variances should be reviewed for better understanding. They could be due to long lead items or accruing costs for items not invoiced among other reasons.
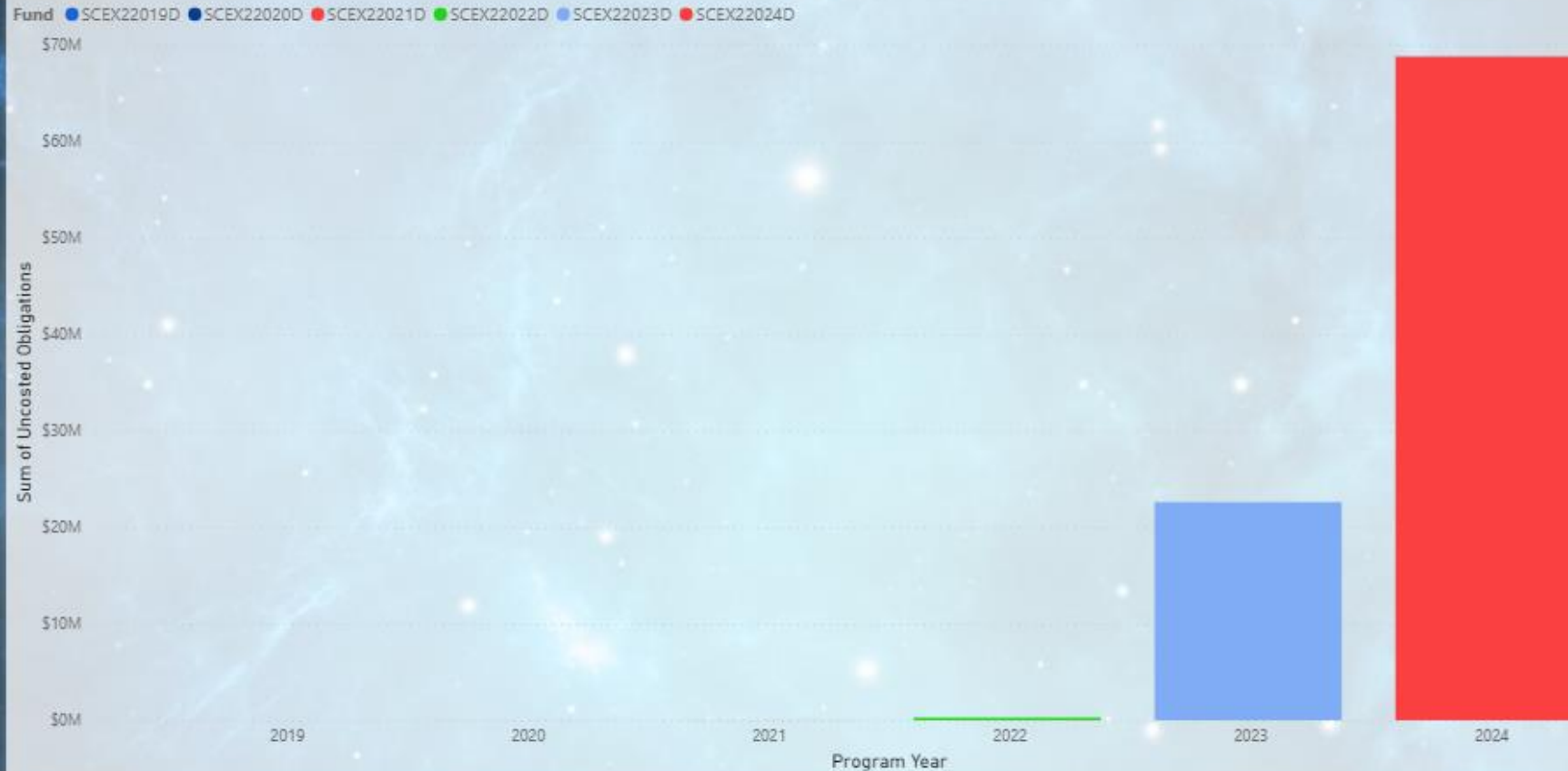
Uncosted Obligations

Fund ● SCEX22019D ● SCEX22020D ● SCEX22021D ● SCEX22022D ● SCEX22023D ● SCEX22024D

(Bar chart — Sum of Uncosted Obligations vs Program Year)

Y-axis: Sum of Uncosted Obligations ($0M – $70M)
X-axis: Program Year (2019, 2020, 2021, 2022, 2023, 2024)

Uncosted Obligation by WBS

Fund	WBS Element	WBS Element Text	Uncosted Obligation
SCEX22024D	134180.05.05.02	JPL-RST Coronagraph	$17,636,000
SCEX22024D	134180.08.02.01	KSC-RST LV Contract	$14,148,890
SCEX22024D	134180.05.03.03	GSFC-RST OTA Harris	$14,070,000
SCEX22023D	134180.05.03.03	GSFC-RST OTA Harris	$8,480,367
SCEX22024D	134180.05.04.04.06	GSFC-RST WOMA Phase	$7,213,584
SCEX22024D	134180.09.07.02	GSFC-RST STScI Scien	$2,197,686
SCEX22024D	134180.05.06.03	GSFC-RST Instrument	$1,960,105
SCEX22024D	134180.09.07.04	GSFC-RST IPAC Scienc	$1,834,429
SCEX22023D	134180.04.05.06.01.02	JPL-Dore/Weak Lensin	$1,816,611
SCEX22023D	134180.04.05.06.01.01	GSFC-Wang/Galaxy Red	$1,146,226
SCEX22023D	134180.04.05.06.01.03	GSFC-Gaudi/Exoplanet	$1,089,407

Behind the Numbers:

Uncosted Obligations represent funds made available to vendors (contractors) by the government to perform work for which costs have not been incurred (work which we have not received an invoice or 533M to reflect costs). If you are seeing an uptick in *Uncosted Obligations* it may indicate the contract is forward funded - whether intentionally or unintentionally (schedule slip). If there is a downtick in *Uncosted Obligations* it should be reviewed as it could represent inadequate funding.

Discuss *Program Year* and *Fund* as well as *WBS*.
How does this relate to the previous slide.