

# Data in Finance: Projecting Intra-Year Cash Flow using Data Analytics

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Associate Vice President, Finance & Personnel

David Kenny  
Director, Business Analytics



# Presenters



**Dylan Baker** is the Associate Vice President, Finance & Personnel in the Office of the Provost. He serves as the chief financial and budgetary advisor to the Provost, providing financial leadership in the areas of resource stewardship, enrollment management, strategic planning, and academic investment. Mr. Baker works closely with the Chief Financial Officer and College Budget Officers to continually improve campus resource management processes. He is widely regarded as an excellent problem solver who expertly applies his extensive knowledge of financial systems, budget models, and policy development to the achievement of diverse strategic goals.



**David Kenny** is the Director of Business Analytics in the Dashboard & Analytics unit. David has overseen the development of dozens of dashboards featuring key performance indicators sourced from core campus data sources. David works closely with Dylan Baker to improve financial forecasting through innovative projects such as the Cash Flow Projection Tool.



# Agenda

- University of Maryland Overview
  - Key attributes
  - Financial Model Overview
- Cash Flow Tool: Defining Scope, Design & Development
- Model Validation, Proofing & Results
- Data Visualization Demonstration



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# **Campus Overview**

# University of Maryland Overview

- Founded in **1856**
- **40,792** Student Enrollment (Fall 2022)
- **#19** Top Public National University (2022-23 U.S. News & World Report)
- **#13** Among Public Universities (2023 Forbes' list of America's Top Colleges)
- **12 Schools & Colleges**
- **Land Grant & AAU**
- **104** undergraduate majors, **115** master's programs and **84** doctoral programs
- **R1** institution designation with **\$1.1 billion** combined research expenditures with the University of Maryland, Baltimore



# System Office Relationship

- UMD is the flagship institution of the System Office (USM)
  - 12 Total Institutions
- UMD reserve requirement stipulated by USM
- Tuition Revenue:
  - Governor sets increases for Undergraduate / Graduate tuition rates in state budget process
  - UMD sets professional graduate program tuition rates
  - Board of Regents must approve complete set of rates





# Cash Flow Tool: Defining Scope, Design & Development

# Scope

- Academic Affairs focus
  - \$1.1B Unrestricted Budget
  - Includes Across 17 Divisions
  - Represents 2/3 of campus unrestricted activity

Division	*Unrestricted Budget %
D200000	15.83%
D300000	14.48%
D320000	10.87%
D290000	10.19%
D270000	9.56%
D250000	9.39%
D280000	7.71%
D310000	3.27%
D430000	3.23%
D330000	2.98%
D230000	2.93%
D350000	2.13%
D210000	2.05%
D370000	1.88%
D240000	1.45%
D260000	1.14%
D340000	0.93%
<b>Total</b>	<b>100%</b>





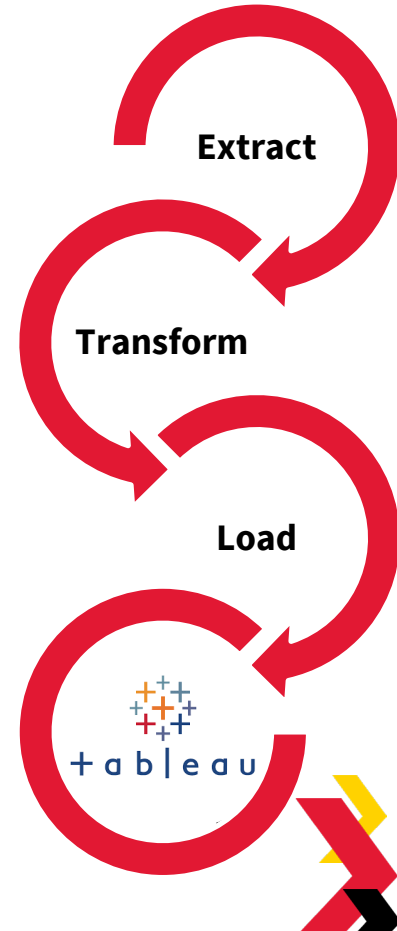
# Design

- Utilize mid-year actuals as projection basis
- Determine baseline assumptions
- Identify project timeline
- Evaluate and select data viz tool
- Consolidate several management reports in one view

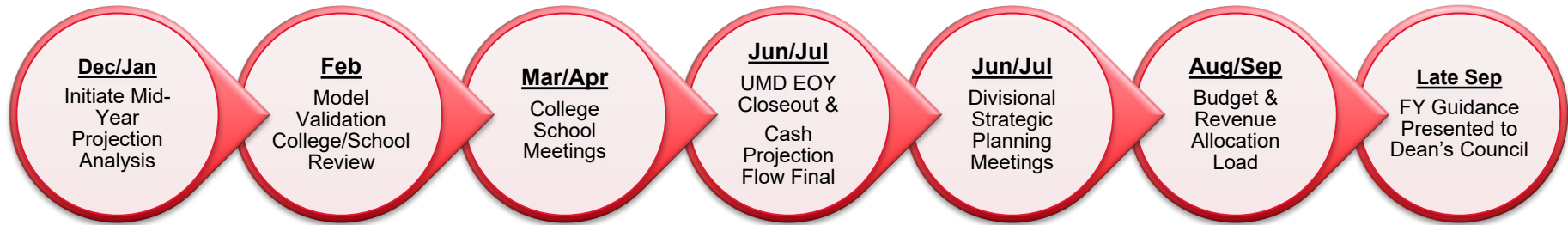


# Development

- Identify required data sources & attributes
- Design ETL tool
- Tableau exploration and worksheet/dashboard development
- Adhere to campus visualization requirements
- Integrate user security for validation and dissemination
- Develop proof of concept for initial validation of baseline assumptions
- Develop systematic, programmatic method to incorporate college transaction detail adjustments



# FY23 Cash Flow Projection Tool Timeline



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# **Model Validation, Proofing & Results**

# Model Validation

- **Internal Validation (Provost Office):**
  - Two intra FY updates (May and June) to proof mid-year projection vs most current actuals
- **External Validation (Colleges & Schools):**
  - Provost/College staff meetings in February & April.
    - February – Discuss application of projection guidance and necessary tweaks to model based on College-specific issues (tuition, fee charges, etc.)
    - April – Review projections and identify areas of budget improvement revealed through in-depth variance analysis.
  - Summer Strategic Planning Meetings - Cash flow model and related reports were incorporated into the Provost’s strategic meetings with the Deans.
  - Model results also fulfilled Budget Office projection request for FY23 year-end prep.



# Model Proofing

- Updated model to include EOY actuals.
- Utilized the mid-year dashboard as a “control”
- Developed a new dashboard view to compare mid-year projection to EOY actuals.
- Reviewed at across all levels:
  - College Level
  - Revenue vs Expense
  - Fund Type
  - Account & Transaction Code





# **Model Demonstration**

# Model Functionality Overview

- Filter on College
- Filter charts utilizing fund type
- Expand and isolate by Revenue or Expense type
- Identifying potential variances by type
- Utilizing the management report view
- Fund Balance trends by fund type





# Model Functionality Overview

1-SACUBO Mid-Year Projected ... | 2-SACUBO Mid-Year vs Curr YT... | 3-Mgmt Rpt Mid-Year vs CurrY... | 4-Mid-Year vs CurrYTD FY22vs... | 5-FY Fund Balance Trend | Report Description

## SACUBO MID-YEAR PROJECTED BALANCES DASHBOARD



SELECT DIVISION: All All Dept(s) FY2023 Mid-Year Projection by All Subfund(s)

- Sacubo Div
- (All)
  - SACUBODiv2
  - SACUBODiv2
  - SACUBODiv23
  - SACUBODiv24
  - SACUBODiv25
  - SACUBODiv26
  - SACUBODiv27
  - SACUBODiv28
  - SACUBODiv29
  - SACUBODiv30
  - SACUBODiv31
  - SACUBODiv32
  - SACUBODiv33
  - SACUBODiv34
  - SACUBODiv35
  - SACUBODiv37
  - SACUBODiv43

Filter on Division

Unrestricted Totals				
	Mid-Year Actuals	Mid-Year Projected Actuals	Budget vs Projected	
Revenue	(\$1,100,741,099)	(\$989,113,536)	(\$1,102,977,131)	\$2,236,033
Expense	\$1,100,741,100	\$507,920,315	\$1,070,285,021	\$30,456,079
<b>Grand Total</b>	<b>\$1</b>	<b>(\$481,193,221)</b>	<b>(\$32,692,110)</b>	<b>\$32,692,111</b>

Fund Balance Projection

2023 Projected Fund Balance: \$538.50M

Difference in Projected Fund Balance: \$32.69M

% of Total Projected Fund Balance Change: 6.46%

FY2023 Projected Fringe Benefits

Mid-Year Projected Actuals: \$186,629,666

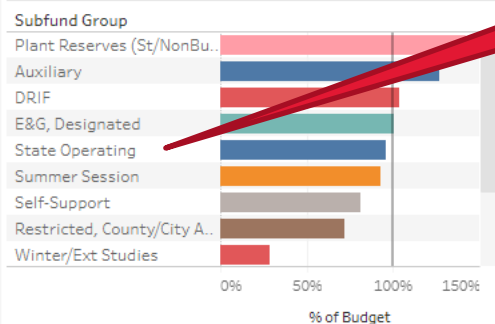
Revised Budget

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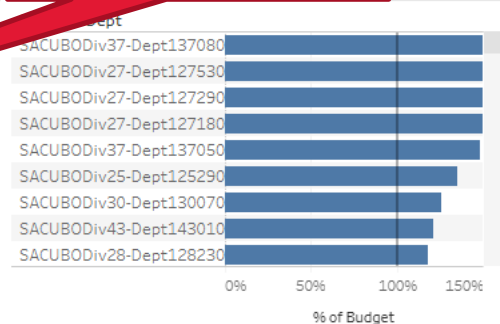
Filter on Department

Filter on Fund Type

FY2023 Expense Budget vs Proj Actuals - Variance by Subfund



FY2023 Expense Budget vs Proj Actuals - Variance by Dept



FY2022 & 2023 Department Projected Fund Balances

SACUBO Dept	2022	2023
SACUBODiv20-Dept120010	\$124,282,718	\$137,938,765
SACUBODiv20-Dept120030	\$109,708	\$215,783
SACUBODiv20-Dept120050	\$1,419,846	\$5,000,422
SACUBODiv20-Dept120090	\$2,467,352	\$2,903,117
SACUBODiv20-Dept120130	\$223,187	\$232,792
SACUBODiv20-Dept120170	\$6,535,068	\$7,736,628
SACUBODiv20-Dept120190	\$2,028,705	(\$6,731,654)
SACUBODiv20-Dept120220	\$0	(\$146,070)
SACUBODiv20-Dept120230	\$1,291,999	\$781,483
SACUBODiv20-Dept120240	\$2,407,227	\$4,558,882
SACUBODiv20-Dept120260	\$861,775	\$925,865



# Model Functionality

1-SACUBO Mid-Year Projected ... 2-SACUBO Mid-Year vs Curr YT... 3-Mgmt Rpt Mid-Year vs CurrY... 4-Mid-Year vs CurrYTD FY22vs... 5-FY Fund Balance Trend Report Description

## SACUBO MID-YEAR PROJECTED BALANCES DASHBOARD



SELECT DIVISION:

SACUBODiv32 SACUBODiv32-Dept132270 Dept(s) FY2023 Mid-Year Projection by All Subfund(s)

Sacubo Div  
 (All)  
 SACUBODiv32

### FY2023 Budget vs Project Actuals Unrestricted Totals

Income Stmt	Level2	Object Code	Account Name	Revised Budget	Mid-Year Actuals	Mid-Year Projected..	Budget vs Proj..
			1123390-OAE..	\$0	\$0	\$0	\$0
			1123380-OAE..	\$0	\$0	\$0	\$0
			1123310-PRO..	\$0	\$0	\$0	\$0
	Tuition	0118-EMBA and non-Fin MS tuition	2957316-On C..	#####	#####	#####	#####
			2957526-Soft..	\$0	(\$316,835)	(\$316,835)	\$16,835
			2957668-Rob..	\$0	(\$72,381)	(\$72,381)	\$72,381
			2957527-Syst..	\$0	(\$72,381)	(\$72,381)	\$72,381
			1123540-Cyb..	\$0	\$0	\$0	\$0

### Fund Balance Projection

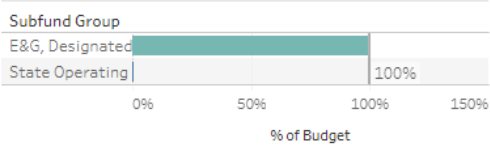
2023 Projected Fund Balance: **\$8.45M**  
 Difference in Projected Fund Balance: **\$2.03M**

### FY2023 Projected Fringe Benefits

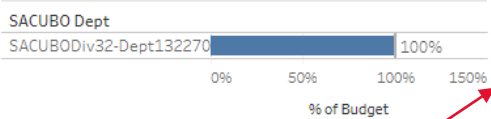
Mid-Year Projected Actuals: \$543,577  
 Revised Budget: \$681,281

Income Stmt: Revenue  
 Account Name: 2957316-On Campus Programs  
 Object Code: 0118-EMBA and non-Fin MS tuition  
 Level2: Tuition  
 Budget vs Projected: **\$1,825,742**

### FY2023 Expense Budget vs Proj Actuals - Variance by Subfund



### FY2023 Expense Budget vs Proj Actuals by Dept



SACUBO Dept	2022	2023
SACUBODiv32-Dept132010	\$18,704,759	\$21,906,890
SACUBODiv32-Dept132270	\$6,425,969	\$8,454,900
SACUBODiv32-Dept132110	\$4,705,735	\$6,326,795
SACUBODiv32-Dept132230	\$6,429,280	\$6,134,410
SACUBODiv32-Dept132250	\$3,204,209	\$4,324,239
SACUBODiv32-Dept132090	\$2,704,540	\$3,467,193
SACUBODiv32-Dept132170	\$2,466,090	\$2,006,574
SACUBODiv32-Dept132070	\$2,100,939	\$1,859,114
SACUBODiv32-Dept132130	\$245,271	\$547,896
SACUBODiv32-Dept132150	\$13,250	\$13,246
SACUBODiv32-Dept132190	(\$1,093,258)	(\$324,688)



# FY23 Model Results

Positive outcome:

- Net 1.08% variance of total fund balance and 0.53% vs budget



Room for improvement:

- Variances remained at lower cost-detail levels





# Check Out Code

- 9:50am - 10:40am – 337A
- 10:50am - 11:40am – 338A

