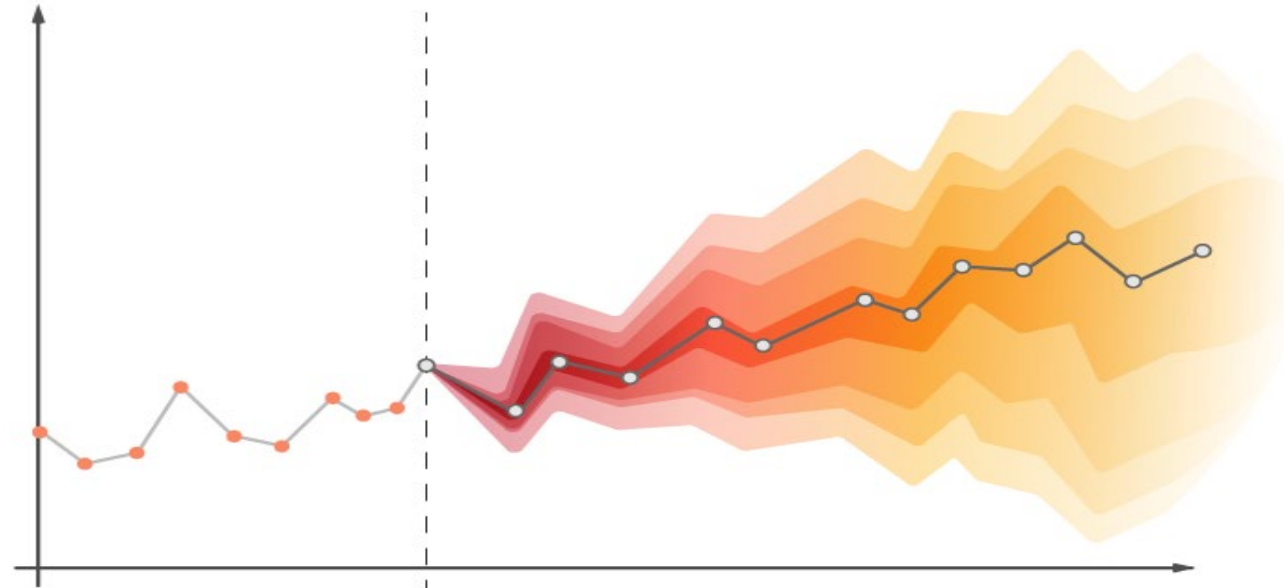


Data Visualization Enhancement of Enrollment and Tuition Revenue Forecasting



John Stanley
Director of Institutional Research
University of Hawai'i–West O'ahu

David Mongold
Institutional Analyst Emeritus
University of Hawai'i System

Presentation Outline

- Review enrollment forecasting method and processes
- Forecasting tuition revenue
- Sample research brief
- Interactive dashboard tool used to:
 - Visualize historical and projected data
 - Scenario-out changes to parameters
- Lessons Learned

A Few Notes About Enrollment Forecasting

- Choosing an appropriate forecasting method
- Enrollment forecast is usually Fall Semester only
- Convert Fall Semester enrollment to annual numbers by adding in Spring term (and Summer if relevant)
- Ensure to include all variables needed for the tuition forecast:
 - Tuition status – resident / non-resident; education level;
 - Student type – first-time; transfer; continuing;
 - Programs; Early Admits (high school students taking college courses)
 - Other, as needed

Analytical Year Full-Time Equivalent Enrollment

	Total	Fall	Spring	AYFTE
Full-Time Headcount	3,348	1,750	1,598	2,240.29
Resident	2,987	1,553	1,434	2,016.79
Exempted	306	168	138	188.58
Non-Resident	27	12	15	16.96
150% Resident	28	17	11	17.96
Part-Time SSH	13,591	7,076	6,515	
Resident	12,559	6,530	6,029	
Exempted	854	461	393	
Non-Resident	83	27	56	
150% Resident	95	58	37	

$$\text{AYFTE} = (\text{Full-Time Headcount} + \text{Part-Time SSH} / 12) / 2$$

Brief History of the Tuition Revenue Forecast

- Tuition Reconciliation:
 - Originally developed for the external auditors
 - Used to review tuition revenues received
- Tuition Forecast:
 - Tuition Reconciliation linked to Enrollment Forecast
 - Used to set policy on scholarships funded by tuition revenue
 - Later used in planning by Budget Office and other UH units
- Dashboarding:
 - Interactive data presentation using Power BI
 - Used to investigate (via scenarios) policy alternatives

Data Sources for Tuition Reconciliation Process

- Student Registration System:
 - Unit record level data by courses taken
 - Fields of interest – tuition status; programs; education level; tuition exempted courses; ethnicity; gender; etc.
- Bursars Office – unit record level data on tuition assessed – used to validate estimated tuition revenue
- Budget Office data on actual tuition revenue received for campus – used to align estimate to actual tuition revenue received

Steps in the Tuition Reconciliation Process

- Calculate expected tuition revenue per student – both fall and spring terms
- Compare calculation to tuition data pulled from accounting system
- Adjust calculation to account for systematic variance
- Compare calculation to Budget Office data on revenue received
- Make adjustments as needed to align estimate with BO data
- Calculate 3 to 5 years of historical data

Example – Estimated Tuition Revenue

Student ID	Tuition Status	Course Reference Number	Credits Taken	Tuition Exempted Course	Program – Early Admit	Course Withdrawal	Tuition Rate
1457312	Resident	C5486	3.0	N	N	N	110
1457312	Resident	C6983	1.0	Y	N	N	40
1457312	Resident	D5482	3.0	N	N	Y	110
1457312	Resident	C5693	3.0	N	N	N	110
1457312	Resident	C5712	3.0	N	N	N	110
1457312	Resident	C6212	3.0	N	N	N	110
1458955	Non-Resident	C5486	3.0	N	N	N	220
1458955	Non-Resident	D5482	3.0	N	N	N	220
1469783	WUE	C5486	3.0	N	N	N	165
1469783	WUE	D5482	3.0	N	N	N	165

Example – Comparison to Bursar’s Data

Filter	Value
Tuition Exempted Course	N
Course Withdrawal	N
Early Admit	N

Student ID	Tuition Status	Total Credits Taken	Tuition Rate	Calculated Tuition	Bursar’s Data	Variance
1457312	Resident	14.0	110	1320	1320	0
1458955	Non-Resident	6.0	220	1320	660	660
1469783	WUE	6.0	165	990	990	0
1476336	Resident	9.0	110	990	990	0
1485255	Resident	9.0	110	990	990	0
1506793	Resident	12.0	110	1320	1320	0
1512669	Non-Resident	15.0	220	2640	2420	220
1512763	WUE	8.0	165	1320	1320	0

Per Credit Hour Tuition Schedule

	Historical				Projected			
Academic Year	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Resident	\$306	\$306	\$306	\$306	\$306	\$306	\$312	\$318
Non-Resident	\$846	\$846	\$846	\$846	\$846	\$846	\$852	\$858
150% Resident	\$459	\$459	\$459	\$459	\$459	\$459	\$468	\$477

Calculation of Tuition Revenue Forecast

	Historical				Projected			
Academic Year	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Analytical FTE	2,180.87	2,240.29	2,113.17	1,995.15	2,023.67	2,063.45	2,102.34	1,995.15
Resident	1,940.38	2,016.79	1,894.58	1,799.77	1,815.06	1,851.25	1,886.55	1,788.77
All Non-Resident	240.50	223.50	218.58	206.37	208.61	212.20	215.79	206.37
Estimated Tuition	\$16,324,200	\$16,738,425	\$15,921,594	\$15,036,969	\$15,252,056	\$15,545,679	\$16,146,659	\$15,613,758
Resident	\$14,250,114	\$14,811,318	\$13,913,820	\$13,136,762	\$13,329,817	\$13,595,561	\$14,126,499	\$13,651,930
All Non-Resident	\$2,074,086	\$1,927,107	\$2,007,774	\$1,900,206	\$1,922,239	\$1,950,118	\$2,020,160	\$1,961,828
	Budget Office Historical Data				Final Tuition Projection			
Budget Office Data	\$16,672,620	\$17,073,514	\$16,202,526	\$15,331,904	\$15,551,286	\$15,850,802	\$16,463,656	\$15,920,171
Resident	\$14,582,176	\$15,134,014	\$14,182,206	\$13,418,672	\$13,615,870	\$13,887,316	\$14,429,647	\$13,944,894
All Non-Resident	\$2,090,444	\$1,939,500	\$2,020,320	\$1,913,233	\$1,935,416	\$1,963,486	\$2,034,009	\$1,975,277
Budget / Estimate	Budget Data as a Percentage of the Estimate				Adjustment Factors			
Resident	102.3%	102.2%	101.9%	102.1%	102.1%	102.1%	102.1%	102.1%
All Non-Resident	100.8%	100.6%	100.6%	100.7%	100.7%	100.7%	100.7%	100.7%

Tuition Revenue Summary

Academic Year	Historical			Projected			
	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Tuition Revenue Assessed	\$17,073,514	\$16,202,526	\$15,331,904	\$15,551,286	\$15,850,805	\$16,463,656	\$15,950,191
Tuition Waivers	\$141,119	\$175,660	\$166,221	\$168,600	\$171,841	\$178,491	\$172,599
Waivers as a % of Tuition	0.8%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Tuition Net of Waivers	\$16,932,395	\$16,026,866	\$15,165,683	\$15,382,686	\$15,678,956	\$16,285,165	\$15,747,572
Fee Revenue	\$49,145	\$70,001	\$66,106	\$66,077	\$68,414	\$69,719	\$66,106
TFSF Revenue	\$16,981,540	\$16,096,867	\$15,231,789	\$15,449,763	\$15,747,370	\$16,354,884	\$15,813,678
% Change from Prior Year	2.8%	-5.2%	-5.4%	1.4%	1.9%	3.9%	-3.3%
Tuition Funded Scholarships	\$1,793,855	\$2,100,349	\$1,653,969	\$1,677,639	\$1,709,955	\$,775,923	\$1,717,155
As a % of TFSF Revenue	10.6%	13.0%	10.9%	10.9%	10.9%	10.9%	10.9%
Net Tuition Revenue	\$15,187,685	\$13,996,518	\$13,577,819	\$13,772,125	\$14,037,415	\$14,578,961	\$14,096,523

- Enrollment and tuition revenue forecasts are published in November for the following academic year:

<https://go.hawaii.edu/BYb>

- Challenge: Forecast model holds input variables constant at time of publication.
- Solution: Our data visualization offers the ability to vary inputs to the forecast model as daily registration data loads in real-time.

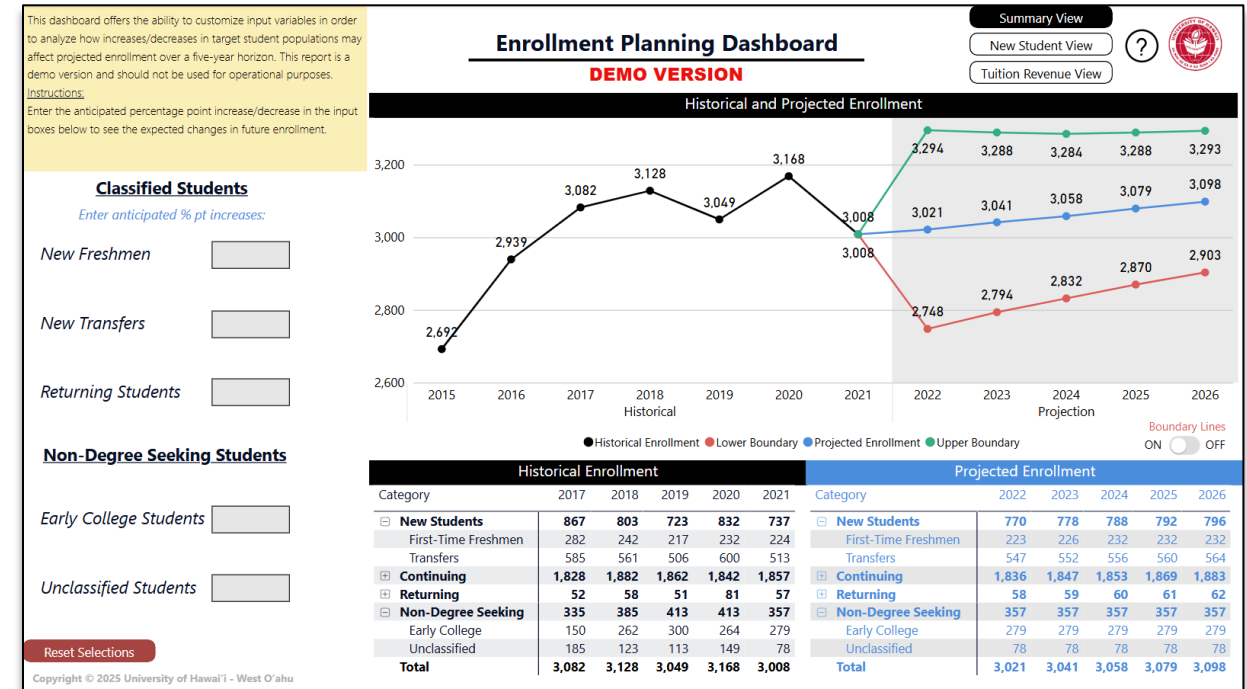
PROJECTED TRENDS IN ENROLLMENT
UNIVERSITY OF HAWAI'I SYSTEM
FALL 2023 TO FALL 2028

Institutional Research, Analysis and Planning Office
University of Hawai'i System
December 2022

Benefits of a Data Visualization Tool

- Can be used as a planning tool for:
 - Measuring impact of varying enrollment scenarios
 - Observe effects of varying student mix by residency
 - Contingency planning
 - Setting tuition schedule
- View the dashboard here:

<https://go.hawaii.edu/bCp>



This dashboard offers the ability to customize input variables in order to analyze how increases/decreases in target student populations may affect projected enrollment over a five-year horizon. This report is a demo version and should not be used for operational purposes.

Instructions:
Enter the anticipated percentage point increase/decrease in the input boxes below to see the expected changes in future enrollment.

Enrollment Planning Dashboard

DEMO VERSION

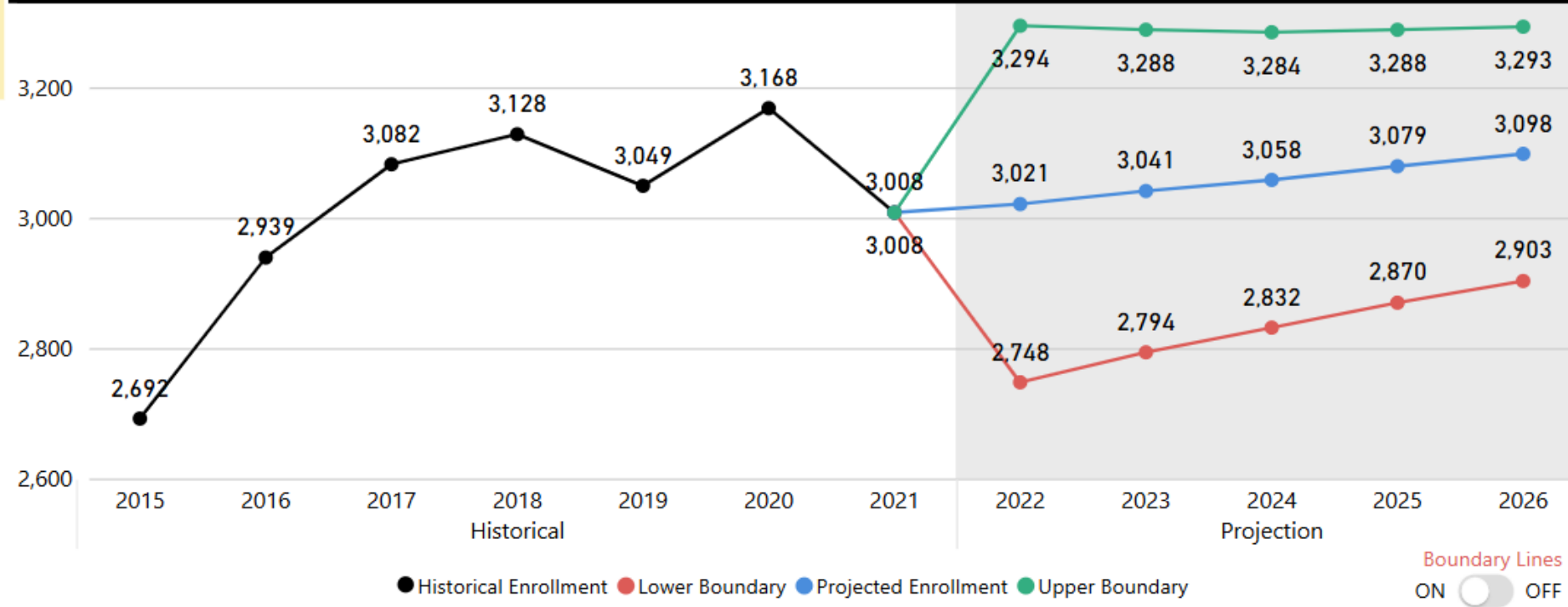
Summary View

New Student View

Tuition Revenue View



Historical and Projected Enrollment



Boundary Lines
ON OFF

Classified Students

Enter anticipated % pt increases:

New Freshmen

New Transfers

Returning Students

Non-Degree Seeking Students

Early College Students

Unclassified Students

Reset Selections

Historical Enrollment						Projected Enrollment					
Category	2017	2018	2019	2020	2021	Category	2022	2023	2024	2025	2026
<input type="checkbox"/> New Students	867	803	723	832	737	<input type="checkbox"/> New Students	770	778	788	792	796
First-Time Freshmen	282	242	217	232	224	First-Time Freshmen	223	226	232	232	232
Transfers	585	561	506	600	513	Transfers	547	552	556	560	564
<input checked="" type="checkbox"/> Continuing	1,828	1,882	1,862	1,842	1,857	<input checked="" type="checkbox"/> Continuing	1,836	1,847	1,853	1,869	1,883
<input checked="" type="checkbox"/> Returning	52	58	51	81	57	<input checked="" type="checkbox"/> Returning	58	59	60	61	62
<input type="checkbox"/> Non-Degree Seeking	335	385	413	413	357	<input type="checkbox"/> Non-Degree Seeking	357	357	357	357	357
Early College	150	262	300	264	279	Early College	279	279	279	279	279
Unclassified	185	123	113	149	78	Unclassified	78	78	78	78	78
Total	3,082	3,128	3,049	3,168	3,008	Total	3,021	3,041	3,058	3,079	3,098

This dashboard offers the ability to customize input variables in order to analyze how increases/decreases in target student populations may affect projected enrollment over a five-year horizon. This report is a demo version and should not be used for operational purposes.

Instructions:

Enter the anticipated percentage point increase/decrease in the input boxes below to see the expected changes in future enrollment.

Classified Students

Enter anticipated % pt increases:

New Freshmen

New Transfers

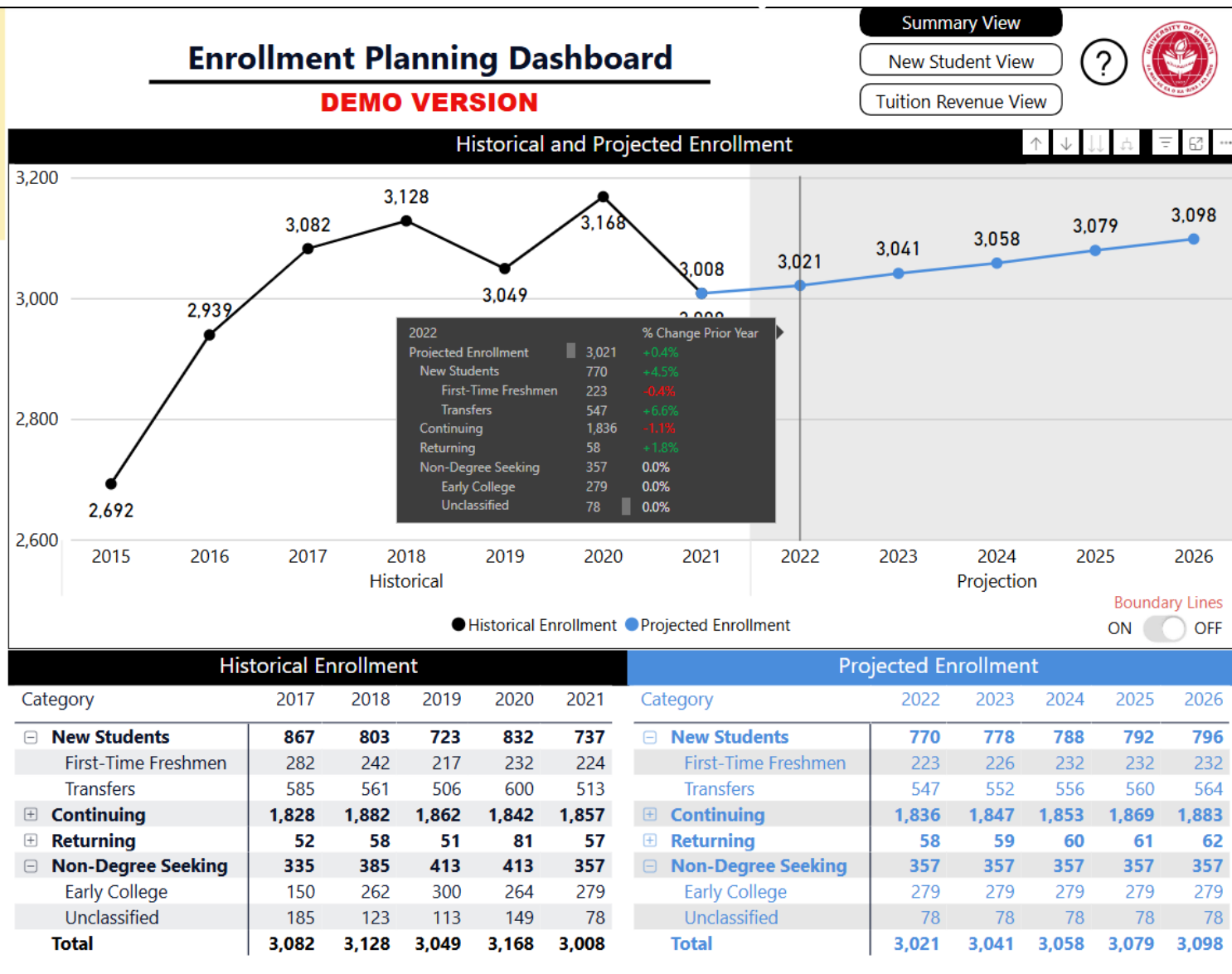
Returning Students

Non-Degree Seeking Students

Early College Students

Unclassified Students

Reset Selections



New Student View

New Freshmen

Leeward

James Campbell High School

Kapolei High School

Nanakuli High Intermediate School

Pearl City High School

Waianae High School

Waipahu High School

Central

Leilehua High School

Mililani High School

Honolulu

W R Farrington High School

[Reset Selections](#)

New Transfers

UH Community Colleges

Hawaii CC

Honolulu CC

Kapiolani CC

Kauai CC

Leeward CC

Maui CC

Windward CC

Enrollment Planning Dashboard

DEMO VERSION

Summary View

Tuition Revenue View

Historical and Projected Enrollment

Year	Enrollment
2015	2,692
2016	2,939
2017	3,082
2018	3,128
2019	3,049
2020	3,168
2021	3,008
2022	3,021
2023	3,041
2024	3,058
2025	3,079
2026	3,098

● Historical Enrollment ● Projected Enrollment

Boundary Lines ON OFF

Historical Enrollment					
Category	2017	2018	2019	2020	2021
⊖ New Students	867	803	723	832	737
⊕ First-Time Freshmen	282	242	217	232	224
⊕ Transfers	585	561	506	600	513
⊕ Continuing	1,828	1,882	1,862	1,842	1,857
⊕ Returning	52	58	51	81	57
⊖ Non-Degree Seeking	335	385	413	413	357
⊕ Early College	150	262	300	264	279
⊕ Unclassified	185	123	113	149	78
Total	3,082	3,128	3,049	3,168	3,008

Projected Enrollment					
Category	2022	2023	2024	2025	2026
⊖ New Students	770	778	788	792	796
⊕ First-Time Freshmen	223	226	232	232	232
⊕ Transfers	547	552	556	560	564
⊕ Continuing	1,836	1,847	1,853	1,869	1,883
⊕ Returning	58	59	60	61	62
⊖ Non-Degree Seeking	357	357	357	357	357
⊕ Early College	279	279	279	279	279
⊕ Unclassified	78	78	78	78	78
Total	3,021	3,041	3,058	3,079	3,098

Tuition Revenue View w/ Parameter Boxes

Instructions: Enter the anticipated percentage point increase/decrease in the input boxes below to see the expected changes in future tuition revenues. This report is a demo version and should not be used for operational purposes.

Student Headcount by Residency

Resident

Non-Resident

Exempted

150% Resident

Reset Selections

Tuition per Credit Hour

Resident

Non-Resident

Exempted

150% Resident

Enrollment Planning Dashboard

DEMO VERSION

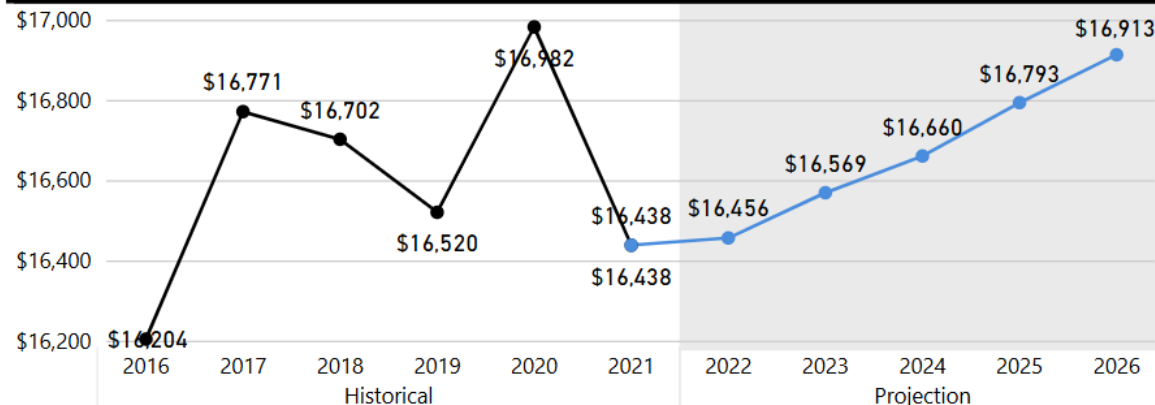
Summary View

New Student View

Tuition Revenue View



Historical and Projected Tuition Net of Waivers + Fees (TFSF Revenue) (\$1,000's)



Historical Enrollment and Tuition and Fee Revenues (\$1,000's)

Category	2017	2018	2019	2020	2021
Student Headcount by Residency	3,082	3,128	3,049	3,168	3,008
Resident	2,736	2,809	2,760	2,867	2,742
Non-Resident	65	66	33	42	36
Exempted	247	227	227	235	207
150% Resident	34	26	29	24	23

Tuition per Credit Hour

Category	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Tuition per Credit Hour										
Resident	300	303	306	306	306	306	306	306	306	306
Non-Resident	840	843	846	846	846	846	846	846	846	846
Exempted	300	303	306	306	306	306	306	306	306	306
150% Resident	450	455	459	459	459	459	459	459	459	459

Projected Enrollment and Tuition and Fee Revenues (\$1,000's)

Category	2022	2023	2024	2025	2026
Student Headcount by Residency	3,021	3,041	3,058	3,079	3,098
Resident	2,751	2,770	2,786	2,805	2,823
Non-Resident	37	37	37	37	37
Exempted	209	210	211	213	214
150% Resident	24	24	24	24	24
Tuition Revenue Assessed	16,545	16,659	16,751	16,884	17,004
Resident	14,672	14,778	14,855	14,979	15,081
Non-Resident	325	325	333	333	333
Exempted	1,355	1,362	1,368	1,378	1,391
150% Resident	194	194	194	194	198
Tuition Waivers	137	138	138	140	141
Tuition Revenue Net of Waivers	16,408	16,521	16,612	16,745	16,864
Fee Revenue	48	48	48	49	49
Tuition Net of Waivers + Fees (TFSF Revenue)	16,456	16,569	16,660	16,793	16,913
Tuition Scholarships	1,787	1,799	1,809	1,824	1,837

- The role of institutional research
 - Provide analytical support
 - Formative collaboration with campus groups
 - Documentation (research brief)
 - Leverage BI to enhance your product



John Stanley
Director of Institutional Research
University of Hawai'i – West O'ahu
jstanley@hawaii.edu



David Mongold
Institutional Analyst Emeritus
University of Hawai'i System
mongold@hawaii.edu

Scan the QR code to
complete the session
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Texas Association for Institutional Research

Annual Conference: February 25-28, 2025
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