Budget Planning Council

# Central Revenue Models: Athens UG Tuition Model & SSI

December 4, 2023

The purpose of this presentation is to provide details of the model used to project tuition revenue. This is a complicated calculation with the Guarantee structure since at any one point in time you have different numbers of students in different cohorts each paying a different tuition rate. A model for the projection of SSI is even more difficult to construct given that funding is based on the interaction of trends in enrollment and degrees across all 13 universities in the state.

Athens Main UG Tuition Model

- Methodology
- Data Sources: Historical Actuals & Projections
- Current Athens Main UG Tuition
- Drivers of Annual Change
  - Rate Increases
  - Incoming Cohort
  - Persistence

FY24-28 Athens Tuition Model: Methodology

Athens' UG Headcounts ✕ FT Tuition Rate = Athens' UG Traditional Tuition Revenue
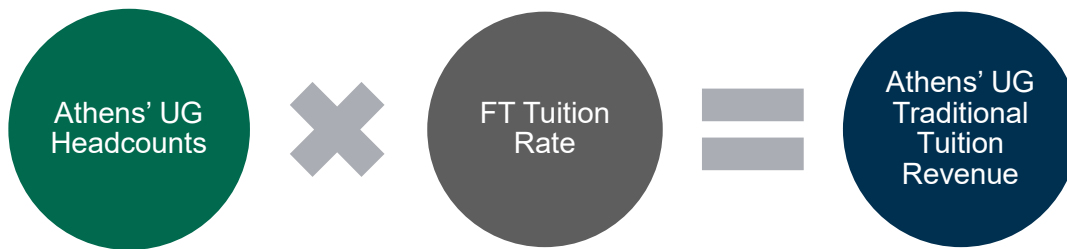
Factors to Consider:

- Student Headcounts, by Tuition Guarantee cohorts (Tracked: 6 YRS)
- Tuition Rates, by student cohort
- Not all students are full-time (Model Adjusts for FT/PT Factor)
- Summer Term: Less predictable

The number of students that start in a cohort changes every term as not all of them continue to enroll or graduate. With each cohort having a different tuition rate, the number of students in each cohort must be multiplied by a different tuition rate to determine the amount of revenue for that subset of students. There are also a certain percentage of students that are not full-time so there is a factor to reduce the revenue by a certain percentage for that. In addition, there are a percentage of students that take courses in summer so there is a projection of additional revenue for summer term though that revenue is less predictable.

Athens Tuition Model: Components

- Incoming Students
  - New Freshman
  - Transfers
- Persistence Rates
  - How incoming students translate into continuing students
  - Fall to Spring and Year to Year
- Annual Total Enrollment by cohort based on persistence
- Cohort Tuition Rates – Existing and Future Assumptions

There are additional complexities involved in determining the revenue for a group of students. While we often quantify the size of an incoming cohort of students, there are subsets within that cohort. First, some of the students in that number are new freshman while others are transfers.

Transfer students come in with completed credit so we cannot assume that they will be producing revenue for at least four years like we would predict for new freshman.

Although a certain number of students begin the freshman year, that number decreases every term as students drop out or graduate. In addition, different cohorts of students have different patterns of persistence – for example cohorts enrolled during COVID.

Athens UG Cohort Tuition Rates

Athens Undergraduate Fees (Per Semester - Full Time) Assumptions, OHIO Guarantee Students

Fall Academic Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Cohort Instructional Fee	5.10%	1.70%	1.30%	1.30%	3.50%	0.00%	1.80%	4.00%	0.00%	0.00%	4.00%	4.00%	3.50%	3.50%
Cohort General Fee	5.10%	1.70%	1.30%	1.30%	3.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cohort Non-resident Surcharge	$ -	$ 250	$ -	$ -	$ 165	$ -	$ 88	$ 199	$ 199	$ 199	$ 207	$ 215	$ 196	$ 203

Fall Academic Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Cohort Instructional Fee	5,114	5,201	5,268	5,336	5,522	5,522	5,612	5,856	5,856	5,856	6,123	6,400	6,652	6,885
Cohort General Fee	660	671	680	688	712	712	712	712	712	712	712	712	712	712
Cohort Non-resident Surcharge	4,482	4,732	4,732	4,732	4,897	4,897	4,985	5,184	5,184	5,184	5,391	5,606	5,802	6,005
Career Fee					72	72	96	108	108	108	108	108	108	108

- Top two rows are the rate increases each year: historical actual and projected future
- After 2019, stopped increasing the General fee to stop impact on Athens Graduate Students
- Non-Resident fee is sometimes increased.
- Green highlight is the current budget year planning assumption and years thereafter are assumptions for budget modeling purposes only.
- Bottom section is how those rate increases translate to actual dollars.
- Career fee started in 2019 and is restricted to added Guarantee Plus services

Note: The state budget was not yet approved at the time that our FY24 OHIO budget was presented to the Board of Trustees for approval. A conservative approach used a 0% tuition rate increase for incoming students. When the state biennium budget was approved, we were able to implement a 3% tuition increase. The state budget provides allowable rate increases for the biennium which allows us 3% for FY24 & FY25.

To determine the revenue for the different groups of students enrolled at a particular point of time, we need to know the tuition rate that will be charged to that group. In addition to the instructional and general fee rates, we also need to know the non-resident fee rate so that we can add that to out-of-state students. In this table you can see the various rate increases for all the components of tuition over time. You can see how tuition has increased each year and the years where tuition was kept flat.

We no longer increase the general fee because that fee is also charged to graduate students where we have a general fee buydown for students on fee waivers. If we increase the general fee, it erodes the value of that buydown. When there is a fee cap, it applies to the combination of instructional and general fees so if we keep the general fee flat, we can increase the

instructional fee more and keep the total within the cap.

In 2019, a career fee was added so the model projects the revenue for that fee. That revenue is restricted to funding our Guarantee Plus program that provides career advising and experiential learning activities.

These rate increases are applied to the dollar rates in the bottom half to get a rate to use with each cohort that can be applied of the number of students to get revenue.

The model will get updated to include the 3% tuition increase for FY24 (AY23).

Incoming Enrollment Assumption

Initial Cohort Assumption		Cohort 17-18	Cohort 18-19	Cohort 19-20	Cohort 20-21	Cohort 21-22	Cohort 22-23	Cohort 23-24	Cohort 24-25	Cohort 25-26	Cohort 26-27	Cohort 27-28	Cohort 28-29
Fall		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
First-Time	Resident	3,530	3,427	3,199	2,682	3,055	4,024	3,660	3,660	3,660	3,460	3,460	3,460
First-Time	Non-Resident	515	553	472	444	609	566	540	540	540	540	540	540
Total First-Time Freshman		4,045	3,980	3,671	3,126	3,664	4,590	4,200	4,200	4,200	4,000	4,000	4,000
Transfers	Resident	394	388	286	288	256	267	270	270	270	270	270	270
Transfers	Non-Resident	67	57	60	37	53	53	55	55	55	55	55	55
Total Transfers		461	445	346	325	309	320	325	325	325	325	325	325
Total Cohort		4,506	4,425	4,017	3,451	3,973	4,910	4,525	4,525	4,525	4,325	4,325	4,325

- Prior to Fall 2023 are "actual" enrollments.
- The 23-24 cohort was modeled at 4,200 incoming first-time freshman similar for future years.
- There are separate assumptions for Resident and Non-Resident since Non-Resident pay an additional fee.
- Transfers will add to tuition and non-resident revenue but they will be in the system fewer years.

Note: the total first-time freshman census for FY24 has been reported by IEA at 4,517 which is much higher than the 4,200 assumption in the tuition model. The model will get updated with actual IEA results.

Once we understand the way rates change over time, we also need to understand the composition of the incoming freshman class. Within a class there are different subgroups that need to be treated differently for purposes of revenue projection. As mentioned before, new freshmen are different that transfers in that we need to assume a transfer student will be enrolled for fewer semesters than a new freshman before they graduate. In both of these groups, we also need to understand the breakdown of resident versus non-resident students since non-resident student pay more in tuition to off-set the fact that we do not receive SSI for a non-resident student.

Cohort Instructional Fee Rates

Student Cohort	Fall	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cohort 15-16	2015	$5,114	$5,114	$5,114	$5,114	$5,201	$5,268	$5,336	$5,522	$5,522
Cohort 16-17	2016		$5,201	$5,201	$5,201	$5,201	$5,268	$5,336	$5,522	$5,522
Cohort 17-18	2017			$5,268	$5,268	$5,268	$5,268	$5,336	$5,522	$5,522
Cohort 18-19	2018				$5,336	$5,336	$5,336	$5,336	$5,522	$5,522
Cohort 19-20	2019					$5,522	$5,522	$5,522	$5,522	$5,522
Cohort 20-21	2020						$5,522	$5,522	$5,522	$5,522
Cohort 21-22	2021							$5,612	$5,612	$5,612
Cohort 22-23	2022								$5,856	$5,856
Cohort 23-24	2023									$5,856

- This is an example of the progression of Instructional Fee rates. Similar progressions are modeled for General, Non-Resident and Career Fee rates
- Some students stay more than four years, which is past their 12 guarantee semesters. After the fourth year (green) students move up to the rate for the <u>incoming</u> cohort for the year after. This shift continues each year that they continue to enroll.
- Rates for 2019 and 2020 are the same because we had a 0% increase for the 2020 class.

Note: the budget assumed 0% tuition increase for Fall 23 but we implemented 3% after the state budget was approved. This table will get updated to reflect the 3% increase in FY24.

Next, we need to determine the tuition rate progression for each cohort. The rate remains flat for four years. If a student enrolls in a fifth year, their rate increases to that of the cohort that followed them. If they remain enrolled for another year, then the rate goes up to that of the cohort that started two years after they did and so on.

This is the progression for the instructional fee. The model also needs to know this progression for the general , non-resident and career fees.

You can see in this table how the 0% tuition increase during COVID results in the rows for the 2019 and 2020 cohorts being the same.

Cohort Persistence Patterns

Cohort	Student Type	Residency	Fall Cohort	Fall 1	Fall 2	Fall 3	Fall 4	Fall 5	Fall 6	Spring 1	Spring 2	Spring 3	Spring 4	Spring 5	Spring 6
Cohort 15-16	First-Time	Resident	2015	100%	81.1%	75.2%	69.2%	18.3%	4.4%	93.6%	78.0%	73.5%	65.3%	12.5%	3.2%
Cohort 16-17	First-Time	Resident	2016	100%	80.1%	72.9%	66.4%	18.5%	3.4%	93.0%	76.8%	70.8%	62.4%	12.0%	2.3%
Cohort 17-18	First-Time	Resident	2017	100%	81.7%	75.1%	69.0%	17.1%	3.5%	92.6%	78.2%	73.4%	63.5%	11.8%	2.7%
Cohort 18-19	First-Time	Resident	2018	100%	81.1%	73.6%	68.0%	18.3%	3.8%	91.7%	76.3%	71.6%	62.2%	12.1%	2.3%
Cohort 19-20	First-Time	Resident	2019	100%	80.8%	75.4%	67.9%	17.6%	3.8%	92.3%	76.9%	72.2%	62.7%	12.3%	2.3%
Cohort 20-21	First-Time	Resident	2020	100%	80.8%	72.0%	68.0%	16.8%	3.5%	90.3%	75.6%	72.4%	62.9%	11.6%	2.5%
Cohort 21-22	First-Time	Resident	2021	100%	78.9%	75.3%	68.8%	17.1%	3.7%	91.1%	76.2%	73.4%	63.8%	12.2%	2.4%
Cohort 22-23	First-Time	Resident	2022	100%	82.5%	76.8%	70.0%	16.6%	3.4%	91.2%	79.2%	74.7%	64.7%	11.5%	2.2%
Cohort 23-24	First-Time	Resident	2023	100%	80.7%	74.7%	68.9%	16.8%	3.5%	90.9%	77.0%	73.5%	63.8%	11.8%	2.4%

- To determine revenue for each cohort, we need to predict how many of the incoming freshmen of a cohort continue (persist) each term.
- The purple cells are the rates that would apply for this year's revenue projection with each cohort's progression already progressing through their career.
- We have predictive modeling for how many students continue from Fall 1 to Spring 1 to Fall 2 to Spring 2, etc. These rates are different by cohort since the characteristics are different for each.
- This is tracked for 6 years since there is a small number (2-4%) that are here that long.
- Cohort 23-24 is based on an average of the three cohorts above that row.
- These are the numbers for freshmen-resident students. There are similar tables for freshmen-non-resident, transfer-resident and transfer-non-resident students.

Here you can see how the concept of the number of students starting in a freshman class decreases every term as some students drop out or graduate. Also remember that new students can be added any year to counterbalance those leaving - this is picked up in the model by adding transfers into the total enrolling each year.

Each Guarantee cohort has a different persistence pattern so we track this separately for every cohort. The purple cells are the rates that would apply for this year's revenue projection with the different cohort each being in a different term at that point in time

This example is for the first-time resident freshman. Three other tables with different persistence patterns are used to the first-time non-resident freshmen, transfer-resident and transfer-non-

resident students.

Note that Summer is also included but it is estimated in a different way since there is no good persistence approach given that it is optional to attend. So, we make some assumptions based on prior relationships between total class sizes and percent attending summer and look at the overall trend to make a reasonable estimate.

Effect of Persistence and Graduation on Enrollment

Fall 2011 Student Cohort
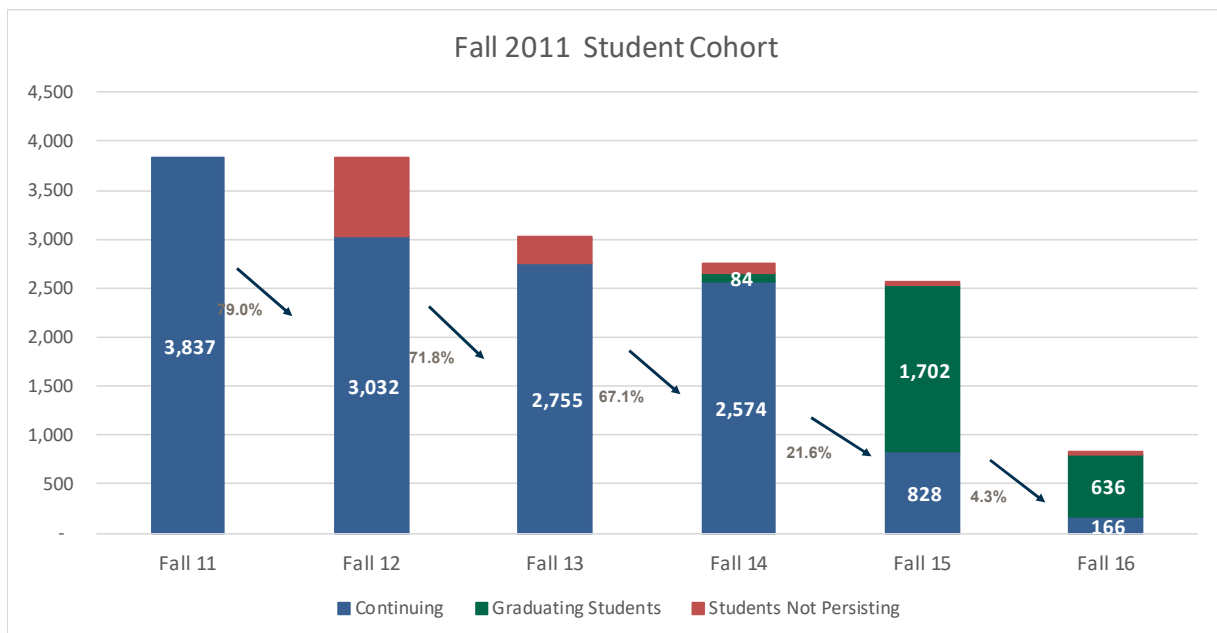
This is an illustration of the factors associated student persistence. Each year, some students drop out (either transferring somewhere else or not continuing with their education). Note how the largest loss is between the freshman and sophomore year. After the sophomore year students become more likely to continue. Starting in the junior year, we lose students when they graduate. Since not all students graduate in four years we still have some students enrolled in the fifth and even sixth year though those numbers are much smaller than they used to be.

Applying Persistence

	Student Type	Residency	Fall Cohort	Fall 2022	Fall 2023	Fall 2024	Fall 2025	Fall 2026	Fall 2027	Fall 2028	Spring 2023	Spring 2024	Spring 2025	Spring 2026	Spring 2027	Spring 2028	Spring 2029
Cohort 15-16	First-Time	Resident	2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cohort 16-17	First-Time	Resident	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cohort 17-18	First-Time	Resident	2017	124	-	-	-	-	-	-	94	-	-	-	-	-	-
Cohort 18-19	First-Time	Resident	2018	624	130	-	-	-	-	-	414	79	-	-	-	-	-
Cohort 19-20	First-Time	Resident	2019	2,164	562	121	-	-	-	-	1,999	392	74	-	-	-	-
Cohort 20-21	First-Time	Resident	2020	1,916	1,810	446	94	-	-	-	1,926	1,672	308	67	-	-	-
Cohort 21-22	First-Time	Resident	2021	2,400	2,291	2,092	519	113	-	-	2,319	2,232	1,941	371	73	-	-
Cohort 22-23	First-Time	Resident	2022	4,024	3,319	3,090	2,815	666	135	-	3,671	3,188	3,007	2,604	462	90	-
Cohort 23-24	First-Time	Resident	2023	-	3,660	2,955	2,735	2,523	615	130	-	3,325	2,819	2,690	2,335	431	87
Cohort 24-25	First-Time	Resident	2024	-	-	3,660	2,954	2,767	2,534	615	-	-	3,333	2,836	2,704	2,346	433

- Once we have the incoming class size (actual and future projection), we can apply the persistence percentage assumptions to the number of incoming students to estimate how many students will be paying tuition each term.
- If you follow a cohort across you can see how the numbers shrink over each fall to spring and year to year transition. At the bottom is the total number of students for that year.
- We then multiply the number of students in each cell by the tuition rate for that cohort in that year. This again is the data for just the resident freshman. A similar table is created for the other non-resident and transfer combinations.

Once you have the persistence percentages you can apply them to the number of the students starting in each cohort to get the number of students enrolled in each term. This again is the data for just the resident freshman. A similar table is created for the other non-resident and transfer combinations.

Total Enrollment

Athens Undergraduate Fall Headcount Projection							
Fall		2023	2024	2025	2026	2027	2028
Guarantee* Headcount	Resident	12,522	13,124	13,538	13,263	13,077	12,914
	Non-Resident	2,000	2,067	2,040	2,022	2,018	2,016
Non-Guarantee Headcount	Resident	707	742	765	749	739	730
	Non-Resident	26	27	27	27	27	27
Total Headcount (Fall)	Resident	13,229	13,866	14,303	14,012	13,816	13,644
	Non-Resident	2,026	2,094	2,067	2,049	2,045	2,043
	Total	15,255	15,960	16,370	16,061	15,861	15,687

- This is the total headcounts for the Fall terms for the future tuition revenue projection.
- Note in the middle that there is also a projection for the small number of non-guarantee (mostly non-degree students) in the system. They have their own different non-guarantee tuition rate and their own persistence pattern.
- The revenue is not just driven by the size of a freshman class – the varying persistence rates for each cohort and each type of student (freshmen vs. transfer and resident vs. non-resident) have to be taken into account and influence the total number of students attending. The model considers how these numbers also vary fall to spring – this table just simplifies things by showing only fall which is traditionally how enrollment is reported.
- Be careful about assuming that a large freshman class instantly fixes a revenue challenge.

There are also students enrolled that are not part of the guarantee – though a much smaller number. The model also tracks the persistence and the single rate table that these students are charged under .

Translating into Revenue

	Student Type	Residency	Fall Cohort	Fall 2023	Fall 2024	Fall 2025	Fall 2026	Fall 2027	Fall 2028
Cohort 19-20	First-Time	Resident	2019	$ 3,103,229	$ 679,052	$ -	$ -	$ -	$ -
Cohort 20-21	First-Time	Resident	2020	$ 9,994,386	$ 2,502,952	$ 550,464	$ -	$ -	$ -
Cohort 21-22	First-Time	Resident	2021	$ 12,857,092	$ 11,740,304	$ 3,039,264	$ 661,728	$ -	$ -
Cohort 22-23	First-Time	Resident	2022	$ 19,436,064	$ 18,095,040	$ 16,484,640	$ 3,900,096	$ 790,560	$ -
Cohort 23-24	First-Time	Resident	2023	$ 21,432,960	$ 17,304,480	$ 16,016,160	$ 14,774,688	$ 3,601,440	$ 795,990
Cohort 24-25	First-Time	Resident	2024	$ -	$ 21,432,960	$ 17,298,624	$ 16,203,552	$ 14,839,104	$ 3,765,645

	Student Type	Residency	Fall Cohort	Spring 2023	Spring 2024	Spring 2025	Spring 2026	Spring 2027	Spring 2028	Spring 2029
Cohort 19-20	First-Time	Resident	2019	$ 11,037,998	$ 2,164,530	$ 415,288	$ -	$ -	$ -	$ -
Cohort 20-21	First-Time	Resident	2020	$ 10,634,910	$ 9,232,383	$ 1,728,496	$ 392,352	$ -	$ -	$ -
Cohort 21-22	First-Time	Resident	2021	$ 13,014,228	$ 12,525,984	$ 10,892,892	$ 2,172,576	$ 427,488	$ -	$ -
Cohort 22-23	First-Time	Resident	2022	$ 21,497,376	$ 18,668,928	$ 17,608,992	$ 15,249,024	$ 2,705,472	$ 527,040	$ -
Cohort 23-24	First-Time	Resident	2023	$ -	$ 19,471,200	$ 16,508,064	$ 15,752,640	$ 13,673,760	$ 2,523,936	$ 532,701
Cohort 24-25	First-Time	Resident	2024	$ -	$ -	$ 19,518,048	$ 16,607,616	$ 15,834,624	$ 13,738,176	$ 2,651,259

- Once you know the number of students for each cohort in a particular term, you can apply the tuition rate for that cohort for that year to determine the revenue.
- As before – these are the revenues for Freshmen Residents. Additional calculations are made for non-residents and both types of transfer students as well as non-guarantee students

Once you have the number of students in each subgroup in a particular term, you simply multiply that by the rate charged for each tuition component (instructional, general, non-resident and career) for that subgroup to get the revenue for each term. Then you can add the revenue for the two terms as well as the projection for summer. Summer projection is done at a much higher level since enrollment volatility in summer makes it difficult to make assumptions about enrollment patterns.

Athens UG Revenue Projection
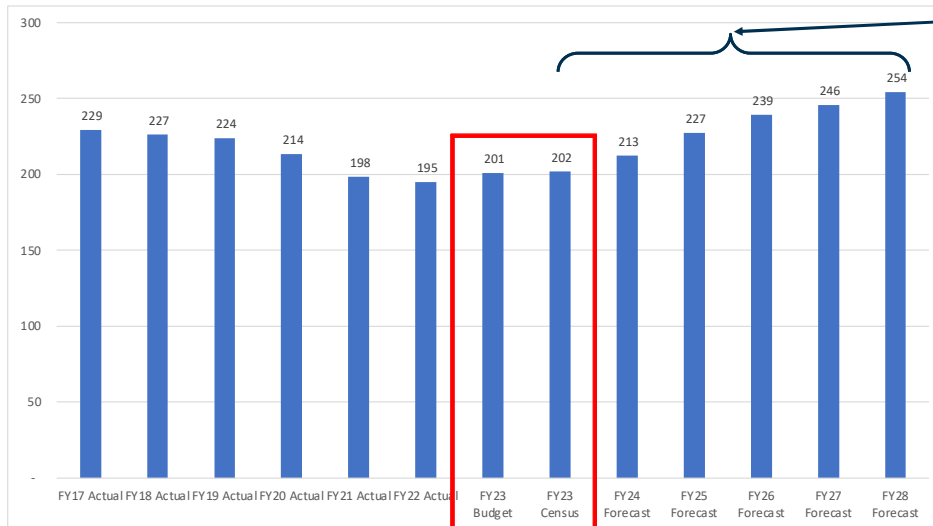
The growth in the next four years is driven by the assumption that we can continue to bring in freshman classes of >4k and continue strong persistence while we graduate the smaller classes from the past few years.

Inflation will allow for tuition increases that compound year over year.

The red box compares the FY23 budget to the census with the larger freshman class – you can see that one good freshman class does not add much – you need to repeat that to see the benefit

Actual enrollments, persistence, and rates affect the model. Example: FY24 budget was 0% UG tuition increase but was able to implement a 3% increase.

Athens UG Revenue Projection Career Fee

The model is also used to project the Career Fee revenue since it is generated by students who are on the Guarantee and there are different rates for cohorts within our current 6-year student career, all of which are part of the tuition model.

Athens Undergraduate Fees (Per Semester - Full Time) Assumptions, OHIO Guarantee Students

Fall Academic Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Cohort Instructional Fee	5.10%	1.70%	1.30%	1.30%	3.50%	0.00%	1.80%	4.00%	0.00%	0.00%	4.00%	4.00%	3.50%	3.50%
Cohort General Fee	5.10%	1.70%	1.30%	1.30%	3.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cohort Non-resident Surcharge	$ -	$ 250	$ -	$ -	$ 165	$ -	$ 88	$ 199	$ 199	$ 199	$ 207	$ 215	$ 196	$ 203

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Cohort General Fee	660	671	680	688	712	712	712	712	712	712	712	712	712	712
Cohort Non-resident Surcharge	4,482	4,732	4,732	4,732	4,897	4,897	4,985	5,184	5,184	5,184	5,391	5,606	5,802	6,005
Career Fee					72	72	96	108	108	108	108	108	108	108

Career Fee started in FY19 (Fall 18).

Athens Subsidy Projection Model

Athens Subsidy Projection Model

- We make a projection for future subsidy.
- This is much more complicated and difficult to predict accurately.
- We take the enrollment assumptions and get a year-to-year change and apply that to credit hour production and degree credits
  - Assumes more students = more credit hours and eventually degrees
  - Assumes what those students will take is similar to what they take now
  - Assumes current completion rates will continue
  - Uses college assumptions about master's enrollments
  - Assumes flat Doctoral activity
- We make assumptions about how much the state will put into the SSI appropriation in future years.
- This gives us potential SSI if we assume our share of the appropriation will remain the same relative to what the other 12 intuitions will do – so does not account for the interactions across institutions.

Completion is based on the average of three years of data that is lagged one year – so for FY24 that would be CY20, CY21 and CY22. So, when a program starts and begins offering credits there is a lag of four years to the point where that level of credit-hour production actually is fully realized in the flow of subsidy. When projecting future degree subsidy you have a long lag for undergraduate activity when you consider that it will take four years to reach the degree and subsidy is based on a three-year average that is lagged a year which totals up to 8 years before you get the full degree subsidy of that student.

Each ODHE SSI model has a reimbursement cost (the statewide cost to product the FTE's) which is a six-year statewide average across all 13 universities. Additional weighting is given to

Graduate and STEM models to get the reimbursement cost for each model.

Subsidy Projection

In millions
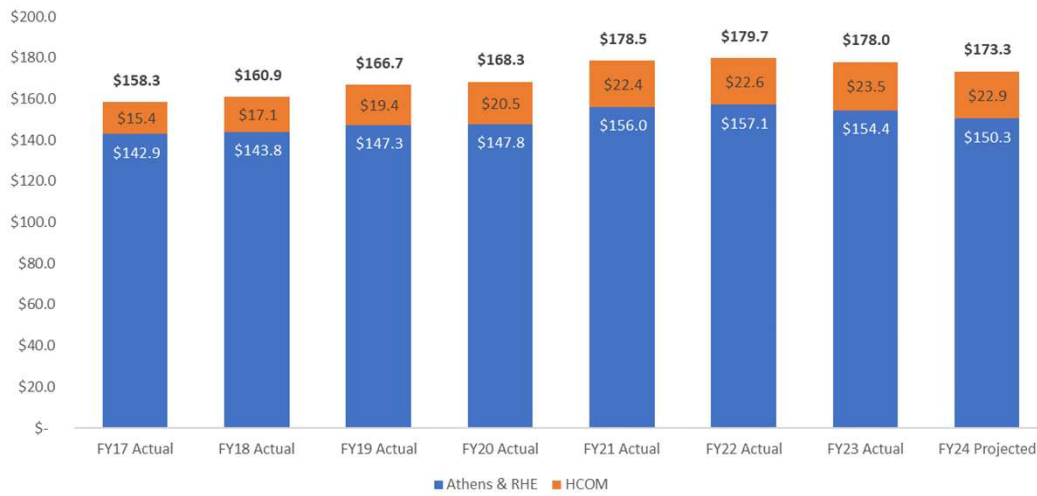
Our enrollment declines over the past several years are starting to impact us and won't rebound with our recent enrollment growth for several more years.

In FY24 & FY25 we will also be receiving a "back payment" due to an underpayment from ODHE due to an error with Kent State podiatry program reporting. Those amounts are not included in the FY24 Projected bar above.

Tuition & Subsidy Projections

- The Tuition and Subsidy models discussed today are Budget Office "home-grown" Excel workbooks and have been adjusted over the years.

- As we continue to fine-tune and make improvements to our tools and models, we have recently collaborated with IEA and are working together to create a dataset that will allow for better scenario planning and to develop more refined forecasting approaches to further improve our forecasting accuracy.