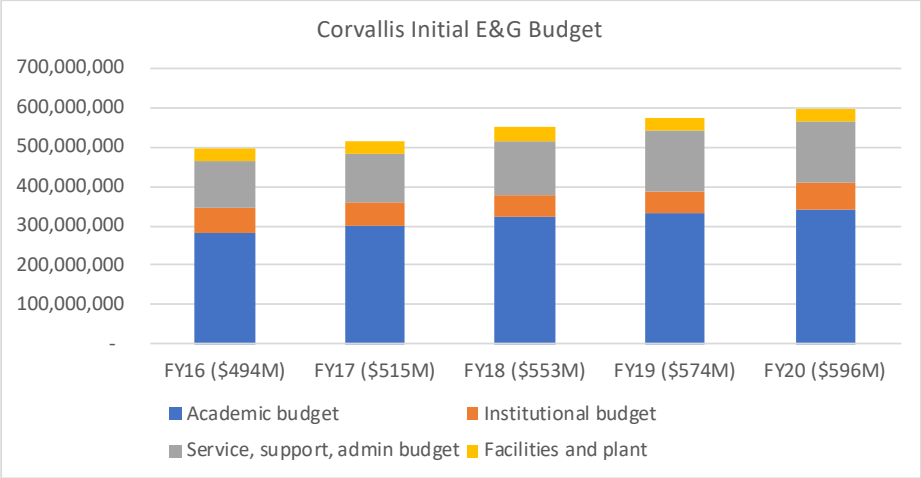
University Budget Conversations

Budget Model Update--November, 2019

The new budget model for Corvallis Education and General Funds (the Shared Responsibility Budget model) was fully implemented for academic unit's mid-year in FY18 and was implemented for all E&G budgeting in FY19. It is a hybrid version of an RCM (for Responsibility Centered Management, an outcomes-based budgeting approach), with significant activity-based budgeting (dollars per credit hour allocations in Ecampus), and incremental budgeting (for administrative and support units as well as community support funding for some academic units).

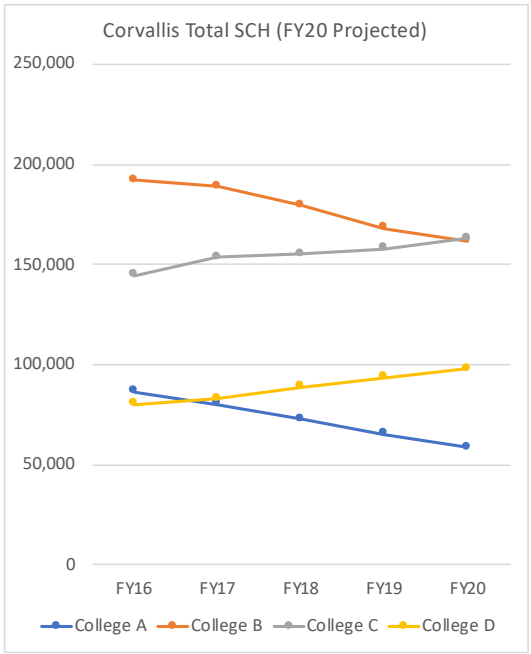
How has the model been working?

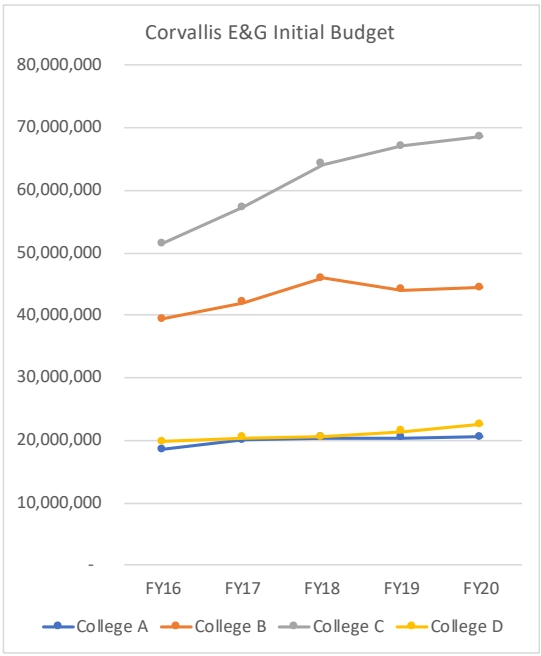
The model was intended to link budgets more directly to activities and outcomes for all modes of teaching (not just for Ecampus) and for other aspects of the university's mission. Because this approach replaces the idea of "base" budget, it is designed to respond somewhat more slowly than Ecampus allocations (three-year averages of outcomes and a "share of the pie" approach rather than a per credit hour allocation).



The budget overall has grown significantly since FY16, though the proportions distributed to different functions are similar. FY16 and FY17 were prior to the model, FY18 had a mid-year adjustment to allocate some additional revenue to colleges that were growing, FY19 includes the mid-year rescission amounts, and FY20 is the current initial budget estimates.

That budget growth does not move uniformly through units, as the model did change how the budget allocations adjust for changing enrollments and graduations. The figure at the right shows changes in Corvallis total SCH taught (on the left, as an example of one measure) for four colleges and the total Corvallis E&G budget for those same colleges. FY19 shows a discontinuity with a reduction for a college that had been declining and increments to colleges that were growing. From FY19 to FY20, colleges with declining enrollments had only small budget increases, while those with growth showed larger allocations. This is the kind of change the model was intended to create. These changes are also broadly consistent with what the model forecast for those units.





What is "Bridge Funding"?

The change to the model did change the budget trajectory for a number of colleges and it was recognized that some transitional support was necessary. Bridge funding is an allocation of budget outside the model for a limited number of years (typically three) based on a plan developed by the Dean and the College and agreed to by the Provost. The goal of this funding is to allow the colleges to make adjustments in their programs and financial commitments in response to the current and projected budget changes. Science and Education have bridge funding agreements in place and Liberal Arts and Public Health and Human Sciences are in the final stages of finishing agreements. Depending on the final version of those agreements there will be from $2.3M to $3.1M in bridge funding allocations this year.

What changes have been made so far?

The change to this approach was a very large shift for OSU and while the model was developed and run in parallel to the traditional budgeting practices for three years, it was not expected that everything would work as intended without adjustments and changes. The goal of the model is to balance budget incentives that align with the goals of SP 4.0 with the realities of limited overall resources. It was expected that there would be some adjustments and modifications to the model as it evolved. For FY20, some of the principal changes included:

- Business and Engineering dropped the pro-school models they had been using, which required a change in how credit hours were attributed (majors vs. non-majors). This was a significant adjustment in the "how" part of the model but had the goal of keeping the college budget allocation the same so that a change made for curricular reasons did not have negative budget consequences.
- Corrected how Honors College credit hours were distributed so that colleges got full credit for all of the Honors courses they delivered; this required making a community support allocation to the Honors College.
- Refined the weighting tables to remove outlier values.
- Corrected the allocation to Veterinary Medicine to reflect the funding agreement for the growth of the non-resident enrolment.
- The counts of minors are now for minors awarded not minors declared.
- Some corrections were made so all certificate and minors were correctly assigned to colleges.
- The proportions for interdisciplinary graduate programs were adjusted so units were credited exactly the same amount for one of these students as for a student in their own programs.

What are some of the issues in the model and what's next?

The model continues to evolve as there is more experience with it. Some of the issues that may be addressed in the next iteration include:

- Currently the model allocates virtually all revenues out, leaving no central reserve. This is why, in part, there was a mid-year rescission in FY19 and a "take-back" as a last step in the FY20 allocation. The model proportions should be adjusted so there is a reasonable central reserve after funding academic, support and administrative units.
- Dedicated funds are currently charged a modest overhead. While the principle of the charge makes sense (spending and managing those funds creates "back-end" costs) instituting the charge has proved complicated and has created some unintended consequences. This approach may need to be revised.
- Consider if service and support units should get any productivity allocations. This has, again, created some unintended incentives that can distract from the core mission of a unit.
- Review the way Pharmacy and Veterinary Medicine are treated inside the model and consider whether a block funding approach would be more appropriate than the partial productivity approach.

University Budget Conversations

Budget Model Weights--November, 2019

The Shared Responsibility Budget model uses weights on credit hours and degrees awarded in some parts of the allocation. The weights are based on relative costs by level (upper-division or bachelor's degree, master's level or master's degree, doctoral level or doctoral degree) and by discipline (mathematics, social sciences, business etc.). This summary briefly explains how those weights are derived and used in the model.

What's the source of the data for the weights?

There are a number of studies that look at the cost of university programs by level and discipline. One of the best known is the Delaware study, but this actually provides only costs by discipline with all levels of instruction lumped into one number. The studies that are more useful are state-level studies (often mandated by state government) that look at costs by level of instruction and discipline. The studies are not done every year as they are a fairly intensive endeavour. The studies used in the OSU model include a synthesis by the State Higher Education Executive Officers Associations of two years of data from Illinois, Ohio, and Florida (2002, 2007, there was also data from New York but the definitions were different and it was not consistent with the other data sets), some data out of a study from Texas (annual), data from the Florida University system (2007-2011), Ohio state universities data (2012, 2013, 2014), and data from the Delaware study for upper-division costs (this is what the data is closest to for level).

The data is most often reported as a dollar cost per credit hour and that is what was used for deriving the weights.

Cost per credit hour

	Lower division	Upper division	Masters level	Doctoral level
Mathematics	$ 192	$ 276	$ 548	$ 765
Psychology	$ 151	$ 243	$ 536	$ 794
Engineering	$ 360	$ 501	$ 713	$ 803
Performing arts	$ 296	$ 421	$ 762	$ 798
Physical sciences	$ 221	$ 364	$ 808	$ 744
Math/Psych Avg		$ 259		

Ratios to average of upper division mathematics and psychology

	Lower division	Upper division	Masters level	Doctoral level
Mathematics	0.741	1.064	2.116	2.954
Psychology	0.581	0.938	2.068	3.064
Engineering	1.390	1.932	2.753	3.098
Performing arts	1.141	1.624	2.942	3.079
Physical sciences	0.851	1.403	3.120	2.873

Upper division college weights—hypothetical Arts and Sciences college

	Undergrad majors	Upper division ratio	Major percentage	Weighted ratio
Mathematics	100	1.064	14%	0.152
Psychology	500	0.938	71%	0.670
Engineering	0	1.932	0%	0.000
Performing arts	50	1.624	7%	0.116
Physical sciences	50	1.403	7%	0.100
College total	700			1.038

The discipline data is reported in almost all cases by the two-digit CIP (Classification of Instructional Program) code defined by the National Center for Education Statistics. This means the disipline definitions are at a high level (Physical Sciences, Biological Sciences, Engineering, Visual and Performing Arts, etc.). While there are subdivisions of the CIP classification (14.0702 is Chemical and Biomolecular Engineering within 14 Engineering, for example) the cost data is not differentiated at that level.[1]

How is that data turned into discipline ratios?

The tables at the left illustrate the approach. The top table has the cost per credit hour for two-digit CIP disciplines by level, as reported in one of the studies. The studies are at different times and locations so the costs are recast as ratios to take out some of the variability due to inflation and differences in local absolute costs. The denominator is based on an average of upper-division costs per credit hour for several common disciplines. (The example uses Mathematics and Psychology, the model uses Communications, Foreign Languages, English, Biological Sciences, Mathematics, Physical Sciences, Social Sciences and History, and Business Management).

[1] The CIP code table can be explored at https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55

That average amount ($259 per credit hour in the example) is then divided into each of the individual costs to yield cost ratios relative to that average cost of the "basket" of upper-division disciplines.

There are some clear patterns in the ratios by level as would be expected in going from lower-division to doctoral instruction. The differences between disciplines are also fairly consistent across the various data sets (Engineering consistently higher than Mathematics, etc.). Each of the data sets was turned into ratios then the ratios were compiled by discipline. Each of those disciplinary groups was examined and any ratios that were unusually high or low were removed and the remainder than averaged. This yielded a table of cost ratios by level and two-digit CIP code.

While the table includes discipline weights for lower-division teaching, these are not used in the model. Lower-division and service credit hours are weighted only by level, not by discipline.

Where do the college ratios come from?

The model allocates funds to colleges, so the ratios were used to develop college average weights. The third table illustrates the overall approach. The number of majors at each level for each program in the college were compiled (bachelor's, master's, doctoral). These numbers were then used to make a weighted average of the relevant ratio for the college as a whole. The third table above illustrates the approach for a hypothetical college of Arts and Sciences. There are no engineering majors, but there majors in the other disciplines. Most of those are in math and psychology so the college weighted ratio is pretty close to those two. The weight is capped so that colleges with a high cost ratio that also have a differential tuition charge do not "double dip" on the allocations to cover those higher costs. This principally impacts engineering in the current model, as it is both a high cost program and a program with a significant differential tuition charge.

The same approach is used to calculate a college-level ratios for the graduate level programs. The resulting college-level weights are applied to the undergraduate completions allocation and the graduate completions allocation.

What's going to change about these?

This cost-weighting approach is part of the state funding allocation model, though the state is using much older ratios from something called the Resource Allocation Model (RAM). The Higher Education Coordinating Commission (HECC) has convened a workgroup to review those weights and update them. If new data becomes available from that work we will incorporate those into the OSU weighting scheme. We are also always looking for additional data on cost of instruction.

The premise of the weighting approach is to recognize that there are significant costs in delivering different programs and curricula. Recognizing these differences was one of the major requests from the deans as the model was being developed. The use of national data is important as the goal was to recognize what the norms were in disciplines not necessarily what current local variations in cost were.

The use of the weights has highlighted some issues about how programs are categorized. All OSU curricular programs are assigned a CIP code and that code does matter in the allocations of state funding and the allocations of budget internally. Some units have been reviewing the classifications of programs to ensure that they are appropriately characterized by their curricular outcomes and the definitions established by NCES. The Division of Undergraduate Studies can help review the classification of a program if it is appropriate.