Incentive-based Budget Model Subcommittee Report
Preface

To fully understand this report, you are encouraged to **learn more about IBB** by reviewing all of the informational and educational materials on the IBB website.

We are committed to **meeting with anyone, anytime, anywhere** to discuss IBB. If you would like to schedule a meeting, please contact Alberto Citarella, University Budget Director.

The following report is **one of eight separate reports** that will be used to develop a comprehensive Incentive-based Budget Model for the University of Vermont. Each of the eight subcommittees was asked to address a particular component of the overall IBB budget model.

The proposed algorithms contained within the reports are **not intended to be a perfect accounting** of revenue generation and resource usage across the University. They do, however, provide a solid foundation upon which the initial IBB model will be based, and they support the project’s *Guiding Principles* and the University’s *Academic Excellence Goals*.

Each report has **only been vetted by the subcommittee that wrote it**. It is possible that the proposed algorithms presented by the eight IBB subcommittees may, at times, contradict each other.

The IBB Steering Committee will use these reports as the basis for its further discussions and final recommendation on an integrated IBB budget model. It is possible that **the Steering Committee may need to adjust the proposed algorithms** to create a coherent, comprehensive and workable budget model.

It is strongly recommended that you **read all eight subcommittee reports**; they are all inter-related. If, after reading a report, you have feedback to share, please complete the survey that accompanies the report.

January 29, 2014
Undergraduate Tuition Revenue and Aid Subcommittee Report to the IBB Steering Committee
January 24, 2014

Subcommittee Charge
This report provides two proposed algorithms to allocate the revenues associated with undergraduate tuition and aid to the revenue-generating Responsibility Centers. This report includes:
- How the revenue generated by undergraduate tuition may be allocated;
- An explanation of the algorithms and their component parts;
- A discussion of how the algorithms support the UVM and IBB guiding principles;
- A description of the process by which the algorithms were developed;
- And a summary of the subcommittee’s deliberations on other factors such as financial aid, student credit hours taught, degree program/majors, number of graduates, in-state, out-of-state, and international student revenue, accounting for the differing costs of instruction between academic units, and interdisciplinary instruction.

Subcommittee Membership
Lisa Aultman-Hall, Professor, Transportation Research Center and School of Engineering (Chair)
Pamela Blum, Assistant Dean for Business Operations, College of Education and Social Services
Antonio Cepeda-Benito, Dean, College of Arts and Sciences
Richard Fanus, Assistant Dean for Business Operations, College of Agriculture and Life Sciences
Marie Johnson, Director, Student Financial Services
Thomas Noordewier, Associate Dean, School of Business Administration
Lisa Schnell, Associate Dean, Honors College
Jeremy Sibold, Associate Professor, Department of Rehabilitation and Movement Science
Deane Wang, Associate Professor, Rubenstein School of Environment and Natural Resources
Beth Wiser, Director, Office of Admissions
Description of the process by which the subcommittee developed the algorithms

The subcommittee met as a group on the following dates and completed the report using email.

October 24, 2013                      December 5, 2013
November 7, 2013                      December 12, 2013
November 21, 2013                     January 3, 2014

The following steps were used to gain group consensus.

A. Exploration, discovery, learning - concepts, concerns, hopes
B. Consideration of UVM values, strategic goals and IBB guiding principles
C. Assessment of the different instructional methods and associated costs
D. Determination of the revenue for distribution (net tuition after financial aid without regard for students' state residency status)
E. Exploration of example algorithms and review of some UVM data
F. Selection of a set of viable algorithms and then narrowing to two algorithms for presentation

Proposed Algorithms

The following assumptions underlie both algorithms presented here:

A. Colleges are the Responsibility Centers where undergraduate tuition is allocated.
B. The Honors College is funded centrally.
C. 12-18 credits per semester generates the same revenue to the university as 12 credits for an individual student (reflecting current policy).
D. Financial aid is deducted from gross tuition leaving total net tuition for allocation.
E. There is no accounting for the relative number of in- and out-of-state students by College.
F. Graduate students in 200 level classes pay graduate tuition and are not in the revenue allocated here.
G. Subvention (which the group concurred should be minimized) is subtracted from net tuition as an absolute dollar amount and/or a percentage using transparent consistent formulae. Part of the use of the subvention funds should include direct incentives for excellence using measurable criteria.
H. The “block grants” of a “hold harmless” phase will be phased down gradually with the expectation that after approximately 5 years of IBB implementation all colleges will be able to operate without such transfers. Within this assumption, there is also the expectation that the subvention pool, the amount subtracted from net tuition that is used for these transfers, will also be reduced gradually. That is, at the end of the 5-year period, the proportion of net tuition available for allocation to the colleges should increase by the percentage that was originally needed to subsidize the “hold harmless” phase.
I. Our algorithms assumed Colleges would require sufficient funds to provide their own teaching assistants (GTAs would not be provided by the Graduate College).
J. Our algorithms assumed Colleges would need sufficient funding to provide for the cost share portion of the work study program which can be considered part of financial aid.
K. Cross-listed classes are normally accrued to the instructor of record (unless participating deans for intercollege programs reach other agreements).
L. All undeclared majors are in a College; non-degree students are in Continuing Education as their College.
M. Differential tuition and program fees will not be used at this time.
Proposed Algorithm 1: “The weighted 90/10” or “The weighted 85/15”

1. Every year, a tally of student credit hours (SCH) for the preceding 2 years and the number of majors are calculated by College (example – to plan for FY15, FY12 and FY13 are used). College of the SCH is based on the instructor of record.

2. Weighted SCH are calculated based on relative national costs of instruction by discipline (NCES CIP codes). The SCH national cost for each department within a College is obtained every 5 years (see below). The weight for an Honors College course is automatically set to 3.0. The closest disciplines to those in the UVM COM will be used to calculate a COM weight. The Continuing Education weight will be set based on the portfolio of courses offered.

3. Between 85 and 90% of the net tuition is allocated based on weighted SCH.

4. Between 10 and 15% of the net tuition is allocated based on proportion of majors by College.

Proposed Algorithm 2: “The weighted 100% SCH”

1. Every year, a tally of student credit hours (SCH) for the preceding 2 years is calculated by College (example – to plan for FY15, FY12 and FY13 are used). College of the SCH is based on the instructor of record.

2. Weighted SCH are calculated based on relative national costs of instruction by discipline (NCES CIP codes). The SCH national cost for each department within a College is obtained every 5 years (see below). The weight for an Honors College course is automatically set to 3.0. The closest disciplines to those in the UVM COM will be used to calculate a COM weight. The Continuing Education weight will be set based on the portfolio of courses offered.

3. 100% of the net tuition is allocated based on weighted SCH.

Both of the algorithms assume that the weighting will be largely based on national norms that take into consideration discipline-specific delivery costs. A reasonable approach would be to use all the universities included in the Carnegie Classification RU/H that participate in The National Study of Instructional Costs and Productivity compiled by the University Delaware. Limiting the sample to peer/aspirant universities creates challenges difficult to overcome. For instance, many UVM peers are private institutions that do not participate in “The Delaware Study”. Also, a large sample size for average cost calculation is desirable and the number of peers is limited. The discipline weight will be based on a cost per SCH set every 5 years for predictability. The subcommittee remained concerned about data quality and variation within “The Delaware Study”. UVM-specific priorities may differ considerably from a given reference group of universities and our recommendation requires careful transparent study of an appropriate reference set. Documentation of the weight calculation will be made available to the UVM community.

Considerable committee discussion centered around whether 1) to weight using national data for the cost of instruction; and 2) to use the relative number of majors as well as SCH for funding allocation. It is important to note that while the subcommittee reached strong consensus in support of weighing SCHs by discipline, the subcommittee was divided with regard to which of the two algorithms was preferred. The subcommittee felt that weighting would reduce the need for subvention and provided a benchmarking tool that would enable or encourage Colleges to

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1 The subcommittee concluded the exact percentages should be set based on more analysis of UVM data but deemed this range appropriate.
contain costs within disciplinary norms. However, some members felt strongly that a portion of funding had to be allocated based on majors. These committee members reasoned that allocating some of the net tuition by number of majors was a fair way to account for the cost of advising, recruiting and retaining majors. Others argued that weighting SChs by discipline already took into account these associated costs, as "instructional" costs in "The Delaware Study" do not exclude advising and similar costs from purely instructional costs. Those who favored Algorithm 2 noted that strategy and policy for UVM recruitment are handled at the university level, and that differential college enrollment and retention trends may be driven by external variables. Most, if not all, committee members felt that allocating some portion on the basis of number of majors had the potential of increasing intercollege collaboration and would reduce the temptation to engage in academic encroaching. At the same time, allocating a large proportion of funding by major, while at the same time using weights, may be double accounting for the differential costs of instruction and also reducing the incentives for cross College teaching. For this reason, only a small portion of funding is allocated by major in Algorithm #1.

Note that the Honors College is not included in the national weighting, but given a weight of 3.0 in our algorithms. This has to do with the fact that there is no "standard model" for Honors Colleges across the country and thus it is impossible to assign it a weight based on the Carnegie Classification. The weighting reflects the relative size of Honors College seminars, but is also designed to incentivize the relationships between the Honors College and all Colleges at UVM.

Note that the algorithms do not distinguish in- versus out-of-state tuition revenue or students' state residency status. Nor do the algorithms account for the relative amount of financial aid the students in different Colleges may receive. Whereas some of the subcommittee considered the use of these factors unpalatable in relation to UVM's community values, this sentiment was not unanimous. Nonetheless, as described below, the subcommittee supports better tracking of these data for future use in a strategic way as well as consideration of future differential tuition or program fees.

**How the algorithms support the IBB guiding principles**

These algorithms create incentives that promote academic quality and excellence by rewarding units for partnerships with the Honors College, and in Algorithm #1, by tying some funding to "majors" which promotes the creation and maintenance of quality programs, recruiting, retention and advising. Some members of the committee indicated that explicit inclusion of majors in the algorithms would encourage use of the number of program majors as a metric to be more widely watched and considered across campus.

These algorithms create incentives at all levels of the University that promote financial sustainability by allowing Deans to manage class size and faculty allocations with simple predictable formulae. Use of weights based on national costs encourages accountability to a reality, albeit based on imperfect measures, outside of UVM.

The subcommittee concurred that the IBB process in general should encourage innovation and entrepreneurship however the various algorithms we considered seem neutral relative to this goal.

These algorithms provide transparency, clarity, and predictability because they are simple and
rely on available and robust data. They are as easy to understand, implement and operate as possible. However, we learned together that understanding these algorithms (and indeed the terminology of IBB) is not straightforward and we recommend examples with numbers be provided to the UVM community, particularly for the explanation of how weights were calculated.

In terms of cycles of the economy, whether robust or downturn, we are confident revenue to each unit will be enhanced or reduced proportional to expenses. However, these revenues remain dependent on attracting students and excellence in financial aid management. These algorithms contain risk in the sense that the rising cost of college education is a challenge nationwide and the revenue to the academic units is impacted by the complexity of financial aid and the willingness for students to pay in a competitive market.

Related Issues for Steering Committee Consideration
The subcommittee considered many other options for incenting excellence and allocating revenue. In the first subsection below, one alternative algorithm is presented and in the following sub-sections numerous factors discussed by the subcommittee are summarized.

Alternate Algorithm: “The un-weighted 75/25”
An alternate algorithm (shown below) was given significant consideration by the sub-committee. The “un-weighted 75/25” is similar to many algorithms used at other universities and is simple to understand and to calculate. Revenues were not expected to be significantly different in the initial phase for each college at UVM. However, the use of weights in Algorithms 1 and 2 were considered to more accurately reflect the differential cost of course delivery and thus allowed reasonable incentives for change.

1. A tally of student credit hours (SCH) for the prior 2 years and the number of majors are calculated by College (example – to plan for FY15, FY12 and FY13 are used). SCHs are allocated based on the faculty of record and their home department.
2. Honors College SCHs are weighted (3.0).
3. 75% of the net tuition is allocated based on SCH (the Honors College weight could be used).
4. 25% of the net tuition is allocated based on proportion of majors by College.

This alternate algorithm does not take into consideration the cost differential between different programs or disciplines. Accounting for these factors was not deemed difficult in terms of data nor was predictability considered problematic and thus the weighted models were preferred. The un-weighted algorithm seemed to require the long term use of significant subvention funds which the subcommittee felt should decline over time.

Other Factors 1: Differential Costs and Prices
The subcommittee recognized the challenge of differential costs of education delivery across units and disciplines. UVM’s service learning, field experiences and laboratory teaching are important. We deemed it too complicated to add these factors into our algorithms. We considered differential tuition or program fees but felt these topics were beyond the charge of the subcommittee. We wanted to ensure clarity in terms of what programs are most expensive to deliver and agreed that use of national data would recognize this reality while still incenting
efficiency and excellence. The members of the subcommittee shared the common goal that subvention should be minimized and not used to equalize differential costs of delivery because it erodes transparency.

There was appropriate concern in the subcommittee discussions about the relative pricing of programs compared to competitors. Some UVM programs may be over-priced and some under-priced. Electing for algorithms that do not make state residency and financial aid transparent by College may be compromising overall campus-wide goals and ability to set strategy. Concern was expressed over the lack of control colleges and programs have in terms of their in-coming class numbers as well as transfer students. A member of the committee felt that the current practice of allocating financial aid without accounting for major failed to recognize that pricing is major-dependent. Other schools have differential tuition and the pool of competitors is not necessarily uniform across colleges. To address these concerns, we recommend that research and data tracking on more program-based pricing, financial aid and accounting for in versus out of state students should be undertaken for potential future UVM use. Future adaptations to these algorithms may use this research. Note this might include pricing programs both higher and lower than current tuition rates, depending on specific competitors.

Other Factors 2: Incenting Quality
The subcommittee was concerned about promoting diversity, student retention and 4-year graduation rates. However, we recommend the Provost consider these factors in allocation of discretionary funding derived from subvention to reward excellence in the units based on data-driven evidence. At the same time as IBB is implemented other enrollment changes may occur across campus. For example, growth of international students who require assistance with English may not be evenly distributed on campus. This is an example of where central support or direct incentives may be required.

Unintended consequences were repeatedly visited by the group. We found the incentives for excellence difficult to implement in the algorithms in part due to inability to accurately measure excellence. The sub-committee was also concerned about “gaming” of the system. For example, the definition of a credit hour leaves room for inflation of SCH. This suggests a key role for a strong central curriculum committee with oversight to ensure colleges are not duplicating courses to teach their own majors, or “gaming” the system with an inflation of credit hours, for example. The senior leadership, deans and Faculty Senate must be aware of this “gaming” potential, watch for it, assess and take corrective action.

Other Factors 3: Interdisciplinary Programs
Algorithms that erode interdisciplinary efforts are undesirable. We do not believe our algorithms explicitly protect from these risks. Often our discussion would point to the possibility of special arrangements between deans to pursue joint endeavors or cross College teaching.

Other Factors 4: Related Administrative Matters
There is an important overlap between the aims of undergraduate education as captured by the tuition allocation algorithm, and the efficiency and effectiveness of some of the units at UVM that will be cost centers. These centers will be subject to administrative review but not to the same “market forces” as the responsibility centers. A healthy and transparent relationship between these two types of units will be critical to the academic mission that our algorithms encompass.