

University Funding Formula

Technical Report

Nova Scotia Council on Higher Education
May 1998

Addendum to

University Funding Formula Technical Report, May 1998

Date: July 20, 2000

Bin Weights and Adjusted Bin Weights

The bin weights listed in Table 1 (page 3), Attachment A1 (page 18) and Attachment A2 (page 19) of the above document are derived by dividing program cost associated with each bin by the Alpha bin cost. As shown in Table One below, these weights results in a cost recovery gap when a fixed tuition revenue is applied. To eliminate this gap, the bin weights were adjusted upward (Table Two). It is these adjusted weights that are in use in the funding formula.

Table One: Derivation of WFCE						
			Based on WFCE			
	Total Cost per FCE	WFCE ¹	Provincial Support per FCE ²	Tuition Revenue per FCE	Total Revenue	Cost Recovery Gap ³
Alpha	\$1,220	1.00	\$610	\$610	\$1,220	\$0
Alpha 2	\$1,525	1.25	\$762	\$610	\$1,372	\$152
Beta	\$1,830	1.50	\$915	\$610	\$1,525	\$305
Beta 2	\$1,976	1.62	\$988	\$610	\$1,598	\$378
Gamma	\$2,135	1.75	\$1,068	\$610	\$1,678	\$458
Delta	\$2,440	2.00	\$1,220	\$610	\$1,830	\$610
Medicine	\$4,880	4.00	\$2,440	\$610	\$3,050	\$1,830
Dentistry	\$6,710	5.50	\$3,355	\$610	\$3,965	\$2,745
Epsilon	\$2,440	2.00	\$1,220	\$610	\$1,830	\$610
Phi(A)	\$3,050	2.50	\$1,525	\$610	\$2,135	\$915
Phi(B)	\$3,660	3.00	\$1,830	\$610	\$2,440	\$1,220
Omega	\$4,880	4.00	\$2,440	\$610	\$3,050	\$1,830

¹WFCE is determined by dividing the Total Cost per FCE by the Alpha Bin cost, \$1220.

²Calculation: \$610 x WFCE

³Calculation: Total Cost - Total Revenue

Table Two: Derivation of Adjusted WFCE

	Based on Adjusted WFCE					
	Total Cost - Tuition Revenue	Adjusted WFCE ⁴	Provincial Support per FCE ⁵	Tuition Revenue per FCE	Total Revenue	Cost Recovery Gap ³
Alpha	\$610	1.00	\$610	\$610	\$1,220	\$0
Alpha 2	\$915	1.50	\$915	\$610	\$1,525	\$0
Beta	\$1,220	2.00	\$1,220	\$610	\$1,830	\$0
Beta 2	\$1,366	2.24	\$1,366	\$610	\$1,976	\$0
Gamma	\$1,525	2.50	\$1,525	\$610	\$2,135	\$0
Delta	\$1,830	3.00	\$1,830	\$610	\$2,440	\$0
Medicine	\$4,270	7.00	\$4,270	\$610	\$4,880	\$0
Dentistry	\$6,100	10.00	\$6,100	\$610	\$6,710	\$0
Epsilon	\$1,830	3.00	\$1,830	\$610	\$2,440	\$0
Phi(A)	\$2,440	4.00	\$2,440	\$610	\$3,050	\$0
Phi(B)	\$3,050	5.00	\$3,050	\$610	\$3,660	\$0
Omega	\$4,270	7.00	\$4,270	\$610	\$4,880	\$0

³Calculation: Total Cost - Total Revenue

⁴Adjusted WFCE is determined by dividing the difference between Total Cost and Tuition Revenue per FCE by Tuition Revenue per FCE (reference is page 4, first paragraph under Fixed Revenue Assumption, in University Funding Formula Technical Report, May 1998).

⁵Calculation: \$610 x Adjusted WFCE

UNIVERSITY FUNDING FORMULA

TECHNICAL REPORT

INTRODUCTION

In March 1997 the Nova Scotia Council of Higher Education released a "Discussion Paper on the Development of a New Funding Formula for Nova Scotia's Universities." During the consultations that followed, universities, faculty associations and students provided detailed written and verbal presentations to the Council on the proposed funding formula described therein. In addition, several working group meetings were held with universities to discuss details of the Council's proposals. Most recently, in January 1998, the Council released a revised version of the Discussion Paper, inviting comments from the university community. The Council then made final adjustments to the proposed funding formula based on new information supplied by the universities. This technical report on the Council's recommendations to government concerning the implementation of a funding formula is intended to provide a detailed response to the issues raised during these consultations.

The proposed formula, which determines the allocation of unrestricted operating grants to universities, consists of three major components: a weighted enrolment grant, a research grant and four extra-formula grants. The weighted enrolment grant accounts for about 91% of base funding. The research grant provides support to cover the indirect costs of research funded by the federal granting councils. Extra-formula grants recognize the existence of additional costs that are associated with location, small size, service to part-time students, and operation in the French language.

Additional elements of the university funding system include restricted operating grants intended to support alterations and renovations and non-space (library and equipment) needs, targeted funding, and capital funding. Although the Council's efforts have been primarily oriented to development of the funding formula, the proposal also contains a number of recommendations related to support for these aspects of university operations.

With regard to the weighted enrolment grant, the Council recognizes that complete information about the relative costs of instruction in each discipline is not available. However, the analysis of cost data from Nova Scotia universities and external jurisdictions has resulted in the development of a costing model that provides a reasonable approximation of the appropriate discipline cost structure. This provides the basis for allocation of the weighted enrolment grant to individual institutions. Completion of the proposed University Costing Project may provide an opportunity for revisiting this issue when the funding formula is reviewed in 4 to 5 years.

WEIGHTED ENROLMENT GRANT

The weighted enrolment grant (WEG) accounts for approximately 91% of base funding. Its allocation to individual institutions is determined on the basis of enrolments weighted by the cost of instruction in each discipline. The enrolment data used are an average of actual enrolments for the three years ending in 1996-97. The weights were derived from a costing analysis using data supplied by some universities in Nova Scotia, together with data from a number of external jurisdictions. The weights are used by assigning each discipline to one of a number of "bins," each of which contains one or more disciplines with similar costs. Enrolments in each of the bins are then given weights reflecting the average cost of disciplines in the bin relative to the cost of disciplines in the lowest cost bin.

Indirect Costs

Since the cost data supplied by universities consisted of direct (i.e. departmental) costs only, an additional cost of \$560 per full course equivalent (FCE) enrolment was added to cover indirect costs (i.e. costs of central administration, physical plant, libraries, etc). Due to available detail costing data showing very high indirect costs, Medicine and Dentistry are exceptions to this approach.

A number of universities have expressed concerns about the assumption of fixed indirect costs of \$560 per FCE across all disciplines that was used in the development of data on discipline costs for Nova Scotia universities. In light of these concerns, the Council has investigated a number of possible approaches to developing cost estimates for Nova Scotia universities. These incorporated the assumption that indirect costs will be higher for disciplines that have higher direct costs. A review of these approaches revealed that they make little difference to the end result since the weights are also intended to reflect, in part, the experience of other jurisdictions.

For example, the range of undergraduate weights used in the weighted enrolment grant is consistent with that observed in cost data from external jurisdictions. This is also the case with respect to graduate programs. The data suggest, therefore, that although variations in indirect costs across disciplines have not been fully taken into account in the calculation of cost data for Nova Scotia, the use of external benchmarks has assured that the bin structure provides a reasonable model of total relative costs of disciplines.

The Council has therefore decided against revision of the cost data underlying the bin structure to accommodate a different approach to indirect costs. The Maritime Provinces Higher Education Commission has developed a methodology to examine the direct and indirect costs of teaching by academic discipline. If the universities in Nova Scotia implement this methodology, the Council may decide to revisit this decision if it is seen as necessary to achieve greater precision in the cost estimates and bin weights.

Revised Bin Structure

In response to concerns expressed by universities and others, the Council has thoroughly reviewed the methodology used to determine the appropriate bin structure and associated set of

weights. As a result, a simpler and more transparent approach to bin placement for undergraduate disciplines has been implemented. This approach relies on the NS data and the external system-wide data that are available from Illinois and the United Kingdom. Placement of disciplines in specific bins is based on calculation of simple averages of the data from these three sources. Qualitative factors and other available cost data (for example, that from the University of Manitoba) are also considered where appropriate. The same methodology has been applied to the review of challenges to bin placements submitted by the universities.

Table 1 provides summary information about the new bin structure. A complete list of disciplines included in each bin is provided in Attachments A1 and A2. A detailed discussion of methodology and comments on challenges to bin placements are provided in Attachment B.

Bin	Weight	Bin	Weight
<i>Undergraduate</i>		<i>Professional</i>	
Alpha	1.00	Medicine	4.00
Alpha2	1.25	Dentistry	5.50
Beta	1.50	<i>Graduate</i>	
Beta2	1.62	Epsilon	2.00
Gamma	1.75	Phi(a)	2.50
Delta	2.00	Phi(b)	3.00
		Omega	4.00

Some changes in bin placements were implemented as a result of bin challenges from specific institutions; other changes have been introduced because of rigorous application of the averaging methodology described above. The review of the bin structure has resulted in three significant changes to the weighted enrolment grant. First, it has become apparent that a significant number of disciplines in the Beta bin have costs that are intermediate between Alpha and Beta. To accommodate this, an Alpha2 bin with a weight of 1.25 has been added. Second, the weight of the Delta bin has been reduced from 2.25 to 2.00. This change is more consistent with both the NS cost data and the external data. Third, a new bin, Beta2, with a weight of 1.62, has been added to accommodate the specialized programming offered at NSCAD.

Enrolment Counts For Graduate Students

A review of cost data for graduate disciplines has revealed that the formula resulted in funding for graduate enrolments that significantly exceeded actual costs reported by Nova Scotia

universities. A limit was therefore placed on the graduate enrolments included for funding under the formula. Master's students are counted for a maximum of two years (i.e. 2 FTEs) and Doctoral students are counted for a maximum of four years (4 FTEs). Exceptions are allowed for disciplines where programs normally require a longer period of time to complete. These limits are consistent with practices in other jurisdictions and are similar to limits placed on graduate enrolment counts in the MPHEC and Ontario weighting schemes. They are also consistent with the cost data from the State of Illinois that were used in the determination of appropriate weights for graduate disciplines. In Illinois, costs are calculated on a per-credit-hour basis rather than a per-student-enrolled basis. In that situation, the assignment of a limited number of credits to the thesis component of graduate programs is equivalent to fixing limits on enrolment counts.

Fixed Revenue Assumption

The formula assumes that universities are able to generate revenues from other sources, notably tuition, to fund the costs of instruction. The minimum amount that universities are assumed to be responsible for has been set at 50% of the average cost of disciplines in the Alpha bin, or \$3,050 per FTE. The assumption is incorporated into the formula by modifying bin weights so that they reflect relative costs minus this assumed revenue.

This specification assures that changes in actual tuition will not affect the funding allocation. One of the concerns expressed during the consultation process was that associating this assumed revenue with actual tuition levels would compel changes in the formula as tuition levels changed, thus destabilizing existing distributions and contradicting one of the funding formula principles of predictability.

The fixed revenue assumption substantially reduces differences across bins in the gap between estimated costs and government funding. Also, it substantially reduces incentives for universities to introduce significant differentials in tuition fees across disciplines.

Enrolment Agreements in Medicine and Dentistry

In the late 1980s, agreements were concluded with Dalhousie University to reduce enrolments in Medicine (by 48 students) and in Dentistry (by 32 students) without any reduction in government funding. In its recent submission to the Council, Dalhousie argued that these agreements should be recognized in the funding formula by including additional enrolments in the weighted enrolment grant.

After careful consideration, the Council has concluded that the cost data used to develop bin weights for Medicine and Dentistry are derived from actual expenditures that are supported by the funding that flows from these agreements. Inclusion of the extra enrolments would therefore have to be accompanied by an offsetting reduction in bin weights. Given this, it is apparent that the agreements are already implicitly incorporated into the new funding formula. The funding formula is intended to reflect fairly and accurately the relative costs of programs as they now are.

Programs with Other Sources of Funding

A number of universities receive funding from other sources to support instruction in particular disciplines. These include the Coady Institute at StFX and Nursing programs at Dalhousie and

StFX. NSAC also receives funding from the Nova Scotia Department of Agriculture and Marketing.

The Council has considered two approaches to adjusting the weighted enrolment grant to account for enrolments that are funded from other sources. One approach would include these enrolments in the WEG with an offsetting adjustment elsewhere in the formula. This approach would imply an implicit guarantee of funding through the formula should funding from other sources be withdrawn. It was incorporated in the funding simulation that was released with the March 1997 Discussion Paper.

The other approach excludes these enrolments from the count used in the WEG. The Council's response to changes in funding from other sources should be considered when they occur, not through an automatic mechanism in the formula. Furthermore, in the case of Nursing, the first approach would not be consistent with the Department of Health's management of the supply of Health Human Resources.

Funding of NSAC by the Nova Scotia Department of Agriculture and Marketing must be considered as an exception to this rule. It is necessitated by the fact that this funding cannot be identified with enrolments in any specific discipline, but rather flows from the historic and close relationship between the Department of Agriculture and Marketing and NSAC, and their sharing of a number of services and facilities.

The Council will accept program proposals from the Coady Institute; however, unless and until the decision to exclude the Coady Institute from the funding formula is changed, the Council review and/or approval of these proposals in no way secures provincial government funding for these programs at some future time.

Co-op Programs

The March 1997 Discussion Paper did not include funding for co-op programs on the grounds that these programs should be operated on a cost recovery basis. A number of universities have questioned this approach. Accordingly, the Council has reviewed available information on the costs of co-op programs and the revenues raised by universities to cover these costs. This revealed that many, but not all, universities charge fees that approximately cover the administrative costs of the programs. It is recognized that universities may face additional costs related to faculty time required to monitor students on work terms, access to university facilities by students during work terms, etc. However, no estimates of the extent and significance of these costs are available on a reliable system-wide basis. Furthermore, recent letters from the Council of Nova Scotia University Presidents to the Minister of Education and Culture have indicated that the university presidents are not comfortable with any system-wide approach to co-op education programming and financing, and each institution prefers to make its own decision about how such programs are organized and funded. Accordingly, the Council has decided not to include the costs associated with organizing work terms for students in co-op programs for funding under the formula.

Corridors

Most universities have expressed general support for the use of corridors as a means of managing changes in funding consequent on changes that take place in enrolment over time. They provide stability to university funding, and make it possible to ensure that enrolment growth at one institution will not be funded at the expense of others.

Concerns that have been raised relate to:

- ▶ the need for detailed information about how the corridor mechanism will be applied in practice, and in particular, how it will accommodate enrolment growth at particular institutions; and
- ▶ the concern that normal fluctuations in enrolment may trigger reductions in funding.

In light of these concerns, the Council proposes that a single enrolment corridor be established for each institution. This corridor will be based on the three-year average of weighted full course equivalent enrolment (WFCE) used in the formula at its inception. Enrolment change over time would be measured by a three-year moving average of WFCEs.

An increase in enrolment will have no effect on funding unless there is a specific agreement by government to fund this growth by adding money to university operating grants or using targeted funds to support the growth of one program while another is deliberately reduced. This approach does not prevent universities from expanding existing programs or developing new ones; it simply ensures that growth at one university is not done at the expense of others.

Likewise, a decline in enrolment below the level used in the formula will not affect funding as long as it does not exceed 5%. A decline that is greater than 5% will, however, initiate a review process. It is recognized that fluctuations in enrolment over time may result in temporary declines that exceed the 5% limit, particularly for smaller universities. However, it is expected that the use of three-year averages will minimize the frequency of this occurrence. Furthermore, the review process will include an assessment of the nature of the decline and prospects for recovery of enrolment. The 5% limit is consistent with, if not more generous than, corridor mechanisms in place in other jurisdictions. Ontario, for example, has a 3% corridor.

Corridors will be reviewed on a regular basis (every 4 to 5 years). This review will be done in the context of optimum levels of enrolments for the post-secondary education system in Nova Scotia. Institutions should not assume that their growth will retroactively be rewarded.

International Students - Differential Fees

Under present funding arrangements, institutions are required to charge differential fees to international students and remit \$1,700 per full-time equivalent international student to the Maritime Provinces Higher Education Commission (MPHEC) for redistribution among all Nova Scotia institutions as part of university operating grants. Certain students, such as those

sponsored by international development agencies and the children of diplomats, are exempt from paying this fee.

The proposed funding formula released in March 1997 suggested that differential fees be replaced by a \$1,700 funding reduction for all international students, with no exceptions. The logic of this proposal was that it would allow institutions greater freedom to establish their own fee policies for international students.

Written responses from some universities have challenged elements of this approach. Some have objected to removal of the exempt category or have argued that there should be no funding reduction for international students; others have suggested different approaches (such as a reduction based on program costs).

After careful consideration of comments received from the universities, the Council continues to recommend elimination of differential fee requirements but has decided to remove the funding reduction from the funding formula proposal. This decision clearly indicates Nova Scotia's commitment to the international marketing of its institutions and negates the need to ensure "exempt" status for appropriate groups of students. It also provides a substantial incentive to the recruitment of international students up to the funded limits (described below).

International Students - Funding Limits

The funding formula proposal continues to recommend that, for funding purposes, enrolment limits for international students be set at 10% of undergraduate enrolment and 30% of graduate enrolment. Universities are free to enrol international students beyond these limits; however, they will not receive any public funding. These limits are proposed for a variety of purposes/reasons:

1. With the elimination of differential fee requirements, universities may charge and retain whatever fees the international student market will bear. The enrolment limits prevent institutions from recruiting international students to the exclusion of domestic students.
2. Different limits have been set for undergraduate and graduate programs to recognize the different impact of international students on the two programs. While all international undergraduate students enhance the educational environment and should receive public funding, it is well recognized that graduate international students play a greater role at institutions across the world. A limit of 30% recognizes the importance of graduate international students while ensuring that there is sufficient domestic demand to warrant public investment in graduate programs. Lowering the enrolment limit, to 15% for example, could result in the destabilization of some of Nova Scotia's graduate programs and universities.

It is important to note that these limits are applied at the institutional level. Some programs may exceed the limit without a loss in funding as long as the limit is not exceeded for the entire

university. However, the Council reserves the right to review individual programs where international graduate student enrolments exceed 50% to determine if it is still in the public interest to provide public funding to international students beyond these amounts.

Enrolment Audits

The weighted enrolment grant is based on full course equivalent enrolments (FCEs), weighted and allocated to bins according to average program delivery costs. Using this approach, institutions with large numbers of students and more expensive programs will receive a proportionately larger share of funds. Enrolment audits are conducted in other jurisdictions, such as Ontario and British Columbia, where funding is based on a system of student enrolments and program weights.

Given the enrolment-driven approach to the funding formula, the Council will audit enrolment data submitted by the institutions. Audits will be conducted as soon as possible after the Council's recommendations are accepted by government.

The Grants & Audit Division of the Nova Scotia Department of Education and Culture has agreed to assist the Council in this process. It will be as straightforward and non-invasive as possible, but is essential to ensure that enrolment data used in the formula are accurate.

RESEARCH GRANTS

Indirect Costs of Peer-Adjudicated Research

The grant to cover the indirect costs of research funded by the granting councils has been reviewed in light of a number of issues raised by the universities. The March 1997 Discussion Paper proposed that funding be set at 40% of the value of grants from Social Sciences and Humanities Research Council (SSHRC), Natural Sciences and Engineering Research Council (NSERC) and the Canada Council of the Arts, and 30% of the value of grants from Medical Research Council (MRC) and National Health Research and Development Program (NHRDP). These rates were based on the analysis contained in a paper by Mireille Brochu* and are a conservative estimate of actual indirect costs. The rate for medical research was set at a lower level because a significant part of this research is conducted in hospitals. A three-year rolling average of data provided by the granting councils will be used to calculate the value of grants eligible for funding.

Dalhousie has provided additional information on grants for medical research which allows for a more detailed determination of the extent to which hospitals, as opposed to universities, support the indirect costs of this research. As a result of a review of this information, the rate for medical research has been increased to 34%.

*Mireille Brochu, "*Indirect Costs on Federal Research Contracts to Universities*", Discussion paper prepared for the Canadian Association of University Research Administrators and Industry Canada, April 1996.

A number of universities have also argued in favour of extending coverage of this element of the funding formula to include other grants. Dalhousie has indicated that grants from the Heart and Stroke Foundation are peer-adjudicated and do not cover indirect costs. NSAC has also indicated that most of the grants it receives for contract research do not provide adequate funds to cover overheads. These arguments are supported by data on contract research provided by the universities. In light of this information, the Council considered extension of the grant to cover the indirect costs of research for funding from other sources; however, because of current fiscal restraints, it agreed to limit coverage of indirect costs to grants from SSHRC, NSERC, MRC, NHRDP and the Canada Council, as was outlined in the original proposal.

Concern has also been expressed about the possibility that an increase in sponsored research could result in a reduction of funding available through the WEG to support instruction. To avoid this, it is proposed that the value of this component of the funding formula be capped at \$7.3 million for now. This corresponds to the 40%/34% funding for peer-adjudicated grants reported by the granting councils for the three year period 1994-95 to 1996-97.

Should there be significant additional money available to the university system, the Council considers that increasing support for the indirect costs of research, in conjunction with a new Research, Development and Innovation Policy being developed for the province, would be one of the critical ways of making Nova Scotia more competitive nationally and internationally.

Incentive for Contract Research

The original funding formula proposal included an incentive to encourage universities to increase their contract research activities. It suggested that universities initially receive funding equal to 3% of the value of their research contracts, and that this be increased to 10% over a three-year period.

From July to September 1997, meetings were held with university representatives to discuss issues surrounding the contract research incentive; however, they were unable to reach a consensus on this component of the funding formula. Some universities were supportive of the original proposal while others did not want any funds taken from what they felt was already inadequate base funding.

After careful consideration, the Council has agreed that it is inappropriate to fund an incentive for contract research until base funding is adequate. When the base is adequately funded, this issue will be revisited. Since contract research acts as an economic catalyst for the provincial economy, the Council asserts that funding to support contract research should also be provided by other government departments (eg. the Department of Economic Development and Tourism). The nature of the research that will be supported, and the form that this support will take in the future, will benefit from planned consultations on research policy in Nova Scotia.

EXTRA-FORMULA GRANTS

Extra formula grants provide funding to recognize costs specific to individual institutions or groups of institutions. Some of these grants are based on the weighted enrolment grant because it is this component of the formula that determines the "basic operating grant" for each institution.

Isolation Grant

The Council sought and considered advice from the university community on the appropriateness of the isolation grant proposed in a previous discussion paper. This was set at 5% of the weighted enrolment grant of each institution located outside the Metro area. These institutions submitted estimates of isolation costs that totalled in excess of \$5.5 million (compared to proposed funding of \$2.3 million). Metro institutions, while accepting some of these claims, noted that there are other costs that are higher for Metro institutions, including those associated with participation in Metro initiatives and the overall cost of living. In effect, the Metro institutions argued that there were some offsetting savings for non-Metro universities.

An accurate assessment of the costs of operating universities outside Metro relative to costs in Metro would require a detailed audit. This would consume considerable resources of the universities and the government and might still not result in a consensus on appropriate cost differentials.

In recognition of the undisputed assertion that, on balance, costs associated with operating outside of Metro are higher, the Council proposes that the isolation grant be retained in the formula. However, given the difficulties associated with developing a reliable and broadly acceptable measure of relative costs, the Council proposes that the isolation grant be replaced with a block grant of \$1.5 million. Based on recent feedback from the universities, the Council recommends a revised distribution of this block grant, as follows:

Acadia	\$350,000
NSAC	\$150,000
St. FX	\$350,000
UCCB	\$500,000
USA	\$150,000

This distribution attempts to recognize the impact of location, institutional size and program offerings on isolation costs.

Size Grant

A recent study of university costs provides evidence of diseconomies of scale for small institutions (Vaughan Dickson, "Cost Determinants in Canadian Universities", *Canadian Journal of Higher Education*, XXIV-1, 1994, pp. 88-99). These diseconomies are greater for smaller institutions and are most pronounced for institutions with enrolments of less than 1,000 FTEs.

To recognize these diseconomies, and the higher costs per student that they imply, the proposed formula includes an extra-formula grant for size. This is set at an additional 10% of the weighted enrolment grant (WEG) for qualifying institutions. Furthermore, to avoid a disincentive to the expansion of enrolment beyond the point where an institution would be eligible for this grant, a "sliding scale" has been established. Institutions with enrolments below 800 FTEs would receive an additional 10% of their WEG to assist them with diseconomies of scale. For every 100 FTE increase, this grant would decrease by 2%. Because of its ability and practice to share administrative structures with Dalhousie, the University of King's College is not eligible for extra funding under this category.

While the Council recognizes that additional costs faced by very small institutions may exceed the amount of funding provided by this grant, it does not believe that it is in the best interests of the system or individual institutions to provide additional funding beyond this sliding scale grant. These institutions should seriously consider alternate means of making administrative savings through new relationships with other universities or institutions in the communities in which they reside.

While the Dickson study also implied that diseconomies may exist for institutions of intermediate size in Nova Scotia, the Council proposes that the eligibility limits for this grant not be extended. Diseconomies for institutions in this size range are likely to be minimal. The Council believes that its approach appropriately tailors the size grant to Nova Scotia conditions.

In an effort to maintain as much base funding as is appropriately possible, this 10% funding will be based on the universities' operating grants under the new funding formula with an envelope of \$175 million, irrespective of whether the operating base is increased. This approach strikes a balance between the extra funding needed to compensate for diseconomies of size and sufficient base funds for the system.

French Language Grant

There are differential costs incurred by an institution which provides programs and services in French within a predominantly English-speaking province. Based on new information received from Université Sainte-Anne on costs associated with operating a Francophone university in a predominantly English province at the Université Sainte-Boniface, the Council now recommends that the Université Sainte-Anne receive a French Language Grant equal to 15% of its WEG as a part of its unrestricted operating grant (rather than the 10% previously proposed). The Council encourages Université Sainte-Anne to seek an additional 15% federal contribution through the Official Languages in Education (OLE) Program.

As with the size grant, in an effort to maintain as much base funding as is appropriately possible, this 15% funding will be based on Université Sainte-Anne's operating grant under the new funding formula with an envelope of \$175 million. This approach strikes a balance between the extra funding needed for this university and sufficient base funds for the system.

Part-time Student Grant

Some institutions have asserted that the formula does not adequately recognize that some costs (e.g. student services, registrar's office, etc.) are a function of enrolments by headcount, and therefore, that greater numbers of part-time students impose greater costs.

Enrolment data show that AST, MSVU and SMU have part-time enrolments, relative to full-time enrolments, that are significantly above the system average. All other institutions have part-time enrolments that are below the system average. In addition, high levels of part-time enrolments indicate an institutional mission or mandate with a focus on part-time students and the infrastructure necessary to accommodate them fully, thereby increasing average costs. For these reasons, application of the part-time student grant has been limited to the three institutions with above average part-time enrolments. UCCB's claim that it should be eligible for the grant has, therefore, not been accepted.

The Council has based the part-time student grant on information contained in a study by Vaughan Dickson,** which suggests that a one percentage point increase in part-time student enrolment, as a percent of full-time enrolment, results in a 0.19% increase in administrative costs. Given that, on average, administrative costs account for about 10% of total costs, it is possible to use this estimate to determine cost differentials, relative to the system average, that are associated with high levels of part-time enrolments. These calculations are used to determine the part-time student grants, totalling \$154,000, that are incorporated in the formula. As in the case of other extra-formula grants, the value of these grants will be fixed (based on current enrolments and system funding).

MSVU has recently provided the Council with the results of an analysis of part-time student costs at an Australian university which suggest that the actual costs associated with part-time enrolments may be substantially greater than the costing included in the formula. This study provides a thorough and substantive analysis of the cost differential as it applies to a particular university. The difficulty with using the results in the formula is that no information is available about the extent to which the results can be taken as typical for all universities and therefore applicable to the Nova Scotia context. This will be a critical issue to be resolved as the Council works with MSVU to come to a better understanding of the results of the formula and the operations of that institution. The Council regards a full-fledged study of the costs of part-time students as necessary. Should this reveal that any institutions have been inequitably treated, the Council would use targeted funding to address the imbalances.

**Dickson, Vaughan (1994) Cost Determinants in Canadian Universities, *The Canadian Journal of Higher Education*, Vol. XXIV-1, 88-99. Although this study did not demonstrate a relationship between overall average costs and the percentage of part-time enrolments, it did demonstrate the existence of a statistically significant relationship between administrative costs and part-time enrolments. It is this latter relationship that has been modelled in the funding formula. There is no reason to believe that universities with a high percentage of part-time students will find savings in other areas of their operations that would offset these additional administrative costs. The fact that the relationship is not apparent when examining overall average costs is due to complexity of the determinants of these costs and to the limited sensitivity of the analytic procedures used in the Dickson paper.

Stewardship of an Academic Community Resource

The March 1997 funding formula proposal suggested that funding for academic community resources be allocated as an extra formula grant. Stewardship, in this case, was defined as "management for others". It was suggested that the funding formula could provide support for the management of a specific university resource, when that resource was provided by one university, but used by many or all of the students and/or universities in Nova Scotia. Such funding might provide an incentive for rationalization of costly services, where appropriate.

However, given the level of support from the universities for the funding formula to maintain as much funding as possible in the base operating envelope, the Council has agreed to delay implementation of this grant until sufficient financial resources are available to support such a grant without negatively impacting on the operating resources of Nova Scotia's universities.

RESTRICTED OPERATING GRANTS

Restricted grants are currently divided into two categories: alterations and renovations and non-space (library and equipment) grants. These grants cannot be used for any other expenditures. Universities have expressed strong support for continuation of this element of the university funding envelope. The Council supports this position and recommends that restricted operating grants for alterations and renovations and non-space be maintained and that total funds made available for these purposes be increased in line with any increase in total unrestricted operating grants allocated by the formula.

The Council also recommends that the accountability requirements for management of restricted funds be reduced in order to increase university management autonomy. The restricted grant will be paid to each university in two installments over the course of the fiscal year. The Council will recommend to the Minister of Education and Culture that he require an annual audit report to demonstrate that at least this amount was spent on alterations and renovations and non-space. This will simplify reporting relationships and minimize unproductive exchanges of information.

TARGETED FUNDING

Targeted funding is intended to support innovative and cooperative initiatives on the part of universities, and to create incentives to encourage implementation of clearly identified provincial and regional priorities. The Council is mindful of government's desire to have this pool of funding available to respond to potential innovations in the university system, and to initiate change and collaboration among the universities. The March 1997 Discussion Paper proposed that targeted funding be set at 3% of total university funding in 1998-1999 (about \$5.4 million), increasing to 5% of funding in 2000-2001 (about \$9 million).

Universities have expressed serious concern that the amount of funds dedicated to targeted funding is so high. These concerns are rooted in the belief that there is presently insufficient operating funds, and that targeted funds, while desirable, are secondary to ensuring the fiscal stability of the university system.

The Council shares these concerns and has now concluded that, for the next few years, targeted funding will be limited to an amount equal to existing commitments plus \$2 million. For 1998-

1999, existing commitments include funding to Dalhousie, Acadia and UCCB for Computer Science and Information Technology; StFX for Aquatic Resources; Dalhousie for the Transition Year Program; SMU for the Atlantic Centre for Disabled Students; and UCCB for the Native Studies Program. These commitments total \$2.95 million. Total targeted funding for 1998-1999 will therefore be set at \$4.95 million.

The Council reminds the university system that without some targeted funding there will be no additional money available to respond to projects, innovation or approved program expansions in any of the institutions.

Accessibility

Historically, \$150,000 in targeted funds for access has been evenly distributed to Saint Mary's for the Atlantic Centre of Support for Disabled Students, to Dalhousie for the Transition Year Program, and to UCCB for the Mi'kmaq Students program. In 1997-98, the Council Finance Committee agreed to provide a total of \$150,000 to Saint Mary's as a one-time grant, pending development and review of a business plan for the Atlantic Centre. This \$150,000 included \$50,000 transferred from the Department of Community Services.

The Council asked each of three universities to prepare a business plan for its accessibility programs outlining factors such as projected costs, number of students and alternate funding sources. At this time, the Council has received and reviewed the business plan from Saint Mary's University, but not from the other two universities. Based on its review, the Council has agreed to increase funding for the Atlantic Centre of Support for Students with Disabilities to \$300,000 annually, beginning in 1997-98. This increased funding is predicated on the assumption that overall funding for the universities will not decline. If this assumption proves incorrect, the funding increase for the Atlantic Centre may have to be reviewed. Once the business plans from Dalhousie University and the University College of Cape Breton have been submitted, they will receive consideration from the Council.

In addition, the Council sought advice from the universities on a new approach to accessibility funding for disabled, African-Canadian and aboriginal students. Replies from the universities indicate a wide spectrum of responses, from funding only disabled students that attend Saint Mary's and not providing funding to other accessibility groups, to funding all students from all accessibility groups at all institutions, to expanding the accessibility groups to include women. It is not feasible to distribute funds to universities on a per eligible student basis as many eligible students are not identified as such to the universities; therefore, the Council recommends that the funding formula continue to distribute accessibility funds on the basis of block grants to the three existing programs. These programs meet currently identified accessibility needs of university students. New programs may apply for funding through the Council if service gaps are identified.

As part of this approach to accessibility funding, universities will be required to ensure that all future capital requests include physical accessibility as part of their capital construction requirements.

IMPLEMENTATION

During the deliberations of the Council, it has become abundantly clear that there is a real and pressing need for additional funding of the university system. Cuts in government funding over the past few years, although necessary given the fiscal situation, have resulted in an alarming increase in tuition levels. While this has been the case across Canada, Nova Scotia now has the highest tuition fees of any province, and student debt loads for some are reaching unprecedented and unmanageable levels.

Furthermore, the Council often found itself having to weigh the needs of research intensive institutions against those with a primary mission for undergraduate education. The Nova Scotia university system needs both. If government wishes to continue with the present number of institutions in their present configurations, and also expects the universities to deliver on their diverse mandates and missions, then the level of funding to the system must be increased.

Based on these factors, the Council recommends that implementation of the funding formula be accompanied by a substantial increase in funding. Specifically, the Council proposes that base funding, consisting of unrestricted operating grants (allocated by the formula) and restricted operating grants, be increased to \$198.8 million as quickly as possible. The Council also recommends that no university should receive a reduction in funding as a result of implementation of the formula. Universities will also be required to make every effort to keep tuition increases to a minimum.

The formula allocation of unrestricted operating grants with base funding of \$198.8 million is shown in Attachment C. Table 2 summarizes the changes in unrestricted operating grants for each university that would occur as a result of the proposed introduction of the formula and increase in system-wide funding. It should be noted that grants are calculated using preliminary enrolment counts provided by each university and are subject to change based on enrolment audits.

BLE 2				
University	Unrestricted Operating Grants (1997-1998)	Proposed Formula Funding	Change	Percent Change
Acadia University	\$17,650,363	\$20,133,501	\$2,483,138	14.1%
Atlantic School of Theology	\$667,818	\$758,814	\$90,996	13.6%
Dalhousie University	\$85,439,789	\$94,144,286	\$8,704,497	10.2%
Mount Saint Vincent University	\$12,061,327	\$12,061,327	\$0	0.0%
N.S. Agricultural College	\$3,235,799	\$4,258,204	\$1,022,405	31.6%
N.S. College of Art and Design	\$3,814,965	\$4,775,197	\$960,232	25.2%
Saint Mary's University	\$15,591,938	\$19,097,356	\$3,505,418	22.5%
Saint Francis Xavier University	\$12,674,880	\$16,725,019	\$4,050,139	32.0%
University College of Cape Breton	\$10,572,683	\$13,501,809	\$2,929,126	27.7%
University of King's College	\$2,040,466	\$2,854,876	\$814,410	39.9%
Université Sainte-Anne	\$2,515,051	\$2,836,280	\$321,229	12.8%
Province Total	\$166,265,079	\$191,146,668	\$24,881,589	15.0%
Notes:				
1. Actual funding for 1997-98 has been reduced by the differential fees paid by international students and remitted to government.				
2. Formula funding is calculated using preliminary enrolment data provided by each university and is subject to change based on enrolment audits. Dalhousie University has not yet provided graduate enrolment data based on limits established by the Council.				

MSVU is the only university that would, under a strict application of the formula, experience a decline in its unrestricted operating grant. Neither the Council nor MSVU have been able to identify the reasons for this. To avoid a reduction in funding, the Council recommends that the unrestricted operating grant (adjusted for international student differential fee remission) for MSVU be fixed at its 1997-1998 level. The Council stands ready to work with MSVU to determine the factors that have contributed to this result.

As discussed above, the Council also proposes that restricted operating grants be increased. Each university would receive an increase equal to the percentage increase in total unrestricted operating grants. Table 3 summarizes the distribution of base funding once the Council's proposals are fully implemented.

TABLE 3

University	Unrestricted Operating Grants	Restricted Operating Grants	Total Base Funding
Acadia University	\$20,133,501	\$899,763	\$21,033,264
Atlantic School of Theology	\$758,814	\$32,898	\$791,712
Dalhousie University	\$94,144,286	\$3,764,456	\$97,908,741
Mount Saint Vincent University	\$12,061,327	\$530,567	\$12,591,894
N.S. Agricultural College	\$4,258,204	\$77,792	\$4,335,996
N.S. College of Art and Design	\$4,775,197	\$218,775	\$4,993,972
Saint Mary's University	\$19,097,356	\$805,260	\$19,902,616
Saint Francis Xavier University	\$16,725,019	\$727,210	\$17,452,229
University College of Cape Breton	\$13,501,809	\$450,871	\$13,952,680
University of King's College	\$2,854,876	\$100,652	\$2,955,528
Université Sainte-Anne	\$2,836,280	\$98,481	\$2,934,761
Province Total	\$191,146,668	\$7,706,726	\$198,853,394

Notes:

1. Formula funding is calculated using preliminary enrolment data provided by each university and is subject to change based on enrolment audits. Dalhousie University has not yet provided graduate enrolment data based on limits established by the Council

Implementation of these proposals will require a substantial additional commitment of government funds. Increases in fiscal targets for assistance to universities set out in Government by Design are intended to support increases in targeted funding. The Council proposes, however, that the planned increase in targeted funding be delayed in order to respond to the urgent need for additional base funding.

Attachment A1

Program Bins and Weights - Undergraduate FCEs

ALPHA (WEIGHT 1.00)

Anthropology
Art
Arts & Soc. Sci.
Asian Studies
Atl. Canada Studies
Bus. Admin.
Bus. Tech. (Other)
Bus. Tech. (Office Admin.)
Cdn Studies
Celtic Studies
Classics
Communications
Comp. Religion
Economics
English
Folklore
French
Geography
German
Gerontology
Greek
Health Services Admin.
History
Humanities
Humanities Tech.
Immersion
Interdis. Studies
Int'l Dev.
Irish Studies
Latin
Mathematics
Mi'kmaq
Modern Languages
Music Theory
Natural Science
Nursing (StFX Distance Ed)
Philosophy
Political Science
Psychology
Public Admin.
Russian
Sociology
Spanish
Theology
Women's Studies

ALPHA2 (WEIGHT 1.25)

Adult Education
Applied Science/Eng. General
Architecture
Bus. Tech. (Computer)
Child & Youth Study
Computer Science
Education
Food Science
Human Ecology
Info Management
Law
Physical Education
Public Relations
Recreation Management

BETA (WEIGHT 1.50)

Agricultural Engineering
Ag. Eng. Tech.
Biology
Biology Technology
Bus. Tech. (Hosp. Admin.)
Tourism & Hospitality
Community Studies
Interdepartmental (NSAC)
Fine Arts
Pharmacy
Social Work

BETA2 (WEIGHT 1.62)

NSCAD Undergraduate
NSCAD Graduate

GAMMA (WEIGHT 1.75)

Animal Science
Animal Science Tech.
Chemistry
Chemistry Tech.
Drama
Earth Sciences
Engineering Technology
Geology
Journalism
Nursing
Nursing (Outpost)
Physics
Physics Tech.
Physiotherapy
Plant Science
Plant Science Tech.
Science
Theatre

DELTA (WEIGHT 2.00)

Engineering
Environmental Science
Health Professions
Music
Occupational Therapy
Oceanography

MEDICINE (WEIGHT 4.00)

MD/PhD
Medicine
Anatomy
Biochemistry
Pathology
Microbiology
Pharmacology
Physiology & Biophysics
PGM
Community Health & Epid.

DENTISTRY (WEIGHT 5.50)

Dentistry
Dental Hygiene

Attachment A2

Program Bins and Weights - Graduate FTEs

EPSILON (WEIGHT 2.00)

Business Administration
Combined LLB/Master's degrees
Divinity
Education
Engineering
Geography
Health Services Administration
Human Communications Disorders
Human Ecology
Library Science & Information Science
Marine Management
Public Administration
Social Work
Theological Studies
No Major Reported

PHI(A) (WEIGHT 2.50)

Adult Education
Agriculture
Art Education
Atlantic Canada Studies
Biology
Classics
Developmental Economics
Economics
Education
Fine Arts
Health Education
History
Human Ecology (MA)
Humanities
Interdisciplinary Studies
International Development
Kinesiology
Languages
Law
Pharmacy
Philosophy
Phys. Ed., Recreation and Leisure Studies
School Psychology
Social Sciences
Theology
Urban and Rural Planning
Women's Studies

PHI(B) (WEIGHT 3.00)

Applied Science
Architecture
Astronomy
Chemistry
Computer Science
Earth Sciences/Geology
Environmental Studies
Mathematics & Statistics
Nursing
Nursing/Health Services Admin
Oceanography
Oral Surgery
Physics
Physiotherapy
Psychology
Science

OMEGA (WEIGHT 4.00) PhD Only

Law
Biology
Chemistry
Classics
Computer Science
Divinity
Earth Sciences
Economics
Engineering
English
French
History
Interdisciplinary Studies
Mathematics
Oceanography
Pharmacy
Philosophy
Physics
Political Science
Psychology
Statistics

Attachment B

The Weighted Enrolment Grant: Revised Bin Structure

UNDERGRADUATE DISCIPLINES

This attachment describes in detail the revised approach to the bin structure and the assignment of disciplines to specific bins that has been used in the development of the weighted enrolment grant. The placement of disciplines in specific bins is based on a simple average of discipline costs, using data from Nova Scotia and system-wide data from Illinois and the United Kingdom. External data that are available from individual universities are not used except in specific contexts where they are necessary to resolve inconsistencies. This reflects the recognition that costs may vary substantially from one university to another for a variety of reasons such as differences in program structure and content, university priorities and length of service of tenured faculty.

To apply this approach, a modified bin structure was introduced. Bins with weights spaced at equal intervals were established as shown in Table B1. Each discipline was then assigned to a specific bin based on calculation of the simple average of the data from the three jurisdictions. Thus, disciplines for which this simple average was between 1.38 and 1.62 would be assigned to Beta, etc.

<i>Bin</i>	<i>Weight</i>	<i>Range of Average Weights</i>
<i>Alpha</i>	<i>1.00</i>	<i>less than 1.13</i>
<i>Alpha2</i>	<i>1.25</i>	<i>1.13 to 1.37</i>
<i>Beta</i>	<i>1.50</i>	<i>1.38 to 1.62</i>
<i>Gamma</i>	<i>1.75</i>	<i>1.63 to 1.87</i>
<i>Delta</i>	<i>2.00</i>	<i>greater than 1.87</i>

Table B2 provides a summary of the cost data for undergraduate disciplines that were used to review the bin structure and set of weights proposed in the March 1997 Discussion Paper. The table provides information on costs per student for Nova Scotia, Illinois and the United Kingdom. Costs are expressed in relative terms, with the average cost of disciplines in the Alpha bin set equal to one. Thus a value of 1.5 for a specific discipline indicates that its average cost is 1.5 times the average cost of a typical discipline in Alpha.

Table B2
Summary of Undergraduate Cost Data and Revised Bin Structure

March 1997

	Discussion	SYSTEM WIDE DATA				
	Paper Bin					Implied
Program	Placement	NS	Illinois	UK	Average	Placement

ALPHA						
Communication	alpha	0.80			0.80	alpha
Social Science	alpha	0.85			0.85	alpha
Sociology/Anthropology	alpha	0.89	0.88		0.89	alpha
Philosophy	alpha	0.98	0.83		0.90	alpha
Classics	alpha	0.92			0.92	alpha
History	alpha	0.96	0.89		0.93	alpha
Psychology	alpha	0.93	0.79	1.09	0.94	alpha
Political Science	alpha	0.97	0.97		0.97	alpha
English	alpha	1.05	0.98		1.02	alpha
Art	alpha	1.02			1.02	alpha
Mathematics & Statistics	alpha	1.04	0.95	1.10	1.03	alpha
Languages	alpha	1.16	1.03	0.95	1.05	alpha
Economics	alpha	1.05	1.04		1.05	alpha
Geography	alpha	1.18	0.88	1.10	1.05	alpha
Business Admin/Management	alpha	1.02	1.15	1.18	1.11	alpha
Religious Studies/Comp. Religion	alpha	1.60	0.83		1.21	alpha2
Health Services Admin	alpha	1.34			1.34	alpha2

ALPHA2						
Public Relations	alpha	1.20			1.20	alpha2
Recreation & Phys Ed	beta	1.38	1.03		1.21	alpha2
Education	beta	1.06	1.31	1.27	1.21	alpha2
Human Ecology/Nutrition/Food Sci.	beta	1.37	1.08		1.22	alpha2
Law	beta	1.42	1.51	0.81	1.24	alpha2
Child and Youth Study	beta	1.26			1.26	alpha2
Computer Science/Information Mgmt	beta	1.29	1.36	1.37	1.34	alpha2
Engineering General	beta	1.35			1.35	alpha2
Architecture	beta	1.27	1.53	1.25	1.35	alpha2

BETA						
Biology	beta	1.28	1.24	1.88	1.46	beta
Pharmacy	beta	1.28		1.78	1.53	beta
Social Work	beta	1.96	1.21		1.58	beta

GAMMA						
Chemistry	gamma	1.56	1.30	2.10	1.65	gamma
Geology/Earth Sciences	delta	2.26	1.16		1.71	gamma
Nursing*	delta	1.84	2.09	1.32	1.75	gamma
Physiotherapy	delta	1.72			1.72	gamma
Theatre/Drama	gamma	2.16	1.36		1.76	gamma
Journalism	gamma	1.78			1.78	gamma
Physics	gamma	1.66	1.34	2.37	1.79	gamma

DELTA						
Engineering	delta	1.72	2.07	1.85	1.88	delta
Music	delta	2.33	1.87		2.10	delta
Occupational Therapy	delta	2.10			2.10	delta
Oceanography	delta	2.41			2.41	delta+

* Nova Scotia data for Nursing exclude distance education Nursing enrolment at St.FX.

Bin placements that did not rely on UK or Illinois data are not included in this table.

New Bin between Alpha and Beta

The cost data presented in Table B2 demonstrate that a significant number of disciplines that were previously in placed in the Beta bin have costs that are actually intermediate between Alpha and Beta. An Alpha2 bin with a weight of 1.25 has been established to accommodate these disciplines.

Lower Weight for Delta

The cost data also demonstrate that, with the exception of Oceanography, the relative cost of disciplines included in the Delta bin lie closer to a weight of 2.00 rather than the weight of 2.25 that was assigned to this bin in the March 1997 Discussion Paper. In the revised bin structure, the weight of this bin has been reduced accordingly. Despite its apparently higher costs, Oceanography is included in this bin on the grounds that it is not appropriate to establish a separate bin for an individual discipline with relatively small enrolments. In addition, for the institution offering this discipline, the high costs of Oceanography, relative to the weight of the Delta bin, is offset by the relatively lower costs of other disciplines included in the bin.

Placement of Individual Disciplines

Universities have also expressed concerns about the placement of a number of individual disciplines, both in response to the March 1997 Discussion Paper and the circulation of the recent draft of this document in January 1998. In cases where additional arguments and information have been provided, the Council has carefully reviewed the available evidence and, where appropriate, has made changes in bin placements. Many of the issues involved are resolved by the use of the revised costing methodology presented in Table B2. The following summarizes additional elements considered in the review of university submissions.

Community Studies

Cost data for Community Studies, which have been revised to exclude co-op work term enrolments (previously inadvertently included by UCCB), suggest placement of Community Studies in Alpha2. In addition, a review of the Nova Scotia cost data shows that, in disciplines which are offered at UCCB and other universities, costs are consistently lower at UCCB than elsewhere in the province. Use of a normalization process to take these factors into consideration results in placement of Community Studies in the Beta bin.

Religious Studies, Comparative Religion

This discipline includes programs offered at a number of universities in Nova Scotia. It does not include programs in Theology. The cost data collected for this discipline suggest its placement in Alpha2. However, the relatively high cost per FCE reported by Acadia is the result of declining enrolment. In addition, the apparent high cost per FCE at MSVU is the result of service teaching in courses whose enrolments are credited to other departments. For these reasons, the reported cost data are not an accurate reflection of the actual cost of instruction in this discipline in Nova Scotia. The Alpha bin is the appropriate placement for this discipline.

Business Administration

Saint Mary's University contends that costs associated with Business Administration warrant its placement in a higher bin. They argue that additional costs are incurred because of "significant competition" for Ph.D.s in business disciplines which require that overscale payments be made in order to attract and hold qualified faculty. They note that overscale payments in their Faculty of

Commerce average 18.6%. Taking account of the share of faculty salaries in the estimated cost of Alpha disciplines, this would imply additional costs of about 10%. These additional costs associated with overscale payments for faculty teaching Business Administration are not sufficient by themselves to warrant placing Business Administration in a higher bin.

This conclusion is consistent with the cost data presented in Table B2. Business Administration has therefore been kept in the Alpha bin.

Tourism and Hospitality Management

MSVU has challenged the placement of its Tourism and Hospitality Management program in Alpha. They note that the program involves extensive laboratory instruction and field work which require a fully equipped kitchen facility and serving area. Attempts by the Council and MSVU to obtain additional cost data from external sources have been unsuccessful. However, a review of costs of Hospitality Administration at UCCB and similar programming in the Nova Scotia Community College suggests that an appropriate placement for the MSVU discipline is the Beta bin. This discipline has therefore been placed in the Beta bin with the Hospitality Administration program at UCCB (see below).

Business Technology

In response to the recent submission by UCCB, costs of the Business Technology program have been revised to exclude enrolments in co-op work terms (previously inadvertently included by UCCB). This revision results in an estimate of costs per FCE that exceeds the average for Alpha disciplines. UCCB has argued that costs are significantly higher for three sub-disciplines of Business Technology: Hospitality Administration (relative cost 1.61), Office Administration (relative cost 1.42) and Computer Information Systems (relative cost 1.25). Averaging these costs with those of comparable programming in the Nova Scotia Community College would result in placement of Hospitality Administration in Beta and Computer Information Systems in Alpha2.

Accordingly, Hospitality Administration has been placed in Beta (with Tourism and Hospitality Management) and Computer Information Systems in Alpha2 (with Computer Science). Office Administration and other Business Technology sub-disciplines remain in Alpha. This allocation closely approximates UCCB's normalized costs for Business Technology as a whole.

Engineering Technology (UCCB)

Revisions to enrolment data used in cost calculations and the normalization of UCCB costs result in a weight of 1.54 for Engineering Technology relative to Alpha disciplines. By itself, this suggests that the Council's placement of this discipline in Beta is appropriate.

However, UCCB has provided additional cost data collected from community colleges in other provinces. This has been supplemented by additional information on system-wide discipline costs collected by the Council, including data from the Nova Scotia Community College (for 1996-97) and Alberta. Given the availability of these new data, it has been decided that the

appropriate comparators should be restricted to community college level programming. Data from Illinois and the UK have therefore been excluded from consideration.

The available data are summarized in the table below.

Relative Costs of Engineering Technology

Data Source	Cost Relative to Alpha Disciplines
Nova Scotia (UCCB and the Nova Scotia Community College)	1.42
Newfoundland	1.95
Alberta Institutes of Technology	1.70
Average	1.69

Averaging the cost data from these sources indicates that the appropriate placement of Engineering Technology is the Gamma bin.

Engineering General

The Associated Universities challenged placement of Engineering General in Alpha2. They argued that restructuring of the program (which involves a reduction in the length of the program from five years to four years and a shift in some course work from the third year at DalTech to the second year at the Associated Universities) has resulted in changes in costs and enrolments. However, despite every opportunity, the Associated Universities have not come forward with cost data to support their contention. Furthermore, a review of the new program indicates that many of the changes involve revisions to courses in Mathematics and other complementary subjects rather than Engineering General. This suggests that the Council's placement of Engineering General in the Alpha2 bin is still appropriate.

Geography

SMU has challenged placement of Geography in the Alpha bin. They present a substantial amount of evidence that explains why their costs (at 1.18 relative to Alpha) are significantly greater than costs of the discipline in Illinois. The differences result from:

- ▶ costs of maintaining a map library, which are born by the department at SMU but by libraries at the universities in Illinois for which information is available;
- ▶ costs of more extensive computer lab facilities and technical support despite significantly smaller enrolment; and
- ▶ costs of a Geography lab (which does not exist at one of the Illinois universities cited).

They justify these higher costs on the grounds that a much higher percentage of their FCE enrolment is Geography majors (33% versus 6% and 3% at the Illinois universities cited).

While SMU's costs suggest placement in Alpha2, this is not consistent with Illinois or UK data, both of which suggest placement in Alpha. An average of the three jurisdictions also leads to placement in Alpha.

Accordingly, Geography remains in the Alpha bin. This placement, however, should not be taken to imply that the program at SMU is presently over funding the program. The purpose of the funding formula is to determine the appropriate allocation of funding among universities. It is not intended for (and should not be used for) determination of the appropriate allocation among departments within individual universities.

Geology/Earth Sciences

A simple averaging of costs for NS and Illinois would suggest that Earth Sciences/Geology be placed in the Gamma bin. This bin placement is consistent with placement of other physical sciences.

Health Services Administration

This program is only offered at Dalhousie University. Costs at that institution would indicate placement in Alpha2. Comparable data from other sources are not available. A review of course descriptions indicate that program delivery is entirely in the form of two-hour lectures/seminars, indicating that there are no qualitative factors that would support moving this discipline to a higher bin. Health Services Administration is placed in the Alpha bin.

Information Management

MSVU has challenged placement of their Information Management program. This discipline is presently grouped with Computer Science in the Alpha2 bin. The MSVU submission shows that their costs (1.80 relative to Alpha) are high relative to costs of Computer Science in Nova Scotia and in other jurisdictions. However, there is no evidence to support the argument that this discipline is inherently more expensive than Computer Science. Information Management is appropriately placed with Computer Science in Alpha2.

Languages

Available cost data for French, Spanish, German, Russian and Modern Languages (separate cost data were not supplied for other languages such as Japanese and Chinese) were combined based on the assumption that all modern languages use similar program delivery methods and, therefore, differences in program costs are a factor of enrolment levels. Aggregation of cost data for Nova Scotia, Illinois and the UK for these language disciplines indicate a cost of 1.09 relative to Alpha disciplines. All modern languages, including Russian, are placed in Alpha.

Public Relations

This program is only offered at Mount Saint Vincent University. New cost data show a weight of 1.2, placing the program in Alpha2. MSVU has argued that this discipline is similar to the Journalism program at UKC and that the two should be grouped in the same bin. A review of the two programs, however, reveals that the Journalism program provides much more intensive

hands on experience than the Public Relations program. Public Relations therefore remains in Alpha2.

Social Work

Cost data for Social Work are available from Dalhousie and Illinois (where Social Work is grouped with Public Administration). Averaging of these data suggest placement in Beta. This placement is also supported by cost data from St. Thomas University in New Brunswick.

Theatre/Drama

Cost data are available from Dalhousie University and Illinois (where it is grouped in the category "Performing Arts"). As shown in Table B2, the data demonstrate that Theatre/Drama is appropriately placed in Gamma.

Art and Fine Art

StFX contends that its "Art" discipline should be counted as Fine Arts and included in the Beta bin. As they indicate, six of the seven courses offered are studio courses which justifies placement of these enrolments in Fine Arts in the Beta bin.

UCCB offers separate programming in Art and Fine Art. However, their Art courses are largely studio-based while the Fine Art courses are largely lecture-based. Their Art enrolments are therefore assigned to Fine Arts in the Beta bin and their Fine Arts to Arts in the Alpha bin.

Dentistry, Dental Hygiene

Costs of Dentistry at Dalhousie University (estimated using indirect costs reported by Dal rather than the standard \$560 per FCE) suggest a bin weight of approximately 7.75. With the exception of the University of Manitoba where costs appear high, cost data from external sources suggest that the appropriate weight is below 6.00.

Costs of Dental Hygiene at Dalhousie are substantially higher than the costs of other programs in the Delta bin. This costing is confirmed by data from the University of Manitoba. In the March 1997 Discussion Paper, this discipline was placed in Delta because these higher costs are compensated by lower costs in other disciplines that are included in the same bin. Given the lower weight now assigned to Delta, this is no longer appropriate. Dentistry and Dental Hygiene are combined in a single bin with a weight of 5.5.

Dalhousie Disciplines

In its response to the January 1998 release of a draft of this Technical Report, Dalhousie did not explicitly challenge bin placements. However, they expressed concern that revisions to the funding formula have resulted in downgrading of a significant number of disciplines that are unique to them (Engineering, Computer Science, Law, Recreation, Nursing, Physiotherapy, Earth Sciences, Music, Occupational Therapy, Dentistry, Russian, Architecture/Environmental Design Studies and Oceanography).

Their challenge relates to the Council's revised methodology which relies almost exclusively on system-wide data sources (Nova Scotia, Illinois, the United Kingdom). The Council has chosen this approach because the evidence clearly indicates that, for a variety of reasons, there are substantial variations in discipline costs per student across universities. Data from individual institutions are therefore not a reliable basis for the determination of 'appropriate' discipline cost levels.

NSAC Disciplines

Based on the cost data from NSAC and the University of Saskatchewan, Animal Science and Plant Science have been placed in Gamma (rather than combined with Biology in Beta). Biology Technology is now grouped with Biology in Beta.

In the March 1997 Discussion Paper, Agricultural Engineering was grouped with Engineering General in the Beta bin. However, a review of Agricultural Engineering has revealed that there are significant distinctions between this discipline and Engineering General. Thus, while Engineering General has been moved to Alpha2, Agricultural Engineering is retained in Beta.

NSCAD Disciplines

A review of cost data from NSCAD and from other art colleges in Canada indicates that costs lie between Beta and Gamma. Given the specialized programming offered at this institution, the NSCAD data together with the external data indicate that placement in Beta would result in significant under funding, while placement in Gamma would result in over funding. Accordingly, a special bin, Beta2 with a weight of 1.62, has been established. This includes undergraduate and graduate enrolments at NSCAD.

Medicine

In assessing concerns expressed by Dalhousie about funding for the Medical School, it is necessary to keep two things in mind. First, the formula is not meant to determine funding levels for individual programs or faculties. Its purpose is solely to determine an appropriate allocation among universities. Second, the Council clearly recognizes that, at the present time, the university system is underfunded.

The appropriate weight for Medicine was determined in the same manner as other disciplines: by dividing estimated costs by enrolments and comparing this to the average cost of disciplines in Alpha. Using costs of \$26,960,118, as identified in the recent study of the Medical School^{***}, this methodology yields a weight relative to Alpha of 3.95 (rounded to 4.00).

At current funding levels this weight results in a weighted enrolment grant of approximately \$20,900,000 for Medicine. Taking into consideration funding for the indirect costs of medical research and tuition revenue, even at the minimum assumed in the formula, Medicine is at least

^{***}"Funding Issues at the Dalhousie Medical School with Recommendations," Report to the Ministers of Health and Education and Culture, January 1997.

as well funded as any other discipline. There is no reason to consider special treatment for this discipline in the formula.

Nursing

In the draft of this Technical Report released in January 1998, all Nursing enrolments were in Beta. StFX has proposed that Distance Education Nursing at StFX remain in Beta but that on-campus programs (at StFX and Dalhousie) be placed in Delta.

Initially, data provided by StFX did not include distance education Nursing enrolments. Exclusion of these enrolments from the costing calculations would result in placement of Nursing in Gamma. When these additional enrolments were added, however, estimated costs per FCE at StFX declined dramatically affecting the three-system average that was used to determine bin placement. Nursing was therefore placed in Beta.

StFX has recently submitted additional data on the costs of their Nursing programs. They provided separate costing calculations for the on-campus and off-campus components of the Nursing program which suggest placement of the on-campus program in Gamma and the distance education program in Alpha.

Most of the available cost data support the StFX argument that Nursing should be in a higher bin, although it appears that the appropriate placement is Gamma rather than Delta. Placement in Gamma also provides funding to Dalhousie that more closely approximates its costs per FCE, calculated using an average of data from system-wide sources, but excluding StFX from the NS average. The cost data submitted by StFX further suggest that the distance education component be in Alpha.

Nursing, exclusive of the StFX distance education program, is placed in Gamma. Distance Education Nursing at StFX is placed in Alpha.

Note: Because of the form in which enrolment data was submitted by StFX, some questions about the appropriate enrolment data to be used in the formula for StFX still need to be resolved. This will be dealt with during the enrolment audit.

The Continuing Care Nursing Program at StFX

Enrolments in the Continuing Care Nursing program at StFX are not currently included in the funding formula. StFX has proposed that they be added.

The Continuing Care program was established in cooperation with the NS Dept. of Health as a means of facilitating a change from employment of nurses in hospitals to employment in the community. With funding from the Dept. of Health and additional revenues it was intended that the program would become self-sustaining. However, enrolments have been low and the Dept. of Health has in recent years provided additional funds. The Council has never been involved in

funding of this program and therefore declines the StFX proposal to include enrolments in the Continuing Care Nursing program in the funding formula.

Teacher Education

MSVU has questioned placement of Teacher Education in Alpha2. The core of their argument is that this is not consistent with costing that was done in connection with the recent restructuring of Teacher Education in the province. These data, however, were not intended to provide information on discipline costing to be used in a funding formula, but were rather a temporary assessment of transition costs. The cost data that are presented describe incremental costs related to the expansion at MSVU and the movement from a one-year to a two-year format. They do not necessarily provide an appropriate basis for calculating average costs per FCE for the full program. Combining the MSVU incremental cost data with that of Acadia and StFX demonstrates an average incremental cost per FCE that is very close to the weight of Alpha2.

All of the available evidence, therefore, including external cost data from Illinois and the UK, support placement of Teacher Education in Alpha2.

Recreation Management

Costing based on data from Acadia (cost relative to alpha of 1.32), UCCB (1.24), StFX (1.17) and Dalhousie (1.66) indicated an average cost relative to Alpha of 1.38. With the exception of Dalhousie, costs for Nova Scotia universities are within the range assigned to the Alpha2 bin.

The system-wide average for Nova Scotia was combined with the Illinois data (cost relative to Alpha of 1.03) to determine placement of this discipline in Alpha2. This placement is consistent with data from all sources except for Dalhousie. Recreation Management is appropriately placed in Alpha2.

Trades at UCCB

UCCB asserts that since its university college model has been accepted by both government and the Council, and that trades training forms an integral part of this model, enrolments in these programs should be included in the funding formula. In the past, funding has been provided by the Apprenticeship Division of the Department of Education and Culture for the block release training of apprentices, and by Human Resources Development Canada for the purchase of training seats for its clients. In recent years, funding to UCCB for apprenticeship training has declined from \$800,000 to about \$200,000 as a result of a decline in enrolments. The federal government purchase of training seats is also being phased out. The Council has decided that it is not appropriate to use university operating grants to provide alternate funding of these programs. The Council would encourage UCCB to seek funding from other sources, such as the Training and Financial Assistance Branch of the Dept. of Education and Culture, if they intend to continue offering the trades program in its present form.

GRADUATE DISCIPLINES

Reliable data on graduate level costs are more difficult to obtain than those for the undergraduate level. This is the case because an analysis of how faculty time is allocated is necessary in order to separate departmental costs into undergraduate, Master's and Doctoral components. This problem is especially acute in the case of graduate programs because enrolment is low compared to enrolment at the undergraduate level. In addition, most of the available Nova Scotia data are from a single university (Dalhousie). These data use a faculty analysis of time to distinguish undergraduate and graduate costs for disciplines in Arts and Science, but it does not distinguish costs at the Master's and Doctoral levels. For these reasons, it is not possible to use the simple averaging approach that was used for undergraduate disciplines. Greater reliance was, therefore, placed on external cost data and on weighting systems used in other jurisdictions to develop the graduate bin structure and weights.

The Illinois costing data provide the most comprehensive source of information on the relative costs of graduate disciplines. It represents a system average for the 12 universities in the state. These data are summarized in Table B3, in which graduate disciplines are grouped according to the bin structure used in the funding formula. As can be seen, the graduate bin structure contained in the WEG is consistent with data from this external source.

**Table B3
Graduate Cost Data for Illinois**

	Existing Graduate Bin Weights	Average Cost of Graduate Disciplines Relative to Alpha Disciplines (Illinois)
Epsilon	2.0	2.0
Phi(a)	2.5	2.3
Phi(b)	3.0	2.9
Omega	4.0	3.6

The Illinois data include an allocation for indirect costs. As such, they suggest that, while indirect costs of graduate disciplines may not have been accounted for in the development of NS cost data, the graduate bin structure nevertheless represents a reasonable approximation of the cost structure of graduate disciplines.

The Illinois cost data do not use enrolment data to calculate costs per full-time equivalent (FTE) student. Instead costs are calculated on a per credit hour basis. This is equivalent to establishing

limits on the length of time that students can be counted for funding purposes. Master's programs typically require 32 semester hours of credit, including thesis. Doctoral programs typically require a Master's degree plus 32 semester hours of credit for course-work and preparation for preliminary examinations, and an additional 32 semester hours of credit for the thesis.

Additional information is also available from the weighting schemes used in other jurisdictions in Canada. The weighting scheme in Ontario was introduced in the late 1960s. The weights were intended to be "roughly reflective of the relative cost of programs at the time of their introduction." A small number of changes in the weights have been introduced since then. Master's level Business Administration, Health Administration and Public Administration are given a weight of 2.0, Master's level Arts and Social Sciences a weight of 3.0, Master's level Sciences a weight of 4.0, and Ph.D.s in all disciplines a weight of 6.0. The graduate categories thus have a structure similar to the graduate bins in the funding formula. By way of contrast, undergraduate weights distinguish lower level undergraduate courses (given a weight of 1.0) from upper level undergraduate courses (given a weight of 1.5), so that the average weight for disciplines that the funding formula places in Alpha is between 1.0 and 1.5. In relation to bin weights in the funding formula, therefore, Epsilon disciplines are given a slightly lower weighting and Omega disciplines a somewhat higher weighting. Weights for Phi(a) and Phi(b) disciplines are similar.

For funding purposes, the Ontario weighting scheme also establishes limits on enrolment counts for graduate students. These are equivalent to 2 years for Master's programs, and 4 ½ years for Doctoral programs *including* time spent at the Master's level.

Nova Scotia cost data, primarily from Dalhousie University, were also used in the evaluation of the graduate bin structure. The data from Dalhousie do not distinguish Master's and Doctoral costs. In addition, data from a single university must be treated with caution given the substantial variations which can occur across universities for a given discipline.

A review of graduate cost data from Dalhousie University shows that, in aggregate, costs implicit in the graduate bin structure**** exceed Dalhousie's reported graduate costs by approximately 16% if no limit is placed on enrolment counts. This result lends further support to the establishment of these limits. The Council has therefore proposed that Master's students be counted for a maximum of two years of full time study, and Doctoral students for a maximum of four years.

Criteria for Placement in Epsilon

The March 1997 Discussion Paper proposed that Master's programs without a thesis, or with a thesis worth less than 2/5 of total program credits, be included in the Epsilon bin. It has been

****For example, the WEG assumes that the cost per FCE for a discipline in Epsilon is equal to two times the cost per FCE for an Alpha discipline.

pointed out that the assignment of credits to the thesis component of programs can be somewhat arbitrary and is not standardized across universities. For this reason, the Council now proposes that this criterion be modified so that Epsilon will include all disciplines that do not have a *required* thesis.

First Year Ph.D. Students

Dalhousie asserts that first-year Ph.D. students should be in the Omega bin rather than the Master's program bins. They argue that these students are typically heavily engaged in developing thesis proposals in addition to completing course work and therefore require more intensive use of faculty time and other resources. They support their argument by referring to the Ontario weighting system in which only those Ph.D. students direct from baccalaureate programs are included in the Master's level category.

Students enrolled in Ph.D. programs at Dalhousie do not always require a Master's degree for entry. The structures of all Ph.D. programs at Dalhousie are designed to include mandatory graduate courses, seminars, examinations and a thesis component. There may be variations between arts and science Ph.D. programs, but generally the first year of a two-year Ph.D. program requires students to take graduate level courses that are similar or identical to the courses that Master's students take. It is only during the second year that they work almost exclusively on the thesis component.

Students who enter a Ph.D. program without a Master's degree are generally allowed to complete their degrees within three years. The first two years of their programs are designed to consist almost entirely of course work, with the third year being devoted to the thesis.

The balance of evidence, therefore, suggests that the preponderance of first year Ph.D. students are primarily engaged in taking courses and seminars and preparing for comprehensive examinations rather than thesis work. The Council therefore reaffirms its recommendation that Ph.D. students be included in the Master's program bins for the first year of their programs. After completion of the first year of their programs, Ph.D. students will be included in the Omega bin.

Placement of Individual Disciplines

Education

The March 1997 Discussion Paper used established enrolment corridors, rather than actual enrolments, for undergraduate Teacher Education. Corridors for graduate diploma students were included with the undergraduate corridors. The Master's program enrolment count was, however, based on actual enrolments.

It is now proposed that enrolment corridors be used at the graduate, as well as the undergraduate, level. Graduate diploma students in Education will also be placed in the Epsilon bin. The Master's programs in Adult Education and School Psychology at MSVU will be placed in Phi(a).

Urban and Rural Planning

Dalhousie asserts that the Urban and Rural Planning program should be grouped in Phi(b) with other Master's programs offered by DalTech's Faculty of Architecture. Dalhousie notes that the Ontario weighting system groups Urban and Rural Planning in the same category as Architecture, Engineering and Science. Cost data are not available to assess this claim; however, a review of program content does not support the claim that costs are likely to be comparable to those of Architecture. It requires substantially more elective course work and substantially less time in thesis preparation. Master of Urban and Rural Planning will remain in Phi(a).

Social Work

Dalhousie asserts that the Master of Social Work should be placed in Phi(b) rather than Epsilon. Dalhousie supports their claim by pointing to the high costs at Dalhousie (a weight of 3.92 relative to Alpha disciplines) and to its placement with Science disciplines in the Ontario weighting scheme. Social Work has been placed in Epsilon because it does not meet the thesis requirement for placement in a higher bin. Students have the option of completing a project or a thesis.

Weight of Phi(b)

Dalhousie refers to a number of disciplines in the Phi(b) bin for which costs are high relative to the weight of the bin. It proposes that the weight of Phi(b) be increased to accommodate this. These include Psychology, Computer Science, Earth Sciences, Physics and Social Work (which has been discussed above):

- ▶ Computer Science - The Dalhousie data do not include cost data from DalTech. When the two are combined, costs are consistent with the weight of 3.0 for Phi(b). The Illinois data suggest a weight of 2.5 for Master's level Computer Science.
- ▶ Psychology - High costs at Dalhousie are not supported by cost data from Acadia or Illinois.
- ▶ Earth Sciences/Geology and Physics - In these cases, the Illinois data do support Dalhousie's argument.

There are two disciplines in Phi(b) for which the evidence supports a higher bin weight. However, these account for under 5% of enrolments in Phi(b) disciplines at Dalhousie and do not justify a change in the weight of the bin.

CONCLUSION

The bin structure described in this document provides a reasonable approximation of the structure of discipline costs. As a result, the weighted enrolment grant provides a sound basis for the allocation of funding to universities in Nova Scotia. Completion of the University Costing Project may provide an opportunity to consider refinements and enhancements to the funding formula.

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