

Queen's University
and the Kingston Area:

AN ECONOMIC PARTNERSHIP

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UNIVERSITY

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SUMMARY

Based on a simplified version of an expenditure model developed by the American Council on Education, the *direct impact* on Queen's University of the Kingston area is estimated to be more than **\$567 million**.

That amount breaks down as follows:

- Student spending is estimated at \$207.3 million.
- Faculty and staff, after taxes, have approximately \$186.3 million to spend.
- Visitors to Queen's are conservatively estimated to spend \$6.4 million locally.
- University direct spending on local goods and services is estimated at \$36.5 million
- The School of Medicine accounts for an additional \$131.4 million in the local community.

The total of \$567.9 million, when augmented by conservative estimates of the multiplicative effects of direct spending, produces an *overall impact of just over \$1 billion*.

The number of jobs directly attributable to Queen's is approximately 4,500, which grows to **8,100** when applying a similar employment multiplier.

INTRODUCTION

The presence of Queen's University offers a wide variety of benefits to residents of the Kingston area. The hundreds of ways in which the Queen's community impacts the region have been documented in previous University publications, such as the AMS publication entitled *Limestone and Learning*, which highlighted various community-oriented services provided by Queen's students. In the *Queen's 1991 Community Report* an overview of the university's "economic, social and educational impact on Greater Kingston" was provided. Since these articles were published, the services offered to the community by Queen's students have expanded, as student numbers have significantly increased and new programs have been developed.

Through technology transfer, public relations efforts to recruit new students, and by serving as a venue for academic conferences, Queen's promotes the Kingston area to national and international audiences. In addition, due to the presence of the School of Medicine, Kingston residents have access to higher quality health care relative to other municipalities in the region. Kingston is also fast-becoming a technology-oriented area through the efforts of PARTEQ, Queen's technology transfer organization, and the Kingston Technology Exchange Centre, both of which are housed in the Biosciences Complex.

The cultural, educational and social benefits provided by the University are well documented. Less understood, however, is the economic benefit that the presence of Queen's confers upon the Kingston area. This report will focus on the impact that Queen's University has on the local economy, by examining its role as an employer and consumer of local goods and services, and the particular contributions made by different groups associated with the University.

An economic impact study was prepared in 1994 (Lohnes, 1994), based on the 1992-93 fiscal year. This report is simply a further update, using data for fiscal year 2001-02, to provide a more recent assessment of the economic impact of the University on the Kingston area.

TRENDS

What has changed in 10 years? It is difficult to summarize an entire decade but what follows is a simple synopsis.

Since the last report was written, the Ontario government (where most operating funding originates) imposed the “Social Contract” in 1993/94 and then further cut funding to universities when the “Common Sense Revolution” resulted in approximately \$17.5 million lost from the base operating budget at Queen's in 1996/97. Funding increases since then have been largely driven by enrolment growth and targeted funding aimed at rewarding universities for performance in research competition as well as graduation rates and graduate placement in the work force.

The overall impact of these government moves has been to “off load” the cost of higher education more onto the shoulders of the students. Student tuition fees represented 17.6% of the operating budget in 1992/93 and 10 years later (in 2001/02) tuition fees made up 37.3% of the operating budget. Student assistance funding (scholarships and bursaries) has also more than tripled over that time from \$5.6 million to \$18.3 million.

Despite these increases in fees, demand for university spaces has increased by virtue of increases in population (the baby boom echo) and general demand (university graduates have the lowest unemployment and earn the highest wages in society). Enrolment of full-time students has increased from 13,166 in 1992/93 to 15,259 in 2001/02 (15.9%). Province of Ontario totals for the same period show increases from 230,260 full-time students to 253,567, or 10.1%, which is a considerably lower rate of growth.

Operating funds from all sources have increased 20.6% in ten years while standard consumer measures of inflation (CPI) has increased 16.4% over the same period. The small difference in funding after inflation (0.42% per year) has tried to accommodate the growth in full-time students but the end result has been increased class sizes and reduced course offerings as well as increases in the ratios of students per faculty and students per staff.

Even with the challenging funding picture described above, Queen's has increased research and fund raising activity and still managed to increase direct spending by 79% from \$316.6 million to \$567.9 million. The overall effect has been to increase the total economic impact, after standard multipliers, from \$500 million to \$1 billion (100% increase). Employment increased from 7,000 jobs to 8,100 or 16%.

DOCUMENTING THE ECONOMIC IMPACT

While most of Queen's revenues come from outside Kingston, many expenditures are made locally. Direct spending for local goods and services, combined with faculty, staff, student and visitor spending all contribute to the economic stability of the Greater Kingston Area. In addition, the presence of the School of Medicine and its affiliated teaching hospitals benefit the community through the provision of jobs and high quality health care. PARTEQ and the Technology Transfer Centre in the Biosciences Complex have facilitated the establishment of over 20 businesses in the Kingston area, providing several employment opportunities, thereby, stimulating the local economy.

Queen's University is the largest civilian employer in the area, directly employing over 3,500 staff and faculty members (including medical staff), a payroll of **\$276.6 million** (salaries and benefits) and total revenues of almost **\$526 million**. Revenues are derived from government grants, tuition, returns on investment, funding from contract research, gifts and donations from private sources, sale of products, tuition and residence fees. The distribution of Queen's total revenue by source for the most recent fiscal year, ended April 30, 2002 is presented in Figure 1.

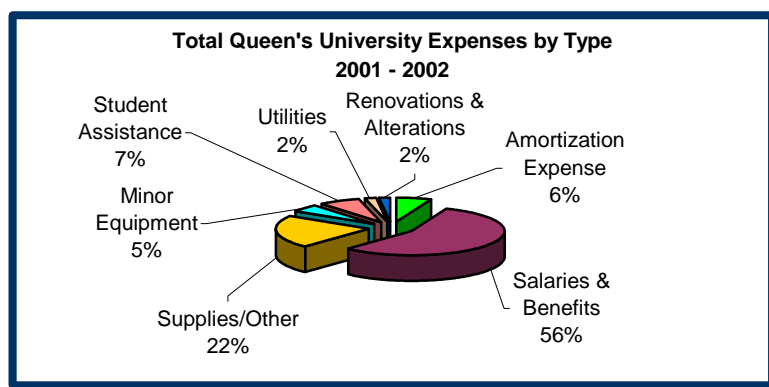
Figure 1: Revenue by Source 2001-02

Revenue by Source	Amount
Ontario Grants	\$122,884,000
Tuition	\$77,680,000
All Other Fees	\$60,508,000
Non-Government Grants & Contracts	\$166,993,000
Donations	\$22,074,000
Investment Income	\$21,801,000
Sales of Products & Services	\$25,185,000
Amortization of deferred capital contributions	\$13,007,000
Other Income	\$15,792,000
Total Revenue	\$525,924,000

Source: Queen's Annual Financial Report, 2001-02

The University uses its revenues to hire faculty and staff, purchase goods and services and to attract students and visitors. Expenses for the 2001-02 fiscal year totaled more than \$503.5 million. The major categories of expenditures and their relative sizes are presented in Figure 2.

Figure 2: Expenditures by Major Type 2001-02



Source: Queen's Annual Financial Report, 2001-02

In addition to local expenditures by the University, it is necessary to examine other factors when determining the economic impact of the University on the Greater Kingston Area. Local spending by faculty and staff, students, visitors and alumni, as well as the economic benefits generated by activities directly related to the School of Medicine and the Biosciences complex must be taken into account.

The economic impact model used in this report is a simplified version of a model developed by the American Council on Education in the early 1970s. It focuses on the expenditure flow into the local economy resulting from the university's presence.

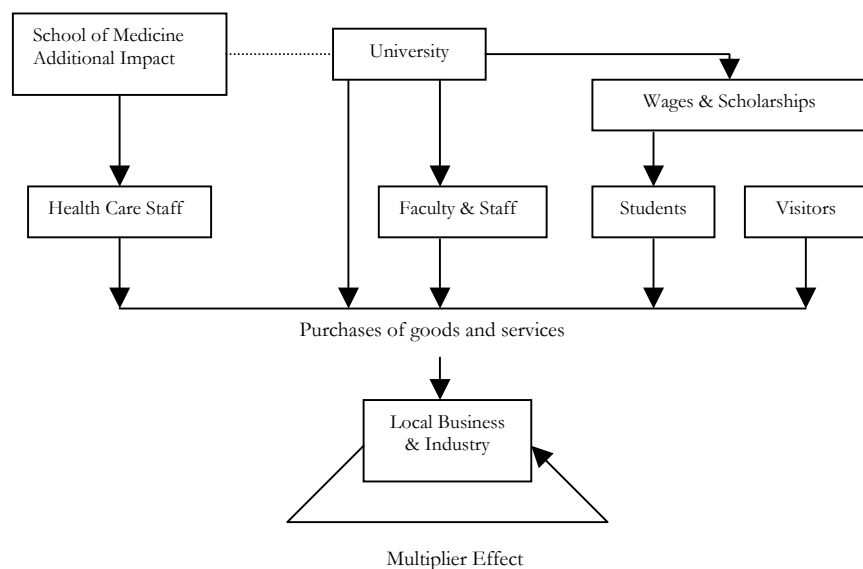
More specifically it attempts to document the initial spending in the local community from four sources:

- students
- faculty and staff
- visitors and returning alumni, and
- the university as a corporation

The figures derived for initial direct spending will be added to the economic impact of externally funded research activities and businesses associated with the Biosciences Complex and the extra funding that the School of Medicine and its affiliated teaching hospitals receive from the Ministry of Health.

Measurement of direct expenditures, however, does not adequately reflect the economic impact of the University on the community. Every dollar spent locally on goods and services circulates and re-circulates within the local economy. Therefore, the effects of original expenditures are multiplied in terms of their effect on overall economic activity (Kubursi, 1994). This is known as the multiplier effect. A value for the multiplier can be statistically derived which will account for the indirect effects of direct expenditures as they flow through the economy, providing a more accurate estimate of the true economic impact of the University. Figure 3 is a diagrammatic representation of the expenditure flow model. The various components of the model will be discussed in the following sections.

Figure 3: Simplified University Expenditure Flow Model



Source: Adapted from Caffrey, J. and Issacs, H. "Estimating the Impact of a College or University on the Local Economy," American Council of Education, 1971.

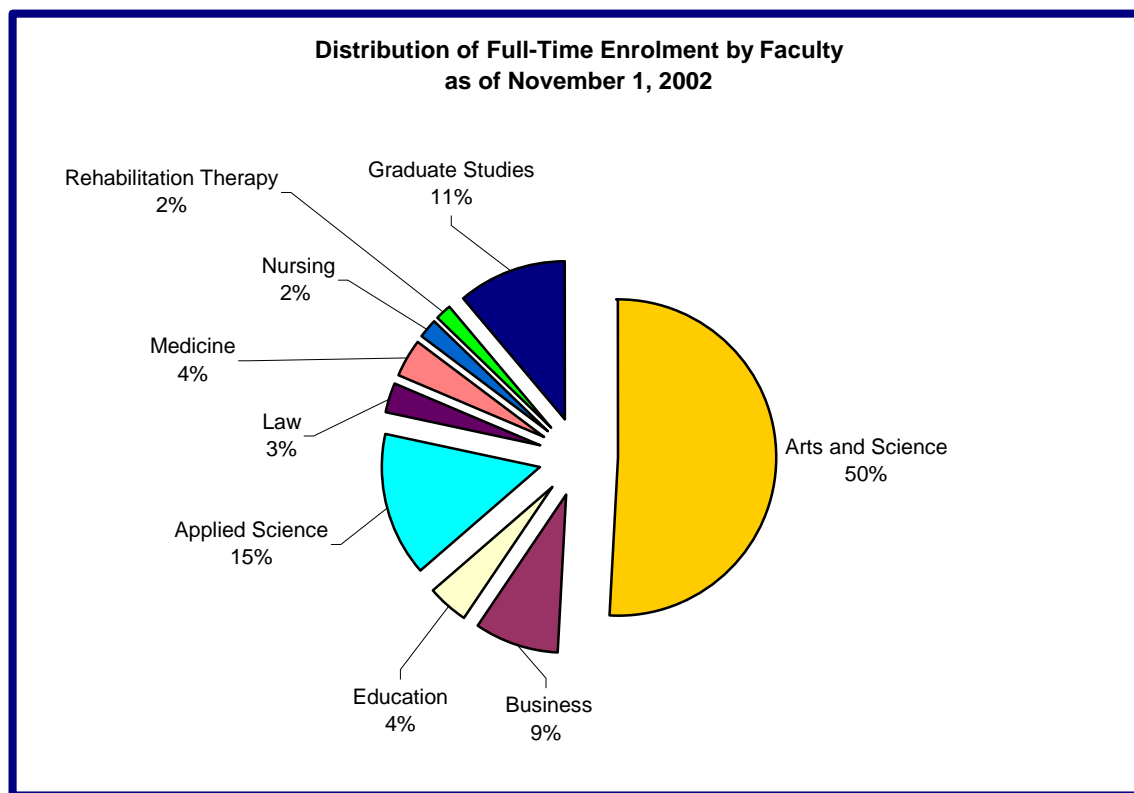
THE STUDENT CONTRIBUTION

Queen's University attracts more students from across the country (on a percentage basis) than other Ontario universities. An estimated ninety percent of full-time students are from outside of the Greater Kingston Area. Of the remaining 10%, it is estimated that half live at home with their parents, and the other half live on their own.

As of November 1, 2002, there were 15,259 full-time and 2,964 part-time students registered at Queen's, enrolled in 13 major degree programs. Figure 5 illustrates the distribution of full-time students by program.

Prior to the 1994 study, only spending by full-time students was considered relevant in assessing the economic impact of the University on the Kingston area. It was surmised that most part-time students would be in the area even if Queen's were not located here, as it was assumed that the majority of them had their permanent residence in Kingston. Thus, any economic impact that they might have on the local economy could not be attributed to the presence of Queen's. In recent years, however, it has become evident that a large proportion of part-time students (approximately one-third) are not originally from the Kingston area (Lohnes, 1994). Consequently, those out-of-area part-time students will be included in the estimate of student spending. It was also assumed that Kingston residents who are full-time students would leave the area to pursue their education elsewhere, if not for the presence of Queen's.

Figure 4: Distribution of Full-Time Enrolment by Faculty, Nov 1, 2002



To establish a reliable estimate of student spending, a number of factors must be considered. First, as the objective of the study is to determine the economic impact on the local community, student tuition fees, related academic costs for books and supplies, and other examples of on-campus student spending must be excluded from the estimates. The majority of on-campus purchases and payments have already been accounted for in the economic impact equation as they are reflected in the University's revenue and expenditure flows.

Second, the student population is by no means homogeneous. Different groups will necessarily have different spending patterns, complicating the derivation of a reliable estimate of student spending. Figure 6 shows the distribution of students by age, gender and level of program.

Finally, students experience many different types of living arrangements. Some students live in on-campus residences, some live at home with their parents, while others live in rental accommodations. Consequently, their living costs vary widely as well.

Figure 5: Distribution of Students by Gender and Age, as at November 1, 2002

Undergraduate					
	Full-Time	Part-Time	Total	% of Total	Average Age
Female	7,443	1,619	9,062	58%	22.9
Male	5,582	914	6,496	42%	22.3
Total	13,025	2,533	15,558	100%	22.6

Graduate					
	Full-Time	Part-Time	Total	% of Total	Average Age
Female	932	233	1,165	44%	30.8
Male	1,302	204	1,506	56%	31.4
Total	2,234	437	2,671	100%	31.2

University Total					
	Full-Time	Part-Time	Total	% of Total	Average Age
Female	8,375	1,852	10,227	56%	23.8
Male	6,884	1,118	8,002	44%	24.0
Total	15,259	2,970	18,229	100%	23.9

Other economic impact studies have used the monthly living expense allowances determined by government student aid programs to establish an estimate of student spending. This approach was not used in this study because it was found to be unsuitable for a variety of reasons, the most important being the living allowance determined by the Ontario Student Aid Program does not adequately reflect the true cost of living. Rather, it is intended to *supplement* a student's other source(s) of income, such as parents, spouse, and employment.

For example, the *maximum* allowable amount from the Ontario Student Aid Program for a single student with no dependents is \$275 per week, which is \$9,350 over the course of the academic year (34 weeks). The cost of a standard double room with board in residence at Queen's was \$7,411 in 2001-02. If a conservative estimate of incidental spending of \$78 per week is added for clothing, transportation,

telephone, entertainment, and sundry items, the cost for students in residence would be \$10,063, which is greater than the OSAP living allowance. It should be noted that this estimate of incidental spending does not include items such as the lease of a computer for the academic year, internet access, textbooks, and so on; nor does it include tuition and student fees. Thus the actual cost of living is even higher.

Financial assistance, both from the university in terms of loans, bursaries, and scholarships, as well as government grants and awards, therefore plays a significant role in student funding. In 2001-02, a total of 5,801 undergraduate students (46.9%) had some form of assistance, including Queen's scholarships, bursaries and loans, government loans and grants, and external awards (see figure 7).

Figure 6: Sample Student Costs of Living

Arts & Science, 1 st Year		Arts & Science, 3 rd Year		Applied Science, 1 st Year		Applied Science, 3 rd Year	
Tuition and fees	\$4,828	Tuition and fees	\$4,828	Tuition and fees	\$7,051	Tuition and fees	\$7,051
Books & supplies	\$980	Books & supplies	\$980	Books & supplies	\$2,059	Books & supplies	\$1,714
Living in residence*	\$11,280	Living in residence*	\$7,960	Living in residence*	\$11,280	Living in residence*	\$7,960
Computer lease	\$1,200	Computer lease	\$1,200	Computer lease	\$1,200	Computer lease	\$1,200
Total	\$18,288	Total	\$14,968	Total	\$21,590	Total	\$17,925

Source: Office of the University Registrar, Student Awards

*Note: Residence includes residence based on double occupancy, residence society fees, and other living expenses such as other food, transportation, recreation, clothing, and laundry.

Figure 7: Total Student Financial Assistance, 2001-02

	Queen's Assistance	Government Grants	Government Loans	All Financial Assistance
Undergraduate	\$15,033,434	\$6,148,617	\$21,464,003	\$44,011,489
Graduate*	\$5,604,889	\$10,996,216		\$16,601,105
<i>Total Full-Time</i>	<i>\$16,490,409</i>	<i>\$6,340,395</i>	<i>\$25,103,928</i>	<i>\$60,612,594</i>
Part-Time	\$645,617	\$338,891	\$1,590,988	\$2,594,799
Other**	\$110,347	\$26,045	\$45,145	\$373,287
Total University	\$17,246,373	\$6,705,331	\$26,740,061	\$63,580,680

Source: Office of the University Registrar, Student Awards, "Queen's University Financial Assistance Report 2001-02"

*Includes external scholarships, source: Institutional Research and Planning

**Interns, residents, fellows, Theology, School of English

The estimate of student spending was derived from a number of surveys conducted in past years on topics ranging from student housing to student buying habits. While none of these surveys specifically dealt with total student spending in the local community, all examined some aspect of the cost of living experienced by a particular group(s) at Queen's. Using the survey results where appropriate, and the advice of staff experienced in the student assistance area, \$12,240 has been chosen as an estimate of the average living cost associated with undergraduate students. A total average provision of \$900 must be added to reflect the May-August rents of those students not living in campus residences.

In estimating graduate student spending, it was assumed that spending equals University-derived income, which is defined as the average amount received as scholarships and employment income at Queen's. In some cases, this income may be supplemented by income from a variety of other sources, including off-campus part-time employment or spousal employment. After statutory deductions and an allowance for tuition fees, books and other related academic costs, net single graduate student disposable income is estimated to be \$12,000. (*Source: Student Awards/School of Graduate Studies.*)

In addition to undergraduate and graduate students, the spending of post-graduate trainees (residents and interns) in the School of Medicine must be taken into account. The 255 residents and interns receive stipends ranging from \$41,713 to \$68,372, depending on the year of residency. This income, after statutory deductions, is considered to be net income available for spending in the area.

To determine total student spending, estimated living costs are multiplied by the number of students and adjusted for the number of months actually spent in the Kingston area (Lohnes, 1994). Student payments to Queen's for food, housing, entertainment and miscellaneous goods and services are then deducted to arrive at an estimate for total local student spending. For the 2001-02 academic year, student off-campus local spending was estimated to be approximately **\$200 million.**

This figure does not represent the total student impact on the local economy. The economic activity generated by student organizations must also be considered. For example, the Alma Mater Society (AMS), operates a variety of services, including the Publishing and Copy Centre, Queen's Pub, and Queen's *Journal*, and employs 400 students per academic year (approximately 700 students per calendar year). The AMS had total revenues of \$7.3 million in 2001-02, of which \$4.27 million was for student and community services, including entertainment.

There are other student societies that operate services and/or are engaged in activities leading to the purchase of goods and services in the community. An example is the Queen's bookstore, operated by Queen's University Engineering Society Services Incorporated. For the 2001-02 academic year the local spending of student-operated community services and organizations was over \$7.7 million.

The student contribution to the local economy is then the sum of individual student spending (\$199.5 million) and the local business expenditures by student organizations generated by the operation of services and organizations (\$7.7 million). For 2001-02, the total figure is estimated at \$207.2 million (See Appendix A).

FACULTY AND STAFF SPENDING

In 2001-02, full-time staff and faculty at Queen's received gross salaries of \$198.6 million. Part-time employee payroll equaled \$42.7 million, bringing the University's gross payroll and benefits to **\$276.6 million**, including hospital research. Deductions for EI, CPP, the Queen's Pension Plan, income tax, and payments to students are subtracted from the total salary figure to establish an estimate of faculty and staff net personal income from the University. For 2001-02, the total figure is estimated to be approximately \$168.3 million, exclusive of the International Study Centre in England. An additional \$2.8 million in net personal income, excluding benefits, generated from food services operated by Brown's and Sodexho-Marriott Foods Services was added to this figure to determine an estimate of total net personal income derived from the University.

A point for consideration is the absence of 'other income' in the economic impact equation. As the payroll figures represent only income received from the University, estimates of income from other sources must be derived elsewhere. Statistics Canada figures suggest that, in Ontario, 'wages and salaries' account for just over 90% of total income (excluding government transfer payments such as family allowances, EI, CPP and income from self-employment). Based on this figure, 'other income' for Queen's employees would total over \$12 million. However, 'other income' has not been included in the faculty/staff estimate of net personal income because it is assumed that personal savings in excess of the Queen's Pension Plan and personal income spent outside the Kingston Area offsets such income (Lohnes, 1994).

The reference to pension contributions raises the question of including faculty and staff retirees in the economic impact equation. Annually, Queen's pays out more than \$44 million in pension benefits to 1,350 retired faculty and staff. It is estimated that there are 1,050 retirees living in the Kingston Area, receiving pension payments of about \$36 million from the University last year. It seems reasonable to include some portion of pension income as another example of the University's contribution to the local economy (Lohnes, 1994). For this study, 50% of the total was deemed a reasonable estimate of local spending for this group. Thus, a figure of \$18 million was calculated as the amount of retiree local spending that could be attributed to the presence of Queen's University.

In sum, local staff and faculty spending equals the estimated value of net personal income for faculty and staff (\$165.5 million), Brown's and Sodexho-Marriott Food Services staff (\$2.8 million) and Queen's pensioners in the local community (\$18 million) for a total of **\$186.3 million** (see Appendix B).

VISITOR SPENDING

The presence of Queen's University brings many visitors to Kingston. In addition to people attending conferences, homecoming, reunions, convocations, sporting and cultural events, the family and friends of students are frequent visitors to the community. In 2001-02, Queen's University Conference Services and the Donald Gordon Centre, which provide accommodation for many organized campus events reported 78,559 'bed nights' of accommodation for conference attendees and visitors, and a total revenue of more than \$5,893,000.

Figure 8: Conference Accommodations

Conference Accommodations, 2001-02		
Facility	Bed Nights	Revenue
Donald Gordon Centre	16,559	\$3,148,000
Conference Services	62,000	\$2,745,059
Total	78,559	\$5,893,059

Since the accommodation and meal costs of visitors using campus facilities are usually paid directly to Queen's, it is assumed that only incidental spending occurs in the larger community. Based on an off-campus spending estimate of \$35 per day, visitors would account for \$2.75 million in local spending.

The office of the University Secretariat reports that for 2001-02, there were, on average, 550 graduates and 2,500 guests for each of seven *spring* convocations, for a total of 3,850 graduates and 17,500 guests. The average number of graduates for each of the four *fall* convocations was 180, plus 1,000 guests, for a total of 720 graduates and 4,000 guests. This brings the grand total of graduates and guests to 26,070.

Alumni Affairs at Queen's reports that approximately 4,000 persons attend the Homecoming Reunion each year, with that number steadily on the rise. It should be noted that this figure does not include attendees to any other business or social events hosted by the University during the year.

The number of Kingston hotel rooms booked for the Homecoming each year is 2,500; hotels in other areas from Gananoque to Napanee are also booked, though, as they are not within the immediate Kingston area, are not directly relevant to this report.

The Kingston Economic Development Corporation (KEDCO) estimates the average overnight Canadian visitor spends \$110/day, including accommodation (an *Overview of Tourism in the Kingston Area*, February 2001). Assuming at least 60% of these visitors stay at hotels and motels, and are in Kingston for the weekend (two nights), they contribute approximately \$3.4 million to the local economy.

It is difficult to determine the contribution of the numerous friends and family who visit Queen's students and staff in a given year. However, as the expenditures of such visitors cannot be disregarded, a conservative estimate of \$0.25 million has been proposed for the purpose of this study.

A total of **\$6.4 million/year** has been chosen as a conservative estimate of the total local visitor spending which can be attributed to the presence of Queen's University.

UNIVERSITY SPENDING

For this report, expenditures have been categorized as follows: payment of wages and salaries to faculty and staff; payment of wages and scholarships to students; and, purchases of goods and services (for simplicity, municipal taxes are considered to be payment for services rendered). As faculty/staff and student expenditures have already been dealt with, this section will focus on the University's expenditures for goods and services.

An examination of expenditures to local suppliers, based on Kingston and area addresses, indicates over **\$34 million** was spent locally on goods and services provided by almost 500 businesses in 2001-02. This represents 22% of the University's spending for goods and services. The total amount paid out by the University in 2001-02 was approximately \$155 million. Of this amount, more than 90% remained in the province and less than 10% left the country for suppliers in the U.S. and Europe. This is likely an underestimation of actual local expenditures as it is difficult to determine how many local purchases may have been invoiced from a head office outside of Kingston. For example, Queen's spends hundreds of thousands of dollars for computer maintenance and leasing that is paid directly to a non-local head-office. However, the local office of the computing firm employs individuals from the Kingston area. Thus, although it is evident that some of the amount on the invoice must enter the local economy, it is difficult to determine how much.

Another example can be taken from major construction and renovation projects that have taken place at Queen's in recent years. Often the tender for such projects involves companies with head-offices outside the Kingston area, yet the construction firms employ local sub-contractors and trades people. Eastern Construction, the firm responsible for the construction of the Stauffer Library in 1994—a \$42 million project—estimated that 40% of the total construction cost and 75% of the labour cost is spent locally.

During the past year, the major construction projects on campus were the construction of Goodes Hall (the new School of Business), Chernoff Hall (the new chemistry building), two new residences, as well as renovations of various sites. Using the conservative 40% estimate from above, at least \$45 million has entered the local economy as a direct result of these projects.

As mentioned previously, Brown's and Sodexo-Marriott operate food services under contract to Queen's. Each company's management handles the accounting records associated with the purchase of food and supplies, and, therefore, they are not reflected in University local supplier figures. Information received from the Director of Food Services indicates that a total of approximately \$1.7 million is spent locally to supply the food service operations at Queen's University.

The University also paid \$2.3 million in property taxes to the City of Kingston in 2001-02, less a municipal garbage rebate of \$550,000, for a net total of \$1.8 million. Total tax revenues for the City of Kingston for that year were about \$103.3 million. Queen's direct contribution represents approximately 2% of the total, and is comprised of a payment in lieu of taxes of \$75/student and full property taxes on all University-owned rental housing, and the aforementioned garbage rebate, as the University does not use the City's garbage services. In addition, Queen's contributed \$151,000 of over \$201,000 in parking fine revenues to the City, even though the cost of patrolling the campus parking lots is borne by the University. The remainder of parking fine revenue, approximately \$50,000, went directly to Queen's.

Queen's also purchases its utilities locally. In 2001-02, the total cost of the University's utilities was \$10.5 million, of which just over \$6 million was paid directly to the City of Kingston for electricity, gas, water and sewer. (The remainder represents payments of approximately \$3.7 million to Ultramar for heating oil and \$235,000 for all utilities for the International Study Centre in England.) That contribution

to local distribution networks coupled with the volume of energy used by Queen's helps to reduce the cost per unit of energy for Kingston and area residents.

In total, the supplier information indicates that over **\$34 million** is spent locally by the University, including approximately \$7.8 million in taxes and utilities. But, as mentioned previously, because much local spending is funneled through head-offices outside Kingston, this figure is likely an underestimation. For example, Cogeco and Grand & Toy both have outlets in Kingston, but all the paperwork goes through their head-offices in the Toronto area. Thus, to more accurately reflect the local expenditure figure, the addition of 40% of the total for those supply companies having a head-office listed as being outside the area, but known to have a local office and 40% of total construction expenditures for 2001-02 was deemed necessary. The size of the figures involved indicates that this is an area that deserves more attention in future studies of the University's economic impact on the Kingston Area.

The local expenditure component is then the sum of the University's direct payments to local suppliers (\$34 million), Brown's and Sodexo-Marriott's payments to local suppliers (\$1.7million), plus an estimate of local spending based on payments to head offices outside Kingston (\$0.8 million) resulting in a total of **\$36.5 million** in consumption of local goods and services.

THE ADDITIONAL IMPACT OF THE BIOSCIENCES COMPLEX

The Biosciences Complex, a \$52 million facility completed in 1997, is equipped with some of Canada's most sophisticated laboratories for research in biotechnology and molecular science. It brings together researchers from 8 different disciplines, including agricultural management and disease treatment, facilitating research collaborations to address some of the world's most complex and pressing problems. The initiative has strengthened Queen's position as a Canadian leader in research and the transfer of technology from the laboratory to the marketplace. In 2001-02, researchers at Queen's conducted over \$69 million dollars worth of research, funded in large part by federal government research grants and industrial sources.

The Complex has brought together, via the Technology Transfer Centre, the expertise of PARTEQ Research and Development Innovations and the Kingston Economic Development Corporation (KEDCO). These two organizations are working towards developing Kingston into a more technology-oriented area, which will diversify and stimulate the local economy. The purpose of PARTEQ is to create new companies based on intellectual property developed at Queen's, known as spin-off companies. Rather than licensing discoveries to existing companies, and generating wealth and spin-off activity elsewhere, PARTEQ's aim is to establish new business ventures in Kingston for the long-term economic benefit of the community.

The success of PARTEQ-spawned companies ensures that scientific expertise stays and grows here and encourages further spin-off activity, generating wealth and employment in Kingston. Since the completion of the Biosciences Complex, 19 spin-off companies, employing more than 125 people, have been established as a result of licensed intellectual property. Examples of these companies are Vaxis Therapeutics, which recently signed a \$5 million investment deal to further research into therapies for sexual dysfunction, Performance Plants, a plant genetics company which focuses on the identification and characterization of genes and the development of new and improved plant varieties, and Neurochem Inc., a biotechnology company which identifies and develops drugs for the treatment of disease. These companies must be taken into account when assessing the economic impact of the University on the local economy, as they would not have located in Kingston but for the presence of Queen's.

THE PRESENCE OF THE SCHOOL OF MEDICINE

Funding for the School of Medicine's operations is predominantly through the Alternative Funding Plan (AFP). Government policies regarding the funding of medical programs have changed in recent years, with the result that the School has been awarded even more than previously. Currently, within Queen's 'books,' approximately **\$131.4 million** is directly related to the School, a dramatic increase from the \$51 million reported in the 1994 study.

The AFP is an agreement between the Ontario Ministry of Health and the University, Clinical Teachers' Association, and three teaching hospitals, with this agreement being in effect until December 31, 2004.

The University, Clinical Teachers' Association, and the three teaching hospitals have created the Southeastern Ontario Academic Medical Organization (SEAMO) to govern the AFP. Queen's Faculty of Health Sciences received \$66.6 million to support its mission of clinical service, education, and research. The School of Medicine is the first and only medical school to be funded on this basis.

In addition, the Faculty of Health Sciences received almost \$15.7 million from University operations to fund medical students and students in the Basic Health Sciences (not funded by the AFP). Salaries include \$42.4 million of clinical department payments to physicians from the Ontario Hospital Insurance Plan (OHIP) pool; prior to the introduction of the AFP, these payments would have been made directly to the physician as fee for service remittance from OHIP. (Source: *Queen's University Annual Financial Report 2001-02*, p. 16 and *Report on the Annual Budget 2002-03*, p. 110.)

Government funding is not the only source of funds for the School of Medicine. Restricted sources such as government agencies, private industry and donors provide funds for medical research activities and contract research. These activities fall outside the scope of the general operating fund and must be considered separately.

In 2001-02, a further \$64.8 million was spent by the School in carrying out research in a variety of disciplines. This amount represents 51% of the total sponsored research conducted at Queen's University. (Source: *Financial Report of Ontario Universities for the Fiscal Year Ended April 20, 2002*—Summary of expense by fund and functional area.)

The total additional impact associated with the School of Medicine is the sum of government basic operating funding (\$66.6 million) and the amount spent conducting sponsored research (\$64.8 million) for a total of \$131.4 million.

The economic benefit associated with the School of Medicine is overshadowed by the higher level of specialized health care enjoyed by the community and the region. The physician-to-population ratio of the Kingston area is currently more than twice the provincial norm, indicating better access to health care. A larger number of physicians also implies a higher degree of quality and specialization among the medical practitioners. The University and associated teaching hospitals attracts physicians interested not only in clinical work, but also in research and teaching. Consequently, many specialized and highly advanced treatments and medical procedures are available to local residents. For example,

- physicians who are experts in highly specialized areas;
- specialized programs for children, neonatal and pediatric intensive care, children's rehabilitation and specialized surgery;
- high-tech diagnostic and treatment equipment;
- a regional dialysis program;

- the presence of the University and its association with area hospitals encourages highly advanced medical research in a variety of fields.

The preceding section briefly illustrates the impact that the School of Medicine has on the Kingston Area. Additional effort is required to document the full extent of the indirect financial linkages between area hospitals and Queen's University, and their impact on the local economy. While the economic impact is difficult to quantify, it is apparent that the School of Medicine has a significant impact on the range and level of medical services available in the region, which translates into considerable economic and social benefit for area residents.

PUTTING IT ALL TOGETHER

Students, faculty, staff, visitors, the University as a corporation and the School of Medicine significantly influence the economy of Kingston and the surrounding area.

Directly, the University is responsible for about \$436 million in expenditures, and over 3,500 faculty and staff positions. The presence of the School of Medicine adds \$131 million in spending to the local economy and an estimated 1,000 additional jobs. Using income and employment multipliers, it is estimated that the presence of Queen's University contributes over **\$1 billion** to the local economy and provides approximately **8,100 jobs**.

A deliberate attempt has been made to keep these figures on the conservative side. But there are other factors that undoubtedly add to the economic impact of Queen's. For example, there has been no attempt to quantify the major effect of spousal income on the local economy. Many faculty, staff and students have spouses employed in the Kingston area, and their income contributes to the overall economic impact on the region.

In the case of University expenditures (Figure 9), we have examined only those payments to local suppliers based on postal addresses. While an estimate has been made of the proportion of non-local head-office expenditure that flows into the local economy, it is likely that this does not adequately reflect actual local spending.

In the long term, the economic stability provided by the University helps to offset the employment realities of business cycles. Through research and scholarship, opportunities for new business ventures are created. Over the long term, those opportunities translate into more local employment, and local production of goods and services.

The presence of Queen's University in Kingston provides a sizable dividend to incomes and jobs in the community. When this economic impact is coupled with the health-related and socio-cultural benefits, it is clear that Queen's is an important partner in sustaining and improving the well-being of the community. An understanding of the impact of the University on the community is essential if the partnership is to be strengthened and improved. This update provides a further step in that direction.

Figure 9: University Expenditures

Direct University Expenditures	Total
University	\$36,500,000
Student Operated Organizations (AMS, ENGSOC, SGPS)	\$7,715,000
Students (Off-campus spending)	\$199,565,000
Faculty/Staff (Including Retirees)	\$186,300,000
Visitors	\$6,400,000
Total	\$436,480,000
University-Related Expenditures due to the presence of the School of Medicine	
Government Funding	\$66,500,000
Sponsored Research Activities	\$64,884,000
Total	\$131,384,000
Total Direct Expenditures	\$567,864,000

MULTIPLIERS

To this point, only direct cash flows into the local economy have been examined.

However, estimates of university-related spending do not complete the picture of the influence on local economic activity. Because of the interdependence of a high consumption, mass production economy, every dollar of final goods purchased provides a flow of income to the entire chain of activity producing these goods. Since direct purchases induce additional rounds of spending, the university's total economic impact is some multiple of university-related initial spending (Salley, 1977).

A multiplier measures the total effect on the local economy of the chain reaction triggered by an initial amount of spending. For example, let us trace one dollar spent by Queen's (or an employee, student or visitor) in Kingston. The University spends one dollar on the purchase of goods or services from a local business. The business receiving the original dollar spends some of this on salaries, local taxes, overhead expenses, purchases of locally made goods, etc. The remainder is spent outside the area in payment of non-local taxes, purchases of goods elsewhere, etc. This is the first round impact.

The second round occurs when the money remaining in the community triggers a new round of spending and the cycle begins again, albeit at a reduced level. If the total successive rounds of spending yield two dollars after the initial introduction of one dollar to the local economy, the multiplier would be 2. This is known as the 'income multiplier'. In effect, the original dollar expenditure induced an additional dollar of expenditure in the community for a total of two dollars (Lohnes, 1994).

The value of the income multiplier varies from community to community and, within a given community, over time. The value of the multiplier is influenced by the amount of local goods imported into the community, consumption and saving patterns, the number and demographic characteristics of the residents, and the diversity of local economic activity. Although the effects of initial spending, and therefore, the value of the multiplier, cannot be traced directly, they can be estimated by means of statistical calculation. Using a method described by Salley (1977), a multiplier of 1.8 has been calculated for Queen's.

A more recent study prepared for the Council of Ontario Universities (Enterprise Canada Research, *The Economic Impact of Ontario Universities*, January 2001, p. 43) computes an economic multiplier for Queen's of between 2.15 and 2.34 using a methodology described by Kubursi in 1994 and an employment multiplier ranging from 1.80 to 1.97. The value of 1.8 as a multiplier calculated by Salley's (1977) method is therefore deemed to be *conservative*.

Based on the spending estimates outlined previously, (\$567.8 million), and the calculated multiplier value of 1.8, total economic impact is estimated to be just over **\$1 billion**.

Converting the impact into an estimate of jobs attributable to the presence of the University can be achieved through the use of an employment multiplier. Some economic impact studies have estimated a 1:1 relationship between the income and employment multipliers, while other studies use separate, although similar, multiplier values.

Assuming the employment multiplier is similar to the income multiplier, total University generated employment is estimated to be **8,100 jobs**. This is derived from the 3,500 directly employed by the University, plus 1,000 additional community health care jobs attributable to the School of Medicine and the 'additional funding' from the Ministry of Health. This total of 4,500 jobs translates to 8,100 when a multiplier of 1.8 is used.

APPENDIX A

Calculation of Student Spending in the Local Community

Full-time Undergraduate students (Note 1)	13,025
Less: Estimated number living at home = 5% (Note 2)	651
<i>Net Undergraduate Students</i>	<i>12,374</i>
Estimated September-April Living Expenses	\$12,240
Estimated Full-time Undergraduate Spending	\$151,460,000
Plus: May-August rents (~3 months; Note 3)	\$7,800,000
Per Student discretionary Spending for those students living at home (Note 4)	\$1,700,000
<i>Estimated Total Undergraduate Spending</i>	<i>\$161,000,000</i>
Full-time Graduate Students	2,234
Estimated Annual Expenses (Note 5)	\$12,000
<i>Estimated Total Graduate Spending</i>	<i>\$26,800,000</i>
Interns and Residents (Note 6)	255
<i>Estimated Spending Based on Net Income</i>	<i>\$9,200,000</i>
Part-time Students: Undergraduate and Graduate (Note 7)	2,964
Estimated Spending	\$36,300,000
May - September Rents	\$2,700,000
<i>Estimated Total Part-Time Student Spending</i>	<i>\$39,000,000</i>
Estimated Total Student Spending	\$236,000,000
Less Internal Spending at Queen's	
Ancillary Fees Including:	
Residence Fees	\$20,189,907
Apartments and Housing Rents	\$4,639,774
Food Services Non-Residence Revenues (Note 8)	\$8,705,093
Entertainment Services (Note 9)	\$1,374,954
Campus Bookstore (Incidental Spending Only) (Note 10)	\$1,524,807
<i>Total Internal Spending</i>	<i>\$36,434,535</i>
<i>Total Estimated Off-Campus Spending</i>	<i>\$199,565,465</i>
Plus: Student Operated Organizations (Note 11)	
AMS	\$7,447,618
Engineering Society	\$96,931
Graduate Student Society	\$170,345
Estimated Total Local Student Spending	\$207,280,359

NOTES TO ACCOMPANY APPENDIX A

1. November 1, 2002 Enrolment, Office of Institutional Research and Planning.
2. Estimate from past AMS summer employment and QMA Omnibus surveys.
3. Average lease period is 11 months, based on the 1990-91 *Off-Campus Student Housing Survey*. Assume 8 months from September to April, plus 3 months to cover the May to August period. Average accommodation cost was ~\$300/month. Of the 12,374 undergraduates not living at home, estimate ~30% live in university residences. Of the remaining 70%, assume 3 months rent @ \$300/month.
4. Derived figure from Student Awards estimated expenses for Undergraduate students.
5. Source: Student Awards/School of Graduate Studies.
6. Residents and interns earn stipends ranging from \$41,713 to \$68,372 (average \$55,043).
7. November 1, 2002 enrolment, Office of Institutional Research and Planning.
8. Includes all Food Services Revenues (staff, faculty and students).
9. Derived from Alma Mater Society and Graduate Student Society financial reports.
10. Estimate provided by Campus Bookstore – 15% of gross sales (\$10,165,378).
11. Services and operations, derived from Alma Mater Society, Engineering Society, and Graduate Student Society financial reports.

APPENDIX B

Calculation of Faculty and Staff Net Personal Income

Full-time Salaries	\$198,623,000
Part-time Salaries	\$42,657,000
Hospital Research Salaries	\$5,971,000
International Study Centre (ISC), England	\$2,275,000
Total	\$249,526,000
Less:	
Queen's Pension Contributions	\$10,430,000
Canada Pension Plan Contributions	\$5,743,000
Employment Insurance Premiums	\$4,286,000
Income Tax Deductions (2001 calendar year)	\$42,448,500
Student Employment Income	\$18,123,000
Estimated Total of All Deductions	\$81,030,500
Net Faculty/Staff Personal Income	\$168,495,500
Less: Estimate of International Study Centre (ISC) income and deductions	- \$3,000,000
<i>Subtotal:</i>	<i>\$165,495,500</i>
Plus: 50% of Pensions of Retirees residing in the Kingston area	\$18,000,000
Plus: Estimated Net Salaries/Wages for Brown's and Sodexho-Marriott Food	\$2,800,000
Total Net University Personal Income	\$186,295,500

APPENDIX C

How to determine the multiplier? Common sense dictates that initial spending in a community will translate into additional spending in some way. The translation varies for a number of reasons. The amount of goods produced locally, leakage from the locality and the type of local expenditure will all affect the final impact. If the initial spending is primarily for local labour (construction services for example), the value added to the local economy will be quite different than if the initial spending is for goods retailed locally but produced elsewhere. A model developed by C.D. Salley, 1977, calculates a multiplier value in two stages. First, the initial non-salary spending impact is calculated for non-salary expenditures based on the relationship of payroll/sales for the major types of non-salary expenditure. The amount of initial non-salary expenditure is added to the local net income figure to arrive at a total local spending figure for the university. The ratio of total spending to local spending is then calculated. A second ratio, local re-spending from personal income is based on an estimate of 13.1% sales as a percentage of payroll for the general retail industry.

Calculation of the Multiplier, M:

$$M = 1 + [r/(1-s)]$$

where:

r = initial spending (line 8)

s = re-spending ratio (line 11)

A. Computation of r

1. Local Consumption by Faculty and Staff	\$ 186,295,500
2. Gross Payroll (less ISC)	\$247,251,000
3. Portion of Payroll Spent Locally: (1)/(2) = (3)	0.75
4. Value added by the University's Local Purchases: .131 X \$amount spent locally	\$4, 781,500
5. Initial Local Income Generated by Purchases: (3) X (4) = (5)	\$3,586,125
6. Total Initial Local Spending: (1) + (5) = (6)	\$189,881,625
7. Total University Spending: (purchases from (4) + (2))	\$252,032,500
8. Ratio of Initial Local Spending to Total University Spending: (6)/(7) = (8)	0.753

B. Computation of s

9. Local Value Added by Total Initial Local Spending: (6) X .131 = (9)	\$24,874,493
10. Induced Local Spending: (9) X (3)	\$18,655,870
11. Ratio of Induced Local Spending to Initial Local Spending: (10)/(6) = (11)	0.098

C. Computation of the Multiplier

12. 1.000 - (11) = 12	0.902
13. (8)/(12) = 13	0.835
14. 1.000 + (13) = (14)	1.835

New Multiplier is rounded to 1.8

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