

DURHAM AND DUKE

AN ANALYSIS OF DUKE UNIVERSITY'S
ESTIMATED TOTAL ANNUAL ECONOMIC IMPACT
ON THE CITY AND COUNTY OF DURHAM

\$3.2 Billion

Duke University Economic Impact
Fiscal Year 2004-2005 Report
Office of Public Affairs

**IN MEMORY OF
RICHARD A. STUBBING
1930 – 2004**

This report is dedicated to the late Richard A. Stubbing, who was for many years a committed and caring citizen of both the campus and Durham communities. The professor of the practice at the Terry Sanford Institute for Public Policy was a central figure in the development of Duke's first impact study, published in 1997. Not only may the origins of that study be traced to the work of students in one of his master classes, but he also provided instrumental advice and encouragement to its authors. He is fondly remembered by associates on and off campus and by the generations of students who studied with him.

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INTRODUCTION

I am pleased to present this latest report on Duke's economic impact on Durham and to reflect on its implications for a healthy and growing Durham/Duke partnership. A report such as this can neither convey the many dimensions and subtleties of a town/gown relationship nor say anything particularly useful about the full benefits one party derives from the other. It can, however, reveal the economic framework of a relationship that officials and planners, on campus and around the city and county, wish to strengthen and promote.

The study estimates Duke's annual economic impact at \$3.2 billion in 2004-2005, as determined by an analysis of university expenditures and how they affected the city and county of Durham. We learn, for example, that wages and benefits totaling \$842 million were paid to 19,022 employees who are Durham residents, and that Duke paid \$21 million for municipal-type services, taxes and fees. In total, the report notes, Duke-related expenditures represented about a third of Durham's total activity in 2004-2005, expressed as a fraction of retail sales.

The \$3.2 billion estimate, while impressive, is a conservative figure, and deliberately so. The report excludes activities for which we have only uncertain estimates, such as the dollar value of the volunteer time donated by students and faculty. Most notably, the analysis assumes that a dollar spent locally by Duke is spent only once more by others before it leaves the Durham County economy – thus doubling its impact. Rates to measure this multiplying effect vary from study to study; the 1:1 multiplier Duke chose falls at the low end of the range of commonly used multipliers.

The idea that Duke's impact is enormous and growing is likely to surprise no one. That impact has increased by more than \$1 billion since the first impact report was issued in 1997, a period during which Duke's total corporate budget itself doubled to \$3.1 billion. Further, the evidence is overwhelming that major research universities such as Duke are economic engines whose activities dramatically benefit their hometowns, states and regions in ways that reports such as this can only suggest. We lead the way in research, medical care and education. We work with industry to develop, patent and market new technologies that will benefit society. That activity translates into new jobs and a better quality of life for our communities.

Universities are communities that do more than spend money, and their home cities are more than assemblages of stores and shops. I am committed to extending and strengthening Duke's engagement in the larger community. I applaud the achievements of the nearly decade-old Duke-Durham Neighborhood Partnership, a far-reaching collaboration with 12 nearby neighborhoods and seven public schools that is viewed as a national model for university-community partnerships. The partners have made major strides in improving community health care, after-school programming, housing for low-income families and student performance in the public schools. Duke will continue to be active in efforts to revitalize downtown Durham, such as the American Tobacco Campus, and will continue to strengthen its collaborations with residents, city officials, planners and agencies such as the Durham Police Department as it proceeds with the development of Central Campus.

Together, the community and Duke can accomplish things neither of us can do alone. When I spoke to the Durham Rotary Club last June, I remarked that Duke is a big institution, an observation whose obviousness is underscored by this impact study. I did so because I wanted two things clearly understood early in my presidency. We at Duke have no wish to dominate on the Durham scene, and we can't be the solution to all problems. What we can do, and should do, I said, is work in partnership. Working with the whole of this community, we can make Durham what we all want and need: an excellent place to live and work, for every citizen of this town.

Richard H. Brodhead
President

ECONOMIC IMPACT HIGHLIGHTS

TOTAL ESTIMATED ANNUAL IMPACT: \$3.2 BILLION FOR 2004-2005

This is a conservative estimate based on impact studies prepared by federal and state agencies and other organizations. Impact models use a “multiplier” of “direct” expenditures to account for the recirculation of money before leaving the economy being studied. This study uses a 1:1 multiplier that falls at the low end of the range of multipliers commonly used. Duke’s study assumes that every dollar it spends in Durham is spent at least once more by others before leaving the local economy. Thus, the university’s “direct” expenditure in Durham of \$263 million for local goods and services has a total impact of \$526 million. Both direct and total impact amounts are listed on the chart on Page 4.

EMPLOYMENT: \$1.68 BILLION

Duke is the largest employer in Durham County and the third largest private employer in North Carolina by number of employees.¹ More than half of its employees (19,022 of 37,026) were Durham residents, representing about 15 percent of all employed persons who reside in Durham County.² Duke attracts a highly skilled work force to the campus and to Triangle firms and its expenditures create jobs. A national study using U.S. Commerce Department data suggests that Duke’s record \$510.6 million in research funding in fiscal year 2004-2005 – the largest of any campus in North Carolina – was responsible for creating more than 18,600 jobs in the area.³ Duke is a major reason North Carolina last year was ranked third nationally – after California and Massachusetts – in biotechnology development.

PURCHASING: \$526 MILLION

Purchases in Durham County totaled \$263 million in 2004-2005, and 829 individual non-government Durham vendors sold at least \$10,000 in goods and services to Duke, an increase of 400 since the 2000 report. In addition, Duke leases 27 percent of the office space in Durham, which generated an estimated \$1.5 million in property taxes to Durham.⁴

DONATIONS: \$114.6 MILLION

Duke and its community provided at least \$57 million in donations of various kinds in 2004-2005, including \$46 million in uncompensated medical care provided by Duke University Health System, primarily to county residents.

STUDENT AND VISITOR SPENDING: \$834 MILLION

Duke’s 12,085 students spent an estimated \$92.5 million off campus. In addition, according to the Durham Convention & Visitors Bureau, visitors to campus spent an estimated \$325 million in the community.

SERVICES, TAXES AND FEES: \$43 MILLION

Duke relieved the city of a cost burden by providing \$16 million for municipal-type services such as the Duke Police Department, bus service, road maintenance, and water and sewer operation. If Duke had not provided this type of service, the city would have had to assume at least a significant portion of the responsibility. Additionally, Duke paid \$5.9 million in taxes and fees in fiscal year 2004-2005 on Duke-owned properties not used principally for educational purposes.

¹ According to Berin Linfors, a statistical analyst with the Employment Security Commission of North Carolina, the state’s top five private employers were, in descending order, Walmart, Food Lion, Duke University, Wachovia Bank and Bank of America in second quarter 2005. <<http://jobs.esc.state.nc.us/lmi/largest/topten.htm>>

² Duke Corporate Payroll Services.

³ Association of American Universities, Employment Impacts of Academic R&D Fiscal year 2000 North Carolina, as determined by the U.S. Commerce Department’s Bureau of Economic Analysis.

⁴ Office of Real Estate Administration, Jeffrey Potter, Duke Real Estate, and the Triangle Business Journal Commercial Real Estate Quarterly Report 2nd quarter 2004

TOTAL ESTIMATED ANNUAL ECONOMIC IMPACT 2004 – 2005

<u>EXPENDITURE</u>	<u>DIRECT</u>	<u>TOTAL IMPACT</u>
EMPLOYMENT ¹	\$ 842,313,000	\$ 1.68 Billion
PURCHASING	\$ 263,180,000	\$ 526,360,000
SERVICES/TAXES/FEES	\$ 21,912,000	\$ 43,824,000
Duke-Provided Services	\$ 16,000,000	
Taxes and Fees	\$ 5,912,000	
DONATIONS ²	\$ 57,200,000	\$ 114,400,000
Uncompensated Care ³	\$ 46,188,000	
Annual Recurring Contributions	\$ 11,049,000	
STUDENT AND VISITOR SPENDING	\$ 417,000,000	\$ 834,000,000
TOTAL IMPACT	\$ 1.6 Billion	\$ 3.2 Billion

(Numbers to the nearest \$1,000.)

¹ Data pertain to Durham residents and were compiled by Duke Payroll Services.

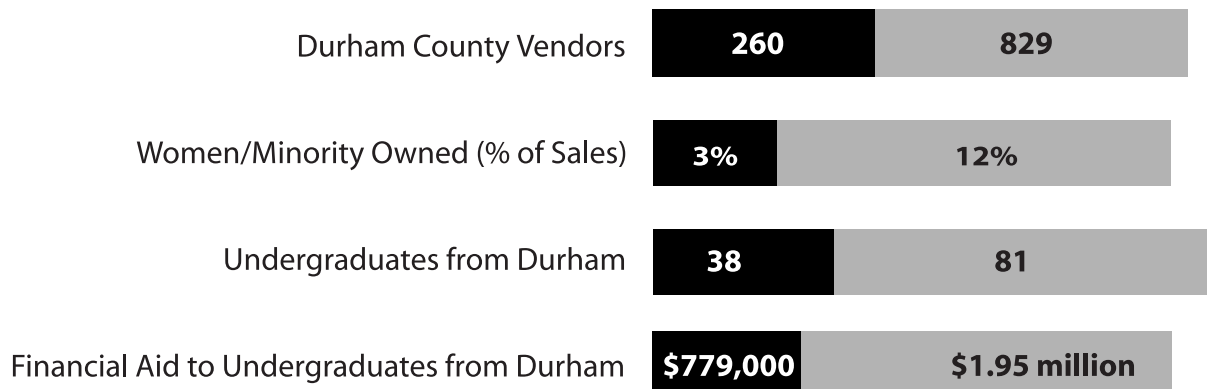
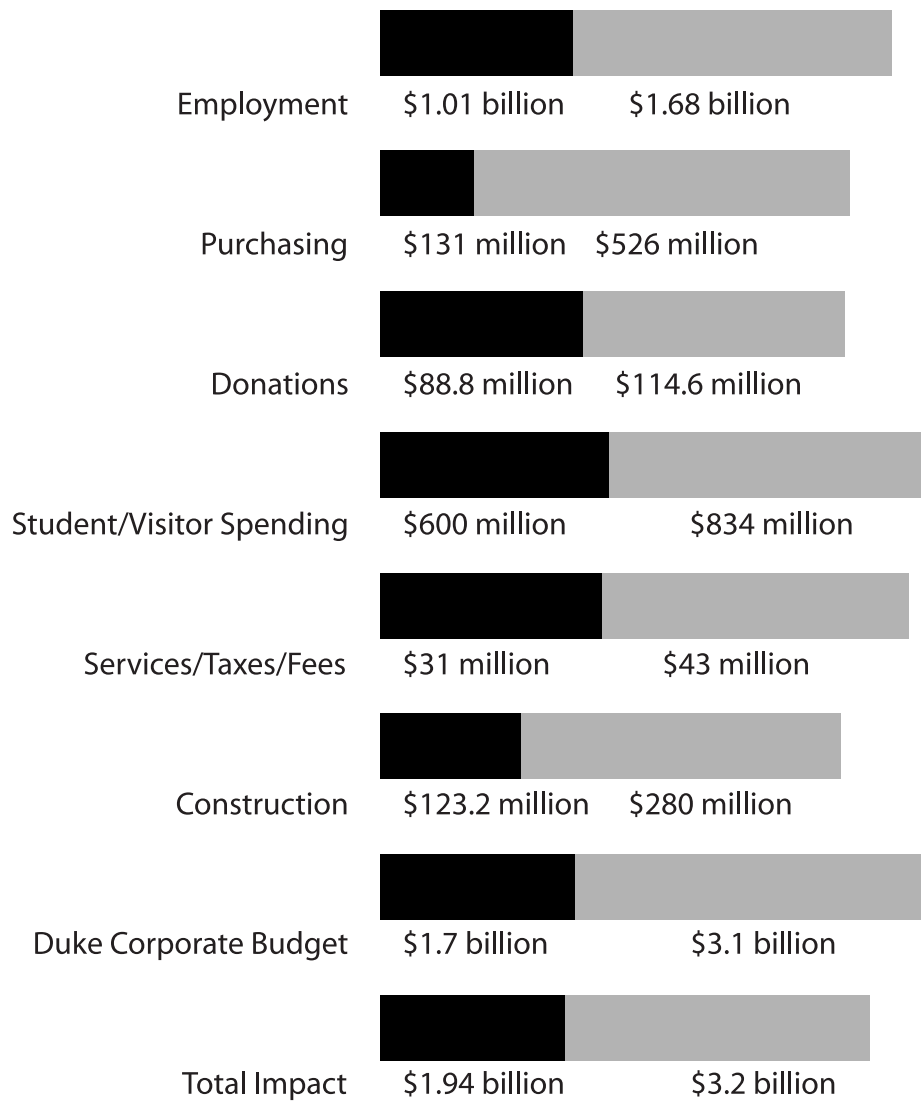
² Estimated donations of funds, services and/or goods from Duke organizations and individuals.

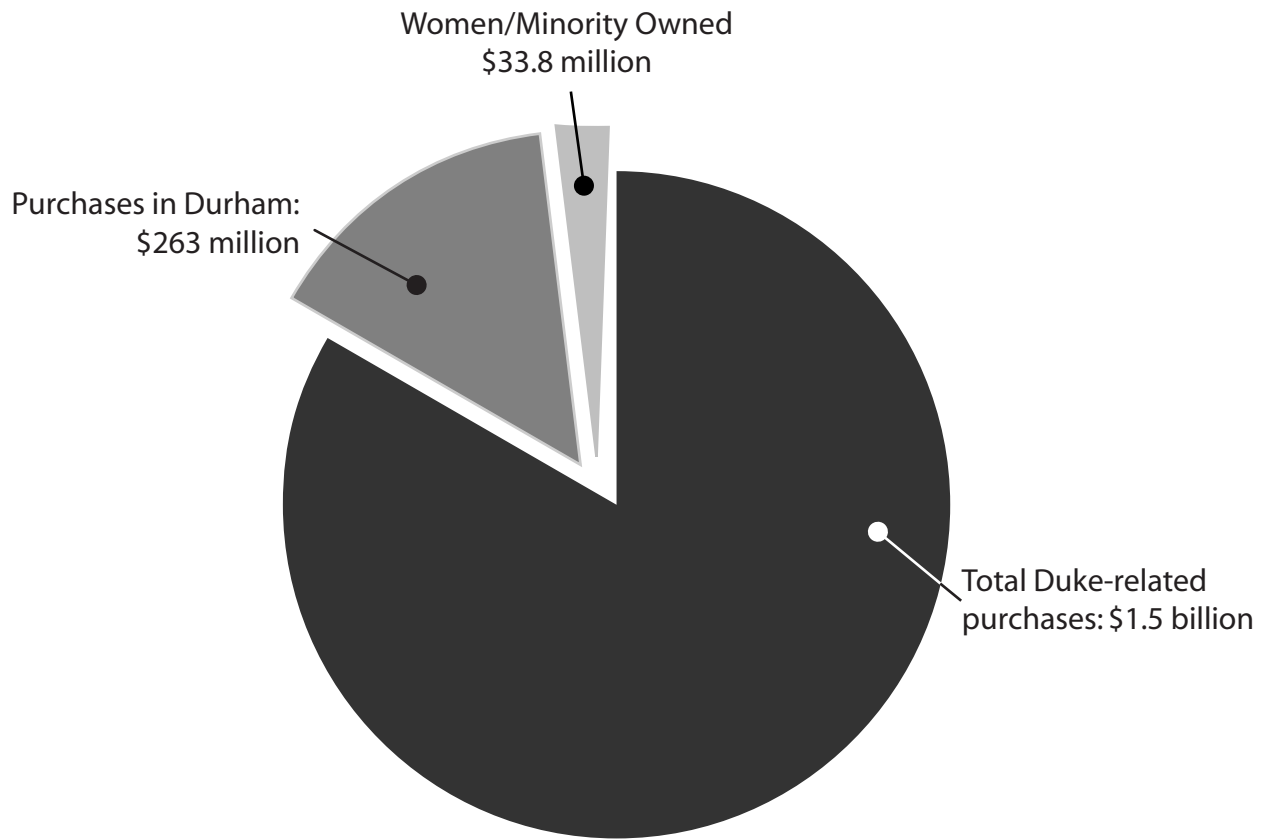
³ Duke University Health System care, at cost, for which Duke was not compensated.

GROWTH OF ECONOMIC IMPACT: SELECTED INDICATORS

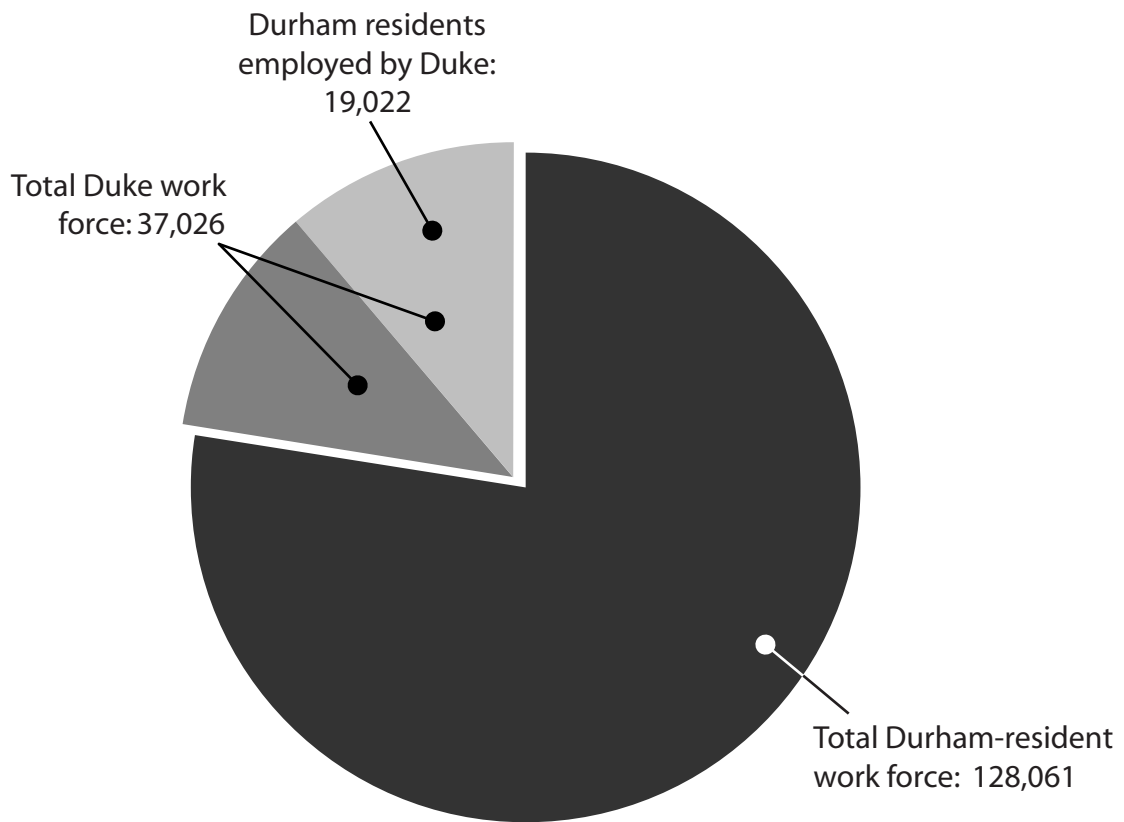
1997

2005





DUKE PURCHASES: DURHAM COUNTY AND TOTAL



DURHAM COUNTY/DUKE WORK FORCE

DUKE UNIVERSITY'S ESTIMATED TOTAL ANNUAL ECONOMIC IMPACT ON THE CITY AND COUNTY OF DURHAM 2004-2005

This study concludes that, stated conservatively, Duke University's estimated total annual economic impact on the city and county of Durham was \$3.2 billion in fiscal year 2004-2005. Actual Duke-related expenditures represented nearly 30 percent of the city of Durham's \$5.1 billion in retail sales, which is one measure of local economic activity.

The university's total annual economic impact on Durham is the result of a calculation based on an economic model that considers certain direct and indirect benefits. Durham benefits from direct university spending for employment, goods and services, taxes and fees, donations and uncompensated medical care provided by the Duke University Health System for Durham County residents. Indirect benefits result from spending in the city and county by others, such as students and campus visitors.

Duke University's fiscal year 2004-2005 budget of \$3.1 billion directly affected Durham. The 19,022 Durham residents who worked that year at Duke earned \$842 million in gross wages and benefits. Duke purchased \$263 million in goods and services from Durham businesses and individuals. Duke paid the city/county \$5.9 million in direct payment of taxes and fees, including nearly \$1.8 million in city sales taxes. Duke University Health System contributed more than \$46 million in uncompensated health care to Durham County and area residents. The university spent \$16 million to provide municipal-type services. In addition, Duke community members donated more than \$3 million to community organizations and charities.

Duke's indirect economic impact also was striking. Duke students, their families, and campus visitors spent an estimated \$417 million in Durham for food, lodging and other local goods and services.

The following sections of this report detail the principal forms of economic impacts:

EMPLOYMENT

Duke is the largest employer in Durham County and the largest private employer in the Research Triangle area, followed by IBM and GlaxoSmithKline. ¹ It is the third largest private employer in North Carolina in terms of total employees, according to the N.C. Employment Security Commission. In 2004-2005, Duke employed a total staff of 37,026 (among them 10,708 part-time and temporaries in all areas, including Durham Regional Hospital and Raleigh Community Hospital) and paid a total of \$1.595 billion in wages and benefits. ² Fifty-one percent (19,022) of Duke's employees were Durham residents, who constituted about 15 percent of the county's total resident work force of more than 128,061. Those Durham residents earned \$842 million in wages and benefits. In fiscal year 2004-2005, the mean salary for Durham residents working at Duke was \$72,545 for employees paid monthly and \$39,723 for hourly paid staff.

¹ Durham County Chamber of Commerce.

² The U.S. Department of Labor defines employment "as the total number of persons on establishment payrolls employed full or part-time who received pay for part of the pay period which included the 12th day of the month."

PURCHASING

Duke purchased an estimated total of \$1.5 billion in goods and services in fiscal year 2004-2005. Of that amount, Durham County firms provided \$263 million in goods and services. Local purchasing of goods and services is dominated by transactions with small firms and individuals. Duke purchased at least \$10,000 in goods and services from 829 different, non-governmental vendors in Durham.

Duke has made several special purchasing arrangements. The Minority/Women-Owned Business Program directed nearly 12 percent of university business in Durham to minority-owned and women-owned vendors. As a result, those Durham firms sold about \$33.8 million in goods and services to Duke in the fiscal year. Vehicle purchasing is done with several Durham dealers through an arrangement with the manufacturers. The fleet totals 672 licensed vehicles, including 32 buses that consumed 191,000 gallons of fuel in 2004-2005. Duke's purchases of light trucks and cars totaled \$868,500.

In total, Duke and Duke-related entities leased more than 1.5 million square feet of space and paid \$28.9 million in lease payments, which generated an estimated \$1.5 million in property taxes payable to Durham.

Construction

Construction is a major and on-going purchasing category at Duke and has been particularly significant in recent years as a number of major new buildings were added to the inventory of 217 facilities on the total 8,709 acres owned by the university. The direct impact included wages paid to workers, purchase of equipment and supplies, as well as fees for architects and other professional services. Duke spent \$280 million for construction in fiscal year 2004-2005, including \$176 million in new construction contracts and \$24.4 million for professional architecture and design services. It is difficult to determine all impacts specific to Durham because out-of-county vendors may or may not employ Durham residents or purchase supplies in Durham.

DONATIONS

Duke and its community provided at least \$57.2 million in donations of various kinds in 2004-2005.

Uncompensated Care

In fiscal year 2004-2005, Duke University Health System provided subsidized care to low-income patients at a cost of \$46 million as well as \$6.8 million of in-kind service contributions and direct support to Lincoln Community Health Center (LCHC) and Durham County Emergency Medical Services (EMS). LCHC provides primary care to Durham residents on a sliding fee scale and also operates a number of outreach programs, including a clinic for the homeless. EMS serves as the primary provider of emergency ambulance service in Durham County.¹

Annual Recurring Contributions

Through voluntary support and donations, both monetary and in-kind, Duke contributed more than \$4.3 million to the Durham community last year. The chart on page 11 notes annually recurring donations, some of which, such as donations by students, are estimated. The largest single form of support was the award of a record total of \$1.95 million in financial aid to 81 Durham residents who are Duke students.

The Children's Education Law Clinic, a program of Duke Law School started in 2002 to provide free legal services to low-income children and their parents in Durham and beyond in matters relating to the rights of children in school. The clinic received \$50,000 from The Duke Endowment and \$50,000 from the Z. Smith Reynolds Foundation for work in 2004.

¹ National reporting guidelines now state uncompensated care expenditures at cost rather than as billed, which was the practice in previous impact statements. Further, these services and expenditures were provided for the benefit of the entire surrounding community, not just Durham County residents.

DUHS: CARE BENEFITS AND DONATIONS

Community care provided by DUHS is reported annually to the North Carolina Medical Care Commission for its yearly Community Care Benefits Report. DUHS reported the following for the fiscal year ended June 30, 2005. Please note that this impact study does not include the non-reimbursed costs DUHS incurred for treating Medicare and Medicaid patients and for medical education and research, which totalled \$78.9 million.

COMMUNITY CARE BENEFIT EXPENDITURES

Cash donations	\$ 350,000
In-kind donations (estimated)	\$ 3,181,000
Subsidized community services	\$ 3,651,000
Total charity care (at cost)	\$ 46,188,000
Non-reimbursed cost of treating Medicare and Medicaid patients	\$ 51,586,000
Non-reimbursed medical education and research costs	\$ 27,363,000
Total	<u>\$132,319,000</u>

IN-KIND AND OTHER DONATIONS TO DURHAM COUNTY

In-kind donations to Lincoln Community Health Center	\$ 2,629,000
Direct support to Lincoln Community Health Center	\$ 2,100,000
Direct support to Emergency Medical Services	\$ 1,500,000
Just for Us/Promising Practices ¹	\$ 340,000
Duke University Affiliated Physicians (DUAP-paid physician expense at Lincoln Community Health Center)	\$ 154,000
Total	<u>\$ 6,723,000</u>

¹ Primary care delivered in the homes of elderly and disabled adults at nine senior public housing and subsidized housing sites. Care includes nutrition, occupational therapy and care-management.

THE DUKE-DURHAM NEIGHBORHOOD PARTNERSHIP

Some contributions are made as part of special initiatives that are meant to have a sustained impact on the community. Duke is engaged in boosting student achievement in the public schools, supporting youth programming and stabilizing neighborhoods by encouraging home ownership and grass-roots leadership throughout the Duke-Durham Neighborhood Partnership (NP). The NP, launched in 1996 and endorsed twice by the Board of Trustees, creates partnerships designed to improve the quality of life in 12 neighborhoods and seven public schools near campus. Duke has raised more than \$12 million to support this effort, which concentrates on priorities identified by residents. In response to community requests, in 1996 Duke created an Office of Community Affairs, which coordinates the Duke-Durham Neighborhood Partnership and Duke/public school/neighborhood/local government interactions on a long-term basis.

Duke's engagement in Durham has benefited from the consistent, sustained support of The Duke Endowment, the Charlotte-based charitable trust. In 2005, a \$515,000 Duke Endowment grant for the Neighborhood Partnership helped the university provide ongoing support for affordable housing, youth programs and nonprofits in the West End and Walltown neighborhoods. An additional \$240,000 helped make health care more accessible to those residents by expanding the Lyon Park Clinic and helping to open the new Walltown Neighborhood Clinic. The Endowment's 2005 grants meant the trust had invested more than \$3.5 million in the Duke-Durham Neighborhood Partnership over the past seven years.

The Duke-Durham Campaign, an annual appeal by local community leaders and volunteers, supports the Duke-Durham Neighborhood Partnership. Donations in 2004-2005 totaled \$357,000 and included a major playground and landscaping project at St. James Family Life Center in Walltown, completed under the supervision of Duke Facilities Management Department, with donations from Duke contractors.

Affordable Housing

To help stabilize the neighborhoods, Duke has a current investment of \$4 million in an affordable housing loan with the nonprofit Self-Help Community Development Corporation. The results of that initiative continue to be felt by new, low-income homeowners in Walltown and Southwest Central Durham and by borrowers of lower-rate mortgage loans. In 2005, Self-Help completed the renovation of the 66th house in Walltown, where home ownership has increased from 15 percent to 25 percent, according to the 2000 census. Thanks largely to support from Duke, local affordable housing organizations have been able to purchase more than 120 houses for rehabilitation and sale to low-income homeowners in partner neighborhoods. Moreover, \$1 million of the Duke investment supported Self-Help's Community Advantage Program, which has provided over \$1 billion of home loans to low-income homebuyers in North Carolina.¹

A Partner for Health

Duke is also committed to providing accessible, quality health care in the partnership neighborhoods. Duke's Community and Family Medicine Division operates wellness centers at two partnership schools to help keep students healthy and in school: George Watts Montessori Elementary and E.K. Powe Elementary. The Lyon Park Clinic, operated by Lincoln Community Health Center and Duke's Community Family Medicine Division, expanded in 2004 to accommodate more patients, most of whom are low-income. The same partners also opened the Walltown Clinic on Broad Street in 2005 to more conveniently serve Walltown residents.

¹ Eakes, Martin. Self-Help Community Development Corporation.

Other Partnership Initiatives

- Duke is helping partner neighborhood centers provide after-school programming to 165 at-risk students through a \$2.25 million, four-year grant (HOPE) from the W. K. Kellogg Foundation.
- Together with the Program in Education and the Community Service Center, Duke's Office of Community Affairs matched 340 Duke tutors with Durham public school students in need of extra assistance – contributing about 25,000 volunteer hours.
- Duke supports the Southwest Central Durham Quality of Life project (SWCD), which brings together residents, nonprofits and businesses to jointly address community issues in six neighborhoods in Southwest Central Durham. In 2005, The Quality of Life committee partnered with the City of Durham, Self-Help, Habitat for Humanity, The Durham Community Land Trustees and the Home Builders Association in planning the development of 14 homes in an area of SWCD called Pauli Murray Place. Duke is helping build a park for the once-blighted neighborhood.

ANNUAL RECURRING CONTRIBUTIONS

INSTITUTIONAL

Financial Aid to Durham Undergraduates	\$ 1,949,000
The Duke Endowment grant to Duke-Durham Neighborhood Partnership ¹	\$ 500,000
Community Service Center	\$ 304,000
Auxiliary Services	\$ 25,000
Office of Information Technology	\$ 83,400
Food Drive	\$ 29,000
Project Share	\$ 16,650

INDIVIDUALS

Student Donations	\$ 80,000
Duke-Durham Campaign ²	\$ 357,000
United Way	\$ 1,071,523
TOTAL	\$ 4,298,923

¹ This annual grant varies in size but has provided more than \$3 million to partnership organizations since 1996.

² Local business people solicit their colleagues for donations to the Duke-Durham Neighborhood Partnership.

STUDENT AND VISITOR SPENDING

Durham receives additional but indirect benefits as a result of Duke University's programs and activities. Student spending and visitor spending off-campus constitute the most significant impact. They are estimated to exceed \$417 million annually.

Student Spending

Duke's 12,085 undergraduate and graduate/professional students spent, by conservative estimate, \$92.5 million. This estimate is based on budgets established by financial aid officers and heads of schools at Duke for the 6,137 undergraduate and 6,022 graduate and professional students and is adjusted to reflect non-university housing and other spending factors. About 15 percent of undergraduate students and the great majority of graduate and professional students (about 96 percent) live off-campus and pay rent for non-university housing.

Visitor Spending

The Durham Convention & Visitors Bureau estimates that visitor spending related to Duke totaled \$325 million in fiscal year 2004-2005. The Bureau also reports that Duke was the most common point of interest for the 5.2 million annual visitors to Durham. While many visitors to Duke came for medical and other university-related purposes, and stayed the day or overnight, a visit to Duke was a key activity for many who came to Durham for other primary purposes. The Bureau calculates that the \$325 million includes 38.8 percent of all spending for conventions, meetings and events, 20.4 percent of other business visitors, 75 percent of visits for personal trips such as healthcare and 49.9 percent of leisure trips to Durham. (Note: DCVB uses county-specific data, based on research compiled from a number of sources, to measure economic impact and calculates that about \$235 million of the total spending recirculates through the Durham economy. This report uses a multiplier of one, at the low end of a range of those commonly used by universities nationally, and estimates that all \$325 million recirculates.)

SERVICES, TAXES AND FEES

Duke paid taxes and provided services, such as a campus-based police department and maintenance of 15 miles of roadway, that totaled nearly \$21.6 million in fiscal year 2004-2005. Duke also contributed \$300,000 to the city as a voluntary contribution toward the cost of fire services received. The city thereby was relieved of a substantial cost burden; if Duke did not provide such services, the city would have to assume responsibility for at least a significant portion of the costs, as is the case for municipalities that host other major universities. In 2004-2005, through an agreement with Durham Police, Duke expanded its police coverage to include periodic patrols of the Ninth Street area near East Campus.

Duke-Provided Services

While Duke is served in many ways by Durham, the university annually provides for itself a number of municipal-type services. Those services cost \$16 million. The university paid \$7.3 million for its police department and staff of 145, including 65 sworn officers, to protect and serve students, employees and visitors, including Durham residents. Duke police traveled 538,339 miles on patrol and wrote approximately 6,500 incident reports.

In addition to police protection, Duke provided its own water and sewer infrastructure and a campus bus system that operated a fleet of buses for a total of about 69,000 hours last year. Duke also maintained 15 miles of private roads that are generally open to the public. This study uses the lowest road maintenance cost estimates, which include snow and ice removal expenditures that may fluctuate significantly from year to year.

DUKE-PROVIDED SERVICES

Police protection	\$ 7,300,000
Road maintenance	\$ 416,923
Water/sewer operation & maintenance	\$ 783,794
Mass transit	\$ 6,000,000
Trash collection and recycling	\$ 1,500,000
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TOTAL	\$ 16,000,717

Taxes and Fees

Direct taxes and fees paid to Durham in fiscal year 2004-2005 totaled \$5.9 million in property taxes, water and sewer fees, landfill tipping fees, storm water fees, privilege licenses, motor vehicle taxes, and city sales taxes. That figure also includes a \$300,000 voluntary contribution to the city for fire services. Duke paid \$354,471 in taxes for properties including the Washington Duke Inn, a hotel owned by the university. Duke purchased the Washington Duke Inn in 1994 from Equitable Life Insurance and voluntarily placed it on the tax rolls even though it is tax exempt because it is part of Duke. Indirectly, Duke also contributes to the tax base. The Trinity Heights Homesites, 40 homes and townhomes that were built on Duke property for faculty and staff in 2001, add at least \$140,000 a year in property taxes. This is property that could have been developed for tax-exempt institutional use.

Duke and Duke-related entities leased more than 1.5 million square feet of space and made \$28.9 million in lease payments. This represents 27 percent of all leased office space in Durham. Lease payments to owners of Durham properties resulted in about \$1.5 million a year in property taxes paid to the city. Neither of these indirect tax estimates are included in the totals for this impact report, which is a conservative estimate of Duke's economic impact.

ACTUAL TAXES AND FEES

*(Combined city and county as reported by the Office of Real Estate Administration.
Numbers to the nearest \$1,000.)*

Property taxes	\$ 354,000
Water and sewer fees	\$ 2,700,000
Landfill fees	\$ 432,000
Storm water fees	\$ 254,000
Voluntary contribution for Fire Services	\$ 300,000
Motor vehicle taxes	\$ 120,000
Sales taxes	\$ 1,752,000
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TOTAL	\$ 5,912,000

CONCLUSION

Like other major research universities, Duke is an economic engine whose activities and health have a dramatic impact on the local economy. This report looks at the most important elements and concludes, using conservative estimates, that Duke's total annual economic impact on Durham was \$3.2 billion in 2004-2005.

The estimated impact is based on data from a variety of sources from both Duke and Durham. The principal elements are university expenditures totaling \$1.18 billion for wages of Durham residents, local goods and services, taxes and fees and donations including uncompensated hospital care and \$417 million in local spending by students and visitors.

Beyond economics, the study observes, a university like Duke is a source of benefits that are widely appreciated but are difficult, if not impossible, to quantify. For example, Duke is a source of intellectual and cultural stimulation, entertainment and recreational opportunities that are available to all residents of Durham.

The following section of this report provides an overview of the ways in which a major research university such as Duke has an impact on its home and surrounding communities, state, region and, not infrequently, the world as well

Finally, it should be explicitly stated that the study is based on this fundamentally important assumption: The Durham/Duke relationship is most likely to thrive through a sustained partnership. It is important to Durham that Duke continue to be a strong and vibrant center for education, for research in all areas, and for service in such fields as business, engineering, law and — in this City of Medicine — in medical care.

The university enjoys excellent health today and continues to plan strategically to ensure its vitality in the years to come. A sustained partnership between Durham and Duke will greatly strengthen collective efforts to improve the lives of Durham residents.

LEADERSHIP IMPACTS OF A MAJOR RESEARCH UNIVERSITY

Leadership in Community, Culture, Business and Industry and Medicine

Duke University is above all else a major research university known internationally for quality in education, research and service. Durham, and for that matter the Triangle and North Carolina, benefit greatly, often in ways that cannot be quantified, from the university's presence and sustained health.

Consider the role of Duke's graduates and students. While it is a fact that more than 5,622 Duke graduates – including holders of bachelor, master, professional and doctoral degrees – live in Greater Durham, it is difficult to quantify their contributions and support of local schools, churches, social and cultural organizations and charitable activities. But we know that they and many others of the 11,858 Duke alumni living elsewhere in the Triangle are among the estimated 40,000 persons who create and lead firms or are employed in Research Triangle Park, which has grown to be one of the most competitive and successful technology centers of its kind in the country. Similarly, while an estimated 75 percent of all Duke students volunteer services to the Durham community in the course of their time at Duke, there is no reliable estimate of the total number of hours of work performed, beyond the 25,000 hours donated annually by the 340 students tutoring in partnership schools. Nor has anyone calculated the economic value (even at the minimum wage) of their free labor as community volunteers.

Community and Culture

The Duke-Durham Neighborhood Partnership described in the impact summary is one major and visible way in which the university has provided leadership to the benefit of both the university and Durham. Other quality of life elements, including the social, cultural and recreational, are obviously important and generally difficult to quantify or describe. The recent opening of the new Nasher Museum of Art, however, provides the opportunity to measure one of Duke's cultural impacts on the community. On opening day for the greater Durham community, nearly 5,000 people came to see great art and architecture, entertainment by Duke-affiliated musicians and singers, and remarks by Durham Mayor Bill Bell, who declared that, although the Nasher Museum belongs to Duke, the City of Durham has claimed it for its own. Today the museum is averaging as many as 500 visitors per day on weekends and more than 200 visitors on week days. In another example of community cooperation, Durham residents enjoy free admission courtesy of *The Herald-Sun* newspaper.

Business and Industry: Enabling Commercialization of New Technologies

Nationally, it is clear that research universities such as Duke are increasingly important to the evolving economy. Expenditures resulting from research funding at Duke cycle through the Durham and state economies, transforming federal funds into revenue for our residents and businesses. In North Carolina, according to the U.S. Commerce Department's Bureau of Economic Analysis, 36 jobs are created for every \$1 million spent in academic research. The jobs are created on and off campus and include both full and part-time positions.

More and more, industries and firms that are successful competitors here and abroad for business and jobs are knowledge-based, high-tech and engaged in cutting edge research. Duke's presence in the Triangle, beyond its role in establishing the Research Park, helps sustain the area's leadership drive and entrepreneurial spirit.

¹ Association of American Universities Employment Impacts of Academic Research and Development Fiscal Year 2000 for North Carolina, as determined by the U.S. Commerce Department's Bureau of Economic Analysis

As part of a new focus on technology transfer, Duke this year more than doubled its technology transfer effort. The newly named Office of Licensing and Ventures will be able to offer more responsive and comprehensive services to faculty exploring commercialization of their discoveries. The goal is to accelerate the pace of technology transfer across the campus. The office is intended to help faculty go through a decision-making process that includes both patentability and marketability analysis, and determine whether licensing their discovery or creating a start up company is a better course for them.

In the last three years alone 14 companies in the Research Triangle area have been formed on the basis of Duke technology and others are in the development stage. Duke has helped university inventors and business interests bring their technologies to commercial markets. Transfer of technology and corporate interaction has accelerated to the point that Duke now averages about \$4,000,000 per year in licensing revenue, 70 new patent applications, 40 US patents issued, 40 licenses, and over \$150,000,000 of commercially sponsored research. This is a roughly threefold increase in all categories over the past decade.

Medical Care and Research

In the City of Medicine, more than a third of Durham employees work in a health-related business and about 7,000 of them are employed by Duke University Health System. DUHS is the largest Durham health-related employer, with 10,391 full time employees, followed by Glaxo Wellcome and Blue Cross/Blue Shield of North Carolina.¹ DUHS is staffed by more than 2,000 physicians and its operating expenditures totaled more than \$1.5 billion last year. Its people, including the more than 2,000 nursing and medical school students, residents and house staff, provided care to thousands of patients from Durham and around the world.

The scale and pace of activity is remarkable. DUHS personnel performed nearly 75,000 surgical operations last year. Outpatient visits totaled just under 1.3 million. In 2004-2005, DUHS totaled 342,082 patient days, averaging 937 adult occupants per day and 83 percent occupancy.

Increasingly, DUHS is a recognized leader in medical service and research. For example, last fall Duke University Hospital joined nine other U.S. hospitals in a new national effort to improve heart care for African Americans and Hispanics. The program, funded by the Robert Wood Johnson Foundation, seeks to design programs to develop and test "best practices" that reduce disparities in cardiac care. The consortium will focus both on what therapies patients receive while in the hospital, and on what happens outside the hospital. While there is evidence that inpatients are increasingly receiving care that is demonstrably effective, there is less information about the challenges they face after discharge.

Research is groundbreaking. For example, two teams of researchers at the Duke Comprehensive Cancer Center have published findings that should assist in the earlier detection of cancer and contribute to more effective treatment. One team focused on the aggressive basal cell breast cancer. The Duke scientists found that basal-type breast cells which lose expression of a certain protein result in the over-proliferation of the cells. The study was published in the November 1, 2005, issue of the *Journal of Cell Science*. The research was sponsored by the National Cancer Institute and supported by several foundations.

A second team helped describe how the factors needed to initiate a tumor are different in important ways from those that maintain a cancer tumor, as reported in the November 15, 2005, issue of the journal *Cancer Cell*. The team studied the role of ras, an important cancer gene that, when mutated, is a key player early in the complex series of events that can lead to cancer in the pancreas, colon, thyroid, and lungs, among others. The study was funded by the National Cancer Institute.

¹ <http://www.durhamchamber.org/business/employers.html>

The threat of nuclear and radiation-based “dirty-bomb” terrorist attacks has prompted the National Institute of Allergy and Infectious Diseases (NIAID) to fund a \$22.25 million radiologic anti-terrorism center at DUMC. One of eight such centers nationwide, the Center for Medical Countermeasures Against Radiation is charged with creating a rapid, inexpensive screening test to gauge a person’s exposure level and with developing drugs that treat radiation’s most toxic effects. The Duke team will collaborate with more than a dozen academic medical centers, pharmaceutical companies, and federal research laboratories to develop drugs and therapies that reduce radiation injury, among other challenges.

ACKNOWLEDGEMENTS

The origins of the initial 1997 impact study, and its successors, may be traced to the work of student members of a master class at Duke’s Terry Sanford Institute of Public Policy, directed by the late Professor of the Practice Richard A. Stubbing. The design, methodology and format of the original document were further shaped by the assistance of three economists in addition to Professor Stubbing: Professor Charles Clotfelter and Professor Helen F. Ladd, both from the Sanford Institute at Duke University, and Michael Walden, professor of economics at North Carolina State University, who is the author of a number of highly regarded impact studies. It was Professor Walden who suggested an appropriate way to express the Duke-Durham relationship in terms of economic activity: Calculate direct Duke-related expenditures as a percentage of Durham’s annual retail sales. In addition, Reyn Bowman, president of the Durham Convention & Visitors Bureau, provided invaluable insight into and information about the impact of student and visitor spending on Duke and Durham.

Staff members of a number of offices at Duke University contributed data presented in this report. Particular thanks are due to John Clements, director of the university’s Office of Budgets and Analysis, who gathered information from many sources; John F. Burness, senior vice president for public affairs and government relations, who commissioned this study; and Susan Kauffman in Duke’s Office of Public Affairs, who edited the report written by Bobby Wayne Clark, a consultant who heads Communications for Higher Education.

METHODOLOGY

Duke University’s annual total economic impact on the city and county of Durham may be significantly greater than the total estimated in this report. There are two principal reasons for this. First, this study, like its predecessors, generally incorporates conservative methodologies and estimates. Second, this report, as in 1997, employs a “multiplier” at the low end of the range of ratios used in mathematical models nationally to measure a university’s economic impact on a city or region. (The multiplier is based on the fact that dollars put into an economy by an institution are spent more than once. For example, each dollar in salary paid to an employee is spent by that employee and again by the first recipient of that employee’s dollar.)

Impact models often use a multiplier of 2:1 or greater, meaning that every \$1 spent by a university is then spent twice more by others before leaving the area under study – thus tripling the impact of the initial dollar. The 1:1 multiplier used in this study simply doubles the value of the initial dollar entering the Durham economy. This is done to avoid overstating certain impacts, particularly of those estimated “indirect” impacts such as student and visitor spending in Durham.

Regarding job creation, this study also references a multiplier commonly adopted to estimate the impact of general expenditures on employment outside the university. In a 2002 study, for example, the University of North Carolina at Chapel Hill concluded that 38.61 external jobs are created for every \$1 million in university spending. The multiplier used for calculating the employment impacts of academic research and development is 35.1.

meaning 35 jobs are created for each \$1 million spent in research and development. That multiplier was derived from state-specific multipliers developed by the U.S. Commerce Department's Bureau of Economic Analysis, as reported by the Association of American Universities.

This study does not attempt to estimate a major secondary impact—spending by university employees. Employee spending, however, does start a second round of expenditures initiated by the university's payroll. The multiplier most commonly used doubles this spending to estimate impact, according to Elliott, Levin, and Meisel. (See Sources.)

University spending within Durham includes estimated purchases, salaries of employees who are residents, and their benefits. Data are for fiscal year 2004-2005 and were provided by Duke University's Office of Financial Services, the Office of Human Resources, and the Office of Budgets and Analysis. In order to estimate student spending beyond the university on items related to Duke University attendance, this study utilized 2004-2005 enrollment data. Relevant budget allowances for expenses other than tuition, fees, and university housing and board plans, and estimates based on numbers of students living off campus, were then factored into the calculation. The calculations were based on student budgets prepared by the Office of Undergraduate Financial Aid, the Graduate School and various professional schools, with the invaluable assistance of Reyn Bowman, president of the Durham Convention & Visitors Bureau. Graduate student expenditures are significantly higher than those of undergraduate students in order to reflect off-campus rent. The total estimated student expenditures figure may be low because it does not include spending in the summer months by undergraduates, nor does it include entertainment expenditures.

SOURCES

Duke University. "Annual Report of Duke University: 2004-2005." Office of the President and Office of the Executive Vice President, Duke University. Durham, 2005.

Duke University. "Durham & Duke: Duke University Economic Impact Report 1997" (and subsequent reports issued in 2000 and 2003). Office of Public Affairs, Duke University. Durham.

Elliott, Donald S., Stanford L. Levin, and John B. Meisel. "Measuring the Economic Impact of Institutions of Higher Education." *Research in Higher Education*: 28.1. 1988: 17-33.

N.C. Employment Security Commission Labor Force Statistics, <<http://www.ncesc.com>>

Walden, Michael. "The Net Economic Impact of North Carolina State University on the State of North Carolina, the Triangle Region, and Wake County." North Carolina State University, 2001.

INQUIRIES AND COMMENTS

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