

# **Impacts of the University of Maryland, College Park**

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# Impacts of the University of Maryland, College Park

## Executive Summary

An in-depth economic assessment of the University of Maryland, College Park's impact on Maryland's economy reveals the following:

### 1. The University's impact on Maryland's economy is massive.

In all, the University supports more than 23,000 jobs held by Marylanders, roughly \$1 billion in household income and \$2.4 billion in business sales per annum. This economic activity in turn produces \$54 million in tax revenues for the State of Maryland and another \$24 million for local governments across the state. Exhibits E1 and E2 provide related statistical detail.

Exhibit E1: Economic impacts of all University-related spending

<i>Type of impact</i>	<i>Direct Impacts</i>	<i>Indirect Impacts</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	14,392	1,825	7,291	<b>23,508</b>
Income (\$millions)	\$685	\$83	\$289	<b>\$1,057</b>
Revenue/sales (\$millions)	\$1,250	\$227	\$895	<b>\$2,372</b>

Source: Sage

Exhibit E2: Fiscal impacts of all University-related spending

<i>Type of tax</i>	<i>Value (\$millions/annum)</i>
State income	\$34
Sales	\$21
Total State of Maryland income & sales taxes	<b>\$54</b>
County income	\$24
Total State and county income & sales taxes	<b>\$79</b>

Source: Sage

### 2. The University is a global research and development powerhouse.

In just one fiscal year (2006), College Park faculty and staff accomplished the following:

- 114 inventions were disclosed;
- 75 patent applications were filed;
- 22 patents were obtained; and
- 28 licensing agreements were executed.

Additionally, in fiscal 2007, the University of Maryland was awarded \$407 million in grants and contracts for sponsored research. This was an increase of \$57 million from the level of funding awarded in the prior year.

### **3. The University has emerged as a leading supplier of scientific talent.**

The global international research community can rely upon the following scientific expertise at the University of Maryland, College Park:

- 944 natural scientists;
- 479 engineers;
- 246 computer scientists; and
- 99 mathematicians.

### **4. The University's capacity to produce highly educated individuals across multiple disciplines continues to expand, particularly Ph.Ds.**

In 2007, the University's graduate programs collectively conferred 1,968 master's degrees, slightly more than the 5-year average and an increase of 10 percent over the number of master's degrees conferred in 2003. Over that same 5-year period the number of doctorates awarded by the Graduate School increased 56 percent from 419 in 2003 to 653 in 2007 and increased each year from 2003 to 2007.

### **5. The University is committed to diversity within its student body and among its faculty/staff.**

The University has a stated objective of achieving a critical mass of minority undergraduate students by 2009 (35%). By the 2006-2007 academic year, the University was well on its way to reaching that objective, with minority students constituting 33.4 percent of all undergraduates. Moreover, over 24 percent of all university employees are members of a minority group and almost 22 percent of faculty members are classified as minorities.

### **6. The University's already massive economic/fiscal impacts upon Maryland are set to expand going forward.**

With the development/redevelopment of East Campus and M Square Research Park, the expanding global reputation of the R&D taking place in College Park, and continued expansion of faculty and enrollment, the University is positioned to generate ever expanding economic and fiscal impacts in Maryland.

## Introduction

*“The University of Maryland is committed to achieving excellence as the State’s primary center of research and graduate education and the institution of choice for undergraduate students of exceptional ability and promise.”*

Mission and Goals Statement, University of Maryland, College Park. February 1, 2006

### Report Objective

The time-honored missions of all institutions of higher education are straightforward: teaching, research, service. Many colleges and universities are primarily devoted to teaching. A few are mostly concerned with research. Almost all provide some kind of service to a larger community, but at significantly differing scales. Relatively few universities can lay major claim to substantial investment in all three missions of higher education.

The flagship of Maryland’s public universities, the University of Maryland, College Park (UMCP) does it all, does it well, and does it in volume. As one of the most highly ranked public universities in the country possessing one of its largest faculties and student bodies, both undergraduate and graduate, the University provides educational excellence to 36,000 students. UMCP now ranks 18<sup>th</sup> nationally in terms of undergraduate degrees conferred, 26<sup>th</sup> in Masters degrees conferred and 16<sup>th</sup> in doctoral degrees conferred.

The University also boasts Nobel laureates, a MacArthur Foundation Genius Prize winner, and a sponsored research budget that has doubled in the past eight years. From its classrooms, its business incubator, its athletic fields, and its concert halls, the University provides a myriad of services to communities in Maryland and far beyond.

This report endeavors to provide stakeholders with a sense of how large and varied the University of Maryland, College Park’s impacts are upon Maryland’s economy, quality of life and fiscal health. The study team, comprised of economists from Sage Policy Group, Inc., a Baltimore-based economic and policy consultancy, has worked to quantify impacts where possible, and to provide salient qualitative detail where appropriate.

### Brief Background

Chartered in 1856 as the Maryland Agricultural College, the University has grown from its initial 34 students into an institution that now serves almost 26,000 undergraduates and over 10,000 graduate students. These students are served by over 12,000 employees, including over 3,700 faculty members who teach in 13 separate colleges and schools. Undergraduates can choose from among 127 majors while graduate students apply themselves to 112 degree granting programs.

In fiscal 2007, the most recently completed fiscal year, the University of Maryland reported a total budget of \$1.3 billion. Roughly half of this budget went to payroll expenses, while \$354 million was expended on research and development activities.

Another \$192 million was spent on non-payroll related goods and services. Finally, \$108 million was spent on construction activities.

Revenues to support this budget were derived from various sources. The State of Maryland appropriation totaled \$370 million, or roughly three-tenths of the University's budget. Tuition and fees added another \$350 million, while auxiliary enterprises such as housing and food services and educational activities accounted for \$227 million. Private contributions in fiscal 2007 totaled almost \$71 million, while investment income added an excess of \$18 million.

## Teaching & Learning

In the short and long terms, the impacts of the University of Maryland are most clearly seen and expressed in the teaching and learning that takes place on campus. Most of the human, financial, and other resources of the University are devoted to instruction of students, who also generate ongoing economic impacts through their spending in the local economy. As these students graduate and move into the world of work in Maryland and elsewhere, the knowledge and skills they acquired during their time at the University enhances their permanent earning capabilities and their ability to economically benefit their communities.

Students entering the University can choose from the 13 different schools and colleges listed below:

- A. James Clark School of Engineering;
- College of Agriculture and Natural Resources;
- School of Architecture, Planning, and Preservation;
- College of Arts and Humanities;
- College of Behavioral and Social Sciences;
- College of Chemical and Life Sciences;
- College of Computer, Mathematical and Physical Sciences;
- College of Education;
- College of Information Studies;
- Philip Merrill College of Journalism;
- Robert H. Smith School of Business;
- School of Public Health; and
- School of Public Policy.

These schools offer hundreds of undergraduate and graduate degree programs. As befits a major university, these schools and colleges offer programs in the traditional liberal arts and humanities, social and natural sciences, physical and mathematical sciences, and the professions, including engineering, education, journalism, business, and public health. These offerings range from programs that would be familiar to Aristotle and the ancient Greeks, including Greek, to cutting edge life and computer sciences and public policy.

In a recently-completed academic year (Fall '06 through Spring '07), approximately 92 percent of undergraduate students were studying on a full-time basis. Two out of five undergraduates lived on campus. Two-thirds of graduate students were studying full-time. Exhibit 1 provides relevant statistical detail.

Exhibit 1: University of Maryland, student population

<i>Student population</i>	<i>Number</i>	<i>Share of total</i>
Undergraduate, full time living on campus	10,844	30%
Undergraduate, full time living off campus	12,936	36%
Undergraduate, part time	2,077	6%
Total undergraduate students	25,857	72%
Graduate, full-time living off campus	6,844	19%
Graduate, part-time	3,313	9%
Total graduate students	10,157	28%
Total student body	36,014	100%

Source: University of Maryland, University Relations

The University also appears to be committed to equal educational opportunity, declaring in its mission statement that diversity of faculty, students and staff is a major component of its ambitions. The University has a stated objective of achieving a critical mass of minority undergraduate students by 2009, which would constitute 35 percent of all undergraduates. By the 2006-2007 academic year, the University was well on its way to reaching that objective, with minority students constituting 33.4 percent of all undergraduates. The distribution of minority students by ethnicity is shown in Exhibit 2.

Exhibit 2: Diversity of undergraduate student population

<i>Ethnicity</i>	<i>Share of total</i>
African-American	13.00%
Hispanic	5.90%
Asian	14.10%
Native American	0.40%
Total minorities	33.40%

Source: University of Maryland, UM Newsdesk, Facts & Figures, [www.umd.edu](http://www.umd.edu)

Diversity also characterizes the graduate student population. As shown in Exhibit 3, roughly one in five graduate students in the 2006-2007 school year was a member of a minority group. Among all graduate students, 8 percent were African-American.

Exhibit 3: Diversity of graduate student population

<i>Ethnicity</i>	<i>Share of total</i>
African-American	8.0%
Total minorities	19.0%

Source: University of Maryland, UM Newsdesk, Facts & Figures, [www.umd.edu](http://www.umd.edu)

These diverse graduate and undergraduate students are taught by a faculty numbering over 3,700. These faculty members are in turn supported by almost 3,900 graduate assistants, who help with instruction, research, and other activities. Just over half of all full-time faculty members are tenured or hold tenure-track positions. Exhibit 4 provides associated statistical detail.

Exhibit 4: Faculty and graduate assistants

<i>Category of faculty/assistants</i>	<i>Number</i>
Full-time faculty	2,896
Part-time faculty	856
Total faculty	3,752
Tenure/tenure track faculty	1,464
Graduate assistants	3,873
Total faculty and graduate assistants	7,625
Source: University of Maryland, University Relations	

Total employment at the University in the last full academic year comprised almost 12,500 employees as shown in Exhibit 5. Three out of five employees were faculty or graduate assistants. Remaining staff included executive, administrative, managerial and support staff.

Exhibit 5: Total University employment

<i>Category of faculty/assistants</i>	<i>Number</i>	<i>Share of total</i>
Full-time faculty	2,896	23%
Part-time faculty	856	7%
Total faculty	3,752	30%
Tenure/tenure track faculty	1,464	12%
Graduate assistants	3,873	31%
Staff	4,829	39%
Total employment	12,454	100%
Source: University of Maryland, University Relations		

Historically, the University has been identified as the second largest employer in Prince George’s County, exceeded only by Andrews Air Force Base, which has approximately 15,000 employees. Excluding those establishments with multiple locations (e.g., Giant Food, Wal-Mart, or the University System of Maryland), the University of Maryland, College Park is one of Maryland’s ten leading employers, roughly equal in size to Aberdeen Proving Ground.

The University has also produced a diverse faculty and workforce. Over 24 percent of all university employees are members of a minority group and almost 22 percent of faculty members are classified as minorities. Exhibit 6 lists more specific data on the ethnicity/race of employees and faculty.

Exhibit 6: Diversity of University employees and faculty

<i>Ethnicity</i>	<i>All employees</i>	<i>Faculty and teaching staff</i>
African-American	13.0%	10.2%
Hispanic	4.1%	2.8%
Asian	7.0%	8.6%
Native American	0.2%	0.1%
Total minorities	24.3%	21.7%
Source: University of Maryland, University Relations		

It would be difficult to live in the state of Maryland for more than a few months and not feel connected to the University. Even those who do not attend the University, its many lectures, artistic performances and sporting events likely work alongside a University graduate, watch University of Maryland sports on television, use a University-developed technology/medicine/product (like Under Armour apparel), or listen to faculty experts comment through various media outlets.

The connection the University forges with its students is immediate. Upon entering, students at the University can choose from an exceptional array of opportunities to become engaged and connected with the academic, research, and/or service life of College Park. Students have varied opportunities to live, study, and work with others who share their interests. For instance:

- A sizable share of incoming students chooses to participate in one of the innovative living-learning programs. For first and second year students these programs combine close contact with faculty, specially designed courses and experiences, and residential life. Among the more notable of these is the Hinman CEOs program, the first in the nation to serve students interested in starting their own businesses.
- The University Honors program provides highly talented incoming students with an opportunity to combine small classes, research, internships, and international experiences. The program is known for strong community bonds and the high expectations of its students, most of whom go directly to graduate or professional schools after finishing at College Park.
- Another research oriented program is Gemstone, housed within the University Honors program. Approximately 600 students work in research teams and work closely with faculty on multidisciplinary research projects.
- In the Robert H. Smith School of Business, the Smith Undergraduate Fellows Program offers more than 20 different academic alternatives to approximately 700 students who combine academics, experiential learning, and internships, which may be internationally based.
- Engineering students also have opportunities for experiential learning to underscore their academic experiences at the University. A Scholars Program for

Industry Oriented Research in Engineering (ASPIRE) gives undergraduates an opportunity to participate in industrial engineering projects and other research under the mentorship of faculty.

The product of all this teaching and learning is a continuous stream of graduates and alumni who transition from life at College Park to life in Maryland, the nation, and the world. Given the University's commitment to diversity and service to minority students, it is notable that among the nation's top public universities College Park ranks first for degrees granted to African-Americans. The accomplishment is even more impressive the more granular the data. For instance, the University ranked in the top 10 nationally in the awarding of the following degrees to minority students:

- Asian-Americans, education, doctorates;
- African-Americans, engineering, doctorates;
- African-Americans, social sciences and history, doctorates;
- Hispanics, social sciences and history, doctorates;
- African-Americans, biological and biomedical sciences, bachelor's degrees;
- African-Americans, engineering, bachelor's degrees;
- Minorities, social sciences and history, bachelor's degrees; and
- African-Americans, social sciences and history, bachelor's degrees.

Beyond learning for the sake of enlightenment, higher education is meant to prepare people for both the world of work and their obligations as citizens. The University of Maryland has been notably successful in both these tasks.

College Park alumni have been building important Maryland corporations for decades from Clark Construction, founded by Jim Clark, Class of 1950, to Kevin Plank, Class of 1997, founder of Under Armour. Between these two are other alumni who have founded biomedical, manufacturing, real estate development, computer security, and home building companies as well as banks.

The halls of Congress and of the General Assembly in Annapolis are filled with College Park alumni. Three members of Maryland's current delegation to the U.S. House of Representatives and 22 current members of the General Assembly are alumni. So too are former U.S. Senators and Congressmen and former Governors.

The over two dozen alumni are officers, directors, or trustees of Maryland-based foundations. As leaders of the nonprofit and philanthropic sector, these Maryland-based alumni play pivotal roles in community life across the state. A partial list of prominent/exceptional alumni is presented below; a more extensive list can be found in the Appendix.

These exceptional graduates represent a minuscule share of total graduates. Every year the University of Maryland produces thousands of graduates. Of the over 6,000 incoming freshmen that arrive at College Park, four out of five can be expected to graduate within six years. In fact, these incoming freshmen are likely to graduate at a

rate somewhat in excess of what has been predicted for them by outside analysts, another sign of the productivity of teaching and learning at College Park.<sup>1</sup>

The University’s Graduate School also produces thousands of graduates each year. While the number of master’s degrees awarded by the Graduate School has been relatively constant in recent years, the number of doctorates that have been awarded has grown substantially. In 2007, graduate programs collectively conferred 1,968 master’s degrees, slightly more than the 5-year average and an increase of 10 percent over the number of master’s degrees conferred in 2003. Over that same 5-year period the number of doctorates awarded by the Graduate School increased 56 percent from 419 in 2003 to 653 in 2007 and increased each year from 2003 to 2007. Exhibit 7 provides a year-by-year summary of graduate degrees awarded by the University.

Exhibit 7: Graduate degrees awarded

<i>Year</i>	<i>Masters</i>	<i>Doctorates</i>	<i>Total</i>
2003	1,793	419	2,212
2004	2,048	483	2,531
2005	1,929	516	2,445
2006	2,001	602	2,603
2007	1,968	653	2,621
Total	9,739	2,673	12,412
5-year average	1,948	535	2,482
Increase from 2003	10%	56%	18%

Sources: Annual Report, 2006-2007, The Graduate School, University of Maryland; Sage

From an economic perspective, the University has a profound effect on all students, regardless of the degree received and even in some cases when the students do not obtain a degree. Despite recent press reports that have questioned the economic benefits of higher education, the data continue to show emphatically that higher education leads to higher incomes. Over time the earnings premium for a college degree has become more pronounced. In 1975, a college graduate earned 19 percent more than a high school graduate. By 2005, that premium had grown to more than 60 percent. As individuals grow older, the premium also increases. Thus, in 2005, college graduates aged 25 to 34 had annual earnings almost \$14,000 greater than high school graduates, while college graduates aged 45 to 54 years old had a differential of almost \$23,000.<sup>2</sup>

To demonstrate the economic impact College Park will have on its students, consider the current estimates of increases in income that arise from higher education. In 2006, the Bureau of Labor Statistics published estimated median (i.e. typical) earnings for all

<sup>1</sup> US News & World Report in its annual rankings of American colleges and universities predicts graduation rates for major, nationally ranked universities and colleges. For the University of Maryland the predicted rate of graduation was 76 percent for the Class of 2000. The actual rate of graduation for the Class of 2000 at College Park was 79 percent. Thus, the Class of 2000 was considered to be a significant over performer in terms of graduation rates.

<sup>2</sup> “Historically large earnings premium for college graduates persists,” College Board, [www.collegeboard.com](http://www.collegeboard.com)

workers categorized by their level of educational achievement from less than a high school diploma to a doctorate. Exhibit 8 converts those findings to today's dollars and compares earnings for each education level to the earnings of a high school graduate.

Exhibit 8: Median earnings by educational level

<i>Educational level</i>	<i>Weekly earnings</i>	<i>Annual earnings</i>	<i>Premium over HS diploma</i>	<i>Increase relative to HS diploma</i>
Doctorate	\$1,552	\$80,691	\$47,585	144%
Professional	\$1,496	\$77,795	\$44,689	135%
Masters	\$1,233	\$64,110	\$31,004	94%
Bachelors	\$1,023	\$53,207	\$20,102	61%
Associate	\$763	\$39,692	\$6,587	20%
Some college	\$713	\$37,080	\$3,975	12%
HS diploma	\$637	\$33,105	\$0	0%
Less than HS diploma	\$447	\$23,225	(\$9,881)	-30%

Sources: Bureau of Labor Statistics, Occupational Outlook Quarterly, Fall 2006; Sage

Using these estimates of typical earnings premiums for higher education, the value of the University of Maryland experience for its students can be estimated. Given the current population of roughly 26,000 undergraduates and the current graduation rate, this population will generate 20,427 bachelor's degrees. Assuming half the remaining alumni obtain associate degrees, the projected median earnings of all undergraduates can be estimated. In today's dollars, all these undergraduates would have an earning potential of \$1.3 billion annually. Moreover, their expected total annual earning potential would be \$439 million higher than an equal number of individuals with only a high school degree. Over a 40-year career, a typical individual with a bachelor's degree would earn over \$800,000 more than a high school graduate. These estimates are presented in Exhibit 9.

Exhibit 9: Increased annual earnings potential for current University of Maryland undergraduates

<i>Educational level</i>	<i>Number</i>	<i>Annual earnings</i>	<i>Total annual earnings (millions)</i>	<i>Premium over HS diploma</i>	<i>Total annual premium (millions)</i>
Bachelors degree	20,427	\$53,207	\$1,087	\$20,102	\$411
Associate degree	2,715	\$39,692	\$108	\$6,587	\$18
Some college	2,715	\$37,080	\$101	\$3,975	\$11
Total	25,857		\$1,295		\$439

Sources: Bureau of Labor Statistics, Occupational Outlook Quarterly, Fall 2006; Sage

A similar calculation can be made for recently awarded graduate degrees and is presented in Exhibit 10. Based on the 2,621 masters, professional, and doctorate degrees conferred in 2007, the typical annual earnings of these College Park alumni would total \$187 million and would be \$100 million greater than the earnings of an equal number of high school graduates. Assuming a working life of 35 years after receiving their degrees, these alumni would earn from \$1.1 million to \$1.7 million more than a high school graduate over that period.

Exhibit 10: Increased earnings potential for recent University of Maryland recipients of graduate degrees

<i>Educational level</i>	<i>Number</i>	<i>Annual earnings</i>	<i>Total annual earnings (millions)</i>	<i>Premium over HS diploma</i>	<i>Total annual premium (millions)</i>
Doctorate	653	\$80,691	\$53	\$47,585	\$31
Professional (1)	563	\$77,795	\$44	\$44,689	\$25
Masters	1,405	\$64,110	\$90	\$31,004	\$44
Total	2,621		\$187		\$100

Note. 1. Assumes that the degrees in architecture and business are classified as professional degrees.  
Sources: Bureau of Labor Statistics, Occupational Outlook Quarterly, Fall 2006; Sage

## Research & Innovation

*“The University of Maryland, College Park is a public research university . . . committed to achieving excellence as the State’s primary center of research...”*

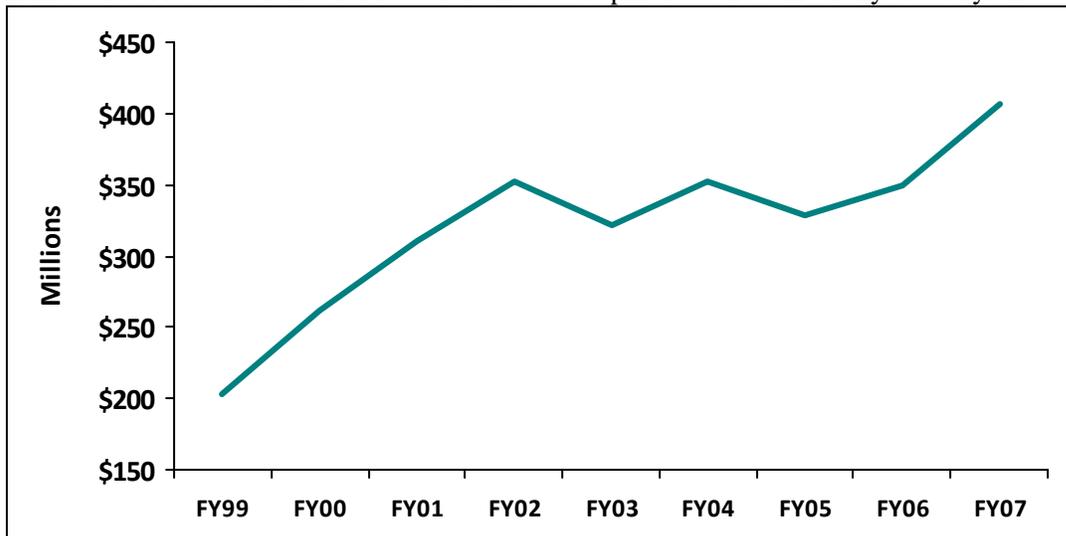
Mission and Goals Statement, University of Maryland, College Park. February 1, 2006

Research is one of the pillars of a great university. But today, simply engaging in research is insufficient. The old image of academic research as an “ivory tower” exercise has been replaced by an understanding of research as the foundation of a knowledge-driven, innovation-producing economy. Whether the identified problem revolves around preserving the vitality of the Chesapeake Bay or other ecosystems, creating the next generation of biotechnology-based pharmaceutical products, or realizing solutions to the problems posed by the need for homeland security, transferring research and intellectual property from the laboratories and halls of academia to the marketplace is an increasingly vital part of university life and an important aspect of the metric by which university performance is measured.

### University research is expanding briskly

In fiscal 2007, the University of Maryland was awarded \$407 million in grants and contracts for sponsored research. This represented an increase of \$57 million from the level of funding awarded in the prior year, as significant an annual increase in funds as the University has received since fiscal 2000. Exhibit 11 provides research funding detail.

Exhibit 11: Awarded funds for research and development at the University of Maryland



Over the past nine years, research funding has increased at an annual average rate of 9 percent, at least triple the general rate of inflation and roughly 50 percent faster than the

University's overall budget.<sup>3</sup> In FY 2007 awarded research funds equaled 31 percent of the overall budget, compared to 25 percent of the budget in fiscal 1999.

This steadily rising pool of funds available for research is a reflection of the growing reputation the University is garnering in various research fields. A recently released and well respected international ranking of the world's 100 major research universities ranks the University of Maryland 37<sup>th</sup> up from 57<sup>th</sup> only three years ago. Among all U.S. universities, the University ranked 28<sup>th</sup> and among U.S. public flagship universities, College Park was in 8<sup>th</sup> place.<sup>4</sup>

The driver behind the growing strength of the University's research capability is a faculty and staff that have captured increasing recognition for their accomplishments. For example, College Park has been home to Nobel Prize laureates for half a century, since Juan Ramón Jiménez won the prize for literature in 1957. The year 2007 was particularly notable as faculty were awarded the National Medal of Science, a MacArthur Foundation Genius Award, a Pulitzer Prize for history, and shared in the Nobel Peace Prize.

With thousands of faculty, a listing of notable research projects generated at College Park might well come to dominate the pages of this report. A sampling of recent projects includes:

#### Case Study: The University of Maryland LEAF House

In October 2007, the LEAF (Leading Everyone to an Abundant Future) House made its appearance on the Mall in Washington, D.C. along with 20-some other entrants in the U.S. Department of Energy's Solar Decathlon, an event that challenges college students to design, build and operate a house powered solely by the sun. A project that involved 250 students, faculty members and mentors from the commercial building trades, the Leaf House was awarded second place in the competition.

The zero energy home designed by the University's student team drew inspiration from the simple, yet vastly complex leaf. The 800-square foot modular structure boasts every sustainable system from the obvious high-tech solar panels to a liquid desiccant waterfall to control humidity, grey water recycling, green wall, and even a plug to charge an electric car.

Since its trip to the Mall, the Leaf House has been featured in the New York Times Sunday Magazine, inhabitat.com (a weblog devoted to the future of design), and many other media outlets. The house even has its own video on YouTube. In late 2007, the Potomac Valley Architecture Foundation and the AIA Potomac Valley Chapter agreed to purchase the house from the University of Maryland School of Architecture, Planning and Preservation and plan to dedicate the house in July 2008 well in advance of its appearance on the Solar House Tour for the Washington area in the fall of 2008.

Sources: inhabit.com, Potomac Valley Architecture Foundation, Voice of America

<sup>3</sup> From Fiscal 1999 to Fiscal 2007, the overall funding of the University grew from \$825 million to over \$1.3 billion, the equivalent of an average annual increase of 6 percent.

<sup>4</sup> Institute of Higher Education, "World's Top 100 Universities Ranking," Jiao Tong University, Shanghai, as reported in UM Newsdesk, Facts & figures, www.umd.edu

- Creation of *recyclable, additive-free plastics*, suitable for food packaging and for medical devices, which address the need to ban plastics with potentially dangerous ingredients;
- Creation of a prototype of a *supercomputer* as much as 100 times faster than current desktops, which may lead the way for the next generation of personal computers;
- Generation of the largest unclassified *database of terrorist incidents* containing records on over 80,000 incidents that have occurred since 1970;
- Leadership of a project designed to provide expert decision analytical tools that integrate climate change data and production capabilities for the *Chesapeake Bay* and its watershed;
- Development of processes to turn any *plant-based material into fuel* that can replace oil-based fuels;
- Provision of leadership to a *NASA* effort to study planets beyond our solar system and examine a comet at close range;
- Development of software to help *preserve records at the National Archives* and paving the way for the planned Electronic Records Archives;
- Pioneering efforts to support the use of satellites to track forest fires and *deliver critical information to disaster management teams*;
- Leadership of a consortium of 13 institutions developing methods to *combat the avian influenza virus*; and
- Work with federal agencies to enlarge research capacities and educational efforts to *mitigate the effects of climate change* and reduce human impacts on climate.

Much of this research and development activity is a direct result of the critical mass of technological expertise resident at College Park. Innovation and creativity is increasingly seen as a byproduct of the interactions among the so-called STEM disciplines—science, technology, engineering, and mathematics. By bringing together hundreds of experts and collaborating with colleagues at nearby federal agencies that sponsor research as well as peers at other universities and research agencies, the University has continued to expand its research capacities. In doing this, College Park and the broader international research community can rely upon the following expertise at the University of Maryland:

- 944 natural scientists;
- 479 engineers;
- 246 computer scientists; and
- 99 mathematicians.

One way to measure the productivity of research and development at the University of Maryland is to analyze data regarding derived intellectual property. In fiscal year 2006, College Park faculty and staff accomplished the following:

- 114 inventions were disclosed;
- 75 patent applications were filed;
- 22 patents were obtained;
- 28 licensing agreements were executed; and
- \$1.9 million in licensing income was produced.

These accomplishments follow a long tradition of intellectual property development on campus. By the end of fiscal 2006, there were 231 licensing agreements in place at College Park, with 67 of these agreements already generating income.

#### Research and business partnerships will continue to expand rapidly

The University has chosen to expand its role in the world of research and to build more bridges to the commercial world. Perhaps the most dramatic reflection of the University's ambitions is the development of M Square Research Park, expected to ultimately comprise 2.5 million square feet of research/development and office space when fully developed. The site for the research park comprises 124 acres next to the College Park Metro Station.

The scale of this project is striking. At full build-out, M Square Research Park will be as large as the biotech parks currently being developed in Baltimore City by Johns Hopkins University and the University of Maryland, Baltimore. Eventual M-Square Research Park construction costs are expected to top \$500 million. Up to 65,000 new jobs are projected at full build-out and annual property tax revenues have been estimated at \$47 million.

While the full build out of M Square Research Park is years away, tenants have already begun to arrive. The first, newly-constructed 120,000 square-foot office building is essentially complete, with the first tenant scheduled to move in spring 2008. Final approvals for the second 120,000 square-foot office building are presently being sought and a federal research tenant is expected to announce its intentions to occupy a major portion of this building in the near-term. Construction has also begun on a 290,000 square-foot building that will house the National Oceanic and Atmospheric Administration Center for Weather and Climate Prediction beginning mid-2009.

In addition to these new structures, existing buildings in the park demonstrate the types of relationships that the University has established with government agencies and private corporations and the breadth of intellectual and technological interests being pursued. Current tenants include the American Center for Physics, the Center for Advanced Study of Language, the National Foreign Language Center, the U.S. Food and Drug Administration's Center for Food Safety and Applied Nutrition, the University of

Maryland Technology Ventures Building (including high-tech tenants), and Raytheon Company.

But the University's efforts do not end there. Primarily through its business and engineering schools as well as the Office of Technology Commercialization, the University links technologists with business people to help translate innovations and ideas into viable commercial ventures. One of the most salient outputs of these types of efforts is the work of the Maryland Technology Enterprise Institute (MTECH), part of the A. James Clark School of the Engineering. This program works with a number of technology, service, and financial partners within the University and within the State of Maryland. In 2007, MTECH offered seven different courses in entrepreneurship education, involved over 100 Hinman CEOs students (i.e. students in the entrepreneurial living-learning program of the University), and had almost 600 registrants in a technology startup boot camp. Participants in these MTECH programs created 60 submissions on behalf of a business plan competition. In 2007, over 50 companies were involved in research work with University faculty, over 100 companies were assisted through the Maryland Technology Extension Service, and almost 60 companies were supported through the Biotechnology Research and Education Program. Since its creation in 1984, MTECH has created or retained over 4,500 jobs and produced \$17 billion worth of economic impact in the State of Maryland.<sup>5</sup>

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<sup>5</sup> Maryland Technology Enterprise Institute, "MTECH impact: Maryland Technology Enterprise Institute 2007 impact data," undated.

## Service

*“The University creates and applies knowledge for the benefit of the economy and culture of the State, the region, nation and beyond.”*

Mission and Goals Statement, University of Maryland, College Park. February 1, 2006

Trying to enumerate the services that the University provides to Marylanders and beyond is an endless and ultimately futile task. By the time any such list appeared to be complete, a set of new services would have been created. The University’s services cover an extraordinarily broad range, from expertise provided to the business community to a rich program of arts and entertainment to the work of alumni in Maryland’s schools and hospitals.

In some cases the economic impacts associated with these services can be quantified. In many more, however, the value of the University’s efforts is very difficult to measure. The information that a University employee provides through a Small Business Development Center may make the difference between a thriving business and one that fails. Moreover, this information may well be passed on from one entrepreneur to another providing additional value to the business community, but making the link between value and the University’s services is difficult at best.

The myriad of services the University provides contribute in important ways to the quality of life in College Park and Maryland. Quality of life is of course critical to the economic vitality of any community, but quantitatively measuring the value of that contribution to community life is virtually impossible. Yet few would argue that a metropolitan area could be vibrant or reach toward greatness or even relevance without a thriving community devoted to intellectualism, the arts or entertainment, which big-time college sports, for instance, provides.

### Information and services provided to the community

As a land grant university that began life as the Maryland Agricultural College, service to the broader community has been a central aspect of the University since inception. As an example, from its origins as a resource to farmers throughout the state, the Maryland Cooperative Extension has grown to include 200 faculty members and 200 employees with offices in every Maryland county and in Baltimore City, providing informal educational services and research-based expertise to citizens throughout the state.

Traditionally, the cooperative extension service provided services through agents or small classes. Today, the University takes advantage of new technology and associated opportunities to impact broader audiences. For example, a web site developed by the Maryland Cooperative Extension and the School of Public Health received a national award for providing health information to low-income households.

Moreover, for almost two decades, the University has been the state’s agency for Small Business Development Centers (SBDCs), which provide links between applied research

and service at the University, government, local economic development agencies and entrepreneurs at small and mid-sized businesses. SBDCs provide management, training, and technical assistance to the business community in order to strengthen emerging and growing companies. The network of SBDCs provides services statewide and in a typical year reaches out to over 10,000 entrepreneurs. In fiscal 2006, clients of SBDC created almost 900 jobs and started 117 new business ventures.

As a complement to SBDC efforts, Maryland's Procurement Technical Assistance Center (PTAC) helps the state's small businesses compete more effectively for government contracts from local, state, and federal agencies. In four years of service, PTAC has helped clients secure over \$65 million in government contract awards, which in turn have supported roughly 2,000 jobs.

Through the University's Office of Professional Studies, continuing education and professional development programs are created that support professionals and individual businesses across the state. These efforts help to maintain licensing and certification requirements for working professionals by keeping them abreast of current advances in their respective fields. In addition, this office works with individual client companies and organizations to assess their workforce development needs and then develops customized programs to meet those needs.

### Enriching cultural and civic life

Part of the University's mission is to contribute to the cultural life of the larger community. Two of the more obvious ways this happens is through the presentation of performing/fine arts and through its highly visible athletic program.

The Clarice Smith Performing Arts Center represents a collection of performing arts venues that principally serve the University's arts departments and student performers. In addition, the Smith Center schedules guest artists including the Australian Chamber Orchestra, the St. Lawrence String Quartet, big band jazz, an annual showcase for modern dance, and every four years the William Kapell International Piano Competition & Festival. This event, considered one of the four best piano events in the nation, is open to pianists from 18 to 33 years of age.

In 2007, the Smith Center and other performing and fine arts venues at College Park drew almost 77,000 visitors. Given the high profile of the Kapell Piano Competition and other events, a significant number of these visitors are estimated to have come from out of state.

### **Crow and David Bring Global Warming Tour to Maryland**

Singer Sheryl Crow's "Stop Global Warming College Tour" stopped at Cole Field House. She was accompanied by Laurie David, producer of, *An Inconvenient Truth* and *Seinfeld* co-creator Larry David, '70. At a news conference before the presentation, university President C. D. 'Dan' Mote Jr. highlighted the campus' green initiatives including, the college's shuttle bus fleet which runs on bio-diesel fuel manufactured from cooking oil used in the dining halls, and rooms lit with energy-efficient bulbs.

In the world of athletics, “Fear the Turtle” has emerged as one of the globe’s great rallying cries. Sports fans rapidly follow the fortunes of the football, basketball (men and women), lacrosse, and soccer teams of College Park—the teams that are followed most intensively by the largest number of Marylanders. These perennial powerhouses frequently grab headlines across the state and indeed, often across the country. Yet it was the University’s field hockey team, two-time national champions, who were invited to the White House by President Bush.

The football, basketball, lacrosse, soccer, and field hockey teams represent only five of the 27 Division I teams fielded by the University. Terps Athletics draw the attention of many across the state and are a major reason for visits to the campus. The Comcast Center is largely devoted to the sports program of the university, particularly and most prominently to the men’s and women’s basketball teams. Other university-related events and a few community-oriented events, however, are also scheduled at that site. Byrd Stadium is home to the Terps football and lacrosse teams. In 2007, over 767,000 fans attended athletic events at College Park.

But enriching civic life takes many forms and goes well beyond attending events. For instance, College Park Scholars have been recognized by the Maryland House of Delegates for contributing 30,000 hours of service to over 100 schools, parks, and nonprofit agencies in Prince George’s and Montgomery counties, Baltimore, and Washington, D.C. over the past 10 years. The College Park chapter of Engineers without Borders has participated in a half dozen projects in recent years in South America, Asia, and Africa, including a solar energy project in Burkina Faso and a wastewater treatment project in Brazil. With respect to the student body, this commitment to civic life continues beyond graduation. The University ranks 12<sup>th</sup> in the number of graduates who have gone on to serve in the Peace Corps.

**Nobel Laureate Delivers Sadat Peace Lecture  
Mohamed El Baradei**

Nobel Prize winner and director-general of the United Nations International Atomic Energy Agency, Mohamed El Baradei, delivered the annual Anwar Sadat Lecture for Peace on October 24, 2006. According to *Reuters*: “A solution to the Israeli-Palestinian conflict is within grasp if the international community commits to a blueprint and pursues dialogue, the head of the UN nuclear watchdog agency said on Tuesday. Speaking at the University of Maryland, Mohammed El Baradei, executive director of the International Atomic Energy Agency, declared that conflicts like those in the Middle East ‘cannot be solved through military force’ and he called for a new broad approach focusing on human security rather than state security.... ‘Because there is already a great deal of agreement on what that blueprint should look like, agreement is not far away,’ he said in delivering the university’s Sadat lecture for peace named after the assassinated former leader of Egypt, Anwar Sadat, who signed a peace treaty with Israel.”

Engagement can also occur at the institutional level. The University President is one of the charter signatories of the American College and University Presidents Climate Commitment. This effort is designed to neutralize greenhouse gas emissions by the University and serves as a renewed and enlarged commitment for research and development related to climate change.

This was part of the reason for the University’s selection as one of the top 15 Green Colleges and Universities. College Park joined a select group of schools from the U.S., Costa Rica, Canada, England, and Scotland. In making their selection, Grist, an environmental news service noted:

“some 91 percent of undergrads voted to raise student fees in order to pay for clean energy . . . . If implemented, the fee increase would eventually raise enough money to make UM the largest higher-ed purchaser of renewable energy in the U.S. UM -- one of the many schools committed to going carbon neutral -- is also doing what it can to reduce energy use: a combined heat-and-power plant completed in 2003 received the U.S. EPA's Energy Star award, and motion sensors that automatically shut down unused office equipment are currently undergoing testing.”<sup>6</sup>

The University is also engaged with young people in the community. The University’s Center for Information and Research on Civic Learning and Engagement (CIRCLE) has teamed up with the Pew Charitable Trust to focus on youth and their propensities to participate in civic life. CIRCLE has now become in effect the principal research agency for the “youth civic engagement movement.”<sup>7</sup>

Alumni engagement in critical professions

Part of the economic mission of the University is to provide the workforce for critical industries and professions that serve Maryland’s citizenry. In the 2005-2006 academic year the University awarded almost 9,000 degrees to students, many of whom go on to work in the state and support the Maryland economy.

Exhibit 12: Degrees conferred by the University in 2005-2006

Type of degree	Number conferred
Bachelors	6,301
Masters	2,001
First professional	29
Doctorate	602
Total	8,933
Source. Digest of Educational Statistics, 2007, U.S. Department of Education.	

The University’s graduates help to support the technology- and knowledge-based economy in Maryland and across the country. In the most recent year, College Park

<sup>6</sup> “15 Green colleges and universities,” August 10, 2007, www.grist.org

<sup>7</sup> *The Baltimore Sun* as cited in UM Newsdesk, Maryland Moments, August 2007, www.umd.edu

awarded 657 undergraduate engineering degrees in a dozen areas including computer, electrical, aerospace, and materials engineering. In addition, 364 Masters-level degrees in engineering and 144 Ph.D. degrees in engineering were also conferred.

Another example of this economic support for the state is the University of Maryland, College Park's continuing role as a vital source of new teachers. The number of College Park graduates who now serve as teachers in public and private schools in the state approaches 1,400. In addition, over 150 graduates have joined Teach for America, a program that encourages the nation's most brilliant college graduates to enter the teaching profession and work in inner city schools across the country.

### Three from University Named as State's Most Influential

President **C. D. Mote, Jr.**, Director of the Maryland Industrial Partnerships Program **Martha Connolly**, and Director of Athletics **Deborah Yow** were named in the inaugural class of influential Marylanders by *The Daily Record* newspaper in Baltimore. Those chosen for the honor were grouped into ten categories and selected for their influence, prominence, contributions to industry, stature with industry, and community involvement. President Mote was honored as a leader in Education. Among the Maryland alumni on the list were **Creig Northrop '90**, President, Creig Northrop & the Northrop Team, **Kevin Plank '97**, founder of Under Armour, **David Simon '83**, Creator and Writer, HBO's *The Wire*, and **Edward St. John '61**, Founder and President, St. John Properties

On behalf of those teachers who deal with the difficulties of literacy among current secondary school students, the University developed a certificate program in adolescent literacy coaching. Three dozen secondary teachers from Prince George's and Montgomery counties have participated in this program.

## The University's Economic & Fiscal Impacts

### Drivers of impact

The most readily measured statewide economic and fiscal impacts of the University of Maryland are those related to the University's operating and construction budgets, spending by full-time students, and spending by out-of-state visitors. These impacts provide an important, but still incomplete picture of the University's economic contribution to the state.

It is important to point out that economic impacts are generated through expenditures (e.g., through University operations, student spending, etc.). Impact calculation methodology is presented in Appendix I, which details the workings of the IMPLAN model utilized to generate impact estimates. This section of the report details various forms of expenditures associated with the University of Maryland and their associated economic and fiscal impacts.

### University spending

As noted earlier the University spent approximately \$1.3 billion in fiscal 2007. Roughly half of this expenditure was for payroll, while the remaining expenditures went to research and development, construction, and other goods and services. The great majority of this spending occurred in Maryland. However, calculating the University's economic impact on Maryland's economy required the study team to determine the extent to which University expenditures took place beyond the state's boundaries. For example, one in eight faculty or staff of the University lives out of state and a certain proportion of non-payroll expenditures are also made beyond Maryland's boundaries. All told and as reflected in Exhibit 13, more than \$1.1 billion of University spending occurred in Maryland in fiscal 2007, which represents 84 percent of University spending.

Exhibit 13: University spending breakdown, FY 2007

Type of spending	Total	Share spent in state	Spending in state
Payroll	\$662.1	87.5%	\$579.3
Non-payroll, excluding construction	\$192.3	35.0%	\$67.3
R&D expenditures	\$354.0	100.0%	\$354.0
Construction expenditures	\$107.9	100.0%	\$107.9
Total University budget	\$1,316.3		\$1,108.5

Source: University of Maryland, University Relations

These University expenditures are estimated to have created over 12,000 direct jobs for Maryland residents. Given the multiplier effect, the total number of jobs supported by University of Maryland spending exceeds 19,300.<sup>8</sup> The total income associated with

<sup>8</sup> The multiplier effect is the name commonly given to the economic impacts that occur when spending and dollars are recycled within a local economy. This is equal to the direct, indirect, and induced impacts listed in relevant exhibits in this section of the report. See Appendix for a discussion of economic and fiscal impacts and the multiplier effect.

these 19,000 plus jobs exceeds \$900 million, while associated revenue and sales for Maryland businesses and other establishments exceeds \$2 billion, including the \$1.1 billion spent directly by the University in Maryland. More detailed information about the economic impacts can be found in Exhibit 14.

Exhibit 14: Economic impacts of University spending on the Maryland economy

<i>Type of impact</i>	<i>Direct Impacts</i>	<i>Indirect Impacts</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	12,031	1,478	5,863	19,373
Income (millions)	\$633	\$68	\$232	\$933
Revenue/sales (millions)	\$1,109	\$181	\$718	\$2,007

Source: Sage

The income associated with these economic impacts also generates tax revenue for the State of Maryland as well as local jurisdictions. Among the most significant of these tax revenue streams is the income tax, part of which goes to the State and part of which goes to county governments. The State sales tax represents another major tax handle.

The most significant fiscal impacts associated with University spending are listed in Exhibit 15. University spending in fiscal 2007 is estimated to have generated \$70 million in income and sales tax revenue for State and county governments. The bulk of this revenue, \$48 million, accrued to the State, while the remainder accrued to various local governments, including, of course, Prince George's County.

Exhibit 15: Fiscal impacts of University spending, FY 2007

<i>Type of tax</i>	<i>Value (millions)</i>
State income	\$30
Sales	\$18
Total state taxes	\$48
County income	\$22
Total state and county taxes	\$70

Source: Sage

### Student spending

Full-time students attending the University have living expenses that create a separate set of economic and fiscal impacts. Exhibit 16 presents basic information on these full-time students and their spending. Total spending by these full-time students is estimated at \$171 million in fiscal 2007. On a per student basis, undergraduates living on campus are estimated by the University to have spent approximately \$4,000, while undergraduates living off campus are assumed to have spent approximately \$7,600, a reflection of the higher cost of living off campus. Each full-time graduate student is estimated to have spent approximately \$16,300 based on available statistical detail.

Exhibit 16: Full-time student spending in FY 2007 (millions)

<i>Student population</i>	<i>Number</i>	<i>Share living in state</i>	<i>Total</i>
Undergraduate living on campus	10,844	100.0%	\$44
Undergraduate living off campus	12,936	100.0%	\$99
Graduate living off campus	6,844	25.5%	\$28
Total			\$171
Source: University of Maryland, University Relations			

Not included in these figures is the spending of part-time students, either undergraduate or graduate. It is assumed that part-time students have other primary occupations and that their spending in the Maryland economy is primarily, though certainly not exclusively, a result of those primary occupations as opposed to their existence as students.

This student spending for living expenses creates what are called induced impacts in Maryland's economy. Induced impacts are those that occur when consumers, as opposed to businesses or universities, buy goods and services from retail and other commercial, consumer-oriented establishments. As listed in Exhibit 17, student spending is estimated to have supported almost 1,000 jobs in Maryland with associated income of \$40 million. This consumer spending also generated \$125 million in revenue or sales for business establishments statewide.

Exhibit 17: Economic impacts of student spending

<i>Type of impact</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	984	984
Income (millions)	\$40	\$40
Revenue/sales (millions)	\$125	\$125
Source: Sage		

The fiscal impacts associated with student spending are listed in Exhibit 18. Total tax revenues resulting from the impacts of student spending are estimated at \$3 million per annum for State and county governments, with roughly two-thirds of those revenues accruing to the State of Maryland.

Exhibit 18: Fiscal impacts of student spending

<i>Type of tax</i>	<i>Value (millions)</i>
State income	\$1.3
Sales	\$0.8
Total state taxes	\$2.0
County income	\$0.9
Total state and county taxes	\$3.0
Source: Sage	

## Visitor spending

The final major source of readily measured economic impacts generated by the University is visitors to the campus. Visits are made by Marylanders and people arriving from out-of-state. Both contribute to the state's economy. Given the University's location within a relatively short drive of Washington, D.C., Virginia, and other states, in-state visitors may well be choosing the University for entertainment and recreational spending over other states. Out-of-state visitors are drawn to the campus for a variety of reasons and their spending in Maryland is clearly a boost to the state's economy that can be credited to the University.

In Exhibit 19, the number of visitors to the campus and the reason for their visit to the campus is listed. An estimate is also made of the number of days they spend on campus during their visits. Despite the fact that the University can account for over 1.1 million campus visitors, it should be noted that this list is incomplete as it does not include several important categories of visitors, including visits by prospective students and their families, visits by prospective employees, parents weekends, among others.

While there are data on those commuting to conferences and workshops as well as those who stay on campus during conferences, an unknown and likely significant number of people attending conferences, but staying overnight in area hotels and motels is not included. The available information about campus visitors is used to estimate the spending of these visitors to the University. Given the number of visitors who are likely not counted, the following estimation of impacts from the spending of visitors to the College Park campus almost certainly underestimates the total economic and fiscal impacts of these visitors.

### **Maryland Day Sets another Record**

Maryland Day was a smashing success with an estimated 77,000 visitors on campus this year - a new record for the university-wide open house. Maryland Day crowds - including many parents with young children - roamed the campus to find almost 400 events showcasing the university. Over 8,000 campus volunteers participated in Maryland Day.

Exhibit 19: Visitors to Maryland

<i>Type of visit</i>	<i>No. of visitors</i>	<i>Average no. of days on campus per visit</i>
Maryland Day Open House	70,000	1
Graduations	25,000	2
Reunions and alumni events	42,000	2
Conferences, seminars, and workshops (1)	14,184	2
Summer camps, other programs (2)	111,035	5
Athletic events	767,283	1
Arts events	76,752	1
<b>Total</b>	<b>1,106,254</b>	

Note. (1) Number is those staying on campus for these events.  
(2) Number is those commuting to these events.  
Source: University of Maryland, University Relations

The number of these visitors who stay overnight is estimated based on the experience of other Maryland colleges and universities as these data are not readily available from the University of Maryland, College Park. On average colleges and universities in Maryland generate almost 1.7 overnight visitors for each student or almost 60,000 of the total visitors to College Park.<sup>9</sup> Those making daytrips to the campus may return to the campus multiple times, for example, for weeklong camps or conferences, or events stretching over a weekend. The total number of daytrips by these visitors is estimated at over 1.5 million. Spending associated with these visits is estimated at over \$140 million in total. See Exhibit 20 for details on types of visits and total spending.

Exhibit 20: Overnight visitors, visitor daytrips and total spending

<i>Type of visit</i>	<i>No. of visitors</i>	<i>Total spending (millions)</i>
Share of all visitors who stay overnight	5.4%	
Overnight visits	59,541	\$26.3
Daytrips by other visitors	1,543,762	\$115.2

Sources: University of Maryland, University Relations, Sage

Exhibit 21 provides estimates of the spending of visitors to the campus listed in Exhibit 20 and distinguishes between overnight and daytrip visitors. Spending data are provided on a per-overnight-visit or per-daytrip basis. For daytrip visitors, a visit is always less than a day and involves no expense for lodging, while the average overnight visitor is estimated to spend between two and five days in Maryland because of the University. The exhibit lists major categories of spending—lodging, food, entertainment, retail and shopping, and transportation. These data include costs associated with entertainment and other events on campus.<sup>10</sup>

Exhibit 21: Visitor spending breakdown

<i>Type of visit</i>	<i>Overnight</i>	<i>Daytrip</i>
Spending per visitor per visit	\$441	\$75
Type of spending		
Hotel/trip/day	40%	
Food/trip/day	32%	53%
Entertainment	3%	6%
Retail	12%	21%
Transportation	12%	21%

Source: Sage

<sup>9</sup> Overnight visitors are estimated on the basis of almost 3.4 out-of-state visitors to all independent colleges and universities in Maryland of whom almost half stay overnight. Sage Policy Group, Inc. The Economic and Fiscal Impact of Sixteen MICUA Member Institutions, January 2008.

<sup>10</sup> According to the University, ticket prices for events vary widely. Some alumni events are free; others cost as much as \$85. Arts events tickets range from \$7 to \$50; athletic tickets range from \$6 per event to \$600 for season tickets. Weeklong camps run from \$250 to \$400. These revenues which tend to fall under the heading of auxiliary operations and help support total University operations. Impacts of these revenues are captured through the overall impacts of the University's operations and the impacts of visitor spending.

Total economic impacts for daytrip visitors to the College Park campus are shown in Exhibit 22. For these visitors, the total economic impacts are over 2,600 jobs, roughly \$69 million in income, and roughly \$195 million in revenue and sales for Maryland businesses.

Exhibit 22: Economic impacts of daytrip visitor spending (per 1,000 visitors)

<i>Type of impact</i>	<i>Direct Impacts</i>	<i>Indirect Impacts</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	1,975	283	361	2,619
Income (millions)	\$42.6	\$12.1	\$14.0	\$68.7
Revenue/sales (millions)	\$115.2	\$38.0	\$41.9	\$195.1

Source: Sage

The fiscal impacts associated with daytrip visitors are presented in Exhibit 23. Total fiscal impacts are estimated at \$5.1 million, most of which would be collected by the State.

Exhibit 23: Fiscal impacts of daytrip visitor spending

<i>Type of tax</i>	<i>Value (millions)</i>
State income	\$2.2
Sales	\$1.3
Total state taxes	\$3.5
County income	\$1.6
Total state and county taxes	\$5.1

Source: Sage

The economic impacts associated with overnight visitors are summarized in Exhibit 24. These visitors' spending would support an estimated total of 532 jobs with associated income of almost \$16 million. Also supported would be roughly \$44 million of sales by Maryland businesses.

Exhibit 24: Economic impacts of overnight visitor spending (per 1,000 visitors)

<i>Type of impact</i>	<i>Direct Impacts</i>	<i>Indirect Impacts</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	386	63	83	532
Income (millions)	\$9.7	\$2.8	\$3.2	\$15.7
Revenue/sales (millions)	\$26.3	\$8.6	\$9.6	\$44.4

Source: Sage

This overnight visitor spending is estimated to generate approximately \$1.2 in tax revenue for State and county governments. As listed in Exhibit 25, the State would receive an estimated \$0.8 million, while county governments would receive \$0.4 million.

Exhibit 25: Fiscal impacts of overnight visitor spending

<i>Type of tax</i>	<i>Value (millions)</i>
State income	\$0.5
Sales	\$0.3
Total state taxes	\$0.8
County income	\$0.4
Total state and county taxes	\$1.2
Source: Sage	

The economic and fiscal impacts of all this spending—by the University, its students, and daytrip and overnight out-of-state visitors—can be added together to estimate the total impact of the University in FY 2007. Exhibit 26 summarizes the economic impacts of all this spending, which supports over 23,000 jobs in Maryland. These jobs are associated with over \$1 billion of income. Additionally, the spending of the University, its students, and its visitors supports almost \$2.4 billion in sales of goods and services by businesses throughout the state.

Exhibit 26: Economic impacts of all spending

<i>Type of impact</i>	<i>Direct Impacts</i>	<i>Indirect Impacts</i>	<i>Induced Impacts</i>	<i>Total Impacts</i>
Jobs (full-time and part-time positions)	14,392	1,825	7,291	23,508
Income (millions)	\$685	\$83	\$289	\$1,057
Revenue/sales (millions)	\$1,250	\$227	\$895	\$2,372
Source: Sage				

Fiscal impacts associated with these economic impacts are summarized in Exhibit 27. In 2007, the University of Maryland helped generate a total of \$54 million in State income and sales taxes, and an additional \$24 million in county income tax, for a total of \$79 million in State and county tax revenues.

Exhibit 27: Fiscal impacts of all spending

<i>Type of tax</i>	<i>Value (millions)</i>
State income	\$34
Sales	\$21
Total state taxes	\$54
County income	\$24
Total state and county taxes	\$79
Source: Sage	

### Impacts set to expand

The estimated economic impacts above are based on the University's operations and activities in FY 2007. In the future, it can be confidently predicted that these impacts will expand dramatically due in large part to the development and redevelopment of the East Campus.

The East Campus development represents a large multi-faceted project that will be located on 38 acres owned by the University to the east of Route 1. To be developed over several decades from 2007 through 2042, this project will encompass the relocation of the University's administrative facilities and the creation of more than 2 million square feet of housing for graduate students. Additional market-rate housing will also be constructed along with office/research and retail space. An early tenant, the Birchmere, has announced intentions to build a 500-seat state-of-the-art music and concert club expected to open in 2010. Theaters, sit-down restaurants, bookstores, an upscale grocery, and a four-star hotel are all worked into the plans with the idea of creating a bustling town center serving students, the University, and the surrounding community.

This project is a clear instance of how the University serves as an engine of economic development. When completed decades from now, this project—estimated at \$700 million in construction costs—is expected to add \$125 million to City of College Park coffers, \$355 million to Prince George's County, and \$886 million to the State of Maryland.<sup>11</sup>

The East Campus development is a noteworthy manifestation of a broader intent to help reshape the University's economic environment. College Park has looked to Georgia Tech and the University of Pennsylvania as models of engagement with the surrounding community with major projects that could benefit both town and gown and improve the quality of life for the greater area. For the University, the goal is straightforward—to be a top 10 university, College Park needs to be a top 10 college town.<sup>12</sup>

#### **Chevy Chase Bank Field Named; Byrd Stadium Expansion Announced**

In August 2006, Chevy Chase Bank and the University of Maryland announced the bank's commitment of \$20 million to support a significant portion of the cost of expanding Byrd Stadium. The Chevy Chase Bank Field is now the home of the Terrapin football and lacrosse teams. Several months later, Athletic Director Debbie Yow announced expansion plans for Chevy Chase Bank Field at Byrd Stadium. Expansion will be completed in phases. Phase One will include a dramatic expansion of Tyser Tower, the addition of 64 luxury suites and 500 mezzanine-level seats. The cost for Phase One of the expansion will be \$50.8 million, to be paid entirely by Maryland Athletics and private support.

Finally, it is worth reiterating that while the economic and fiscal impacts of the University of Maryland, College Park presented above are dramatic, these measured impacts are partial. An ongoing impact of the University is the increased earning power of graduates—a lifelong economic benefit both to alumni and to their communities.

<sup>11</sup> "East Campus redevelopment initiative," University of Maryland, undated.

<sup>12</sup> Ovetta Wiggins, "U-Md. project envisions a livelier College Park," Washington Post, January 7, 2008, [washingtonpost.com](http://washingtonpost.com)

## Conclusion

Maryland would be much diminished without the University of Maryland, College Park in myriad ways. In all, the University supports more than 23,000 jobs held by Marylanders, roughly \$1 billion in income and almost \$2.4 billion in business sales per annum. This economic activity in turn produces \$54 million in tax revenues for the State of Maryland and another \$24 million for local governments.

But these measured impacts are partial in nature. The University also increases the life-time earnings of its graduates and produces people who are empowered to reshape their communities for the better.

The University has also emerged as a research and development powerhouse. In just one fiscal year (2006), College Park faculty and staff accomplished the following:

- 114 inventions were disclosed;
- 75 patent applications were filed;
- 22 patents were obtained;
- 28 licensing agreements were executed; and
- \$1.9 million in licensing income was produced.

The University also plays a disproportionate role developing people for critical occupations, including engineering, nursing and teaching. Graduate degree production continues to rise rapidly. In 2007, the University's graduate programs collectively conferred 1,968 master's degrees, slightly more than the 5-year average and an increase of 10 percent over the number of master's degrees conferred in 2003. Over that same 5-year period the number of doctorates awarded by the Graduate School increased 56 percent from 419 in 2003 to 653 in 2007 and increased each year from 2003 to 2007.

With the development/redevelopment of East Campus and M Square Research Park, the expanding global reputation of the work taking place in College Park, and continued expansion of faculty and enrollment, the University is positioned to generate ever expanding economic and fiscal impacts in Maryland. The University's future is another reason to conclude that Maryland will remain at or near the forefront of U.S. states in terms of 21<sup>st</sup> century preparedness.

## **Appendix I: IMPLAN**

IMPLAN is an economic impact assessment software system. The system was originally developed and is now maintained by the Minnesota IMPLAN Group (MIG). It combines a set of extensive databases concerning economic factors, multipliers and demographic statistics with a highly refined and detailed system of modeling software. IMPLAN allows the user to develop local-level input-output models that can estimate the economic impact of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships.

There are two major components to IMPLAN: data files and software. An impact analysis using IMPLAN starts by identifying expenditures in terms of the sectoring scheme for the model. Each spending category becomes a "group" of "events" in IMPLAN, where each event specifies the portion of activity allocated to a specific IMPLAN sector. Groups of events can then be used to run impact analysis individually or can be combined into a project consisting of several groups. Once the direct economic impacts have been identified, IMPLAN can calculate the indirect and induced impacts based on a set of multipliers and additional factors.

The hallmark of IMPLAN is the specificity of its economic datasets. The database includes information for five-hundred-and-twenty-eight different industries (generally at the three or four digit Standard Industrial Classification level), and twenty-one different economic variables. Along with these data files, national input-output structural matrices detail the interrelationships between and among these sectors. The database also contains a full schedule of Social Accounting Matrix (SAM) data. All of this data is available at the national, state, and county level.

Another strength of the IMPLAN system is its flexibility. It allows the user to augment any of the data or algorithmic relationships within each model in order to more precisely account for regional relationships. This includes inputting different output-to-income ratios for a given industry, different wage rates, and different multipliers where appropriate. IMPLAN also provides the user with a choice of trade-flow assumptions, including the modification of regional purchase coefficients, which determine the mix of goods and services purchased locally with each dollar in each sector. Moreover, the system also allows the user to create custom impact analyses by entering changes in final demand. This flexibility is a critically important feature in terms of the Sage proposed approach. Sage is uniquely qualified to develop data and factors tailored to this project, and, where appropriate, overwrite the default data contained in the IMPLAN database.

A final advantage of IMPLAN is its credibility and acceptance within the profession. There are over five hundred active users of IMPLAN databases and software within the federal and state governments, universities, and among private sector consultants. The following list provides a sampling of IMPLAN users.

## Sample of IMPLAN Users:

### Academic Institutions

Alabama A&M University  
Albany State University  
Auburn University  
Cornell University  
Duke University  
Iowa State University  
Michigan Tech University  
Ohio State  
Penn State University  
Portland State University  
Purdue University  
Stanford University  
Texas A&M University  
University of California – Berkeley  
University of Wisconsin  
University of Minnesota  
Virginia Tech  
West Virginia University  
Marshall University/College of Business

### Federal Government Agencies

Argonne National Lab  
Fed. Emergency Man. Agency (FEMA)  
US Dep't of Agriculture, Forest Service  
US Dep't of Ag., Econ Research Service  
US Dep't of Int., Bureau of Land Mgmt.  
US Dep't of Int., Fish and Wildlife Serv.  
US Dep't of Int., National Parks Service  
US Army Corps of Engineers

### State Government Agencies

MD Dep't of Natural Resources  
Missouri Department of Economic Development  
California Energy Commission  
Florida Division of Forestry  
Illinois Dep't of Natural Resources  
New Mexico Department of Tourism  
South Carolina Employment Security  
Utah Department of Natural Resources  
Wisconsin Department of Transportation

### Private Consulting Firms

Coopers & Lybrand  
Batelle Pacific NW Laboratories  
Boise Cascade Corporation  
Charles River Associates  
CIC Research  
BTG/Delta Research Division  
Crestar Bank  
Deloitte & Touche  
Ernst & Young  
Jack Faucett Associates  
KPMG Peat Marwick  
Price Waterhouse LLP  
SMS Research  
Economic Research Associates  
American Economics Group, Inc.  
L.E. Peabody Associates, Inc.  
The Kalorama Consulting Group  
West Virginia Research League

## Appendix II: Distinguished alumni from the University of Maryland

Among the thousands of alumni of the University of Maryland College Park, many have made their mark in the state in the areas of business, government civic life, and in other areas. The following is a highly selective list of alumni who have worked and continue to work for the betterment of the State of Maryland.

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### **Elected leaders and government executives**

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Saqib Ali, member, Maryland House of Delegates

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Roscoe G. Bartlett, Congressman, 6<sup>th</sup> District

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Gail Bates, member, Maryland House of Delegates

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Elizabeth Bobo, member, Maryland House of Delegates

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Aisha Braveboy, member, Maryland House of Delegates

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David Brinkley, member, Maryland Senate

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James Brochin, member, Maryland Senate

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William Bronrott, member, Maryland House of Delegates

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John Brooks, former state Deputy Secretary of Agriculture

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Joseph Bryce, Chief Legislative Officer, Office of the Governor

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Elijah E. Cummings, Congressman, 7th District

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Dereck Davis, member, Maryland House of Delegates

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Pat Florestano, Regent, former Secretary of Higher Education

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Tawana P. Gaines, member, Maryland House of the Delegates

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Guy Guzzone, member, Maryland House of the Delegates

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Steny Hoyer, House Majority Leader and Congressman, 5th District

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James Hubbard, member, Maryland House of Delegates

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Harry Hughes, former Governor of Maryland

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Jolene Ivey, member, Maryland House of Delegates

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Mary Dulany James, member, Maryland House of Delegates

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Verna Jones, member, Maryland Senate

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Dolores Goodwin Kelley, member, Maryland Senate

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Cliff Kendall, chairman, Board of Regents

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Benjamin Kramer, member, Maryland House of Delegates

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Rona Kramer, member, Maryland Senate

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Stephen Lafferty, member, Maryland House of Delegates

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Susan Lee, member, Maryland House of Delegates

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Marvin Mandel, Regent and former Governor of Maryland

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Tony McConkey, member, Maryland House of Delegates

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Thomas McMillen, Regent, former U.S. Congressman, Rhodes Scholar

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Mike Miller, president, Maryland Senate

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Parren Mitchell, seven-term Congressman, 7<sup>th</sup> District, civil rights leader

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Douglas J.J. Peters, member, Maryland Senate

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Robert Pevenstein, vice chair, Board of Regents

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Justin Ross, member, Maryland House of Delegates

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C.A. "Dutch" Ruppensberger, Congressman, 2nd District

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**Elected leaders and government executives**

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Peter Shapiro, former chair, Prince George's County Council

Paul Stull, member, Maryland House of Delegates

Joseph Tydings, former U.S. Senator and former chairman, Board of Regents

Millard Tydings, four-term U.S. senator

Ken Ulman, Howard County Executive

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**Entrepreneurs and business founders**

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Anirban Basu, founder, chairman & CEO, Sage Policy Group Inc.

Thomas Blair, founder, FedMed

Jim Clark, founder, Clark Construction

Doug Dollenberg, founder, Nottingham Properties

Bob Fischell, founder, Fischell Biomedical

Barry Gossett, Regent & founder, CEO, Acton Mobile Industries

Terry Chase Hazell, president & CEO, SB Nanosciences

Bob Mitchell, Regent & founder, CEO,

Bob Pincus, founder, Fidelity & Trust Bank

Kevin Plank, founder and CEO, Under Armour

Ed St. John, founder, St. John Properties

Steve Walker, founder, Trusted Information Systems

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**Civic leaders and others**

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Buffy Beaudoin-Schwartz, trustee, Columbia Foundation

Hugh Breslin III, trustee, Community Foundation of Washington County

Florence Brody, president, Norman & Florence Brody Family Foundation

Jane Brown, director, Robert W. Deutsch Foundation

Lyn Chasen, president, Jewish Social Service Agency Foundation

Ed Crooke, director, Baltimore Equitable Insurance Foundation

Dominique Dawes, Gold medalist, represented Maryland in Olympics

James Delaplaine, trustee, Delaplaine Foundation

Michael Gelman, vice president and trustee, MorningStar Foundation

Lowell Glaser, president, Lowell & Harriet Glaser Family Foundation

Joe Hardiman, president, Hardiman Family Foundation, trustee, NASDAQ Education Foundation

Bruce Hoffberger, trustee, Hoffberger Foundation and Hoffberger Family Fund

Jack Kay, president, The Kay Family Foundation

Jeong Kim, president, Jeong H. Kim Foundation

Don Kirson, secretary-treasurer, Baltimore Jewish Health Foundation

Amy Macht, president, Macht Foundation and vice-president, Charles Crane Family Foundation

Maria Otero, trustee, Calvert Social Investment Foundation

Esther Pearlstone, president, Peggy Meyerhoff Pearlstone Foundation

P. Justin "P.J." Pearlstone, trustee, Pearlstone Family Fund

David Pollinger, trustee & treasurer, Howard & Geraldine Polinger Family Foundation

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**Elected leaders and government executives**

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Marvin Rabovsky, vice-president & director, Shady Grove Adventist Hospital Foundation

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Arnold Richman, trustee, Baltimore Community Foundation

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Carole Sibel, trustee, Mount Washington Pediatric Foundation

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Helen Smith, vice-president, Gordon V. & Helen C. Smith Foundation

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Robert H. Smith, president, Charles E. Smith Family Foundation

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Michele Snyder, president, Michele Smith Foundation

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Ingrid Tauber, secretary-treasurer, Laszlo N. Tauber Family Foundation

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Craig Thompson, partner, Venable, Education Department appointee to study Baltimore City schools

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Ollie Travers, trustee, James Lawrence Kernan Hospital Endowment Fund

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Antoinette "Toni" Ungaretti, director, Undergraduate Studies, Johns Hopkins University

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