**Full Book-Entry** **RATINGS: Moody's Aa1 / S&P AA+**
**(See "RATINGS" herein)**

*In the opinion of Co-Bond Counsel, interest on the Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance with the requirements of federal tax laws. Interest on the Bonds is not a preference item for purposes of the individual federal alternative minimum tax; however, interest paid to certain corporate holders of the Bonds indirectly may be subject to alternative minimum tax under circumstances described under "TAX MATTERS - Federal Tax Matters" herein. Co-Bond Counsel are of the further opinion that the Bonds are exempt from personal property taxes in Pennsylvania and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of initial delivery of the Bonds. For a more complete description of federal and state tax matters pertaining to the Bonds, see "TAX MATTERS" herein.*

# $183,145,000
# PENNSYLVANIA HIGHER EDUCATIONAL FACILITIES AUTHORITY
# The Trustees of the University of Pennsylvania
# Revenue Bonds, Series A of 2018

**Dated: Date of Delivery** **Due: February 15, as shown on inside front cover**

The Bonds described above will be issued by the Pennsylvania Higher Educational Facilities Authority (the "Authority") under a Trust Indenture dated as of January 15, 1987, as previously amended and supplemented and as further amended and supplemented by a Thirteenth Supplemental Indenture of Trust dated as of October 1, 2018 (collectively, and as amended and supplemented from time to time, the "Indenture"), between the Authority and The Bank of New York Mellon Trust Company, N.A., Philadelphia, Pennsylvania, as trustee, paying agent and bond registrar (in such capacities, the "Trustee"). The Bonds will be payable from and secured by certain funds held by the Trustee under the Indenture and payments to the Trustee, as assignee of the Authority, under the Loan Agreement dated as of January 15, 1987, as previously amended and supplemented and as further amended and supplemented by a Thirteenth Supplemental Loan Agreement dated as of October 1, 2018 (collectively, and as amended and supplemented from time to time, the "Loan Agreement"), between the Authority and

Penn
UNIVERSITY of PENNSYLVANIA

The Trustees of the University of Pennsylvania (the "University"). The Bonds are Additional Bonds (as defined in the Indenture) payable, equally and ratably with all other bonds of the Authority issued and outstanding under the Indenture, solely from the funds under the Indenture and from payments to be received by the Authority pursuant to the Loan Agreement. The Loan Agreement is a general, unsecured obligation of the University. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" herein.

Interest on the Bonds is payable on February 15 and August 15 of each year, commencing February 15, 2019, until maturity or redemption prior to maturity. The principal of and interest on the Bonds will be paid by the Trustee. So long as The Depository Trust Company, New York, New York ("DTC") or its nominee, Cede & Co., is the Bondholder, such payments will be made directly to Cede & Co. Disbursement of such payments to the Beneficial Owners is the responsibility of the Direct Participants and Indirect Participants, as more fully described herein.

The Bonds are subject to optional and mandatory redemption prior to maturity as described herein. See "DESCRIPTION OF THE BONDS" herein.

The Bonds will be issued only as fully registered bonds without coupons and, when issued, will be registered in the name of Cede & Co., as registered owner and nominee for DTC. DTC will act as securities depository for the Bonds. Purchases of beneficial interests in the Bonds will be made in book-entry form, in denominations of $5,000 or any integral multiple thereof. Purchasers will not receive certificates representing their interest in the Bonds purchased. So long as Cede & Co. is the registered owner, as nominee of DTC, references herein to the Bondholders or registered owners shall mean Cede & Co., as aforesaid and shall not mean the Beneficial Owners of the Bonds. See "BOOK-ENTRY SYSTEM" herein.

**The Bonds are limited obligations of the Authority. Neither the general credit of the Authority nor the credit or the taxing power of the Commonwealth of Pennsylvania or any political subdivision thereof is pledged for the payment of the principal or redemption price of, and interest on, the Bonds, nor shall the Bonds be or be deemed to be general obligations of the Authority or obligations of the Commonwealth of Pennsylvania or any political subdivision thereof, nor shall the Commonwealth of Pennsylvania or any political subdivision thereof be liable for the payment of the principal and redemption price of, and interest on, the Bonds. The Authority has no taxing power.**

**MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES, YIELDS AND CUSIPS**
**(See Inside Front Cover Page)**

This cover page contains information for quick reference only. It is not a summary of this issue. Investors must read the entire Official Statement, including the Appendices, to obtain information essential to making an informed investment decision.

The Bonds are offered when, as and if issued by the Authority and received by the Underwriters (as defined herein), subject to the approving legal opinion of Ballard Spahr LLP and Andre C. Dasent, P.C., each of Philadelphia, Pennsylvania, Co-Bond Counsel. Certain legal matters will be passed upon for the University by Wendy S. White, Esquire, Senior Vice President and General Counsel of the University; for the Authority by its counsel, Barley Snyder LLP, Lancaster, Pennsylvania; and for the Underwriters by their counsel, Drinker Biddle & Reath LLP, Philadelphia, Pennsylvania. It is expected that the Bonds in definitive form will be available for delivery through the facilities of DTC on or about October 17, 2018.

**BofA Merrill Lynch**

**Morgan Stanley** **Goldman Sachs & Co. LLC**

**Loop Capital Markets** **Wells Fargo Securities** **Drexel Hamilton, LLC**

Dated: October 3, 2018

**$183,145,000**
**PENNSYLVANIA HIGHER EDUCATIONAL FACILITIES AUTHORITY**
**THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA**
**REVENUE BONDS, SERIES A OF 2018**

**MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES, YIELDS AND CUSIPS**

**$42,210,000 Serial Bonds**

| Maturity Date (February 15) | Principal Amount | Interest Rate | Price | Yield | CUSIP† |
|---|---|---|---|---|---|
| 2022 | $6,735,000 | 5.000% | 109.338 | 2.080% | 70917S 3L5 |
| 2023 | 4,230,000 | 5.000 | 111.626 | 2.170 | 70917S 3M3 |
| 2024 | 5,540,000 | 5.000 | 113.570 | 2.280 | 70917S 3N1 |
| 2025 | 1,570,000 | 5.000 | 115.303 | 2.380 | 70917S 3P6 |
| 2027 | 1,990,000 | 5.000 | 118.109 | 2.570 | 70917S 3Q4 |
| 2028 | 2,030,000 | 5.000 | 119.304 | 2.650 | 70917S 3R2 |
| 2029 | 2,165,000 | 5.000 | 118.487 (c) | 2.740 | 70917S 3S0 |
| 2030 | 2,325,000 | 5.000 | 117.766 (c) | 2.820 | 70917S 3T8 |
| 2031 | 2,150,000 | 5.000 | 117.229 (c) | 2.880 | 70917S 3U5 |
| 2032 | 2,485,000 | 3.250 | 98.400 | 3.400 | 70917S 3V3 |
| 2033 | 2,320,000 | 5.000 | 116.075 (c) | 3.010 | 70917S 3W1 |
| 2034 | 4,505,000 | 4.000 | 104.513 (c) | 3.430 | 70917S 3X9 |
| 2035 | 4,165,000 | 3.375 | 97.478 | 3.580 | 70917S 3Y7 |

**$42,500,000 4.000% Term Bonds Due February 15, 2043, Priced @ 101.869 to Yield 3.760%(c) (CUSIP†: 70917S 3Z4)**

**$98,435,000 5.000% Term Bonds Due February 15, 2048, Priced @ 112.607 to Yield 3.410%(c) (CUSIP†: 70917S 4A8)**

(c) Callable premium bond; priced to first optional redemption date of February 15, 2028.

† CUSIP is a registered trademark of the American Bankers Association. CUSIP data herein is provided by CUSIP Global Services, managed by S&P Capital IQ on behalf of the American Bankers Association. This data is not intended to create a database and does not serve in any way as a substitute for the CUSIP services provided by CUSIP Global Services. CUSIP numbers are included herein solely for the convenience of the purchasers of the Bonds. None of the Authority, the University or the Underwriters shall be responsible for the selection or correctness of the CUSIP numbers set forth herein.

**PENNSYLVANIA HIGHER EDUCATIONAL FACILITIES AUTHORITY**
(Commonwealth of Pennsylvania)
1035 Mumma Road
Wormleysburg, PA 17043

**BOARD MEMBERS**

| | |
|---|---|
| Honorable Thomas W. Wolf<br>Governor of the Commonwealth of Pennsylvania | President |
| Honorable John H. Eichelberger, Jr.<br>Designated by the President Pro Tempore of the Senate | Vice President |
| Honorable Andrew E. Dinniman<br>Designated by the Minority Leader of the Senate | Vice President |
| Honorable Stanley E. Saylor<br>Designated by the Speaker of the House of Representatives | Vice President |
| Honorable Joseph M. Torsella<br>State Treasurer | Treasurer |
| Honorable Curtis M. Topper<br>Secretary of General Services | Secretary |
| Honorable Anthony M. DeLuca<br>Designated by the Minority Leader of the House of Representatives | Board Member |
| Honorable Eugene A. DePasquale<br>Auditor General | Board Member |
| Honorable Pedro A. Rivera<br>Secretary of Education | Board Member |

**Executive Director**
Robert Baccon

**Authority Counsel**
(Appointed by the Office of General Counsel)
Barley Snyder LLP, Lancaster, Pennsylvania

**Trustee**
The Bank of New York Mellon Trust Company, N.A.
Philadelphia, Pennsylvania

**Co-Bond Counsel**
(Appointed by the Office of General Counsel)

Ballard Spahr LLP
Philadelphia, Pennsylvania

Andre C. Dasent, P.C.
Philadelphia, Pennsylvania

**University Counsel**
Wendy S. White, Esquire
Senior Vice President and General Counsel of the University

**Counsel to Underwriters**
Drinker Biddle & Reath LLP
Philadelphia, Pennsylvania

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

IN CONNECTION WITH THIS OFFERING THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS THAT STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

THE BONDS MAY BE OFFERED AND SOLD TO CERTAIN DEALERS (INCLUDING DEALERS DEPOSITING THE BONDS INTO INVESTMENT ACCOUNTS) AND TO OTHERS AT PRICES LOWER THAN THE PUBLIC OFFERING PRICES AND SAID PUBLIC OFFERING PRICES MAY BE CHANGED FROM TIME TO TIME BY THE UNDERWRITERS WITHOUT PRIOR NOTICE TO THE PUBLIC, BUT WITH PRIOR NOTICE TO THE AUTHORITY AND THE UNIVERSITY.

THE ORDER AND PLACEMENT OF MATERIALS IN THIS OFFICIAL STATEMENT, INCLUDING THE APPENDICES, ARE NOT TO BE DEEMED TO BE A DETERMINATION OF RELEVANCE, MATERIALITY, OR IMPORTANCE, AND THIS OFFICIAL STATEMENT, INCLUDING THE APPENDICES, MUST BE CONSIDERED IN ITS ENTIRETY. THE OFFERING OF THE BONDS IS MADE ONLY BY MEANS OF THIS ENTIRE OFFICIAL STATEMENT.

---

The information set forth herein has been obtained from the Pennsylvania Higher Educational Facilities Authority (the "Authority") as to information concerning the Authority, and The Trustees of the University of Pennsylvania (the "University"), and other sources which are believed to be reliable, but the information provided by sources other than the Authority is not guaranteed as to accuracy or completeness by the Authority. The information and expressions of opinions herein are subject to change without notice and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in any of the information set forth herein since the date hereof.

The Underwriters (as defined herein) have provided the following sentence for inclusion in the Official Statement: The Underwriters have reviewed the information in this Official Statement in accordance with, and as part of, their responsibilities to investors under the federal securities law as applied to the facts and circumstances of this transaction, but the Underwriters do not guarantee the accuracy or completeness of such information.

No dealer, broker, salesperson or other person has been authorized by the Authority, the Underwriters or the University to give any information or to make any representations with respect to the Bonds, other than those contained in this Official Statement, and if given or made, such other information or representations must not be relied upon as having been authorized by any of the foregoing. This Official Statement does not constitute an offer to sell or the solicitation of any offer to buy any of the Bonds in any jurisdiction in which it is unlawful to make such an offer, solicitation, or sale.

The Bonds are not and will not be registered under the Securities Act of 1933 as amended, or under any state securities laws, and the Indenture has not been and will not be qualified under the Trust Indenture Act of 1939, as amended, because of available exemptions therefrom. Neither the Securities and Exchange Commission nor any federal, state, municipal, or other governmental agency will pass upon the accuracy, completeness, or adequacy of the Official Statement.

This Official Statement speaks only as of the date printed on the cover page hereof. The information contained herein is subject to change. The Official Statement will be made available through the Electronic Municipal Market Access system.

## TABLE OF CONTENTS

# Official Statement

## $183,145,000
## PENNSYLVANIA HIGHER EDUCATIONAL FACILITIES AUTHORITY
## The Trustees of the University of Pennsylvania
## Revenue Bonds, Series A of 2018

### INTRODUCTION

The following introductory statement is subject in all respects to more complete information contained elsewhere in this Official Statement. Capitalized terms used in this Official Statement that are not otherwise defined herein have the meanings given to them in APPENDIX C hereto.

**Purpose of the Official Statement**

The purpose of this Official Statement, including the cover pages and the Appendices, is to furnish certain information relating to (1) the Pennsylvania Higher Educational Facilities Authority (the "Authority"), (2) the Authority's The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2018, in the aggregate principal amount of $183,145,000 (the "Bonds"); and (3) The Trustees of the University of Pennsylvania (the "University").

**The Authority**

The Authority is a body corporate and politic, constituting a public corporation and a governmental instrumentality of the Commonwealth of Pennsylvania (the "Commonwealth"), created by the Pennsylvania Higher Educational Facilities Authority Act of 1967 (Act. No. 318 of the General Assembly of the Commonwealth, approved December 6, 1967, as amended) (the "Act"). The Authority has no taxing power. For additional information concerning the Authority, see "THE AUTHORITY" herein.

**The University**

The University is an independent non-sectarian research institution of higher education chartered under the laws of the Commonwealth. One of only nine colleges and universities established during the colonial period, the University is the third oldest Ivy League school. It is a privately endowed, gift-supported non-profit institution.

The University has a full-time student body of over 22,800 and a 280-acre campus in West Philadelphia (excluding the Hospital of the University of Pennsylvania) on which over 150 University buildings are situated. In addition, the Morris Arboretum in Northwestern Philadelphia encompasses 92 acres with 30 buildings, and the New Bolton Center in Chester County, Pennsylvania, consists of 600 acres with 77 buildings. The University is comprised of an academic component and a health system component known as the University of Pennsylvania Health System (the "Health System").

APPENDIX A contains certain information on the history, organization, operations, and financial condition of the University. APPENDIX B contains the audited financial statements of the University for the fiscal years ended June 30, 2018 and June 30, 2017.

**The Bonds**

The Bonds are authorized by resolution of the Authority adopted on September 20, 2018, and will be issued as Additional Bonds under a Trust Indenture dated as of January 15, 1987, as previously supplemented and amended and as further supplemented and amended by a Thirteenth Supplemental Indenture of Trust dated as of October 1, 2018 (collectively, and as amended and supplemented from time to time, the "Indenture"), each between the Authority and The Bank of New York Mellon Trust Company, N.A., as successor trustee thereunder (the "Trustee"). The Bonds initially will be issued in the form of one registered bond in the aggregate principal amount of each maturity thereof and will be registered in the name of Cede & Co., as nominee for The Depository Trust Company, New York, New York ("DTC"). DTC will maintain a book-entry system for recording ownership interests in the Bonds. See "BOOK-ENTRY SYSTEM" herein.

**Plan of Financing**

The Bonds are being issued by the Authority to undertake a project (collectively, the "2018 Project") on behalf of the University, consisting generally of (i) the payment or reimbursement of the University for costs expended in connection with various capital projects of the University, including the financing of a portion of the projects in the University's capital budget, which may include (without limitation) acquisition, construction, renovation and equipping of Stemmler Hall, Richards Medical Research Labs Towers, Leidy Laboratories, Hill College House, and construction of the Perelman Center for Political Science and Economics and the Wharton Academic Research Building and Substation, and (ii) payment of the costs of issuing the Bonds.

The proceeds of the Bonds will be loaned to the University for the purposes described above pursuant to a Loan Agreement dated as of January 15, 1987, as previously supplemented and amended and as further supplemented and amended by a Thirteenth Supplemental Loan Agreement dated as of October 1, 2018 (collectively, and as amended and supplemented from time to time, the "Loan Agreement"), between the Authority and the University. Under the Loan Agreement, the University will be obligated to make loan payments to the Trustee, as assignee of the Authority, in amounts and at times sufficient, among other things, to pay the principal and redemption price of, and interest on, the Bonds when due.

**Tax Matters**

Federal Tax Matters

In the opinion of Co-Bond Counsel, interest on the Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance with the requirements of federal tax laws. Interest on the Bonds is not a preference item for purposes of the individual federal alternative minimum tax; however, interest paid to certain corporate holders of the Bonds may be indirectly subject to alternative minimum tax under circumstances described herein.

Pennsylvania Taxes

Co-Bond Counsel are of the further opinion that the Bonds are exempt from personal property taxes in Pennsylvania and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of initial delivery of the Bonds.

For a more complete discussion of federal and state income tax matters, see "TAX MATTERS" herein.

**Security and Sources of Payment for the Bonds**

The Bonds are limited obligations of the Authority, payable on a parity with Prior Bonds described below, and solely from (1) payments to be made by the University under the Loan Agreement and (2) certain funds held by the Trustee under the Indenture, and not from any other fund or source of the Authority. The Authority has previously issued on behalf of the University, and there are currently outstanding under the Indenture, the following series of the Authority's bonds (collectively, the "Prior Bonds"):

- The Trustees of the University of Pennsylvania Revenue Bonds, Series B of 2009, issued in the original aggregate principal amount of $42,860,000 (of which $6,545,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series C of 2009, issued in the original aggregate principal amount of $28,755,000 (of which $7,970,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series of 2010, issued in the original aggregate principal amount of $71,410,000 (of which $16,935,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2011, issued in the original aggregate principal amount of $150,000,000 (of which $11,125,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2015, issued in the original aggregate principal amount of $205,670,000 (of which $196,110,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series B of 2015, issued in the original aggregate principal amount of $165,150,000 (of which $162,395,000 was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Revenue Bonds, Series C of 2015, issued in the original aggregate principal amount of $8,020,000 (all of which was outstanding as of June 30, 2018);

- The Trustees of the University of Pennsylvania Refunding Revenue Bonds, Series A of 2016, issued in the original aggregate principal amount of $168,565,000 (all of which was outstanding as of June 30, 2018); and

- The Trustees of the University of Pennsylvania Refunding Revenue Bonds, Series A of 2017, issued in the original aggregate principal amount of $178,395,000 (all of which was outstanding as of June 30, 2018).

The obligation of the University to make payments under the Loan Agreement is a general, unsecured obligation of the University. The Bonds will not be secured by a pledge of gross receipts or other specified revenues of the University or by a mortgage lien on or security interest in any University property.

See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" herein.

**Definitions and Summaries of Documents**

Definitions of certain words and terms used in the Official Statement and summaries of the Indenture and the Loan Agreement are included in APPENDIX C. Such definitions and summaries do not purport to be comprehensive or definitive. All references herein to such documents are qualified in their entirety by reference to the definitive forms of such documents, copies of which may be viewed at the office of the Trustee in Philadelphia, Pennsylvania, and will be provided to any prospective purchaser requesting the same upon payment by such prospective purchaser of the cost of complying with such request.

## THE AUTHORITY

The Authority is a body corporate and politic, constituting a public corporation and a governmental instrumentality of the Commonwealth, created by the Act. The Authority's address is 1035 Mumma Road, Wormleysburg, Pennsylvania 17043.

Under the Act, the Authority consists of the Governor of the Commonwealth, the State Treasurer, the Auditor General, the Secretary of Education, the Secretary of the Department of General Services, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, the Minority Leader of the Senate and the Minority Leader of the House of Representatives. The President Pro Tempore of the Senate, the Speaker of the House of Representatives, the Minority Leader of the Senate and the Minority Leader of the House of Representatives may designate a member of their respective legislative bodies to act as a member of the Authority in his or her stead. The members of the Authority serve without compensation but are entitled to reimbursement for all necessary expenses incurred in connection with the performance of their duties as members. The powers of the Authority are exercised by a governing body consisting of the members of the Authority acting as a board.

The Authority is authorized under the Act to, among other things, acquire, construct, finance, improve, maintain and operate any educational facility (as therein defined), with the rights and powers, inter alia: (1) to finance projects for colleges (including universities) by making loans to such colleges which may be evidenced by, and secured as provided in, loan agreements, security agreements or other contracts, leases or agreements; (2) to borrow money for the purpose of paying all or any part of the cost of construction, acquisition, financing, alteration, reconstruction and rehabilitation of any educational facility which the Authority is authorized to acquire, construct, finance, improve, install, maintain or operate under the provisions of the Act and to pay the expenses incident to the provision of such loans; and (3) to issue bonds and other obligations for the purpose of paying the cost of projects, and to enter into trust indentures providing for the issuance of such obligations and for their payment and security.

As of June 30, 2018, revenue bonds and notes of the Authority issued to finance various projects in the Commonwealth were outstanding in the amount of $5,884,997,769. None of the revenues of the Authority with respect to its revenue bonds and notes issued for the benefit of other institutions will be pledged as security for any bonds or notes issued for the benefit of the University. Further, no revenue bonds and notes issued for the benefit of other institutions will be payable from or secured by the revenues of the Authority or other moneys securing any bonds or notes issued for the benefit of the University.

The Authority has issued, and may continue to issue, other series of bonds for the purpose of financing other projects, including other educational facilities. Each such series of bonds to the extent issued to benefit educational institutions other than the University is or will be secured by instruments separate and apart from the Indenture securing the Bonds.

The Act provides that the Authority is to obtain from the Pennsylvania State Public School Building Authority, for a fee, those executive, fiscal and administrative services which are not available from the colleges and universities, as may be required to carry out the functions of the Authority under the Act. Accordingly, the Authority and the State Public School Building Authority share an executive, fiscal and administrative staff and operate under a joint administrative budget.

The following are key staff members of the Authority who are involved in the administration of the financings and projects:

**Robert Baccon**
**Executive Director**

Mr. Baccon has served as an executive of both the Authority and the State Public School Building Authority since 1984. He is a graduate of St. John's University with a bachelor's degree in management and holds a master's degree in international business from the Columbia University Graduate School of Business. Prior to his present post, Mr. Baccon held financial management positions with multinational U.S. corporations and was Vice President - Finance for a major highway construction contractor.

**David Player**
**Comptroller & Director of Financial Management**

Mr. Player serves as the Comptroller & Director of Financial Management of both the Authority and the State Public School Building Authority. He has been with the Authority and the State Public School Building Authority since 1999. Prior to his present post, he served as Senior Accountant for both authorities and as an auditor with the Pennsylvania Department of the Auditor General. Mr. Player is a graduate of The Pennsylvania State University with a bachelor's degree in accounting. He is a Certified Public Accountant and Certified Internal Auditor.

**Beverly M. Nawa**
**Administrative Officer**

Mrs. Nawa has served as the Administrative Officer of both the Authority and the State Public School Building Authority since August 2004. She is a graduate of Alvernia College with a bachelor's degree in business administration. Prior to her present employment, Mrs. Nawa served as an Audit Senior and an Accounting Systems Analyst with the Pennsylvania Department of the Auditor General.

Mr. Baccon has announced his intention to retire as Executive Director effective October 17, 2018, at which time Mrs. Nawa will assume his duties as Acting Executive Director of the Authority.

THE AUTHORITY HAS NOT PREPARED OR ASSISTED IN THE PREPARATION OF THIS OFFICIAL STATEMENT, EXCEPT THE STATEMENTS UNDER THIS SECTION AND UNDER THE HEADING "LITIGATION – THE AUTHORITY," AND, EXCEPT AS AFORESAID, THE AUTHORITY DISCLAIMS RESPONSIBILITY FOR THE DISCLOSURES SET FORTH HEREIN MADE IN CONNECTION WITH THE OFFER, SALE, AND DISTRIBUTION OF THE BONDS.

## PLAN OF FINANCING

### 2018 Project

The Bonds are being issued by the Authority to undertake the 2018 Project consisting generally of (i) the payment or reimbursement of the University for costs expended in connection with various capital projects of the University, including the financing of a portion of the projects in the University's capital budget, which may include (without limitation) acquisition, construction, renovation and equipping of Stemmler Hall, Richards Medical Research Labs Towers, Leidy Laboratories, Hill College House, and construction of the Perelman Center for Political Science and Economics and the Wharton Academic Research Building and Substation, and (ii) payment of the costs of issuing the Bonds.

### Estimated Sources and Applications of Funds

The following sets forth the estimated sources and uses of funds in connection with the 2018 Project:

**Sources of Funds:**

| | |
|---|---|
| Principal Amount of the Bonds | $183,145,000 |
| Net Original Issue Premium/(Discount) | 17,684,171 |
| Total Estimated Sources of Funds | $200,829,171 |

**Applications of Funds:**

| | |
|---|---|
| Capital Project Costs | $200,000,000 |
| Costs of Issuance[(1)] | 829,171 |
| Total Estimated Applications of Funds | $200,829,171 |

(1) Includes Underwriters' discount, counsel fees (including Co-Bond Counsel, Underwriters' counsel and Authority's counsel), rating agency fees, Trustee and paying agent fees, accountant fees and other expenses related to issuance of the Bonds, printing costs, and miscellaneous fees and expenses of the Authority.

## DESCRIPTION OF THE BONDS

### Description of the Bonds

The Bonds are dated as indicated on the cover page hereof and will bear interest from such date at the rates set forth on the inside front cover page hereof, payable semiannually on February 15 and August 15 of each year, commencing February 15, 2019, until maturity or prior redemption, and will mature on the dates and in the amounts set forth on the inside front cover page of this Official Statement.

Interest on the Bonds will be paid on each Interest Payment Date by check or draft mailed to the persons in whose name the Bonds are registered on the registration books of the Authority (the "Bond Register") maintained by the Trustee at the address appearing thereon on the close of business on the February 1 or August 1 (whether or not a Business Day), as applicable, immediately preceding each Interest Payment Date (the "Regular Record Date"). Any such interest not so paid or duly provided for shall cease to be payable to the persons who are registered owners of the Bonds as of the Regular Record Date and will be payable to the persons who are registered owners of the Bonds at the close of business on the fifteenth day (the "Special Record Date") preceding the special payment date (the "Special Payment Date"), which will be the date fixed by the Trustee for the payment of defaulted interest whenever moneys become available for such payment. The principal of, and premium, if any, and interest on the Bonds are payable in any legal tender which at the time of payment constitutes lawful money of the United States of America.

DTC will act as securities depository under a book-entry system for the Bonds. Unless such system is discontinued, the provisions described below under "BOOK-ENTRY SYSTEM" (including provisions regarding payments to and transfers by the owners of beneficial interests in the Bonds) will be applicable to the Bonds. See "BOOK-ENTRY SYSTEM" below.

The Indenture and the Loan Agreement and all provisions thereof are incorporated by reference in the text of the Bonds, and the Bonds provide that each registered owner, beneficial owner and Direct or Indirect Participant (as hereinafter defined) in DTC, by acceptance of a Bond (including receipt of a book-entry credit evidencing an interest therein), assents to all of the provisions of the Indenture and the Loan Agreement as an explicit and material part of the consideration running to the Authority to induce it to issue the Bonds. Copies of the Indenture and the Loan Agreement, including the full text of the form of the Bonds, are on file at the corporate trust office of the Trustee in Philadelphia, Pennsylvania.

**Optional Redemption**

The Bonds maturing on and after February 15, 2029, are subject to optional redemption prior to maturity by the Authority, at the direction of the University, in whole or in part, at any time on or after February 15, 2028, at a redemption price equal to one hundred percent (100%) of the principal amount thereof, plus interest accrued to the redemption date. Any partial redemption of the Bonds may be in any order of maturity and in any principal amount (in authorized denominations) within a maturity as designated by the University.

**Mandatory Redemption**

The Bonds maturing on February 15, 2043, and February 15, 2048, will be subject to mandatory sinking fund redemption at a redemption price equal to 100% of the principal amount thereof on February 15 of the years and in the amounts set forth below.

| Bonds Maturing February 15, 2043 | | Bonds Maturing February 15, 2048 | |
|---|---|---|---|
| Year (February 15) | Amount | Year (February 15) | Amount |
| 2040 | $10,260,000 | 2044 | $10,855,000 |
| 2041 | 10,690,000 | 2045 | 11,425,000 |
| 2042 | 11,140,000 | 2046 | 12,030,000 |
| 2043* | 10,410,000 | 2047 | 25,155,000 |
| | | 2048* | 38,970,000 |

* Final maturity date.

The principal amount of the Bonds otherwise required to be redeemed by mandatory sinking fund redemption as described above may be reduced by the principal amount of the Bonds previously called for optional redemption or theretofore delivered to the Trustee by the University in lieu of cash payments under the Loan Agreement or purchased by the Trustee out of moneys in the Bond Fund established under the Indenture and which have not theretofore been applied as a credit against any sinking fund installment, in either case in such order of sinking fund installments as the University may direct.

## Notice of Redemption

Notice of any redemption, identifying the Bonds or portions thereof to be redeemed, will be given not less than 30 days nor more than 45 days prior to the redemption date, by first class (postage paid) to the registered owners of the Bonds to be redeemed at their registered addresses as shown on the Bond Register. Failure to mail any such notice or any defect in the mailed notice or the mailing thereof to any registered owner of a Bond will not affect the validity of the redemption proceedings as to the registered owner of any other Bond. No further interest will accrue on the principal of any Bonds called for redemption after the date fixed for redemption if payment of the redemption price thereof has been duly provided for, and the registered owners of such Bonds will have no rights with respect to such Bonds except to receive payment of the redemption price thereof and unpaid interest accrued to the date fixed for redemption.

If at the time of mailing of any notice of redemption, the Authority shall not have deposited with the Trustee monies sufficient to redeem all the Bonds called for redemption, such notice may state that such redemption is conditional, that is, is subject to the deposit of the redemption monies with the Trustee not later than the opening of business on the date fixed for redemption and shall be of no effect unless such monies are so deposited.

So long as DTC or its nominee is the registered owner of the Bonds, any failure on the part of DTC or failure on the part of a nominee of a Beneficial Owner (having received notice from a Participant or otherwise) to notify the Beneficial Owner affected by any redemption of such redemption shall not affect the validity of the redemption.

## Selection of Bonds to be Redeemed

If less than all of the Bonds of a particular maturity are called for redemption, the Trustee shall select the Bonds of such maturity to be redeemed from the Bonds of such maturity Outstanding and not previously called for redemption by lot; provided, however, that, if the Bonds are registered in book-entry only form and so long as DTC or a successor securities depository is the sole holder of such Bonds, if less than all of the Bonds of a particular maturity are called for redemption, the selection for redemption of such Bonds shall be made in accordance with the operational arrangements of DTC then in effect.

For a discussion of the operational arrangements of DTC, see "BOOK-ENTRY SYSTEM" below.

## Defeasance

If the Authority deposits with the Trustee funds, evidenced by moneys and/or Defeasance Investments (as defined in APPENDIX C) the principal of and interest on which, when due, will be sufficient to pay the principal or redemption price of any Bonds, by call for redemption or otherwise, together with interest accrued to the due date or the redemption date, as appropriate, in accordance with the terms of the Indenture, such Bonds shall no longer be deemed to be Outstanding under the Indenture. Interest on such Bonds, as appropriate, will cease to accrue on the due date or the redemption date, as appropriate, and from and after the date of such deposit of funds with the Trustee the holders of the Bonds will be restricted to the funds so deposited as provided in the Indenture.

## BOOK-ENTRY SYSTEM

The Bonds will be issued in book-entry form. DTC will act as securities depository for the Bonds. The Bonds will be issued as fully registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully registered bond certificate will be issued for the Bonds of each maturity thereof in the aggregate principal amount thereof and will be deposited with DTC. The following discussion will not apply to any Bonds issued in certificated form following the discontinuance of the DTC Book-Entry System, as described below.

So long as Cede & Co., as nominee of DTC, is the registered owner of the Bonds, the Beneficial Owners of the Bonds will not receive or have the right to receive physical delivery of the Bonds, and references herein to the Bondholders or Owners or registered owners of the Bonds shall mean Cede & Co. and shall not mean the Beneficial Owners of the Bonds.

DTC, the world's largest depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has Standard & Poor's rating of AA+. The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

Purchases of the Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of a Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co. or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership.

DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participants to which accounts such Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of Bonds may wish to take certain steps to augment the transmission to them of notices of significant events with respect to the Bonds, such as redemptions, tenders, defaults, and proposed amendments to the Bond documents. For example, Beneficial Owners of Bonds may wish to ascertain that the nominee holding the Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the registrar and request that copies of the notices be provided directly to them.

Redemption notices shall be sent to DTC. If less than all of the Bonds of a particular maturity are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in the Bonds to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to Bonds unless authorized by a Direct Participant in accordance with DTC's procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co. consenting or voting right to those Direct Participants to whose accounts Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal, premium and interest payments on the Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Authority or the Trustee, on the payable date in accordance with their respective holdings shown on DTC's records. Payments by the Direct or Indirect Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participants and not of DTC, the Trustee, the University or the Authority, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal, premium and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Authority, the University or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the Bonds at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor securities depository is not obtained, Bond certificates are required to be printed and delivered.

The Authority may decide to discontinue use of the system of book-entry only transfers through DTC (or a successor securities depository). In that event, Bond certificates will be printed and delivered to DTC.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the Authority and the University believe to be reliable, but neither the Authority nor the University take responsibility for the accuracy thereof.

**The Authority and the University cannot and do not give any assurances that DTC will distribute to Direct Participants or that Direct Participants, Indirect Participants or other persons will distribute to the Beneficial Owners payments of principal of and interest and premium, if any, on the Bonds paid or any redemption or other notices or that they will do so on a timely basis or will serve and act in the manner described in this Official Statement. Neither the Authority nor the University is responsible or liable for the failure of DTC or any Direct Participant, Indirect Participant or other person to make any payments or give any notice to a Beneficial Owner with respect to the Bonds or any error or delay related thereto.**

None of the Authority, the Underwriters, the Trustee, or the University will have any responsibility or obligations to any Direct Participants or Indirect Participants or to any Beneficial Owner with respect to (i) the accuracy of any records maintained by DTC, any Direct Participant, or any Indirect Participant; (ii) the payment by DTC, any Direct Participant, or any Indirect Participant of any amount with respect to the principal of or premium, if any, or interest on the Bonds; (iii) any notice that is permitted or required to be given to holders of the Bonds under the Indenture, (iv) the selection by DTC, any Direct Participant, or any Indirect Participant of any person to receive payment in the event of a partial redemption of the Bonds; (v) any consent given or other action taken by DTC as holder of the Bonds; or (vi) any other procedures or obligations of DTC, Direct Participants or Indirect Participants under the book-entry system.

## SECURITY AND SOURCES OF PAYMENT FOR THE BONDS

### Limited Obligations

The Bonds are limited obligations of the Authority. Neither the general credit of the Authority nor the credit or the taxing power of the Commonwealth or any political subdivision thereof is pledged for the payment of the principal of, or premium, if any, or interest on the Bonds, nor shall the Bonds be or be deemed to be general obligations of the Authority or obligations of the Commonwealth or any political subdivision thereof, nor shall the Commonwealth or any political subdivision thereof be liable for the payment of the principal of, or premium, if any, or interest on the Bonds. The Authority has no taxing power.

### The Indenture

The Bonds will be issued under and pursuant to the Indenture and will be payable thereunder equally and ratably with the Prior Bonds. Additional Bonds may be issued under the Indenture, payable thereunder equally and ratably secured with the Prior Bonds and the Bonds, to pay the cost of any capital additions or to refund bonds or other indebtedness. The Indenture does not limit the amount of Additional Bonds that may be issued thereunder. The Indenture provides that all bonds issued thereunder are limited obligations of the Authority, payable only from and secured by sums payable under the Loan Agreement and amounts held in funds and accounts created under the Loan Agreement or the Indenture. The Authority has pledged to the Trustee the payments received or receivable by the Authority from the University pursuant to the Loan Agreement, and all income and receipts earned on funds held by the Trustee under the Indenture and the Loan Agreement, as security for the performance of the obligations of the Authority under the Indenture, including payments due on the Bonds, the Prior Bonds and any Additional Bonds.

See APPENDIX C hereto for a description of the Indenture.

### The Loan Agreement

Under the Loan Agreement, the Authority will loan the proceeds of the Bonds to the University for the purpose of undertaking the 2018 Project. The Loan Agreement is an unsecured general obligation of the University to which the full faith and general credit of the University are pledged. Such pledge shall remain in full force and effect until the Prior Bonds, the Bonds and all Additional Bonds and the interest thereon have been duly paid or otherwise discharged. The University will pay in immediately available funds to the Trustee, as assignee of the Authority as to the loan payments under the Loan Agreement, for deposit into the Bond Fund established under the Indenture, on or before each Interest Payment Date, an amount which, together with other available funds on deposit with the Trustee in the Bond Fund, is sufficient to pay the interest and principal or redemption price on the Bonds due and payable on such date. The Loan Agreement provides that the University shall pay all loan payments and additional payments without notice or demand, and without abatement, deduction, set-off, counterclaim, recoupment or defense or any right of termination or cancellation arising from any circumstances whatsoever.

The obligation of the University to make payments under the Loan Agreement is a general, unsecured obligation of the University. The Bonds will not be secured by a pledge of gross receipts or other specified revenues of the University or by a mortgage lien on or security interest in any University property.

The Loan Agreement does not limit or restrict the ability of the University to incur future indebtedness, nor does it limit or restrict the ability of the University to grant any liens or to pledge or assign any property of the University, including its future revenues, as security for the payment of future indebtedness. Accordingly, the University may incur debt in the future without limit and may secure the payment of such future debt with all or any part of the University's assets, including its future revenues. In the event the University were to incur secured debt in the future, upon a default by the University with respect to the Bonds, holders of the Bonds would have no claim upon or right to payment from any property securing any future secured debt unless such secured debt were first paid in full. Currently, none of the existing long-term, general obligation debt of the University is secured by a lien on any assets or a pledge of any revenues or other property of the University with the exception of various capital equipment leases and certain mortgage loans incurred by affiliated entities of the University. However, most of the long-term debt of the Health System is secured by a pledge of the gross revenues of the Health System. For a more complete discussion of the University's outstanding long-term debt, see "UNIVERSITY FINANCIAL DATA - Indebtedness of the University's Academic Component" in APPENDIX A hereto.

See APPENDIX C hereto for a description of the Loan Agreement.

### University of Pennsylvania Health System

The Health System consists of certain operating divisions of the University and affiliated entities, including the Presbyterian Medical Center of the University of Pennsylvania Health System d/b/a Penn Presbyterian Medical Center, Pennsylvania Hospital of the University of Pennsylvania Health System, The Chester County Hospital and Health System, The Lancaster General Hospital, Wissahickon Hospice, Clinical Care Associates of the University of Pennsylvania Health System, Lancaster General Health, Princeton HealthCare System Holding, Inc. and other health-related enterprises. The University and other members of the Health System have entered into a Master Trust Indenture securing certain indebtedness issued for the benefit of the operating divisions and entities comprising the Health System. The indebtedness issued under the Master Trust Indenture is payable solely from, and secured by a pledge of, the revenues of the "Obligated Group" established under the Master Trust Indenture, and the general credit of the University is not pledged to its payment. As of June 30, 2018, the principal amount of the total long-term debt of the Health System was $2,226,866,000, generally representing obligations limited to one or more components of the Health System, including $2,078,020,000 principal amount of debt secured by notes issued under the Master Trust Indenture.

For a more complete description of the Health System, see "THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM" in APPENDIX A hereto.

**No Recourse Against Members of the Authority**

No recourse shall be had for payment of the principal of or interest or premium, if any, on the Bonds, or for any claims based on the Bonds or on the Indenture or any indenture supplemental thereto, against any member, officer or employee, past, present or future, of the Authority, or of any successor corporation, as such, either directly or through the Authority or any such successor corporation, whether by virtue of any constitutional provision, statute or rule of law, or by the enforcement of any assessment or penalty, or otherwise, all such liability of such members, officers or employees being released as a condition of and as consideration for the execution of the Indenture and the issuance of the Bonds.

## TAX MATTERS

### Federal Tax Matters

General. Concurrently with the issuance of the Bonds, Co-Bond Counsel will deliver their opinion to the effect that interest on the Bonds is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of initial delivery of the Bonds, assuming the accuracy of the certifications of the Authority and the University and continuing compliance by the Authority and the University with the requirements of the Internal Revenue Code of 1986, as amended (the "Code"). Interest on the Bonds is not an item of tax preference for purposes of the individual federal alternative minimum tax ("AMT"). The corporate AMT was repealed by legislation enacted on December 22, 2017 (known as the "Tax Cuts and Jobs Act"), effective for tax years beginning after December 31, 2017. For tax years beginning on or before December 31, 2017, interest on the Bonds is not an item of tax preference for purposes of the corporate AMT in effect prior to enactment of the Tax Cuts and Jobs Act; however, interest on the Bonds while held by a corporation (other than an S corporation, regulated investment company, or real estate investment trust) may be indirectly subject to federal AMT because of its inclusion in the adjusted current earnings of a corporate holder. Co-Bond Counsel expresses no opinion regarding other federal tax consequences relating to ownership or disposition of, or the accrual or receipt of interest on, the Bonds.

The Code establishes requirements that must be complied with subsequent to the issuance of the Bonds for interest thereon to be and remain excluded from gross income pursuant to Section 103 of the Code. Failure to comply with these requirements could cause the interest on the Bonds to be included in gross income, retroactive to the date of issue of the Bonds or at some later date. The requirements include, but are not limited to, the provisions of Section 148 of the Code which prescribes yield and other limits within which the proceeds of the Bonds are to be invested and may require that certain investment earnings on the foregoing be rebated on a periodic basis to the United States. The University and the Authority have covenanted to comply with the provisions of the Code.

Original Issue Discount. Certain of the Bonds are being offered at a discount ("original issue discount") equal generally to the difference between the public offering price and the principal amount. For federal income tax purposes, original issue discount on a Bond accrues periodically over the term of the Bond as interest with the same tax exemption and alternative minimum tax status as regular interest. The accrual of original issue discount increases the holder's tax basis in the Bond for determining taxable gain or loss upon sale or redemption prior to maturity. Holders should consult their tax advisers for an explanation of the accrual rules.

Original Issue Premium. Certain of the Bonds are being offered at a premium ("original issue premium") over their principal amount. For federal income tax purposes, original issue premium is amortizable periodically over the term of a Bond through reductions in the holder's tax basis for the Bond for determining taxable gain or loss upon sale or redemption prior to maturity. Amortization of premium does not create a deductible expense or loss. Holders should consult their tax advisers for an explanation of the amortization rules.

Information Reporting and Backup Withholding. A person making payments of tax-exempt interest to a bondholder is generally required to make an information report of the payments to the Internal Revenue Service and to perform "backup withholding" from the interest if the bondholder does not provide an IRS Form W-9 to the payor. "Backup withholding" means that the payor withholds tax from the interest payments at the backup withholding rate, currently 24%. Form W-9 states the bondholder's taxpayer identification number or basis of exemption from backup withholding.

If a holder purchasing a Bond through a brokerage account has executed a Form W-9 in connection with the account, as generally can be expected, there should be no backup withholding from the interest on the Bond.

If backup withholding occurs, it does not affect the excludability of the interest on the Bonds from gross income for Federal income tax purposes. Any amounts withheld pursuant to backup withholding would be allowed as a refund or a credit against the owner's Federal income tax once the required information is furnished to the Internal Revenue Service.

**Pennsylvania Tax Exemption**

Co-Bond Counsel will also deliver their opinion to the effect that, under existing law as enacted and construed on the date of initial delivery of the Bonds, the Bonds are exempt from personal property taxes in Pennsylvania, and interest on the Bonds is exempt from the Pennsylvania personal income tax and the Pennsylvania corporate net income tax.

**Changes in Federal and State Tax Law**

From time to time, there are legislative proposals in the Congress and in the states that, if enacted, could alter or amend the federal and state tax matters referred to herein or adversely affect the market value of the Bonds. It cannot be predicted whether or in what form any such proposal might be enacted or whether if enacted it would apply to bonds issued prior to enactment. In addition, regulatory actions are from time to time announced or proposed and litigation is threatened or commenced which, if implemented or concluded in a particular manner, could adversely affect the market value of the Bonds. It cannot be predicted whether any such regulatory action will be implemented, how any particular litigation or judicial action will be resolved, or whether the Bonds or the market value thereof would be impacted thereby. Purchasers of the Bonds should consult their tax advisors regarding any pending or proposed legislation, regulatory initiatives or litigation.

### Other

The foregoing summary is included herein for general information only and does not discuss all aspects of United States federal taxation that may be relevant to a particular holder of Bonds in light of the holder's particular circumstances and income tax situation. Prospective investors are urged to consult their own tax advisors as to any tax consequences to them from the purchase, ownership and disposition of Bonds, including the application and effect of state, local, non-U.S., and other tax laws.

## LEGAL MATTERS

Legal matters incident to the authorization, issuance, and sale of the Bonds will be passed upon by Ballard Spahr LLP and Andre C. Dasent, P.C., each of Philadelphia, Pennsylvania, Co-Bond Counsel. The proposed form of opinion of Co-Bond Counsel with respect to the Bonds is included in APPENDIX D hereto. Certain legal matters will be passed upon for the Authority by its counsel, Barley Snyder LLP, Lancaster, Pennsylvania; for the University by Wendy S. White, Esquire, Senior Vice President and General Counsel of the University; and for the Underwriters by their counsel, Drinker Biddle & Reath LLP, Philadelphia, Pennsylvania.

Ballard Spahr LLP, which is acting as Co-Bond Counsel in connection with the Bonds, and Drinker Biddle & Reath LLP, which is acting as counsel to the Underwriters in connection with the Bonds, each periodically provide general legal services to the University unrelated to the issuance of the Bonds.

## INDEPENDENT ACCOUNTANTS

The financial statements of the University as of June 30, 2018 and June 30, 2017 and for the fiscal years then ended, included in APPENDIX B to this Official Statement, have been audited by PricewaterhouseCoopers LLP, independent accountants, as stated in their report appearing in APPENDIX B hereto.

## RATINGS

Moody's Investors Service ("Moody's") and S&P Global Ratings ("S&P") have assigned the Bonds long-term municipal bond ratings of "Aa1" and "AA+", respectively. Any explanation of the significance of any ratings may only be obtained from the rating agency furnishing the same.

The University has furnished to the rating agencies certain information and material concerning the Bonds and itself. Generally, rating agencies base their ratings on this information and materials and on investigations, studies and assumptions made by the rating agencies themselves. There is no assurance that the ratings initially assigned to any of the Bonds will be maintained for any given period or time or that such ratings may not be revised downward or withdrawn entirely by a rating agency if, in its judgment, circumstances so warrant. None of the University, the Authority or the Underwriters have undertaken any responsibility to bring to the attention of the holders of the Bonds any proposed revision or withdrawal of the rating of the Bonds or to oppose any such proposed revision or withdrawal. Any downward change in or the withdrawal of any such rating might have an adverse effect on the market price or marketability of the Bonds to which it applies.

## UNDERWRITING

Pursuant to the provisions of a bond purchase contract among the Authority, the University and Merrill Lynch, Pierce, Fenner & Smith Incorporated, as representative, on behalf of itself and the underwriters listed on the cover page of this Official Statement (the "Underwriters"), the Underwriters have agreed, subject to certain conditions, to purchase the Bonds from the Authority at an aggregate discount of $387,877.71 from the initial public offering prices indicated on the inside front cover page of this Official Statement. The Underwriters will be obligated to purchase all of the Bonds if any are purchased. The public offering prices may be changed, from time to time, by the Underwriters. The Bonds may be offered and sold to certain dealers (including the Underwriters and other dealers depositing the Bonds into investment trusts) at prices lower than such public offering price.

The bond purchase contract for the Bonds requires the University to indemnify the Authority and the Underwriters against certain liabilities relating to this Official Statement.

The Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage activities. Certain of the Underwriters and their respective affiliates have, from time to time, performed, and may in the future perform, various financial advisory and investment banking services for the University, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the Underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities, which may include credit default swaps) and financial instruments (including bank loans) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the University.

Morgan Stanley & Co. LLC, one of the Underwriters of the Bonds, has entered into a retail distribution with its affiliate Morgan Stanley Smith Barney LLC. As part of this arrangement, Morgan Stanley & Co. LLC may distribute municipal securities to retail investors through the financial advisor network of Morgan Stanley Smith Barney LLC. As part of this arrangement, Morgan Stanley & Co. LLC may compensate Morgan Stanley Smith Barney LLC for its selling efforts with respect to the Bonds.

Wells Fargo Securities is the trade name for certain securities-related capital markets and investment banking services of Wells Fargo & Company and its subsidiaries, including Wells Fargo Bank, National Association ("WFBNA"), which conducts its municipal securities sales, trading and underwriting operations through the Wells Fargo Bank, NA Municipal Products Group, a separately identifiable department of WFBNA, registered with the Securities and Exchange Commission as a municipal securities dealer pursuant to Section 15B(a) of the Securities Exchange Act of 1934. WFBNA, acting through the Municipal Products Group, an underwriter of the Bonds, has entered into an agreement (the "WFA Distribution Agreement") with its affiliate, Wells Fargo Clearing Services, LLC (which uses the trade name "Wells Fargo Advisors") ("WFA"), for the distribution of certain municipal securities offerings, including the Bonds. Pursuant to the WFA Distribution Agreement, WFBNA will share a portion of its underwriting or remarketing agent compensation, as applicable, with respect to the Bonds with WFA. WFBNA has also entered into an agreement (the "WFSLLC Distribution Agreement") with its affiliate Wells Fargo Securities, LLC ("WFSLLC"), for the distribution of municipal securities offerings, including the Bonds. Pursuant to the WFSLLC Distribution Agreement, WFBNA pays a portion of WFSLLC's expenses based on its municipal securities transactions. WFBNA, WFSLLC, and WFA are each wholly-owned subsidiaries of Wells Fargo & Company.

## LEGALITY OF THE BONDS FOR INVESTMENT AND DEPOSIT

Under the Act, the bonds of the Authority (including the Bonds) are made securities in which all officers of the Commonwealth and its political subdivisions and municipal officers and administrative departments, boards and commissions of the Commonwealth, all banks, bankers, savings banks, trust companies, savings and loan associations, investment companies, and other persons carrying on a banking business, all insurance companies, insurance associations, and other persons carrying on an insurance business, and all administrators, executors, guardians, trustees and other fiduciaries, and all other persons whatsoever who are authorized to invest in bonds or other obligations of the Commonwealth, may properly and legally invest any funds, including capital belonging to them or within their control, and the bonds of the Authority (including the Bonds) are made securities which may properly and legally be deposited with, and received by, any State or municipal officers or agency of the Commonwealth for any purpose for which the deposit of bonds or other obligations of the Commonwealth is authorized by law.

## NEGOTIABILITY

Under the Act, the Bonds have all the qualities of negotiable instruments under the law merchant and the laws of the Commonwealth relating to negotiable instruments.

## LITIGATION

**The Authority**

There is no litigation of any nature pending or, to the Authority's knowledge, threatened against the Authority at the date of this Official Statement to restrain or enjoin the issuance, sale, execution or delivery of the Bonds, or in any way contesting or affecting the validity of the Bonds or any proceedings of the Authority taken with respect to the issuance or sale thereof, or the pledge or application of any moneys or the security provided for the payment of the Bonds or the existence or powers of the Authority.

**The University**

There are various legal actions pending against the University, which have arisen in the ordinary course of the University's business. In the opinion of University's management, any adverse decisions will not have a material adverse effect on the University's current business, financial position or operations. See "LITIGATION" in APPENDIX A hereto.

## CONTINUING DISCLOSURE

At the time of issuance of the Bonds, the University will enter into a Continuing Disclosure Agreement (the "Disclosure Agreement") with the Trustee for the benefit of the holders of the Bonds as required to enable the Underwriters to comply with their obligations under Rule 15c2-12 of the Securities and Exchange Commission (the "Rule"). Under the Disclosure Agreement, the University will covenant to provide, through the Electronic Municipal Market Access ("EMMA") system of the Municipal Securities Rulemaking Board ("MSRB"), the following:

- within 150 days of the end of each fiscal year of the University, a copy of its annual financial statements prepared in accordance with generally accepted accounting principles and audited by a certified public accountant, together with an update of the financial information and operating data set forth in Appendix A hereto as follows: (a) under "PROGRAMS," the information under the headings "Undergraduate Student Applications and Enrollment;" "Tuition, Fees and Other Charges," and "Student Financial Aid;" (b) under "UNIVERSITY FINANCIAL DATA," the information under the headings "Contributions," "Sponsored Research," "Endowment," "Endowment Spending Policy," "Investment Policy," and "Investment Performance;" and (c) under "THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM," the information under the heading "Health System's Financial and Operating Summary;" and

in a timely manner, but not in excess of ten business days after the occurrence of the event, notice of the occurrence of any of the following events with respect to the Bonds: principal and interest payment delinquencies; nonpayment related defaults, if material; unscheduled draws on debt service reserves reflecting financial difficulties; unscheduled draws on credit enhancements reflecting financial difficulties; substitution of credit or liquidity providers, or their failure to perform; adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, or a Notice of Proposed Issue (IRS Form 5701-TEB) or other material notices of determinations with respect to tax status of the Bonds, or other events affecting the tax status of the Bonds; modifications to rights of registered owners of the Bonds, if material; bond calls (excluding mandatory sinking fund redemptions), if material, and tender offers; defeasances; release, substitution or sale of property securing repayment of the Bonds, if material; rating changes; bankruptcy, insolvency, receivership, or similar proceeding by the University; consummation of a merger, consolidation, or acquisition involving the University, or sale of all or substantially all of the assets of the University, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; and appointment of an additional or a successor trustee, or the change in name of a trustee, if material.

The Disclosure Agreement may be amended by the University, in its discretion, in any particular way permitted by the Rule. In addition, the University reserves the right (i) to modify from time to time the specific types of information provided or the format of the presentation of its annual financial information and other operating data, to the extent necessary or appropriate in the judgment of the University, and (ii) upon prior written notice to EMMA to amend or terminate any or all of its continuing disclosure covenants for any reason if permitted to do so under the Rule. Any such amendment or modification must be supported by an opinion of counsel expert in federal securities law addressed to the University and the Trustee, to the effect that such amendment or modification would not, in and of itself, cause the undertaking of the University under the Disclosure Agreement to violate the Rule if such amendment or modification had been effective on the date of the Disclosure Agreement but taking into account any subsequent change in an official interpretation of the Rule.

In the event of a breach or default by the University of its covenants to provide information and notices as specified in the Disclosure Agreement, the Trustee or any record or beneficial owner of the Bonds may, but is not be required, to bring an action in a court of competent jurisdiction to compel specific performance by the University. No monetary damages may be recovered under any circumstances for any breach or default by the University of its covenants under the Disclosure Agreement. A breach or default under the Disclosure Agreement shall not constitute an event of default with respect to the Bonds or the Indenture or the Loan Agreement.

The University has entered into similar disclosure agreements in accordance with the Rule in connection with prior debt obligations issued on behalf of the University, including bonds issued on behalf of the Health System. Such information may be available to investors so long as the University is obligated to provide such information as part of its other undertakings. In reviewing its filings with EMMA made during the five years prior to the date of this Official Statement, the University has noted the following:

- In connection with the University becoming the sole corporate member of The Chester County Hospital and Health System ("TCCHHS") effective September 1, 2013, and TCCHHS becoming a member of the obligated group with respect to the Health System's limited obligation debt on June 12, 2014, the University filed an event notice with EMMA on February 12, 2015, which was more than the required 10 business days after the underlying event.

- In connection with the execution on December 22, 2016, of the definitive agreement relating to the proposed affiliation of the University with Princeton HealthCare System Holding, Inc., the University filed an event notice with EMMA on January 19, 2017, which was more than the required 10 business days after the underlying event.

- The annual financial statements and other financial and operating information regarding the Health System for the fiscal year ended June 30, 2016, as filed generally with EMMA on September 23, 2016, were not linked to the CUSIP numbers for the outstanding University of Pennsylvania Health System Health System Revenue Bonds, Series C of 2016, issued by the Authority on behalf of the Health System on August 25, 2016, which was corrected on November 15, 2017.

The University is currently in compliance in all material respects with its previous undertakings with regard to continuing disclosure for prior obligations issued. Further, the University has reviewed its disclosure policies and procedures to ensure that the University will be in compliance with continuing disclosure undertakings in the future.

The Authority is not a party to the Disclosure Agreement, and is not required to provide disclosure regarding its financial condition because, among other things, its financial condition is not material to an investment in the Bonds. In addition, the Authority has no responsibility for the University's compliance with the Disclosure Agreement or for the information provided by the University thereunder.

## CERTAIN RELATIONSHIPS

Certain Trustees of the University have affiliations with firms participating in the issuance and sale of the Bonds, as follows:

- Hon. Thomas W. Wolf, Governor of the Commonwealth of Pennsylvania and an ex officio Trustee of the University, is a Board Member and President of the Pennsylvania Higher Educational Facilities Authority.

- Mr. Mark O. Winkelman is an Emeritus Trustee of the University. Mr. Winkelman was formerly a Senior Director of Goldman Sachs & Co. LLC, from 1999 to 2014, and currently serves on the board of directors of The Goldman Sachs Group, Inc.

For a description of the University's comprehensive conflict-of-interest policy, see "THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA -- Transactions between the University and Members of its Board of Trustees" in APPENDIX A hereto.

## MISCELLANEOUS

The distribution of this Official Statement in connection with the offering of the Bonds has been duly approved by the Authority and the University. This Official Statement is not to be construed as a contract or agreement between the Authority or the University and the purchasers or holders of any Bonds.

All of the summaries of the provisions of the Act, the Indenture, the Loan Agreement and of the Bonds set forth herein are only brief outlines of certain provisions thereof and are made subject to all of the detailed provisions thereof, to which reference is hereby made for further information, and do not purport to be complete statements of any or all such provisions of such document.

The Bonds have not been recommended by any federal or state securities commission or regulatory authority. Furthermore, the foregoing authorities have not confirmed the accuracy or determined the adequacy of this document. Any representation to the contrary is a criminal offense.

Information concerning the University and the 2018 Project to be financed by the Bonds has been provided by the University. All estimates, projections, and assumptions herein have been made on the best information available and are believed to be reliable, but no representations whatsoever are made that such estimates, projections, or assumptions are correct or will be realized. So far as any statements herein involve matters of opinion, whether or not expressly so stated, they are intended merely as such and not as representations of fact.

The Authority has not assisted in the preparation of this Official Statement, except for the statements under the sections captioned "THE AUTHORITY" and "LITIGATION - The Authority" herein and, except for those sections, the Authority is not responsible for any statements made in this Official Statement. Except for the authorization, execution, and delivery of documents required to effect the issuance of the Bonds, the Authority assumes no responsibility for the disclosures set forth in this Official Statement.

PENNSYLVANIA HIGHER EDUCATIONAL
FACILITIES AUTHORITY

By: /s/ Robert Baccon
Robert Baccon
Executive Director

**Approved:**

THE TRUSTEES OF THE UNIVERSITY
OF PENNSYLVANIA

By: /s/ MaryFrances McCourt
MaryFrances McCourt
Vice President for Finance and Treasurer

# APPENDIX A

## INFORMATION CONCERNING
## THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA

TABLE OF CONTENTS



---

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements included or incorporated by reference in this Appendix A constitute projections or estimates of future events, generally known as forward-looking statements. These statements are generally identifiable by the terminology used such as "plan," "expect," "estimate," "budget" or other similar words. These forward-looking statements include, among others, the information under the caption "UNIVERSITY FINANCIAL DATA" in this Appendix A.

The achievement of certain results or other expectations in these forward-looking statements involves known and unknown risks, uncertainties and other factors which may cause actual results, performance or achievements described to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. The University does not plan to issue any updates or revisions to those forward-looking statements if or when changes in its expectations, or events, conditions or circumstances on which these statements are based occur.

## THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA

*The information set forth in this Appendix A is intended to provide certain information regarding The Trustees of the University of Pennsylvania (the "University") and the University of Pennsylvania Health System.*

### General

The Trustees of the University of Pennsylvania (the "University" or "Penn") is an independent non-sectarian research institution of higher education chartered under the laws of the Commonwealth of Pennsylvania (the "Commonwealth"). One of only nine colleges and universities established during the colonial period, the University is the third oldest Ivy League school. It is a privately endowed, gift-supported non-profit corporation and is exempt from federal income taxes as an organization described in Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (the "Code").

The University has a long history of innovation. Unique among its colonial peers in its departure from the traditional ecclesiastical curriculum, the University established the first liberal arts curriculum, combining for the first time a scientific and classical education and offering such new fields of study as modern languages, physics, mathematics, history, and economics. As the nation's first university, it introduced the concept of a multi-disciplinary education. It founded the nation's first School of Medicine in 1765, marking the beginning of formal medical education in North America, and the nation's first hospital established by a medical school.

The first professorships in botany and chemistry in the United States were established at the University. Benjamin Rush, a chemistry professor, joined the medical faculty in 1769 and published the first book on insanity in the United States, pioneering the study of mental disease. The Wharton School of Finance and Commerce, the first collegiate school of business, opened in 1881. In 1896, the world's first psychology clinic opened at the University. During World War II, ENIAC, the original large-scale, all-electronic digital computer, which was the forerunner of the computer industry, was designed and built at the Moore School of Electrical Engineering. The Piersol Rehabilitation Center, founded in 1959, was the first rehabilitation center in the City of Philadelphia (the "City").

The University continues this pioneering tradition today in fields as diverse as cancer research, genomics, gene therapy, digital media design, cognitive science, materials science, aging, biotechnology, bioethics, neuroscience, demography, management and technology, bioinformatics and computational biology, nanotechnology, translational research and public policy, among other areas. The Penn Compact – a mission statement articulated at the 2004 inauguration of President Amy Gutmann – has propelled the University from excellence to eminence by advancing its core endeavors of teaching, research and service. It focused on increasing access to the University's exceptional intellectual resources; integrating knowledge across academic disciplines with emphasis on innovative understanding and discovery; and engaging locally, nationally, and globally to bring the benefits of Penn's research, teaching, and service to individuals and communities at home and around the world.

The University has a full-time student body of over 22,800 and a 280-acre campus in West Philadelphia (excluding the Hospital of the University of Pennsylvania) on which over 150 University buildings are situated. In addition, the University owns two properties that are not adjacent to the campus. The Morris Arboretum, located in Chestnut Hill, Pennsylvania, encompasses 92 acres with 30 buildings. The Morris Arboretum conducts four major activities: education, research, outreach and horticultural display. As the official Arboretum of the Commonwealth, it provides research and outreach services to state agencies, community institutions and to citizens of Pennsylvania and beyond. The New Bolton Center, in Kennett Square, Pennsylvania, consists of 600 acres with 77 buildings. Opened in 1954, the New Bolton

Center comprises the George D. Widener Hospital for Large Animals, the University of Pennsylvania School of Veterinary Medicine's teaching hospital for large animals, featuring one of the world's largest equine surgical facilities, the Marshak Dairy, the Laboratory of Aquatic Animal Medicine and Pathology and one of Pennsylvania's three Animal Diagnostic Laboratories.

In July 2007, the University acquired from the United States Postal Service two properties adjacent to the eastern edge of the University's main campus. These properties include 2.5 acres of land and associated buildings which the University has leased for redevelopment to a private developer under a long term ground lease, and 14 acres of property which the University developed, together with adjacent property of the University, to form a 24-acre urban park now known as Penn Park. Penn Park is the centerpiece of "Penn Connects," the University's long-term master land use and urban design campus plan. Penn Park brings 20% more green space to the urban campus of the University and creates a new gateway uniting University City in West Philadelphia with Center City in Philadelphia.

In September 2010, the University acquired 23 acres of land and facilities located across the Schuylkill River from the University's main campus. More than 250,000 square feet of laboratory, office and warehouse space remains on the property that formerly comprised the DuPont Marshall Laboratory. The site is intended to be repurposed with light industrial, flex-use, and buildings scaled to fit the need for practical commercialization and business opportunities in the region. The site has also been designated as the home for the Penn Center for Innovation, a new initiative that will provide the infrastructure, leadership and resources needed to transfer promising Penn inventions, know-how and related assets into the marketplace for the public good. As of June 30, 2018, nearly 181,000 square feet of space was leased to University tenants, small research and technology businesses, and for storage for the University and other entities.

The University is comprised of an academic component (see "Programs- Academic" below) and a Health System component (more particularly described in "THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM" below).

Governance

The University is governed by its Board of Trustees (the "University Trustees"). The Executive Committee of the University Trustees (the "Executive Committee") is elected annually and can act on behalf of the full University Trustees in most matters. Under the bylaws of the University, the University Trustees may consist of a maximum of 14 Charter Trustees, 28 Term Trustees, 14 Alumni Trustees, including the President of the Alumni Society, and four Commonwealth Trustees. The Governor of the Commonwealth and the President of the University are Ex-Officio Trustees. Charter Trustees are elected by the University Trustees from among persons who have served as University Trustees for a period of not less than five years. Term Trustees are elected by the University Trustees for terms of five years. Alumni Trustees are elected by Penn Alumni for terms of five years from among those persons who have received degrees from the University. The Commonwealth Trustees are each appointed by one of the following members of the Pennsylvania legislature: the President Pro Tempore of the Senate, the Minority Leader of the Senate, the Speaker of the House of Representatives, and the Minority Leader of the House of Representatives. Under normal circumstances, Charter, Term and Alumni Trustees must retire at the age of 70, or following 10 years' service per the Statutes, at which time Charter Trustees are designated by the University Trustees as Trustees Emeriti. Term and Alumni Trustees who have been elected to two five-year terms in any class are eligible for election by the University Trustees as Trustees Emeriti. Trustees Emeriti and Ex-Officio Trustees are non-voting University Trustees.

In addition, the University has an Investment Board, which can include members who are not University Trustees. The Investment Board oversees the investment of endowment and similar funds, and all other investment funds of the University.

The members of the University Trustees as of August 31, 2018 are listed below:



## Transactions Between the University and Members of its Board of Trustees

The University has a comprehensive conflict-of-interest policy that was formally adopted by the University Trustees in June 2000. The policy applies to University Trustees, officers and members of the Investment Board ("Covered Persons"), and is intended to address any real, potential, or apparent conflicts of interest that might call into question a person's duty of undivided loyalty to the University. The policy, which is in conformity with the Intermediate Sanctions regulations of the Internal Revenue Service ("IRS") applicable to tax-exempt organizations, adopts the IRS standard for approval of a transaction between a Covered Person and the University. The standard requires that a Covered Person seeking to enter into a transaction with the University recuse himself or herself from the decision-making process, that any payments made are at fair market value, and that the transaction, as a whole, is fair, reasonable and in the best interests of the University.

The relationships of certain Trustees of the University with certain transaction participants in connection with the offering of the Bonds are described under the "CERTAIN RELATIONSHIPS" in the forepart of the Official Statement.

### Officers of the University

The officers of the University are the President, the Provost, the Executive Vice Presidents, the Senior Vice President and General Counsel, the Vice Presidents, the Secretary, the Treasurer and the Comptroller. Subject to the policies of the University, all officers except the President are elected by the University Trustees upon nomination by the President. The President is elected by the University Trustees upon nomination by the Executive Committee. The principal officers of the University are as follows:

| | |
|---|---|
| Dr. Amy Gutmann | *President* |
| Dr. Wendell Pritchett | *Provost* |
| Mr. Craig R. Carnaroli | *Executive Vice President* |
| Dr. J. Larry Jameson | *Executive Vice President for the Health System and Dean of the Perelman School of Medicine* |
| Wendy S. White, Esquire | *Senior Vice President and General Counsel of the University and Health System* |
| Ms. MaryFrances McCourt | *Vice President for Finance and Treasurer* |
| Ms. Anne Papageorge | *Vice President for Facilities and Real Estate Services* |
| Mr. John H. Zeller | *Senior Vice President for Development and Alumni Relations* |
| Ms. Leslie Laird Kruhly | *Vice President and University Secretary* |
| Mr. John F. Horn | *Comptroller* |

## PROGRAMS

### Academic

The University is comprised of the twelve schools listed below, four of which, marked by an asterisk (*), offer undergraduate degrees. Graduate and professional degrees are offered by all twelve schools:

| | |
|---|---|
| School of Arts and Sciences * | School of Design |
| School of Engineering and Applied Science * | School of Dental Medicine |
| School of Nursing * | School of Law |
| Wharton School * | Perelman School of Medicine |
| Annenberg School for Communication | School of Social Policy and Practice |
| Graduate School of Education | School of Veterinary Medicine |

The quality and success of the programs offered by the University have been consistently recognized around the world. The University was ranked eighth in the 2019 *U.S. News and World Report*

National Universities Ranking and twelfth on the Best Values Schools. In these same rankings, the University's Wharton School was ranked first for undergraduate business students. In the 2019 *US News and World Report* Best Graduate Schools rankings, the University's Wharton School was ranked third among graduate business schools, the School of Nursing was ranked fourth among nursing schools, and the Law School (7$^{th}$), the Perelman School of Medicine (6$^{th}$ in research, 8$^{th}$ in primary care), the School of Veterinary Medicine (7$^{th}$), and the School of Graduate Education (4$^{th}$) – as well as departments across the School of Arts and Sciences, the School of Engineering, the School of Nursing, the Wharton School, the Graduate School of Education, and the Perelman School of Medicine – were all ranked in the top ten among the survey's wide range of specific academic areas. From a global perspective, the University is ranked among the top 19 institutions around the world in all three of the major international university rankings: the Academic Ranking of World Universities of the Center for World-Class Universities at the Shanghai Jiao Tong University, the QS World University Rankings, and the *Times Higher Education* World University Rankings. In 2014, the Middle States Commission on Higher Education reaffirmed the University's accreditation, following a rigorous, two-year process in which the University first prepared an in-depth, campus-wide Self-Study Report and was then reviewed by an external evaluation team of faculty members and senior administrators from peer institutions.

The proximity of all twelve of the University's schools on a single campus has stimulated a number of renowned multi-disciplinary enterprises aimed at solutions to major issues impacting a global society. Among them are: the Center for Public Health Initiatives, Penn Institute for Urban Research, Leonard Davis Institute of Health Economics, Laboratory for Research on the Structure of Matter, David Mahoney Institute for Neurological Sciences, Lauder Institute, Abramson Family Cancer Research Institute, and Institute for Regenerative Medicine, as well as globally-focused initiatives such as the Perry World House and the Penn Wharton China Center.

The twelve schools also combine their expertise in campus-wide academic theme years, which bring together a wide range of perspectives to illuminate critical global issues such as health, food, evolution, water, and the role of art in urban settings.

### Faculty

For the 2018 Academic Year, there are 2,666 standing faculty at the University, approximately one for every four full-time undergraduates on campus. Approximately 77% of the faculty, excluding clinician educators in the Perelman School of Medicine, is tenured. All of the University's full-time faculty has earned a doctorate and/or other terminal professional degree.

The faculty of the University is actively engaged in teaching and research. Honors and awards received by members of the faculty include the Nobel Prize, Pulitzer Prize, Bancroft Prize, Carnegie Fellowship, Guggenheim Fellowship, National Medal of Science, MacArthur Foundation Fellowship, Sloan Research Fellowship, Wolf Prize in Medicine, and Presidential Early Career Award for Scientists and Engineers.

Members of the faculty hold memberships and leadership positions in such prestigious professional and learned societies as the American Academy of Arts and Sciences, American Association for the Advancement of Science, American Philosophical Society, National Academy of Engineering, National Academy of Medicine, National Academy of Science, and Royal Society of London.

### Undergraduate Student Applications and Enrollment

The following table sets forth certain information regarding undergraduate applicants, acceptances and matriculants for the academic years indicated:

| Applicants, Acceptances and Matriculants | | | | | |
|---|---|---|---|---|---|
| Academic Year | Applicants | Acceptances | Acceptance Percentage | Matriculants | Matriculation Percentage |
| 2014-2015 | 35,866 | 3,718 | 10.4% | 2,425 | 65.2% |
| 2015-2016 | 37,268 | 3,787 | 10.2% | 2,435 | 64.3% |
| 2016-2017 | 38,918 | 3,674 | 9.4% | 2,491 | 67.8% |
| 2017-2018 | 40,413 | 3,757 | 9.3% | 2,457 | 65.4% |
| 2018-2019* | 44,491 | 3,740 | 8.4% | 2,519 | 67.4% |

* 2018-2019 numbers are as of August 24, 2018, and are subject to change.

The Admissions Office received 44,491 applications for the entering class for fall of 2018. This is an increase of 10.1 percent from the number for the 2017-2018 academic year.

The following is a five year analysis of the mean college entrance examination scores achieved by entering freshmen:

| Mean SAT Scores | | | |
|---|---|---|---|
| Academic Year | SAT 1 Critical Reading | SAT 1 Writing | SAT 1 Math |
| 2014-2015 | 715 | 733 | 733 |
| 2015-2016 | 718 | 728 | 739 |
| 2016-2017 | 723 | 731 | 740 |
| 2017-2018 | 734 | n/a* | 749 |
| 2018-2019 | 723 | n/a* | 757 |

* Starting in 2017, Penn no longer collects writing-based SAT scores

The full-time equivalent enrollment at the University for the academic years indicated is as follows:

| Full-Time Equivalent Enrollment | | | | | |
|---|---|---|---|---|---|
| Academic Year | Undergraduate | Graduate | Professional | Full-Time Equivalent Enrollment | Total Degrees Awarded |
| 2013-2014 | 10,721 | 3,220 | 8,498 | 22,439 | 7,812 |
| 2014-2015 | 10,787 | 3,209 | 8,567 | 22,563 | 7,867 |
| 2015-2016 | 10,800 | 3,175 | 8,692 | 22,667 | 8,021 |
| 2016-2017 | 10,884 | 3,156 | 8,519 | 22,559 | 8,129 |
| 2017-2018 | 10,903 | 3,201 | 8,571 | 22,855 | N/A |

*Notes:*
*1. Graduate students are all non-undergraduate students pursuing degrees in Research Masters (AM, MS), PhD, or dual degree PhD (PhD and MD/VMD/DMD/JD), and Professional students are all non-undergraduate students pursuing degrees other than Research Masters, PhD, or dual degree PhD.*
*2. Standard Part-time = 1/3 FTE is applied.*

## Tuition, Fees and Other Charges

The cost of education at the University is covered by tuition and fees, gifts, grants, income derived from investments and other sources. The University believes that its tuition, fees and other related student expenses are competitive with other major private institutions.

The University's total undergraduate tuition and fees and the standard undergraduate room and board charges are set forth in the table below. Graduate and professional schools set their own tuition rates and fees annually. Tuition and fees for full-time programs range from $31,466 to $109,968 per year. The University offers substantial financial assistance to both residential and non-residential students.

| Undergraduate Tuition, Fees and Other Charges | 2017-18 Academic Year | 2018-19 Academic Year |
|---|---|---|
| Academic Year Tuition & Fees for a Full-Time Undergraduate (excluding room & board) | $53,534 | $55,584 |
| Academic Year Room & Board Charges | 15,066 | 15,616 |
| Total | $68,600 | $71,200 |

## Student Financial Aid

The University's undergraduate admissions policy reflects the philosophy that admission is need-blind. For the 2017-2018 academic year, approximately 62% of all University students received some type of financial assistance. Approximately 47% of undergraduate students received need-based grants from the University.

For the fiscal years listed below, the components of student financial aid were as follows:

Scholarships, Grants and Institutional Loans
*(in millions)*

| | Fiscal Year Ended June 30, | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| Grants - Unrestricted revenues | $148.7 | $155.9 | $157.0 | $158.8 | $165.3 |
| Grants- Endowment income | 59.5 | 63.6 | 74.2 | 84.3 | 92.7 |
| Endowed & University Admin. Fed. Loans(1) | 15.7 | 17.5 | 17.1 | 9.4 | 5.3 |
| Federal, State & private grants(2) | 50.3 | 52.7 | 51.8 | 49.0 | 53.9 |
| Tuition remission(3) | 132.6 | 133.5 | 143.1 | 152.0 | 165.8 |
| Total | $406.8 | $423.2 | $443.2 | $453.5 | $483.0 |

(1) Includes Federal Perkins, Nursing and Health Profession Loans, and University endowed loans administered by the University.
(2) Includes gifts and payments from third parties.
(3) Includes tuition remission for faculty/staff attending the University as well as research fellowships, research assistantships, teaching fellowships, and departmental grants. Does not include stipends.

Commencing with the 2009-2010 academic year, the University implemented a policy of meeting dependent undergraduate students' needs without expecting them to take out student loans. Under this policy, almost 96% of students with family income of up to $100,000 are receiving some form of need based grant funding.

The Penn Plan (Tuition Stabilizer Plan) and Penn Guaranteed Loan Program

The University has long been a leader in financing higher education for students and parents. The Penn Plan, a program of alternative payment options, was initiated in 1984. The program is made available to families of undergraduates, graduate degree candidates and students in the professional schools. The program is a partnership among the student, the student's family and the University to assure that students can manage more effectively the cost of attendance. As of June 30, 2018, 322 graduate, professional and undergraduate students and their families were participating in the Penn Plan.

In 1997, the University established the Penn Guaranteed Loan Program whereby the University guaranteed loan obligations incurred by students attending the University. The program provided lower cost alternative loans to graduate and professional students attending the University. Loans issued by private lending institutions were guaranteed by the University under the Penn Guaranteed Loan Program. As of June 30, 2018, the amount of the loans outstanding for which the University is the guarantor was $45,567,199. The reserve established to support this contingent liability was $3,298,538.

## UNIVERSITY FINANCIAL DATA

General

The financial statements of the University have been prepared on an accrual basis and include the accounts of the University and its related entities, including the Health System. All material transactions between the University and its related entities have been eliminated.

The selected financial data and other information below have been derived by management from the audited financial statements of the University prepared in accordance with accounting principles generally accepted in the United States of America. The University's annual audited financial statements for the fiscal years ended June 30, 2018 and 2017 are presented in Appendix B. The University will undertake to make available certain annual operating and financial information, including its audited annual financial statements, through the Municipal Securities Rulemaking Board -- Electronic Municipal Market Access (http://emma.msrb.org) in accordance with a continuing disclosure agreement to be entered into by the University in connection with the issuance of the Bonds in accordance with Rule 15c2-12 promulgated under the Securities Exchange Act of 1934, as amended. See "CONTINUING DISCLOSURE" in the forepart of this Official Statement.

| Summarized Statements of Financial Position (in thousands) | Fiscal Year Ended June 30, | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| Total Assets | $18,002,615 | $19,000,235 | $21,373,983 | $23,082,794 | $26,414,714 |
| Total Liabilities | $5,030,778 | $5,509,215 | $6,861,394 | $6,835,361 | $7,840,748 |
| Net Assets: | | | | | |
| Unrestricted | 6,869,201 | 7,153,207 | 8,447,469 | 9,466,538 | 11,152,992 |
| Temporarily restricted | 2,960,272 | 3,026,715 | 2,629,729 | 3,108,053 | 3,554,235 |
| Permanently restricted | 3,142,364 | 3,311,098 | 3,435,391 | 3,672,842 | 3,866,739 |
| Total Net Assets | $12,971,837 | $13,491,020 | $14,512,589 | $16,247,433 | $18,573,966 |

| Summarized Statements of Activities (in thousands) | Fiscal Year Ended June 30, | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| Revenue and other support | $6,610,522 | $7,119,997 | $8,576,320 | $9,194,188 | $10,093,931 |
| Expenses | (6,348,798) | (6,723,115) | (8,139,987) | (8,850,931) | (9,561,019) |
| Increase in net assets from operations | 261,724 | 396,882 | 436,333 | 343,257 | 532,912 |
| (Decrease) Increase in net assets from non-operating activities | 1,415,987 | 122,301 | 585,236 | 1,391,587 | 1,793,621 |
| (Decrease) Increase in total net assets | 1,677,711 | 519,183 | 1,021,569 | 1,734,844 | 2,326,533 |
| Net assets, beginning of year | 11,294,126 | 12,971,837 | 13,491,020 | 14,512,589 | 16,247,433 |
| Net assets, end of year | $12,971,837 | $13,491,020 | $14,512,589 | $16,247,433 | $18,573,966 |

## Operating Budget

The University operates under a decentralized budget management structure, termed "Responsibility Center Management (RCM)." This framework promotes the broad stewardship of financial resources and encourages and rewards innovation and efficiency. The University engages in a disciplined budget process, under which each responsibility center submits a high level five-year budget during the fall and a detailed annual budget during the spring. Key central planning parameters include undergraduate total charges, the salary pool, the employee benefit rate, and income growth under the endowment spending rule. Budgets are reviewed by the University Office of Budget and Management Analysis and discussed in detail in meetings with the Provost (schools and resource centers) or the Executive Vice President (administrative and auxiliary centers). The full University budget in both an RCM and Generally Accepted Accounting Principles (GAAP) format is presented to the Trustees for approval in June. The University monitors budget performance during the course of the year, and requires that each responsibility center provide an updated forecast each quarter. The University reports GAAP performance against both the prior year actual results and the current year budget to the Trustees on a quarterly basis.

Commonwealth Appropriations

Although the University has no legal relationship with the Commonwealth, it has, pursuant to specific legislative appropriations, received sums from the Commonwealth for its support and maintenance and for other specific purposes in each year since 1903. Approximately $33,606,000 of the total unrestricted revenue of the University for Fiscal Year 2018 was provided from Commonwealth appropriations. The Pennsylvania legislature has appropriated a slight increase for Fiscal Year 2019, most of which is targeted to support the School of Veterinary Medicine. Once an appropriation is made, it may be reduced administratively, usually because of Commonwealth budgetary constraints. There is no assurance that the Commonwealth will not reduce the University's appropriation for Fiscal Year 2019 or thereafter.

Contributions

The University has consistently ranked among the top 15 private universities in America in philanthropic support. In December 2012, the *Making History* campaign was concluded, reaching $4.3 billion of philanthropic support against an original goal of $3.5 billion. On April 12, 2018, Power of Penn Campaign was launched, with the goal to raise $4.1 billion between 2013 and 2021. This is the most ambitious fundraising goal in Penn history. With shared University objectives, including other key priorities defined by the University's Schools and Centers, the University's goals are to raise an additional $569 million for undergraduate, graduate, and professional student aid-- if successful this would bring the total raised for such purposes to over $1.2 billion over the two campaigns-- and raise an additional $500 million for faculty support, bringing the total raised for such purpose to over $1.07 billion during that same period.

Contributions, defined as new gifts and pledges, for the years listed below were as follows:

| | Contributions *(in thousands)* | | | |
|---|---|---|---|---|
| Fiscal Year Ended June 30 | Endowment | Facilities | Operations | Total |
| 2014 | $162,171 | $35,567 | $168,935 | $366,673 |
| 2015 | 154,593 | 21,909 | 145,558 | 322,060 |
| 2016 | 189,279 | 32,371 | 169,684 | 391,334 |
| 2017 | 233,167 | 30,464 | 175,263 | 438,894 |
| 2018 | 165,233 | 79,126 | 211,501 | 455,860 |

Sponsored Research

The University has long been a center for programs of research and training, and a significant portion of its research and graduate education programs are supported by research grants and contracts. The aggregate dollar amount of grants and contracts awarded to the University for sponsored research and training from governmental and private agencies during the years listed below were as follows:

| Research Grants and Contracts *(in thousands)* | |
|---|---|
| Fiscal Year Ended June 30 | Total Grants and Contracts Awarded |
| 2014 | $ 935,213 |
| 2015 | 938,816 |
| 2016 | 1,030,626 |
| 2017 | 1,017,544 |
| 2018 | 1,091,438 |

For the last decade, the University has consistently ranked in the top 20 universities performing sponsored research as tabulated by the National Science Foundation, based on obligations for research and development. Forecasts of future years' growth rates in externally reimbursed expenditures under sponsored research and instruction agreements are complicated by the uncertainty of future national policy decisions and budget priorities.

Sponsored programs and research projects are funded as to both direct and indirect costs. Indirect costs are costs actually incurred, but differ from direct costs in that they have been incurred for purposes common to a number of projects, programs or activities of the University, and cannot be identified and charged directly to such specific projects, programs or activities with any reasonable degree of accuracy or without an inordinate amount of record keeping. Examples include utilities, maintenance, janitorial services and interest on debt issued to support research facilities, and such administrative services as accounting, purchasing, personnel and library.

Both direct and indirect cost activities are essential for the operation of the University. Without reimbursement for indirect costs, sponsored programs and research in the University would require additional institutional support of indirect services, to the detriment of other University activities. For most federal awards, the items included in each indirect cost category, the indirect cost rate and the appropriate base to be used in allocating such costs are reached through negotiation with the federal government.

In Fiscal Year 2018, the University received expendable grant and contract awards from the federal government (principally the Department of Health and Human Services) in the amount of $730.4 million, $214.6 million of which was awarded for indirect costs. Actual indirect cost revenues received, totaling $198.5 million for Fiscal Year 2018, represented approximately 5.9% of total unrestricted revenue. In Fiscal Year 2018, the University's Federal Indirect Cost Rate ("ICR") for research was 61% of modified total direct costs. Modified total direct costs requires that equipment, capital expenditures, charges for patient care, tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subaward in excess of $25,000 are excluded from the calculation of ICR. The University's fiscal year 2019 ICR will remain at 61%. Certain types of federal awards include indirect costs at rates less than the research rate, such as training grants that are awarded at an 8% rate.

Some federal grants, especially for sponsored instructional and educational services, carry a stipulated limit on ICRs. Federal research grants and contracts are only infrequently subject to such limits.

Private foundations, corporations and other state and local agencies may also allow indirect costs as part of the sponsored program, contract or grant. In Fiscal Year 2018, the University received non-federal contracts and grants of $360.9 million, of which $72.2 million represented indirect cost recovery.

Endowment

As of June 30, 2018, the market value of the endowment totaled approximately $13.8 billion, an increase of $1.6 billion over the prior fiscal year. This increase is largely due to realized and unrealized gains from investments of $1.4 billion, investment income of $106.7 million, new endowment gifts of $181.7 million, $181.4 million of investments as a result of the membership substitution transaction with Princeton HealthCare System Holding, Inc. occurring on January 1, 2018, $198.5 million of transfers to create board designated funds, and a spending rule distribution outflow (as further described below) of $516.0 million to provide budgetary support for endowed programs. Investment income comprised approximately 5.7% of the University's total operating revenues for the fiscal year ended June 30, 2018.

Endowment Funds of the University
*(in millions)*

| Fiscal Year ended June 30 | Market Value |
|---|---|
| 2014 | $ 9,582 |
| 2015 | 10,134 |
| 2016 | 10,715 |
| 2017 | 12,213 |
| 2018 | 13,777 |

The aggregate market value of the University's endowment funds at June 30, 2018 includes certain non-marketable real estate, private equity and natural resources investments, totaling approximately 33.7% of the portfolio, which are valued based on the most recent net asset value reported to the endowment by the managers of such investments, adjusted for cash flows where applicable.

The University is obligated under certain limited partnership agreements to advance additional funding periodically up to committed levels. At June 30, 2018, the University had unfunded commitments of $3.2 billion to a variety of private equity, real estate, natural resources and other commitment funds. Based upon past experience, the University expects these commitments to be funded over the next five years depending on market conditions.

Endowment Spending Policy

In 1981, the University Trustees adopted an endowment spending policy governing the expenditure of funds invested in the University's Associated Investments Fund ("AIF"). The spending policy is designed: (i) to smooth the impact of short-term market moves that may affect the endowment's value; (ii) to make endowment distributions more predictable for purposes of managing and planning the University's operating budget; and (iii) to protect the real value of the endowment over time.

Under the current spending policy, the distribution for Fiscal Year 2019 is the sum of: (i) 70% of the prior fiscal year distribution adjusted by an inflation factor; and (ii) 30% of the prior fiscal year-end fair value of the AIF, lagged one year, multiplied by 5.0%.

Investment Policy

The investment objectives of the University's endowment and similar funds are the preservation and growth of principal in constant dollars so as to provide, under a prudent spending rule policy, a consistent level of real growth of budgetary support from such funds. The vast majority of the University's endowment funds are invested in the AIF, an open-ended, pooled investment vehicle that had a market value of approximately $12.3 billion as of June 30, 2018. The AIF asset allocation as of June 30, 2018 is shown below.

| Associated Investment Fund<br>Asset Allocation<br>Fiscal Year ended June 30, 2018 | |
|---|---|
| Domestic Equity | 6.6% |
| International Equity | 11.8% |
| Emerging Market Equity | 9.1% |
| Absolute Return | 28.9% |
| Real Estate | 5.6% |
| Private Equity | 25.5% |
| Natural Resources | 7.4% |
| Fixed Income/Cash | 5.1% |
| Total | 100.0% |

## Investment Performance

For Fiscal Year 2018, the AIF return was 12.9%. Longer measurement periods and comparisons with certain indices are reflected in the chart below.

Associated Investment Fund
Annualized Returns for Periods ending June 30, 2018*

| | 1-Year | 3-Year | 5-Year | 10-Year |
|---|---|---|---|---|
| AIF (University Investment Pool) | 12.9% | 8.3% | 9.9% | 7.4% |
| Composite Benchmark** | 11.2% | 6.6% | 7.9% | 6.2% |

** The investment returns shown above do not include expenses related to operating the Penn Office of Investments. Expenses related to the Penn Office of Investments are netted from returns on investments in the University's consolidated financial statements.*

*** The Composite Benchmark is a weighted average of the individual asset classes in the AIF, where the weights are set forth in accordance with AIF's strategic asset allocation.*

## Property, Plant and Equipment of the University

The book value of the University's investment in plant assets for the fiscal years ended June 30, 2018 and 2017 are shown below (in thousands):

| Property, plant and equipment, net of depreciation *(in thousands)* | | |
|---|---|---|
| | Fiscal Year Ended June 30, | |
| | 2017 | 2018 |
| Land | $ 366,960 | $ 431,440 |
| Buildings | 8,426,732 | 9,357,800 |
| Moveable equipment and other | 1,942,076 | 1,935,319 |
| Construction-in-progress | 590,926 | 929,115 |
| Total plant | 11,326,694 | 12,653,674 |
| Less accumulated depreciation | (4,874,388) | (5,335,055) |
| Property, plant and equipment, net | $6,452,306 | $7,318,619 |

The University recorded $507,890,000 and $470,716,000 of depreciation expense for the years ended June 30, 2018 and 2017, respectively.

The University has conditional asset retirement obligations of $20,364,000 and $23,332,000 as of June 30, 2018 and 2017, respectively, which primarily relate to asbestos contained in buildings and underground steam distribution piping and are included within accrued expenses and other liabilities in the Consolidated Statements of Financial Position.

### Indebtedness of the University's Academic Component

The following University indebtedness outstanding as of June 30, 2018, excluding any indebtedness of the Health System, is a general obligation of the University payable from the assets and revenues of the University:

| Long-Term Debt (Academic Component) Description | Outstanding Principal Amount at June 30, 2018 |
|---|---|
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series of 1990 | $ 6,500,000 |
| Washington County Authority Revenue Bonds Series of 2004 | 53,400,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series B of 2009 | 6,545,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series C of 2009 | 7,970,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series 2010 | 16,935,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series 2011 | 11,125,000 |
| The Trustees of the University of Pennsylvania Taxable Bonds Series 2012 | 300,000,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series A of 2015 | 196,110,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series B of 2015 | 162,395,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series C of 2015 | 8,020,000 |
| PHEFA The Trustees of the University of Pennsylvania Refunding Revenue Bonds Series A of 2016 | 168,565,000 |
| PHEFA The Trustees of the University of Pennsylvania Revenue Bonds Series A of 2017 | 178,395,000 |
| Other Loans | 12,663,000 |
| Total Long-Term Debt (including current portion) | $1,128,623,000 |

The limited obligation debt of the Health System is more particularly described below under "THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM – Health System Limited Obligation Debt."

### Capital Expenditures

As a large and complex institution with substantial capital facilities, the University regularly invests in maintaining, updating and expanding its facilities to meet its operating needs. Capital expenditures of the University are funded from available resources of the University, which may include future fundraising activities or future capital borrowings.

### Future Borrowing

Depending on market conditions, the University may incur additional indebtedness, which may include additional bonds issued under the Indenture, to refinance certain currently outstanding indebtedness of the University, convert interest rate modes to take advantage of market conditions, to finance future capital projects, or for other legally authorized purposes.

*[Remainder of page intentionally left blank]*

## THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM

### Structure and Governance

The University of Pennsylvania Health System ("UPHS" or the "Health System") is an operating division of the University and was created by action of the University Trustees on June 18, 1993 to integrate a tri-part mission of education, research and patient care. The Health System includes the following enterprises as of June 30, 2018:

| Enterprise | Description |
|---|---|
| Hospital of the University of Pennsylvania ("HUP") | 837 licensed bed (including 32 bassinets) quaternary acute care hospital |
| Pennsylvania Hospital ("PAH") | 525 licensed bed (including 50 bassinets) acute care hospital |
| Presbyterian Medical Center, d/b/a Penn Presbyterian Medical Center ("PPMC") | 375 licensed bed acute care hospital |
| The Chester County Hospital and Health System ("TCCHHS") | 280 licensed bed (including 32 bassinets) acute care hospital |
| Lancaster General Health ("LG Health") | Regional integrated health system, including Lancaster General Hospital ("LG Hospital"), a 565 licensed bed acute care hospital, and Women & Babies Hospital, a 95 licensed bed (including 48 bassinets) women's health facility |
| Princeton HealthCare System Holding, Inc. ("PHCSH") | Regional integrated health system, including University Medical Center at Princeton, a 343 licensed bed acute care hospital (including 24 bassinets), Princeton House Behavior Health, a 110-bed psychiatric and behavioral health facility and Princeton Homecare Services, a provider of homecare and hospice services |
| Clinical Practices of the University of the Pennsylvania ("CPUP") | The approved faculty practice plan for the clinical practices of 1,871 members of the medical faculty of the Perelman School of Medicine |
| Clinical Care Associates ("CCA") | 236 member primary care physician network |
| Wissahickon Hospice ("Wissahickon") | Provides hospice care serving the terminally ill |

The Hospital of the University of Pennsylvania and the Clinical Practices of the University of Pennsylvania are unincorporated operating divisions of the University. PAH, PPMC, TCCHHS, LG Health, CCA and Wissahickon are Pennsylvania nonprofit corporations of which the University is the sole corporate member, and LG Hospital is a Pennsylvania nonprofit corporation of which LG Health is the sole corporate member. PHCSH is a New Jersey nonprofit corporation of which the University is the sole corporate member. None of PAH, PPMC, TCCHHS, LG Health, LG Hospital, PHCSH, CCA and Wissahickon are liable for the payment of University indebtedness.

In addition to the facilities of the Health System described above, the Health System also participates, through corporate affiliations, in the ownership and/or operation of other healthcare facilities, with which the Health System also maintains clinical affiliations, as follows:

The Health System and The Good Shepherd Home, through a joint venture in which the Health System holds a 30% interest, operate PENN Medicine at Rittenhouse, located on the site of the former Graduate Hospital in Philadelphia, consisting principally of a 30,000 square foot long-term acute care hospital and a 46,000 square foot inpatient rehabilitation facility to which the Health System relocated the existing inpatient rehabilitation services provided at HUP and Pennsylvania Hospital.

The Health System and Kindred Healthcare, through a joint venture in which the Health System holds a 50% interest, operate Lancaster Rehabilitation Hospital, located in Lancaster County. The hospital operates a 59-bed state-of-the-art rehabilitation center in a 57,000 square foot facility on approximately 6 acres which is dedicated to the treatment and recovery of individuals who have experienced a stroke, trauma, brain injury, spinal cord injury, neurological conditions or other rehabilitation diagnoses.

The University Trustees have established an umbrella governance structure for UPHS called "PENN Medicine." The purpose of this governance structure is to operate, oversee, and coordinate the academic, research, and clinical missions of the Health System and the Perelman School of Medicine. PENN Medicine has integrated many of the functions of the separate governing boards of the Health System and the Perelman School of Medicine into a single board, thus emphasizing the interdependency of the three missions. The Health System, together with the Perelman School of Medicine, comprises PENN Medicine.

Under the PENN Medicine structure, PPMC, PAH, TCCHHS, LG Health, PHCSH, CCA and Wissahickon Hospice have retained their own separate legal existence and their own governing boards. The PENN Medicine Board is widely representative, drawn from University and the individual Health System governing boards, faculty, management, and others who have relevant expertise in health care and finance. Andrew R. Heyer serves as the chair of the PENN Medicine Board and of its Executive Committee.

Under the bylaws of PENN Medicine, the Chairman of the PENN Medicine Board is required to be a University Trustee, and the University Trustee Chair sits on the PENN Medicine Board. The bylaws also create a PENN Medicine Executive Committee, a majority of which consists of University Trustees. The PENN Medicine Trustees have certain responsibilities delegated to them by the University Trustees. The University Trustees maintain ultimate control over the governance and the operation of the Health System.

The members of the Health System have entered into a Master Trust Indenture ("MTI") securing certain indebtedness issued for the benefit of the operating divisions and entities comprising the Health System. HUP and CPUP are "Designated Units" under the MTI. The Designated Units, together with PAH, PPMC, TCCHHS, LG Health, LG Hospital, PHCSH, CCA and Wissahickon, are the current members of the "Obligated Group" under the MTI. The indebtedness issued under the MTI is payable solely from, and secured by a pledge of, the revenues of the Obligated Group members. The general credit of the University is not pledged to its payment.

The MTI and related agreements contain certain restrictive covenants which limit the issuance of additional indebtedness and, among other things, require the Health System to meet an annual debt service coverage requirement of "income available for debt service" (excess of revenue over expenses plus depreciation, amortization, interest expense and extraordinary items) of not less than 110% of the annual debt service requirements. For the Fiscal Year ended June 30, 2018, the Health System met this requirement.

As of June 30, 2018, the Health System was obligated in respect of $2,372,537,000 aggregate principal amount of long-term indebtedness, including (i) $2,078,020,000 incurred through the issuance of revenue bonds secured by Master Notes issued under the Master Indenture, and (ii) $148,846,000 principal amount of other long-term debt, constituting general obligations of one or more members of the Obligated Group, but which are not payable from or secured by Master Notes issued under the MTI. See "Health System Limited Obligation Debt" below.

In addition to its inter-school and inter-departmental affiliations, the Health System maintains many external institutional affiliations. These affiliations provide additional resources for the educational, research, and clinical missions of PENN Medicine. The most significant category of affiliations is related to medical education where the Health System maintains affiliations for undergraduate and graduate medical education. Members of the standing faculty of the Perelman School of Medicine provide the vast majority of the medical staff at several leading medical institutions adjacent to HUP and the Perelman School of Medicine, including The Children's Hospital of Philadelphia, Children's Seashore House, Philadelphia Child Guidance Clinic and the Philadelphia Veterans Affairs Medical Center. In research, most of the affiliations are investigator-to-investigator. PENN Medicine also maintains significant institution-to-institution relationships with the Howard Hughes Medical Institute and the Wistar Institute.

The Health System is also developing affiliations with other institutions and has established non-corporate affiliations (not owned or controlled by the University) with Virtua Health System, Cape Regional Health Center, Bayhealth Medical Center, St. Mary Medical Center and Mercy Health System of Southeastern Pennsylvania, and Grand View Health.

### Health System's Financial and Operating Summary

The Health System's unrestricted net assets increased from $4.093 billion for the fiscal year ended June 30, 2017 to $5.138 billion for the fiscal year ended June 30, 2018, an increase of $1.044 billion (25.5%). This was primarily attributed to positive excess of revenue over expenses of $1.073 billion, which included $398.5 million recognized as a result of the PHCSH affiliation in January 2018, and a positive pension and post retirement plan adjustment of $151.8 million. Transfers to the Perelman School of Medicine and the University totaled $203.3 million.

The excess of revenue over expenses from operations was $382.7 million for the fiscal year ended June 30, 2018, reflecting a slight decrease of $4.1 million from the prior fiscal year, but the eighteenth consecutive year of positive operating performance, exclusive of investment income. Including non-operating gains (interest and dividends, net realized gains, contributions and other support and unrealized gains on alternative investments) the total excess of revenue over expenses was $1.073 billion.

The following table summarizes certain historical utilization statistics of the Health System for the five fiscal years ended June 30, 2018.

| Certain Utilization Statistics | | | | | |
|---|---|---|---|---|---|
| | Fiscal Year Ended June 30 | | | | |
| | 2018 [1] | 2017 | 2016 | 2015 | 2014 |
| Adult and Neonatal Staffed Beds | 2,721 | 2,387 | 2,366 | 1,708 | 1,683 |
| Newborn Bassinets | 169 | 145 | 145 | 97 | 97 |
| Adult and Neonatal Admissions | 127,209 | 118,566 | 114,764 | 83,163 | 81,750 |
| Newborn Admissions | 15,543 | 13,075 | 12,791 | 10,789 | 9,550 |
| Adult and Neonatal Patient Days | 710,789 | 656,661 | 639,406 | 490,547 | 483,711 |
| Newborn Patient Days | 38,240 | 31,852 | 29,444 | 25,225 | 22,755 |
| Adult and Neonatal Average Length of Stay (Days) | 5.59 | 5.54 | 5.57 | 5.90 | 5.92 |
| Newborn Average Length of Stay (Days) | 2.46 | 2.44 | 2.30 | 2.34 | 2.38 |
| Adult and Neonatal Staffed Beds Occupancy | 82.0% | 76.4% | 75.7% | 78.7% | 78.4% |
| Inpatient Surgical Procedures | 46,270 | 44,366 | 43,729 | 30,074 | 29,078 |
| Day Surgery Procedures | 65,349 | 59,888 | 56,362 | 38,082 | 35,562 |
| Emergency Room Visits | 331,767 | 303,253 | 294,679 | 182,426 | 172,115 |
| Outpatient Visits | 4,099,264 | 3,870,296 | 3,637,849 | 2,456,427 | 2,242,196 |
| Observation Visits | 25,719 | 21,079 | 19,672 | NR | NR |

*Source: Health System records.*

1 *Effective January 1, 2018, UPHS and PHCSH entered into an affiliation agreement whereby UPHS became the sole corporate member of PHCSH.*

## Health System Limited Obligation Debt

The following Health System indebtedness outstanding as of June 30, 2018, are obligations limited to one or more components of the Health System, including Health System obligations secured under the MTI:

| Long-Term Debt (Health System Component)<br>*(in thousands)*<br><br>Description | Outstanding Balance at June 30, 2018 |
|---|---|
| *Fixed rate debt obligations*: | |
| Lancaster County Hospital Authority, Series A of 2016 | $ 164,540 |
| Lancaster County Hospital Authority, Series B of 2016 | 128,050 |
| Pennsylvania Higher Education Facilities Authority, Series A of 2017 | 400,000 |
| Pennsylvania Higher Education Facilities Authority, Series C of 2016 | 129,015 |
| Pennsylvania Higher Education Facilities Authority, Series A of 2015 | 300,445 |
| Pennsylvania Higher Education Facilities Authority, Series A of 2012 | 136,950 |
| Pennsylvania Higher Education Facilities Authority, Series A of 2009 | 33,005 |
| Pennsylvania Higher Education Facilities Authority, Series B of 2008 | 52,000 |
| New Jersey Health Care Facilities Financing Authority, Series A of 2016 | 183,440 |
| University of Pennsylvania Health System 2017 Taxable Bond | 200,000 |
| Lancaster General Hospital 2015 Taxable Note | 72,805 |
| *Variable rate debt obligations:* | |
| Pennsylvania Higher Educational Facilities Authority Series A of 2014 | 100,000 |
| Pennsylvania Higher Educational Facilities Authority Series A of 2008 | 69,995 |
| New Jersey Health Care Facilities Financing Authority, Series B of 2016 | 65,000 |
| New Jersey Health Care Facilities Financing Authority, Series C of 2016 | 20,000 |
| Lancaster County Hospital Authority, Series A of 2012 | 22,775 |
| Total Parity Master Indenture Obligations | $2,078,020 |
| Build-to-suit leases, net of related interest | 122,860 |
| Mortgages, Notes and capital leases | 25,986 |
| Total other UPHS Debt | $148,846 |
| Unamortized original issue premiums/discounts and cost of issuance | 145,671 |
| Total Long Term Debt (including current portion) | $2,372,537 |

## ADDITIONAL UNIVERSITY INFORMATION

### Employee Relations

As of August 31, 2018, the University's academic component (the "Academic Component") presently has an academic staff of approximately 11,977 (standing faculty, associated faculty and academic support staff) and 11,451 full-time administrative and support employees. Of these, 1,136 are covered by six collective bargaining agreements in the following general categories: housekeeping employees (534); groundskeepers (26); truck drivers (18); parking (9); mail (8); police officers (83); skilled trades (207); library workers (132); stage hands (4) and dining services (115). No other employees of the University are covered by collective bargaining agreements.

Collective bargaining agreements with respect to all unionized employees are in full force and effect. These contracts expire as follows: the skilled trade's contract, in June 2019; the dining services contract, in July 2020; the library contract, in July 2020; the police officers' contract, in August 2020; the housekeeping staff contract, in July 2022; and the stage hands contract in September 2023.

At June 30, 2018, the Health System had 30,001 employees. Employees of certain components of the Health System are covered by two collective bargaining agreements representing employees at certain facilities as follows (numbers of employees are at June 30, 2018): 108 physical plant employees at HUP are represented by the International Union of Operating Engineers, Local 835 (AFL-CIO) under a collective bargaining agreement that expires on June 30, 2019; and 11 physical plant employees at Penn Medicine at

Rittenhouse are represented by the International Union of Operating Engineers, Local 835 (AFL-CIO) under a collective bargaining agreement that expires on September 30, 2019.

Retirement Plan

Retirement benefits are principally provided to employees through contributory defined contribution plans. The Academic Component's policy with respect to its contribution is to provide up to 9% of eligible employees' salaries, while the Health System's contribution can be up to 6.5%. The University's contributions to these plans amounted to $194,597,000 and $176,023,000 for the fiscal years ended June 30, 2018 and June 30, 2017, respectively.

The Health System has a non-contributory defined contribution plan and a non-contributory defined benefit plan which were frozen to new entrants effective July 1, 2010. The Academic Component has a non-contributory defined benefit pension plan which was frozen to new full-time entrants effective July 1, 2000 and part time entrants effective July 1, 2018. Benefits under these plans generally are based on the employee's years of service and compensation during the years preceding retirement. Contributions to the plans are made in amounts necessary to at least satisfy the minimum required contributions as specified in the Internal Revenue Code and related regulations.

Retirement benefits are provided for CPUP physicians and certain administrative personnel through payments by the Health System to the University of $29,666,000 and $27,306,000 in the fiscal years ended June 30, 2018 and June 30, 2017, respectively.

TCCHHS has a number of affiliates with either a 403(b) or 401(k) defined contribution savings plan design. All affiliates share the same employer discretionary matching process; each affiliate will match 50% of an employee's contribution (subject to the IRS annual contribution limit) up to a total of 6% of the employee's salary in fiscal years 2018 and 2017. Total contributions to the plans were $4,156,000 and $3,643,000 for the fiscal years ended June 30, 2018 and June 30, 2017, respectively. TCCHHS also has a defined contribution profit sharing plan covering all eligible employees, as defined. TCCHHS may choose to contribute a discretionary amount to the plan each year. The Health System made no discretionary contributions to this plan in the fiscal years ended June 30, 2018, and June 30, 2017.

LG Health has a defined benefit non-contribution pension plan covering all eligible employees, as defined. LG Health makes annual contributions to the plan to the extent permitted under federal regulations. The plan was amended to freeze benefit accruals for all participants effective June 30, 2013. LG Health also has a defined contribution plan 403(b) where employer contributions to the defined contribution plan are based on a formula as defined by the plan document. Total expenses under this plan were $22,968,000 and $23,153,000 for the fiscal years ended June 30, 2018 and June 30, 2017, respectively.

PHCSH has a defined benefit noncontributory pension plan covering all eligible employees, as defined. The plan was amended to freeze benefit accruals for all participants effective December 31, 2011. PHCSH also has a defined contribution plan 401(a) where employer contributions to the defined contribution plan are based on a formula as defined by the plan document. Total expenses under this plan were $2,652,000 for the six months ended June 30, 2018.

Insurance

General. The assets of the University, including assets of the Health System, are protected by a comprehensive program of insurance. The general liability coverage is placed with a reciprocal risk retention group known as "Pinnacle," which is owned by seventeen universities, including the University. The seventeen universities consist of both public and private institutions which have a united mission to maintain long-term stability while offering broad insurance coverage and minimize the total cost of risk. The general liability limit in the amount of $2,000,000 is subject to a $500,000 deductible, with the reciprocal risk retention group covering the next $1,500,000 of exposure. The University maintains all-risk property liability coverage with commercial insurance carriers at a limit of $2.50 billion for property, plant and equipment, with a $500,000 deductible per incident for University owned and leased properties and a $100,000 deductible per incident for the Health System owned and leased properties. The property policy does not include LG Health or PHCSH. In addition to Pinnacle and the all-risk property insurance program, the University's present coverage includes automobile liability insurance, professional liability, excess/umbrella liability insurance, fine arts insurance, environmental impairment liability, workers' compensation and employers' liability, crime insurance, directors and officers insurance, fiduciary liability, cyber liability, helipad premises liability, non-owned aviation liability, student athlete injury liability, special accident liability, active shooter liability, international safety and security assistance and an inventory of surety bonds that are contractually required to satisfy its obligations. The University conducts periodic reviews of its insurance needs in an effort to maintain adequate coverage at reasonable cost.

Malpractice Insurance. Act 111, the Pennsylvania Health Care Services Malpractice Act, requires every health care provider (hospitals, physicians and nurse mid-wives) to insure their medical malpractice liability exposure by purchasing commercial insurance or qualifying as a self-insurer. This statute, as amended, provides for a Medical Care Availability and Reduction of Error Fund (the "MCare Fund"), which provides coverage for all medical malpractice awards against a health care provider in excess of the primary limits with limits of $500,000 per incident and $1,500,000 in the aggregate. The primary limit of coverage prescribed by the statute is currently $500,000 per incident per health care provider and $1,500,000 in the aggregate for physicians and nurse mid-wives, and $2,500,000 in the aggregate for a hospital. Nurse practitioners, physician assistants, clinical nurse specialists, perfusionists and physical therapists also are required to secure coverage with limits of $1 million per incident and $3 million in the aggregate. With the exception of LG Health, TCCHHS and PHCSH, the Health System insures these exposures through Franklin Casualty Insurance Company, a wholly owned insurance subsidiary included in the combined financial statements of the Health System that has been operational since July 1, 1997. TCCHHS is insured as a member of Cassatt Insurance Group. LG Health is insured through Lancaster General Insurance Company Ltd, an insurance company incorporated and licensed in the Cayman Islands the sole shareholder of which is LG Health, however under a reinsurance agreement Lancaster General Insurance Company serves as reinsurer to Franklin Casualty Insurance Company insuring the aforementioned exposures of LG Health. The company insures only the primary medical professional liability risk of the Health System employed physicians, nurse midwives, nurse practitioners, physician assistants, clinical nurse specialists, perfusionists, physical therapists and owned hospitals. Franklin Casualty Insurance Company is ultimately responsible for payment of any malpractice awards within the primary limits and the prescribed limits for nurse practitioners, physician assistants, clinical nurse specialists, perfusionists and physical therapists. The Health System's exposure in excess of coverage provided by the MCare Fund or the limits for nurse practitioners, physician assistants and physical therapists is covered by a program that utilizes self - insurance and commercial insurance.

Litigation

The University is a party in various legal proceedings arising in the ordinary course of its operations. In the opinion of management, the University has adequate insurance to cover the estimated potential liability for damages in these cases, and, to the extent such liability is not covered by insurance, any adverse decision would not have a material adverse effect on the University's financial position.

# APPENDIX B

# FINANCIAL STATEMENTS OF THE UNIVERSITY
# FOR THE FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

# University of Pennsylvania

Consolidated Financial Statements
June 30, 2018 and 2017

# University of Pennsylvania
## Index
## June 30, 2018 and 2017

pwc

# Report of Independent Auditors

To the Trustees of the University of Pennsylvania:

We have audited the accompanying consolidated financial statements of the University of Pennsylvania (the "University"), which comprise the consolidated statements of financial position as of June 30, 2018 and 2017, and the related consolidated statements of activities and of cash flows for the years then ended.

## Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

## Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the University's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

## Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the University of Pennsylvania as of June 30, 2018 and 2017, and its changes in net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

PricewaterhouseCoopers LLP

September 27, 2018

PricewaterhouseCoopers LLP, Two Commerce Square, Suite 1800, 2001 Market Street, Philadelphia, PA 19013-7042
T: (267) 330 - 3000, F: (267) 330 - 3300, www.pwc.com/us

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

University of Pennsylvania
(in thousands)

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| **Assets** | | |
| Cash and cash equivalents | $ 1,431,172 | $ 972,818 |
| Accounts receivable, net | 451,936 | 388,212 |
| Patient receivables, net | 758,472 | 696,591 |
| Contributions receivable, net | 280,634 | 241,352 |
| Loans receivable, net | 79,360 | 91,037 |
| Other assets | 360,640 | 263,850 |
| Investments, at fair value | 15,733,881 | 13,976,628 |
| Property, plant and equipment, net | 7,318,619 | 6,452,306 |
| Total assets | $ 26,414,714 | $ 23,082,794 |
| **Liabilities** | | |
| Accounts payable | $ 289,096 | $ 242,260 |
| Accrued expenses and other liabilities | 2,290,303 | 1,993,775 |
| Deferred income | 206,436 | 215,613 |
| Deposits, advances and agency funds | 170,728 | 150,336 |
| Federal student loan advances | 68,686 | 82,009 |
| Accrued retirement benefits | 1,241,307 | 1,448,418 |
| Debt obligations | 3,574,192 | 2,702,950 |
| Total liabilities | 7,840,748 | 6,835,361 |
| **Net assets** | | |
| Unrestricted | 11,152,992 | 9,466,538 |
| Temporarily restricted | 3,554,235 | 3,108,053 |
| Permanently restricted | 3,866,739 | 3,672,842 |
| | 18,573,966 | 16,247,433 |
| Total liabilities and net assets | $ 26,414,714 | $ 23,082,794 |

The accompanying notes are an integral part of these consolidated financial statements.

# Consolidated Statements of Activities

University of Pennsylvania
for the years ended June 30, 2018 and 2017
(in thousands)

| | 2018 | 2017 |
|---|---|---|
| Unrestricted | | |
| Revenue and other support: | | |
| Tuition and fees, net | $ 999,376 | $ 937,868 |
| Commonwealth appropriations | 33,606 | 33,606 |
| Sponsored programs | 1,016,153 | 967,189 |
| Contributions and donor support | 267,450 | 194,539 |
| Investment income | 578,700 | 540,679 |
| Net patient service revenue | 6,245,081 | 5,702,819 |
| Sales and services of auxiliary enterprises | 120,816 | 120,265 |
| Other income | 755,364 | 619,183 |
| Independent operations | 77,385 | 78,040 |
| | 10,093,931 | 9,194,188 |
| Expenses: | | |
| Compensation and benefits | 5,496,929 | 5,040,448 |
| Depreciation and amortization | 509,921 | 471,093 |
| Interest on indebtedness | 90,476 | 80,421 |
| Other operating expenses | 3,463,693 | 3,258,969 |
| | 9,561,019 | 8,850,931 |
| Increase in net assets from operations | 532,912 | 343,257 |
| Nonoperating revenue, net gains, reclassifications and other: | | |
| Return on investments, net of amounts classified as operating revenue | 507,321 | 465,613 |
| Pension, OPEB and other, net | 201,838 | 175,366 |
| Contributions and donor support for capital related activities | 444,383 | 34,833 |
| Total nonoperating revenue, net gains, reclassifications and other | 1,153,542 | 675,812 |
| Increase in unrestricted net assets | 1,686,454 | 1,019,069 |
| Temporarily Restricted | | |
| Contributions | 219,858 | 159,146 |
| Return on investments, net | 737,066 | 735,228 |
| Net assets released from restrictions | (510,742) | (416,050) |
| Increase in temporarily restricted net assets | 446,182 | 478,324 |
| Permanently Restricted | | |
| Contributions | 177,413 | 203,286 |
| Return on investments, net | 16,484 | 34,165 |
| Increase in permanently restricted net assets | 193,897 | 237,451 |
| Increase in net assets from nonoperating and restricted revenue, net gains, reclassifications and other | 1,793,621 | 1,391,587 |
| Increase in total net assets | 2,326,533 | 1,734,844 |
| Net assets, beginning of year | 16,247,433 | 14,512,589 |
| Net assets, end of year | $ 18,573,966 | $ 16,247,433 |



The accompanying notes are an integral part of these consolidated financial statements.

University of Pennsylvania
for the years ended June 30, 2018 and 2017
(in thousands)

| | 2018 | 2017 |
|---|---|---|
| Cash flows from operating activities: | | |
| Increase in net assets | $ 2,326,533 | $ 1,734,844 |
| Adjustment to reconcile increase in net assets to net cash provided by operating activities: | | |
| Depreciation and amortization | 495,430 | 471,387 |
| Provision for bad debts | 172,670 | 201,231 |
| Gain on investments, net | (1,383,213) | (1,358,190) |
| Loss on disposal of plant, property and equipment | 680 | 87,153 |
| Donated equipment | (2,057) | (937) |
| Proceeds from split-interest agreements designated for operations | 82,844 | 22,515 |
| Receipt of contributed securities | (53,070) | (113,317) |
| Proceeds from contributed securities | 18,456 | 29,436 |
| Receipt of contributions designated for the acquisition of long-lived assets and long-term investment | (612,028) | (177,858) |
| Pension, OPEB and other, net | (201,838) | (175,366) |
| Changes in operating assets and liabilities: | | |
| Patient, accounts and loans receivable | (243,465) | (308,636) |
| Contributions receivable | (38,520) | 914 |
| Other assets | (36,867) | 6,905 |
| Accounts payable, accrued expenses and accrued retirement benefits | 124,264 | 5,793 |
| Deposits, advances and agency funds | 20,034 | (12,789) |
| Deferred income | (9,177) | 5,282 |
| Net cash provided by operating activities | 660,676 | 418,367 |
| Cash flows from investing activities: | | |
| Purchase of investments | (12,390,888) | (7,879,448) |
| Proceeds from sale of investments | 12,487,507 | 7,682,436 |
| Purchase of property, plant and equipment | (868,479) | (781,421) |
| Cash acquired in Princeton HealthCare System (PHCS) membership substitution | 46,440 | - |
| Net cash used by investing activities | (725,420) | (978,433) |
| Cash flows from financing activities: | | |
| Proceeds from contributions received designated for the acquisition of long-lived assets and long-term investment | 192,153 | 179,000 |
| Proceeds from contributed securities received designated for the acquisition of long-lived assets and long-term investment | 34,208 | 83,278 |
| Federal student loan advances | (13,323) | 1,213 |
| Repayment of long-term debt | (60,245) | (58,509) |
| Proceeds from issuances of long-term debt | 370,305 | 200,300 |
| Net cash provided by financing activities | 523,098 | 405,282 |
| Net increase (decrease) in cash and cash equivalents | 458,354 | (154,784) |
| Cash and cash equivalents, beginning of year | 972,818 | 1,127,602 |
| Cash and cash equivalents, end of year | $ 1,431,172 | $ 972,818 |
| Supplemental disclosure of cash flow information: | | |
| Cash paid for interest, net of amounts capitalized | $ 90,727 | $ 79,944 |
| Contributed securities received | 53,070 | 113,317 |
| (Decrease) increase in accrued plant, property and equipment | (63) | 32,301 |
| Assets acquired in PHCS membership substitution | 843,745 | - |
| Liabilities assumed in PHCS membership substitution | 426,836 | - |
| Contribution received in PHCS membership substitution | 416,909 | - |

The accompanying notes are an integral part of these consolidated financial statements.

# 1. Significant Accounting Policies

## Organization

The University of Pennsylvania (University), located in Philadelphia, Pennsylvania, is an independent, nonsectarian, not-for-profit institution of higher learning founded in 1740. The University Academic Component (Academic Component) provides educational services, primarily for students at the undergraduate, graduate, professional and postdoctoral levels and performs research, training and other services under grants, contracts and similar agreements with sponsoring organizations, primarily departments and agencies of the United States Government. The University also operates an integrated health care delivery system, the University of Pennsylvania Health System (UPHS). The University is a tax-exempt organization under Section 501(c) (3) of the Internal Revenue Code.

## Basis of Presentation

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and include the accounts of the University and its subsidiaries over which the University has a controlling financial interest or exercises control. All material transactions between the University and its subsidiaries are eliminated in consolidation. Investments in subsidiaries over which the University has the ability to exercise significant influence are reported using the equity method of accounting. Other investments in subsidiaries are reported using the cost method of accounting.

The net assets of the University are classified and reported as follows:

Unrestricted - Net assets that are not subject to donor-imposed restrictions.

Temporarily restricted - Net assets that are subject to legal or donor-imposed restrictions that will be met by actions of the University and/or the passage of time. These net assets include gifts donated for specific purposes and appreciation on permanent endowment, which is restricted by Pennsylvania law on the amounts that may be expended in a given year.

Permanently restricted – The original value of donor restricted net assets, the use of which is limited to investment and can only be appropriated for expenditure by the University in accordance with the Pennsylvania Uniform Principal and Income Act (Pennsylvania Act).

Expenses are reported as a decrease in unrestricted net assets. Gains and losses on investments are reported as increases or decreases in unrestricted net assets unless their use is restricted by explicit donor stipulation or by law. Donor-restricted resources intended for the acquisition or construction of long-lived assets are initially reported as temporarily restricted net assets and released from restrictions from temporarily restricted net assets to unrestricted net assets when the asset is placed in service or in accordance with donor-specified terms.

Expirations of temporary restrictions on contributions and investment income, reported as Net assets released from restrictions, and the corresponding amounts are included in the Consolidated Statements of Activities as follows (in thousands):

| Temporarily Restricted Net Assets | 2018 | 2017 |
|---|---|---|
| Net assets released from restrictions | $ (510,742) | $ (416,050) |

| Unrestricted Net Assets | 2018 | 2017 |
|---|---|---|
| Contributions and donor support | $ 190,445 | $ 118,077 |
| Investment income | 274,407 | 263,140 |
| Contributions and donor support for capital related activities | 45,890 | 34,833 |
| Net assets released from restrictions | $ 510,742 | $ 416,050 |

Gains or losses associated with investment activities are included in Return on investments, net. Gains or losses associated with property, plant and equipment disposals are included in Other operating expenses. Gains or losses associated with all other activities, such as debt retirements and pension and postretirement plan actuarial valuation adjustments, are reported in Pension, Other post-retirement employee benefits (OPEB) and other, net.

### Fair Value

The University values certain financial and non-financial assets and liabilities by applying the FASB pronouncement on Fair Value Measurements. The pronouncement defines fair value and establishes a framework for measuring fair value that includes a hierarchy that categorizes and prioritizes the sources used to measure and disclose fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (an exit price). The hierarchy is broken down into three levels based on inputs that market participants would use in valuing the asset or liability and are developed based on market data obtained from sources independent of the University as follows:

Level 1: Unadjusted quoted market prices in active markets for identical assets or liabilities.

Level 2: Unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or inputs other than quoted prices that are observable.

Level 3: Unobservable inputs for the asset or liability.

Inputs broadly refer to the assumptions that market participants use to make valuation decisions, including assumptions about risk. Inputs may include price information, volatility statistics, specific and broad credit data, liquidity statistics and other factors. The University is required by the pronouncement to maximize the use of observable inputs (Levels 1 and 2) and minimize the use of unobservable inputs (Level 3). The University considers observable data to be that market data which is readily available, regularly distributed or updated, reliable and verifiable, not proprietary and provided by independent sources that are actively involved in the relevant market. The categorization of a financial instrument within the hierarchy is based upon the pricing transparency of the instrument and does not necessarily correspond to the University's perceived risk of that instrument.

Assets and liabilities are disclosed in the Consolidated Notes to Financial Statements within the hierarchy based on the lowest (or least observable) input that is significant to the measurement. The University's assessment of the significance of an input requires judgment, which may affect the valuation and categorization within the fair value hierarchy. The fair value of assets and liabilities using Level 3 inputs are generally determined by using pricing models or discounted cash flow methods, which all require significant management judgment or estimation.

As a practical expedient, the University is permitted to estimate the fair value of an investment in an investment company at the measurement date using the reported net asset value (NAV). Adjustment is required if the University expects to sell the investment at a value other than NAV or if the NAV is not calculated in accordance with U.S. GAAP. The University holds investments in its portfolio which are generally valued based on the most current NAV. This amount represents fair value of these investments at June 30, 2018 and 2017. Investments reported at NAV, as a practical expedient, are not included within levels 1, 2, or 3 in the fair value hierarchy.

The University performs additional procedures, including due diligence reviews, on its investments in investment companies and other procedures with respect to the capital account or NAV provided to ensure conformity with US GAAP. The University has assessed factors including, but not limited to, managers' compliance with the Fair Value Measurement standard, price transparency and valuation procedures in place.

### Cash and Cash Equivalents

Cash equivalents include short-term, highly liquid investments and are carried at cost which approximates fair value. Unrestricted short-term investments available for current operations with maturities of three months or less when purchased are classified as cash equivalents.

### Investments, at Fair Value

The majority of the University's investments are held in the Associated Investments Fund (AIF). The AIF is invested in accordance with the investment policies set out by an Investment Board which has been appointed by the Trustees of the University of Pennsylvania (the Trustees). The Office of Investments is responsible for the day-to-day management of the AIF including identifying, selecting and monitoring a variety of external investment managers to implement the strategic asset allocation set forth by the Investment Board. The AIF may include marketable and not readily marketable securities that it intends to hold for an indefinite period of time. The University also holds other investments which are not invested in the AIF due to various restrictions. The majority of these investments are in highly liquid short-term and equity type investments. Changes in the fair value of investments are reported in Return on investments, net in the Consolidated Statements of Activities. The following is a summary of the investments held in the AIF by asset allocation as well as investment risk:

### Short-Term

Short-term investments include cash equivalents and fixed income investments with maturities of less than one year. Short-term investments are valued using observable market data and are categorized as Level 1 based on quoted market prices in active markets. The majority of these short-term investments are held in a US Treasury money market account.

### Equity

Equity investments consist of direct holdings of public securities in managed accounts as well as exchange traded funds and private funds. The securities held in managed accounts, along with exchange traded funds, are generally valued based on quoted market prices in active markets obtained from exchange or dealer markets for identical assets, and are accordingly categorized as Level 1. Private funds are valued at NAV.

### Debt

Debt investments consist of direct holdings of securities in managed accounts and private funds. Securities such as US Treasuries, held in managed accounts, are valued based on quoted market prices in active markets and are categorized as Level 1. Securities such as corporate bonds, high yield bonds and bank loans, also held in managed accounts, are valued based on quoted market prices or dealer or broker quotations and are categorized as Level 2 or in the cases where inputs are unobservable as Level 3. Private funds are valued at NAV.

### Absolute Return

Absolute return investments are made up of allocations to private funds. The fund managers of these private funds invest in a variety of securities, based on the strategy of the fund, which may or may not be quoted in an active market. Illiquid securities, if any, are generally designated as a side pocket by hedge fund managers and may be valued based on an appraised value, discounted cash flow, industry comparables or some other method. Private funds are valued at NAV.

### Real Estate

Investments in real estate are primarily in the form of private funds. The fund managers of these private funds primarily invest in investments for which there is no readily determinable market value. The fund manager may value the underlying investments based on an appraised value, discounted cash flow, industry comparables or some other method. Private funds are valued at NAV.

### Private Equity

Investments in private equity are in the form of close-ended private funds. The fund managers primarily invest in investments for which there is no readily determinable market value. The fund manager may value the underlying private investments based on an appraised value, discounted cash flow, industry comparables or some other method. These private fund investments are valued at NAV.

### Natural Resources

Investments in natural resources are made up of private funds and securities in managed accounts. The fund managers of these private funds primarily invest in investments for which there is no readily determinable market value. The fund manager may value the underlying investments based on an appraised value, discounted cash flow, industry comparables or some other method. Private funds are valued at NAV. The securities held in the managed accounts are generally valued based on quoted market prices in active markets obtained from exchange or dealer markets for identical assets, and are accordingly categorized as Level 1.

### Derivatives

The University, in the normal course of business, utilizes derivative financial instruments in connection with its investment activity. Derivatives utilized by the University include futures, options, swaps and forward currency contracts and are reflected at fair value following the definition of Level 1 and 2 assets and liabilities as previously described. Investments in derivative contracts are subject to foreign exchange and equity price risks that can result in a loss of all or part of an investment. In addition, the University is also subject to additional counterparty risk should its counterparties fail to meet the terms of their contracts.

### Investment Risks

The University's investing activities expose it to a variety of risks including market, credit and liquidity risks. The University attempts to identify, measure and monitor risk through various mechanisms including risk management strategies and credit policies.

Market risk is the potential for changes in the fair value of the University's investment portfolio. Commonly used categories of market risk include currency risk (exposure to exchange rate differences between functional currency relative to other foreign currencies), interest rate risk (changes to prevailing interest rates or changes in expectations of futures rates) and price risk (changes in market value other than those related to currency or interest rate risk, including the use of NAV provided).

Credit risk is the risk that one party to a financial investment will cause a financial loss for the other party by failing to discharge an obligation (counterparty risk).

Liquidity risk is the risk that the University will not be able to meet its obligations associated with financial liabilities.

### Endowment

The University's endowment consists of 6,364 donor-restricted permanent or term endowment funds and 895 unrestricted endowment funds established by management for a variety of purposes. The University reports all endowment investments at fair value. The majority of the endowment funds of the University have been pooled in the University's AIF. The endowment funds not pooled in the AIF are primarily invested in equities and bonds.

The Commonwealth of Pennsylvania has not adopted the Uniform Management of Institutional Funds Act (UMIFA) or the Uniform Prudent Management of Institutional Funds Act (UPMIFA). Rather, the Pennsylvania Act governs the investment, use and management of the University's endowment funds.

The Pennsylvania Act does not require the preservation of the fair value of a donor's original gift as of the gift date of a donor-restricted endowment fund, absent explicit donor stipulations to the contrary. However, based on its interpretation of the Pennsylvania Act and relevant accounting literature, the University classifies as permanently restricted net assets for reporting purposes: (i) the original value of gifts donated to the permanent endowment; (ii) the original value of subsequent gifts to the permanent endowment; and (iii) accumulations to the permanent endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund. The remaining portion of the donor-restricted endowment fund that is not classified in permanently restricted net assets is classified as temporarily restricted net assets until those amounts are appropriated for expenditure by the University. The Pennsylvania Act allows a nonprofit to elect to appropriate for expenditure between 2% and 7% of the endowment fair value, determined at least annually and averaged over a period of three or more preceding years.

In accordance with the Pennsylvania Act, the University has elected to adopt and follow an investment policy seeking a total return for the investments held by the AIF, whether the return is derived from appreciation of capital or earnings and distributions with respect to capital or both. The endowment spending policy which the Board of Trustees has elected to govern the expenditure of funds invested in the AIF is designed to manage annual spending levels and is independent of the cash yield and appreciation of investments for the year. For Fiscal Year 2018, the spending rule target payout was based on the sum of: (i) 70% of the prior fiscal year distribution adjusted by an inflation factor; and (ii) 30% of the prior fiscal year-end fair value of the AIF, lagged one year, multiplied by 5.0% for all funds. The payout or allocation to operations exceeded actual income, net of expenses, by $516,034,000 in 2018 and by $485,860,000 in 2017.

### Property, Plant and Equipment

Property, plant and equipment (PPE) is reported net of related depreciation. Donated PPE is reported based on estimated fair value at the date of acquisition. Capital leases are categorized as buildings or equipment and are reflected at the lower of the net present value of the minimum lease payments or the fair value of the leased asset at the inception of the lease. All other PPE is reported at cost. Depreciation is computed on the straight-line method over the estimated useful lives of the assets or the shorter of the lease term or estimated useful life of the asset for capital lease assets. Contributions of library materials, as well as rare books and other collectibles, are not recorded for financial statement presentation, while purchases are recorded as Other operating expenses on the Consolidated Statement of Activities in the period acquired.

### Split-Interest Agreements

The University's split-interest agreements with donors consist of irrevocable charitable remainder trusts, charitable gift annuities, pooled income funds, perpetual trusts and charitable lead trusts. Assets are invested and payments are made to donors and/or other beneficiaries in accordance with the respective agreements.

The University recognizes assets contributed to charitable remainder trusts, charitable gift annuities and pooled income funds, where it serves as trustee, at fair value, recognizes a liability to the beneficiaries based on the present value of the estimated future payments to beneficiaries to be made over the estimated remaining life of those beneficiaries using current market rates at the date of the contribution, and recognizes the difference as contribution revenue. Subsequently, the trust assets, invested in equity and debt securities, are measured at fair value at quoted market prices, and are categorized as Level 1, with the changes reported as an adjustment to Investments, at fair value on the Consolidated Statements of Financial Position and Return on investments, net on the Consolidated Statements of Activities. Liabilities to beneficiaries are revalued based on current market rates, and are categorized as Level 2, with the changes reported as an adjustment to Accrued expense and other liabilities on the Consolidated Statements of Financial Position and Return on investments, net on the Consolidated Statements of Activities.

Charitable remainder trust assets, where the University does not serve as trustee, are initially valued using the current fair value of the underlying assets, using observable market inputs based on its beneficial interest in the trust, discounted to a single present value using current market rates at the date of the contribution. The initially contributed assets are categorized as Level 3, and reported as Investments, at fair value on the Consolidated Statements of Financial Position and Contribution revenue on the Consolidated Statements of Activities. Subsequent valuation follows this same approach with changes in fair value reported as an adjustment to Investments, at fair value on the Consolidated Statements of Financial Position and Return on investments, net on the Consolidated Statements of Activities. The primary unobservable input used in the fair value measurement of the charitable remainder trust assets is the discount rate. Significant fluctuation in the discount rates utilized in this calculation could result in a material change in fair value.

Perpetual trust assets are initially valued at the current fair value of the underlying assets using observable market inputs based on its beneficial interest in the trust. The initially contributed assets are categorized as Level 3 and are reported as Investments, at fair value on the Consolidated Statements of Financial Position and as Contribution revenue on the Consolidated Statements of Activities. Subsequent valuation follows this same approach with changes in fair value reported as an adjustment to Investments, at fair value on the Consolidated Statements of Financial Position and Return on investments, net on the Consolidated Statements of Activities. The primary unobservable inputs used in the fair value measurement of the perpetual trust assets are the underlying securities held by the trust. Significant fluctuation in the market value of these underlying securities could result in a material change in fair value.

The University reports charitable lead trust assets by discounting future cash flows using current market rates at the measurement date, matched to the payment period of the agreement. The initially contributed assets are categorized as Level 3, and reported as Investments, at fair value on the Consolidated Statements of Financial Position and as Contribution revenue on the Consolidated Statements of Activities. Subsequent valuation follows this same approach with changes in fair value reported as an adjustment to Investments, at fair value on the Consolidated Statements of Financial Position and Return on investments, net on the Consolidated Statements of Activities. The primary unobservable input used in the fair value measurement of the charitable lead trust assets is the discount rate. Significant fluctuation in the discount rates utilized in this calculation could result in a material change in fair value.

### Income Taxes

The University is a tax exempt organization under Section 501(c)(3) of the Internal Revenue Code. Most of its activities and income are related to its exempt purposes and are exempt from federal and state income taxes. None of its activities and income is subject to Pennsylvania income tax. Unrelated activities and income are subject to federal "Unrelated Business Income Tax."

The University regularly evaluates its tax position and does not believe it has any uncertain tax positions that require disclosure or adjustment to the consolidated financial statements.

### Tuition and Fees

The University practices need-blind admissions for citizens and permanent residents of the United States, Canada and Mexico, meaning that qualified undergraduate applicants are admitted without regard to financial circumstances. This admissions policy is paired with a grant-based financial aid program, which meets the full demonstrated financial need of all undergraduate students with grants and work-study funding. Students and their families may still choose to borrow if they wish to help meet any expected family contribution. Tuition and fees have been reduced by certain grants and scholarships in the amount of $350,151,000 in 2018 and $333,582,000 in 2017.

### Sponsored Programs

The University receives grant and contract revenue from governmental and private sources. In 2018 and 2017, grant and contract revenue earned from governmental sources totaled $730,368,000 and $713,113,000, respectively. The University generally recognizes revenue associated with the direct and the applicable indirect costs of sponsored programs as the related costs are incurred. The University negotiates its federal indirect rate with its cognizant federal agency. Indirect costs recovered on federally-sponsored programs are generally based on predetermined reimbursement rates which are stated as a percentage and distributed based on the modified total direct costs incurred. Indirect costs recovered on all other grants and contracts are based on rates negotiated with the respective sponsors. Funds received for sponsored research activity are subject to audit. Based upon information currently available, management believes that any liability resulting from such audits will not materially affect the financial position or operations of the University.

### Contributions

Unrestricted Contributions and donor support includes net assets released as a result of corresponding expenditures which met donor imposed restrictions. Contributions, including unconditional promises to donate cash and other assets, are recognized as revenue in the period received and are reported as increases in the appropriate net asset category based on donor restrictions. Contributions designated for the acquisition of long-lived assets and long-term investment are reported in Nonoperating revenue, net gains, reclassifications and other.

The University reports unconditional pledges at fair value by discounting future cash flows using current market rates at the measurement date, ranging from 2.87% to 3.90%, matched to the payment period of the agreement, and accordingly categorizes these assets as Level 3. The primary unobservable input used in the fair value measurement of the University's Contributions receivable is the discount rate. Significant fluctuation in the discount rates utilized in this calculation could result in a material change.

### Net Patient Service Revenue

Net patient service revenue is derived from UPHS patient services and is accounted for at established rates on the accrual basis in the period the service is provided. Patient service revenue is net of charity care and community services. Certain revenue received from third-party payors is subject to audit and retroactive adjustment. Any changes in estimates under these contracts are recorded in operations currently.

### Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

### Recent Authoritative Pronouncements

Periodically, the Financial Accounting Standards Board (FASB) issues updates to the Accounting Standards Codification (ASC) which impacts the University's financial reporting and related disclosures. The paragraphs which follow summarize a number of relevant updates. Unless otherwise noted, the University is currently evaluating the impact that these updates will have on the consolidated financial statements.

In May 2014, the FASB issued a standard on Revenue from Contracts with Customers. This standard implements a single framework for recognition of all revenue earned from customers. This framework ensures that entities appropriately reflect the consideration to which they expect to be entitled in exchange for goods and services by allocating transaction price to identified performance obligations and recognizing revenue as performance obligations are satisfied. Qualitative and quantitative disclosures are required to enable users of financial statements to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. The standard is effective for fiscal year 2019.

In June 2018, the FASB issued a standard on Clarifying the Scope and the Accounting Guidance for Contributions Received and Contributions Made. The new guidance explains how entities will determine whether to account for a transfer of assets as an exchange transaction (under other guidance) or a contribution. The FASB also clarified that a contribution is conditional if the agreement includes both a barrier (as defined) and a right of return or release. The standard is effective for fiscal year 2019.

In August 2016, the FASB issued a standard on the Presentation of Financial Statements of Not-for-Profit Entities. The new guidance requires that not-for-profit entities no longer distinguish between resources with temporary and permanent restrictions on the face of their financial statements, effectively presenting two classes of net assets instead of three. The guidance also changes how not-for-profit entities report certain expenses and provide information about their available resources and liquidity. The standard is effective for fiscal year 2019.

In February 2016, the FASB issued a standard on Leases. This standard requires lessees to recognize assets and liabilities for the rights and obligations created by leases with terms in excess of 12 months. The recognition, measurement, and presentation of expenses and cash flows arising from a lease will primarily depend on its classification as a finance or operating lease. The accounting by lessors remains largely unchanged. The standard is effective for fiscal year 2020.

In November 2016, the FASB issued a standard on Restricted Cash. This standard requires that the Consolidated Statement of Cash Flows explain the change during the period in the total of cash, cash equivalents and restricted cash. Additionally, a disclosure describing the nature of the restrictions and a reconciliation of total cash, cash equivalents and restricted cash to the amounts of Cash and cash equivalents presented on the Consolidated Statement of Financial Position is required. The standard is effective for fiscal year 2020.

In March 2017, the FASB issued a standard on Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. This standard requires the bifurcation of net benefit cost, as follows: service cost continues to be reported in Compensation and benefits, while the remaining components of net benefit cost are reported in Pension, OPEB and other, net. The University early adopted this standard for fiscal year 2018. The adoption of the standard resulted in an increase to Net assets from operations of $11,256,000 for the year ended June 30, 2018, with a retrospective increase to Net assets from operations of $45,798,000 for the year ended June 30, 2017.

## 2. University of Pennsylvania Health System - Summarized Financial and Related Information

The Trustees formed Penn Medicine, the governance structure which oversees the activities of UPHS and the University of Pennsylvania Perelman School of Medicine (PSOM). The governing body operates, oversees and coordinates the academic, research and clinical missions of Penn Medicine.

UPHS is comprised of the following operating entities: Clinical Practices of the University of Pennsylvania; Clinical Care Associates; Hospital of the University of Pennsylvania; Penn Presbyterian Medical Center; Pennsylvania Hospital of the University of Pennsylvania Health System; Chester County Hospital and Health System; Lancaster General Health (LGH); Wissahickon Hospice of the University of Pennsylvania Health System; Franklin Casualty Insurance Company, a wholly owned Risk Retention Group; and, Quaker Insurance Company Ltd., a wholly owned offshore captive insurance company, (collectively referred to as RRG/Captive). In January 2018, through a membership substitution, Princeton HealthCare System (PHCS) became a part of UPHS.

Throughout the year, certain transactions (primarily billings for allocations of common costs, physicians' salaries and benefits, certain purchased services and support for PSOM) are conducted between UPHS and the University. Nonoperating, net, as shown below, includes transfers from UPHS to the University of $198,394,000 and $180,632,000 in 2018 and 2017, respectively, to further the research and educational activities of PSOM and $4,874,000 and $0 in 2018 and 2017, respectively, for other activities. In addition, UPHS recognized operating expenses of $19,844,000 and $19,351,000 in 2018 and 2017, respectively, to support academic operating activities in the clinical departments of PSOM.

The effect of all these transactions is included in the following summarized financial information of UPHS as of and for the years ended June 30, 2018 and 2017 (in thousands):

| | 2018 | 2017 |
|---|---|---|
| Net patient service revenue | $ 6,417,674 | $ 5,903,582 |
| Provision for bad debt | (164,763) | (193,651) |
| Net patient service revenue less bad debts | 6,252,911 | 5,709,931 |
| Other revenue | 529,240 | 428,721 |
| Total expenses | (6,399,423) | (5,751,787) |
| Excess of revenue over expenses from operations | 382,728 | 386,865 |
| Nonoperating, net | 728,454 | 275,059 |
| Increase in net assets | $ 1,111,182 | $ 661,924 |
| | | |
| Total current assets | $ 1,992,168 | $ 1,481,230 |
| Assets whose use is limited: | | |
| Held by trustees | 274,300 | 116,085 |
| RRG/ Captive | 207,403 | 195,982 |
| Donor restricted and other | 648,104 | 581,629 |
| Designated | 2,584,262 | 2,303,595 |
| Property and equipment, net | 4,103,777 | 3,309,820 |
| Investments and other assets | 1,204,215 | 962,164 |
| Total assets | $ 11,014,229 | $ 8,950,505 |
| | | |
| Total current liabilities | $ 1,110,380 | $ 876,636 |
| Long-term debt, net of current portion | 2,274,859 | 1,451,816 |
| Other liabilities | 1,833,978 | 1,938,223 |
| Total liabilities | $ 5,219,217 | $ 4,266,675 |
| | | |
| Net assets | | |
| Unrestricted | $ 5,137,511 | $ 4,093,287 |
| Temporarily restricted | 456,528 | 406,073 |
| Permanently restricted | 200,973 | 184,470 |
| Total net assets | $ 5,795,012 | $ 4,683,830 |
| Total liabilities and net assets | $ 11,014,229 | $ 8,950,505 |

## Net Patient Service Revenue

Net Patient Service Revenue (NPSR), net of contractual allowances and discounts, is as follows for the years ended June 30, 2018 and 2017 (in thousands):

| | 2018 | 2017 |
|---|---|---|
| Third Party Payors | $ 6,359,410 | $ 5,798,498 |
| Self-Pay | 58,264 | 105,084 |
| Total All Payors | $ 6,417,674 | $ 5,903,582 |

NPSR for the years ended June 30, 2018 and 2017 is derived from the following payers:

| | 2018 | 2017 |
|---|---|---|
| Medicare (including Managed Medicare) | 31% | 30% |
| Medicaid (including Managed Medicaid) | 11% | 12% |
| Managed Care | 37% | 32% |
| Independence Blue Cross (IBC) | 17% | 20% |
| Commercial | 3% | 4% |
| Self Pay | 1% | 2% |
| | 100% | 100% |

UPHS has agreements with the following third-party payers that provide for payments at amounts that differ from its established rates:

Inpatient acute care services and outpatient services rendered to Medicare program beneficiaries are paid at prospectively determined rates. These rates vary according to a patient classification system that is based on clinical, diagnostic, and other factors. Inpatient psychiatric services and medical education costs related to Medicare beneficiaries are paid based on a cost reimbursement methodology. UPHS is reimbursed for cost reimbursable items at a tentative rate with final settlement determined after submission of annual cost reports by each hospital and audits thereof by the Medicare fiscal intermediary.

Inpatient and outpatient services rendered to Medicaid program beneficiaries are paid at prospectively determined rates. Additional amounts are allocated to each hospital for training residents and serving a disproportionate indigent population.

Laws and regulations governing the Medicare and Medicaid programs are extremely complex and subject to interpretation. As a result, there is at least a reasonable possibility that recorded estimates will change by a material amount in the near term.

During 2017, UPHS and IBC reached agreement on terms of a five-year agreement. Payments made for inpatient services provided to IBC traditional and managed care subscribers are effected on a per case rate basis for most services. Payment for outpatient services is principally based upon negotiated fee schedules. Hospital and physician rates also provide for annual inflationary increases. In addition, incentives are paid for high performance with regard to clinical outcomes and patient quality. The agreement continues unless terminated by the parties.

During 2015, UPHS and Aetna reached agreement on terms of a five-year agreement. The terms of the agreement provide payments for inpatient hospital services on a per case rate basis. Payments for outpatient services continue to be predominantly based upon negotiated fee schedules.

UPHS also has reimbursement agreements with certain commercial insurance carriers, health maintenance organizations and preferred provider organizations. The basis for reimbursement under these agreements includes prospectively determined rates per discharge, discounts from established charges and prospectively determined per diem rates.

### Charity Care

UPHS provides services to patients who meet certain criteria under its charity care policy without charge or at amounts less than UPHS' established rates. Because UPHS does not pursue collections, such amounts have been excluded from NPSR. UPHS estimates the costs of providing charity care services based on data derived from a combination of UPHS' cost accounting system and the ratio of costs to charges. Of the Total expenses reported above by UPHS, an estimated $19,189,000 and $16,134,000 were incurred as a result of providing services to charity patients for the years ended June 30, 2018 and 2017, respectively.

### Provision for Bad Debt

The provision for bad debt is based on management's assessment of expected net collections considering economic conditions, historical experience, trends in health care coverage and other collection indicators. Included in this assessment are patients who do not have health insurance or do not meet the criteria to qualify for UPHS' charity care policy. UPHS pursues collection of these amounts, however certain amounts are deemed to be uncollectible. Periodically throughout the year, management assesses the adequacy of the allowances for uncollectible accounts based upon historical write-off experience by payor category, including not covered by insurance, and history of cash collections. The results of this review are then used to make any modifications to the provision for bad debt to establish an appropriate allowance for uncollectible accounts. No significant modifications were made for fiscal years 2018 or 2017. After satisfaction of amounts due from insurance and reasonable efforts to collect from patients have been exhausted, UPHS follows established guidelines for placing certain past-due patient balances with collection agencies, subject to terms of certain restrictions on collection efforts as determined by UPHS. Account receivables are written off after collection efforts have been followed in accordance with UPHS' policy. UPHS' allowances for uncollectible accounts totaled $271,700,000 and $225,244,000 at June 30, 2018 and 2017, respectively.

### Medical Professional Liability Claims

The University is insured for medical professional liability claims through the combination of the Medical Care Availability and Reduction of Error Fund (Mcare), various commercial insurance companies and risk retention programs.

Mcare levies health care provider surcharges, as a percentage of the Pennsylvania Joint Underwriters Association rates for basic coverage, to pay claims and pay administrative expenses of Mcare participants. These surcharges are recognized as expenses in the period incurred. Mcare operates on a pay-as-you-go basis and no provision has been made for any future Mcare assessments in the accompanying financial statements, as the University's portion of the unfunded Mcare liability cannot be estimated.

Anticipated insurance recoveries and estimated liabilities for medical malpractice claims or similar contingent liabilities are presented separately on the Consolidated Statement of Financial Position in Accounts receivable, net of allowances and Accrued expenses and other liabilities, respectively. The University accrues for estimated risks arising from both asserted and unasserted medical professional liability claims. The estimate of the gross liability and corresponding receivable for unasserted claims arising from unreported incidents is based on analysis of historical claims data by an independent actuary, which is recorded utilizing a 2.25% to 3.50% discount rate as of June 30, 2018 and 2017. The gross liability recorded under this program is $734,383,000 and $714,363,000 at June 30, 2018 and 2017, respectively, with a corresponding receivable of $106,673,000 and $100,167,000 at June 30, 2018 and 2017, respectively.

### PHCS Membership Substitution

Effective January 1, 2018, the University and PHCS entered into an affiliation agreement whereby the University became the sole corporate member of PHCS. PHCS is a comprehensive healthcare provider located in central New Jersey that principally includes the Medical Center of Princeton, a general acute care hospital facility in Plainsboro, New Jersey, with 319 inpatient beds (plus 24 newborn bassinets), and Princeton House Behavioral Health, which includes a 110 bed inpatient facility in Princeton, New Jersey, and four additional outpatient locations. PHCS includes approximately 1,200 physicians on staff and employs approximately 3,200 people.

No consideration was exchanged for the net assets contributed and acquisition costs are expensed as incurred. UPHS recorded non-operating contribution income of $398,493,000 in fiscal year 2018 reflecting the fair value of the contributed unrestricted net assets of PHCS on January 1, 2018. Additionally, Restricted contribution income of $8,254,000 and $10,162,000 were recorded in temporarily restricted and permanently restricted net assets, respectively as of January 1, 2018.

Total fair value of assets, liabilities and net assets contributed by PHCS and its subsidiaries at January 1, 2018 were as follows (in thousands):

| | January 1, 2018 |
|---|---|
| Cash and cash equivalents | $ 46,440 |
| Patients accounts receivable, net | 43,895 |
| Prepaid expenses and other current assets | 17,533 |
| Investments and assets limited as to use | 213,460 |
| Property, plant and equipment, net | 491,877 |
| Other assets | 30,540 |
| Total assets acquired | $ 843,745 |
| | |
| Accounts payable and accrued expense | $ 75,954 |
| Accrued compensation and related benefits | 32,962 |
| Estimated third-party settlements | 7,099 |
| Long-term debt | 293,861 |
| Other liabilities | 16,960 |
| Total liabilities assumed | $ 426,836 |
| | |
| Unrestricted | $ 398,493 |
| Temporarily restricted | 8,254 |
| Permanently restricted | 10,162 |
| Total net assets | $ 416,909 |
| Total liabilities and net assets | $ 843,745 |

A summary of the pro-forma combined financial results of UPHS and PHCS for the years ended June 30, 2018 and June 30, 2017, as if the affiliation had occurred on July 1, 2016 is as follows (unaudited and in thousands):

| | 2018 | 2017 |
|---|---|---|
| Total operating revenue | $ 7,020,438 | $ 6,610,678 |
| Total operating expense | 6,636,843 | 6,224,240 |
| Operating gain | $ 383,595 | $ 386,438 |
| Nonoperating activity, net | 275,329 | 237,958 |
| Increase in unrestricted net assets | $ 658,924 | $ 624,396 |

## 3. Accounts Receivable

Accounts receivable are reported at their net realizable value.; The major components of receivables, net of allowances for doubtful accounts of $20,363,000 and $17,980,000 at June 30, 2018 and 2017, respectively, are as follows (in thousands):

| | 2018 | 2017 |
|---|---|---|
| Sponsored research | $ 140,790 | $ 137,675 |
| Malpractice | 106,673 | 100,167 |
| Student | 25,298 | 13,193 |
| Trade | 96,181 | 53,272 |
| Investment income | 5,884 | 4,032 |
| Other | 77,110 | 79,873 |
| Total Accounts receivable | $ 451,936 | $ 388,212 |

## 4. Loans Receivable

Loans receivable, and related allowances for doubtful accounts, consist of the following at June 30, 2018 and 2017 (in thousands):

| | 2018 | | |
|---|---|---|---|
| | Receivable | Allowance | Net |
| Student Loans: | | | |
| Federally-sponsored | $ 57,562 | | $ 57,562 |
| Other | 14,160 | $ 3,300 | 10,860 |
| Total Student loans | $ 71,722 | $ 3,300 | $ 68,422 |
| Other | 11,168 | 230 | 10,938 |
| Total | $ 82,890 | $ 3,530 | $ 79,360 |

| | 2017 | | |
|---|---|---|---|
| | Receivable | Allowance | Net |
| Student Loans: | | | |
| Federally-sponsored | $ 67,221 | | $ 67,221 |
| Other | 15,847 | $ 2,936 | 12,911 |
| Total Student loans | $ 83,068 | $ 2,936 | $ 80,132 |
| Other | 11,136 | 231 | 10,905 |
| Total | $ 94,204 | $ 3,167 | $ 91,037 |

Loans receivable primarily consists of student loans. Student loans include federally-sponsored student loans and donor-restricted student loans with mandated interest rates and repayment terms. The federally-sponsored student loans represent amounts due from current and former students under various Federal Government funded loan programs offered to graduate and undergraduate students. Loans disbursed under these programs are able to be assigned to the Federal Government upon default by the borrower; therefore, no related allowance is considered necessary. Funding received under these programs is ultimately refundable to the Federal Government in the event the University no longer participates and accordingly is reported as a liability in Federal student loan advances in the Consolidated Statements of Financial Position. Determination of the fair value of student loans receivable is not practicable.

Loans receivable are reported at their net realizable value. The University regularly assesses the adequacy of the allowances for credit losses of its loans by performing ongoing evaluations, including such factors as aging, differing economic risks associated with each loan category, financial condition of specific borrowers, economic environment in which the borrowers operate, level of delinquent loans, value of collateral and existence of guarantees or indemnifications.

## 5. Contributions Receivable

A summary of contributions receivable at June 30, 2018 and 2017, is as follows (in thousands):

| | 2018 | 2017 |
|---|---|---|
| Unconditional promises expected to be collected in: | | |
| Less than one year | $ 134,133 | $ 108,885 |
| One year to five years | 169,363 | 144,626 |
| Over five years | 29,896 | 36,588 |
| | 333,392 | 290,099 |
| Less: Discount | (20,912) | (17,187) |
| Less: Allowances for doubtful amounts | (31,846) | (31,560) |
| Total Contributions receivable, net | $ 280,634 | $ 241,352 |

At June 30, 2018 and 2017, the University has outstanding unrecorded conditional promises to give, including non-legally binding bequests, of $312,013,000 and $303,926,000, respectively. When they become unconditional promises to give or are received in cash, they will be recorded and generally will be restricted for operations, endowment and capital projects as stipulated by the donors.

## 6. Investments, at Fair Value

A summary of investments, including the AIF, measured at fair value in accordance with the Fair Value Measurements standard, as of June 30, 2018 and June 30, 2017 is as follows (in thousands):

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2018 |
|---|---|---|---|---|---|
| Short-term | $ 996,590 | | | | $ 996,590 |
| Equity: | | | | | |
| US equities | 808,186 | | | $ 998,766 | 1,806,952 |
| International equities | 353,369 | | | 1,027,747 | 1,381,116 |
| Emerging market equities | 163,933 | | | 960,603 | 1,124,536 |
| Total Equity | 1,325,488 | | | 2,987,116 | 4,312,604 |
| Debt: | | | | | |
| US treasuries | 1,668,642 | $ 42,348 | | | 1,710,990 |
| Corporate bonds | 1,533 | 156,245 | | 99,581 | 257,359 |
| High yield | | | | 106 | 106 |
| Total Debt | 1,670,175 | 198,593 | | 99,687 | 1,968,455 |
| Split-interest agreements | 77,817 | | $ 320,976 | | 398,793 |
| Absolute return | | | | 3,176,304 | 3,176,304 |
| Real estate | | 59 | | 687,727 | 687,786 |
| Private equity | | | 8,473 | 3,182,297 | 3,190,770 |
| Natural resources | 262,132 | | | 727,529 | 989,661 |
| Derivative instruments | | 10,386 | | | 10,386 |
| Other | | | 2,532 | | 2,532 |
| Total assets | $ 4,332,202 | $ 209,038 | $ 331,981 | $ 10,860,660 | $ 15,733,881 |

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2017 |
|---|---|---|---|---|---|
| Short-term | $ 983,371 | | | | $ 983,371 |
| Equity: | | | | | |
| US equities | 772,121 | $ 31 | | $ 952,865 | 1,725,017 |
| International equities | 462,289 | | | 1,052,689 | 1,514,978 |
| Emerging market equities | 128,217 | | | 971,792 | 1,100,009 |
| Total Equity | 1,362,627 | 31 | | 2,977,346 | 4,340,004 |
| Debt: | | | | | |
| US treasuries | 1,292,532 | 44,756 | | | 1,337,288 |
| Corporate bonds | 1,615 | 159,760 | | 105,049 | 266,424 |
| High yield | | | | 142 | 142 |
| Total Debt | 1,294,147 | 204,516 | | 105,191 | 1,603,854 |
| Split-interest agreements | 74,469 | | $ 396,029 | | 470,498 |
| Absolute return | | | | 2,912,273 | 2,912,273 |
| Real estate | | 60 | | 696,563 | 696,623 |
| Private equity | | | 10,814 | 2,197,350 | 2,208,164 |
| Natural resources | 237,864 | 4,036 | | 514,778 | 756,678 |
| Derivative instruments | 2,399 | 251 | | | 2,650 |
| Other | | | 2,513 | | 2,513 |
| Total assets | $ 3,954,877 | $ 208,894 | $ 409,356 | $ 9,403,501 | $ 13,976,628 |

Included in Short-term investments is $158,105,000 and $19,440,000 of amounts held by trustees under indenture and escrow agreements at June 30, 2018 and 2017, respectively.

At June 30, 2018 and 2017, Short-term investments include $70,708,000 and $59,705,000, respectively, of outstanding receivables from trading activities. At June 30, 2018 and 2017, Short-term investments include $50,961,000 and $44,196,000, respectively, of outstanding payables from trading activities.

As of June 30, 2018 and 2017 there were no transfers between Level 1 and 2.

Liabilities related to equity short positions of $289,977,000 and $197,681,000 at June 30, 2018 and 2017, respectively, are reported in Accrued expenses and other liabilities on the Consolidated Statements of Financial Position. These liabilities are valued using observable market data and are categorized as Level 1 based on quoted market prices in active markets.

The University has made investments in various long-lived partnerships and, in other cases, has entered into contractual agreements that may limit its ability to initiate redemptions due to notice periods, lock-ups and gates. The University has also made commitments to various limited partnerships. The University expects these funds to be called over the next 5 years. The total amount of unfunded commitments is $3,214,634,000 which represents 25.9% of the AIF value as of June 30, 2018.

Details on the fair value, remaining estimated life, outstanding commitments, current redemption terms and restrictions by strategy and type of investment are provided below (in thousands):

| Strategy | Fair Value June 30, 2018 | Fair Value June 30, 2017 | Outstanding Commitments | Redemption Terms | Redemption Restrictions |
|---|---|---|---|---|---|
| Short-term | $ 996,590 | $ 983,371 | | Daily | None |
| Equity | | | | | |
| Managed accounts | 952,964 | 870,645 | | Daily, monthly, and semi-annually with varying notice periods | None |
| Mutual funds | 378,636 | 364,519 | | Daily | None |
| Private funds (1) | 2,981,004 | 3,104,840 | $ 140,950 | Weekly to annually with varying notice periods | Lock-up provisions ranging from 0 to 5 years; side pocket investments |
| Total Equity | 4,312,604 | 4,340,004 | 140,950 | | |
| Debt | | | | | |
| Managed accounts | 1,868,768 | 1,498,663 | | Daily | None |
| Private funds (1) | 99,687 | 105,191 | | Daily to annually with varying notice periods | None; side pocket investments |
| Total Debt | 1,968,455 | 1,603,854 | | | |
| Absolute return | 3,176,304 | 2,912,273 | 508,552 | Range from monthly to annually and 16 close-ended funds not available for redemption | Lock-up provisions ranging from 0 to 5 years with earlier redemptions subject to redemption fee; 16 close-ended funds not available for redemption, and side pocket investments |
| Real estate | 687,786 | 696,623 | 683,426 | Close-ended funds not available for redemption | Close-ended funds not available for redemption |
| Private equity | 3,190,770 | 2,208,164 | 1,732,395 | Close-ended funds not available for redemption | Close-ended funds not available for redemption |
| Natural resources | | | | | |
| Managed accounts | 222,670 | 202,763 | | Daily | None |
| Private funds (1) | 766,991 | 553,915 | 149,311 | Close-ended funds not available for redemption | Close-ended funds not available for redemption |
| Total Natural Resources | 989,661 | 756,678 | 149,311 | | |
| Totals | $ 15,322,170 | $ 13,500,967 | $ 3,214,634 | | |

(1) Private funds consist of close-ended and open-ended funds generally in the form of limited partnerships. Close-ended funds have varying remaining fund terms between 1 to 15 years.

Included in Level 1 split-interest agreement investments above are readily marketable assets invested by the University separately from the AIF where the University serves as trustee with an aggregate fair value of $77,817,000 and $74,469,000 at June 30, 2018 and 2017, respectively. Included in these amounts are assets related to the University Academic Component charitable gift annuities totaling $41,147,000 and $40,328,000 at June 30, 2018 and 2017, respectively. Level 3 split-interest agreement investments are managed and invested outside of the University by external trustees.

Invested in the AIF with an aggregate fair value of $167,480,000 and $155,291,000 at June 30, 2018 and 2017, respectively, is a perpetual trust managed by an external trustee who has delegated investment decisions to the University. The University invests the assets of this trust in accordance with its endowment policy.

Included in split-interest agreements are amounts held to meet legally mandated annuity reserves of $28,326,000 and $28,532,000 as of June 30, 2018 and 2017, respectively, as required by the laws of the following states where certain individual donors reside: California, New Jersey and New York.

A summary of Level 3 assets included in split-interest agreements, where the University is not trustee, measured at fair value, as of June 30, 2018 and 2017 is as follows (in thousands):

| | 2018 | 2017 |
|---|---|---|
| Charitable remainder trusts | $ 17,239 | $ 15,991 |
| Charitable lead trusts | 5,621 | 92,590 |
| Perpetual trusts | 298,116 | 287,448 |
| Total | $ 320,976 | $ 396,029 |

Changes to the reported amounts of split-interest agreements measured at fair value using unobservable (Level 3) inputs as of June 30, 2018 and 2017 are as follows (in thousands):

| | Charitable Remainder Trusts | Charitable Lead Trusts | Perpetual Trusts | Total |
|---|---|---|---|---|
| June 30, 2017 | $ 15,991 | $ 92,590 | $ 287,448 | $ 396,029 |
| Net realized gains | | | 2,346 | 2,346 |
| Net unrealized gains/(losses) | 670 | (4,110) | 8,322 | 4,882 |
| Acquisitions | 622 | | | 622 |
| Liquidations | (44) | (82,859) | | (82,903) |
| June 30, 2018 | $ 17,239 | $ 5,621 | $ 298,116 | $ 320,976 |

| | Charitable Remainder Trusts | Charitable Lead Trusts | Perpetual Trusts | Total |
|---|---|---|---|---|
| June 30, 2016 | $ 11,113 | $ 113,449 | $ 275,483 | $ 400,045 |
| Net realized gains | | | 516 | 516 |
| Net unrealized gains | 252 | 338 | 16,191 | 16,781 |
| Acquisitions | 4,626 | 1,340 | 2,229 | 8,195 |
| Liquidations | | (22,537) | (6,971) | (29,508) |
| June 30, 2017 | $ 15,991 | $ 92,590 | $ 287,448 | $ 396,029 |

The following tables set forth the fair value, related gains (losses) and notional amounts of the University's derivative instruments by contract type as of June 30, 2018 and 2017 (in thousands):

2018

| | Notional Amount | Gross Derivative Assets | Gross Derivative Liabilities | Derivative Losses |
|---|---|---|---|---|
| Foreign currency contracts | $ 126,869 | $ 302 | $ 6,276 | $ (29,513) |
| Futures contracts | (426,582) | 10,084 | | (56,526) |
| Options contracts | (11) | | 153 | |
| Total | $ (299,724) | $ 10,386 | $ 6,429 | $ (86,039) |

| | 2017 | | | |
|---|---|---|---|---|
| | Notional Amount | Gross Derivative Assets | Gross Derivative Liabilities | Derivative Losses |
| Foreign currency contracts | $ 299,533 | $ 251 | $ 7,976 | $ (5,459) |
| Futures contracts | (348,650) | 2,399 | | (62,062) |
| Total | $ (49,117) | $ 2,650 | $ 7,976 | $ (67,521) |

The notional amount is representative of the volume and activity of the respective derivative type during the years ended June 30, 2018 and 2017.

Gross derivatives assets and liabilities are shown in Investments, at fair value and Accrued expenses and other liabilities on the Consolidated Statements of Financial Position, respectively. Derivative gains (losses) are shown in Return on investments, net on the Consolidated Statements of Activities, in the appropriate net asset classification.

A summary of the University's total investment return, net of external and direct internal investment expenses, for the years ended June 30, 2018 and 2017 is presented below (in thousands):

| | 2018 | 2017 |
|---|---|---|
| AIF investment income | $ 100,290 | $ 80,745 |
| AIF realized and unrealized gains | 1,349,913 | 1,294,544 |
| Return on AIF | 1,450,203 | 1,375,289 |
| Other investment gains | 114,961 | 137,256 |
| Total Return on investments, net | $ 1,565,164 | $ 1,512,545 |

## 7. Endowment

The composition and changes to the amount of the University's endowment at June 30, 2018 are as follows (in thousands):

| | Unrestricted | Temporarily Restricted | Permanently Restricted | Total |
|---|---|---|---|---|
| Donor-restricted endowment funds | | $ 3,099,924 | $ 3,849,147 | $ 6,949,071 |
| Quasi-endowment funds | $ 6,828,370 | | | 6,828,370 |
| June 30, 2018 | $ 6,828,370 | $ 3,099,924 | $ 3,849,147 | $ 13,777,441 |

| | Quasi | Donor Restricted | | |
|---|---|---|---|---|
| | Unrestricted | Temporarily | Permanently | Total |
| Net assets, June 30, 2017 | $ 5,931,351 | $ 2,641,506 | $ 3,640,350 | $ 12,213,207 |
| Investment return: | | | | |
| Investment income, net of expenses | 48,729 | 57,911 | 109 | 106,749 |
| Gains, realized and unrealized | 719,502 | 674,044 | 12,677 | 1,406,223 |
| Total investment return | 768,231 | 731,955 | 12,786 | 1,512,972 |
| New gifts | 13,786 | 398 | 167,495 | 181,679 |
| Allocation of endowment assets for expenditure | (516,034) | | | (516,034) |
| Other investment allocation | (5,871) | | | (5,871) |
| Transfers to create board designated funds | 198,535 | | | 198,535 |
| Other transfers | (3,354) | (3,504) | 18,369 | 11,511 |
| PHCS membership substitution | 163,024 | 8,271 | 10,147 | 181,442 |
| Released from restriction | 278,702 | (278,702) | | |
| Net assets, June 30, 2018 | $ 6,828,370 | $ 3,099,924 | $ 3,849,147 | $ 13,777,441 |

The composition and changes to the amount of the University's endowment as of June 30, 2017 are as follows (in thousands):

| | Unrestricted | Temporarily Restricted | Permanently Restricted | Total |
|---|---|---|---|---|
| Donor-restricted endowment funds | | $ 2,641,506 | $ 3,640,350 | $ 6,281,856 |
| Quasi-endowment funds | $ 5,931,351 | | | 5,931,351 |
| June 30, 2017 | $ 5,931,351 | $ 2,641,506 | $ 3,640,350 | $ 12,213,207 |

| | Quasi | Donor Restricted | | |
|---|---|---|---|---|
| | Unrestricted | Temporarily | Permanently | Total |
| Net assets, June 30, 2016 | $ 5,161,319 | $ 2,143,305 | $ 3,410,740 | $ 10,715,364 |
| Investment return: | | | | |
| Investment income, net of expenses | 39,871 | 47,824 | 149 | 87,844 |
| Gains, realized and unrealized | 707,411 | 684,311 | 16,702 | 1,408,424 |
| Total investment return | 747,282 | 732,135 | 16,851 | 1,496,268 |
| New gifts | 11,623 | 29,980 | 201,970 | 243,573 |
| Allocation of endowment assets for expenditure | (485,860) | | | (485,860) |
| Other investment allocation | (6,559) | | | (6,559) |
| Transfers to create board designated funds | 245,471 | | | 245,471 |
| Other transfers | (8,141) | 2,302 | 10,789 | 4,950 |
| Released from restriction | 266,216 | (266,216) | | |
| Net assets, June 30, 2017 | $ 5,931,351 | $ 2,641,506 | $ 3,640,350 | $ 12,213,207 |

The fair value of certain permanently restricted endowment funds is less than the original donated value by $0 and $81,000 as of June 30, 2018 and 2017, respectively, and is reflected as a reduction of Temporarily restricted assets.

## 8. Property, Plant and Equipment, net

The components of PPE at June 30, 2018 and 2017 are as follows (in thousands):

| | Estimated Useful Life in years | 2018 | 2017 |
|---|---|---|---|
| Land and land improvements | N/A to 20 | $ 431,440 | $ 366,960 |
| Buildings and fixed equipment | 5 to 50 | 9,357,800 | 8,426,732 |
| Moveable equipment and other | 4 to 20 | 1,935,319 | 1,942,076 |
| Construction-in-progress | | 929,115 | 590,926 |
| | | 12,653,674 | 11,326,694 |
| Less: Accumulated depreciation | | (5,335,055) | (4,874,388) |
| Property, plant and equipment, net | | $ 7,318,619 | $ 6,452,306 |

The University recorded $507,890,000 and $470,716,000 of depreciation expense for the years ended June 30, 2018 and 2017, respectively.

The University capitalized $19,027,000 and $11,272,000 of interest costs for the years ended June 30, 2018 and 2017, respectively.

The University has conditional asset retirement obligations of $20,364,000 and $23,332,000 as of June 30, 2018 and 2017, respectively, which primarily relate to asbestos contained in buildings and underground steam distribution piping and are included within Accrued expenses and other liabilities in the Consolidated Statements of Financial Position.

## 9. Split-Interest Agreements

Changes in the value of assets, liabilities and net assets pursuant to split-interest agreements as of June 30, 2018 and 2017 are as follows (in thousands):

| 2018 | Assets | Liabilities | Net Assets |
|---|---|---|---|
| June 30, 2017 | $ 470,498 | $ (47,511) | $ 422,987 |
| New contributions | 3,682 | (3,770) | (88) |
| Investment income | 2,255 | (1,388) | 867 |
| Realized and unrealized gain, net | 10,920 | | 10,920 |
| Payments and settlements | (88,562) | 6,972 | (81,590) |
| Actuarial adjustment | | (1,268) | (1,268) |
| Net change | (71,705) | 546 | (71,159) |
| June 30, 2018 | $ 398,793 | $ (46,965) | $ 351,828 |

| 2017 | Assets | Liabilities | Net Assets |
|---|---|---|---|
| June 30, 2016 | $ 471,768 | $ (47,424) | $ 424,344 |
| New contributions | 9,647 | (2,403) | 7,244 |
| Investment income | 1,556 | (1,470) | 86 |
| Realized and unrealized gain, net | 22,672 | | 22,672 |
| Payments and settlements | (35,145) | 7,081 | (28,064) |
| Actuarial adjustment | | (3,295) | (3,295) |
| Net change | (1,270) | (87) | (1,357) |
| June 30, 2017 | $ 470,498 | $ (47,511) | $ 422,987 |

## 10. Contingencies, Guarantees and Commitments

The University offers various loan programs for students and families to pay tuition, fees and other costs. Certain loans issued by private lending institutions are guaranteed by the University totaling $37,613,000 and $49,410,000 at June 30, 2018 and 2017, respectively. Upon default by the borrower, the University is required to pay all or a portion of the outstanding loan balance. The University recognizes a liability for the greater of the fair value of the guarantee or defaults in the portfolio of guaranteed loans. The recognized liability is $3,299,000 and $3,666,000 at June 30, 2018 and 2017, respectively and reflects the fair value of the guarantee on these outstanding loan balances.

Various lawsuits, claims and other contingent liabilities arise in the ordinary course of the University's education and health care activities. Based upon information currently available, management believes that any liability resulting therefrom will not materially affect the financial position or operations of the University.

The University is currently involved in various projects that have resulted in capital and property acquisition commitments from the University. As of June 30, 2018, approximately $419,016,000 has been committed by the University.

## 11. Pension and Other Postretirement Benefit Costs

Retirement benefits are principally provided to employees through contributory defined contribution plans. The Academic Component's policy with respect to its contribution is to provide up to 9% of eligible employees' salaries, while the UPHS contribution can be up to 6.5%. The University's contributions to these plans amounted to $194,597,000 and $176,023,000 as of June 30, 2018 and 2017, respectively.

The University also has non-contributory defined benefit pension plans. Benefits under the plans generally are based on the employee's years of service and compensation during the years preceding retirement. Contributions to the plans are made in amounts necessary to at least satisfy the minimum required contributions as specified in the Internal Revenue Service Code and related regulations. The Academic Component's plan was frozen to new full-time entrants effective July 1, 2000 and part-time entrants effective July 1, 2018. UPHS' primary plan was frozen to new entrants effective July 1, 2010; the benefit accruals for all participants of the LGH and PHCS plans were frozen effective June 30, 2013 and December 31, 2011, respectively.

During the year ended June 30, 2018, certain terminated vested participants in the UPHS and LGH defined benefits plans were fully paid out their pension benefits as part of a one-time vested termination cashout offering (VTCO). The PBO and ABO as of June 30, 2018 reflect the pay-out of benefits for these participants. The total lump sum payments from the VTCO were $156,928,000.

Additionally, the University provides certain healthcare and life insurance benefits (OPEB) for retired employees. Only a limited number of employees may become eligible for such benefits if they reach retirement age while working for the University. These and similar benefits for active and certain retired employees are provided through insurance contracts.

The University uses a measurement date of June 30 for its defined benefit pension and OPEB plans.

### Change in Plan Assets/ Obligation and Funded Status

The funded status of the plans is measured as the difference between the plan assets at fair value and the projected benefit obligation (PBO) for Pension Benefits or accumulated postretirement benefit obligation (APBO) for Other Postretirement Benefits. The resulting net liability is recorded in Accrued retirement benefits on the Statements of Financial Position. The following shows changes in the benefit obligation, plan assets and funded status (in thousands):

| 2018 | Pension Benefits | Other Postretirement Benefits | Total |
|---|---|---|---|
| **Change in Plan Assets** | | | |
| Fair value of plan assets, beginning of year | $ 2,371,317 | $ 444,723 | $ 2,816,040 |
| University contributions | 109,568 | 35,614 | 145,182 |
| Plan participants' contributions | 158 | 7,873 | 8,031 |
| Actual return on plan assets | 216,840 | 51,673 | 268,513 |
| Acquisition | 139,791 | | 139,791 |
| Benefits paid | (246,876) | (34,543) | (281,419) |
| Fair value of plan assets, end of year | $ 2,590,798 | $ 505,340 | $ 3,096,138 |

| Change in Benefit Obligation | | | | | | |
|---|---|---|---|---|---|---|
| Benefit obligation, beginning of year (PBO/APBO) | $ | 3,262,668 | $ | 913,685 | $ | 4,176,353 |
| Service cost | | 70,041 | | 30,240 | | 100,281 |
| Interest cost | | 137,472 | | 36,044 | | 173,516 |
| Plan participants' contributions | | 158 | | 7,873 | | 8,031 |
| Acquisition | | 167,552 | | | | 167,552 |
| Net actuarial (gain)/loss | | (71,366) | | (36,932) | | (108,298) |
| Benefits paid | | (246,876) | | (34,543) | | (281,419) |
| Benefit obligation, end of year (PBO/APBO) | $ | 3,319,649 | $ | 916,367 | $ | 4,236,016 |
| | | | | | | |
| Funded status, end of year | $ | 728,851 | $ | 411,027 | $ | 1,139,878 |
| Other retirement programs | | | | | | 101,429 |
| Accrued retirement benefits | | | | | $ | 1,241,307 |

| 2017 | | Pension Benefits | | Other Postretirement Benefits | | Total |
|---|---|---|---|---|---|---|
| **Change in Plan Assets** | | | | | | |
| Fair value of plan assets, beginning of year | $ | 2,082,315 | $ | 379,925 | $ | 2,462,240 |
| University contributions | | 128,454 | | 34,699 | | 163,153 |
| Plan participants' contributions | | 160 | | 7,293 | | 7,453 |
| Actual return on plan assets | | 239,431 | | 52,154 | | 291,585 |
| Benefits paid | | (79,043) | | (29,348) | | (108,391) |
| Fair value of plan assets, end of year | $ | 2,371,317 | $ | 444,723 | $ | 2,816,040 |
| | | | | | | |
| **Change in Benefit Obligation** | | | | | | |
| Benefit obligation, beginning of year (PBO/APBO) | $ | 3,165,114 | $ | 920,401 | $ | 4,085,515 |
| Service cost | | 75,092 | | 32,454 | | 107,546 |
| Interest cost | | 130,172 | | 35,796 | | 165,968 |
| Plan participants' contributions | | 160 | | 7,293 | | 7,453 |
| Plan amendments | | | | (1,749) | | (1,749) |
| Transfers | | | | (3,285) | | (3,285) |
| Net actuarial (gain)/loss | | (28,827) | | (47,877) | | (76,704) |
| Benefits paid | | (79,043) | | (29,348) | | (108,391) |
| Benefit obligation, end of year (PBO/APBO) | $ | 3,262,668 | $ | 913,685 | $ | 4,176,353 |
| | | | | | | |
| Funded status, end of year | $ | 891,351 | $ | 468,962 | $ | 1,360,313 |
| Other retirement programs | | | | | | 88,105 |
| Accrued retirement benefits | | | | | $ | 1,448,418 |

The Accumulated Benefit Obligation for the Pension Benefits was $2,975,984,000 and $2,925,489,000 at June 30, 2018 and 2017, respectively.

### Net Periodic Benefit Cost

The components of net periodic benefit cost for pension benefits and other postretirement benefits are as follows (in thousands):

| 2018 | | Pension Benefits | | Other Postretirement Benefits | | Total |
|---|---|---|---|---|---|---|
| **Net Periodic Cost** | | | | | | |
| Service cost | $ | 70,041 | $ | 30,240 | $ | 100,281 |
| Interest cost | | 137,472 | | 36,044 | | 173,516 |
| Expected return on plan assets | | (176,009) | | (32,726) | | (208,735) |
| Amortization of: | | | | | | |
| Net prior service cost | | | | (323) | | (323) |
| Net losses | | 40,827 | | 5,971 | | 46,798 |
| Net periodic benefit cost | $ | 72,331 | $ | 39,206 | $ | 111,537 |

| 2017 | | Pension Benefits | | Other Postretirement Benefits | | Total |
|---|---|---|---|---|---|---|
| **Net Periodic Cost** | | | | | | |
| Service cost | $ | 75,092 | $ | 32,454 | $ | 107,546 |
| Interest cost | | 130,172 | | 35,796 | | 165,968 |
| Expected return on plan assets | | (156,124) | | (28,674) | | (184,798) |
| Amortization of: | | | | | | |
| Net prior service cost | | | | (121) | | (121) |
| Net losses | | 53,220 | | 11,529 | | 64,749 |
| Net periodic benefit cost | $ | 102,360 | $ | 50,984 | $ | 153,344 |

### Unrestricted Net Assets

The University recorded the following year-end valuation adjustments to its Pension and Other Postretirement Benefit Plans in Pension, OPEB and Other, net in the Consolidated Statements of Activities (in thousands):

| 2018 | | Pension Benefits | | Other Postretirement Benefits | | Total |
|---|---|---|---|---|---|---|
| **Unrestricted Net Assets** | | | | | | |
| Net actuarial loss | $ | 585,806 | $ | 115,078 | $ | 700,884 |
| Net prior service cost/(credit) | | | | (3,146) | | (3,146) |
| Total | $ | 585,806 | $ | 111,932 | $ | 697,738 |
| Adjustment to unrestricted net assets (gain)/loss | $ | (153,023) | $ | (61,924) | $ | (214,947) |

| 2017 | | Pension Benefits | | Other Postretirement Benefits | | Total |
|---|---|---|---|---|---|---|
| **Unrestricted Net Assets** | | | | | | |
| Net actuarial loss | $ | 738,829 | $ | 177,325 | $ | 916,154 |
| Net prior service cost/(credit) | | | | (3,469) | | (3,469) |
| Total | $ | 738,829 | $ | 173,856 | $ | 912,685 |
| Adjustment to unrestricted net assets (gain)/loss | $ | (165,352) | $ | (84,517) | $ | (249,869) |

The estimated amount that will be amortized from Unrestricted Net Assets into net periodic benefit cost in 2019 is as follows (in thousands):

| | Pension Benefits | Other Postretirement Benefits |
|---|---|---|
| Amortization of prior service credit | | $ (387) |
| Amortization of net losses | $ 30,984 | 2,461 |

## Actuarial Assumptions

The expected long-term rate of return on plan assets is management's best estimate of the average investment return expected to be received on the assets invested in the plan over the benefit period. The expected long-term rate of return on plan assets has been established by considering historical and future expected returns of the asset classes invested in by the pension trust, and the allocation strategy currently in place among those classes.

| | Pension Benefits | | Other Postretirement Benefits | |
|---|---|---|---|---|
| Weighted-Average Assumptions Used to Determine Benefit Obligations at Year End | 2018 | 2017 | 2018 | 2017 |
| Discount rate | 4.28% | 4.19% | 4.29% | 4.00% |
| Salary increase | 3.03% | 2.91% | N/A | N/A |
| Weighted-Average Assumptions Used to Determine Net Periodic Benefit Cost | | | | |
| Discount rate | 4.24% | 4.23% | 4.00% | 3.95% |
| Expected long-term return on plan assets | 7.46% | 7.52% | 7.50% | 7.50% |
| Salary increase | 3.99% | 3.82% | N/A | N/A |
| Assumed Health Care Cost Trend Rates | | | | |
| Initial trend rate | N/A | N/A | 6.54% | 6.54% |
| Ultimate trend rate | N/A | N/A | 4.71% | 4.70% |
| Fiscal year end that ultimate trend rate is reached | N/A | N/A | 2037 | 2037 |

Assumed health care cost trend rates have a significant effect on the amounts reported for the Other postretirement benefits. A one-percentage-point change in assumed health care trend rates would have the following effects on Other postretirement benefits (in thousands):

| | 1-Percentage Point Increase | 1-Percentage Point Decrease |
|---|---|---|
| 2018 | | |
| Effect on total of service and interest cost | $ 14,876 | $ (11,261) |
| Effect on APBO | 166,322 | (130,445) |

## Expected Contributions

The University expects to contribute $86,865,000 and $34,187,000 for pension benefits and other postretirement benefits, respectively, during the fiscal year ending June 30, 2019.

Expected Benefits Payments (in thousands):

| Expected benefit payments for the year ending: | Pension Benefits | Other Postretirement Benefits before Medicare Part D Subsidy | Impact of Medicare Part D Subsidy |
|---|---|---|---|
| June 30, 2019 | $ 115,183 | $ 27,709 | $ 162 |
| June 30, 2020 | 119,320 | 29,825 | 169 |
| June 30, 2021 | 126,793 | 32,068 | 174 |
| June 30, 2022 | 134,903 | 34,241 | 180 |
| June 30, 2023 | 142,867 | 36,175 | 184 |
| June 30, 2024 to June 30, 2028 | 847,669 | 212,314 | 973 |

Plan Assets and Allocations

The principal investment objectives for the pension and other postretirement benefits plans are to ensure the availability of funds to pay pension benefits as they become due under a broad range of future economic scenarios, to maximize long-term investment returns with an acceptable level of risk based on the pension obligations, and to invest the pension trust in a diversified manner.

The University's Office of Investments is responsible for the day-to-day management of the majority of the investments of the pension and other postretirement benefits. The investments are made in accordance with policies set out by the Investment Board which has been appointed by the Trustees. The pension and other postretirement benefit investments are similar in nature to those investments discussed in Notes 1 and 6 – Investments, at Fair Value. However, the actual allocations to specific investments within each asset class may vary due to certain restrictions imposed by investment managers and ERISA regulations.

A summary of plan assets, measured at fair value, as of June 30, 2018 and 2017, is as follows (in thousands):

Pension Benefits:

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2018 |
|---|---|---|---|---|---|
| Short-term | $ 63,769 | | | | $ 63,769 |
| Equity: | | | | | |
| US equities | 307,663 | $ 328 | | $ 150,046 | 458,037 |
| International equities | 142,875 | | | 250,654 | 393,529 |
| Emerging market equities | 6,395 | | | 141,825 | 148,220 |
| Debt: | | | | | |
| US treasuries | 288,406 | 8,400 | | | 296,806 |
| Corporate bonds | 36,829 | 79,764 | | 154,097 | 270,690 |
| Absolute return | 13,335 | | | 520,465 | 533,800 |
| Real estate | | | | 45,198 | 45,198 |
| Private equity | 3,868 | | | 179,116 | 182,984 |
| Natural resources | 105,564 | 1,210 | | 91,116 | 197,890 |
| Derivative instruments: | | | | | |
| Forward currency contracts | | 65 | | | 65 |
| Total assets | $ 968,704 | $ 89,767 | $ - | $ 1,532,517 | $ 2,590,988 |

| Liabilities | Level 1 | Level 2 | Level 3 | Investments at NAV | 2018 |
|---|---|---|---|---|---|
| Derivative instruments | | $ 190 | | | $ 190 |
| Total liabilities | $ - | $ 190 | $ - | $ - | $ 190 |

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2017 |
|---|---|---|---|---|---|
| Short-term | $ 121,646 | | | | $ 121,646 |
| Equity: | | | | | |
| US equities | 284,518 | | | $ 178,754 | 463,272 |
| International equities | 125,750 | | | 239,604 | 365,354 |
| Emerging market equities | 45,327 | | | 132,157 | 177,484 |
| Debt: | | | | | |
| US treasuries | 241,530 | $ 8,577 | | | 250,107 |
| Corporate bonds | | 67,783 | | 154,745 | 222,528 |
| Absolute return | | | | 457,776 | 457,776 |
| Real estate | | | | 43,298 | 43,298 |
| Private equity | | | | 97,601 | 97,601 |
| Natural resources | 92,926 | 1,353 | | 77,935 | 172,214 |
| Derivative instruments: | | | | | |
| Forward currency contracts | | 68 | | | 68 |
| Total assets | $ 911,697 | $ 77,781 | $ - | $ 1,381,870 | $ 2,371,348 |

| Liabilities | Level 1 | Level 2 | Level 3 | Investments at NAV | 2017 |
|---|---|---|---|---|---|
| Derivative instruments | | $ 31 | | | $ 31 |
| Total liabilities | $ - | $ 31 | $ - | $ - | $ 31 |

Other Postretirement Benefits:

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2018 |
|---|---|---|---|---|---|
| Short-term | $ 26,269 | | | | $ 26,269 |
| Equity: | | | | | |
| US equities | 6,123 | | | $ 57,429 | 63,552 |
| International equities | 6,878 | | | 83,354 | 90,232 |
| Emerging market equities | 3,240 | | | 40,349 | 43,589 |
| Debt: | | | | | |
| US treasuries | 25,351 | | | | 25,351 |
| Corporate bonds | | $ 282 | | 10,165 | 10,447 |
| Absolute return | | | | 154,140 | 154,140 |
| Real estate | | | | 14,337 | 14,337 |
| Private equity | | | | 34,457 | 34,457 |
| Natural resources | 34,928 | 526 | | 7,535 | 42,989 |
| Derivative instruments: | | | | | |
| Forward currency contracts | | 34 | | | 34 |
| Total | $ 102,789 | $ 842 | $ - | $ 401,766 | $ 505,397 |

| Liabilities | Level 1 | Level 2 | Level 3 | Investments at NAV | 2018 |
|---|---|---|---|---|---|
| Derivative instruments | | $ 57 | | | $ 57 |
| Total | $ - | $ 57 | $ - | $ - | $ 57 |

| Assets | Level 1 | Level 2 | Level 3 | Investments at NAV | 2017 |
|---|---|---|---|---|---|
| Short-term | $ 36,651 | | | | $ 36,651 |
| Equity: | | | | | |
| US equities | 15,751 | | | $ 57,364 | 73,115 |
| International equities | 7,189 | | | 76,747 | 83,936 |
| Emerging market equities | 13,647 | | | 32,985 | 46,632 |
| Debt: | | | | | |
| US treasuries | 18,977 | | | | 18,977 |
| Corporate bonds | | $ 372 | | 10,071 | 10,443 |
| Absolute return | | | | 114,904 | 114,904 |
| Real estate | | | | 8,732 | 8,732 |
| Private equity | | | | 16,853 | 16,853 |
| Natural resources | 29,617 | 587 | | 4,263 | 34,467 |
| Derivative instruments: | | | | | |
| Forward currency contracts | | 24 | | | 24 |
| Total | $ 121,832 | $ 983 | $ - | $ 321,919 | $ 444,734 |

| Liabilities | Level 1 | Level 2 | Level 3 | Investments at NAV | 2017 |
|---|---|---|---|---|---|
| Derivative instruments | | $ 11 | | | $ 11 |
| Total | $ - | $ 11 | $ - | $ - | $ 11 |

As of June 30, 2018, the University has unfunded commitments to limited partnerships totaling $369,938,000, which are expected to be called over the next 5 years.

Transfers between leveled assets are based on the actual date of the event which caused the transfer. As of June 30, 2018 and 2017 there were no transfers between Level 1 and 2.

| 2018 | Pension Benefits | | Other Postretirement Benefits | |
|---|---|---|---|---|
| Allocation of Plan Assets | Target | Actual | Target | Actual |
| Short-term | 0.0% | 2.5% | 0.0% | 5.2% |
| Equity: | | | | |
| US equities | 16.6% | 17.7% | 13.0% | 12.6% |
| International equities | 14.9% | 15.2% | 19.0% | 17.9% |
| Emerging markets equities | 6.8% | 5.7% | 10.0% | 8.6% |
| Debt: | | | | |
| US treasuries | 22.9% | 11.5% | 10.0% | 5.0% |
| Corporate bonds | 1.4% | 10.4% | 0.0% | 2.1% |
| Absolute return | 21.2% | 20.6% | 29.0% | 30.5% |
| Real estate | 2.1% | 1.7% | 3.0% | 2.8% |
| Private equity | 5.8% | 7.1% | 5.0% | 6.8% |
| Natural resources | 8.3% | 7.6% | 11.0% | 8.5% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |

## 12. Debt Obligations

Debt obligations at June 30, 2018 and 2017 are as follows (in thousands):

| | Final Maturity | Effective Interest Rate at June 30, 2018 | 2018 | 2017 |
|---|---|---|---|---|
| Academic Component: | | | | |
| Fixed rate debt obligations: | | | | |
| The Trustees of the University of Pennsylvania | | | | |
| Series 2012 Taxable Bonds | 09/2112 | 4.67% | $ 300,000 | $ 300,000 |
| Pennsylvania Higher Educational Facilities Authority (PHEFA) | | | | |
| Series A of 2017 revenue bonds | 08/2046 | 2.26% - 3.72% | 178,395 | 178,395 |
| Series A of 2016 revenue bonds | 08/2041 | 0.78% - 2.93% | 168,565 | 169,635 |
| Series A of 2015 revenue bonds | 10/2045 | 0.95% - 2.99% | 196,110 | 200,985 |
| Series B of 2015 revenue bonds | 10/2038 | 0.95% - 3.38% | 162,395 | 163,795 |
| Series C of 2015 revenue bonds | 10/2035 | 3.68% | 8,020 | 8,020 |
| Series A of 2011 revenue bonds | 09/2021 | 2.92% - 3.68% | 11,125 | 11,125 |
| Series of 2010 revenue bonds | 09/2033 | 3.99% - 4.15% | 16,935 | 16,935 |
| Series B of 2009 revenue bonds | 09/2020 | 3.51% - 3.99% | 6,545 | 8,570 |
| Series C of 2009 revenue bonds | 09/2019 | 3.51% - 3.70% | 7,970 | 11,635 |
| Other loans | 05/2031 | 1.00% - 4.91% | 12,663 | 914 |
| Variable rate debt obligations: | | | | |
| PHEFA Series of 1990 revenue bonds | 12/2020 | 1.73% | 6,500 | 6,500 |
| Washington County Authority Series of 2004 | 07/2034 | 1.00% | 53,400 | 53,400 |
| Total Academic Component outstanding bonds payable | | | 1,128,623 | 1,129,909 |
| Unamortized issuance costs, premiums and discounts, net | | | 73,032 | 78,304 |
| Total Academic Component debt obligations | | | $ 1,201,655 | $ 1,208,213 |
| UPHS: | | | | |
| Fixed rate debt obligations: | | | | |
| Lancaster County Hospital Authority (LCHA) | | | | |
| Series A of 2016 revenue bonds | 08/2042 | 0.84% - 3.25% | $ 164,540 | $ 168,585 |
| Series B of 2016 revenue bonds | 08/2046 | 1.43% - 3.22% | 128,050 | 128,050 |
| PHEFA | | | | |
| Series A of 2017 revenue bonds | 08/2047 | 2.60% - 3.68% | 400,000 | |
| Series C of 2016 revenue bonds | 08/2041 | 0.62% - 3.08% | 129,015 | 129,290 |
| Series A of 2015 revenue bonds | 08/2045 | 1.10% - 4.00% | 300,445 | 324,855 |
| Series A of 2012 revenue bonds | 08/2042 | 1.66% - 4.08% | 136,950 | 136,950 |
| Series A of 2009 revenue bonds | 08/2021 | 4.20% - 4.91% | 33,005 | 43,110 |
| Series B of 2008 revenue bonds | 08/2037 | 5.65% - 6.00% | 52,000 | 52,000 |
| New Jersey Health Care Facilities Financing Authority (NJHCFFA) | | | | |
| Princeton Healthcare System Series A of 2016 | 07/2045 | 1.51% - 4.08% | 183,440 | |
| University of Pennsylvania Health System Taxable Note | 08/2047 | 4.08% | 200,000 | |
| Lancaster General Hospital 2015 Taxable Note | 08/2022 | 2.66% | 72,805 | 75,211 |
| Build to suit lease, net of related interest | Various | N/A | 122,860 | 123,013 |
| Mortgages, notes and capital leases | Various | Various | 25,986 | 23,443 |
| Variable rate debt obligations: | | | | |
| NJHCFFA Princeton Healthcare System Series B of 2016 | 07/2045 | 1.05% - 1.18% | 65,000 | |
| NJHCFFA Princeton Healthcare System Series C of 2016 | 07/2045 | 1.24% - 1.37% | 20,000 | |
| LCHA Series A of 2012 revenue bonds | 08/2041 | 1.58% | 22,775 | 23,375 |
| PHEFA Series A of 2014 revenue bonds | 08/2045 | 0.89% | 100,000 | 100,000 |
| PHEFA Series A of 2008 revenue bonds | 08/2037 | 1.51% | 69,995 | 69,995 |
| Total UPHS outstanding bonds payable | | | 2,226,866 | 1,397,877 |
| Unamortized issuance costs, premiums and discounts, net | | | 145,671 | 96,860 |
| Total UPHS debt obligations | | | 2,372,537 | 1,494,737 |
| Total University debt obligations | | | $ 3,574,192 | $ 2,702,950 |

Contractual maturities of debt obligations and build-to-suit lease payments are as follows (in thousands):

| | Academic Component | UPHS | | | University |
|---|---|---|---|---|---|
| Fiscal Year | Bond and Other Loan Obligations | Bond and Other Loan Obligations | Build-to-Suit Lease Payments | Total | Total |
| 2019 | $ 31,348 | $ 97,633 | $ 10,742 | $ 108,375 | $ 139,723 |
| 2020 | 16,540 | 47,619 | 10,992 | 58,611 | 75,151 |
| 2021 | 27,490 | 49,708 | 11,249 | 60,957 | 88,447 |
| 2022 | 18,356 | 57,225 | 11,512 | 68,737 | 87,093 |
| 2023 | 21,907 | 113,316 | 11,781 | 125,097 | 147,004 |
| Thereafter | 1,012,982 | 1,738,505 | 145,633 | 1,884,138 | 2,897,120 |
| Total Principal | 1,128,623 | 2,104,006 | 201,909 | 2,305,915 | 3,434,538 |
| Unamortized issuance costs, premiums and discounts, net | 73,032 | 145,671 | | 145,671 | 218,703 |
| Build-to-suit lease related interest | | | (79,049) | (79,049) | (79,049) |
| Total debt obligation | $ 1,201,655 | $ 2,249,677 | $ 122,860 (a) | $ 2,372,537 | $ 3,574,192 |

(a) Present value of future lease payments

The University has letters of credit with various financial institutions to secure certain self-insured liabilities in the amount of $10,556,000 and $8,081,000 at June 30, 2018 and 2017, respectively. These letters of credit have evergreen provisions for automatic renewal. There have been no draws under these letters of credit.

## Academic Component

On January 19, 2017, Pennsylvania Higher Educational Facilities Authority (PHEFA) issued Series A of 2017 revenue bonds (PHEFA 2017A bonds) with an aggregate principal amount of $178,395,000. The proceeds were used to fund or reimburse the University for the cost of various capital projects. Interest on the PHEFA 2017A bonds is fixed with coupons ranging between 4.00% to 5.00%.

The University has variable rate debt in the amount of $59,900,000 which is subject to optional tender by the holders upon seven days' notice. These bonds are reflected in the table above based on original scheduled maturities. In the event that the University receives notice of any optional tender on its variable rate demand bonds, the purchase price will be repaid from the remarketing of the bonds. However, in the event that the entire remarketing effort were to fail, the University would have the general obligation to purchase the bonds.

On June 14, 2016, the University entered into a five year agreement with a financial institution, whereby the institution has agreed to provide a line of credit in the amount of $100,000,000 for general purposes of the University. The University pays a fee annually on the unused amount of the line of credit. As of June 30, 2018, there have been no draws under the agreement.

## UPHS

The PHEFA Revenue Bonds, Lancaster County Hospital Authority (LCHA) Revenue Bonds and New Jersey Health Care Facilities Financing Authority (NJHCFFA) Revenue Bonds are secured by master notes issued under the UPHS Master Trust Indenture (MTI). The MTI and related agreements contain certain restrictive covenants which limit the issuance of additional indebtedness, and among other things, require UPHS to meet an annual debt service coverage requirement of "income available for debt service" (excess of revenue over expenses plus depreciation, amortization, interest expense and extraordinary items) at an amount equal to 110% of the annual debt service requirements. If the coverage requirement for a particular year is not met, within six months of the close of that fiscal year, UPHS must retain the services of a consultant to make recommendations to improve the coverage requirement. UPHS must also implement the recommendations of the consultant to the extent that they can be feasibly implemented. UPHS will not be considered to be in default of the provisions of the MTI so long as UPHS has sufficient cash flow to pay total operating expenses and debt service for the fiscal year. In both 2018 and 2017, UPHS met its debt service coverage requirement under the MTI. Additionally, UPHS has pledged its gross revenues to secure its obligation under the MTI.

The NJHCFFA PHCS Series A, B and C of 2016 were issued on January 20, 2016 for the purpose of refinancing a majority of the outstanding PHCS debt through bond issuance and direct placement obligations.

On December 13, 2017, PHEFA issued Series A of 2017 Health System revenue bonds (PHEFA UPHS 2017A bonds) with an aggregate principal amount of $400,000,000. Proceeds of $171,600,000 were used to fund or reimburse the Health System for the cost of various capital projects. The remaining proceeds of $269,200,000, including the issuance premium, were deposited in a capital project fund held by trustee to be drawn upon for future capital expenditures. This portion of the financing is reflected as a noncash transaction in the Statement of Cash Flows. Future reimbursements from the capital project fund will be accounted for as a cash inflow from investing activities in the Statement of Cash Flows. Interest on the PHEFA UPHS 2017A bonds is fixed with coupons ranging between 3.125% to 5.00%.

On December 13, 2017, The Trustees of the University of Pennsylvania issued 4.008% Taxable Health System Bonds. (UPHS Taxable 2017 bonds) with an aggregate principal amount of $200,000,000. The proceeds were used to fund or reimburse the Health System for the cost of various capital projects. Interest on the PHEFA UPHS 2017A bonds is fixed with coupon of 4.008%.

On August 25, 2016, PHEFA issued Series C of 2016 Health System refunding revenue bonds (PHEFA UPHS 2016C bonds) with an aggregate principal amount of $129,290,000. The proceeds were used to fund an escrow which will be used to refund $123,400,000 from PHEFA UPHS Series A of 2011 bonds. The refunded PHEFA UPHS Series A of 2011 bonds were legally defeased, and as such, are no longer included among UPHS's reported liabilities. Interest on the PHEFA UPHS 2016C bonds is fixed with coupons ranging between 2.00% to 5.00%.

As a result of the legal defeasance of debt associated with the issuance of PHEFA UPHS 2016C bonds, UPHS reported a loss on early extinguishment of debt in Pension, OPEB and other, net on the Consolidated Statements of Activities in the amount of $27,947,000 for the year ended June 30, 2017.

UPHS has variable rate debt in the amount of $69,995,000 which is subject to optional tender by the holders upon seven days' notice. These bonds are reflected in the debt obligations maturity table above based on original scheduled maturities. In the event that UPHS receives notice of any optional tender on its variable rate demand bonds, the purchase price will be repaid from the remarketing of the bonds. However, in the event that the entire remarketing effort were to fail, UPHS has in place a renewable direct pay letter of credit issued by Bank of America with an expiration date of April 15, 2023. In the event that the letter of credit cannot be drawn upon, UPHS would have the general obligation to purchase the bonds.

On April 13, 2016, UPHS entered into a three year agreement with a financial institution, whereby the institution has agreed to provide a line of credit in the amount of $100,000,000 for general purposes of UPHS. UPHS pays a fee annually on the unused amount of the line of credit. As of June 30, 2018, there have been no draws under the agreement.

### Interest Rate Swap Agreements

The University enters into interest rate swap agreements to synthetically modify the interest rate terms of its long term debt portfolio. These agreements are not entered into for trading or speculative purposes. Fair value of these agreements is determined by obtaining quotes from Goldman Sachs Mitsui Marine Derivative Products, L.P. (GSMMDP) and Merrill Lynch, respectively, which are based on the income approach, using observable market data to discount future net payment streams and accordingly considers this to be a Level 2 measurement. The quotes provided also represent the amount the University would accept or be required to pay to transfer the agreement to GSMMDP and Merrill Lynch, respectively, or exit price as defined by the Fair Value Measurements standard. The University also takes into account the risk of nonperformance. On January 1, 2018 UPHS exercised its option to terminate early the $69,995,000 notional value swap resulting in a market value adjustment gain of $164,000.

The following table summarizes the terms of the University's remaining interest rate swap agreements (in thousands):

| | Academic Component | UPHS | | |
|---|---|---|---|---|
| Notional Amounts | $ 101,950 | $ 22,775 | $ 21,395 | $ 21,395 |
| Trade Date | 11/6/2007 | 7/28/2006 | 7/15/2009 | 1/7/2010 |
| Maturity Date | 7/1/2034 | 7/1/2041 | 8/15/2023 | 8/15/2023 |
| Rates: | | | | |
| Receive | 67% of 1-Month LIBOR | 70% of 1-month LIBOR | 3.184% | 2.902% |
| Pay | 3.573% | 3.980% | SIFMA index | SIFMA index |

The following tables summarize the fair value of the interest rate swap agreements, not designated as hedging instruments, as of June 30, 2018 and 2017, and the related gains/(losses) on the interest rate swap agreements, both realized and unrealized, for the years ended June 30, 2018 and 2017 (in thousands):

| Consolidated Statements of Position | Line Item | 2018 | 2017 |
|---|---|---|---|
| Asset interest rate swaps | | | |
| UPHS | Other assets | $ 1,292 | $ 2,635 |
| Total Asset interest rate swaps | | $ 1,292 | $ 2,635 |
| Liability interest rate swaps | | | |
| Academic Component | Accrued expenses and other liabilities | $ 15,922 | $ 21,929 |
| UPHS | Accrued expenses and other liabilities | 4,799 | 7,524 |
| Total Liability interest rate swaps | | $ 20,721 | $ 29,453 |

| Consolidated Statements of Activities | Line Item | 2018 | 2017 |
|---|---|---|---|
| Academic Component | Return on investments, net | $ 3,175 | $ 6,424 |
| UPHS | Return on investments, net | (323) | (767) |
| Total | | $ 2,852 | $ 5,657 |

## 13. Net Assets

The major components of net assets at June 30, 2018 and 2017 are as follows (in thousands):

| 2018 | Unrestricted | Temporarily restricted | Permanently restricted | Total |
|---|---|---|---|---|
| General operating | $ 4,259,171 | $ 306,506 | | $ 4,565,677 |
| Sponsored programs | 57,502 | | | 57,502 |
| Capital | | 118,493 | | 118,493 |
| Student loans | 7,949 | | | 7,949 |
| Planned giving agreements | | 29,312 | $ 17,592 | 46,904 |
| Endowment | 6,828,370 | 3,099,924 | 3,849,147 | 13,777,441 |
| Total | $ 11,152,992 | $ 3,554,235 | $ 3,866,739 | $ 18,573,966 |

| 2017 | Unrestricted | Temporarily restricted | Permanently restricted | Total |
|---|---|---|---|---|
| General operating | $ 3,482,264 | $ 267,246 | | $ 3,749,510 |
| Sponsored programs | 42,749 | | | 42,749 |
| Capital | | 84,411 | | 84,411 |
| Student loans | 10,174 | 1,291 | $ 17,152 | 28,617 |
| Planned giving agreements | | 113,599 | 15,340 | 128,939 |
| Endowment | 5,931,351 | 2,641,506 | 3,640,350 | 12,213,207 |
| Total | $ 9,466,538 | $ 3,108,053 | $ 3,672,842 | $ 16,247,433 |

## 14. Operating Leases

The University leases research labs, office space and equipment under operating leases expiring through December 2043. Rental expense for the years ended June 30, 2018 and 2017 totaling $114,060,000 and $99,417,000, respectively, is included in the accompanying Consolidated Statements of Activities.

At June 30, 2018, future minimum lease payments under existing operating leases were as follows (in thousands):

| | |
|---|---|
| 2019 | $ 97,936 |
| 2020 | 82,488 |
| 2021 | 74,077 |
| 2022 | 63,582 |
| 2023 | 52,951 |
| Thereafter | 338,454 |
| Total Minimum lease payments | $ 709,488 |

## 15. Functional Classification of Expenditures

Expenses for the years ended June 30, 2018 and 2017 are categorized on a functional basis as follows (in thousands):

| | 2018 | | | | | 2017 |
|---|---|---|---|---|---|---|
| | Compensation and benefits | Depreciation and amortization | Interest on indebtedness | Other operating expense | Total | Total |
| Instruction | $ 893,751 | $ 66,893 | $ 5,952 | $ 442,956 | $ 1,409,552 | $ 1,333,880 |
| Research | 439,251 | 41,647 | 22,284 | 336,450 | 839,632 | 798,539 |
| Hospital and physician practices | 3,634,858 | 309,259 | 54,800 | 2,378,661 | 6,377,578 | 5,736,697 |
| Auxiliary enterprises | 35,030 | 35,347 | 5,879 | 88,028 | 164,284 | 160,193 |
| Other educational activities | 148,560 | 14,504 | 686 | 39,256 | 203,006 | 183,973 |
| Student services | 55,044 | - | 149 | 43,437 | 98,630 | 98,527 |
| Academic support | 38,816 | 16,209 | 239 | 36,669 | 91,933 | 179,571 |
| Management and general | 243,557 | 20,130 | 310 | 40,086 | 304,083 | 287,445 |
| Independent operations | 8,062 | 5,932 | 177 | 58,150 | 72,321 | 72,106 |
| Total | $ 5,496,929 | $ 509,921 | $ 90,476 | $ 3,463,693 | $ 9,561,019 | $ 8,850,931 |

Operation and maintenance of PPE and depreciation are allocated to functional classifications based on square footage. Interest expense is allocated to the functional classifications of the activity that directly benefited from the proceeds of the debt.

## 16. Subsequent Events

The University has evaluated subsequent events for the period from June 30, 2018 through September 27, 2018, the date the consolidated financial statements were issued.

# APPENDIX C

# DEFINITIONS OF CERTAIN TERMS AND SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE AND THE LOAN AGREEMENT

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

DEFINITIONS OF CERTAIN TERMS AND
SUMMARY OF CERTAIN PROVISIONS OF
THE INDENTURE AND THE LOAN AGREEMENT

DEFINITIONS

The following are definitions of the terms used in this Appendix C.

"Act" means the Pennsylvania Higher Educational Facilities Authority Act of 1967 (Act of December 6, 1967, P.L. 678), as from time to time amended or supplemented.

"Additional Bonds" means Bonds, other than the 2009 Bonds, the 2010 Bonds, the 2011A Bonds, the 2015 Bonds, the 2016A Bonds, the 2017A Bonds and the 2018A Bonds issued under the Indenture.

"Administrative Expenses" means those expenses reasonably and properly incurred by the Authority in carrying out its responsibilities and duties, or in providing its services and facilities to the University under the Act or the Indenture or pursuant to the Loan Agreement and shall include the fees and expenses of the Trustee with respect to its duties under the Indenture.

"Annual Administrative Fee" means the annual fee for the general administrative services of the Authority with respect to a particular series of the Bonds issued under the Indenture.

"Authority" means Pennsylvania Higher Educational Facilities Authority, or its successor or successors.

"Authority Board" means the governing body of the Authority.

"Bond" or "Bonds" means the 2009 Bonds, the 2010 Bonds, the 2011A Bonds, the 2015 Bonds, the 2016A Bonds, the 2017A Bonds and the 2018A Bonds or any other revenue bonds issued under the Indenture.

"Bond Fund" means the Bond Fund created pursuant to the Original Indenture.

"Bondholder" or "holder of Bonds" means the Registered Owner of any Bond.

"Certificate" means a written statement signed by or on behalf of the Person charged with responsibility therefor.

"Certified Public Accountant" means a Person who shall be Independent, appointed by the University Board or the Authority, as the case may be, actively engaged in the business of public accounting, and duly certified as a certified public accountant under the laws of the Commonwealth.

"Certified Resolution" of the Authority or of the University means a copy of one or more resolutions certified by the Secretary, Associate Secretary or Assistant Secretary of the Authority or the University, as the case may be, under its seal to have been adopted by the Authority Board or the University Board, as the case may be, and to be in effect on the date of such certification.

"Code" means the Internal Revenue Code of 1986, as amended, and all applicable regulations promulgated thereunder or applicable thereto.

"Commonwealth" means the Commonwealth of Pennsylvania.

"Consultant" or "University Consultant" means a Person who shall be Independent, appointed by the University Board, satisfactory to the Authority and not unsatisfactory to the Trustee, qualified to pass upon questions relating to the financial affairs of institutions of higher education or institutions providing health services, as appropriate, and having a favorable reputation for skill and experience in the financial affairs of such institutions.

"Cost" or "Costs", in connection with any Project, means all expenses which are properly chargeable thereto under Generally Accepted Accounting Principles or which are incidental to the financing, acquisition, and construction of any Project, including, but without limiting the generality of the foregoing:

(a) Amounts payable to contractors and costs incident to the award of contracts;

(b) Cost of labor, facilities and services furnished by or for the University or the Authority and their employees or others, materials and supplies purchased by the University or the Authority or others, and permits and licenses obtained by the University, the Authority or others;

(c) Engineering, legal, accounting, other professional and advisory fees and costs of surveys (including environmental surveys);

(d) Premiums for surety bonds and insurance during construction and costs on account of personal injuries and property damage in the course of construction and insurance against the same;

(e) Interest on the Bonds during construction;

(f) The Authority's initial fee and the Annual Administrative Fee and Administrative Expenses during the period prior to completion of any Project;

(g) Printing, engraving and other expenses of financing, including but not limited to the fees of Bond Counsel, University Counsel, Financial Advisor, and Trustee, and expenses incurred in connection with obtaining municipal bond ratings, municipal bond insurance, letters of credit and standby take-outs or credit agreements;

(h) Costs, fees and expenses in connection with the acquisition of real and personal property or rights therein, including premiums for title insurance;

(i) Cost of equipment purchased by the University and necessary for the completion and proper operation of any Project or property in question;

(j) Amounts required to repay temporary loans or advances from other funds of the University made to finance the Costs of any Project;

(k) Cost of acquisition of real estate, construction and prior construction and/or site costs and improvements performed by the University in anticipation of any Project; and

(l) Moneys necessary to fund the funds created under the Indenture.

In the case of any Project for refunding or redeeming any Bonds or other indebtedness, "Cost" includes, without limiting the generality of the foregoing, the items listed in (c), (f), (g) and (l) above, advertising and other expenses related to the redemption of the Bonds or other indebtedness to be redeemed, and the Redemption Price thereof (and the accrued interest payable on redemption to the extent not otherwise provided for).

Whenever Costs are required to be itemized, such itemization shall, to the extent practicable, correspond with the items listed above. Whenever Costs are to be paid under the Indenture, such payment may be made by way of reimbursement to the University, the Authority or others who have paid the same.

"Counsel" means an attorney-at-law or law firm (who may be Bond Counsel or counsel for the University, the Trustee or the Authority) not unsatisfactory to the Trustee.

"Debt Service Requirements" means for a specified period and with respect to a particular series of Bonds, interest payable during the period (excluding interest funded from the proceeds of the Bonds), amounts required to be paid into any mandatory sinking fund account during the period, and amounts required to pay the principal maturing during the period which would not be redeemed or paid prior to or at maturity through any sinking fund account.

"Defeasance Investments" means and includes any of the following securities, if and to the extent the same are at the time legal for investment of Authority funds:

(a) Government Obligations; and

(b) Pre-refunded Debt obligations, the income from which is exempt from federal income taxation under Section 103 of the Internal Revenue Code of 1986, as amended, or the National Housing Act of 1939, as amended, rated "AAA" by Standard & Poor's Ratings Services, a division of The McGraw-Hill Companies, Inc. and "Aaa" by Moody's Investors Service or equivalent ratings then in effect, having a term no longer than ten (10) years from the date of purchase.

"Eighth Supplemental Indenture" means the Eighth Supplemental Indenture of Trust dated as of October 1, 2010 between the Authority and the Trustee.

"Eighth Supplemental Loan Agreement" means the Eighth Supplemental Loan Agreement dated as of October 1, 2010 between the Authority and the University.

"Eleventh Supplemental Indenture" means the Eleventh Supplemental Indenture of Trust dated as of April 1, 2016 between the Authority and the Trustee.

"Eleventh Supplemental Loan Agreement" means the Eleventh Supplemental Loan Agreement dated as of April 1, 2016 between the Authority and the University.

"Fifth Supplemental Indenture" means the Fifth Supplemental Indenture of Trust dated as of August 1, 2005 between the Authority and the Trustee.

"Fifth Supplemental Loan Agreement" means the Fifth Supplemental Loan Agreement dated as of August 1, 2005 between the Authority and the University.

"First Supplemental Indenture" means the First Supplemental Indenture of Trust dated as of March 15, 1995 between the Authority and the Trustee.

"First Supplemental Loan Agreement" means the First Supplemental Loan Agreement dated as of March 15, 1995 between the Authority and the University.

"Fiscal Year" when used with respect to the University, means the period of twelve months beginning July 1 of each year unless and until a different Fiscal Year is adopted by the University and notice thereof given to the Authority and the Trustee.

"Fourth Supplemental Indenture" means the Fourth Supplemental Indenture of Trust, dated as of January 1, 2005, between the Authority and the Trustee.

"Fourth Supplemental Loan Agreement" means the Fourth Supplemental Loan Agreement, dated as of January 1, 2005, between the Authority and the University.

"Generally Accepted Accounting Principles" means those accounting principles, not contrary to those promulgated by a nationally recognized financial standards body, applicable in the preparation of financial statements of institutions of higher learning.

"Government Obligations" means direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America.

"Indenture" means the Trust Indenture dated as of January 15, 1987, as supplemented by the First Supplemental Indenture, the Second Supplemental Indenture, the Third Supplemental Indenture, the Fourth Supplemental Indenture, the Fifth Supplemental Indenture, the Sixth Supplemental Indenture, the Seventh Supplemental Indenture, the Eighth Supplemental Indenture, the Ninth Supplemental Indenture, the Tenth Supplemental Indenture, the Eleventh Supplemental Indenture, the Twelfth Supplemental Indenture and the Thirteenth Supplemental Indenture between the Authority and the Trustee, as originally executed and as amended or supplemented as therein provided.

"Independent" means with respect to the Certified Public Accountant, the Insurance Consultant and any other Consultant, a Person who is not a member of the University Board (or other University governing body) or the Authority Board, an officer or employee of the Authority or an officer or employee of the University, or which is not a partnership, corporation or association having a partner, director, officer, member or substantial stockholder who is a member of the University Board or the Authority Board, an officer or employee of the Authority or an officer or employee of the University; provided, however, that the fact that such Person is retained regularly by or transacts business with the Authority or the University shall not make such Person an employee within the meaning of this definition.

"Insurance Consultant" means a Person who is Independent, appointed by the University and not unsatisfactory to the Authority or the Trustee, qualified to survey risks and to recommend insurance coverage for higher education facilities and services and organizations engaged in like operations and having a favorable reputation for skill and experience in such surveys and such recommendations, and who may be a broker or agent with whom the University regularly transacts business.

"Investment Securities" with respect to the 2018A Bonds, means and includes any of the following securities, if and to the extent the same are at the time legal for investment of Authority funds:

(a) Government Obligations;

(b) Bonds, debentures, notes or other evidences of indebtedness issued by any of the following agencies or such other like governmental or government-sponsored agencies which may be hereafter created: Bank for Cooperatives; Federal Intermediate Credit Banks; Federal Financing Bank; Federal Home Loan Bank System; Federal Home Loan Mortgage Corporation; Export-Import Bank of the United States; Farmers Home Administration; Small Business Administration; Inter-American Development Bank; International Bank for Reconstruction and Development; Federal Land Banks; the Federal National Mortgage Association; the Government National Mortgage Association; or the Tennessee Valley Authority;

(c) Direct and general obligations of any state of the United States or any municipality of the Commonwealth of Pennsylvania, to the payment of the principal of and interest on which the full faith and credit of such state or municipality is pledged, if at the time of their purchase such obligations are rated in the AA or higher, or Aa or higher, rating category by either Standard & Poor's Ratings Services, a division of The McGraw-Hill Companies, Inc. ("S&P") or Moody's Investors Service ("Moody's"), respectively, or in a similar rating category subsequently adopted by such services, or upon the discontinuance of either or both of such services, in equivalent rating categories of such other nationally recognized rating service or services as the case may be, satisfactory to the Authority;

(d) Demand deposits, including interest bearing money market accounts, time deposits, trust funds, trust accounts, overnight bank deposits, interest-bearing deposits, other deposit products, certificates of deposit, including those placed by a third party pursuant to an agreement between the Trustee and the University, or bankers acceptances of depository institutions, including the Trustee or any of their affiliates;

(e) Repurchase agreements or similar arrangements, (i) with banking institutions or other financial institutions, including the Trustee or any bank or financial institution affiliated with the Trustee if applicable, (having or the parent company of which shall have a current S&P or other equivalent rating for any purpose, including outstanding indebtedness, of a least "A") pursuant to which there shall have been delivered to the Trustee, or its designee, Investment Securities of the types set forth in subsections (a) and/or (b) above having at all times a fair market value of at least 100% of the value of such agreement; or (ii) with banking institutions or other financial institutions, including the Trustee and any affiliate of the Trustee if applicable, not meeting the rating requirements of (i) above pursuant to which there shall have been delivered to the Trustee or its designee, Investment Securities of the types set forth in subsection (a) and/or (b) under and at all times having a fair market value of least 101% of the value of such agreement;

(f) Shares of open-end, diversified investment companies (i) registered under the Investment Company Act of 1940, (ii) rated, at the time of purchase, AA or higher by S&P or Aa or higher by Moody's, or equivalent ratings then in effect, (iii) maintaining a constant net asset value per share in accordance with regulations of the Securities and Exchange Commission, and (iv) individually having aggregate net assets of not less than $10,000,000 on the date of purchase; including, without limitation, any money market mutual fund for which the Trustee or an affiliate of the Trustee serves as investment manager, administrator, shareholder servicing agent, and/or custodian or subcustodian, notwithstanding that (i) the Trustee or an affiliate of the Trustee receives and retains fees from funds for services rendered provided to such funds, (ii) the Trustee charges and collects fees for services rendered pursuant to the Indenture, which fees are separate from the fees received from such funds, and (iii) services performed for such funds and pursuant to the Indenture may at times duplicate those provided to such funds by the Trustee or its affiliates; provided that the purchase of any particular investment company shall be limited to an aggregate amount owned at any time of $10,000,000;

(g) Commercial paper rated, at the time of purchase, A-1 (or higher) by S&P or P-1 (or higher) by Moody's, or equivalent ratings then in effect;

(h) Public housing bonds issued by public agencies or municipalities, or temporary notes, preliminary loan notes or project notes issued by public agencies or municipalities, but only if such obligations are rated, at the time of purchase, "AAA" or the equivalent by a nationally recognized rating agency; and

(i) Escrow certificates with respect to securities listed in subsections (a) or (b) above, including without limitation zero coupons and similar accrual certificates.

"Loan Agreement" means the Loan Agreement dated as of January 15, 1987, as supplemented by the First Supplemental Loan Agreement, the Second Supplemental Loan Agreement, the Third

Supplemental Loan Agreement, the Fourth Supplemental Loan Agreement, the Fifth Supplemental Loan Agreement, the Sixth Supplemental Loan Agreement, the Seventh Supplemental Loan Agreement, the Eighth Supplemental Loan Agreement, the Ninth Supplemental Loan Agreement, the Tenth Supplemental Loan Agreement, the Eleventh Supplemental Loan Agreement, the Twelfth Supplemental Loan Agreement and the Thirteenth Supplemental Loan Agreement between the Authority and the University, and all modifications, alterations, amendments and supplements thereto.

"Loan Payments" means the payments of principal of and interest on the Loan made pursuant to the Loan Agreement.

"Ninth Supplemental Indenture" means the Ninth Supplemental Indenture of Trust dated as of February 1, 2011 between the Authority and the Trustee.

"Ninth Supplemental Loan Agreement" means the Ninth Supplemental Loan Agreement dated as of February 1, 2011 between the Authority and the University.

"Officer's Certificate" means a certificate signed by a Responsible Officer.

"Original Indenture" means the Indenture of Trust dated as of January 15, 1987, between the Authority and the Trustee.

"Original Loan Agreement" means the Loan Agreement dated as of January 15, 1987, between the Authority and the University.

"Outstanding" in connection with the Bonds, means, as of the time in question, all Bonds authenticated and delivered under the Indenture, except such thereof as:

(a) are cancelled or required to be cancelled under the terms of the debt incurring instrument;

(b) for the payment, redemption or purchase of which moneys or Defeasance Investments (the principal of and interest on which Defeasance Investments when due, will provide sufficient moneys to fully pay the principal, premium, if any, of and interest on the Bonds when due or a portion thereof) shall have been or shall concurrently be deposited with the Trustee, or an escrow agent appointed for such purpose; provided that, if Bonds are being redeemed, the required notice of redemption shall have been given or provision satisfactory to the Trustee or other appropriate party shall have been made therefor, and that if Bonds are being purchased, there shall be a firm commitment for the purchase and sale thereof; or

(c) in substitution for which other Bonds have been authenticated and delivered pursuant to the Indenture.

"Person" means an individual, a corporation, a partnership, an association, a joint stock company, a trust, an unincorporated organization, a government body, and any other political subdivision, municipality or municipal authority or any other group or entity.

"Pledged Revenues" means all amounts payable by the University to the Authority under the Loan Agreement (except those representing the Annual Administrative Fee of the Authority and Administrative Expenses), all moneys and Investment Securities held in any Funds and Accounts and all income and receipts earned from investment of the moneys in such Funds and Accounts.

"Project" means the issuance of Bonds by the Authority and the lending of the proceeds thereof to the University to pay the Costs of any project of the University permitted under the Act.

"Redemption Price," where used with respect to a Bond, means the principal amount of such Bond plus the applicable premium, if any, and accrued interest payable upon redemption thereof pursuant to the Indenture.

"Registered Owner," "Owner" or "Bondholder," in connection with a Bond, means the Person or Persons in whose name or names the Bond is registered on the books of the Authority kept for that purpose in accordance with the Indenture and the Bond.

"Regulatory Body" means and includes: (i) the United States of America and any department of or corporation, agency, or instrumentality heretofore or hereafter, created, designated or established by the United States of America; (ii) the Commonwealth, any political subdivision thereof, and any department of or corporation, agency or instrumentality heretofore or hereafter created, designated or established by the Commonwealth; (iii) the City of Philadelphia and any department of, or corporation, agency or instrumentality heretofore or hereafter created, designated or established by, the City; and (iv) any other public or private body, whether Federal, State, local or otherwise, which, in each case, has or exercises regulatory or supervisory jurisdiction and authority over the University, but shall not include the Authority.

"Responsible Officer" means (i) when used with respect to the Authority, the President, any Vice President, the Secretary, any Assistant Secretary, the Treasurer, any Assistant Treasurer, the Executive Director, any Assistant Executive Director, the Controller or any Assistant Controller, (ii) when used with respect to the University, the following administrative officers, the President, the Senior Vice President, the Vice President for Finance, Secretary, Assistant Secretary, Associate Secretary or Treasurer, and (iii) when used with respect to either the University or the Authority, as the case may be, any other person designated by resolution of the Authority Board or the University Board to act for any of the foregoing, either generally or with respect to the execution of any particular document or other specific matter, a certified copy of which resolution shall be on file with the Trustee.

"Second Supplemental Indenture" means the Second Supplemental Indenture of Trust dated as of January 15, 1998 between the Authority and the Trustee.

"Second Supplemental Loan Agreement" means the Second Supplemental Loan Agreement dated as of January 15, 1998 between the Authority and the University.

"Seventh Supplemental Indenture" means the Seventh Supplemental Indenture of Trust dated as of March 1, 2009 between the Authority and the Trustee.

"Seventh Supplemental Loan Agreement" means the Seventh Supplemental Loan Agreement dated as of March 1, 2009 between the Authority and the University.

"Sixth Supplemental Indenture" means the Sixth Supplemental Indenture of Trust dated as of April 1, 2008 between the Authority and the Trustee.

"Sixth Supplemental Loan Agreement" means the Sixth Supplemental Loan Agreement dated as of April 1, 2008 between the Authority and the University.

"Tenth Supplemental Indenture" means the Tenth Supplemental Indenture of Trust dated as of April 1, 2015 between the Authority and the Trustee.

"Tenth Supplemental Loan Agreement" means the Tenth Supplemental Loan Agreement dated as of April 1, 2015 between the Authority and the University.

"Third Supplemental Indenture" means the Third Supplemental Indenture of Trust dated as of February 1, 2002 between the Authority and the Trustee.

"Third Supplemental Loan Agreement" means the Third Supplemental Loan Agreement dated as of February 1, 2002 between the Authority and the University.

"Thirteenth Supplemental Indenture" means the Thirteenth Supplemental Indenture of Trust dated as of October 1, 2018 between the Authority and the Trustee.

"Thirteenth Supplemental Loan Agreement" means the Thirteenth Supplemental Loan Agreement dated as of October 1, 2018 between the Authority and the University.

"Trustee" means The Bank of New York Mellon Trust Company, N.A., Philadelphia, Pennsylvania, or its successor for the time being in the trust created by the Indenture.

"Twelfth Supplemental Indenture" means the Twelfth Supplemental Indenture of Trust dated as of January 1, 2017 between the Authority and the Trustee.

"Twelfth Supplemental Loan Agreement" means the Twelfth Supplemental Loan Agreement dated as of January 1, 2017 between the Authority and the University.

"2009 Bonds" means the $276,365,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Revenue Bonds, Series A, B and C of 2009 issued by the Authority under the terms of the Indenture.

"2010 Bonds" means the $71,410,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Revenue Bonds, Series of 2010 issued by the Authority under the terms of the Indenture.

"2011 Bonds" means the $150,000,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2011 issued by the Authority under the terms of the Indenture.

"2015 Bonds" means the $378,840,000 original aggregate principal amount of The Trustees of the University of the Pennsylvania Revenue Bonds, Series A of 2015, B of 2015 and C of 2015 (Federally Taxable) issued by the Authority under the terms of the Indenture.

"2016A Bonds" means the $169,635,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Refunding Revenue Bonds, Series A of 2016 issued by the Authority under the terms of the Indenture.

"2017A Bonds" means the $178,395,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Refunding Revenue Bonds, Series A of 2017 issued by the Authority under the terms of the Indenture.

"2018A Bonds" means the $183,145,000 original aggregate principal amount of The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2018 issued by the Authority under the terms of the Indenture.

"2018A Bonds Account" means the account created pursuant to the Thirteenth Supplemental Indenture.

"2018 Project" means the Project financed with the proceeds of the 2018 Bonds as described in the Indenture.

"University" means The Trustees of the University of Pennsylvania, an institution of higher education, organized and existing under the laws of the Commonwealth of Pennsylvania, or its successors and assigns.

"University Board" means the then legally constituted governing body vested with the power of management of the University or a duly authorized committee thereof.

## THE INDENTURE

The 2018A Bonds are being issued under and subject to the provisions of the Indenture between the Authority and the Trustee, to which reference is made for complete details of the terms of the 2018A Bonds. The following summarizes certain provisions of the Indenture, but is not to be regarded as a full statement thereof.

### Pledge and Assignment

Under the Indenture, the Pledged Revenues payable to the Authority from the University under the Loan Agreement, as well as all income and receipts earned on funds (except the Rebate Fund) held by or deposited with the Trustee under the Indenture, have been pledged to the Trustee. The rights of the Authority under the Loan Agreement have been assigned to the Trustee to secure the payment of the Bonds and the performance and observance of the covenants contained in the Indenture.

Moneys from time to time in the various funds of the Indenture (other than the Rebate Fund) shall be held by the Trustee, in trust, for the benefit of the Registered Owners of Bonds, except: (a) each sinking fund account created for a particular series of Bonds shall be applied and held solely for the particular specified Bonds; (b) accrued interest held in the 2018A Bonds Account of the Bond Fund shall be held and applied solely for the 2018A Bonds; and (c) moneys and investments in any fund or account representing amounts payable on any Bonds previously matured or called for redemption shall be held for the benefit of the former Registered Owners thereof only.

### Application of Proceeds of 2018A Bonds

Upon the issuance and delivery of the 2018A Bonds, the Authority will transfer the proceeds to the Trustee, and the Trustee shall deposit the proceeds of the 2018A Bonds into the Settlement Fund.

From the Settlement Fund the Trustee is directed to make the following transfers: (a) to the payment of the costs of issuing the 2018A Bonds, the amount set forth in a certificate of the Authority delivered to the Trustee, and (b) to the University, the remaining proceeds of the 2018A Bonds for application to reimburse the University for the costs of the 2018 Project.

### Additional Bonds

The Authority may issue Additional Bonds under the Indenture on parity with the Bonds upon execution of a supplemental indenture setting forth the terms of the Additional Bonds and upon execution by the University of a supplement to the loan agreement covenanting to pay the debt service on all Outstanding Bonds.

Bond Fund

There is established with the Trustee pursuant to the Indenture a Bond Fund. The Trustee shall deposit in the Bond Fund a sum equal to the accrued interest on the 2018A Bonds, plus Loan Payments made by the University from time to time, as received pursuant to the Loan Agreement. The Trustee shall establish within the Bond Fund a 2018A Bonds Account which the Trustee shall use to pay the principal or Redemption Price of the 2018A Bonds as they mature or become due and the interest on the 2018A Bonds as it becomes payable.

Settlement Fund

There is established with the Trustee pursuant to the Indenture a Settlement Fund. The Trustee shall deposit in the Settlement Fund the proceeds of the 2018A Bonds for use as described in "Application of Proceeds of 2018A Bonds" above.

Investment of Funds

All moneys received by the Trustee under the Indenture for deposit in any funds established thereunder shall be considered trust funds, shall not be subject to lien or attachment and shall, except as therein provided, be deposited in the commercial department of the Trustee and shall, to the extent not insured, be fully secured as to principal by Government Obligations or as may be permitted by law in connection with the deposit of public funds. Under certain conditions the Trustee may deposit such moneys in other authorized depositories, where to the extent not insured, they shall be secured as to principal by Government Obligations or as may be permitted by law in connection with the deposit of public funds. Such security shall be deposited with a Federal Reserve bank, with the trust department of the Trustee as authorized by law with respect to trust funds in the Commonwealth or with a bank or trust company having a combined net capital and surplus of not less than $50,000,000.

The Trustee shall invest moneys held in the Bond Fund in Investment Securities maturing, or being subject to redemption by the Trustee, at the time when funds will foreseeably be needed for purposes of the Indenture. The Trustee shall make such investments at the direction of the University. The interest and income received upon such deposits and investments and any profit or loss resulting from the sale of securities shall be added or charged to the appropriate Fund or Account. The Trustee shall not knowingly make any investments of moneys held in any fund inconsistent with the provisions of the Indenture relating to "arbitrage bonds" but may rely on investment instructions of the University as being in compliance with the requirements of the Code, as amended. Neither the Trustee nor the Authority shall be accountable for any depreciation in the value of any security or any loss resulting from the sale thereof.

Covenants of the Authority

The Authority shall, among other things, promptly pay the interest on and the principal of the Bonds according to the terms thereof, but only out of the Pledged Revenues of the Authority and funds held under the Indenture. The Authority shall cause the University to comply with insurance provisions of the Loan Agreement.

The Authority covenants that it will make no investment or other use of the proceeds of the Bonds that would cause the Bonds to be "arbitrage bonds" as the term is defined in Section 148 of the Code, as amended.

Defaults and Remedies

Events of Default, as defined in the Indenture, include, among other things, the following:

(a) if payment of any installment of interest on the Bonds is not made when it becomes due and payable;

(b) if payment of the principal or Redemption Price of any Bond is not made when it becomes due and payable at maturity or unconditional call for redemption;

(c) if there is a default in the payment of amounts due under the Loan Agreement or any other event of default shall occur thereunder;

(d) if the Authority fails to comply with any provisions of the Act relating to or affecting the Project undertaken by the Authority for the University or for any reason is rendered incapable of fulfilling its obligations under said Act or the Indenture relating to or affecting the Project undertaken by the Authority for the University;

(e) if the University makes an assignment for the benefit of creditors or a composition agreement with all or a material part or its creditors, or a trustee, receiver, executor, conservator, liquidator, sequestrator or other judicial representative, similar or dissimilar, is appointed for the University or any of its assets or revenues, or there is commenced any proceeding in liquidation, bankruptcy, reorganization, arrangement of debts, debtor rehabilitation, creditor adjustment or insolvency, local, state or federal, by or against the University and if such is not vacated, dismissed or stayed on appeal within 60 days; or

(f) if the Authority defaults in the due and punctual performance of any other covenants in the Bonds or in the Indenture, and such default continues for 60 days after written notice specifying such default and requiring the same to be remedied shall have been given to the Authority and the University by the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the Registered Owners of not less than 25% in aggregate principal amount of Bonds then Outstanding; provided, however, that if such performance requires work to be done, actions to be taken or conditions to be remedied, which by their nature cannot reasonably be done, taken or remedied, as the case may be, within such 60-day period, no Event of Default shall be deemed to have occurred or to exist if, and so long as, the Authority or the University shall commence such performance within such 60-day period and diligently and continuously prosecute the same to completion.

If any Event of Default has occurred and is continuing, the Trustee may, and upon written request of the Registered Owners of 25% in principal amount of the Bonds then Outstanding shall, by notice in writing to the Authority, declare the principal of all Bonds then Outstanding to be immediately due and payable. Upon such declaration the said principal, together with interest accrued thereon, shall become due and payable immediately at the place of payment provided therein, anything in the Indenture or in the Bonds to the contrary notwithstanding, unless the University cures such Event of Default prior to the declaration. If all arrears of interest upon the Bonds (and interest on overdue installments of interest) are paid and all other things in respect to which the Authority may have been in default are performed and the reasonable charges of the Trustees are paid, such declaration and its consequences may be annulled by the Registered Owners of a majority in aggregate principal amount of the Bonds then Outstanding and declared to be due and payable in the manner provided for in the Indenture.

For a more complete statement of rights and remedies of the Registered Owners of Bonds and of the limitations thereon, reference is made to the Indenture.

Limitations on Actions by Registered Owners of Bonds

No Registered Owner of the Bonds shall have any right to pursue any remedy under the Indenture unless (a) the Trustee shall have been given written notice of an Event of Default, (b) the Registered Owners of at least 25% in principal amount of the Bonds then Outstanding shall have requested the

Trustee, in writing, to exercise the powers granted under the Indenture or to pursue such remedy, (c) the Trustee shall have been offered indemnity satisfactory to it against costs, expenses and liabilities, and (d) the Trustee shall have failed to comply with such request within a reasonable time.

### Amendments and Supplements

The Indenture may be amended or supplemented, without the consent of the Registered Owners of the Bonds, by a Supplemental Indenture, for one or more of the following purposes: (a) to add additional covenants of the Authority or to surrender any right or power in the Indenture conferred upon the Authority, (b) to cure any ambiguity or to cure, correct or supplement any defective provision of the Indenture in such manner as shall not be inconsistent with the Indenture and shall not impair the security thereof or adversely affect the Registered Owners of the Bonds; or (c) to reflect changes in applicable law. The Indenture may be amended by a Supplemental Indenture approved by the Registered Owners of at least 66-2/3% in aggregate principal amount of the Bonds then Outstanding and affected by such amendment except with respect to (a) interest payable on the Bonds, (b) the dates of maturity or redemption provisions of the Bonds, (c) the amendment provisions of the Indenture, and (d) the Pledged Revenues and the covenants in the Indenture to pay over, maintain or restore the same, including the Funds and Accounts.

### Defeasance

When interest on, and the principal or Redemption Price (as the case may be), of all Bonds issued under the Indenture have been paid, or there shall have been deposited with the Trustee an amount, evidenced by moneys and Defeasance Investments, which, together with the interest thereon, when due, will provide sufficient moneys to fully pay all Bonds issued under the Indenture, as well as all other sums payable thereunder by the Authority, all right, title and interest of the Trustee shall thereupon cease, and the Trustee, on demand of the Authority shall release the Indenture and shall execute such documents to evidence such release as may be reasonably required by the Authority and shall turn over to the Authority or to such person, body or authority as may be entitled to receive the same, all balances remaining in any funds thereunder.

## THE LOAN AGREEMENT

The following is a summary of certain provisions of the Loan Agreement by and between the Authority and the University pursuant to which the Authority has agreed to loan to the University the proceeds of the 2018A Bonds and the University has agreed, among other things, to make payments in amounts sufficient to pay the Debt Service Requirements on and other amounts due with respect to the 2018A Bonds. This summary should not be regarded as a full statement of the document itself or the portions summarized. For complete statements of the provisions thereof, reference is made to the document in its entirety, a copy of which will be available for inspection at the corporate trust office of the Trustee in Philadelphia, Pennsylvania.

### Loan Payments

The University shall pay for deposit in the Bond Fund created under the Indenture on or before the respective due dates thereof, an amount which, together with other available funds in the Bond Fund, is sufficient to pay the interest on and principal of the 2018A Bonds due and payable on such date.

The University shall also pay directly to the Authority amounts due and payable with respect to the initial and annual Authority fees plus the Authority's Administrative Expenses.

The obligations of the University under the Loan Agreement, including the obligation to make the payments required under the Loan Agreement sufficient to cover the payment of principal or Redemption Price of and interest on the 2018A Bonds, are absolute and unconditional.

Nature of Obligations of the University

The Authority has assigned all of its rights, title and interest in and to the Loan Agreement and all payments payable or which may become payable thereunder and all security therefor (except for certain amounts representing the Annual Administrative Fee and the reimbursement of the Authority's Administrative Expenses and those amounts representing the Authority's rights to indemnification) to be held in trust and applied by the Trustee for the benefit and security of the Registered Owners of the Bonds. The Loan Agreement is an unsecured obligation of the University and the full faith and credit of the University is pledged to secure the payments thereunder.

Insurance

The University covenants to provide and maintain the following:

(a) Insurance against loss and/or damage to its facilities under a policy or policies in form and amount covering such risks as are ordinarily insured against by similar institutions.

(b) Public liability and property damage insurance, automobile liability insurance and, if applicable, special hazard insurance in certain specified amounts.

(c) Workmen's compensation and employer's liability insurance meeting the University's statutory obligations.

(d) Boiler and machinery coverage when deemed advisable by the Insurance Consultant or when required by ordinance or law.

(e) Excess liability coverage covering the excess of amounts insured against pursuant to subsection (b) as it relates to public liability insurance to be maintained in force so that the total coverage available equals certain specified amounts.

(f) Fidelity bonds on all officers and employees of the University who collect or have custody of or access to revenues, receipts or other funds of the University, such bonds to be in such amounts as are customarily carried by like organizations engaged in like activities of comparable size and having comparable income.

The University shall employ each year during the term of the Loan Agreement an Insurance Consultant. In the event that any insurance required by the Loan Agreement is commercially unavailable at a reasonable cost, or has been otherwise provided, the University with the approval of the Authority may accept such substitute coverage as is recommended by the Insurance Consultant's certificate setting forth amounts and types of insurance then in force, stating whether, in the opinion of such Insurance Consultant, such insurance then in force is in compliance with the requirements of the Loan Agreement, and stating the amounts and types of insurance to be maintained during the next ensuing Fiscal Year.

Additional Covenants of the University

The University covenants that it will abide by covenants made by it under the Loan Agreement. The University further covenants that it will preserve and maintain its existence as an organization organized and operated exclusively for educational purposes and that it will maintain the necessary accreditation to enable it to maintain its authority to operate the University as an institution of higher education in the Commonwealth and that it will operate its facilities as an institution of higher education within the meaning of the Act.

The University covenants that during the term of the Loan Agreement it will not initiate any proceedings or take any action to dissolve, liquidate or terminate its existence as a corporation or otherwise dispose of all or substantially all of its assets, except to consolidate or merge with or sell or otherwise transfer all or substantially all of its assets to another corporation and provided that (a) the successor corporation formed by such consolidation or merger shall be a corporation organized under the laws of the United States or any state, district or territory thereof and shall be an institution of higher learning as required by the Act, (b) the successor corporation expressly assumes in writing the full and faithful performance of the University's duties and obligations under the Loan Agreement and, in the opinion of a Consultant, such successor corporation is financially capable of fulfilling such duties and obligations and the transaction will not adversely affect the security for the Bonds, (c) immediately after such consolidation or merger, the University or such successor corporation shall not be in default in the performance or observance of any duties, obligations or covenants of the Loan Agreement, and (d) the Authority and the Trustee shall have received an opinion of Counsel satisfactory to them that the exemption from federal income tax of the interest on the Bonds will not be affected by the merger, transfer or consolidation.

The University covenants that it will maintain its facilities in good order, repair and operating condition and that all actions taken by the University have been and will be in full compliance with all pertinent laws, ordinances, rules, regulations and orders applicable to the University.

The University covenants to keep accurate records and books of account and to annually have an examination of its financial statements made by a Certified Public Accountant, a copy of which shall be available for inspection at reasonable times by the Registered Owners of the Bonds at the office of the Authority.

The University covenants that it will not take any action or permit any action to be taken on its behalf, or cause or permit any circumstances within its control to arise or continue, if such action or circumstances would cause the interest paid on the Bonds to be subject to federal income tax.

Events of Default and Remedies

The following are "Events of Default" under the Loan Agreement:

(a) if the University fails to make any payment required by the Loan Agreement with respect to interest and principal due on the Bonds when the same shall become due and payable;

(b) if an event of default shall have occurred and be continuing with respect to any outstanding indebtedness of the University other than the Bonds;

(c) if the University fails to perform any of its other covenants and such failure continues for 60 days after the Authority gives notice thereof; provided, however, that if such performance requires work to be done, actions to be taken or conditions to be remedied, which by their nature cannot reasonably be done, taken or remedied, as the case may be, within such 60-day period, no Event of Default shall be deemed to have occurred or to exist if, and so long as, the University shall commence such performance within such 60-day period and diligently and continuously prosecute the same to completion;

(d) if the University shall file a voluntary petition in bankruptcy or shall be adjudicated a bankrupt or insolvent, or in any action or proceeding shall file any petition or answer seeking any reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future applicable federal, state or other statute or law, or shall seek or consent to or acquiesce in the appointment of any trustee, receiver or liquidator of the University or of all or substantially all of its properties;

(e) if within 60 days after commencement of any proceeding against the University seeking any reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any federal, state or other statute or law, such proceeding shall not have been dismissed, or, within 60 days after the appointment, without the consent or acquiescence of the University, of any Trustee, receiver or liquidator of the University or of all or substantially all of its properties, such appointment shall not have been vacated or stayed on appeal or otherwise, or, within 60 days after the expiration of any such date, such appointment shall not have been vacated; or

(f) if an Event of Default shall have occurred and be continuing under the Indenture.

Upon the occurrence and continuation of any Event of Default, the Trustee may take one of any combination of the following remedial steps:

(g) declare an amount equal to all amounts then due and payable on the Bonds to be immediately due and payable;

(h) have access to and inspect, examine and make copies of the books and records and accounts, data and income tax and other tax returns of the University;

(i) take whatever action at law or in equity may appear necessary or desirable to collect the amounts then due and thereafter become due, or to enforce performance and observance of any obligation, agreement or covenant of the University under the Loan Agreement;

(j) by action or submit in equity require the University to account as if it were the trustee of an express trust for the Bondholders; and

(k) withhold any and all further performance under the Loan Agreement.

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

## APPENDIX D

## PROPOSED FORM OF OPINION OF CO-BOND COUNSEL

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

[FORM OF OPINION OF BALLARD SPAHR LLP
AND ANDRE C. DASENT, P.C, AS CO-BOND COUNSEL]

October __, 2018

Pennsylvania Higher Educational
Facilities Authority
1035 Mumma Road
Wormleysburg, PA 17043

The Bank of New York Mellon
Trust Company, N.A., as Trustee
Global Corporate Trust
1735 Market Street
Philadelphia, PA 19103

Merrill Lynch, Pierce, Fenner & Smith
Incorporated, as Representative of the Underwriters
4 Penn Center, 1600 JFK Blvd., Suite 1210
Philadelphia, PA 19103

Re: $183,145,000 Pennsylvania Higher Educational Facilities Authority,
The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2018

Ladies and Gentlemen:

We have acted as co-bond counsel to the Pennsylvania Higher Educational Facilities Authority (the "Authority") in connection with the issuance of $183,145,000 aggregate principal amount of its The Trustees of the University of Pennsylvania Revenue Bonds, Series A of 2018 (the "Bonds").

The Bonds are issued under and pursuant to the laws of the Commonwealth of Pennsylvania (the "Commonwealth"), including the Pennsylvania Higher Educational Facilities Authority Act of 1967, the Act of December 6, 1967, P.L. 678, as amended and supplemented (the "Act"), and a Trust Indenture dated as of January 15, 1987, as supplemented by a First Supplemental Indenture of Trust dated as of March 15, 1995, a Second Supplemental Indenture of Trust dated as of January 15, 1998, a Third Supplemental Indenture of Trust dated as of February 1, 2002, a Fourth Supplemental Indenture of Trust dated as of January 1, 2005, a Fifth Supplemental Indenture of Trust dated as of August 1, 2005, a Sixth Supplemental Indenture of Trust dated as of April 1, 2008, a Seventh Supplemental Indenture of Trust dated as of March 1, 2009, an Eighth Supplemental Indenture of Trust dated as of October 1, 2010, a Ninth Supplemental Indenture of Trust dated as of February 1, 2011, a Tenth Supplemental Indenture of Trust dated as of April 1, 2015, an Eleventh Supplemental Indenture of Trust dated as of April 1, 2016, a Twelfth Supplemental Indenture of Trust dated as of January 1, 2017, and a Thirteenth Supplemental Indenture of Trust dated as of October 1, 2018 (collectively, the "Indenture"), between the Authority and The Bank of New York Mellon Trust Company, N.A., as successor trustee (the "Trustee").

The Bonds are being issued at the request of The Trustees of the University of Pennsylvania (the "University") to provide funds which will be used for the purpose of: (i) the financing (including the reimbursement) of a portion of the projects in the University's capital budget, which may include (without limitation) acquisition, construction, renovation and equipping of Stemmler Hall, Richards Medical Research Labs Towers, Leidy Laboratories, Hill College House, and construction of the Perelman Center for Political Science and Economics and the Wharton Academic Research Building and Substation, and (ii) payment of certain costs of issuance in respect of the Bonds (collectively, the "Project").

The proceeds of the Bonds are being loaned to the University pursuant to a Loan Agreement dated as of January 15, 1987, as supplemented by a First Supplemental Loan Agreement dated as of March 15, 1995, a Second Supplemental Loan Agreement dated as of January 15, 1998, a Third Supplemental Loan

Agreement dated as of February 1, 2002, a Fourth Supplemental Loan Agreement dated as of January 1, 2005, a Fifth Supplemental Loan Agreement dated as of August 1, 2005, a Sixth Supplemental Loan Agreement dated as of April 1, 2008, a Seventh Supplemental Loan Agreement dated as of March 1, 2009, an Eighth Supplemental Loan Agreement dated as of October 1, 2010, a Ninth Supplemental Loan Agreement dated as of February 1, 2011, a Tenth Supplemental Loan Agreement dated as of April 1, 2015, an Eleventh Supplemental Loan Agreement dated as of April 1, 2016, a Twelfth Supplemental Loan Agreement dated as of January 1, 2017, and a Thirteenth Supplemental Loan Agreement dated as of October 1, 2018 (collectively, the "Loan Agreement") between the Authority and the University. Under the Loan Agreement, the University is obligated to make payments in amounts sufficient to pay, among other things, the principal or redemption price of and interest on the Bonds.

The Bonds are secured by the Indenture and by an assignment to the Trustee of all of the Authority's right, title and interest in and to the Loan Agreement (except for the Authority's rights thereunder to receive payments of administrative fees and expenses and indemnification against liability).

The University has represented in the Loan Agreement that it is an organization described in Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (the "Code"). The University has covenanted that, throughout the term of the Loan Agreement, it will not carry on or permit to be carried on in the University Facilities (as defined in the Loan Agreement) any trade or business, nor will it take any action or permit any action to be taken on its behalf or cause or permit any circumstance within its control to arise or continue if the conduct of such trade or business or such other action or circumstance would cause the interest paid by the Authority on the Bonds to be subject to federal income tax in the hands of the holders thereof. The University has further covenanted that it will neither make nor instruct the Trustee to make any investment or other use of the proceeds of the Bonds, nor take or omit to take any other action which would cause the Bonds to be arbitrage bonds under Section 148(a) of the Code.

Under the Indenture and the Loan Agreement, respectively, the Authority and the University have covenanted that they will comply with the requirements of Section 148 of the Code pertaining to arbitrage bonds. In addition, an officer of the Authority responsible for issuing the Bonds and a representative of the University have executed a certificate stating the reasonable expectations of the Authority and the University on the date of issue of the Bonds as to future events that are material for the purposes of such requirements of the Code.

In our capacity as co-bond counsel, we have examined such documents, records of the Authority and other instruments as we deemed necessary to enable us to express the opinions set forth below, including original counterparts or certified copies of the Indenture, the Loan Agreement and the other documents listed in the closing memorandum in respect of the Bonds filed with the Trustee. We have assumed that the Authority and the University will comply with their respective covenants in the Indenture and the Loan Agreement relating to the tax-exempt status of the Bonds. We have also examined an executed Bond of each series, authenticated by the Trustee, and have assumed that all other Bonds of such series have been similarly executed and authenticated. We have also assumed that the Indenture has been duly authorized, executed and delivered by the Trustee, and that the Loan Agreement has been duly authorized, executed and delivered by the University.

Based on the foregoing, it is our opinion that:

1. The Authority is a body corporate and politic validly existing under the laws of the Commonwealth, with full power and authority to undertake the Project, to execute and deliver the Indenture and the Loan Agreement and to issue and sell the Bonds.

2. The Indenture and the Loan Agreement have been duly authorized, executed and delivered by the Authority and the covenants of the Authority therein are valid and binding obligations of the Authority enforceable in accordance with their terms, except as the rights created thereunder and the enforcement thereof may be limited by bankruptcy, insolvency or other similar laws or equitable principles affecting the enforcement of creditors' rights generally.

3. The issuance and sale of the Bonds have been duly authorized by the Authority. Based on the assumption as to execution and authentication set forth above, the Bonds have been duly executed and delivered by the Authority and authenticated by the Trustee, are valid and binding obligations of the Authority and are entitled to the benefit and security of the Indenture, except as the rights created thereunder and the enforcement thereof may be limited as indicated in paragraph 2.

4. Under the laws of the Commonwealth as presently enacted and construed, the Bonds are exempt from personal property taxes in Pennsylvania, and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax.

5. Interest on the Bonds (including original issue discount) is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of initial delivery of the Bonds, assuming the accuracy of the certifications of the Authority and the University and continuing compliance by the Authority and the University with the requirements of the Code. Interest on the Bonds is not an item of tax preference for purposes of the individual federal alternative minimum tax ("AMT"). The corporate AMT was repealed by legislation enacted on December 22, 2017 (known as the "Tax Cuts and Jobs Act"), effective for tax years beginning after December 31, 2017. For tax years beginning on or before December 31, 2017, interest on the Bonds is not an item of tax preference for purposes of the corporate AMT in effect prior to enactment of the Tax Cuts and Jobs Act; however, interest on the Bonds held by a corporation (other than an S corporation, regulated investment company, or real estate investment trust) may be indirectly subject to federal AMT because of its inclusion in the adjusted current earnings of a corporate holder. We express no opinion regarding other federal tax consequences relating to ownership or disposition of, or the accrual or receipt of interest on, the Bonds.

Original issue premium on a Bond issued at an issue price that exceeds its principal amount is amortizable periodically over the term of a Bond through reductions in the holder's tax basis for the Bond for determining taxable gain or loss from sale or from redemption prior to maturity. Amortization of premium does not create a deductible expense or loss.

We express no opinion herein with respect to the adequacy of the security or sources of payment for the Bonds or the accuracy or completeness of any offering document used in connection with the sale of the Bonds.

We call your attention to the fact that the Bonds are limited obligations of the Authority, payable only out of certain revenues of the Authority and certain other moneys available therefor as provided in the Indenture, and that the Bonds do not pledge the credit or taxing power of the Commonwealth or any political subdivision, agency or instrumentality thereof. The Authority has no taxing power.

Very truly yours,

[ THIS PAGE INTENTIONALLY LEFT BLANK ]

Penn

UNIVERSITY of PENNSYLVANIA