Board of Curators Meeting - Public Session

University of Missouri System
St. Pat's A&B, Havener Center, Missouri S&T
Apr 21, 2022 8:00 AM - 2:00 PM CDT

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UNIVERSITY OF MISSOURI
BOARD CHAIR REPORT

There are no materials for this information item.

UNIVERSISTY OF MISSOURI

PRESIDENT’S REPORT

There are no materials for this information item.

STUDENT REPRESENTATIVE TO THE
BOARD OF CURATORS REPORT

There are no materials for this information item.

No. 1

Recommended Action - Approval of Board of Curators Executive Committee and Standing Committees Appointments, 2022

It was recommended by Chair Chatman, moved by Curator ____________ and seconded by Curator _____________, that the following Board of Curators Executive Committee and Standing Committees appointments be approved for 2022:

Executive Committee
Darryl M. Chatman, Chair
Greg E. Hoberock
Jeff L. Layman

Academic, Student Affairs, Research and Economic Development Committee
Todd P. Graves, Chair
Greg E. Hoberock
Jeff L. Layman
Robin R. Wenneker

Audit, Compliance and Ethics Committee
Keith A. Holloway, Chair
Julia G. Brncic
Jeff L. Layman

Finance Committee
Greg E. Hoberock, Chair
Todd P. Graves
Jeff L. Layman
Michael A. Williams

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Governance, Compensation and Human Resources Committee
Michael A. Williams, Chair
Julia G. Brncic
Keith A. Holloway
Robin R. Wenneker

Health Affairs Committee
Robin R. Wenneker, Chair
Keith A. Holloway
Jeff L. Layman
Michael A. Williams
Ronald G. Ashworth (non-curator)
John R. Phillips (non-curator)

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ____________________.

No. 2

Recommended Action - Revised 2022 Board of Curators Meeting Calendar

It was recommended by Chair Chatman, endorsed by President Choi, moved by Curator __________ and seconded by Curator __________, that the revised 2022 Board of Curators meeting calendar be approved as follows:

REVISED 2022 BOARD OF CURATORS MEETING CALENDAR

DAY(S)	DATE(S)	LOCATION
Thursday	February 3	UM – Columbia
Thursday	April 21	Missouri S&T
Thursday	June 23-24	Columbia, Missouri
~~Thursday~~ Wednesday	September ~~8~~ 7	UM – Kansas City
Thursday	November 17	UM – St. Louis

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ________________.

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No. 3

Recommended Action - 2023 Board of Curators Meeting Calendar

It was recommended by Chair Chatman, endorsed by President Choi, moved by Curator ___________ and seconded by Curator ___________, that the proposed 2023 Board of Curators meeting calendar be approved as follows:

PROPOSED 2023 BOARD OF CURATORS MEETING CALENDAR

DAY(S)	DATE(S)	LOCATION
Thursday	February 9	UM – Columbia
Thursday	April 20	Missouri S&T
Thursday	June 29	Columbia, Missouri
Thursday	September 7	UM – Kansas City
Thursday	November 16	UM – St. Louis

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ____________________.

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Proposed 2023 Board of Curators Meeting Calendar

Last meeting: November 17, 2022 (UMSL)

Day(s)	Date(s)	City	Host/Comments	Mailing Dates
Thursday	February 9 (Health Affairs Cte Mtg Feb 2)	Columbia (11 weeks from last meeting)	MU	January 25
Thursday	April 20 (Health Affairs Cte Mtg April 13)	Rolla (10 weeks from last meeting)	Missouri S&T	April 5
Thursday	June 29 (Health Affairs Cte Mtg June 22)	Columbia (10 weeks from last meeting)	BOC/System President	June 14
Thursday	September 7 (Health Affairs Cte Mtg Aug 31)	Kansas City (10 weeks from last meeting)	UMKC	August 23
Thursday	November 16 (Health Affairs Cte Mtg Nov 9)	St. Louis (10 weeks from last meeting)	UMSL	November 1

Revised State Statutes

Regular meetings of board.
RSMo 172.110. There shall be two regular meetings of said board of curators in each year, to be holden in the university edifice or in the town of Columbia. The annual meeting shall be held on the third Tuesday in December and the semiannual meeting on the Tuesday preceding the first Thursday in June, unless different days shall be fixed upon by said board.

University of Missouri Collected Rules and Regulations

UM CR&R 10.030 Board Bylaws

- C. Article III The Board of Curators
  1. Meetings
     - a. Annual meeting -- The regular meeting of the Board held during the month of May or June, as scheduled by the Board of Curators of each year, shall be deemed to be the annual meeting of the Board of Curators, and shall be held on such date in May or June as is fixed by the Board.
     - b. Regular meetings -- The Board may hold regular meetings at a time and place to be fixed by the Board. The time and place of a regular meeting may be changed by order of the Board.

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REVIEW CONSENT AGENDA

There are no materials for this information item.

CONSENT

Recommended Action - Consent Agenda

It was endorsed by President Choi, moved by Curator ___________ and seconded by Curator ___________, that the following items be approved by consent agenda:

CONSENT AGENDA

Action

A. Minutes, February 3, 2022 Board of Curators Meeting
B. Minutes, February 3, 2022 Board of Curators Committee Meetings
C. Minutes, March 4, 2022 Board of Curators Special Meeting
D. Minutes, March 15, 2022 Board of Curators Special Meeting
E. Minutes, March 22, 2022 Board of Curators Special Meeting
F. Minutes, March 25, 2022 Board of Curators Special Meeting and Committee Meeting
G. Degrees, Spring Semester 2022 for all Campuses
H. Approval, Collected Rules and Regulations, 140.012, Investment Policy for General Pool, UM
I. Naming Opportunity, UMSL

Roll call vote of the Board:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion _________________.

Consent A

Recommended Action - Minutes, February 3, 2022 Board of Curators Meeting Minutes

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the February 3, 2022 Board of Curators meeting be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

Consent B

Recommended Action - Minutes, February 3, 2022 Board of Curators Committee Meetings

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the February 3, 2022 Board of Curators committee meetings, be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

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Consent C

Recommended Action - Minutes, March 4, 2022 Board of Curators Special Meeting

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the March 4, 2022 Board of Curators special meeting be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

Consent D

Recommended Action - Minutes, March 15, 2022 Board of Curators Special Meeting

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the March 15, 2022 Board of Curators special meeting be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

Consent E

Recommended Action - Minutes, March 22, 2022 Board of Curators Special Meeting

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the March 22, 2022 Board of Curators special meeting be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

Consent F

Recommended Action - Minutes, March 25, 2022 Board of Curators Special Meeting and Committee Meeting

It was moved by Curator ________________ and seconded by Curator ________________, that the minutes of the March 25, 2022 Board of Curators special meeting and committee meeting be approved as presented.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

Consent G

Recommended Action – Approval of Degrees, Spring Semester 2022, for all universities

It was recommended by Chancellors, endorsed by President of the University of Missouri Mun Choi, recommended by the Academic, Student Affairs and Research & Economic Development Committee, moved by Curator________, seconded by Curator ________that the following action be approved:

> that the action of the President of the University of Missouri in awarding degrees and certificates to candidates recommended by the various faculties and committees of the four University of Missouri System campuses who fulfill the requirements for such degrees and certificates at the end of the Spring Semester 2022, shall be approved, and that the lists of said students who have been awarded degrees and certificates be included in the records of the meeting.

Roll call vote of Board:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion__________________.

Approval of Collected Rules & Regulation 140.012
Investment Policy for General Pool
UM

Management recommends for Board approval a change in the Investment Policy for the General Pool which would add Real Estate / Infrastructure to the list of asset classes approved for the Strategic Portfolio of the General Pool.

The General Pool, which represents the aggregate working capital of the University, is managed within three distinct sub-portfolios. The Liquidity Portfolio generally contains cash and cash equivalents and serves as the primary source of liquidity for the University's day-to-day operations. The Core Portfolio serves as a secondary source of liquidity and is invested largely in liquid public debt securities and related investment vehicles. The Strategic Portfolio represents funds not anticipated to be needed for liquidity, with a long-term investment horizon.

As part of the recent review of Retirement Plan asset allocation, the University's Investment Advisory Committee had discussions about the merits of real estate investment in the current market environment, ultimately resulting in a recommendation to increase the real estate allocation within the Retirement Plan. In these same discussions, we found that real estate investment would benefit the Strategic Portfolio of the General Pool as well.

Investment in Real Estate would be largely funded from the existing Risk Balanced allocation. Based on the latest Verus capital market assumptions, Real Estate has an expected return of 8.5% relative to an expected return of 6.2% for existing Risk Balanced investments in the Strategic Portfolio. Further, Real Estate is diversifying and risk-reducing to the General Pool due to low correlations with other existing asset classes.

General Pool investment risk across the three sub-portfolios is managed by a systematic risk budgeting mechanism which establishes a target for market volatility reserves based on the modeled risk of portfolio asset allocation. Using our standard risk methodology, the addition of Real Estate to the Strategic Portfolio reduces our modeled risk reserve from approximately 2.24% to 2.13%.

The following proposed policy language is essentially the same as what currently exists for the Retirement Plan and Endowment Pool investment policies:

> *<u>Real Estate/Infrastructure</u>*
> *Specific types of fund investments may be structured as equity and/or debt and include categories broadly defined as core, value added, and opportunistic. In addition, investments may be made in real estate investment trusts and master limited partnerships from time to time.*
>
> *Legal account structures will primarily be in the form of limited partnership agreements with average tenure of 10-12 years. Separately managed accounts and institutional commingled funds may also be utilized from time to time.*

No. H

Recommended Action - Approval of Collected Rules and Regulations 140.012 General Pool Investment Policy, UM

It was recommended by Executive Vice President Ryan Rapp, endorsed by President Mun Y. Choi, recommended by the Finance Committee, moved by Curator ________________ and seconded by Curator ________________, that the:

Existing investment policy of Collected Rules and Regulations, Section 140.012, be amended, as noted in the attached documents:

Roll call vote of the Committee:	YES	NO
Curator Graves		
Curator Hoberock		
Curator Layman		
Curator Williams		

The motion ____________________.

Roll call vote of Board of Curators:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion __________________.

140.012 Investment Policy for General Pool

Bd. Min. 12-6-91; Amended Bd. Min. 12-9-93; Amended Bd. Min. 11-14-94; Amended Bd. Min. 12-13-96; Amended Bd. Min. 9-26-97; 1-21-98; Revised 2-01-00; Amended Bd. Min. 9-27-02; Amended Bd. Min. 11-22-02; Revised 1-5-04; Amended Bd. Min. 9-9-04; Amended Bd. Min. 1-26-07; Amended Bd. Min.2-6-09; Amended Bd. Min. 6-5-09; Amended Bd. Min.6-17-11; Revised in entirety, Bd. Min. 6-26-12. (Note: Board approval on 6-26-12 replaced previous rules 140.010, 140.011, 140.012 and 140.013 with new language and reissued new rules 140.010 through 140.016.) Amended Bd. Min. 1-31-13; Amended Bd. Min. 6-25-15; Amended Bd. Min. 10-1-15; Amended Bd. Min. 10-7-16; Amended Bd. Min. 11-15-18. Amended Bd. Min. 9-24-20

A. **Introduction** – The General Pool represents the University's cash and reserves, both restricted and unrestricted, including, but not limited to, operating funds, auxiliary funds, service operations funds, self-insurance funds, debt service funds, and plant funds.
B. **Responsibilities and Authorities** – See CRR 140.010, "*Policy for Management and Oversight of Selected University Investment Pools*"
C. **Investment Objectives** – The General Pool shall be managed in a way that both recognizes and balances the underlying needs of the pool, including, but not limited to, accommodation of University cash flow cyclicality, satisfaction of various ongoing liquidity needs, maximization of risk-adjusted investment returns, diversification and preservation of capital.
D. **Authorized Investments** – The General Pool shall be invested as follows:

	Investment Portfolios		
	Liquidity	**Core**	**Strategic**
Management	Internal/External	External	External
Minimum Allocation	20%	20%	0%
Maximum Allocation	100%	60%	45%
Liquidity Objective	High	Moderate	Moderate/Low
Volatility Tolerance	Low	Moderate	Moderate/High
Return Expectation	Low	Moderate	Moderate/High

1. **Liquidity Portfolio**
   The Liquidity portfolio is expected to have very low volatility and low (cash-like) returns. It is the primary source of liquidity for the University's operating cash flow needs, constructed utilizing securities and investment vehicles that primarily have same day liquidity with minimal day-to-day price fluctuations. Exposures will be obtained by investing in the following:
   a. Bank deposits covered by FDIC insurance or otherwise collateralized by U.S. Government and U.S. Government Agency securities.

b. Money market funds which are SEC 2a-7 compliant and have received the highest possible rating by at least two Nationally Recognized Statistical Rating Organizations.
c. Commercial Paper which has received a rating of at least A1 / P1 / F1 by two of the Nationally Recognized Statistical Rating Organizations
d. Repurchase Agreements collateralized by the U.S. Government and U.S. Government Agency securities.
e. Yield Enhancement Strategies that seek returns higher than, or comparable to, traditional cash investments, while diversifying the risk inherent in traditional cash investments. To implement these strategies, liquid non-cash-like securities are often purchased in conjunction with a hedge instrument that substantially hedges away the non-cash-like attributes of the securities. Instruments that may be part of such transactions include: U.S. Treasury securities, sovereign bonds issued by G10 countries, other fixed income securities and precious metals. To hedge away the non-cash like attributes, the following instruments may be used: futures contracts, asset/interest rate swaps, currency forwards, securities lending agreements, and repurchase agreements.
f. Other short-term investment vehicles of similar quality, with an average duration of one year or less.
g. U.S. Treasury securities, U.S. Government Agency securities and U.S. Government guaranteed securities, including but not limited to: all direct obligations of the U.S. Government, Federal Farm Credit Banks, Federal Home Loan Banks, Federal National Mortgage Association, and Federal Home Loan Mortgage Corporation.
h. Internal short-term loans at market interest rates to the University's Central Bank as a substitute for commercial paper which could otherwise be issued externally by the Central Bank under the University's Commercial Paper Notes program. Such short-term loans must be approved by the Vice President for Finance.

2. **Core Portfolio**

   The Core portfolio is expected to have moderate volatility with moderate returns, invested primarily in public debt securities and related investment vehicles. It will serve as a secondary source of liquidity, built utilizing excess operating funds not expected to be needed for purposes of funding the operational needs of the University under normal circumstances. This portfolio will be expected to generate higher returns than the Liquidity portfolio through the use of some combination of credit risk, interest rate risk, illiquidity risk and idiosyncratic (active) risk.

   a. Public Debt

      Specific types of debt include, but are not limited to, sovereign, corporate, inflation-linked, high yield, emerging market, commercial mortgage-backed securities, and residential mortgage-backed securities.

Exposure will be obtained primarily through physical securities, however, from time to time derivative instruments commonly accepted by other institutional investors such as futures, swaps, options, forward contracts, and reverse repurchase agreements may be utilized. Exposures may include long/short positions.

Legal account structures will primarily be in the form of separately managed accounts and institutional commingled funds, however, from time to time limited partnership agreements or other similar forms may also be utilized.

3. **Strategic Portfolio**
The Strategic portfolio will be built utilizing excess operating funds that should not be needed for liquidity purposes. As compared to the Core portfolio, the Strategic portfolio will have higher return expectations and a higher level of expected volatility. These are truly long-term funds and should be thought of similarly to retirement and endowment funds.

   a. Risk Balanced
   It is expected that this portfolio will be meaningfully balanced across traditional risk factors including equities, real interest rates, inflation (both actual and expected), commodities and credit. Additionally, non-traditional risk factors including value, momentum, carry, defensive and trend may be included. It is also expected that idiosyncratic (active) risk will be taken in this portfolio from time to time.

   Exposure will be obtained through physical securities and/or conventional derivative instruments commonly accepted by other institutional investors such as, futures, swaps, options, forward contracts and reverse repurchase agreements.

   Legal account structures will primarily be in the form of separately managed accounts, institutional commingled funds and limited partnership agreements.

   b. Real Estate/Infrastructure
   Specific types of fund investments may be structured as equity and/or debt and include categories broadly defined as core, value added, and opportunistic. In addition, investments may be made in real estate investment trusts and master limited partnerships from time to time.

   Legal account structures will primarily be in the form of limited partnership agreements with average tenure of 10-12 years. Separately managed accounts and institutional commingled funds may also be utilized from time to time.

   ~~b.~~c. Private Debt
   Specific types of long-only and long/short strategies including, but are not limited to, distressed debt funds, distressed for

control funds, whole loans and pools, levered loans and pools, and mortgage servicing rights.

Legal account structures will primarily be in the form of limited partnership agreements.

~~c.~~d. Venture Capital
Investments shall be consistent with the University's mission to foster innovation in support of economic development. Maximum allocation shall be $5 million.

Investments require unanimous approval by the Executive Vice President for Finance and Operations and the Chief Investment Officer in consultation with the President.

Utilization of external managers shall be consistent with the guidelines established in CRR 140.011, "*Policy for Investment Manager Selection, Monitoring and Retention.*"

~~d.~~e. Endowment Pool
As part of its Strategic Portfolio, the General Pool may invest in the University's Endowment Pool, as established and governed by CRR 140.013, *"Investment Policy for Endowment Pool."*

E. **Risk Management**

1. The Chief Investment Officer shall establish and implement procedures to:
   a. Regularly monitor the University's cash flow forecasts.
   b. Maintain minimum daily liquidity (securities or investment vehicles which can be liquidated on a same-day basis) equal to 30 days operating cash outflows for the University.
   c. Maintain minimum weekly liquidity (securities or investment vehicles which can be liquidated within 5 business days) equal to 60 days operating cash outflows for the University.
   d. As applicable, maintain overall liquidity sufficient to satisfy credit rating agency guidelines for any self-liquidity needs of the University's debt portfolio.
   e. Maintain a contingency funding plan to address unanticipated market / liquidity events, with the objective of having ready access to cash to meet the University's operating cash flow needs at all times.
   f. Based on the level of projected risk within the General Pool, as modeled by the University's Investment Consultant, maintain appropriate reserves within the General Pool to mitigate drawdown risk, allowing the University to better manage through periods of market volatility.

F. **Excluded Instruments –** The General Pool shall not be deemed to include, and the limitations contained herein shall not be deemed applicable to, any program-related funds, instruments, and assets not held primarily for investment such as interests governed by CRR 70.070, "*Entrepreneurial Activity*."

140.012 Investment Policy for General Pool

Bd. Min. 12-6-91; Amended Bd. Min. 12-9-93; Amended Bd. Min. 11-14-94; Amended Bd. Min. 12-13-96; Amended Bd. Min. 9-26-97; 1-21-98; Revised 2-01-00; Amended Bd. Min. 9-27-02; Amended Bd. Min. 11-22-02; Revised 1-5-04; Amended Bd. Min. 9-9-04; Amended Bd. Min. 1-26-07; Amended Bd. Min.2-6-09; Amended Bd. Min. 6-5-09; Amended Bd. Min.6-17-11; Revised in entirety, Bd. Min. 6-26-12. (Note: Board approval on 6-26-12 replaced previous rules 140.010, 140.011, 140.012 and 140.013 with new language and reissued new rules 140.010 through 140.016.) Amended Bd. Min. 1-31-13; Amended Bd. Min. 6-25-15; Amended Bd. Min. 10-1-15; Amended Bd. Min. 10-7-16; Amended Bd. Min. 11-15-18. Amended Bd. Min. 9-24-20

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D. **Authorized Investments** – The General Pool shall be invested as follows:

	Investment Portfolios		
	Liquidity	**Core**	**Strategic**
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Return Expectation	Low	Moderate	Moderate/High

1. **Liquidity Portfolio**
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   a. Bank deposits covered by FDIC insurance or otherwise collateralized by U.S. Government and U.S. Government Agency securities.

b. Money market funds which are SEC 2a-7 compliant and have received the highest possible rating by at least two Nationally Recognized Statistical Rating Organizations.
c. Commercial Paper which has received a rating of at least A1 / P1 / F1 by two of the Nationally Recognized Statistical Rating Organizations
d. Repurchase Agreements collateralized by the U.S. Government and U.S. Government Agency securities.
e. Yield Enhancement Strategies that seek returns higher than, or comparable to, traditional cash investments, while diversifying the risk inherent in traditional cash investments. To implement these strategies, liquid non-cash-like securities are often purchased in conjunction with a hedge instrument that substantially hedges away the non-cash-like attributes of the securities. Instruments that may be part of such transactions include: U.S. Treasury securities, sovereign bonds issued by G10 countries, other fixed income securities and precious metals. To hedge away the non-cash like attributes, the following instruments may be used: futures contracts, asset/interest rate swaps, currency forwards, securities lending agreements, and repurchase agreements.
f. Other short-term investment vehicles of similar quality, with an average duration of one year or less.
g. U.S. Treasury securities, U.S. Government Agency securities and U.S. Government guaranteed securities, including but not limited to: all direct obligations of the U.S. Government, Federal Farm Credit Banks, Federal Home Loan Banks, Federal National Mortgage Association, and Federal Home Loan Mortgage Corporation.
h. Internal short-term loans at market interest rates to the University's Central Bank as a substitute for commercial paper which could otherwise be issued externally by the Central Bank under the University's Commercial Paper Notes program. Such short-term loans must be approved by the Vice President for Finance.

2. **Core Portfolio**

The Core portfolio is expected to have moderate volatility with moderate returns, invested primarily in public debt securities and related investment vehicles. It will serve as a secondary source of liquidity, built utilizing excess operating funds not expected to be needed for purposes of funding the operational needs of the University under normal circumstances. This portfolio will be expected to generate higher returns than the Liquidity portfolio through the use of some combination of credit risk, interest rate risk, illiquidity risk and idiosyncratic (active) risk.

a. Public Debt

Specific types of debt include, but are not limited to, sovereign, corporate, inflation-linked, high yield, emerging market, commercial mortgage-backed securities, and residential mortgage-backed securities.

Exposure will be obtained primarily through physical securities, however, from time to time derivative instruments commonly accepted by other institutional investors such as futures, swaps, options, forward contracts, and reverse repurchase agreements may be utilized. Exposures may include long/short positions.

Legal account structures will primarily be in the form of separately managed accounts and institutional commingled funds, however, from time to time limited partnership agreements or other similar forms may also be utilized.

3. **Strategic Portfolio**
The Strategic portfolio will be built utilizing excess operating funds that should not be needed for liquidity purposes. As compared to the Core portfolio, the Strategic portfolio will have higher return expectations and a higher level of expected volatility. These are truly long-term funds and should be thought of similarly to retirement and endowment funds.

a. Risk Balanced
It is expected that this portfolio will be meaningfully balanced across traditional risk factors including equities, real interest rates, inflation (both actual and expected), commodities and credit. Additionally, non-traditional risk factors including value, momentum, carry, defensive and trend may be included. It is also expected that idiosyncratic (active) risk will be taken in this portfolio from time to time.

Exposure will be obtained through physical securities and/or conventional derivative instruments commonly accepted by other institutional investors such as, futures, swaps, options, forward contracts and reverse repurchase agreements.

Legal account structures will primarily be in the form of separately managed accounts, institutional commingled funds and limited partnership agreements.

b. Real Estate/Infrastructure
Specific types of fund investments may be structured as equity and/or debt and include categories broadly defined as core, value added, and opportunistic. In addition, investments may be made in real estate investment trusts and master limited partnerships from time to time.

Legal account structures will primarily be in the form of limited partnership agreements with average tenure of 10-12 years. Separately managed accounts and institutional commingled funds may also be utilized from time to time.

c. Private Debt
Specific types of long-only and long/short strategies including, but are not limited to, distressed debt funds, distressed for

control funds, whole loans and pools, levered loans and pools, and mortgage servicing rights.

Legal account structures will primarily be in the form of limited partnership agreements.

d. Venture Capital
Investments shall be consistent with the University's mission to foster innovation in support of economic development. Maximum allocation shall be $5 million.

Investments require unanimous approval by the Executive Vice President for Finance and Operations and the Chief Investment Officer in consultation with the President.

Utilization of external managers shall be consistent with the guidelines established in CRR 140.011, "*Policy for Investment Manager Selection, Monitoring and Retention.*"

e. <u>Endowment Pool</u>
As part of its Strategic Portfolio, the General Pool may invest in the University's Endowment Pool, as established and governed by CRR 140.013, *"Investment Policy for Endowment Pool."*

E. **Risk Management**

1. The Chief Investment Officer shall establish and implement procedures to:
    a. Regularly monitor the University's cash flow forecasts.
    b. Maintain minimum daily liquidity (securities or investment vehicles which can be liquidated on a same-day basis) equal to 30 days operating cash outflows for the University.
    c. Maintain minimum weekly liquidity (securities or investment vehicles which can be liquidated within 5 business days) equal to 60 days operating cash outflows for the University.
    d. As applicable, maintain overall liquidity sufficient to satisfy credit rating agency guidelines for any self-liquidity needs of the University's debt portfolio.
    e. Maintain a contingency funding plan to address unanticipated market / liquidity events, with the objective of having ready access to cash to meet the University's operating cash flow needs at all times.
    f. Based on the level of projected risk within the General Pool, as modeled by the University's Investment Consultant, maintain appropriate reserves within the General Pool to mitigate drawdown risk, allowing the University to better manage through periods of market volatility.

F. **Excluded Instruments –** The General Pool shall not be deemed to include, and the limitations contained herein shall not be deemed applicable to, any program-related funds, instruments, and assets not held primarily for investment such as interests governed by CRR 70.070, "*Entrepreneurial Activity*."

Naming Opportunity
Welcome and Alumni Center
UMSL

Pursuant to CRR 110.080, naming of buildings and exterior areas requires Board approval. The University of Missouri – St. Louis requests approval to name the new Welcome and Alumni Center the Richter Family Welcome and Alumni Center in recognition of the Richter Family's $8,000,000 commitment to support the construction of the Welcome and Alumni Center facility.

Kirk Richter enrolled at UMSL in 1964, one year after the University was founded, graduating in 1968 with a degree in accounting. Like legions of UMSL students who would come after him, he was the first member of his family to attend college. Kirk spent most of his career at Sigma Aldrich, where he served as Controller, Vice President/Treasurer and Chief Financial Officer.

Maureen Richter, a 1974 graduate of the College of Education, met Kirk in 2008 while part of the Mercy Hospice Bereavement Program as each mourned the death of their first spouse. Kirk and Maureen invested countless personal hours in UMSL – Maureen serving on the College of Education Dean's Cabinet and Kirk as president of the UMSL Alumni Association, member and multi-term president of the business alumni chapter and member of the Chancellor's Council.

Shortly before Kirk's death on Jan. 14 after a battle with cancer, the couple committed an additional $4 million to create a leadership gift of $8 million toward the new Welcome and Alumni Center – the largest individual philanthropic gift to one project in the university's history. Kirk was preceded in death by his first wife, Kathleen Richter. He is survived by his wife, Maureen, children Laura and Daniel (Kelsey) Richter; Stephen (Renae), Christopher (Annette), Daniel (Chiara) and Jonathan (Hannah) Peterson, and 16 grandchildren.

In recognition of and tribute to the Richter's extraordinary philanthropy and leadership to UMSL, we propose naming this new space the Richter Family Welcome and Alumni Center.

University of Missouri President Mun Choi and the Chancellor Kristin Sobolik support this naming.

No. I

Recommended Action - Naming Opportunity, UMSL

It was recommended and endorsed by President Mun Y. Choi and UMSL Chancellor Kristin Sobolik, moved by Curator ________________ and seconded by Curator ________________, that the following action be approved:

that the new Welcome and Alumni Center be named the Richter Family Welcome and Alumni Center.

Roll call vote of the Committee:	YES	NO
Curator Graves		
Curator Hoberock		
Curator Layman		
Curator Williams		

The motion ____________________.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ____________________.

FINANCE COMMITTEE

Greg E. Hoberock (Chair)
Todd P. Graves
Jeff L. Layman
Michael A. Williams

The Finance Committee ("Committee") oversees the fiscal stability and long-term economic health of the University. The Committee will review and recommend policies to enhance quality and effectiveness of the finance functions of the University.

I. Scope

In carrying out its responsibilities, the Committee monitors the University's financial operations, fundraising performance, debt level, capital priorities and investment performance; requires the maintenance of accurate and complete financial records; and maintains open lines of communication with the Board about the University's financial condition.

II. Executive Liaison

The Vice President for Finance of the University or some other person(s) designated by the President of the University, with the concurrence of the Board Chair and the Committee Chair, shall be the executive liaison to the Committee and responsible for transmitting committee recommendations.

III. Responsibilities

In addition to the overall responsibilities of the Committee described above and in carrying out its responsibilities, the charge of the Committee shall include

A. Reviewing and making recommendations to the Board on the following matters:
    1. University operating budget and financial plan;
    2. University capital budget and master facility plans;
    3. capital projects;
    4. tuition, fees and housing rates;
    5. state appropriation requests;
    6. pursuant to applicable Collected Rules and Regulations, contracts and reports;
    7. insurance brokers and self-insurance programs;
    8. pursuant to applicable Collected Rules and Regulations, real estate sales, purchases, leases, easements and right-of-way agreements;
    9. the issuance of debt;
    10. asset allocation guidelines and other policies related to the University's investment management function; and
    11. additional matters customarily addressed by the finance committee of a governing board for an institution of higher education.

B. Providing governance oversight to:
    1. long-range financial planning strategies;
    2. fundraising and development strategies;
    3. total indebtedness and debt capacity of the University;
    4. the investment portfolio performance; and
    5. the financial condition of the pension fund.

C. Reviewing periodic reports including:
    1. quarterly and year-end financial reports that measure the University's fiscal condition;

2. annual purchasing reports on bids and equipment leases;
3. quarterly debt-management reports;
4. quarterly and year-end investment performance reports;
5. semi-annual reports on development and fundraising activities; and
6. other financial reports as requested by the Committee.

Approved by the Board of Curators: Feb 4, 2021

Fiscal Year 2023 Budget Update
UM

At the April 2022 Board of Curator's meeting, Executive Vice President for Finance and Operations Ryan Rapp will provide an update on development of budgets for Fiscal Year (FY) 2023. The Board of Curators will approve the operating budget at the June meeting.

A key component of financial health of any institution is commitment of the institution's leadership to sound financial management and the Board holding leadership accountable for maintaining the institution's financial health in the context of its strategic objectives. The financial plan approved at the February Board meeting translates the strategic plan into multi-year financial initiatives and defines financial performance expectations for each institution. This is the first step in the annual financial planning cycle; the next step is budget, which serves as the plan for the next year and establishes operating performance expectations.

For FY2023, each university and MU Healthcare is expected to submit a budget with operating performance within an acceptable range of the Board approved financial accountability targets for approval at the June meeting.

Table 1: Financial Accountability Targets by Unit

	UM	MU	UMKC	Missouri S&T	UMSL	MU Healthcare
Operating Margin	>2.5%	>2.0%	>1.0%	>2.0%	>1.0%	>7.0%
Spendable Cash to Operations	>1.0	>0.80	>0.55	>0.80	>0.55	200 DCOH
Spendable Cash to Debt	>2.0	>1.6	>1.0	>1.6	>1.0	>1.5
Debt Service Coverage*		>3.0	>2.5	>3.0	>2.5	>4.5
**Metric used to determine if unit can afford to take on additional debt service*						

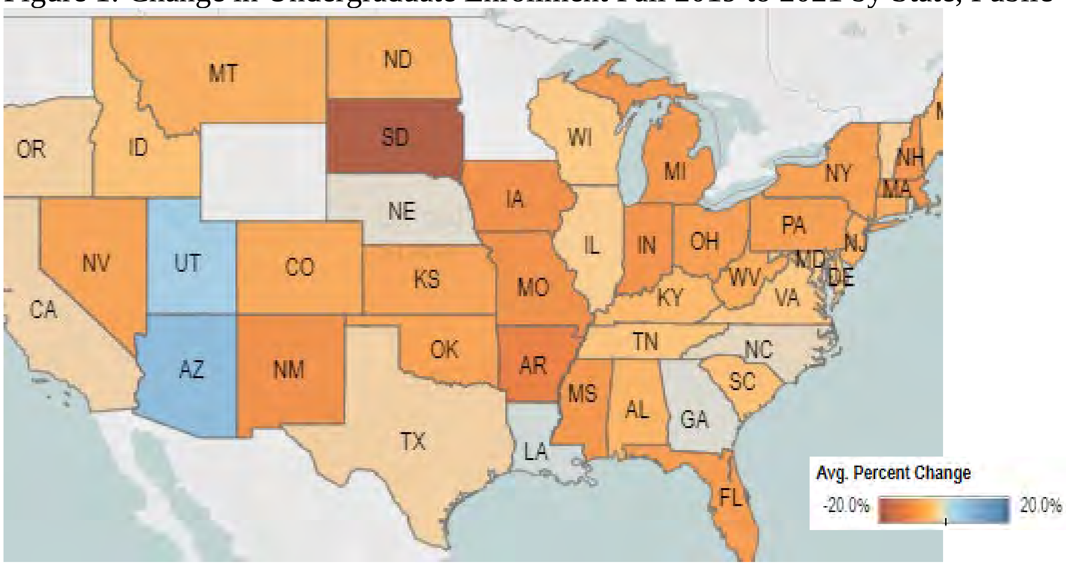
<u>2022 Moody's Higher Education Outlook – Emerging from the Pandemic</u>

Moody's 2022 outlook is stable for the U.S. higher education sector as students repopulate campus. The repopulation of campus is driving modest increases in tuition and significant year over year growth in auxiliary revenues. Record investment returns in FY 2021 have bolstered institutions' wealth and liquidity, especially those with large endowments and pensions. Over the next year, the higher education sector will be challenged to maintain accessibility and affordability amid a period of high inflation and labor shortages, which will drive spending up.

Net Tuition & Fees and State Appropriations

Nationally net tuition revenue is projected to moderately increase over prior year, which encompasses 38% of public institution's operating revenues. The enrollment trend resulting from the pandemic has caused an exponential decline as the life cycle of a cohort will span across 4-6 years. Smaller cohorts in Fall 2020 stemming from the beginning of the pandemic will have a continuing negative impact on net tuition in FY 2023 and beyond. The National Student Clearinghouse Research Center reported undergraduate Fall 2021 enrollment for 4-year public institutions is down 4% from Fall 2019, the freshman cohort during this period is down 10.1%. Figure 1 presents the undergraduate enrollment change by state from Fall 2019 to 2021. Over this period the undergraduate population at Missouri 4-year public universities experienced an 8.6% decline.

Figure 1: Change in Undergraduate Enrollment Fall 2019 to 2021 by State, Public 4-year



Source: National Student Clearinghouse Research Center

Tuition pricing power and enrollments will remain constrained as students continue to see short-term earnings outweighing the current cost of obtaining a higher education degree. Discounting tuition for 4-year institutions is expected continue gradual increases. Only 22% of first year students in 2019-20 paid full tuition without receiving any form of financial aid.

Nationally, state revenues are expected to show slower growth or flatten into FY 2022 after strong growth in FY 2021. Strong state finances generally result in increased funding for higher education institutions.

Auxiliary Enterprise

During the pandemic, auxiliary revenues experienced steep declines of nearly 35% in FY 2020 and 2021 combined. Auxiliary revenues generally trended with campus depopulation as events were canceled or void of spectators. Moody's projects auxiliary revenues at four-year institutions will rebound quickly and outpace net tuition growth with campus repopulation.

Patient Medical Services

Moody's December Outlook Report noted "Patient care revenue will rise as academic medical centers and universities' other health care operations benefit from pent-up demand for treatments and surgeries and the continuation of telemedicine. Labor shortages, however, will dampen revenue growth, with institutions unable to meet rising clinical demand because of insufficient staffing."

Grants & Contracts
Research universities receive significant revenue in the form of grants and contracts from federal, state and local governments and private industry for specific projects. These monies serve as the engine for the research enterprise. Garnering these funds is incredibly competitive and the use of these funds is highly restricted. With the increase in federal budgets for research through the pandemic, there will be more research funding available for the universities to compete. However, it is important to note the federal government views academic research as a partnership, with reimbursements of overhead failing to cover the full costs of research.

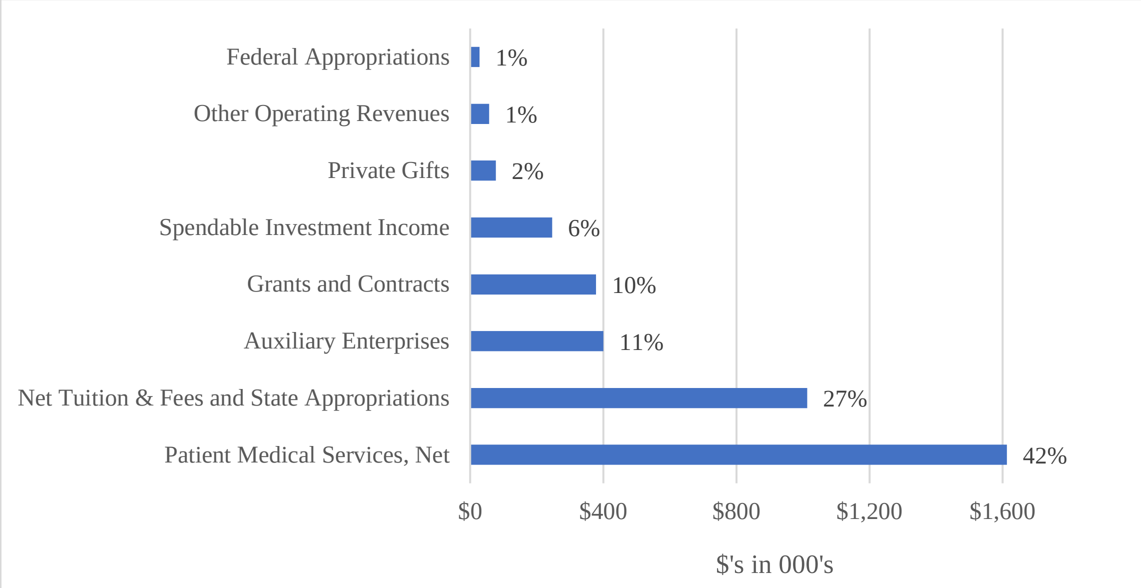
Investment Income and Private Gifts
Philanthropy and endowment income support 10% of core public institutional budgets, with a wide variation in the level of support. Record investment returns in FY 2021 have built wealth and liquidity for the higher education sector. Moody's December Outlook Report noted "median annual returns of 30-40% for FY 2021 increased the sector's total cash and investments by around 35%." Greater wealth and liquidity provide universities with financial flexibility and improved balance sheet measures to invest in capital projects.

Inflation
The higher education sector is not immune to the increase inflation. Elevated commodity prices and supply chain issues associated with building materials will be challenging as capital projects ramp up following a pause during the pandemic. Margins for institutions will continue to diminish the longer inflation remains high unless revenues can continue to keep pace with inflationary pressure. Moody's December Outlook Report noted "The higher costs will come into play just as many institutions begin to reinvest in programs and hiring following significant cuts made in fiscal 2021, many of which were one-time in nature, to offset Covid-related revenue losses. Colleges will be hard-pressed to pass these higher expenses on to students, given the difficulty of raising tuition in a cost-conscious market. EBIDA margins in fiscal 2022, while improving from the prior year, will remain depressed as a result, with only around one-third of public universities and half of privates likely to generate margins greater than 10%"

Labor Shortages
Universities responded quickly to the sharp revenue declines caused by the pandemic; in FY 2021 the higher education sector saw a 14% reduction in employment. Moody's December Outlook Report noted "While some of these cost reductions were one-time in nature and will be restored, some savings will be permanent because of the use of new technology, smaller footprints due to continued remote working, and online teaching."

The University of Missouri's FY 2022 Revenue Outlook

Figure 2: Projected FY 2022 Operating Revenue Source by Type, excludes Investment Income and Federal Stimulus Funding



Patient Medical Services Revenues are generated by the patient care areas of the University's healthcare operations. A key piece of the institution's research growth strategy is further improving the research profile of the academic medical center. This improved research profile should have downstream clinical impacts, with higher quality researchers contributing to better clinical care, and supporting more capital investment and research faculty within the clinical care units. Patient service revenue now accounts for 42% of the University's total operating revenues and remains the largest driver of growth at the institution. The most recent long-range financial plan projects patient revenue to grow by approximately 6% annually but the percentage of the University's total operating revenue it represents should remain constant. MU Healthcare drives the majority of net patient revenues, with several small clinics on the UMKC campus also contributing.

Net Tuition & Fees and State Appropriations are the "lifeblood" of an academic institution, as these are the revenue sources that support the core mission of education, public service, research and economic development. These two funding sources build the base of funding for academic operations, as they are the primary funding sources unencumbered by restrictions that relate to the core mission. Gifts and grants generally come with specific restrictions or a specific scope of work. Auxiliary and healthcare operations incur their own cost structures to generate revenue, and while they may provide some level of support to academic operations, the level of support is very small when compared to tuition and state appropriations. At the University, these sources represent 27% of the University's total operating revenue.

Auxiliary Enterprise revenues are generated by self-supporting operations that run on a break even or better basis. Auxiliary enterprises are a diverse group of service units that offer goods and services to the University community that help maintain a fully functional research university, but don't contribute directly to the institution's core mission. Examples of auxiliary operations include student housing, student dining, and bookstores. Although a few operations generate a "profit" or net revenue, auxiliaries typically do not generate significant funds to reinvest in core campus operations. However, it is critical these operations are operated in a sustainable manner and considered in the total cost of attendance for students. These revenues represented 11% of the University's total operating revenues.

Grants & Contracts represent contractual revenues to perform activities related to the University's core mission, generally undertaken on a cost-reimbursement basis. The vast majority of the Universities' grants and contracts relate to their research mission. Across the higher education industry, research costs are higher than the revenue generated. At the University, on average, research costs about $1.24 for every dollar of research revenue generated. The source for that subsidy is generally tuition or state appropriations, as the other portions of the University's revenue are generally offset with breakeven expenses.

There is an economic, competitive, and intellectual development aspect to bringing extramural research awards to the University. Nearly all grants awarded to the University involve the addition of grant-funded positions for employees and students to conduct the research in conjunction with a faculty member, commonly referred to as a principal investigator (PI). Principal investigators that can attract substantial extramural research awards generate jobs and income in the Missouri economy which assists in the Gross Domestic Product (GDP) and competitive environment of the state. These research funding streams are also key to the University retaining its status amongst the pre-eminent research universities in the country. Grants and contracts represented 10% of total operating revenues for the University.

Spendable Investment Income represents the current spending portion of investments driven by endowment pool and general pool spending policies. Some public research universities, the University of Missouri included, receive income from investment returns on institutional cash balances and their endowment. Only a handful of public research universities benefit from significant endowments without specific donor restrictions. One such example is the University of Michigan, which now earns more in investment income than it receives from state appropriations. Even while investment balances remain large in this case, the dollar amount per enrolled student is still low when compared to private peer institutions. The University has reshaped this investment distribution process via the general pool dividend, where the use of the funding is approved by the Board on an annual basis for strategic investments proposed by each institution. This process will remain in effect for FY 2023 and the dividend uses will be presented for approval at the September Board Meeting.

Private Gifts support 2% of the University's total operating revenue and does not include permanently endowed funds given to the University to provide on-going support through investment returns. Private gifts will typically fund specific projects or purposes with a wide variation in the level of support. This often results in institutions having to provide operational support for amounts received. In short, this support is not a substitute for state appropriations, tuition, and other unrestricted funding. While philanthropic gifts advance the institution, it is the responsibility of public research universities to find creative ways to use philanthropy to support core operations.

Other Income Sources represent the remaining revenues acquired by the University and represents 1% of total operating revenues. These sources include royalties, rental income, and other miscellaneous sources. While the amount of these sources varies by campus, of these sources, only 30% represent unrestricted income available for supporting the University's core mission.

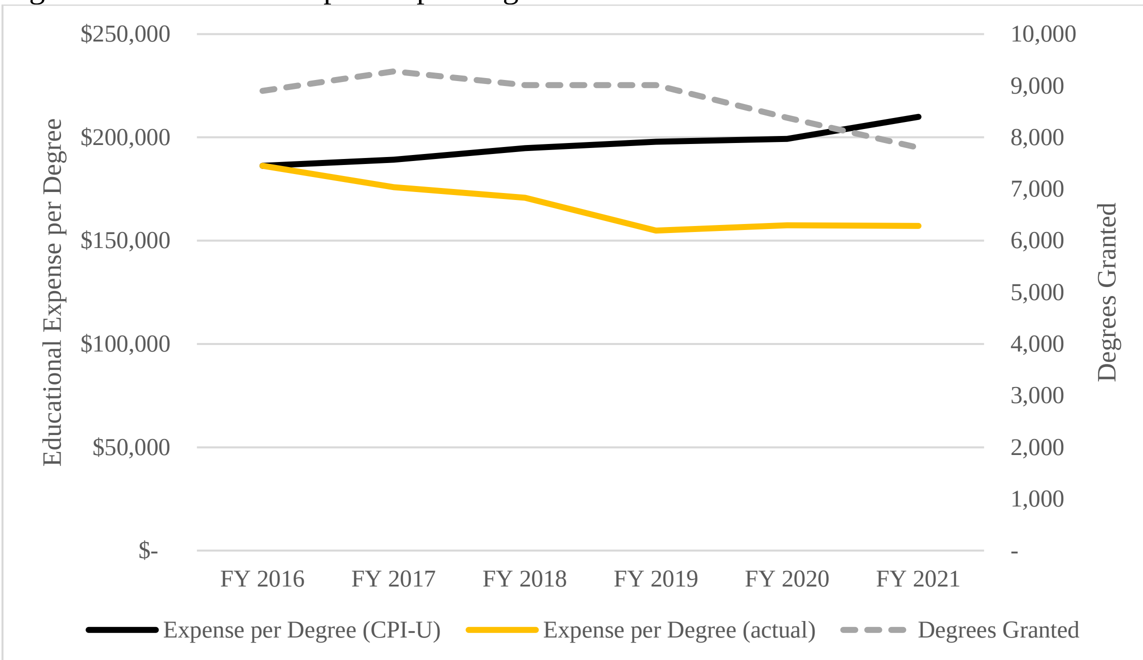
Federal Appropriations represents federal funding received through the Smith-Lever and Hatch Act awarded by the National Institute of Food and Agriculture to support agriculture extension work. The University also receives federal interest rate subsidies through the Build America Bond program.

The University remains focused on growing revenue sources outside of tuition and state appropriations. However, these sources' ability to impact the academic enterprise and academic quality are small in comparison to tuition and state appropriations. For instance, growing other revenue sources by 10% would generate an amount equal to a 1% increase in tuition and fees. In addition, it will take a significant amount of time for alternate revenue sources to become a large part of the University's operating budget. It is very difficult to generate additional revenue from external sources such as philanthropists, alumni, or others without restrictions or specific designations on its use.

Expense Management initiatives helped to balance budgets within available sources

From FY 2016 to 2022, the University experienced significant revenue disruptions to the academic enterprise. The first involved a significant enrollment decline at the largest campus, followed immediately by the onset of a nationwide pandemic that limited the University's ability to conduct its operations. Between the two crises, the University had to reorganize operations and make significant reductions to operations. These reductions were more than just volume driven; the University also reduced the amount of cost per unit of output (degrees granted).

Figure 3: Educational Expenses per Degree Granted



Note: Educational expenses excludes expenditures for auxiliaries, healthcare, and funding received from grants/contracts.

Between FY 2016 and 2020 (prior to the implementation of COVID cost reduction measures), the University's educational cost per degree granted (spending on instruction, public service, and administrative functions) declined by 9% when compared to inflation. It is important to note the enrollment drop from the smaller freshman class in Fall 2017 takes four years to show up in the degrees granted, meaning the recruitment events dating to November 2015 did not show up as a degree reduction until 2020.

As service organizations, most spend at the University and most public research universities relates to compensation. To deal with the revenue crisis, the University had to impact staffing to reduce costs. Most staff and spend occurs close to delivery of the mission and is controlled by deans and department chairs. Over half of spend and staffing in the organization is distributed across the colleges and schools. Each university implemented cost reduction measures to balance budgets with the demands of each institution's mission over the preceding six years. As demonstrated in the table below, the University reduced the labor force by 1,112 positions from Fall 2015 to Fall 2021. Job functions of university staff vary, with a wide array of staff performing jobs that support mission delivery; allowing faculty to focus efforts on teaching, research, and public service. These reductions in staff roles are in response to the budget challenges but also represent an intentional effort to change the way work is done through shared services, technology and administrative streamlining. It will be important these efforts continue. These job loss figures exclude faculty which were also reduced over the same period.

Table 6: 2015 to 2021 Changes in Full-time Staff Positions

Occupational Grouping	Fall 2021	Change in	Percent
Office & Admin Support	1,531	(905)	-37%
Maintenance, Construction, Transportation	484	(212)	-30%
Service	783	(123)	-14%
Business Ops & Management	2,116	(122)	-5%
Instructional Support	269	(66)	-20%
Community Service & Arts	1,236	(62)	-5%
Other	142	(30)	-17%
Healthcare Practitioners	1,036	142	16%
IT/Engineering/Science	1,812	266	17%
Total	9,409	(1,112)	-11%

Source: Institutional research Table 3.10

Over the same period, the University also reduced the number of tenured and tenure track faculty in response to the declines in both enrollment and state support. The reductions in faculty and staff correlate with the drops in both degrees (12% decline) and full-time equivalent enrollment (13% decline).

Table 7: 2015 to 2021 Change in Tenure/Tenure-Track Positions

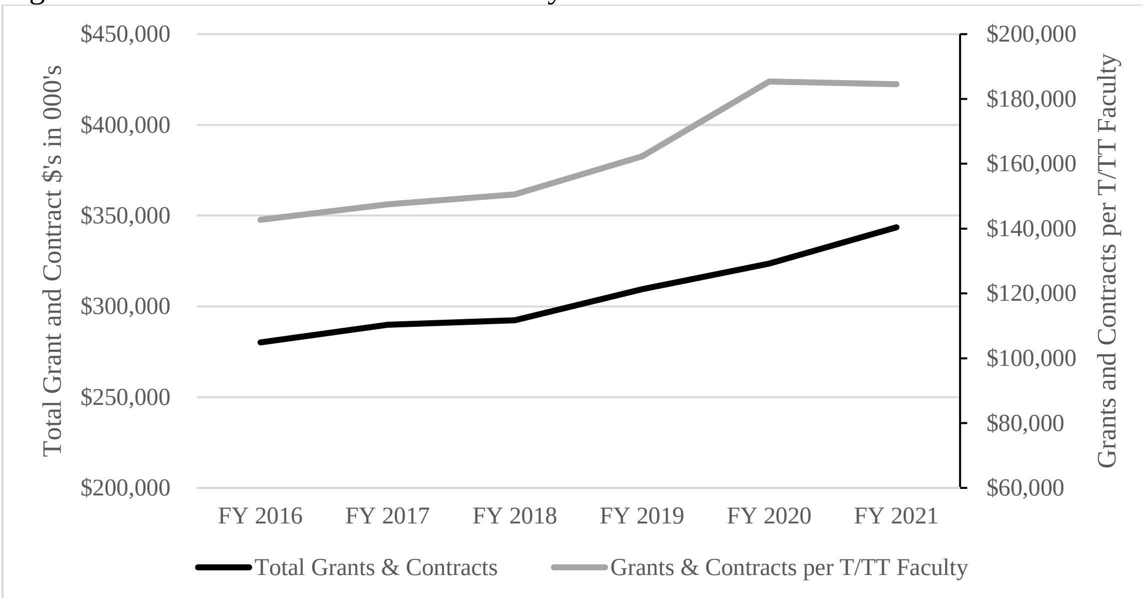
Tenure/Tenure Track Faculty	Fall 2021	Change in	Percent
Full Professor	749	(48)	-6%
Associate Professor	626	(112)	-18%
Assistant Professor	402	(26)	-6%
Total	1,777	(186)	-12%

Source: Institutional research Table 3.10

If the University's staffing and faculty costs dropped by roughly an order of magnitude of volume, why didn't the University stay flat in the operating degree per student category? Two factors drove the change: improved research productivity and less than inflationary growth in net tuition and state support per degree granted.

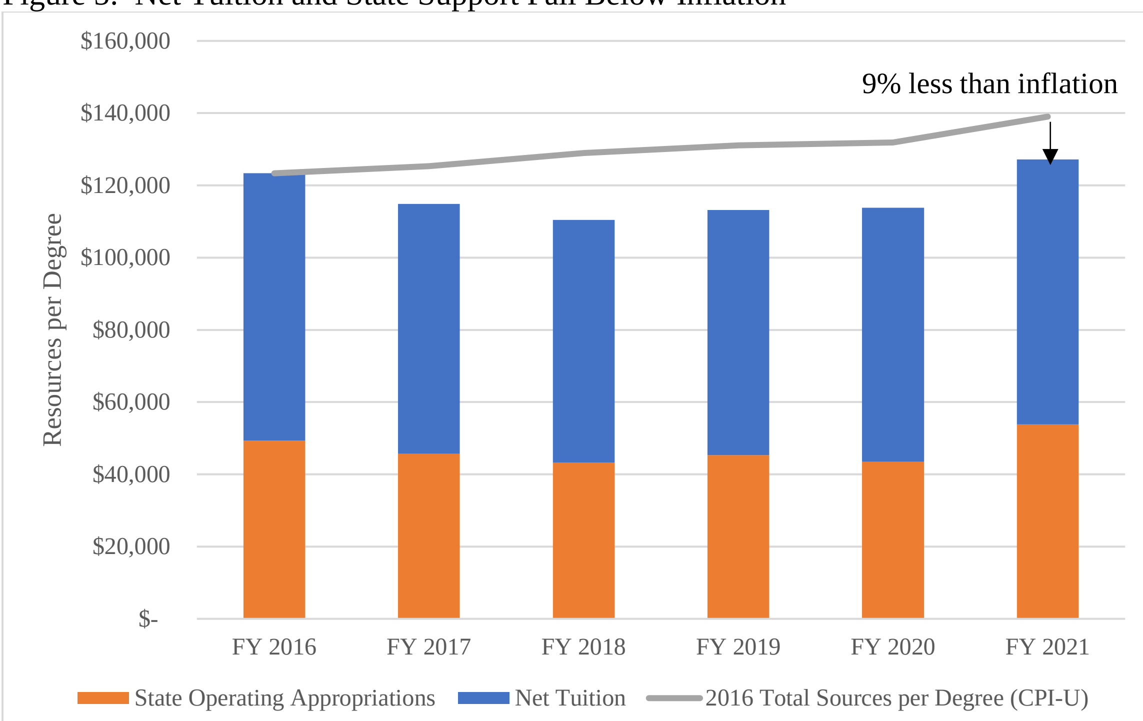
Over the past five years, the University has begun to grow grants and contracts revenues by improving the research productivity of current faculty. Since FY 2015, grants and contracts revenue per faculty has grown by 29%, driving an overall growth in grants and contracts revenue of 23% as the number of tenured and tenure track faculty have declined.

Figure 4: Grants and Contracts Productivity



From FY 2016 to FY 2021, state support and net tuition received per degree ended the period unchanged, at about $123,000 per degree in nominal terms. However, when accounting for impact of inflation, actual resources per degree issued fell by 9%.

Figure 5: Net Tuition and State Support Fall Below Inflation



Looking back at the past five years, the University made decisions to respond to the financial challenges faced. These challenges stemmed from the enrollment losses and the global pandemic. However, for the FY 2023 budget cycle and longer-term trends faced by the University look to be shifting as the broader environment for higher education adapts to a new economic cycle:

- The University System has stabilized enrollment, but some challenges at individual universities remain. Each university will have to continue to compete well for a declining student population.

- State revenues continue to grow, leaving funding available for investment in higher education that has not been seen in the past two decades.

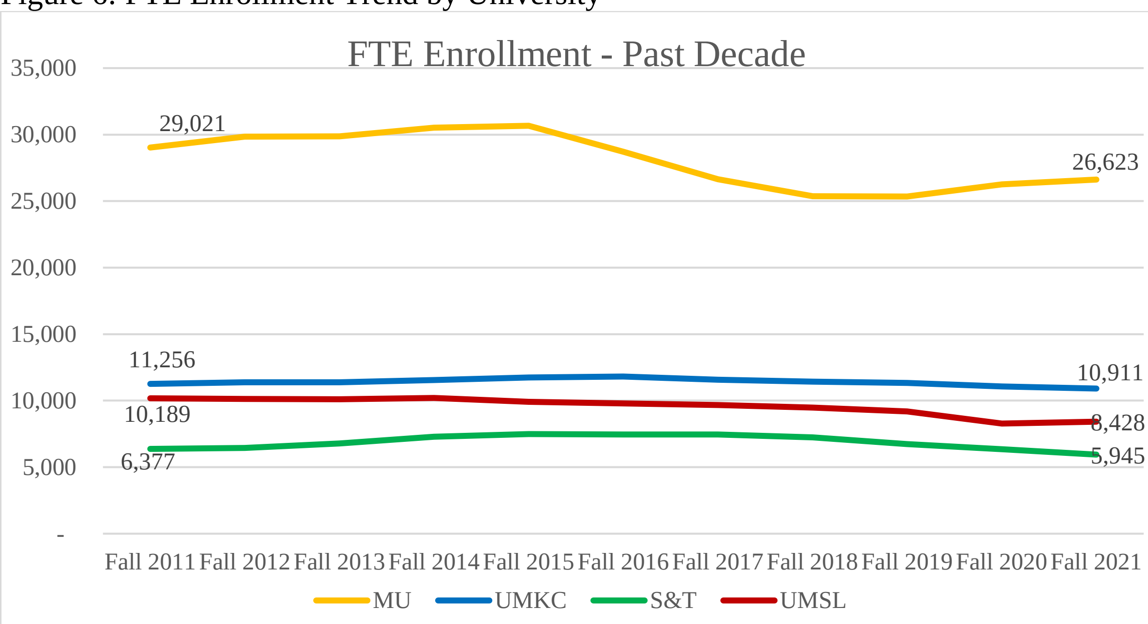
- The funding environment for federal research has improved, especially in response to the additional research emanating from the pandemic.

- Inflationary pressures will serve as a mitigator to funds available for new investment.

Enrollment for Fall 2023 – Third Year Defined by Pandemic

According to data from the National Student Clearinghouse Research Center, undergraduate Fall 2021 enrollment for public four-year institutions declined by 2.5% from previous year whereas graduate enrollment experienced a 3.9% increase. Undergraduate enrollment was declining before the pandemic. The pandemic accelerated this decline. From Fall 2016 to 2021, undergraduate enrollment dropped 4.2% at public four-year institutions.

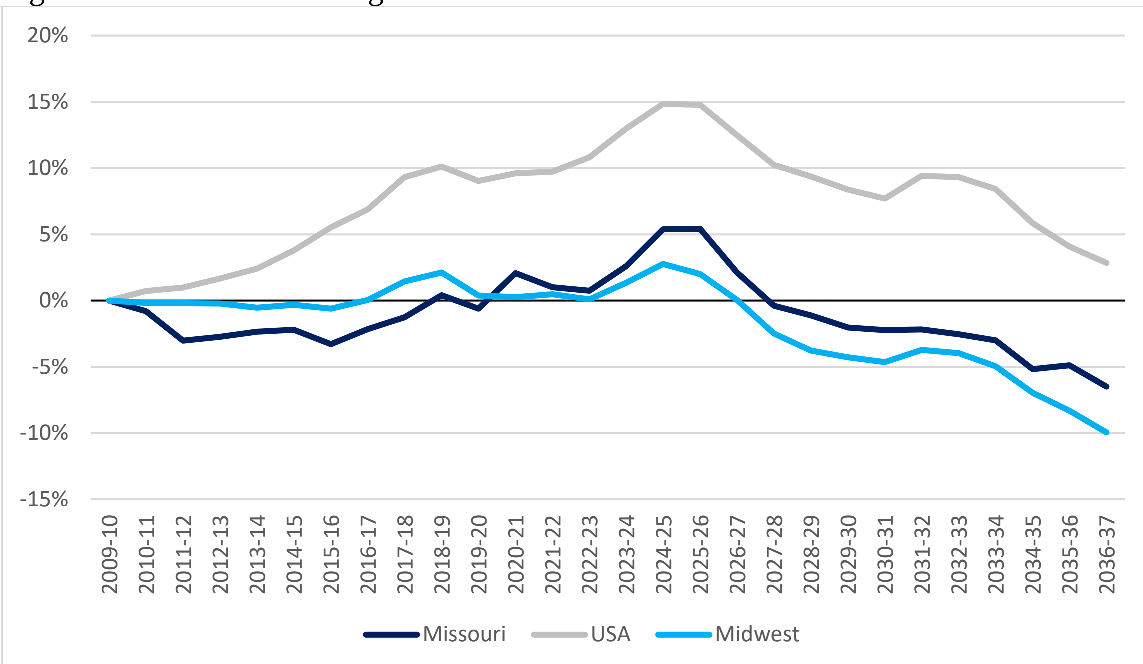
Figure 6: FTE Enrollment Trend by University



Source: Institutional Research Table 1.21

The University's enrollment trend faces pressure similar to the national trend. MU's enrollment has started to increase as freshman enrollment improves and smaller cohorts from Fall 2016 and Fall 2017 graduate. While MU increased in total FTE students for the Fall 2021, UMSL, UMKC and Missouri S&T's enrollment all declined. This has been a continuation of a slow downward trend since peaking in the fall of 2015.

Figure 7: Trend in Future High School Graduates



Source: WICHE Knocking at the College Door Report

Figure 7 shows the trend in enrollment growth from 2010 through 2037. The three lines represent Missouri, the Midwest Region, and the United States in total. High school graduates in Missouri will trend upward through the fall of 2026 after a slight decline after the past three years. Past 2026, high school graduates will begin dropping across the nation and in Missouri. These demographic challenges will place pressure on future enrollment growth for traditional students.

In reviewing enrollment trends and data, it is important to note the differences between the student populations at each institution for Fall 2021 enrollment. MU and S&T tend to have enrollment driven more by traditional students that matriculate as freshman. The urban universities' undergraduate populations are more dependent on transfer students.

	MU	Missouri S&T	UMKC	UMSL
Undergraduate Students				
Headcount *(excludes dual credit)*	23,696	5,696	6,945	6,008
% of Total Undergraduate Headcount (*across the 4 institutions)*	56%	13%	16%	15%
Transfer Students[1]				
Headcount	1,367	234	999	1,147
% of Institution's Undergraduate Headcount *(excludes continuing & dual credit)*	20%	16%	43%	70%
First-time College Freshman[1]				
Headcount	4,843	1,188	1,148	296
% of Institution's Undergraduate Headcount *(excludes continuing & dual credit)*	71%	82%	49%	18%

Note 1: Population is degree seeking

Current enrollment trends for the fall reflect overall year over year growth in first-time college admits and acceptance over prior year. MU and UMSL have experienced positive year-over year growth in first-time college admits and acceptance. Missouri S&T first-time college admits are up from prior year, however acceptance is currently down when compared to prior year. UMKC first time college admits are flat from prior year and acceptance is down slightly over this point in the process from prior year. This data is monitored on a weekly basis and each institution is focused on enrolling their class and taking actions to improve admissions and yield. Budgets will reflect the most recent enrollment estimates and ensure appropriate cost actions are taken to keep budgets balanced, if necessary.

Looking Forward

Tuition and fees and state support serve as the cornerstone to sustain quality research universities for the State of Missouri. The State support and public policy changes made by legislators and the Governor over the past two years reinforce the State's commitment in the University. This is further reinforced by the Governor recommending a 5.4% increase for the FY 2023 recurring appropriations.

The State has also made investments in the University's infrastructure during this period. FY 2021 the University received $36 million from the State for critical maintenance and repair projects across the four universities. In FY 2022 the State appropriated $21 million to the University to support a new veterinary laboratory at MU, capital improvements at the Delta Research Center, and the Advance Manufacturing Building at Missouri S&T. In FY 2023 the Governor has recommended to support each of the universities' highest capital investment priority, totaling $225.75 million.

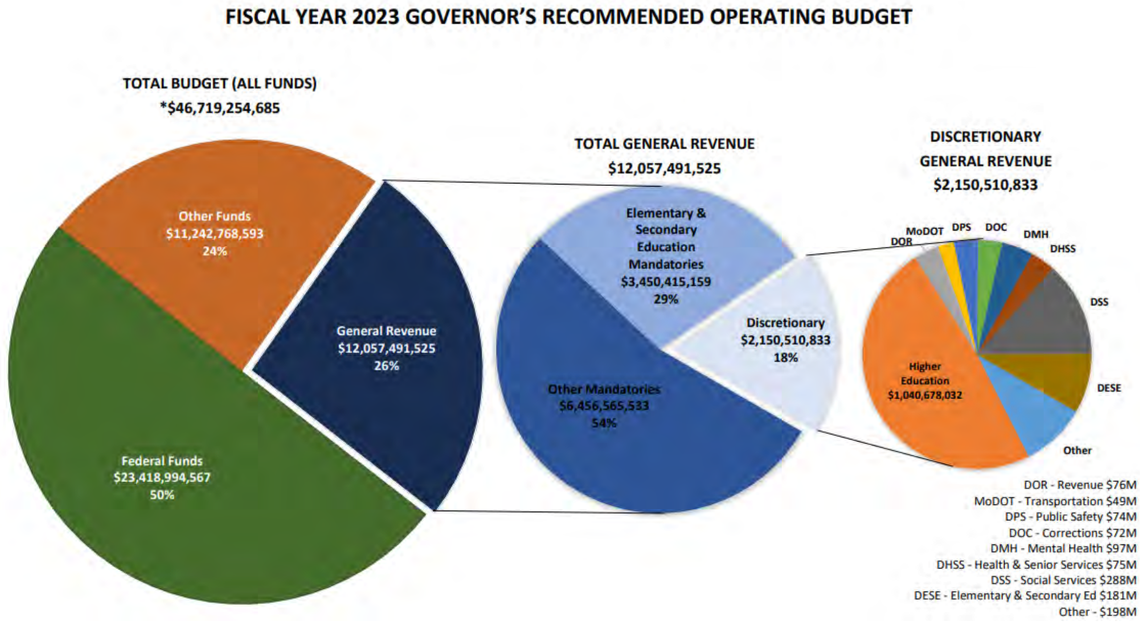
In addition to the improved operating support, the legislature and Governor have allowed universities to modernize methods of charging tuition with plateaus and differential tuition. With plateaus and differential tuition, the University will be able to price tuition to fund investments need to maintain quality and provide the student with a predictable simplified fee structure based on their program. However, in doing so, the University also needs to exercise restraint and ensure students receive a high-quality education and improve completion rates and time to complete. The University will bring forward the Fall 2023 and 2024 tuition and fee recommendations at the May Board meeting.

State Budget Growth and Federal Stimulus Provides Significant Support to Higher Education and Workforce Development

The State's budget continues to see significant revenue growth with increases in tax collections and the one-time federal stimulus funding. This available funding has shifted the outlook for higher education, with increases to operating appropriations and capital appropriations readily available for the first time in nearly a decade. Higher Education continues to serve as the balance wheel for state budgets, participating disproportionately in both increases and decreases in available state funding.

Missouri's economy and employment was able to recover faster and did not decline as much in comparison to the national economy since the start of the COVID-19 pandemic. Personal income received remains strong from federal stimulus payments. The wage growth experienced this year has not occurred in more than two decades. As the labor market continues to recover, wage growth is expected to continue thereby increasing income tax collections. The Governor's FY 2023 budget is based on a forecasted increase of 2.1% in income tax collections.

Figure 8: Governor’s Operating Budget by Funding Restrictions



Higher education continues to compose the largest are of discretionary spending for the State. Moving forward, the University plans to continue engaging with elected officials to demonstrate the value and return on investment for research universities in the state of Missouri. Initial returns on this strategy have worked well, with the University receiving a significant share of the capital money available through the federal stimulus funding. The University’s government relations team will continue to advocate for additional state funding to support the University’s efforts to grow other revenue streams to improve research and economic development for the state.

<u>The Impact of Inflation</u>

While the above sections note potential positive revenue factors, much of that revenue growth could be consumed by rising prices for the University’s key areas of cost. For calendar year 2021, the Consumer Price Index rose by 7.0%, the highest level of inflation in four decades. Inflation is moving to levels not experienced by current employees, and the University will need to focus on adapting to these inflationary pressures without impacting competitiveness. To date, the University has already experienced the following inflationary pressures in non-personnel costs:

- The University’s primary fuel supplier for the MU Powerplant increased prices by 10% over the prior year and another 14% for FY 2023.
- Over the course of FY 2022, the University’s primary paper supplier increased costs by 10% with three separate price increases.

- MU Healthcare faces significant cost pressure, with the primary supplier of medical supplies increasing prices by 7% in FY 2022 with further increases expected in FY 2023.
- Like all organizations, the University is experiencing significant labor force challenges. MU Healthcare and the medical schools are struggling to hire and retain nurses and healthcare workers, and wages to attract new employees continue to rise. Some of the same pressures have occurred in other units across the University, with voluntary turnover increasing and time to fill job openings lengthening out over several months for key positions.

However, these inflationary pressures are not uniform across the organization. The University will take a strategic approach in addressing inflationary pressures, especially as they relate to wages and areas of value within the organization. The University will not take across the board actions to address salary inflation, but rather, take a strategic approach driven both by market factors, employee performance, and relationship between the salary areas and each institution's goals.

A key piece in responding to these inflationary pressures will be improving revenues in line with inflation (for areas that need to be maintained) or growing revenues above inflation (for areas needing investment). Growing revenues at or above inflation is a key indicator of a healthy business operation.

Budget Plans will Support Academic Excellence

Over the past two decades, the University maintained academic quality through successive state budget challenges, an enrollment crisis, and inability to increase tuition due to statutory tuition caps. For the coming year, the State's budget has significant sources of revenue that will facilitate additional capital investment. Differential tuition and plateaus are now possible. Now is the time for a bold vision to build an academy that supports the future workforce, research, and economic development needs of the state. The additional investment through the budget process requires a focus on generating investments that support:

1) Improving student academic success through increased graduation rates, time to completion and increased placement outcomes.

2) Growing research faster than the market, improving the ranking to national public research university peers, as the state has no public institutions with similar research profiles.

To generate improved outcomes, the University will change the way it operates by:

1) Holding faculty and staff to high standards, but also compensating them for those standards.

2) Increasing tuition to reflect quality improvements, but in a way that is reflective of the demand for degrees.

3) Pushing for public policy in Missouri higher education that rewards quality and outcomes.

4) Providing citizens and legislators with an understanding of the benefits of what they get for what they spend with the University of Missouri.

Next Steps

Between the April and June Board meetings, the University's leadership team will take any feedback from the Board and incorporate it into the current budget planning process underway. As a reminder, the Budget is the next step in the financial performance process:

Feb.	• Board Approves FY 2023 Financial Performance Targets • Presentation of Long-range Financial Plan
April	• Trends Driving FY 2023 Budget • Board Approves Five-year Capital Plan
May	• Board Approves Tuition and Fees for FY 2023 and 2024
June	• Board Approves FY 2023 Operating Budgets • Board Approves Appropriations Request for FY 2024

At the June Board meeting, each university and MU Healthcare will submit their FY 2023 budget to the Board for approval. Budgets are expected to remain within an acceptable range of the targets defined in the financial planning process.

Defined Benefit Plan Financial Management Strategy
UM

Management recommends the following items for Board approval:

- Approve changes to the Plan's asset allocation targets - CRR 140.015 *Investment Policy for Retirement, Disability and Death Benefit Plan*

- Adopt new financial management policy for the Plan - CRR 530.020 *Retirement, Disability and Death Benefit Plan Financial Management Policy*

- Accept changes to the Plan's actuarial assumptions as recommended by Segal's *Report on Actuarial Valuation Assumptions Study*

The details of each of these items was presented to the Board of Curators at a joint meeting of the Finance and the Governance, Compensation and Human Resources Committees held on March 25, 2022.

Supporting materials for each of these items is enclosed.

No. 1

Recommended Action - Approval of Defined Benefit Plan Financial Management Strategy, UM

It was recommended by Executive Vice President Ryan Rapp, endorsed by President Mun Y. Choi, recommended by the Finance Committee, moved by Curator _______________ and seconded by Curator _______________, that the:

Defined Benefit Plan Financial Management Strategy be approved, inclusive of the following items: Amendment of existing Collected Rules and Regulations, Section 140.015, *Investment Policy for Retirement, Disability and Death Benefit Plan,* as noted in the attached documents; adoption of new Collected Rules and Regulations, Section 530.020, *Retirement, Disability and Death Benefit Plan Financial Management Policy*, as noted in the attached documents; and, acceptance of the changes to actuarial assumptions for the University's Retirement, Disability and Death Benefit Plan as recommended by Segal in the attached Report on Actuarial Valuation Assumptions Study:

Roll call vote of the Committee:	YES	NO
Curator Graves		
Curator Hoberock		
Curator Layman		
Curator Williams		

The motion ___________________.

Roll call vote of Board of Curators:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion _________________.

140.015 Investment Policy for Retirement, Disability and Death Benefit Plan

Bd. Min. 6-26-12, Revised Bd. Min. 6-14-13, Revised Bd. Min. 9-12-13, Revised 6-25-15, Revised 2-4-16; Revised 4-14-16; Amended Bd. Min. 9-28-17.

A. **Introduction** -- The University's Retirement, Disability and Death Benefit Plan ("Plan") was established to provide retirement income and other stipulated benefits to qualified employees in amounts and under the conditions described in the plan. A Trust was established in 1958 and is being funded to provide the financial security of those benefits.

B. **Responsibilities and Authorities –** See CRR 140.010 "*Policy for Management and Oversight of Selected University Investment Pools*."

C. **Investment objectives** -- The primary objective to be achieved in the active management of Trust assets is to provide for the full and timely payment of retirement, disability and death benefits to qualified employees. In order to fulfill this objective the University must maintain a prudent actuarially sound funding of the Plan's liabilities. This funding requirement is derived from three principal sources; the total investment return on Trust assets and the amount of University and employee contributions.

   Trust assets should be managed in a manner that maximizes returns while attempting to minimize losses during adverse economic and market events, with an overall appetite for risk governed by the Plan's liability structure and the need to make promised benefit payments to members over time. This will be accomplished through a more 'risk-balanced' portfolio that seeks meaningful diversification of assets, which necessarily means less equity risk and more long-term bond exposure relative to peers. To offset potentially lower returns from a more risk-balanced portfolio, a key component of this strategy includes a less common, yet prudent, program of return enhancement commonly referred to in the investment industry as portable alpha. These investment objectives seek to prioritize the long-term structural needs of our Retirement Plan over short-term performance comparisons of the investment portfolio relative to peers.

D. **Authorized Investments –** The Plan shall be invested in externally managed funds, consistent with the guidelines established in CRR 140.011, "*Policy for Investment Manager Selection, Monitoring and Retention*" and CRR 140.017, "*Allowable Investments*," in the following asset classes:

~~Asset Class~~	~~Economic Environment~~	~~Risk Factor(s)~~	~~Sub-Class Target~~	~~Asset Class Target~~	~~Range~~
~~**Public Equity**~~	~~*Rising Growth*~~ ~~*Falling Inflation*~~	~~*Equity*~~ ~~*Currency*~~		~~**35%**~~	~~**25%-45%**~~
~~**Private Equity**~~	~~*Rising Growth*~~ ~~*Falling Inflation*~~	~~*Equity*~~ ~~*Currency*~~ ~~*Liquidity*~~		~~**12%**~~	~~**7%-17%**~~
~~**Public Debt**~~				~~**20%**~~	~~**10%-30%**~~
~~*Sovereign Bonds*~~	~~*Falling Growth*~~ ~~*Falling Inflation*~~	~~*Interest Rates*~~ ~~*Currency*~~	~~*10%*~~	-	-
~~*Inflation-Linked Bonds*~~	~~*Falling Growth*~~ ~~*Rising Inflation*~~	~~*Inflation*~~ ~~*Interest Rates*~~ ~~*Currency*~~	~~*10%*~~		-
~~*Opportunistic*~~	~~*Rising Growth*~~ ~~*Falling Inflation*~~	~~*Interest Rates*~~ ~~*Credit Spreads*~~	~~*0%*~~		-
~~**Private Debt**~~	~~*Rising Growth*~~ ~~*Falling Inflation*~~	~~*Credit Spreads*~~ ~~*Liquidity*~~		~~**6%**~~	~~**3%-11%**~~
~~**Diversifiers**~~				~~**27%**~~	~~**17%-37%**~~
~~*Risk Balanced*~~	~~*Rising Growth*~~ ~~*Falling Growth*~~ ~~*Rising Inflation*~~ ~~*Falling Inflation*~~	~~*Diversified*~~	~~*12%*~~		-
~~*Commodities*~~	~~*Rising Growth*~~ ~~*Rising Inflation*~~	~~*Inflation*~~	~~*5%*~~		-
~~*Real Estate/ Infrastructure*~~	~~*Rising Growth*~~ ~~*Rising Inflation*~~	~~*Equity*~~ ~~*Credit Spreads*~~ ~~*Inflation*~~ ~~*Liquidity*~~	~~*10%*~~		-
~~*Opportunistic*~~	~~*Rising Growth*~~ ~~*Rising Inflation*~~	~~*Equity*~~ ~~*Interest Rates*~~	~~*0%*~~		-
~~**Total Portfolio**~~				~~**100%**~~	

Asset Class	**Asset Class Target**	**Allowable Range**
Commodities	*5%*	*0%-15%*
Inflation-Linked Bonds	*9%*	*3%-19%*
Private Debt	*6%*	*3%-9%*
Private Equity	*13%*	*9%-17%*
Public Equity	*34%*	*20%-45%*
Real Estate / Infrastructure	*13%*	*9%-17%*

Risk Balanced	*12%*	*7%-17%*
Treasuries	*8%*	*3%-18%*
Cash and Cash Equivalents	*0%*	*0%-20%*
Total Portfolio	*100%*	

E. **Portfolio Rebalancing**

Asset allocations shall be monitored on an ongoing basis as changes in market behavior may cause variations from the target asset mix. Rebalancing of the portfolio shall be considered at least quarterly, and more often if necessary to maintain allocations within the allowable ranges. The need to rebalance shall take into account any logistical issues associated with fully funding a particular asset sector, as well as any tactical decisions to overweight or underweight a particular asset sector based on current market conditions. The University may utilize external managers to rebalance portfolio exposures consistent with targets and allowable ranges established by this policy. In those instances, conventional derivative instruments commonly accepted by other institutional investors, such as futures, swaps, options, forward contracts and reverse repurchase agreements may be utilized.

Actual asset classes allocations shall not fall outside of the allowable ranges, with the exception of violations caused solely by periods of extreme market distress, when it may not be possible or advisable to immediately bring such allocations back to within the allowable ranges.

F. **Currency Risk Management**

In the context of a global investment portfolio, currency risk exists to the extent that investments contain exposures to foreign currencies. The desirability of this currency exposure is not necessarily aligned dollar for dollar with the desired exposure to assets denominated in foreign currencies. As such, external managers in any asset class may implement currency strategies to alter the currency exposure of the portfolio when deemed prudent to do so in the context of the particular investment mandate. In addition, the University may utilize external managers to implement currency strategies to alter exposures in an active or passive manner as part of a portfolio or asset class overlay when deemed prudent to do so.

G. **Portable Alpha Program**

Synthetic market exposures across asset classes including equities, sovereign bonds, inflation-linked bonds and commodities may be obtained through derivative instruments commonly accepted by other institutional investors, such as futures, swaps, options, forward contracts and reverse repurchase agreements. These derivative instruments shall be managed by external investment firms with appropriate expertise, experience and depth of resources.

When synthetic market exposures are obtained through derivative instruments, a portion of the resulting cash and cash equivalent balances may be invested by active alpha managers seeking to add returns over the benchmark. These alpha managers will possess broadly diverse strategies/styles and, in the aggregate, are expected to produce returns that show little or no relationship to the economic environment being experienced at any given time. Furthermore, this portfolio of managers will be constructed with a goal of low/no correlation to the synthetic market exposures obtained through the derivative instruments. The risk drivers within the portable alpha portfolio should generally be well-known, empirically-tested, sources of return that can be systematically harvested through dynamic long/short strategies. They can be thought of either as returns that underlie "classic" hedge fund strategies (hedge fund risk premia), such as arbitrage and macro or the returns from "classic" styles (style premia), such as value, momentum, carry, defensive and low volatility.

Legal account structures will be in the form of one or a combination of separate accounts, institutional commingled funds and/or limited partnerships or other similar forms.

The allowable range of the portable alpha portfolio shall be 0-27% of the total Retirement Plan.

Management of liquidity risk is a critical component of the portable alpha program. If not managed appropriately, there is a risk that synthetic market exposures may need to be unwound at undesirable points in time in order to meet margin calls during volatile markets. To help mitigate this risk, prudent balances of cash and cash equivalents shall be maintained as part of the program and monitored daily.

The following table outlines the minimum cash requirements with associated replenishing guidelines:

	Cash Margin*	Replenishing Guidelines
Target	30%	n/a
Range 1	29.9% to 20%	Develop action plan to replenish to Target within 12 months
Range 2	19.9% to 10%	Develop action plan to replenish to Range 1 within 60 days, with subsequent plan to replenish to Target within 12 months
Range 3	9.9% or less	Take immediate action to replenish to Range 2 as quickly as possible. Follow with plan to replenish to Range 1 within 60 days, and subsequent plan to replenish to Target within 12 months

**Cash Margin is defined as Portable Alpha Program cash and cash equivalents divided by the total of synthetic market exposures outstanding across all asset classes with the program.*

~~**Other** – The Board of Curators delegates to the President of the University the following responsibilities with respect to the Plan:~~

~~Recommend contributions to the Plan.~~
~~Recommend annuity, mortality and other tables as may be useful in actuarial determination.~~
~~Recommend actuarial valuations made by experts retained for that purpose.~~
~~Maintain data necessary for actuarial valuations of the assets of the Plan.~~

~~Maintain accurate records for the Plan.~~

NOTE: The delegations contained within Section H. *Other* (above) have been moved to the proposed CRR 530.020 *Retirement, Disability and Death Benefit Plan Financial Management Policy,* Section D. *Other Matters*

140.015 Investment Policy for Retirement, Disability and Death Benefit Plan

Bd. Min. 6-26-12, Revised Bd. Min. 6-14-13, Revised Bd. Min. 9-12-13, Revised 6-25-15, Revised 2-4-16; Revised 4-14-16; Amended Bd. Min. 9-28-17.

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**Cash Margin is defined as Portable Alpha Program cash and cash equivalents divided by the total of synthetic market exposures outstanding across all asset classes with the program.*

530.020 Retirement, Disability and Death Benefit Plan Financial Management Policy

A. Introduction - This policy establishes principles for the prudent financial management of the University's Retirement, Disability and Death Benefit Plan ("the Plan").

B. Policy Objectives

1. Recognize the Plan's total pension liability as a significant debt of the University which must be managed accordingly.
2. Prioritize and protect University funding for Plan contributions needed to achieve and maintain full funding of the Plan, utilizing actuarial assumptions and risk levels appropriate for a closed plan.
3. Provide cost stabilization provisions to protect the University's operating budget - to the extent possible – from volatility in Plan contributions.
4. Provide full transparency to internal and external constituents of the Plan and University.

C. Financial Management Principles

While closed to new participants since October 2019, annual benefit payments under the Plan are projected to continue growing through 2043; based on current mortality assumptions, benefit payments by the Plan will continue well past 2090. At the time this policy was adopted, total remaining benefit payments over the life of the Plan were projected to be more than $19 billion. Given the magnitude and longevity of the Plan's liabilities, the following principles have been established:

1. <u>Expected Investment Return / Liability Discount Rate</u> - Current governmental accounting standards utilize the same actuarial

assumption for both the expected rate of return on the Plan's investments and the discount rate applied to the Plan's benefit liabilities. This creates tension when managing risk, particularly for closed plans. A higher discount rate results in a lower pension liability with lower required contributions, while the same higher expected investment return often results in a higher level of risk within the Plan's investment portfolio. A lower discount rate results in a higher pension liability with higher required contributions, while the same lower expected investment return often results in a lower level of risk within the Plan's investment portfolio.

With a pension plan closed to new participants, annual contributions going into the plan will decline over time, leaving a closed plan increasingly reliant on investment income and, ultimately, plan assets to fund the plan's liabilities. As such, reducing the risk and volatility of the plan's investments becomes increasingly important as the plan matures in closure. This represents the ultimate tradeoff in managing a pension plan under current governmental accounting standards – balancing an acceptable level of investment risk against the strain of pension contributions on operating budgets.

Regardless of the actuarial assumptions used by the Plan, the University remains responsible for the actual benefit payment obligations under the Plan. Any differences between what is assumed and what actually occurs will flow through to impact required Plan contributions, with corresponding impact to the University's operating budgets. As an example, while a higher expected investment return may result in lower Plan contributions initially, if the Plan's realized investment returns are lower than what was expected, future contributions must necessarily increase to cover the shortfall. Given the time value of money and the longevity of the Plan's liabilities, any underfunding of contributions in the near term will almost always lead to significantly higher required contributions over time.

Consistent with each of the objectives noted above, the following principle should govern the management of the Plan's actuarial expected investment return / liability discount rate:

a. When the actuarily determined funded status of the Plan exceeds 95%, the Executive Vice President for Finance and Operations, in consultation with the Board Finance Committee, should work with the Plan's actuary to evaluate the feasibility of lowering the Plan's expected investment return / liability discount rate by an amount that brings the funded status of the Plan back down to 95%, to the extent this can be accomplished without causing an increase in contributions already being paid into the Plan. As the expected investment return / liability discount rate is lowered, the investment risk of the Plan's investments should be lowered concurrently.

b. At minimum, this practice should remain in place until the expected investment return / liability discount rate drops to a level equal to the FTSE Pension Index + 2%. The FTSE Pension Index is commonly used by corporate plan sponsors and actuaries to establish discount rates used to value private pension liabilities in compliance with SEC and FASB requirements. The University may substitute another standard liability index in accordance with any shifts in common practice of valuing pension liabilities.

2. <u>Plan Contributions</u> – The Actuarily Determined Contribution (ADC) for the Plan is equal to the normal cost payment plus an amortization payment on the unfunded actuarial accrued liability (if applicable). In determining the ADC, the University will follow standard actuarial

practices, working in conjunction with the Plan's independent actuary. Differences between actual and expected experience and their related impact on the amortization payment must be amortized on a closed basis. For purposes of this policy, regardless of actuarial determination, the amortization payment component of the ADC shall not be lowered below the level in existence when this policy was adopted until the Plan is fully funded on an actuarial basis utilizing an expected investment return / liability discount rate as prescribed by Section C.1.b. "*Expected Investment Return / Liability Discount Rate*." With the inclusion of this special provision for amortization payments, the University's required Plan contribution shall be referred to as the Minimum Actuarily Determined Contribution (MADC). The University shall make the MADC into the Plan on an annual basis.

3. <u>Cost Stabilization</u> – Until depleted, the Plan's Stabilization Fund is intended to be the primary means to provide cost stabilization to Plan contributions. The Stabilization Fund can be used to help fund year over year increases to the MADC (as applicable).

   As another means of cost stabilization, it is possible that the provisions of Section C.2. *"Plan Contributions"* may result in Plan contributions in certain years being higher than what is actuarily required (years in which the MADC is greater than the ADC). Given the objective to help provide cost stabilization for the Plan, it is the explicit intent of this policy that excess contributions in one year (the amount by which the MADC exceeds the ADC) may be used to help offset other years in which the MADC exceeds the level of the prior year MADC. The University can only utilize unused excess contributions from the previous five years towards the current year contribution.

This policy explicitly acknowledges that efforts to provide cost stabilization may not be effective during periods of financial markets duress. To the extent this (or any other factors) cause the actuarily determined funded status of the Plan to fall below 75%, the Executive Vice President for Finance and Operations should develop formal recommendations for the Board Finance Committee to improve the funded status of the Plan, which should include a review of investment risk, required contributions and the management of the Plan's liabilities.

4. Plan Benefits – given the magnitude of the Plan's liabilities and the additional risks inherent in managing a closed plan, under no circumstances shall Plan benefits be increased above levels in place at the time of this policy's adoption.

5. Actuarial Review / Transparency – The University shall continue to engage an independent actuary to prepare an annual valuation of the Plan, as well determine the Plan's annual ADC/MADC requirement. The Plan's independent actuary shall also conduct a formal review of the Plan's actuarial assumptions not less than every five years. Actuarial reports shall be made available to the Board on an annual basis as well as other internal and external constituents of the Plan and University.

D. Other Matters

The Board of Curators delegates to the Executive Vice President for Finance and Operations of the University the following responsibilities with respect to the Plan:

1. Recommend contributions to the Plan.
2. Recommend annuity, mortality and other tables as may be useful in actuarial determination.

3. Recommend actuarial valuations made by experts retained for that purpose.

4. Maintain data necessary for actuarial valuations of the assets of the Plan.

5. Maintain accurate records for the Plan.

(NOTE: Section D - Other Matters is currently contained within the Investment Policy for the Retirement Plan (CRR 140.015). These items are being relocated to this new policy.)

University of Missouri Retirement, Disability and Death Benefit Plan

Report on Actuarial Valuation Assumptions Study Based on 2016–2020 Actuarial Experience

This report has been prepared at the request of the Board of Curators to assist in administering the Plan. This report may not otherwise be copied or reproduced in any form without the consent of the Board of Curators and may only be provided to other parties in its entirety. The measurements shown in this report may not be applicable for other purposes.

Segal

April 21, 2022

333 West 34th Street
New York, NY 10001
segalco.com
T 212.251.5000

March 15, 2022

Ryan Rapp
Executive Vice President for Finance & Operations
University of Missouri System
Jesse Hall 311
Columbia, Missouri 65211-3020

Dear Mr. Rapp:

We are pleased to present this comprehensive actuarial valuation assumptions study of the University of Missouri Retirement, Disability and Death Benefit Plan.

The report provides a complete review of all actuarial valuation assumptions and our recommendations in light of prevailing economic trends and the University's own actuarial experience patterns observed during the 2016 through 2020 quinquennium.

We look forward to reviewing this report with you and to answering any questions you may have.

Sincerely,

Segal

By: Joshua Kaplan

Joshua Kaplan, FSA, MAAA, EA, FCA
Vice President and Consulting Actuary

Table of Contents

Section 1: Summary

The Actuarial Process

It is the primary intent of an actuarial valuation to compare, as of a given date, the value of actuarial liabilities (present value of future pension payments) with the value of the plan's assets so as to measure the current funded status of the program's actuarial liabilities and there from, future annual cost requirements for plan liability funding.

The valuation of actuarial liabilities is based on the sex, age, service, job classification, and pay level characteristics of the plan's participants as well as assumptions as to future actuarial experience.

In other words, when attempting to quantify the current value of pension payments that, for some active employees, will not be made until many years in the future, the actuary directly incorporates the current actuarial characteristics of the participants and then applies projection factors to reflect anticipated future trends.

Such projection factors represent the actuary's best estimate of the future experience of the plan's participants and are based on both observed historical patterns and judgments (including those of University officials) as to current and predicted demographic and related economic trends which are likely to be of influence in the future.

For example, in the valuation of plan assets, the actuary must assign a value to the current assets which will best reflect both their current and ultimate worth when such assets will be required to fund pension payments. The actuary must also make an assumption as to the average rate of growth that current assets and future contributions will achieve in future years. For the University's pension plan, estimates of such future trends are developed, in part, by means of a retrospective five-year study of its own demographic and financial experience which this report describes in detail.

Purpose of an Actuarial Experience Study

The purpose of this study is to develop actuarial assumptions that will best reflect emerging experience. These assumptions will then be used for the future funding of the University of Missouri Retirement, Disability and Death Benefit Plan. Of course, the new results observed in this actuarial experience study cannot be directly factored into the actuarial valuation process. Rather, to the extent that past experience appears to predict intrinsic future demographic trends of the employee group, new actuarial assumptions based on such trends are developed for use in the actuarial valuation in order to produce a stable pattern of future annual cost requirements.

In order to fund for current and future retirement benefits, it is not only important to understand past experience but to also make informed judgments as to the relevance of such experience for the future. The significance of this long range planning is apparent when one considers that an employee now aged twenty-five will probably retire more than forty years from now and will be in receipt of benefits for another twenty years or so, for a total covered period of about sixty years under the plan. Thus, while the retirement for which we are funding will not occur, in this case, for more than forty years from now, the University is now making plan contributions on behalf of the participant in order to build up a sufficient reserve to meet the obligation of providing for this employee’s retirement pension.

Therefore, in order to predict future experience, the actuary must develop a set of actuarial assumptions as to future mortality, termination of employment, probabilities of retirement at specific ages, increases in salary and the investment performance of the fund. While the unique future employment pattern of each particular plan participant cannot be predicted, it is the intention of the experience study to develop a set of average future parameters that, subject to periodic adjustments will ultimately prove to be accurate in the aggregate. As explained below, the actuary is seeking “statistically credible” data on which to base his assumptions.

Credibility

Credibility is the trustworthiness or reliability of a statistical result being obtained from a statistical investigation. The larger the group, the smaller the probability that the surveyed experience is a random fluctuation and hence, the more credible are the results. Therefore, only relatively large pension plans will justify experience studies, since, for smaller pension plans, the results do not have a sufficiently high statistical confidence limit. This is also the reason why the University’s experience study is performed quinquennially, i.e., so that a sufficiently large experience is measured. This tends to smooth statistical aberrations and make the results more credible.

Historical Consistency

As noted above, experience during the quinquennium is being reviewed in this report as one of the tools for predicting future experience of the Retirement Plan. However, credible past experience alone is insufficient for the actuary to directly apply in developing his future actuarial assumptions under the Retirement Plan. Therefore, an actuary needs to review related professional research to project credible experience into the future. These studies, known as secular trend studies, are very important to the prediction of certain events such as expected future retirement and mortality rates. Therefore, the following sections of this report will discuss such projected secular trends as they relate to the results of the quinquennial experience study.

Plan Provisions

The experience during the quinquennium reflects the actual plan provisions in effect during this period, which, for purposes of this study, were materially the same. If the plan provisions are significantly changed, past experience alone may not be appropriate to project experience in the future. For example, if eligibility for retirement is significantly changed, then future retirement experience may be different than that of prior experience. The only change in plan provisions during this study period was the closing of the plan effective October 1 2019. We do not anticipate that this change will have any effect on future demographic experience of the current member group.

Section 2: Annual Investment Return Assumption and Asset Valuation Method

Objective

As indicated in Section 1 of this report, the actuarial valuation process compares the present value of future pension liabilities with the plan's current assets and thereby develops annual contribution requirements to fully fund any unfunded liabilities over prescribed periods of time.

This process requires the actuary to assign a value to the current assets which will reflect their ultimate worth when such assets will be required to fund pension payments, and to make an assumption as to the average rate of growth that current assets and future contributions will achieve in future years.

Asset Valuation

For actuarial valuation purposes, the market value of the Plan's assets are not used. In lieu of using market value of assets, an "actuarial" value of assets is employed. Originally, the actuarial value of assets used in the actuarial valuation of the University Plan was book value. Effective with the October 1, 2001 actuarial valuation, the University adopted a new asset valuation methodology referred to as the Expected Return Asset Valuation Method using five-year smoothing.

Under this methodology, the actuarial value of assets are valued at market value less unrecognized returns in each of the prior five years. Unrecognized return is equal to the difference between the actual market return and the expected market return, and is recognized over a five-year period. The actuarial value is further adjusted, if necessary, to be within 20% of the market value.

The table on the next page shows the actuarial and market value of assets as well as the ratio of the two over the past 19 years.

Valuation Date October 1,	Actuarial Value of Assets	Market Value	Ratio of Actuarial Value to Market Value
2002	$1,949,793,833	$1,624,828,194	120.0%[1]
2003	2,067,727,548	1,875,784,774	110.2
2004	2,075,032,000	2,059,391,310	100.8
2005	2,125,656,340	2,366,280,626	89.8
2006	2,325,263,899	2,578,022,645	90.2
2007	2,651,534,668	2,983,628,277	88.9
2008	2,808,125,912	2,427,134,469	115.7
2009	2,843,422,463	2,369,518,719	120.0[1]
2010	2,851,957,127	2,518,673,108	113.2
2011	2,828,696,693	2,504,265,310	113.0
2012	2,790,622,385	2,788,322,126	100.1
2013	2,950,555,185	3,051,916,429	96.7
2014	3,160,999,182	3,244,105,034	97.4
2015	3,289,215,768	3,109,173,461	105.8
2016	3,433,435,252	3,303,240,367	103.9
2017	3,572,150,725	3,572,074,894	100.0
2018	3,668,671,608	3,684,544,817	99.6
2019	3,763,641,862	3,735,404,966	100.8

[1] Limited to 120% of market value

Valuation Date October 1,	Actuarial Value of Assets	Market Value	Ratio of Actuarial Value to Market Value
2020	3,888,025,089	3,792,152,115	102.5

Market values are prone to volatility from year to year due to changes in prevailing economic conditions. Fluctuations in market value cause the annual contribution requirements to fluctuate in a reverse fashion, i.e., inflated market values would produce smaller contribution requirements and vice versa. Because of the long term nature of the plan's obligations, the University determined that it would be beneficial to not have the University's cost oscillate with short-term and volatile market swings. However, a 20% corridor around market value (i.e. 80% - 120%) is employed to control the differential between actuarial value and market value.

The Expected Return Asset Valuation Method for purposes of determining actuarial value of assets is now the most widely used methodology by both governmental and private sector pension plans. We recommend that the University continue the use of the current method.

Assumed Rate of Average Future Investment Return

The economic assumptions have a significant impact on the development of plan liabilities. Changes to these assumptions can substantially alter the results determined by the actuary. The goal of our analysis is to produce a consistent set of economic assumptions that appropriately reflect expected future economic trends.

The primary economic assumptions that affect the System's funding are:

- Investment return
- Salary increases

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 27 (ASOP 27), Selection of Economic Assumptions for Measuring Pension Obligations, to provide actuaries guidance in developing economic assumptions. A key feature of the ASB's guidance is the "building block" approach in developing economic assumptions. This approach requires the actuary to consider the key component parts of major assumptions and determine reasonable best-estimates for each component.

Section 2: Annual Investment Return Assumption and Asset Valuation Method

Under this approach, we consider the investment rate of return assumption as the combination of an inflation component and a real rate of return component. The components of the salary increase assumption are inflation and productivity. The inflation component is included in all economic assumptions, and therefore is key to developing a consistent set of actuarial assumptions.

In developing a recommendation for the assumed inflation component, we reviewed a commonly referenced historical measure of inflation, the Consumer Price Index for all urban consumers (CPI-U). The table below shows how recent inflation experience is below the longer-term average rate.

Average Annual Change in CPI-U (periods ended September 30, 2020)

Past 5 Years	1.8%
Past 10 Years	1.8%
Past 20 Years	2.0%
Past 30 Years	2.3%

The average annual rate of increase in the CPI-U over the five years ended September 30, 2020 is 1.8%. Historical trend is a less important consideration for the assumed rate of inflation, but assists in determining the reasonable bounds of expected inflation.

As another basis for estimating the future expected inflation, we reference the 2020 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (2020 OASDI Trustees Report). The range of inflation rates in this report was 3.0% for low-cost projection, 2.4% for the intermediate and 1.8% for high-cost projection.

Yet another source is the Survey of Professional Forecasters published by the Federal Reserve Bank of Philadelphia. The 10-year forecast from the Third Quarter 2020 report is 2.03%. The Philadelphia Fed also publishes the Livingston Survey, which shows a median 2.00% projected long-term inflation assumption in the June 2020 survey.

Another important source for inflation forecasting is the 10-year breakeven inflation rate, which is the implied expected inflation rate in the difference in yields between 10-year Treasury securities and 10-year TIPS. This is an important metric because it measures the actual inflation expectations of the market. As of the most recent pension valuation date, October 1, 2020, the 10-year expected inflation based on this metric is 1.63%

Section 2: Annual Investment Return Assumption and Asset Valuation Method

After reviewing and considering the range of future inflation, we determine the specific point in the range which is to be the estimate of long-term future inflation rates. Because we find no compelling reasons to favor either the high or low end of the range of the various forecasts, we determined that the current 2.2% inflation rate assumption is a reasonable estimate for the future annual rate of inflation for purposes of the building block approach in developing the investment return assumption and the salary increase assumptions.

The investment rate of return assumption is developed using the “building block” approach as outlined in ASOP 27. Under this approach, the investment rate of return assumption is made up of two components; the inflation component and the real investment rate of return component. The inflation component determined above is combined with the reasonable real rate of return component. This total return is then evaluated and refined. The final recommendation is then made.

For purposes of developing the range of real rates of return, we reviewed the 10-year capital market assumptions used by the University’s investment consultant, Verus. We have also reviewed the 10-year capital market assumptions for 2021 from Segal Marco Advisors (SMA). These capital market assumptions were based on total return. Therefore, to arrive at the real rates of return, the expected inflation component was subtracted from the total return to derive the real rate of return by class.

Based on the Plan’s current target allocation and real rate of return assumptions by asset class, the expected real rate of return on an arithmetic basis per Verus is 5.57% on a 10-year horizon. Based on SMA assumptions, the expected real rate of return on an arithmetic basis is 5.60% on a 10-year horizon. The development of the total rates of return and the corresponding returns on a geometric basis are shown on the next page:

Section 2: Annual Investment Return Assumption and Asset Valuation Method

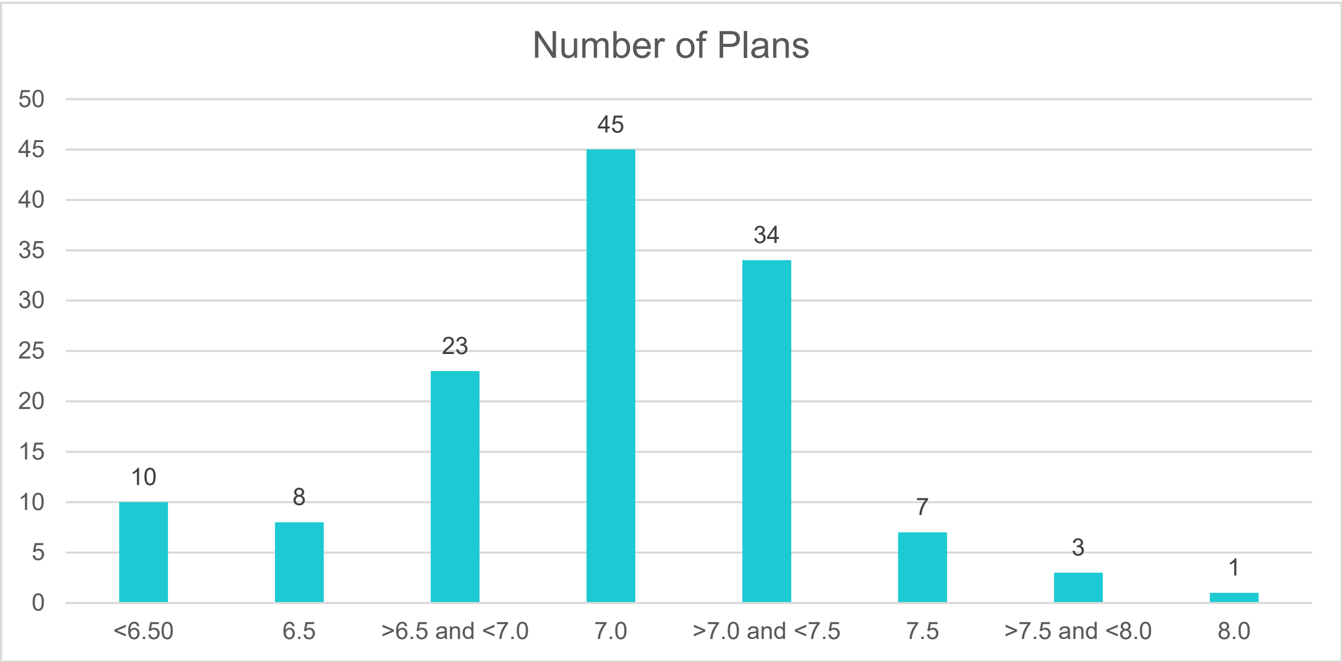
Asset Category	Target Allocation	Expected Real Rate of Return		Contribution to Total Real Rate of Return	
		Verus	SMA	Verus	SMA
US Large	16.90%	3.96%	5.66%	0.67%	0.96%
International Developed	11.30%	5.09%	6.41%	0.58%	0.72%
Emerging Markets	5.80%	6.44%	8.31%	0.37%	0.48%
Private Equity	13.00%	9.89%	9.66%	1.29%	1.26%
US TIPS	10.00%	-0.71%	-0.49%	-0.06%	-0.04%
US Treasury	9.00%	-0.78%	-0.49%	-0.06%	-0.04%
Commodities	3.30%	1.65%	2.71%	0.05%	0.09%
Real Estate	13.0%	7.22%	6.91%	0.94%	0.90%
Precious Metals	1.70%	2.70%	2.71%	0.05%	0.05%
Risk Parity	12.00%	5.50%	4.70%	0.66%	0.56%
Private Debt	6.00%	7.00%	4.21%	0.42%	0.25%
Portable Alpha Overlay	22.00%	1.00%	1.25%	0.22%	0.28%
Cash	-22.00%	-2.08%	-1.09%	0.46%	0.24%
Total expected real rate of return:				5.57%	5.60%
Assumed rate of inflation:				2.20%	2.20%
Total expected investment return (arithmetic):				7.77%	7.80%
Volatility drag:				0.82%	0.72%
Expected net investment return (geometric):				6.95%	7.08%

Actuarial Standard of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, contains the following discussion on the use of geometric or arithmetic returns:

The use of a forward looking expected geometric return as a discount rate will produce a present value that generally converges to the median present value as the time horizon lengthens (i.e., if the actuary determines a funding obligation using the forward looking expected geometric return to discount the obligation to produce a present value, it is expected that in the limiting case there will be enough money to fund the obligation 50% of the time). The use of a forward looking expected arithmetic return as a discount rate will generally produce a mean present value (i.e., there will be no expected actuarial gains and/or losses).

Based on the above analysis, we recommend a change to the assumed rate of investment return from the current assumption of 7.20% to 7.00%.

A review of 131 state and local government retirement plans contained in the 2021 Public Fund Survey presented by the National Association of State Administrators (NASRA) reveals only 44 have an investment return assumption higher than 7.00%, that nearly three-fourths have reduced their investment return assumption since fiscal year 2017, and that all but 5 plans (96%) have reduced their investment return assumption since fiscal year 2010. The average investment return assumption is 6.99% and the median return is 7.00%. The graph below shows the results of the most recent Survey results presented by NASRA.



Section 3: Salary Progression Trends

Objective

Under the University of Missouri Retirement, Disability and Death Benefit Plan, the annual pension payable at normal retirement age is computed by multiplying the number of years of an employee's service by 2.2% (1.0% for members hired on or after October 1, 2012) of their final average compensation base (average annual salary for the five highest consecutive years of employment).

The actuarial process requires that a projection of compensation base at retirement or termination be made in order to compute expected future pension payments and the current actuarial value of such payments. In order to make this compensation projection, the actuary must develop an assumed salary progression scale based on the relative average salary levels of employees at various points in their careers.

The salary increase assumption consists of two components — one representing inflation and one that represents increases for promotion and longevity. The inflation component is considered in Section 2 of this report.

Methodology

Salary experience during the five-year period from September 30, 2015 through September 30, 2020 has been analyzed for purposes of evaluating the promotion and longevity component of the salary increase assumption. We compiled salary increase experience separately for the Academic and Administrative employees and the Clerical and Service employees by age, for all members included in any two consecutive valuations during the 2015–2020 period, weighted by salary. The results are shown in the tables at the end of this section.

Results of Salary Progression Rates Study

In reviewing the total salary increases shown in the tables, we have observed the inflation component of the increases to be an average of 1.8% over the five-year period. The remainder of the observed salary increase represents the promotion and longevity components of the increases.

Section 3: Salary Progression Trends

The results of the salary increase study reveal the following:

- There continues to be differences between the results of Academic and Administrative personnel and those of Clerical and Service.
- Academic and Administrative personnel averaged approximately 0.4% higher annual increase then Clerical and Service.
- Therefore, we are proposing continuing different salary progression rates for Academic and Administrative personnel then for Clerical and Service employees.

Observed Average Annual Rate of Pay Increases (Weighted By Salary)[1]

Period	Academic & Administrative	Clerical & Service
10/1/2015 – 9/30/2016	2.5%	3.1%
10/1/2016 – 9/30/2017	2.5%	1.4%
10/1/2017 – 9/30/2018	4.8%	5.4%
10/1/2018 – 9/30/2019	4.4%	4.1%
10/1/2019 – 9/30/2020	2.9%	1.2%
Average Rate Observed Over Quinquennium	3.4%	3.0%

Based on these results, we recommend that the current salary increase scale be modified as indicated in the following tables. The overall rates of promotion and longevity increase proposed for Academic and Administrative are slightly increased with a few small exceptions at certain ages. For Clerical and Service, the proposed promotion and longevity rates of salary progression are overall relatively steady with slight increases and decreases at various ages. The assumed inflation component of the salary increases remained at 2.2% at all ages.

[1] Total salary increases of which 1.8% represented the average observed basic inflation component over the five-year period

Academic and Administrative Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
20	9.8	8.5	8.5
21	11.5	8.0	8.0
22	9.2	7.5	7.5
23	8.6	7.0	7.0
24	4.8	6.5	6.5
25	5.0	6.0	6.0
26	5.0	5.5	5.5
27	4.3	5.0	4.5
28	4.9	4.5	4.2
29	3.6	4.0	3.9
30	3.4	3.5	3.6
31	3.5	3.0	3.3
32	2.7	2.8	3.0
33	2.8	2.7	2.8
34	3.0	2.6	2.7

[1] Excludes the basic inflation component, which was assumed to be 2.2% per annum but was observed to be a 1.8% across the board increase over the 5-year period and is expected to be 1.9% in future years.

Academic and Administrative Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
35	2.5	2.5	2.6
36	2.8	2.4	2.5
37	2.5	2.3	2.4
38	2.7	2.3	2.3
39	1.7	2.2	2.2
40	2.4	2.1	2.1
41	2.3	2.0	2.0
42	1.3	1.9	1.9
43	1.8	1.9	1.9
44	2.7	1.8	1.8
45	1.4	1.7	1.8
46	1.8	1.6	1.7
47	1.6	1.5	1.7
48	1.9	1.4	1.6
49	1.9	1.3	1.6
50	1.5	1.3	1.4
51	1.6	1.3	1.4

Academic and Administrative Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
52	1.0	1.2	1.2
53	1.2	1.0	1.0
54	0.5	0.8	0.9
55	0.8	0.6	0.8
56	1.0	0.5	0.7
57	1.1	0.4	0.6
58	0.0	0.3	0.5
59	0.7	0.2	0.4
60	0.1	0.1	0.3
61	0.8	0.1	0.2
62	0.1	0.1	0.1
63	-0.4	0.1	0.1
64	0.1	0.1	0.1
65	-0.4	0.0	0.0

Clerical and Service Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
20	3.0	6.1	6.1
21	4.0	5.5	5.5
22	4.7	5.0	5.0
23	3.6	4.0	4.0
24	3.4	3.5	3.5
25	3.6	3.0	3.1
26	3.4	2.8	2.9
27	2.3	2.7	2.7
28	2.4	2.6	2.5
29	1.8	2.5	2.3
30	2.1	2.4	2.2
31	2.0	2.3	2.1
32	1.9	2.2	2.0
33	2.0	2.1	1.9
34	1.4	2.0	1.8

[1] Excludes the basic inflation component, which was assumed to be 2.2% per annum but was observed to be a 1.8% across the board increase over the 5-year period and is expected to be 1.9% in future years.

Clerical and Service Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
35	0.9	1.9	1.8
36	1.9	1.8	1.7
37	1.9	1.7	1.7
38	1.4	1.6	1.6
39	1.4	1.5	1.5
40	1.5	1.4	1.4
41	1.5	1.3	1.3
42	1.2	1.2	1.3
43	1.0	1.1	1.2
44	1.7	1.0	1.1
45	0.7	0.9	1.0
46	1.1	0.8	0.9
47	1.3	0.7	0.9
48	0.7	0.6	0.8
49	0.9	0.6	0.8
50	1.0	0.6	0.7
51	0.8	0.6	0.7

Clerical and Service Employees
Experience Study 5-Year Period Ended September 30, 2020

Rates of Promotion and Longevity Pay Increases[1]

Age	Actual Total Salary Increase (%)	Expected Increase (%)	Proposed Rate (%)
52	1.0	0.5	0.6
53	0.6	0.5	0.6
54	0.5	0.5	0.5
55	0.5	0.5	0.5
56	0.6	0.4	0.4
57	0.4	0.4	0.4
58	0.6	0.3	0.3
59	0.2	0.2	0.3
60	0.2	0.1	0.2
61	0.2	0.1	0.2
62	0.2	0.1	0.1
63	0.4	0.1	0.1
64	0.2	0.1	0.1
65	0.0	0.0	0.0

Section 4: Severance of Employment

Objective

Our primary objective in this section of the report is to make as accurate a prediction as possible of the future rate of employment termination exclusive of the retirement and mortality causes which are discussed in Sections 5 and 7, respectively, of this report.

Based on such predictions, the actuary will perform periodic actuarial valuations and will (based on mathematical formulae) calculate how many employees of the current University staff will remain in employ long enough to qualify for retirement benefits. The Actuary will also compute how many of the remaining employees will be vested in a pension at the time of employment termination and in what amount, which is dependent upon length of service at such vested termination. These calculations then undergo further refinement due to other factors in order to arrive at a value of actuarial liabilities used in developing annual University contribution requirements.

Methodology

We have measured the rates of employment severance experienced among those persons who were employed by the University at the beginning of the quinquennium on October 1, 2015 and those persons who were subsequently employed during the quinquennium and then terminated employment during the quinquennium (ended September 30, 2020). Severance of employment from causes other than retirement, mortality, and disability, which were studied separately, was considered.

The resulting severance was studied separately by employment category (Academic and Administrative or Clerical and Service). Within each of the groupings, severance was plotted in comparison with the attained years of service with the University at the time of severance.

Results of Severance Investigation

The results of our analysis of the exhibited severance during the quinquennium may be summarized as follows:

- Due to the closure of the plan effective October 1, 2020, we have generally focused this investigation on mid-high service employees as the exposure as low service will decline to zero over time.
- Set forth on the table is the observed rate of termination during this quinquennium (except for mortality, retirement, or disability) for the grouping and completed years of service shown per one thousand active participants at the beginning of that year of service. For comparative purposes, we are also showing our current assumed rates of severance.

Section 4: Severance of Employment

- Observed rates of severance were in general slightly higher than the prior assumed rates and therefore, we have increased the assumed rates at various ages for both the Academic and Administrative and Clerical and Service groups. Those changes are highlighted below.
- In addition, the prior assumed rates ended at 20 years of service but as we have observed continued severance after 20 years of service, the proposed new assumed rates have been extended by five years through 25 years of service.

Section 4: Severance of Employment

Rates of Employment Severance (%) – Academic and Administrative

Years of Service	Observed 2016-2020	Current Assumption	Proposed Assumption
0	22.45	21.50	21.50
1	19.32	21.00	21.00
2	18.24	18.50	18.50
3	16.05	17.00	17.00
4	14.45	13.00	15.00
5	14.13	13.50	14.00
6	13.81	12.00	13.00
7	10.96	10.00	12.00
8	9.99	9.00	11.00
9	7.85	8.50	10.00
10	8.78	7.50	9.00
11	7.57	7.00	8.00
12	7.74	6.00	7.00
13	7.20	5.50	6.00
14	6.26	5.00	5.00
15	4.54	5.00	5.00
16	5.32	4.50	5.00
17	6.54	4.00	5.00
18	5.64	4.00	5.00
19	4.20	3.50	5.00
20	3.69	0.00	4.00

Section 4: Severance of Employment

Rates of Employment Severance (%) – Academic and Administrative

Years of Service	Observed 2016-2020	Current Assumption	Proposed Assumption
21	5.65	0.00	4.00
22	5.63	0.00	4.00
23	2.86	0.00	4.00
24	3.23	0.00	4.00

Section 4: Severance of Employment

Rates of Employment Severance (%) – Clerical and Service

Years of Service	Observed 2016-2020	Current Assumption	Proposed Assumption
0	32.73	31.00	31.00
1	27.91	23.00	23.00
2	22.73	19.50	19.50
3	20.01	17.50	17.50
4	14.31	13.50	13.50
5	14.52	13.50	13.50
6	11.49	11.50	11.50
7	12.32	10.50	11.00
8	11.43	10.00	11.00
9	9.61	9.00	11.00
10	13.48	8.50	10.00
11	9.23	7.50	9.00
12	8.43	7.00	8.00
13	7.82	6.50	7.00
14	7.08	6.00	6.00
15	7.62	5.00	5.00
16	6.87	4.50	5.00
17	5.75	4.00	5.00
18	5.03	4.00	5.00
19	5.21	4.00	5.00
20	2.87	0.00	5.00

Section 4: Severance of Employment

Rates of Employment Severance (%) – Clerical and Service

Years of Service	Observed 2016-2020	Current Assumption	Proposed Assumption
21	3.14	0.00	5.00
22	6.13	0.00	5.00
23	6.02	0.00	5.00
24	3.95	0.00	5.00

Section 5: Disability Rates

Objective

The University offers a Long Term Disability (LTD) program. Although this Plan does not pay LTD benefits, the Plan does provide that the retirement benefit is determined reflecting service credit during the period of disability. Since those members who sever employment due to disability are treated differently under the Plan than members who sever employment due to other reasons, the actuary will need to project the number of members that will become disabled and the number among those who will survive to collect a retirement benefit.

Methodology

We have measured the rates of disability severance experienced among those persons who were employed by the University at the beginning of the quinquennium on October 1, 2016 and those persons who were subsequently employed during the quinquennium and then became disabled during the quinquennium (ended September 30, 2020).

Results of Disability Rates Study

The results of our analysis of the exhibited disablement during the quinquennium may be summarized as follows:

- Set forth on the table is the observed number of those who became disabled during the quinquennium compared with the number expected to become disabled.
- Disablement observed was much lower than expected. A much more modest reduction was observed in the prior quinquennium.
- Although the number of disability retirements at each age is too small to credibly evaluate the specific rate at each age, the pattern of lower disablements over this study period and the prior period leads us to recommending reducing the current incidence of disability assumption by 20% at each age.

Section 5: Disability Rates

Incidence of Disability

Period	Expected Number of Disableds	Actual Number of Disableds
10/1/2015 – 9/30/2016	41	22
10/1/2016 – 9/30/2017	41	13
10/1/2017 – 9/30/2018	42	17
10/1/2018 – 9/30/2019	43	17
10/1/2019 – 9/30/2020	44	11
Total	211	80

Section 6: Summer Employment

Objective

Under the University of Missouri Retirement, Disability and Death Benefit Plan, there is a separate benefit added to normal pension for participants receiving 9-month appointments designated as summer service. This benefit is calculated at normal retirement age and computed by multiplying the total number of summer appointments by 2.2% (1.0% for members hired on or after October 1, 2012) of their compensation base (average of the 5 consecutive highest summer salaries earned during the summers worked). Summer salary may not exceed 3/9 of regular compensation.

The actuarial process requires a projection of both the number of future summer appointments and the future compensation base used in this additional benefit in order to compute future expected pension payments and their current actuarial value. The additional benefit for summer appointment is valued as a load on the actuarial liability and normal cost of academic and administrative participants. This load is based on the ratio of summer appointment salaries to total salaries for all academic and administrative employees. The current assumed load is 3.3%

Methodology

The ratio of summer salaries (with 3/9 of regular compensation adjustment) to total salary for academic and administrative employees receiving a supper appointment was evaluated for each year of the 2016–2020 quinquennium.

Results of Summer Employment Study

The results of our analysis of summer employment during the quinquennium may be summarized as follows:

- Set forth on the table is the observed ratio of total limited summer salaries to total regular compensation for academic and administrative active members.
- Over the 2016–2020 quinquennium, summer employment salaries/appointments were lower than expected. Based on these findings, we recommend lowering the assumption to a load of 2.20%.

Section 6: Summer Employment

Proportion of Summer Appointments/Salaries

Period	Total Academic and Administrative Payroll	Total Limited Summer Salaries	Ratio
10/1/2015 – 9/30/2016	$915,115,659	$20,089,112	2.20%
10/1/2016 – 9/30/2017	922,852,864	20,387,714	2.21%
10/1/2017 – 9/30/2018	961,369,925	20,377,397	2.12%
10/1/2018 – 9/30/2019	992,947,048	20,698,082	2.08%
10/1/2019 – 9/30/2020	920,259,842	20,154,583	2.19%
Total	$4,712,545,338	$101,706,888	2.16%

Section 7: Retirement Rates

Objective

Another key facet of our experience study relates to the determination of the age at which plan participants retire from the University. There are two different types of retirement under the University's Retirement Plan. The two different types of retirement are, first, normal retirement (i.e., retirement at or after attaining age 65) and early retirement (i.e., retirement prior to attaining age 65).

All employees who retired during the quinquennium were analyzed to determine the frequency of retirement at each attained age. Separate frequency analyses were then done by attained age at retirement within the subsets of employment classification (Academic and Administrative or Clerical and Service) and by service.

With regard to those plan participants who retire at or after normal retirement age, it is important to determine the frequency of plan participants who retire when first eligible (age 65) in comparison with those plan participants who defer retirement beyond age 65. This is relevant since, for example, a plan participant retiring at age 67 will be receiving an increased pension due to two additional years of pension service credit and an increased final average salary. However, such a plan participant will receive pension payments for a shorter duration since the retiree commenced receiving payments later in life. Therefore, whether deferring retirement beyond age 65 will result in an increase or decrease in contribution requirements, in comparison with the contribution requirements if the plan participant would retire at age 65, depends upon the specific compensation, service and other data of the particular plan participant.

In the case of plan participants who retire early, we must again ascertain the frequency of retirement at each age. This is important in that early retirement benefits are subsidized, especially for those with 25 years of service, i.e., the reductions which apply to the pension otherwise payable at normal retirement to ascertain the smaller pension payable commencing upon early retirement date do not fully reflect the additional cost inherent for disbursing this benefit for a longer expected future lifetime. Because subsidized early retirement benefits provide an "actuarial reward" for employees who may wish to retire prior to age 65, there can be a significant cost involved in such a program.

Results of Retirement Age Examination

- Set forth below are the observed rates of retirement during the quinquennium by age, separately by category of employment and by service. As in the prior study, we have presented the experience separately for those who had less than 25 years of service and those who had 25 or more years of service at retirement. For ages 65 and older, all years of service were aggregated in the study due to a lack of an early retirement subsidy at those ages.

Section 7: Retirement Rates

- We continue to find a difference in the probability of retiring at a given attained age at retirement by employment category (Academic and Administrative or Clerical and Service). Therefore, we recommend that the probabilities of retirement by attained age continue to be applied separately for the Academic and Administrative or Clerical and Service subsets.
- There was a tenured faculty buyout in the 2018–2019 plan year, so the retirement experience for that year was excluded from the experience study for Academic and Administrative members.
- We have found a sufficient analysis basis within each of the subsets so that the pattern of retirement at most retirement ages forms a credible basis for examination at such ages. At very early and very late retirement ages there was statistically less data to provide totally credible results and mathematical techniques of graduation were applied to determine consistent probabilities of retirement at those ages free of statistical aberration.
- We recommend the rate of retirement shown in the “proposed retirement” columns of the below tables be utilized for actuarial valuation purposes.

Section 7: Retirement Rates

Retirement Rates (%) - Academic and Administrative Employees

	Under 25 Years of Service			25+ Years of Service		
Age	**Actual Retirement Rate[1]**	**Expected Retirement Rate**	**Proposed Retirement Rate**	**Actual Retirement Rate[1]**	**Expected Retirement Rate**	**Proposed Retirement Rate**
55	5.4	4.0	5.0	9.7	6.0	8.0
56	2.3	3.0	3.0	5.4	4.0	4.0
57	2.9	3.0	3.0	4.1	4.0	4.0
58	5.6	3.0	3.0	3.7	4.0	4.0
59	5.0	3.0	3.0	6.9	4.0	4.0
60	6.1	5.0	5.0	8.1	7.0	8.0
61	4.5	5.0	5.0	11.5	7.0	12.0
62	14.1	10.0	10.0	24.2	20.0	25.0
63	9.4	10.0	10.0	13.4	12.0	12.0
64	12.4	10.0	10.0	13.6	12.0	12.0

[1] Weighted by member salary

Section 7: Retirement Rates

Retirement Rates (%) - Academic and Administrative Employees

Age	Actual Retirement Rate[1]	Expected Retirement Rate	Proposed Retirement Rate
65	24.5	20.0	25.0
66	24.2	20.0	25.0
67	20.2	15.0	20.0
68	17.6	15.0	20.0
69	23.1	15.0	20.0
70	23.6	20.0	20.0
71	14.8	20.0	20.0
72	23.0	20.0	20.0
73	24.2	20.0	20.0
74	14.1	20.0	20.0
75	22.4	20.0	20.0
76	15.2	20.0	20.0
77	28.9	20.0	20.0
78	31.7	20.0	20.0
79	32.7	20.0	20.0
80	21.4	100.0	100.0

[1] Weighted by member salary

Retirement Rates (%) – Clerical and Service Employees

Age	Under 25 Years of Service			25+ Years of Service		
	Actual Retirement Rate[1]	Expected Retirement Rate	Proposed Retirement Rate (%)	Actual Retirement Rate[1]	Expected Retirement Rate	Proposed Retirement Rate (%)
55	5.7	7.0	7.0	12.4	9.0	12.0
56	5.0	5.0	5.0	4.6	6.0	6.0
57	5.5	5.0	5.0	7.5	6.0	6.0
58	3.2	5.0	5.0	7.4	6.0	6.0
59	4.0	5.0	5.0	11.4	6.0	12.0
60	6.7	10.0	10.0	17.3	12.0	18.0
61	12.7	10.0	10.0	24.7	12.0	24.0
62	19.1	20.0	20.0	54.1	35.0	50.0
63	12.5	14.0	15.0	25.3	19.0	30.0
64	19.4	14.0	15.0	32.0	19.0	30.0

[1] Weighted by member salary

Section 7: Retirement Rates

Retirement Rates (%) – Clerical and Service Employees

Age	Actual Retirement Rate[1]	Expected Retirement Rate	Proposed Retirement Rate
65	40.7	35.0	40.0
66	46.2	35.0	40.0
67	37.5	25.0	35.0
68	30.4	25.0	35.0
69	24.2	25.0	35.0
70	39.0	25.0	35.0
71	25.6	25.0	35.0
72	42.1	25.0	35.0
73	28.7	25.0	35.0
74	24.5	25.0	35.0
75	34.4	25.0	35.0
76	49.3	25.0	35.0
77	36.8	25.0	35.0
78	60.1	25.0	35.0
79	45.8	25.0	35.0
80	22.6	100.0	100.0

[1] Weighted by member salary

Section 8: Mortality Experience

Objective

As actuaries, we have studied mortality rates for various occupational segments of the U.S. population and the trends relative thereto. The following two subsections will explain the importance of the mortality assumption in a pension plan valuation:

- Retired Participants - One of the most profound effects of mortality experience in a pension plan is with regard to the mortality experience of pensioners after their retirement. In order to accurately gauge the amount of reserves necessary to provide pensions for the lifetime of the covered employees, we must first determine how long the pensioners will be collecting their monthly benefit checks. However, the mortality effect does not stop merely at this point. Some pensioners will have, upon their deaths, reduced pensions payable to their surviving spouses for the spouses' remaining lifetimes.

  Additionally, mortality experience can vary significantly among subsets such as academic and administrative members versus clerical and service members as well as disabled versus non-disabled retirees.

- Active Participants - In addition to projecting the mortality rates of pensioners, we must also make assumptions as to the probability of employees dying prior to retirement, since the death of active employees prior to their meeting the eligibility requirements for retirement pensions and pre-retirement death benefits reduces the cost of the plan.

  Thus, we must distinguish the following probabilities of active employees: (1) dying in-service prior to meeting the eligibility requirements for any plan benefits, (2) becoming eligible for pre-retirement death benefits under the plan, and (3) surviving to the retirement age specified in the plan.

Methodology

To analyze the assumption of future mortality of plan participants, we must look to published reports and studies of various segments of the national population. Since the probability of death at any age between 25 and 65 is rather small (averaging approximately 0.2%, a statistical analysis of the University's active population of 15,900 members should find approximately 32 active deaths per year). As of September 30, 2020, there were approximately 11,000 retirees and beneficiaries in pay status. Given the University's retiree age distribution, the probability of death in a year for the retiree population is approximately 3.0% (approximately 330 retiree deaths per year). Given these facts and the comparatively small number of deaths at each age relative to the amount needed for full credibility mathematically, the University's data is too small to develop a fully credible mortality table.

We therefore turn to published studies of mortality performed with larger groups that do present credible information. Mortality rates in the United States have continued to improve. The mortality assumption used in valuing liabilities under the University's pension plan for the prior quinquennium has been the RP-2014 Employee, Healthy Annuitant, and Disabled Retiree Tables with generational projection using Scale MP-2017.

For this experience study we believe that the Pub-2010 Public Plans Mortality Tables published by the Society of Actuaries are the most appropriate tables for this plan. Previously we had used a combined table for all members. However, the Pub-2010 tables are published for separate subgroups and there is no combined table. Therefore, we believe that the Teachers table is appropriate for the academic and administrative group and the General table is appropriate for the clerical and service group.

Although the University's statistical data on mortality is not sufficient to determine a fully credible mortality table, actual mortality experience for the University's retirees were determined. This experience is partially credible and was taken into account when setting the mortality assumption. Shown below is a comparison of the assumed healthy mortality rates with the actual rates at selected ages.

Section 8: Mortality Rates

Benefit-Weighted Mortality Rates – Academic and Administrative Retirees

	Male			Female		
Age	**Current Mortality Table[1]**	**Proposed Table[2]**	**Actual**	**Current Mortality Table[1]**	**Proposed Table[2]**	**Actual**
55 – 59	0.69	0.27	0.67	0.44	0.26	0.27
60 – 64	0.94	0.46	0.11	0.65	0.37	0.20
65 – 69	1.32	0.72	0.45	0.96	0.54	0.71
70 – 74	1.98	1.25	1.06	1.49	0.93	1.10
75 – 79	3.19	2.34	1.69	2.46	1.83	1.89
80 – 84	5.31	4.34	5.26	4.10	3.50	3.64
85 – 89	9.28	8.21	8.15	7.35	6.78	6.98
90 – 94	15.60	14.40	13.97	12.49	12.15	10.68
95 – 99	23.44	22.60	26.91	19.70	20.24	20.65
Actual Deaths to Expected	74.8%			78.4%		

[1] RP-2014 Mortality Table for Healthy Annuitants with generational projection using scale MP-2017
[2] Pub-2010 Teacher Healthy Retiree Amount-Weighted Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Benefit-Weighted Mortality Rates – Clerical and Service Retirees

	Male			Female		
Age	**Current Mortality Table[1]**	**Proposed Table[2]**	**Actual**	**Current Mortality Table[1]**	**Proposed Table[2]**	**Actual**
55 – 59	0.65	0.61	3.59	0.43	0.41	0.52
60 – 64	0.94	0.96	1.36	0.65	0.54	0.53
65 – 69	1.30	1.36	2.05	0.95	0.81	0.80
70 – 74	1.93	2.17	3.35	1.49	1.37	1.64
75 – 79	3.19	3.91	4.55	2.47	2.47	2.95
80 – 84	5.36	6.98	7.41	4.16	4.52	5.05
85 – 89	8.99	12.04	14.73	7.37	8.51	8.44
90 – 94	15.63	20.31	24.11	12.45	14.70	18.24
95 – 99	23.48	30.30	44.70	19.59	22.97	37.50
Actual Deaths to Expected	160.2%			115.2%		

[1] RP-2014 Mortality Table for Healthy Annuitants with generational projection using scale MP-2017
[2] Pub-2010 General Healthy Retiree Amount-Weighted Table, weighted 124% for males and 112% for females, with generational projection using Scale MP-2020

Section 8: Mortality Rates

The actual mortality rates in each age grouping are volatile because of the relatively small number of deaths. While the actual experience rates are not credible to determine a mortality table, they do show that during the quinquennium, more deaths occurred among retirees than were assumed for clerical and service retirees and fewer deaths than assumed for academic and administrative retirees. The results also bear out that the mortality experience for the academic and administrative group was significantly different than for the clerical and service group as expected due to the significantly different demographics of these groups.

In order to blend the University's partially credible experience with the standardized tables published by the Society of Actuaries, we have utilized what is termed "the limited fluctuation credibility procedure" to determine the appropriate scaling factor of the base tables for each gender and each member classification.

The table below shows the derivation of the weighting factors, adjusted for credibility, for each gender and member classification. The "Z-Factor" referenced below is a measure of the credibility of each group based on a 90% confidence interval and a 5% margin of error and the "Best Fit Ratio" is the benefits weighted ratio of actual to expected deaths. The "Final Scale Factor" is then determined as the weighted average of the "Best Fit" and 100% based on the Z-Factor.

Academic and Administrative Versus Pub-2010 Teacher Healthy Retiree Amount-Weighted Table

	Best Fit Ratio	Z-Factor	Final Scale Factor
Males	91.6%	55.8%	95%
Females	108.5%	36.9%	103%

Clerical and Service Versus Pub-2010 General Healthy Retiree Amount-Weighted Table

	Best Fit Ratio	Z-Factor	Final Scale Factor
Males	166.8%	35.7%	124%
Females	127.4%	44.7%	112%

The experience reported above is for healthy retired members. The mortality experience for active members, beneficiaries, and disabled members is either not available or the available sample was too small to be credible. However, we propose the follow changes to those assumptions based on the most recently available, appropriate, standardized tables and the adjustment factors for the healthy retiree mortality rates. Additionally, the beneficiary proposed assumption is based on the approximate distribution of pensioner benefits between the academic and administrative group and the clerical and service group.

All of the proposed mortality tables include a projection of future mortality improvement based on the MP-2020 generational projection scale published by the Society of Actuaries.

Section 8: Mortality Rates

Disabled Retirees: 95% of the Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Tables (sex specific)

Beneficiaries: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables (sex specific)

Academic and Administrative Active and Inactive Members: Pub-2010 Teacher Employee Amount-Weighted Table (sex specific), weighted 95% for males and 103% for females

Clerical and Service Active and Inactive Members: Pub-2010 General Employee Amount-Weighted Table (sex specific), weighted 124% for males and 112% for females

The University also engaged the services of Club Vita, which is a company that has its own proprietary longevity model for projecting member mortality. The Club Vita model produced liabilities that were very close to those generated by the above assumptions, and therefore provided and independent validation on the proposed assumptions.

Annual Mortality Rates for Male Non-Retired Participants (%)

Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]	Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]	Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]
25	0.05	0.01	0.03	44	0.09	0.05	0.10	63	0.66	0.34	0.51
26	0.05	0.02	0.04	45	0.10	0.06	0.11	64	0.74	0.37	0.54
27	0.05	0.02	0.04	46	0.11	0.06	0.12	65	0.83	0.41	0.58
28	0.04	0.02	0.04	47	0.12	0.07	0.13	66	0.92	0.45	0.62
29	0.05	0.02	0.04	48	0.13	0.08	0.14	67	1.01	0.49	0.66
30	0.05	0.02	0.05	49	0.15	0.09	0.16	68	1.12	0.53	0.71
31	0.05	0.02	0.05	50	0.16	0.10	0.17	69	1.23	0.58	0.76
32	0.05	0.03	0.05	51	0.18	0.11	0.19	70	1.36	0.63	0.82
33	0.05	0.03	0.06	52	0.20	0.12	0.20	71	1.50	0.69	0.89
34	0.05	0.03	0.06	53	0.22	0.13	0.22	72	1.66	0.75	0.96
35	0.05	0.03	0.06	54	0.25	0.15	0.24	73	1.84	0.81	1.06
36	0.06	0.03	0.07	55	0.27	0.16	0.27	74	2.04	0.87	1.16
37	0.06	0.03	0.07	56	0.30	0.18	0.29	75	2.26	0.95	1.26
38	0.06	0.04	0.07	57	0.34	0.19	0.32	76	2.49	1.08	1.38
39	0.06	0.04	0.08	58	0.38	0.21	0.35	77	2.77	1.24	1.51
40	0.06	0.04	0.08	59	0.42	0.23	0.37	78	3.07	1.43	1.67
41	0.07	0.04	0.09	60	0.47	0.26	0.41	79	3.40	1.64	1.78
42	0.07	0.05	0.09	61	0.53	0.28	0.44	80	3.77	1.88	2.03
43	0.08	0.05	0.10	62	0.59	0.31	0.47				

[1] RP-2014 Employee Tables projected generationally with Scale MP-2017

[2] 95% of Pub-2010 Teacher Employee Amount-Weighted Table projected generationally with Scale MP-2020

[3] 124% of Pub-2010 General Employee Amount-Weighted Table projected generationally with Scale MP-2020

Section 8: Mortality Rates

Annual Mortality Rates for Female Non-Retired Participants (%)

Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]	Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]	Age	Current Rate[1]	Proposed Rate (A&A)[2]	Proposed Rate (C&S)[3]
25	0.02	0.01	0.01	44	0.06	0.04	0.05	63	0.31	0.22	0.27
26	0.02	0.01	0.01	45	0.06	0.05	0.06	64	0.34	0.24	0.29
27	0.02	0.01	0.01	46	0.07	0.05	0.06	65	0.37	0.26	0.32
28	0.02	0.01	0.01	47	0.08	0.06	0.07	66	0.40	0.29	0.35
29	0.02	0.01	0.02	48	0.09	0.06	0.07	67	0.45	0.32	0.38
30	0.02	0.02	0.02	49	0.10	0.07	0.08	68	0.50	0.36	0.42
31	0.02	0.02	0.02	50	0.11	0.07	0.09	69	0.55	0.41	0.46
32	0.03	0.02	0.02	51	0.12	0.08	0.10	70	0.61	0.46	0.50
33	0.03	0.02	0.02	52	0.13	0.09	0.11	71	0.68	0.52	0.56
34	0.03	0.02	0.03	53	0.14	0.10	0.12	72	0.76	0.59	0.62
35	0.03	0.02	0.03	54	0.16	0.10	0.13	73	0.84	0.68	0.69
36	0.03	0.02	0.03	55	0.17	0.11	0.14	74	0.94	0.78	0.76
37	0.03	0.03	0.03	56	0.18	0.12	0.16	75	1.05	0.88	0.85
38	0.04	0.03	0.04	57	0.20	0.13	0.17	76	1.16	1.02	0.95
39	0.04	0.03	0.04	58	0.21	0.15	0.18	77	1.29	1.17	1.04
40	0.04	0.03	0.04	59	0.23	0.16	0.20	78	1.45	1.35	1.15
41	0.04	0.04	0.05	60	0.25	0.17	0.21	79	1.62	1.56	1.30
42	0.05	0.04	0.05	61	0.27	0.18	0.23	80	1.81	1.88	1.43
43	0.05	0.04	0.05	62	0.29	0.20	0.25				

[1] RP-2014 Employee Tables projected generationally with Scale MP-2017

[2] 95% of Pub-2010 Teacher Employee Amount-Weighted Table projected generationally with Scale MP-2020

[3] 124% of Pub-2010 General Employee Amount-Weighted Table projected generationally with Scale MP-2020

Section 9: Summary of Actuarial Funding Assumptions

Set forth below is a summary of the recommended actuarial standards developed for use in the computation of annual contribution requirements during this quinquennium:

Net Investment Return:	7.00%.
Inflation	2.20%
Salary Increases at Selected Ages :	

Age	Academic & Administrative Rate (%)	Clerical & Service Rate (%)
25	8.2	5.3
30	5.8	4.4
35	4.8	4.0
40	4.3	3.6
45	4.0	3.2
50	3.6	2.9
55	3.0	2.7
60	2.5	2.4

Salary increases include an assumed inflation rate of 2.2%.

Mortality Rates:

Academic & Administrative Members:

Healthy: Pub-2010 Teacher Healthy Annuitant Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Disabled: Pub-2010 Non-Safety Disabled Annuitant Mortality Table, weighted 95% for males and females, with generational projection using Scale MP-2020

Non-Annuitant: Pub-2010 Teacher Employee Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Surviving Spouse: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables projected generationally with Scale MP-2020

	Clerical & Service Members: *Healthy*: Pub-2010 General Healthy Annuitant Mortality Table, weighted 124% for males and 112% for females with generational projection using Scale MP-2020 *Disabled*: Pub-2010 Non-Safety Disabled Annuitant Mortality Table, weighted 95% for males and females, with generational projection using Scale MP-2020 *Non-Annuitant*: Pub-2010 General Employee Mortality Table, weighted 124% for males and 112% for females, with generational projection using Scale MP-2020 *Surviving Spouse*: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables projected generationally with Scale MP-2020

Section 9: Summary of Actuarial Funding Assumptions

Termination Rates Before Retirement:

	Withdrawal Rate[1] (%)	
Years of Service	Academic & Administrative	Clerical & Service
0	21.5	31.0
1	21.0	23.0
2	18.5	19.5
4	15.0	13.5
6	13.0	11.5
8	11.0	11.0
10	9.0	10.0
12	7.0	8.0
14	5.0	6.0
16	5.0	5.0
18	5.0	5.0
20	4.0	5.0
22	4.0	5.0
24	4.0	5.0

[1] Withdrawal rates do not apply at or beyond early retirement or 25 years of service

Age	Disability Rates (%)
40	0.04
45	0.10
50	0.19
55	0.37
60	0.61

Retirement Rates:

	Academic & Administrative		Clerical & Service	
Age	**Under 25 Years of Service**	**Over 25 Years of Service**	**Under 25 Years of Service**	**Over 25 Years of Service**
55	5%	8%	7%	12%
56 - 58	3	4	5	6
59	3	4	5	12
60	5	8	10	18
61	5	12	10	24
62	10	25	20	50
63 - 64	10	12	15	30
65 - 66	25	25	40	40
67 - 79	20	20	35	35
80	100	100	100	100

Load for Summer Appointments 2.20% of Academic & Administrative active member liability and normal cost

Section 10: Impact of Recommended Assumptions on Actuarial Valuation Results

The recommended changes in the assumptions will impact the results of the actuarial valuation as follows:

			Net Employer Contribution		
	Normal Cost	Unfunded Liability	Amount	Level 1 % of Pay	Level 2 % of Pay
October 1, 2020 Valuation	$59,384,616	$899,503,574	$123,154,799	12.66%	9.11%
Change due to:					
• Interest Rate	$2,863,621	$111,541,581	$11,197,366	1.08%	0.91%
• Salary Scale	663,412	10,141,624	1,535,478	0.16%	0.11%
• Severance Rates	-4,643,115	-31,340,225	-7,338,022	-0.81%	-0.48%
• Disability Rates	126,347	2,648,702	354,105	0.04%	0.03%
• Summer Employment Load	-524,205	-18,525,746	-2,117,211	-0.20%	-0.17%
• Retirement Rates	804,102	47,609,999	4,898,026	0.46%	0.41%
• Mortality Rates	1,422,174	101,773,654	10,173,564	0.95%	0.87%
Total Changes	$712,336	$223,849,589	18,703,306	1.68%	1.68%
Total Recommended Assumptions	$60,096,952	$1,123,353,163	$141,858,105	14.34%	10.79%

Section 10: Impact of Recommended Assumptions on Actuarial Valuation Results

Based on the October 1, 2020 Actuarial Valuation

	Current Assumptions			Recommended Assumptions		
Contribution Requirements	**Total Plan**	**Level One % of Projected Payroll**	**Level Two % of Projected Payroll**	**Total Plan**	**Level One % of Projected Payroll**	**Level Two % of Projected Payroll**
1. Normal cost	$59,384,616	6.99%	3.35%	$60,096,952	7.05%	3.41%
2. 23-year amortization of unfunded liability	78,604,764	7.04%	7.04%	96,595,735	8.65%	8.65%
3. Expected employee contribution	-14,834,581	-1.37%	-1.28%	-14,834,581	-1.37%	-1.28%
4. Net employer contribution	$123,154,799	12.66%	9.11%	$141,858,105	14.34%	10.79%

Funding Status	Current Assumptions	Recommended Assumptions
Actuarial liability	$4,787,528,662	$5,011,378,251
Actuarial value of assets	3,888,025,088	3,888,025,088
Unfunded liability	899,503,574	1,123,353,163

Section 11: Funding Policy

The actuarial assumptions determine the total projected future cost of the plan. Once this total future cost is determined the funding method determines how this total cost is allocated to future time periods. This plan uses the Entry Age Normal Cost method to allocate plan costs. This method determines for each member a level annual cost, as a percent of salary, from hire until termination or retirement that is projected to fully fund their retirement benefit. The Entry Age method provides the most level and predictable cost of any funding method. It is also the method that is required to be used for calculation for GASB 67 and 68 accounting. For these reasons, we would not recommend any change in the underlying funding method.

Any projected plan costs that are not covered by either current plan assets or projected future normal costs are unfunded liabilities that must be amortized. The amortization policy has been a level-dollar amortization amount over a closed 30-year period that commenced as of October 1, 2013 (22 years remaining on amortization period as of October 1, 2021).

Actuarial Standard of Practice No. 4 gives guidance of the selection of the amortization period, noting that it should take into account the duration of the actuarial accrued liability and the average remaining service lifetime of active plan participants. The plan was closed to new members effective October 1, 2019. As a result, both the liability duration and the average future service have been declining and are projected to continue to decline in the future.

The Government Finance Officers Association (GFOA) offers best practices in their document *Core Elements of a Funding Policy.* In that document they state that "[a]mortization of the unfunded actuarial accrued liability should … [n]ever exceed 25 years, but ideally fall in the 15–20 year range". Furthermore, the GFOA states that "[f]or closed plans that still have active members … amortization periods should be shorter."

We recommend that the current amortization period be shortened to no more than 20 years as of October 1, 2021. It would be inappropriate to maintain a longer amortization period as this would extend the payment period far beyond the average future working lifetime of current plan members. This would push the burden of funding the plan costs onto a future cohort of members that do not even participate in the defined benefit plan and threaten the benefit security of current plan members.

In order to maintain stability in future amortization payments, we recommend that the funding policy be amended to provide for separate amortization schedules for future liability changes that arise due to future gains or losses, or future assumption changes. We recommend that future actuarial losses be amortized over a period of 15 to 20 years. Similarly, we recommend that future actuarial gains be amortized over a period of 20 to 25 years. Finally, we recommend that the assumption changes in this report and any future assumption changes be amortized over 20 years. Thus, all liabilities in the October 1, 2021 valuation would be amortized over a closed 20-year period.

Defined Benefit Plan Financial Management Strategy

Overview

- The University's defined benefit plan has always been managed with great care and remains very well funded relative to other public pension plans.

- The proposed actions will further strengthen the financial condition of the plan while protecting the University's operating budget – to the extent possible - from cost volatility.

Update - Buyout of Vested Terminations

- Vested Terminations - employees who terminated University employment prior to retirement, yet maintain vested benefits in the defined benefit plan
- As of the most recent valuation date, the defined benefit plan had approximately 5,900 vested termination participants with aggregate benefit liabilities of $366 million
- Planning is underway to create a plan to which would target these vested termination participants with a cash buyout offer.
- The main objective of this initiative is to reduce overall plan liabilities, which helps reduce plan volatility

Proposed Changes to Investment Mix

	Current Policy	Proposed Policy
Expected Real Return	4.4%	4.8%
Actuarial Inflation Assumption	2.2%	2.2%
Expected Return	**6.6%**	**7.0%**

	Expected Returns	Current Policy	Proposed Policy	Proposed Change
Public Equity	6.0%	35%	34%	**(1%)**
Private Equity	9.5%	12%	13%	**1%**
Real Estate	8.5%	10%	13%	**3%**
Treasuries	1.5%	10%	8%	**(2%)**
TIPS	1.7%	10%	9%	**(1%)**

- The Current Policy results in an Expected Return of 6.6%
- With proposed changes to investment mix, the Expected Return increases to 7.0%
- The current actuarial return assumption is 7.20%
- It is recommended that the actuarial return assumption be lowered from 7.2% to 7.0%

Objectives – Proposed CRR

- Recognize the Plan's total pension liability as a significant debt of the University which must be managed accordingly.
- Prioritize and protect University funding for Plan contributions needed to achieve and maintain full funding of the Plan, utilizing actuarial assumptions and risk levels appropriate for a closed plan.
- Provide cost stabilization provisions to protect the University's operating budget - to the extent possible – from volatility in Plan contributions.
- Provide full transparency to internal and external constituents of the Plan and University.

Actuarial Valuation Assumptions Study

- Performed by the University's independent actuary (Segal)

- The study is performed every five years; the last review occurred in 2017.

- Based on a review of five years of economic and demographic experience, Segal has recommended changes to the defined benefit plan's actuarial assumptions that best reflect emerging experience.

- *Changes in assumptions will not change actual (ultimate) plan cost but do impact the amount and timing of contributions*

Recommendations for Board Action

- Approve changes to Retirement Plan asset allocation targets
  CRR 140.015 *Investment Policy for Retirement, Disability and Death Benefit Plan*

- Adopt new financial management policy for Retirement Plan
  CRR 530.020 *Retirement, Disability and Death Benefit Plan Financial Management Policy*

- Accept changes to Retirement Plan actuarial assumptions as recommended by Segal's *Report on Actuarial Valuation Assumptions Study*

Five-year Capital Plans for MU, MU Health Care, Missouri S&T, UMKC, and UMSL

The capital planning process approved at the September 2017 Board of Curators meeting includes development of a five-year capital plan that will be reviewed and approved annually by the Board of Curators. The capital plan contains two sections, five-year capital plan included in the five-year finance plan and strategic development project plan for aspirational strategic projects not currently included in the finance plan. This process allows for execution of the current year plans and will provide additional time for fundraising, working with legislature, and additional due diligence during years two through five. Capital plans will assist in driving any official fundraising campaigns for capital projects. Major capital projects will be approved by the Board of Curators before being incorporated into any approved capital plans, budget plans, or long-range business plans. Major capital projects include any new construction over $5 million in project cost or any renovation/infrastructure improvements over $8 million in project cost.

The capital planning process and investment in existing facilities are two key components of Facilities Stewardship. Facilities stewardship is about taking a long and broad view of an institution's past and future. The University of Missouri System is comprised of over 1,500 buildings, four primary campuses and a health care system. Total valuation is over $11 billion. Investment to maintain these facilities over the past 15 years has been insufficient. UM education and general (E&G) facilities now have over $1.9 billion in facilities needs (FCN), resulting in the facilities portfolio being rated below average condition. Due to continued limited funding, we must be deliberate in setting capital priorities to uphold our stewardship responsibility. The capital planning process is critical in ensuring we uphold that responsibility.

Included herein is the current year, FY22, and the FY 2023 - 2027 Capital Project Plans for review and approval. The enclosed information includes:

- Facilities Stewardship information with historic spending.
- Capital Plans included in the five-year finance plans summary table of all proposed projects by category (new construction or renovation/infrastructure) with campus priority, project cost, and the year anticipated for Curator approval; summary table of project funding sources; and project descriptions.
- Strategic Development Projects Plans summary table for aspirational strategic projects not yet included in the five-year finance plan and project descriptions.

No. 2

Recommended Action - Approval of Five-year Capital Plans for MU, MU Health Care, Missouri S&T, UMKC and UMSL

It was recommended by President Choi, Chancellor Agrawal, Chancellor Dehghani, and Chancellor Sobolik, recommended by the Finance Committee, moved by Curator _______________ and seconded by Curator _______________, that the:

MU: Capital Plan included in Finance Plan:

- Veterinary Medical Diagnostic Laboratory Addition
- Lottes Health Sciences Library Building – Renovate for Consolidation
- Pershing Hall – Renovate for Student Health Center & School of Medicine/MUHC Offices
- MU Research Reactor – West Expansion
- Medical Sciences Building – Renovations
- NextGen Precision Health- 4th Floor Fit-Out
- Radioisotope Facility at Discovery Ridge
- Swine Facility- South Farm Phase II
- Swine Facility- Middlebush Farm Phase II

Strategic Projects Development Plan:

- Vivarium Facility Expansion
- Bond Life Sciences Center - Phase II
- Facilities Needs and Operations Reduction Project
- Jesse Hall Exterior Masonry/Metal Repairs & Window Replacement
- Medical Science Building Replace Electrical Distribution System
- National Swine Resource and Research Center – Addition for NIH CO6 Grant Funding
- Pickard Hall – Decommissioning and Mitigation

MUHC: Capital Plan included in Finance Plan:

- MUHC Campus Consolidation & Inpatient Services Expansion

UMKC: Capital Plan included in Finance Plan:

- New Health Science Building
- School of Medicine, St Joseph's Facility
- Steam Heating Plant Renewal

Strategic Projects Development Plan:

- Olson Performing Arts Center Renovations and Additions
- UMKC Athletics Performance Center Additions & Renovations
- Spencer Chemistry & Biological Science Renovation Phase II
- New Student Housing
- 4747 Troost Renovation

S&T: Capital Plan included in Finance Plan:

- Missouri Protoplex – Phase One
- Arrival Court
- Subsurface Parking Garage
- Missouri Protoplex – Phase Two
- Welcome Center
- Engineering Research Lab Addition and Renovation
- Schrenk Hall Addition and Renovation - Phase III

Strategic Projects Development Plan:

- Innovation Campus Program Expansion
- University Center West
- McNutt Hall Addition

UMSL: Capital Plan included in Finance Plan:

- Optometry and Honors College Consolidation
- Music and Fine Arts to General Services Building Consolidation
- College of Education Consolidation
- Thomas Jefferson Library/Computer Laboratory Consolidation
- Welcome Center

Strategic Projects Development Plan:

- Stadler Hall Renovation

be approved for further planning and development as described in the following materials.

Roll call vote of the Committee:	YES	NO
Curator Hoberock		
Curator Graves		
Curator Layman		
Curator Williams		

The motion ___________________.

Roll call vote:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graham		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ___________________.

Fiscal Years 2022 – 2027 Capital Plan included in Finance Plan for University of Missouri

			2022*	2023	2024	2025	2026	2027
Project	**University**	**Priority**	**Current Year**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
New Construction			**$197,006,230**	**$161,476,000**	**$0**	**$52,266,768**	**$52,040,100**	**$66,000,000**
Veterinary Medical Diagnostic Laboratory Addition	MU	1	$30,000,000					
MU Research Reactor – West Expansion	MU	4	$20,000,000					
NextGen Precision Health - 4th Floor Fit-Out	MU	6		$16,500,000				
Radioisotope Facility at Discovery Ridge	MU	7		$19,976,000				
Swine Facility - South Farm Phase II	MU	8		$5,000,000				
Swine Facility - Middlebush Farm Phase II	MU	9		$5,000,000				
MUHC Campus Consolidation Inpatient Services Expansion	MUHC	1						$66,000,000
New Health Science Building	UMKC	1		$100,000,000				
School of Medicine - New St. Joseph's Facility	UMKC	2		$15,000,000				
Missouri Protoplex – Phase One	S&T	1	$13,068,182					
Arrival Court	S&T	2	$9,600,000					
Subsurface Parking Garage	S&T	3	$9,920,000					
Missouri Protoplex – Phase Two	S&T	4	$88,668,048					
Welcome Center	S&T	5	$25,750,000					
Engineering Research Lab Addition and Renovation	S&T	6				$52,266,768		
Schrenk Hall Addition and Renovation – Phase III	S&T	7					$52,040,100	
Renovation/Infrastructure			**$95,550,000**	**$20,000,000**	**$0**	**$0**	**$0**	**$0**
Lottes Health Sciences Library Building – Renovate for Consolidation	MU	2	$8,500,000					
Pershing Hall – Renovate for Student Health Center & School of Medicine/MUHC Offices	MU	3	$11,250,000					
Medical Sciences Building – Renovations	MU	5		$20,000,000				
Steam Heating Plant Renewal	UMKC	3	$12,000,000					

Project	University	Priority	2022* Current Year	2023 Year 1	2024 Year 2	2025 Year 3	2026 Year 4	2027 Year 5
Optometry and Honors College Consolidation	UMSL	1	$14,500,000					
Music and Fine Art to General Services Building Consolidation	UMSL	2	$11,000,000					
College of Education Consolidation	UMSL	3	$19,800,000					
Thomas Jefferson Library/Computer Laboratory Consolidation	UMSL	4	$8,000,000					
Welcome Center	UMSL	5	$10,500,000					
Total Project Cost			**$292,956,230**	**$181,476,000**	**$0**	**$52,266,768**	**$52,040,100**	**$66,000,000**

*Projects listed under 2022 are projects approved or will be approved during FY22.

Fiscal Years 2022 – 2027 Capital Plan included in Finance Plan Funding Summary for University of Missouri

Projects							**Funding Strategy**				
#	**Title**	**University**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	Veterinary Medical Diagnostic Laboratory Replacement Building	MU	NC	$8.1M	0.49	$30,000,000	$0	$15,000,000	$0	$0	$15,000,000
2	Lottes Health Sciences Library Building – Renovate for Consolidation	MU	RE	$7.7M	0.37	$8,500,000	$0	$0	$8,500,000	$0	$0
3	Pershing Hall – Renovate for Student Health Center & School of Medicine/MUHC Offices	MU	RE	$1.8M	0.11	$11,250,000	$0	$0	$11,250,000	$0	$0
4	MU Research Reactor – West Expansion	MU	NC	NA	NA	$20,000,000	$0	$0	$0	$0	$20,000,000
5	Medical Science Building - Renovations	MU	RE	$46.5M	0.46	$20,000,000	$0	$0	$0	$0	$20,000,000
6	NextGen Precision Health- 4th Floor Fit-Out	MU	NC	NA	NA	$16,500,000	$0	$0	$0	$0	$16,500,000
7	Radioisotope Facility at Discovery Ridge	MU	NC	NA	NA	$19,976,000	$0	$0	$0	$19,976,000	$0
8	Swine Facility- South Farm Phase II	MU	NC	NA	NA	$5,000,000	$0	$0	$0	$0	$5,000,000
9	Swine Facility- Middlebush Farm Phase II	MU	NC	NA	NA	$5,000,000	$0	$0	$0	$0	$5,000,000
1	MUHC Campus Consolidation & Inpatient Services Expansion	MUHC	NC	NA	NA	$66,000,000	$66,000,000	$0	$0	$0	$0
1	New Health Science Building	UMKC	NC	NA	NA	$100,000,000	$0	$50,000,000	$0	$0	$50,000,000
2	School of Medicine - New St Joseph’s Facility	UMKC	NC	NA	NA	$15,000,000	$0	$0	$2,000,000	$13,000,000	$0
3	Steam Heating Plant Renewal	UMKC	RE	$12M	0.42	$12,000,000	$12,000,000	$0	$0	$0	$0

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Projects							Funding Strategy				
# Title	University	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1 Missouri Protoplex – Phase One	S&T	NC	$5.3M	0.38	$13,068,182	$0	$13,068,182	$0	$0	$0
2 Arrival Court	S&T	NC	NA	NA	$9,600,000	$0	$9,600,000	$0	$0	$0
3 Subsurface Parking Garage	S&T	NC	NA	NA	$9,920,000	$0	$9,920,000	$0	$0	$0
4 Missouri Protoplex – Phase Two	S&T	NC	NA	NA	$88,668,048	$0	$33,668,048	$0	$0	$55,000,000
5 Welcome Center	S&T	NC	NA	NA	$25,750,000	$0	$18,750,000	$7,000,000	$0	$0
6 Engineering Research Laboratory Addition and Renovation	S&T	NC/RE	$13.0M	0.49	$52,266,768	$0	$26,133,384	$0	$26,133,384	$0
7 Schrenk Hall Addition and Renovation – Phase III	S&T	NC/RE	$19.1M	0.57	$52,040,100	$0	$0	$0	$0	$52,040,100
1 Optometry and Honors College Consolidation	UMSL	RE	$40M	0.22-0.67	$14,500,000	$0	$0	$7,250,000	$0	$7,250,000
2 Music and Fine Art to General Services Building Consolidation	UMSL	RE	$36.5M	0.30-0.49	$11,000,000	$0	$0	$5,500,000	$0	$5,500,000
3 College of Education Consolidation	UMSL	RE	$63.7M	0.22-0.67	$19,800,000	$0	$0	$9,900,000	$0	$9,900,000
4 Thomas Jefferson Library/Computer Laboratory Consolidation	UMSL	RE	$22.0M	0.33	$8,000,000	$0	$2,000,000	$3,000,000	$0	$3,000,000
5 Welcome Center	UMSL	RE	$27.0M	0.48	$10,500,000	$0	$5,000,000	$2,750,000	$0	$2,750,000
Total					**$644,339,098**	**$78,000,000**	**$183,139,614**	**$57,150,000**	**$59,109,384**	**$266,940,100**

Fiscal Years 2022 – 2027 Strategic Projects Development Plan for University of Missouri

Project							Funding Strategy				
#	Title	University	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Vivarium Facility Expansion	MU	NC	NA	NA	$15,000,000	$0	$0	$15,000,000	$0	$0
2	Bond Life Sciences Center - Phase II	MU	NC	NA	NA	$80,000,000	$0	$0	$80,000,000	$0	$0
3	Facilities Needs and Operations Reduction Project	MU	RE	$81.4M	0.26 - 0.47	$56,000,000	$0	$0	$0	$0	$56,000,000
4	Jesse Hall Exterior Masonry/Metal Repairs & Window Replacement	MU	RE	$13.4M	0.26	$11,000,000	$0	$0	$0	$0	$11,000,000
5	Medical Science Building Replace Electrical Distribution System	MU	RE	$46.5M	0.47	$8,000,000	$0	$0	$0	$0	$8,000,000
6	National Swine Resource and Research Center – Addition for NIH CO6 Grant Funding	MU	NC	$0.4M	0.02	$8,000,000	$0	$0	$0	$8,000,000	$0
7	Pickard Hall – Decommissioning and Mitigation	MU	Demo	$5.45M	0.44	$12,000,000	$0	$0	$12,000,000	$0	$0
1	Olson Performing Arts Center Renovations and Additions	UMKC	RE/NC	$10.1M	0.41	$30,000,000	$0	$30,000,000	$0	$0	$0
2	UMKC Athletics Performance Center Additions and Renovations	UMKC	RE/NC	$5M	0.35	$55,000,000	$0	$55,000,000	$0	$0	$0
3	Spencer Chemistry & Biological Science Renovation Phase II	UMKC	RE	$10M	0.36	$40,000,000	$0	$0	$0	$0	$40,000,000
4	New Student Housing*	UMKC	NC	NA	NA	$45,000,000	$45,000,000	$0	$0	$0	$0
5	4747 Troost Renovation	UMKC	RE	$6.4M	0.42	$8,500,000	$0	$0	$0	$0	$8,500,000
1	Innovation Campus Program Expansion	S&T	NC	NA	NA	$95,000,000	$0	$0	$0	$95,000,000	$0
2	University Center West	S&T	NC	NA	NA	$7,267,050	$0	$0	$7,267,050	$0	$0
3	McNutt Hall Addition	S&T	NC	NA	NA	$10,956,750	$0	$10,956,750	$0	$0	$0
1	Stadler Hall Renovation	UMSL	RE	$30M	0.57	$38,500,000	$0	$0	$0	$0	$38,500,000
	Total					**$355,346,800**	**$45,000,000**	**$95,956,750**	**$114,267,050**	**$103,000,000**	**$162,000,000**

*New Student Housing Project to be funded through a Public Private Partnerships (P3's)

University of Missouri – Columbia
Fiscal Years 2022 – 2027 Capital Plan

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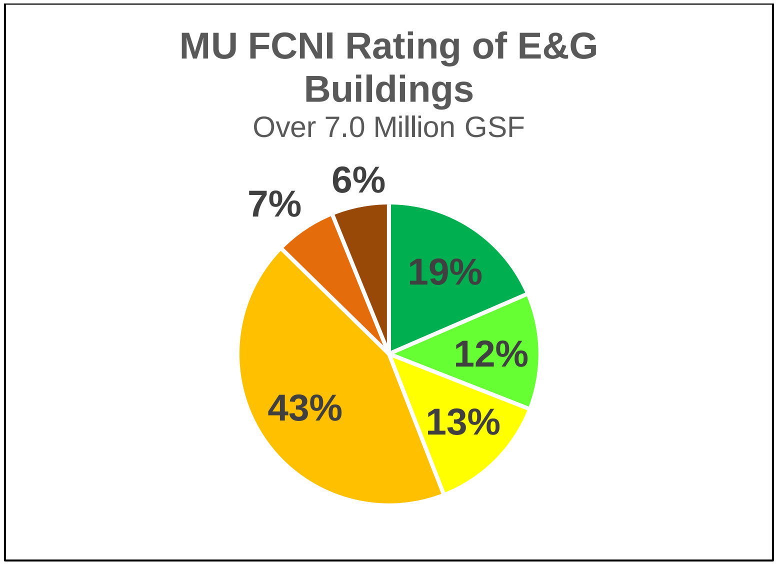
University of Missouri - Columbia Facilities Stewardship

CRR 110.015 was established to maintain the facilities of the University of Missouri System in adequate condition to meet the needs of the University's education and research missions. A Facilities Condition Needs Index (FCNI) of 0.30 or lower was established as the goal for the Education and General (E&G) facility portfolio. CRR 110.015 also requires each campus to annually establish its facilities needs funding (target spend) by calculating the investment required to achieve and maintain the campus FCNI goal of 0.30 or lower for its E&G facilities over the next ten years.

MU currently has a FCNI of 0.30 and a backlog of $881.6 million of facilities needs. Fifty-six (56%) of the E&G space on the campus fall in the category of Below Average Condition, Poor condition, or Replacement is recommended. MU continues to underfund their target spend and their facilities needs are growing.



E&G Facilities *(Dollars shown in Millions)*	**2017**	**2018**	**2019**	**2020**	**2021**
Target Spend	$52.7	$52.4	$55.9	$59.0	$60.2
Actual Spend	$47.5	$29.9	$21.6	$28.5	$13.9
Recurring	$20.2	$17.2	$16.3	$12.7	$8.1
One-Time	$27.3	$12.7	$5.3	$15.8	$5.8
Difference in Target and Actual	($5.2)	($22.5)	($34.3)	($30.5)	($46.3)
FCN Backlog	$780.8	$811.8	$840.9	$867.8	$881.6
Deferred Maintenance	$268.4	$283.6	$283.9	$306.1	$446.8
Plant Adaption	$108.1	$108.8	$115.0	$118.3	$120.5
Capital Renewal	$404.3	$419.4	$442.0	$443.4	$314.3
Recommended Target for next year	$52.4	$55.9	$59.0	$60.2	$61.0
Campus FCNI	**0.30**	**0.30**	**0.31**	**0.31**	**0.30**

Facility Condition Needs Index
Excellent Condition, typically new construction (0.000 - 0.100)
Good Condition, renovations occur on schedule (0.101 - 0.200)
Fair Condition, in need of normal renovation (0.201 - 0.300)
Below Average Condition, major renovation required (0.301 - 0.500)
Poor Condition, total renovation indicated (0.501 - 0.600)
Replacement Recommended (0.600 and Higher)

April 21, 2022

University of Missouri - Columbia: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan

MU	2022*	2023	2024	2025	2026	2027
	Current Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Construction	**$50,000,000**	**$46,476,000**	**$0**	**$0**	**$0**	**$0**
Veterinary Medical Diagnostic Laboratory Addition	$30,000,000					
MU Research Reactor – West Expansion	$20,000,000					
NextGen Precision Health- 4th Floor Fit-Out		$16,500,000				
Radioisotope Facility at Discovery Ridge		$19,976,000				
Swine Facility- South Farm Phase II		$5,000,000				
Swine Facility- Middlebush Farm Phase II		$5,000,000				
Renovation/Infrastructure	**$19,750,000**	**$20,000,000**	**$0**	**$0**	**$0**	**$0**
Lottes Health Sciences Library Building – Renovate for Consolidation	$8,500,000					
Pershing Hall – Renovate for Student Health Center & School of Medicine/MU Health Care Offices	$11,250,000					
Medical Sciences Building – Renovations		$20,000,000				
Total Project Cost	**$69,750,000**	**$66,476,000**	**$0**	**$0**	**$0**	**$0**

* Projects listed under 2022 are projects approved or will be approved during FY22.

University of Missouri – Columbia: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan Funding

Project						Funding Strategy				
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Veterinary Medical Diagnostic Laboratory Replacement Building	NC	$8.1M	0.49	$30,000,000	$0	$15,000,000	$0	$0	$15,000,000
2	Lottes Health Sciences Library Building – Renovate for Consolidation	RE	$7.7M	0.37	$8,500,000	$0	$0	$8,500,000	$0	$0
3	Pershing Hall – Renovate for Student Health Center & School of Medicine/MU Health Care Offices	RE	$1.8M	0.11	$11,250,000	$0	$0	$11,250,000	$0	$0
4	MU Research Reactor – West Expansion	NC	NA	NA	$20,000,000	$0	$0	$0	$0	$20,000,000
5	Medical Science Building – Renovations	RE	$46.5M	0.46	$20,000,000	$0	$0	$0	$0	$20,000,000
6	NextGen Precision Health- 4th Floor Fit-Out	NC	NA	NA	$16,500,000	$0	$0	$0	$0	$16,500,000
7	Radioisotope Facility at Discovery Ridge	NC	NA	NA	$19,976,000	$0	$0	$0	$19,976,000	$0
8	Swine Facility- South Farm Phase II	NC	NA	NA	$5,000,000	$0	$0	$0	$0	$5,000,000
9	Swine Facility- Middlebush Farm Phase II	NC	NA	NA	$5,000,000	$0	$0	$0	$0	$5,000,000
	Total				$136,226,000	$0	$15,000,000	$19,750,000	$19,976,000	$81,500,000

April 21, 2022

1. **Veterinary Medical Diagnostic Laboratory Replacement Building, MU – Project Approval at the September 2021 BOC Meeting**

The Veterinary Medical Diagnostic Laboratory (VMDL) Addition project will construct a new facility of approximately 33,600 gross square feet (GSF) directly adjacent to the existing VMDL building which is 21,140 GSF. In conjunction with the new construction, the project, will demolish one existing building a block away, the 40,350 gsf Veterinary Science Building (VSB).

The key operational elements of the new facility include a new necropsy & biocontainment suite, incinerator, and diagnostic laboratories. These functions in the current VMDL cannot be modernized to current standards due to structural, size, and configuration constraints. New construction of these functions provides the most effective means to satisfy the goals of the project, to improve safety for students, staff, and the public; minimize potential contamination; and improve operational efficiencies. This concept will also better segregates and secures biohazards between the currently shared service yards in the veterinary complex of buildings. The existing VMDL is considered below average condition with an FCNI of 0.49.

The VMDL is Missouri's only veterinary laboratory accredited by the American Association of Veterinary Laboratory Diagnosticians. Each year, the VMDL performs in excess of 100,000 diagnostic tests, for agricultural animals as well as companion animals. The VMDL is a major resource to State and national networks to monitor and investigate potential outbreaks of animal diseases such as avian influenza and foot-and-mouth disease; human diseases such as West Nile virus and rabies; and cases of brucellosis, salmonellosis, and other diseases that have an impact on animal and public health. The VMDL has established a new collaboration with the Missouri Department of Conservation and is certified to test chronic wasting disease in wild and captive animal.

This project will eliminate $8.15 million in facilities needs and will increase annual operating cost by $650,422.

Funding for the $30,000,000 project will be $15,000,000 from gifts and $15,000,000 from the State.

2. **Lottes Health Sciences Library Renovation, MU**

This project will renovate 35,000 – 40,000 gross square feet (gsf) of existing space within the Medical Science Complex, and supports both the campus Strategic Space Reduction plan, and the new MUHC Children's Hospital Facility. The renovation will consolidate, centralize, and modernize the Health Sciences Library to a single floor adjacent to the main lobby space connecting the academic and research areas of the complex. This provides the opportunity to renovate the vacated areas for on-campus office space for the Department of Child Health faculty that will be relocated from the Keene Street location, as the Children's Hospital Facility becomes operational in 2024

The Health Sciences Library is the primary library for the University of Missouri School of Medicine, the Sinclair School of Nursing, and the School of Health

Professions. The library activities have changed over the years providing an opportunity to revisit the size of spaces and focus on services and resources which are critical to advancing teaching and research within these schools; this will also enhance the student experience. The Department of Child Health trains physicians, fosters innovation through discovery and application, and provides high-quality health care; including more than 30 pediatric subspecialties for patients throughout Missouri and beyond. With the construction of the Children's Hospital Facility on the main campus, it is crucial to have departmental offices in close proximity. This renovation allows for interior building systems to be updated and will address the building's facilities needs

Funding for the $8,500,000 project will be provided by the University.

3. **Pershing Hall Student Health Center and School of Medicine/MU Health Care Offices, MU**

This project will renovate Pershing Hall, a two-story, 32,200 gross square feet (gsf) building directly north of the new Children's Hospital Facility. The renovation will provide space on the upper floor for the Student Health Center; and the lower floor will accommodate office space needs for School of Medicine Department of Obstetrics, Gynecology, and Women's Health and MU Health Care (MUHC) functions which need to be relocated from the Keene Street location as the new Children's Hospital Facility becomes operational in 2024. Enabling projects will be completed to relocate the existing functions of Residential Life and Campus Dining Services Convenience market to other nearby buildings.

With the construction of the Children's Hospital Facility (CHF) on the main campus, MUHC has identified some additional relocations and renovations to develop efficient operations. The Student Health Center currently occupies space on the 4th floor of the University Physicians Medical Building (UPMB) which is challenging for students to find and occupies space that would be better served by MUHC clinics, consistent with the primary building usage. The relocation to Pershing places the Student Health Center in a more visible location and closer to the academic core. The lower floor will allow for office space needed for efficient access to the CHF including the Department of Obstetrics, Gynecology and Women's Health. This department strives to be a leading provider of high-quality, evidence-based, patient-centered women's health care services to the citizens of mid-Missouri and beyond; providing excellent education of medical students, residents, fellows, and others in women's health; and producing internationally recognized innovative research in reproductive biology, perinatal medicine, and women's health. With the construction of the Children's Hospital Facility on the main campus, it is crucial to have the departmental office relocated from Keene Street in conjunction with the new facility.

Funding for the $11,250,000 project will be provided by the University.

4. **MU Research Reactor – West Expansion, MU**
The project will consist of a 40,000 - 45,000 gross square feet (gsf) building addition to the west of the existing building located north of the reactor building. The three-story project will construct offices on a second floor to house staff growth and will eliminate four modular office trailers currently in the complex. The ground floor will house shell space to allow for the future fit out for 15,000 gsf of hot cells and laboratories. The third floor is the mechanical space necessary for the building's long-term function, including needed storage space.

For more than 50 years, the faculty and staff of the MU Research Reactor (MURR) have promoted groundbreaking research and developed life-saving radiopharmaceuticals. The MURR expansion will allow for growth for R&D industry partners and researchers, scientists, engineers, and students at MU. MURR recently executed an exclusive multi-year agreement (worth over $300M) with Advanced Accelerator Applications International, SA (AAA), a Novartis company, to provide a key ingredient in a targeted therapy for certain types of cancerous tumors. This project provides the shell space needed to fit-out modules for future growth.

Funding for the $20,000,000 project will be from the State.

5. **Medical Sciences Building Renovations, MU**
The project will renovate laboratories for School of Medicine researchers which have not been improved in more than 20 years. Various areas of the building have undergone laboratory renovations to create modern, modular laboratory areas creating collaborative environments. A programming and planning study is in progress to determine the scale of the renovations and connectivity to other infrastructure improvements needed.

Medical Science Building is a key space resource for research laboratories related to the Health Sciences, particularly the School of Medicine. The building has an FCNI of 0.46 with facility needs over $47 million. The significant size (258,000 gsf) and location, connected to the University Hospital, make it imperative to improve the condition before it reaches critical state and continue its use as a laboratory resource well into the future.

Updated laboratories will accommodate new faculty hires through the School of Medicine which is a key component to the implementation of Mizzou Forward.

Funding for the $20,000,000 project will be from the State.

6. **NextGen Precision Health 4th Floor Fit Out, MU**
The 4th Floor of the NextGen Precision Health (NGPH) Facility was shelled for future fit-out as part of the original construction project. The building infrastructure was included in the original construction to support both wet and dry laboratories consistent with the 2nd and 3rd floors. The 4th floor labs and PI office space was designed as part of the NGPH building. The project committee completed a program verification study in the March 2022 and determined the initial design (with minor modifications) is valid

for the anticipated additional research teams. Additional planning and budgeting surrounding the non-fixed laboratory equipment will take place as needed to develop the final budget for this effort.

The fit-out of the laboratories will enhance opportunities recruiting new researchers as part of Mizzou Forward.

Funding for the $16,500,000 project will be from the State.

7. **<u>Radioisotope Facility at Discovery Ridge, MU</u>**
This project will construct a new, 33,000 gross square feet (gsf), single story radioisotope processing facility at Discovery Ridge. The types of spaces include processing and research spaces, laboratories, storage space for waste, shipping and receiving space, conference rooms, classrooms, and office space for Missouri University Research Reactor (MURR) and the Department of Energy (DOE). The partnership with DOE is under review, and if accepted, DOE will fund the project costs. Details of the real estate agreement will be negotiated as the DOE considers and evaluates the MU proposal.

The DOE Isotope Program (DOE IP) has collaborated with the University of Missouri Research Reactor (MURR) for decades. More recently that collaboration has grown such that MURR was one of the first to join DOE IP's University Network. This new partnering approach allows for economical supply of R&D grade Se-75 and Lu-177 by combining unique strengths. Building on the proven partnering abilities and taking a fresh look at core strengths of each organization has led to the concept of establishing a DOE Isotope Processing Center (DOE IPC) at the University of Missouri-Columbia. The proposed Center would leverage MURR's competency and experience in the weekly processing and supply of short-lived isotopes as active pharmaceutical ingredients (APIs).

Funding for the $19,976,000 project will be from Federal funds.

8. **<u>Swine Facility – South Farm II, MU</u>**
The Swine Facility – South Farm Phase One will be completed in Spring 2022 and provide 14,000 gross square feet (gsf) of space to further enhance the current research efforts and those in the pipeline. This facility was designed to allow for expansion of additional swine holding units, and the size of the addition will be based on the current and projected near term needs.

The facility at the South Farm Research Center will provide critical animal space to accommodate the research programs for new faculty in large animal genetic engineering and will serve two NIH-funded centers — the National Swine Research and Resources Center and the Center for Somatic Cell Gene Editing, both of which are supported by the NIH Office of the Director. Continued investment in this program area is a component of Mizzou Forward.

Funding for the $5,000,000 project will be $5,000,000 from the State.

9. Swine Facility – Middlebush Farm Phase II, MU

The Swine Facility – Middlebush Farm Phase One will be completed in Fall 2022 and provide 8,300 gross square feet (gsf) of space to further enhance the research in this area of study. This facility was designed to allow for expansion of additional laboratory units, and the size of the addition will be based on the current and projected near term needs.

The facility at the Middlebush Farm will provide animal BSL-2 research and laboratory space to accommodate the Center for Influenza and Emerging Infectious Disease, which has garnered over $15 million in NIH and CDC funding during the past two years. Continued investment in this program area is a component of Mizzou Forward.

Funding for the $5,000,000 project will be from the State.

University of Missouri - Columbia
Strategic Projects Development Plan

April 21, 2022

FY 2023 - University of Missouri – Columbia: Strategic Projects Development Plan

Project						**Funding Strategy**				
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	Vivarium Facility Expansion	NC	NA	NA	$15,000,000	$0	$0	$15,000,000	$0	$0
2	Bond Life Sciences Center - Phase II	NC	NA	0.06	$80,000,000	$0	$0	$80,000,000	$0	$0
3	Facilities Needs Project	RE	$169M	0.26-0.47	$56,000,000	$0	$0	$0	$0	$56,000,000
4	Jesse Hall Exterior Masonry/Metal Repairs & Window Replacement	RE	$13.4M	0.26	$11,000,000	$0	$0	$0	$0	$11,000,000
5	Medical Science Building Replace Electrical Distribution System	RE	$46.5M	0.47	$8,000,000	$0	$0	$0	$0	$8,000,000
6	National Swine Resource and Research Center – Addition for NIH CO6 Grant Funding	NC	$0.4M	0.02	$8,000,000	$0	$0	$0	$8,000,000	$0
7	Pickard Hall – Decommissioning and Mitigation	Demo	$5.45M	0.44	$12,000,000	$0	$0	$12,000,000	$0	$0
	Total				$190,000,000	$0	$0	$107,000,000	$8,000,000	$75,000,000

1. **Vivarium Facility Expansion, MU**

   Construct new or add to existing animal facilities for the housing of small animal models. The facility will be planned to make progress to close small, isolated vivaria in multiple locations along with increasing capacity to serve future faculty recruitment by creating new space which can operate efficiently through the Division of Research, Innovation, Impact – Office of Animal Resources.

   The use of small animal models is a significant need in the type of research going forward given investments in faculty hiring in the School of Medicine and Molecular Imaging and Theranostic Center (MITC). The investment in the Medical Science Building vivarium completed in 2019 has been successful in meeting current and near-term faculty needs. Given future plans to divest from the Dalton Building vivarium and recruit new faculty across campus as part of Mizzou Forward, a comprehensive plan to add capacity for the small animal models is needed.

   The project budget of $15,000,000 will be funded by the University.

2. **Bond Life Sciences Center – Phase II, MU**

   When the Bond Life Sciences Center was originally designed, the building was sited to accommodate future expansion to the east. This project would revisit that concept to develop laboratories for future research initiatives.

   MU was among the first institutions to commit to interdisciplinary research. The Life Sciences Center was completed in 2004 and includes state-of-the-art laboratories, shared meeting areas and public spaces that provide unmatched opportunities for interdisciplinary research as a component of the Mizzou Forward initiative.

   This $80,000,000 project will be funded by the University.

3. **Facilities Needs and Operations Reduction Project, MU**

   This project will provide critical exterior repairs to Jesse Hall, Hill Hall, and Tucker Hall; critical mechanical systems replacements for Hill Hall, Tucker Hall, and the Medical Science Building; critical electrical system replacement to the Medical Sciences Building, and demolition of Pickard Hall.

   Mechanical System Replacement Projects

   Medical Science Building is a key space resource for research laboratories related to the Health Sciences, particularly the School of Medicine. The building has an FCNI of 0.46 with facility needs over $47 million. The significant size (258,000 gsf) and location as a major facility connected to the University Hospital, make it imperative to improve the condition before it reaches critical state to continue its use as a laboratory resource for the future. The replacement work for this building includes the remaining 10 AHU's that are 50+ years old, adding 2 new AHUs to eliminate window box air conditioning, replacing ten aged fume hoods, replacing steam radiators with a modern system, and extending the fire suppression to the entire building. The building is primarily laboratories for the School of Medicine and key to continuing future research expenditures.

Hill Hall is a core campus building with and FCNI of 0.40 and nearly $5 million in facility needs. The moderate size (45,000 gsf) and location of the building near Jesse Hall make it a potential for investment to pull it away from the critical needs list for buildings exceeding .40. The replacement work for this building includes replacing the antiquated and marginally functional system to provide adequate ventilation to allow for a healthy environment for students, faculty, and staff.

Tucker Hall is a core campus laboratory building with an FCNI of 0.26 and over $11 million in facility needs. The large size (86,000 gsf) and location near Life Sciences Building, Physics Building, and Chemistry Building make it a potential for investment to improve the condition before it reaches critical state and maintaining it as a laboratory resource for the future. The replacement work for this building includes replacing all air handling units, exhaust system, and conversion of the dual duct system to a more energy efficient and modern single duct with reheat to continue the use of this building for research laboratories into the future.

Exterior Envelope Repair Projects

Jesse Hall has stood as the heart of the iconic campus fabric for more than a century. The building has an FCNI of .26 with facility needs over $13 million. The building exterior is a combination of brick and stone masonry with ornamental and structural painted metal with original wood windows which are in various stages of deterioration and rotting. The large size (127,000 gsf) and historic significance of the building make it a potential for investments to improve the condition for the future Tigers to come.

Hill Hall is a core campus building with and FCNI of .40 and nearly $5 million in facility needs. The moderate size (45,000 gsf) and location of the building near Jesse Hall make it a potential for investment to pull it away from the critical needs list for buildings exceeding .40. Exterior envelope repairs on this building include roof and window replacement and selective masonry tuckpointing.

Tucker Hall is a core campus laboratory building with an FCNI of .26 and over $11 million in facility needs. The large size (86,000 gsf) and location near Life Sciences Building, Physics Building, and Chemistry Building make it a potential for investment to improve the condition before it reaches critical state and maintaining it as a laboratory resource for the future. Exterior envelope repairs on this building include waterproofing the foundation and selective tuckpointing.

Electrical System Replacement

Medical Science Building is a key space resource for research laboratories related to the Health Sciences, particularly the School of Medicine. The building has an FCNI of 0.46 with facility needs over $47 million. The significant size (258,000 gsf) and location as a major facility connected to the University Hospital, make it imperative to improve the condition before it reaches critical state to continue its use as a laboratory resource for the future. As renovations occur in Medical Science Building, the electrical system is modified and improved in increments leading to challenges for maintenance. This project would complete a comprehensive electrical distribution system replacement throughout the building.

Building Decommissioning
Pickard Hall is located on Francis Quadrangle, the historic heart of the MU campus. Currently, the building sits idle due to regulatory complications surrounding the nearly century old contamination from early groundbreaking research endeavors in radium extraction. This project will complete the decommissioning process required by the Nuclear Regulatory Commission.

The project cost of $56,000,000 will be requested from the State.

4. **<u>Jesse Hall Exterior Masonry/Metal Repairs & Window Replacement, MU</u>**
The project will repair the exterior deteriorating brick and stone masonry, and ornamental and structural painted metal, and replace the original wood windows.

Jesse Hall has stood as the heart of the iconic campus fabric for more than a century. The building has an FCNI of .26 with facility needs over $13 million. The building exterior is a combination of brick and stone masonry with ornamental and structural painted metal with original wood windows which are in various stages of deterioration and rotting. The large size (127,000 gsf) and historic significance of the building make it a potential candidate for investments to improve the condition for the future Tigers to come.

The project budget of $11,000,000 will be requested from the State.

5. **<u>Medical Science Building Replace Electrical Distribution System, MU</u>**
As renovations have occurred in Medical Science Building, the electrical system has been modified and improved in increments which has led to challenges for maintenance operations. The concept for this project is to complete a comprehensive electrical distribution system replacement throughout the building.

Medical Science Building is a key space resource for research laboratories related to the Health Sciences, particularly the School of Medicine. The building has an FCNI of 0.46 with facility needs over $47 million. The significant size (258,000 gsf) and location as a major facility connected to the University Hospital, make it imperative to improve the condition before it reaches critical state to continue its use as a laboratory resource for the future.

The project cost of $8,000,000 will be requested from the State.

6. **<u>National Swine Resource and Research Center – Addition for NIH CO6 Grant Funding, MU</u>**
The project would construct an additional of 12,220 gross square feet expansion to the National Swine Resource and Research Center (NSRRC). The expansion will allow the NSRRC to double animal housing capacity, expand swine lines through breeding under

specific pathogen free conditions, supply swine models at various ages, establish novel swine models for new research areas, and supply swine models free of certain viruses for xenotransplantation and gene therapy.

The NSRRC is the only NIH-funded swine resource center to develop and supply swine models to biomedicine fields. Over the past 19 years, the NSRRC has developed the infrastructure needed to assist swine-based research across multiple disciplines. Increasingly, pigs are being used as models for human disease, and pig models are predicted to make a major contribution to the FDA Critical Path and NIH National Center for Advancing Translational Sciences initiatives directed toward increasing the efficacy of identifying new therapeutic agents and facilitating their more rapid entry into clinical practice. With a sequenced pig genome, major advances have been made in developing swine-specific reagents and creating germline modifications for making genetically engineered swine models. With these tools in place, swine models are making unprecedented contributions toward unraveling the molecular basis of human disease and developing new therapeutic strategies.

The project cost of $8,000,000 is a request for a Federal grant funding.

7. **<u>Pickard Hall – Decommissioning and Mitigation, MU</u>**

Pickard Hall is located on the east side of Francis Quadrangle. Currently, the building sits idle due to regulatory complications surrounding the nearly century old contamination from early research in radium extraction. This project will complete the decommissioning process required by the Nuclear Regulatory Commission (NRC).

The only way to fully eliminate the long-term liability for MU is to completely remove the building and prepare the site for a future facility. The current building is small, but sits on a site that can support more functions in the heart of campus than the current building allows. The site will be prepared for a new signature building, one which respects history yet provides options for the future.

The unknown extent of the radium contamination complicates the potential for rehabilitating the building, both in scale and cost. Remediating the contamination necessitates the removal of the basement slab to remove capped piping, removing unknown quantities of brick from the masonry bearing walls, and removing unknown quantities of the wood structural system. These unknowns put the institution at risk for significant cost and time. Complete removal of the building will assure the elimination of the contamination and any regulatory obligations requiring significant staff oversight and unknown future costs. There is, however, no reason to believe that putting off the decision to remove the building will do anything other than allow potential future costs to increase.

Pickard Hall, and the Francis Quadrangle context in which it sits, is important to the physical and emotional fabric of the campus. The intent for future building development is consistency with the architectural characteristics of the surrounding historic district. Providing a redevelopment site in the core of the historic campus allows the opportunity for a flexible and adaptable building that supports the future goals of the University.

The project budget of $12,000,000 will be funded by University funds

MU Health Care

Fiscal Years 2022 – 2027 Capital Plan

April 21, 2022

MU Heath Care: Fiscal Years 2022 – 2027 Capital Plan included in Finance Plan

	2022* Current Year	2023 Year 1	2024 Year 2	2025 Year 3	2026 Year 4	2027 Year 5
New Construction	**$0**	**$0**	**$0**	**$0**	**$0**	**$66,000,000**
MU Health Care Campus Consolidation & Inpatient Services Expansion						$66,000,000
Renovation/Infrastructure	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$66,000,000**

*Projects listed under 2022 are projects anticipated to have project approval during FY22.

MU Health Care: Fiscal Years 2022 – 2027 Preliminary Capital Plan included in Finance Plan Funding

MUHC						**Funding Strategy**				
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	MU Health Care Campus Consolidation & Inpatient Services Expansion	NC	NA	NA	$66,000,000	$66,000,000	$0	$0	$0	$0
	Total				**$66,000,000**	**$66,000,000**	**$0**	**$0**	**$0**	**$0**

1. **<u>MUHC Campus Consolidation & Inpatient Services Expansion, MUHC</u>**

This project will construct a four-story clinic building with up to approximately 125,000 to 150,000 gross square feet to accommodate medicine and surgical specialty clinics and departments. The building will be constructed on University owned property.

University Hospital currently has a shortage of space needed for high revenue-generating, hospital-based services such as diagnostic cardiology, cardiac catheterization labs, interventional radiology labs, endoscopy labs, etc. This has a negative impact on access and, consequently, patient and referring physician satisfaction.

A new ambulatory clinic building will allow for growth of medicine and surgical specialties; decant outpatient services to allow for more profitable, hospital-based services; meet ongoing payer and patient demands for more outpatient-based services, abate leases secured for short-term solutions; and create synergies and efficiencies by consolidating clinics, especially those that now have two locations due to capacity constraints.

A study conducted by Cannon Design indicates multiple specialty clinics are nearing or exceeding target utilization, creating significant limitations in terms of growth. Some of the specialty clinics are in prime, high-cost hospital space. A couple of clinics have had to split off into two locations, some of which have required adding leased space, to accommodate physician recruitment needed to meet growing demand.

The project budget of $66,000,000 will be debt financed.

MU Health Care
Preliminary Strategic Projects Development Plan

April 21, 2022

FY23 MU Health Care: Preliminary Strategic Projects Development Plan*

Project						Funding Strategy				
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	N/A									
	Total				**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

*MUHC currently does not have any projects on the Preliminary Strategic Projects Development Plan

April 21, 2022

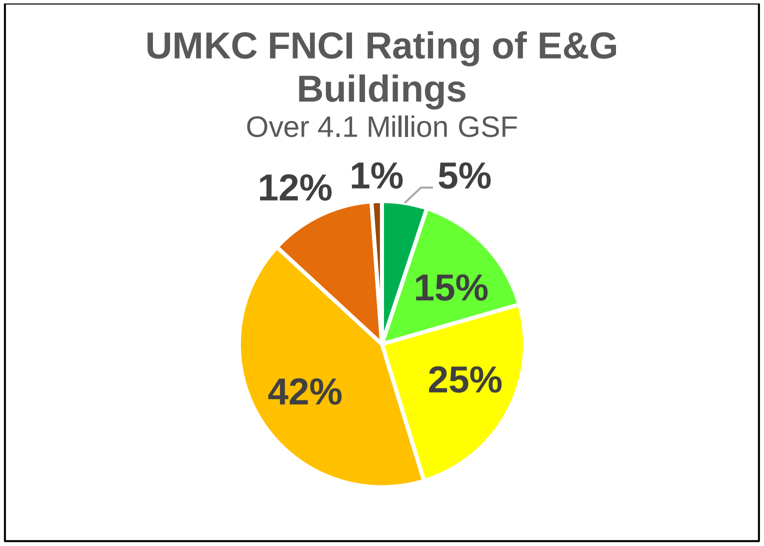
University of Missouri – Kansas City
Fiscal Years 2022 – 2027 Capital Plan

April 21, 2022

University of Missouri - Kansas City Facilities Stewardship

CRR 110.015 was established to maintain the facilities of the University of Missouri System in adequate condition to meet the needs of the University's education and research missions. A Facilities Condition Needs Index (FCNI) of 0.30 or lower was established as the goal for the Education and General (E&G) facility portfolio. CRR 110.015 also requires each campus to annually establish its facilities needs funding (target spend) by calculating the investment required to achieve and maintain the campus FCNI goal of 0.30 or lower for its E&G facilities over the next ten years.

UMKC currently has a FCNI of 0.31 and a backlog of $433.2 million of facilities needs. Fifty-five (55%) of the E&G space on the UMKC campus fall in the category of Below Average Condition, Poor condition, or Replacement is recommended. UMKC continues to underfund their target spend and their facilities needs are growing.



E&G Facilities *(Dollars shown in Millions)*	**2017**	**2018**	**2019**	**2020**	**2021**
Target Spend	$22.3	$24.7	$27.0	$23.3	$25.3
Actual Spend	$14.2	$25.0	$8.3	$13.3	$16.3
Recurring	$6.9	$7.0	$5.5	$6.5	$5.2
One-Time	$7.3	$18.0	$2.8	$6.8	$11.1
Difference in Target and Actual	($8.1)	$0.3	($18.7)	($10.0)	($9.0)
FCN Backlog	$395.8	$416.7	$400.9	$417.2	$433.2
Deferred Maintenance	$174.3	$187.5	$233.0	$250.4	$269.9
Plant Adaption	$33.4	$34.0	$32.9	$33.4	$34.0
Capital Renewal	$188.1	$195.1	$145.0	$133.4	$129.3
Recommended Target for next year	$24.7	$27.0	$23.3	$25.3	$26.0
Campus FCNI	**0.30**	**0.31**	**0.30**	**0.30**	**0.31**

Facility Condition Needs Index
Excellent Condition, typically new construction (0.000 - 0.100)
Good Condition, renovations occur on schedule (0.101 - 0.200)
Fair Condition, in need of normal renovation (0.201 - 0.300)
Below Average Condition, major renovation required (0.301 - 0.500)
Poor Condition, total renovation indicated (0.501 - 0.600)
Replacement Recommended (0.600 and Higher)

April 21, 2022

University of Missouri - Kansas City: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan

Projects	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
	Current Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Construction	**$0**	**$115,000,000**	**$0**	**$0**	**$0**	**$0**
New Health Science Building		$100,000,000				
School of Medicine – New St. Joseph's Facility		$15,000,000				
Renovation/Infrastructure	**$12,000,000**	**$0**	**$0**	**$0**	**$0**	**$0**
Steam Heating Plant Renewal	$12,000,000					
Total Project Cost	**$12,000,000**	**$115,000,000**	**$0**	**$0**	**$0**	**$0**

University of Missouri - Kansas City: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan Funding

Projects						**Funding Strategy**				
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	New Health Science Building	NC	NA	NA	$100,000,000	$0	$50,000,000	$0	$0	$50,000,000
2	School of Medicine - New St. Joseph's Facility	NC	NA	NA	$15,000,000	$0	$0	$2,000,000	$13,000,000	$0
3	Steam Heating Plant Renewal	RE	$12	0.42	$12,000,000	$12,000,000	$0	$0	$0	$0
	Total				**$127,000,000**	**$12,000,000**	**$50,000,000**	**$2,000,000**	**$13,000,000**	**$50,000,000**

1. **<u>New Health Science Building, UMKC</u>**
   This project will construct a new Health Science Building of approximately 150,000 GSF on the UMKC Health Science Campus. While the new facility will serve all of the UMKC Health Science programs, the building will focus on the needs of the School of Dentistry (SOD) and School of Medicine (SOM). Deficiencies in both of the aging clinical, research, and teaching facilities require urgent focus to construct a new facility to meet growing clinical, research and education needs, and fuel the success in building upon our current research strengths in areas that disproportionately affect lives of individuals in Missouri – perinatal death, drug addiction, dental health, cardiovascular and neurodegenerative disease.

   When the UMKC SOM opened its doors in 1971, it did so with a goal of training physicians who would become the primary care workforce for the people in Missouri. Between 2019-2021, more than 60% of the SOM graduates chose a primary care residency with up to 40% of graduates remaining in residency programs in Missouri. Today, UMKC ranks as one of the top medical schools in the country where graduates pursue primary care training based on the 2021-2022 US News and World report rankings, but they do so in aging teaching facilities and research laboratories. For more than a century, SOD, has been the only dental school in the state of Missouri, preparing the next generation of oral health care professionals, two thirds of which practice in Missouri, while conducting cutting-edge research, and delivering high-quality care to patients in their clinic environment housed in the dental school. Renovation will increase patient safety and improve space for education of the next generation of dentists and hygienists.

   The UMKC Health Science District (HSD) brings together 12 public and private partners in an 18-block region that support the growth of rural interprofessional health education programs. Through shared expertise, resources, and personnel; the HSD represents fertile opportunities for collaboration on research, grants, and community outreach. State funding not only has the potential to catalyze new collaborations across our region and among University of Missouri academic campuses, but it also has the potential to attract industry partnerships and One Health partnerships to advance the fields of biomedical engineering, tissue regeneration, and Big Data and with the broader University of Missouri System, increasingly invest in bioinformatics and data science focus toward the goal of personalized medicine and treatment for patients in Missouri. A P3 option to provide additional floors to the building to align with the Master Plan vision of increased density in the area, is being explored. The additional space would be occupied by other partners.

   Funding for the $100,000,000 project will be provided by $50,000,000 in University funding and $50,000,000 in State funding.

2. **<u>School of Medicine – New St. Joseph's Facility, UMKC</u>**
   The new UMKC School of Medicine (SOM)-Saint Joseph facility will provide student support and study space, classrooms, group meeting rooms, a simulation center, and other associated spaces to grow the enrollment numbers as envisioned below.

UMKC School of Medicine has establish an additional location in Saint Joseph, Missouri to recruit, prepare, and encourage graduates to become part of the primary health care community in rural Missouri counties. This goal addresses the existing shortage of primary care physicians practicing and is consistent with the mission of the UMKC SOM and the UMKC strategic plan. To achieve this objective UMKC SOM has launched a collaborative relationship with the Mosaic Life Care. This clinical campus will serve as the training site for MD track students in the medical school training program sponsored by UMKC SOM. The UMKC SOM will begin this initiative by admitting 20 additional students per year and locate them at the Saint Joseph campus. Students admitted to the rural curriculum tract at UMKC SOM will complete their four-year training program onsite in Saint Joseph resulting eventually in 80 students at UMKC SOM, St. Joseph. The new facility will allow the UMKC-SOM to provide much-needed health care practitioners who will serve rural Missouri communities.

Funding for the $15,000,000 project will be provided by $2,000,000 in University funding and a $13,000,000 from a Federal appropriation.

3. **<u>Steam Heating Plant Renewal, UMKC</u>**

This project will continue the phased replacement of the heating infrastructure in alignment with the university's Heating System Master Plan. The majority of Educational & General (E&G) facilities on both the Volker and Health Sciences Campuses are served by this infrastructure. This project will replace the Miller Nichols Library heat plant, eliminate reliance on the Spencer Chemistry plant, decommission the School of Medicine heating plant and connect the School of Medicine to the Health Sciences Building Plant.

The University of Missouri-Kansas City Volker Campus includes three large steam plants and many smaller plants which distribute heat to campus facilities. The three large plants are located in Miller Nichols Library, Spencer Chemistry, and School of Education. Each plant provides steam to the surrounding campus buildings through a network of underground piping. Six of the seven boilers in these large plants have been in service for over 50 years. This project replaces the boilers in the Miller Nichols Library plant, expands its capacity and extends its service to the distribution network now served by the Spencer Chemistry plant. The Spencer Chemistry plant will no longer be a primary heating source but will be retained as a backup.

Health Sciences Campus has one large heating plant in each of the three facilities – School of Medicine, School of Dentistry, and Health Sciences Building. The boilers in School of Dentistry and School of Medicine have been in service for over 50 years. This project will decommission the School of Medicine plant and connect that building to the Health Sciences Building plant. A recent study has determined that the Health Sciences Building plant has enough capacity to serve both buildings.

The project will eliminate $12 million of facilities needs.

The project budget of $12,000,000 will be funded by an internal loan.

University of Missouri - Kansas City
Strategic Projects Development Plan

April 21, 2022

FY 23 – University of Missouri - Kansas City: Strategic Development Projects Plan

Projects						Funding Strategy				
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Olson Performing Arts Center Renovations and Additions	RE/NC	$10.1M	0.41	$30,000,000	$0	$30,000,000	$0	$0	$0
2	UMKC Athletics Performance Center Additions and Renovations	RE/NC	$5M	0.35	$55,000,000	$0	$55,000,000	$0	$0	$0
3	Spencer Chemistry & Biological Science Renovation Phase II	RE	$10M	0.36	$40,000,000	$0	$0	$0	$0	$40,000,000
4	New Student Housing*	NC	NA	NA	$45,000,000	$45,000,000	$0	$0	$0	$0
5	4747 Troost Renovation	RE	$6.4M	0.42	$8,500,000	$0	$0	$0	$0	$8,500,000
	Total				**$178,500,000**	**$45,000,000**	**$85,000,000**	**$0**	**$0**	**$48,500,000**

*New Student Housing Project to be funded through a Public Private Partnerships (P3’s).

1. **<u>Olson Performing Arts Center Renovations and Additions, UMKC</u>**
The project will add a 2,400 square feet Black Box theatre, 4 dance studios, including one that could be used for performances, and support space for those facilities including; 2 dressing rooms with restrooms and showers, and 6 office spaces to the Olson Performing Arts Center (OPAC).

The Conservatory shares space in the OPAC with the KCRep, particularly Spencer Theatre and the spaces associated with that theatre. Because of limited access to Spencer Theatre, UMKC student dance and opera productions take place in White Recital Hall, an auditorium with no dressing rooms, no fly system for sets and projects, little wing space for moving on and off stage, and a hardwood floor which is dangerous for dancer's feet and legs. Student theatre productions largely take place in OPAC 119, a room converted into a small Black Box theatre with no support spaces and seating for fewer than fifty students. A dedicated and designed Black Box Theatre would allow for growth in the dance, opera, musical theatre, and other theatre areas by providing a dedicated performance space that matches the needs of students in performance and in theatre design, and allows growth of undergraduate enrollment.

The Conservatory Dance Division currently has four well-used studio spaces that do not meet the National Association of Schools of Dance (NASD) guidelines of 100 square feet per dancer, feature uneven temperature control leading to dancers working in temperatures not conducive to strenuous physical activity, and regularly have sound bleed between the spaces. One studio features a drop ceiling that is so low, dancers cannot practice the lifts that are key to their choreography. With the current number and size of studio spaces, scheduling is an issue, making it difficult to provide adequate space and time for rehearsals. Four modern dance studios would allow dance students to work in areas that are not hazardous to their health and allow the dance program to grow enrollment.

This project will eliminate $2.1 million in facilities needs.

Funding for the $30,000,000 project will be from gifts.

2. **<u>Athletics Performance Center Additions and Renovations, UMKC</u>**
This project provides new and or renovated facilities for Kansas City Athletics and Student Recreation. The project will renovate spaces for student recreation to allow for expanded programming. The facility will provide student athletes with facilities for academics, sports medicine and strength and conditioning, for all fourteen NCAA Division One sports at UMKC. Also included are offices for athletics and recreation staff and 4,000 enhanced seats for athletic and other campus events in a modern and engaging atmosphere with improved concessions and hospitality areas.

The Kansas City Athletics Mission Statement states that "The University of Missouri - Kansas City Athletics Department will provide academic, athletic, and personal development opportunities to support student-athletes. We will promote a culture of comprehensive excellence while providing the resources that will enable our student-athletes, coaches, and staff to achieve the highest levels of success. It is our mission to develop the best athletic programs and serve as a great source of pride in representing the UMKC community and Kansas City."

The project will provide world class experiences for students and student athletes alike, and improving on key university priorities of increased enrollment, retention of current students, and increased community engagement and awareness. The facility will be a point of pride on campus, increase alumni engagement, and provide additional visitors to ensure the Kansas City community knows that UMKC is the best academic option in the city

The funding will be provided by $55,000,000 in gifts.

3. **<u>Spencer Chemistry and Biological Sciences Renovation - Phase II, UMKC</u>**
This project would continue the renovation of the 153,827 gross square feet (gsf) Biological Sciences Building and Spencer Chemistry Building. The second phase will renovate approximately 75,000 gsf in both Spencer Chemistry and the Biological Sciences Building and will complete the renovation of these facilities. This project will build upon the first phase, which renovated about 79,000 gsf and was completed in 2018 and funded by the State with the Board of Public Buildings Bond as the primary funding source. The Phase II renovation will address additional deferred maintenance, research spaces, teaching spaces, and other facility deficiencies that were beyond reach of the Phase I budget. The renovation will provide state of the art teaching laboratories and support spaces, while providing improved laboratory systems to support research activities, support student retention, meet current laboratory standards, and encourage student collaborative learning. The project is consistent with the Campus Master Plan.

The Spencer Chemistry and Biological Sciences Buildings were originally constructed in 1968 and had not been renovated or updated since the 1980's prior to the Phase One renovation which was completed in 2018. These buildings serve Chemistry and Biology undergraduate and graduate majors, as well as those who go into professional schools or graduate studies in medical and dental. They also serve as part of the teaching mission for our Pharmacy, Medicine, and Nursing Programs. The facility is outdated, provides inadequate space for teaching, and does not meet current safety codes and standards. The chemistry department was recently merged into the School of Biological Sciences to create a larger School of Biological and Chemical Sciences

The project will eliminate $26.4 million of facilities needs.

Funding for the $40,000,000 project will be provided by the State.

4. **<u>New Student Housing, UMKC</u>**
This project would construct a new 500 bed student housing facility, primarily focused on undergraduate students utilizing suite style and community living style configurations as recommended by the Master Plan. It is anticipated that the project will be developed through a public private partnership model (P3).

The on-campus living experience has been a key recruitment driver for undergraduate enrollment growth at UMKC since 2005. As UMKC's on-campus housing capacity grew from about 360 to almost 1,500 beds, undergraduate enrollment increased about 20% from 6,813 students in Spring 2006 to 8,233 students in Fall 2017. The diversity of housing options allows students at all levels to extend their on-campus experience. UMKC desires to continue to grow their on campus living capacity as a strategic means of continued enrollment growth.

Housing on the UMKC Volker campus currently consists of the 559 bed Oak Street Residence Hall and the 329 bed Herman and Dorothy Johnson Residence Hall. Both of these buildings provide suite style living and predominately house undergraduate students. Housing on the UMKC Health Sciences District at Hospital Hill has 243 beds in the Hospital Hill Apartments.

The $45,000,000 project will be financed and developed using a P3 model.

5. <u>4747 Troost Renovation, UMKC</u>

This project consists of the renovation of the 4747 Troost Building to create an integrated location for UMKC's Outreach and Community focused programs. The project includes the renovation of the existing 54,028 gsf which was constructed in 1961. This project will address approximately $6.4 million in facilities needs.

The renovated project will allow for the relocation of other programs at 4825 Troost and begin a process of long-term redevelopment that will include a combined site and mixed-use development that will include parking and may include retail and housing components in a public private partnership (P3) development. The project also may include related program relocation and redevelopment on nearby sites within and adjacent to the Volker Campus.

The UMKC 4747 and 4825 Troost site is currently home to many programs and affiliated organizations that are central to the University outreach and community focus. KCUR Public Radio, KCRep, KCEZ/ KC Stem Alliance, UMKC Center for Neighborhoods, UMKC Midwest Center for Non-Profit Leadership, UMKC Cookingham Institute, Jumpstart and a few other similar entities are located in these buildings. In addition, the site houses much of the University entrepreneurship and innovation outreaches, led by groups such as KC SourceLink, UMKC Innovation Center, UMKC Solo Incubator Law Office, UMKC Entrepreneurial Law Clinic, and the UMKC Office of Technology Transfer.

The existing buildings are in very poor condition and lack public amenities, accessibility, and parking that the programs require. The renovation project will provide modern spaces for these programs while also providing increased space for research and community education and training. Both the existing and new programmatic uses will benefit from their co-location and from the tremendous public access provided by being on Troost Avenue with its heavy public transit use and services.

Funding for the $8,500,000 project will be from the State.

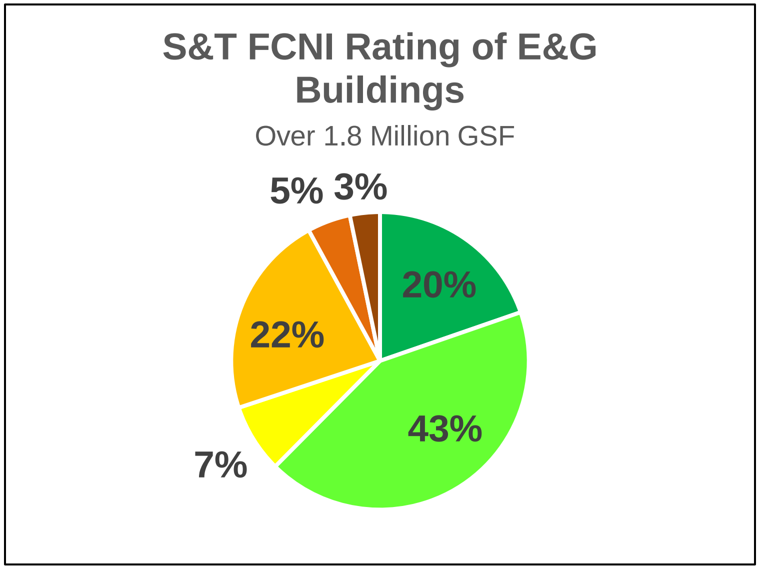
Missouri University of Science and Technology
Fiscal Years 2022 – 2027 Capital Plan

April 21, 2022

Missouri University of Science and Technology Facilities Stewardship

CRR 110.015 was established to maintain the facilities of the University of Missouri System in adequate condition to meet the needs of the University's education and research missions. A Facilities Condition Needs Index (FCNI) of 0.30 or lower was established as the goal for the Education and General (E&G) facility portfolio. CRR 110.015 also requires each campus to annually establish its facilities needs funding (target spend) by calculating the investment required to achieve and maintain the campus FCNI goal of 0.30 or lower for its E&G facilities over the next ten years.

Missouri S&T currently has a FCNI of 0.21 and a backlog of $185.1 million of facilities needs. Thirty percent (30%) of the E&G space on the campus falls in the category of Below Average Condition, Poor condition, or Replacement is recommended. Missouri S&T has only achieved their target spend once in the last five years and their facilities needs are growing.



E&G Facilities *(Dollars shown in Millions)*	**2017**	**2018**	**2019**	**2020**	**2021**
Target Spend	$16.4	$16.2	$17.0	$17.9	$21.9
Actual Spend	$16.9	$14.5	$16.9	$13.0	$14.1
Recurring	$8.7	$9.0	$8.4	$8.5	$8.1
One-Time	$8.2	$5.5	$8.5	$4.5	$6.0
Difference in Target and Actual	$0.5	($1.7)	($0.1)	($4.9)	($7.8)
FCN Backlog	$154.8	$153.6	$150.4	$182.1	$185.1
Deferred Maintenance	$61.9	$59.5	$58.9	$85.6	$91.0
Plant Adaption	$68.1	$68.6	$65.9	$69.4	$63.1
Capital Renewal	$24.8	$25.5	$25.6	$27.2	$31.0
Recommended Target for next year	$16.2	$17.0	$17.9	$21.9	$18.8
Campus FCNI	**0.20**	**0.19**	**0.18**	**0.21**	**0.21**

Facility Condition Needs Index
Excellent Condition, typically new construction (0.000 - 0.100)
Good Condition, renovations occur on schedule (0.101 - 0.200)
Fair Condition, in need of normal renovation (0.201 - 0.300)
Below Average Condition, major renovation required (0.301 - 0.500)
Poor Condition, total renovation indicated (0.501 - 0.600)
Replacement Recommended (0.600 and Higher)

Missouri University of Science and Technology: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan

Missouri S&T	2022*	2023	2024	2025	2026	2027
	Current Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Construction	**$147,006,230**	**$0**	**$0**	**$52,266,768**	**$49,562,000**	**$0**
Missouri Protoplex – Phase One	$13,068,182					
Arrival Court	$9,600,000					
Subsurface Parking Garage	$9,920,000					
Missouri Protoplex – Phase Two	$88,668,048					
Welcome Center	$25,750,000					
Engineering Research Lab Addition and Renovation				$52,266,768		
Schrenk Hall Addition and Renovation – Phase III					$52,040,100	
Renovation/Infrastructure	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Project Cost	**$147,006,230**	**$0**	**$0**	**$52,266,768**	**$52,040,100**	**$0**

*Projects listed under 2022 are projects anticipated to have project approval during FY22.

Missouri University of Science and Technology: Fiscal Years 2022 – 2027 Capital Plan included in Finance Plan Funding

Projects										
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	Missouri Protoplex – Phase One	NC	$5.3M	0.38	$13,068,182	$0	$13,068,182	$0	$0	$0
2	Arrival Court	NC	NA	NA	$9,600,000	$0	$9,600,000	$0	$0	$0
3	Subsurface Parking Garage	NC	NA	NA	$9,920,000	$0	$9,920,000	$0	$0	$0
4	Missouri Protoplex – Phase Two	NC	NA	NA	$88,668,048	$0	$33,668,048	$0	$0	$55,000,000
5	Welcome Center	NC	NA	NA	$25,750,000	$0	$18,750,000	$7,000,000	$0	$0
6	Engineering Research Lab Addition and Renovation	NC/RE	$13.0 M	0.49	$52,266,768	$0	$26,133,384	$0	$26,133,384	$0
7	Schrenk Hall Addition and Renovation – Phase III	NC/RE	$19.1 M	0.57	$52,040,100	$0	$0	$0	$0	$52,040,100
	Total				**$251,313,098**	**$0**	**$111,139,614**	**$7,000,000**	**$26,133,384**	**$107,040,100**

1. **<u>Missouri Protoplex Phase Two, Missouri S&T: Project Approval at November 2021 BOC Meeting</u>**

   The Missouri Protoplex - Phase One project will construct a new General Services Building near Exit 185 to the north of Interstate 44 and Nagogami Road (Route E) and just to the north west of Fraternity Circle. The new 39,621 gross square feet (GSF), single story building includes offices, conference rooms, a training room, shop space, and storage to accommodate Facilities Operations; Design, Construction and Space Management; and Environmental Health and Safety. The building exterior façade is anticipated to be an insulated metal panel system. Once the new facility is constructed, the existing General Services building will be demolished to clear the site for the Missouri Protoplex facility construction.

   As identified in Missouri S&T's 2018 Strategic Plan, the University's mission includes discovering, disseminating, preserving and applying knowledge, and fostering innovation to support economic development. In September, the Board of Curators approved Missouri S&T's 2020 Master Plan, which identified the area north of Interstate 44 at Exit 185 for a Manufacturing Technology and Innovation Campus. The purpose of the Manufacturing Technology and Innovation Campus is to broaden Missouri S&T's ability to engage with technology partners and grow economic development opportunities for Missouri. The Missouri Protoplex will be the first building in this new campus, providing space for manufacturing outreach, research, and technology development collaborations with Missouri companies. The site for this new facility is located at Exit 185 to the north of Interstate 44, east of White Columns Drive and south of Collegiate Boulevard; roughly where the existing General Services Building is located. This location provides good access and visibility from Interstate 44.

   Funding for the $13,068,182 project will be provided by gifts.

2. **<u>Arrival Court, Missouri S&T: Project Approval at November 2021 BOC Meeting</u>**

   The University Drive Relocation and US Highway 63 roundabout projects, currently under construction, define a new arrival district that will pronounce the new Missouri S&T campus main entrance "a gateway into the S&T Experience". The new entrance and Arrival Court will provide an iconic and powerful first impression at the east end of the realigned University Drive. The Arrival Court will be developed around a west to east axis formed between the new roundabout and the historically significant Rolla Building, and is encircled by the existing Havener Center and proposed Student Experience Center to the north, the proposed Welcome Center to the northeast, and a future building to the south; as indicated on the current 2020 Campus Master Plan. The Arrival Court will also include vehicular circulation, accessible parking, drop-off areas, sidewalks, multiple outdoor plaza areas and features, wayfinding signage, and landscape improvements.

   Missouri S&T envisions an Entry Plaza, with sodded seating areas to the north and south, adjacent to and slightly elevated from the main vehicular entrance and drop-off. Visitors would be greeted by a water feature in the area, which could house a series of sculptural pieces, historic artifacts, and iconic signage to promote the Missouri S&T Brand.

The Main Lawn, which unites the entry plaza and Rolla Building in an axial relationship, will gently slope from east to west, creating opportunities for informal student gatherings and recreational activities, as well as more formal events, such as outdoor lectures and graduation ceremonies. The vision is to incorporate soft and hardscape with a pedestrian walkway to accommodate emergency vehicles.

In addition to the entry plaza, an events plaza is envisioned to be sited between the Student Experience Center and the future Welcome Center. The events plaza will serve as a primary gathering point for students, providing a lively and vibrant atmosphere for casual socialization, and a venue for Missouri S&T's innovative community to engage with one another. This plaza will be a combination of hard surfaces and landscaped areas. Hard surfaces will consist of a variety of colored concrete pavers and other durable materials as determined during the design phase, and landscaped areas will include native plants as well as flowering trees. The plaza will also have a variety of seating options for students to collaborate.

Funding for the $9,600,000 project will be provided by gifts.

3. <u>Subsurface Parking Garage, Missouri S&T: Project Approval at November 2021 BOC Meeting</u>

The subsurface parking garage will be located in the new arrival court immediately south of Havener Center, east of US Highway 63, west of State Street, and north of Bertelsmeyer Hall in the heart of campus. The site takes advantage of the depressed grade area between the Rolla building and the new entrance being created to campus. The parking garage will accommodate parking for a minimum 140 vehicles; the design/build process will be utilized to optimize the maximum number of parking spaces. Two pedestrian area ways will exit the structure with an elevator at one location exiting into the center of the events plaza between the new Student Experience Center and the future Welcome Center. The top of the garage will accommodate the appropriate drainage for landscaping, and shall be structurally capable of accommodating emergency vehicles on the hardscape pedestrian walkway. Mechanical ventilation, fire suppression system, security cameras and lighting will be provided as well as a climate-controlled area for the elevator.

The proposed subsurface parking garage will provide convenient and accessible parking at the new arrival court for visitors to campus while reserving prime campus real estate for future development of academic and research facilities. This parking structure will support visitor parking for Havener Center, Student Experience Center, and the future Welcome Center. Other options for parking are located on the west side of Bishop Avenue (US Highway 63). The proposed parking structure is an integral component of the arrival court that is formed at the new campus entrance created by the realignment of University Drive and the construction of the new roundabout on Bishop Avenue.

Funding for the $9,920,000 project will be provided by gifts.

4. **<u>Missouri Protoplex Phase Two, Missouri S&T</u>**
The new Missouri Protoplex will be the first building in the Manufacturing Technology and Innovation Campus (Innovation Campus). The new three-story building of approximately 208,000 gross square feet (gsf) will incorporate a mix of flexible high-bay spaces, lab spaces, offices and meeting areas. The Innovation Campus will be located on Collegiate Blvd where the General Services Building is currently located and will provide convenient vehicular access and critical visibility from I-44. Phase One and other enabling projects include the demolition of Compressible Flow Laboratory, Dangerous Materials Storage Facility, Temporary Research Facility, Maintenance Shed #1, Transit Depot, and the General Services Building. Phase One, currently in design, will also construct a new 29,791 gsf General Service Building on Fraternity Circle adjacent to the existing Grounds Equipment Storage Building to accommodate offices and shop space for the facilities services unit.

The Missouri Protoplex is intended to develop advanced manufacturing in Missouri and the highly skilled, future-ready workforce needed to position Missouri as a global leader in advanced manufacturing, manufacturing education, research and development, technical assistance, outreach, and entrepreneurship. The Protoplex will serve as the anchor facility for the campus and as a hub connecting industry, state and federal agencies, and colleges and universities throughout Missouri, all with the aim of developing new processes and products for Missouri manufacturers and streamlining the process of moving research and innovation from university labs to the marketplace. As Missouri's STEM-focused research university and the only university in the state that offers a manufacturing engineering degree, Missouri S&T has the expertise, location, and educational programs to lead this initiative and stimulate advanced manufacturing in Missouri and the U.S

Funding for the $88,668,048 project will be $55,000,000 from the State and $33,668,048 from gifts.

5. **<u>Welcome Center, Missouri S&T</u>**
This project will construct a new two-story, 26,994 gross square feet (gsf) Welcome Center. This prominent location is part of the Master Plan's Arrival District along Highway 63. The location of the new building on the site will enhance the visibility of the iconic Rolla Building. The facility will accommodate large groups with a flexible interior for a variety of events. An auditorium and presentation space will have operable walls that open to a lobby/gallery area, creating one large, 500-seat presentation space. Small conference rooms for meetings with faculty advisors will also be provided. The facility will also accommodate offices for admissions and enrollment management departments.

Analysis of recruitment success rates has resulted in a commitment to improve the student and parent experience during campus visits. This new facility will accommodate recruitment events in a single location through shared space and flexibility. A large lobby and gallery will display information and exhibits related to campus life and the student experience, using static and interactive displays, video, and full-scale projects. Small conference rooms for meetings with faculty advisors will overlook the lobby/gallery.

Providing a new “front door” for visitors and potential new students, this flexible facility will allow for multiple types of events within a highly branded environment, and will enhance the public perception of the University. The proposed location is key to the newly defined Arrival District and strengthens the goals of the campus master plan to create a clear and structured wayfinding experience for prospective students and visitors.

Funding for the $25,750,000 project will be $18,750,000 in gifts and $7,000,000 in University funds.

6. **Engineering Research Lab (ERL) Addition and Renovation, Missouri S&T**
The Engineering Research Laboratory (ERL) Addition and Renovation project will construct approximately 34,600 gross square feet (gsf) on the east side of ERL and connect to the north side of Straumanis-James Hall. The project will also renovate 43,421 of existing space in the Engineering Research Laboratory building. This will create a research center of approximately 162,540 gsf that will aesthetically improve and anchor the northeast corner of the campus. The project also addresses life safety code issues, energy conservation measures, accessibility issues, and will upgrade mechanical, electrical, and plumbing systems in the ERL.

This building will provide additional interdisciplinary research space which has been identified as a high priority in both the Strategic Plan and Campus Master Plan. Since this project will house interdisciplinary research, its impact will be felt campus-wide and affects all degree programs. The project will address approximately $13 million of facilities needs. Additional operating costs are estimated to be $517,090 annually and will be funded through the Campus operating budget. The estimated number of students impacted annually will be 1300.

Funding for the $52,266,768 project will be $26,133,384 in gifts and $26,133,384 in Federal funds.

7. **Schrenk Hall Addition and Renovation - Phase III (Biosciences Building), Missouri S&T**
The Schrenk Hall Addition and Renovation – Phase III will renovate Schrenk Hall (1938 &1973) to accommodate the Chemistry and Biological Sciences departments. This will be the final phase with the renovation of 17,600 gross square feet (gsf) of the west wing and the replacement of the east wing with a new 90,400 gsf facility and atrium. This project will provide new teaching laboratories, research laboratories, and support space. The project also takes into consideration growth and consolidation of department entities that are spread over multiple buildings on campus.

This project is the final phase of an interdisciplinary complex dedicated to providing world-class education and research in biological sciences, chemistry, and chemical and biochemical engineering. Equipped with expanded research space, open-concept research labs and improved accessibility, this facility will leverage Missouri S&T's strengths in computational science, environmental engineering, and materials science and engineering to advance medical, environmental, and biomedical research. The building will also be home to an interdisciplinary Center for Research in Biomaterials, where students and faculty will conduct research in bio-active, bio-inspired, and bio-mimetic materials for a variety of applications. The facility will be an integral component of the student experience at Missouri S&T, since almost every student will take at least one course in one or more important foundational area of biological sciences or chemistry.

The existing 1938 Schrenk Hall East should be demolished due to its very poor condition, and the structural system is not conducive to modern building systems. The Facilities Condition Needs Index (FCNI) is 0.57 with over $19 million in facilities needs. Missouri S&T has been committed to moving this challenging project forward in a phased approach and investing when possible, to address immediate campus needs. Recently, $4 million was added to the Phase 2A budget of the west wing renovation for Biological Sciences Research Labs in addition to the already planned Chemistry Research and Instructional Labs. Another commitment by the campus, constructed general classrooms, that were planned for this facility, but were built as an addition to the Computer Science Building Student Classroom Learning Center. Since 2016, demand for larger classrooms has increased due to growth. This investment results in more efficient instruction serving more students that will allow them to complete their degrees faster. Both investments have reduced the project budget and overall scope of this project by $9 million.

This project will eliminate $19.1 million in facilities needs and will increase annual operating cost by $187,772. Funding for the $50,040,100 project will be from the State.

Missouri University of Science and Technology
Strategic Projects Development Plan

April 21, 2022

FY 23 – Missouri University of Science and Technology: Strategic Development Projects Plan

Project						**Funding Strategy**				
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	Innovation Campus Program Expansion	NC	NA	NA	$95,000,000	$0	$0	$0	$95,000,000	$0
2	University Center West	NC	NA	NA	$7,267,050	$0	$0	$7,267,050	$0	$0
3	McNutt Hall Addition	NC	NA	NA	$10,956,750	$0	$10,956,750	$0	$0	$0
	Total				**$113,223,800**	**$0**	**$10,956,750**	**$7,267,050**	**$95,000,000**	**$0**

1. **<u>Innovation Campus Program Expansion, Missouri S&T</u>**
The initial concept for the Innovation Campus Expansion proposes providing additional program space in three separate buildings adjacent to the Missouri Protoplex building. These facilities will provide research, laboratory, meeting, and classroom space.

The Innovation Campus Program Expansion is intended to follow construction of the Missouri Protoplex and accommodate additional program to support pre-production, testing and development, business incubation, cyber-security, and materials, manufacturing and methods. Research that will occur on the Innovation Campus will focus on advanced manufacturing, additive manufacturing, and the development of tools and techniques to reduce production costs, lead time, improve product quality, and reliability and safety. The work will draw on the expertise of Missouri S&T faculty in aerospace, ceramic, electrical, manufacturing, mechanical, metallurgical, and systems engineering, as well as engineering management, materials science and engineering, economics, and business information and technology. The Innovation Campus will build on and broaden Missouri S&T's strong relationships with over 60 companies in the aerospace, electronics and computing, infrastructure, and the steel manufacturing industries through four consortia through which S&T conducts non-proprietary research for consortia members who benefit from this shared expertise.

These facilities will also accommodate meeting and classroom space for the education and training of high-skilled advanced manufacturing workers, collaboration among manufacturers and entrepreneurs with faculty from colleges and universities across our state, and education focused on innovation, entrepreneurship and economic development.

Funding for the $95,000,000 project will be by Federal funds.

2. **<u>University Center West, Missouri S&T</u>**
The University Center West project will construct a 20,000 gross square feet (gsf), two-story facility at the southwest corner of Bishop Avenue and University Drive. The Center will provide space for a food service venue, offices for Campus Housing and Dining Services, and a central mail facility to serve the nearby residential complex.

This facility will provide a dining venue to serve the Residential Commons One & Two, and the University Commons building. These facilities currently do not have a dining facility. Additionally, this facility will locate the campus housing and dining staff that serve these students to a more accessible location near these large housing complexes.

Funding for the $7,267,050 project will be provided by University funds.

3. **<u>McNutt Hall Addition, Missouri S&T</u>**
The current program calls for the addition of 18,315 gross square feet (gsf) to the north side of McNutt Hall to expand the glassblowing and metalworking laboratories on campus. The addition will also provide public spaces for exhibition, events, offices, and student collaboration rooms, and act as a new highly visible public entry plaza on the north end of campus off of Highway 63.

The design focuses on the craft and production process of student work by exhibiting the shop space to visitors. The shops may be viewed by visitors from walkways above the shop floor or from the dedicated viewing areas separated from the shops with glass partitions. Students will have an expanded shop area for completing glass projects in a hot, warm, and cold shop. Metalworking students will have forges, tools, and special finishing areas available to them.

The inclusion of experiential learning is a unique educational opportunity at Missouri University of Science and Technology. The University has a desire to integrate application with education, and part of the University strategy is to provide experiential learning to all students. Additionally, the University has a broad initiative to connect arts and sciences in unique ways to augment student education. Student interest in applied glass forming and metalworking has increased and there is significant impetus for shop space dedicated and designed specifically for student exploration of these materials. Dedicated glassblowing and metal working shop space will allow programs and experiential learning on campus to expand. It will also offer a tangible way to link materials engineering science to the deeper human history of art and craft.

There will be a strong emphasis on exhibition and display of student, faculty, and visiting faculty work. Additionally, exhibits through the project will provide ways to educate visitors regarding the process and the history of each craft as an art and science.

The annual operating cost is anticipated at $109,523. The $10,956,750 project will be funded by gifts.

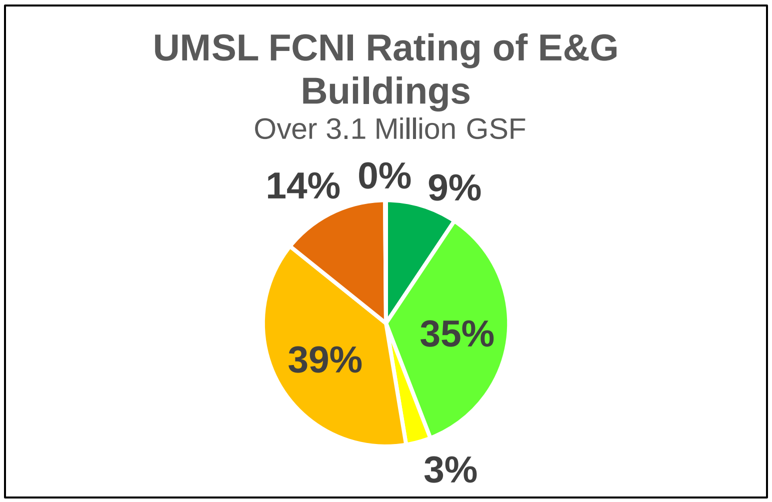
University of Missouri – St. Louis
Fiscal Years 2022 – 2027 Capital Plan

April 21, 2022

University of Missouri – St. Louis Facilities Stewardship

CRR 110.015 was established to maintain the facilities of the University of Missouri System in adequate condition to meet the needs of the University's education and research missions. A Facilities Condition Needs Index (FCNI) of 0.30 or lower was established as the goal for the Education and General (E&G) facility portfolio. CRR 110.015 also requires each campus to annually establish its facilities needs funding (target spend) by calculating the investment required to achieve and maintain the campus FCNI goal of 0.30 or lower for its E&G facilities over the next ten years.

UMSL currently has a FCNI of 0.33 and a backlog of $449.2 million of facilities needs. Fifty-three percent (53%) of the E&G space on the UMSL campus fall in the category of Below Average Condition, Poor condition, or Replacement is recommended. UMSL continues to underfund their target spend and their facilities needs are growing.



Facility Condition Needs Index
Excellent Condition, typically new construction (0.000 - 0.100)
Good Condition, renovations occur on schedule (0.101 - 0.200)
Fair Condition, in need of normal renovation (0.201 - 0.300)
Below Average Condition, major renovation required (0.301 - 0.500)
Poor Condition, total renovation indicated (0.501 - 0.600)
Replacement Recommended (0.600 and Higher)

E&G Facilities *(Dollars shown in Millions)*	**2017**	**2018**	**2019**	**2020**	**2021**
Target Spend	$31.7	$32.5	$31.0	$31.0	$31.9
Actual Spend	$7.2	$22.2	$8.6	$10.6	$18.1
Recurring	$3.5	$6.4	$5.6	$6.2	$9.9
One-Time	$3.7	$15.8	$3.0	$4.4	$8.1
Difference in Target and Actual	($24.5)	($10.4)	($22.4)	($20.4)	($13.8)
FCN Backlog	$363.8	$375.7	$389.6	$441.8	$449.2
Deferred Maintenance	$199.0	$205.5	$212.2	$238.6	$242.6
Plant Adaption	$37.8	$39.1	$41.1	$48.1	$48.9
Capital Renewal	$127.0	$131.1	$136.3	$155.1	$157.7
Recommended Target for next year	$32.6	$31.0	$31.0	$31.9	$30.5
Campus FCNI	**0.35**	**0.35**	**0.35**	**0.33**	**0.33**

April 21, 2022

University of Missouri – St. Louis: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan

Projects	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
	Current Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Construction	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
N/A						
Renovation/Infrastructure	**$63,800,000**	**$0**	**$0**	**$0**	**$0**	**$0**
Optometry and Honors College Consolidation	$14,500,000					
Music and Fine Art to General Services Building Consolidation	$11,000,000					
College of Education Consolidation	$19,800,000					
Thomas Jefferson Library/Computer Laboratory Consolidation	$8,000,000					
Welcome Center	$10,500,000					
Total Project Cost	**$63,800,000**	**$0**	**$0**	**$0**	**$0**	**$0**

University of Missouri – St. Louis: Fiscal Year 2022 - 2027 Capital Plan included in Finance Plan

Project						**Funding Strategy**				
#	**Title**	**Type**	**Facility Needs**	**FCNI**	**Total Cost**	**Debt**	**Gifts**	**Internal**	**Federal**	**State**
1	Optometry and Honors College Consolidation	RE	$40M	0.22-0.67	$14,500,000	$0	$0	$7,250,000	$0	$7,250,000
2	Music and Fine Art to General Services Building Consolidation	RE	$36.5M	0.30-0.49	$11,000,000	$0	$0	$5,500,000	$0	$5,500,000
3	College of Education Consolidation	RE	$63.7M	0.22-0.67	$19,800,000	$0	$0	$9,900,000	$0	$9,900,000
4	Thomas Jefferson Library/Computer Laboratory Consolidation	RE	$22.0M	0.33	$8,000,000	$0	$2,000,000	$3,000,000	$0	$3,000,000
5	Welcome Center	RE	$27.0M	0.48	$10,500,000	$0	$5,000,000	$2,750,000	$0	$2,750,000
	Total				**$63,800,000**	**$0**	**$7,000,000**	**$28,400,000**	**$0**	**$28,400,000**

1. **Optometry and Honors College Consolidation, UMSL**
Renovation of Provincial House will include constructing offices, laboratories, classrooms, and common core areas to consolidate space for Optometry and the Honors Collee. The project provides new infrastructure (HVAC, electrical switchgear, building envelope, etc.), classrooms, teaching labs and the associated technology required to teach and learn in today's modern-day world. The project will also include extensive renovation to common use areas to allow students to study and collaborate. This project will address ADA deficiencies with building access including entryways, elevators, and restrooms. Exterior improvements include building envelope items, replacement/upgrade of signage, sidewalks, accessible routes, doors, and stairs.

This project is aligned with UMSL's ten-year Master Plan, Space Survey, and ISES Report by addressing two major findings. First, all studies have identified UMSL as having excessive space compared to campus demand. resulting with unsustainable operating expenses. Second, the Master Plan has identified that UMSL is lacking common areas where students can study, learn, and collaborate with their peers resulting with lost enrollment to other state schools. The proposed consolidation effort is vital to UMSL's survival and will reduce UMSL's overall footprint, lowering the gross square feet (gsf), thus reducing operational expenses and addressing deferred maintenance across seven buildings while adding collaboration space to help retain and attract student enrollment

The School of Optometry is primarily operating on South Campus in three buildings (Patient Care Center, South Campus Classroom Building and Marillac) where space is grossly underutilized, and/or the FCNI index exceeds campus standards , or in some instances has exceeded the building's useful life. Renovating underutilized space at the Patient Care Center, Provincial House, and SSB Building (North Campus) will allow UMSL to consolidate and reduce UMSL's footprint by an additional 50,000 gsf, reduce operating expenses by $275,000 annually, reduce facilities needs by $26 million with the demolition of the six buildings on the South Campus Classroom Building including: Marillac Hall, Boiler Garage, South Campus Computer Building, Technology and Learning Center and Education Administration.

Funding for the $14,500,000 project will be provided by $7,250,000 from the State and $7,250,000 from the University.

2. **Music and Fine Art to General Services Building Consolidation, UMSL**
Renovation of General Services Building (GSB), will include constructing offices, practice facilities, laboratories, classrooms, and common core areas to consolidate space for Fine Arts and Music. The project provides new infrastructure (HVAC, electrical switchgear), classrooms, teaching labs and the associated technology required to teach and learn in today's modern-day world. The project will also include extensive renovation to common use areas to allow students to study and collaborate. This project will address ADA deficiencies related to building access including; entryways, elevators, and restrooms. Exterior improvements include replacement/upgrade of signage, sidewalks, accessible routes and stairs.

This project is aligned with UMSL's ten-year Master Plan, Space Survey, and ISES Report by addressing two major findings. First, all studies have identified UMSL as having excessive space when compared to the current campus demand, resulting with unsustainable operating expenses. Second, the Master Plan has identified UMSL is lacking common areas where students can study, learn, and collaborate with their peers resulting with loss enrollment to other state schools. This consolidation effort is vital to UMSL's survival, will reduce UMSL's overall footprint, lowering the gross square feet (gsf), reducing operational expenses, and addressing deferred maintenance across seven buildings while adding collaboration space to help retain and attract student enrollment.

General Services Building is an underutilized building located on North Campus near the core of UMSL. The School of Music and Fine Arts programs are currently operating in separate buildings outside of the core where the spaces are either improperly designed for current needs, or have high a FCNI. Renovating GSB will allow UMSL to consolidate the School of Music and Fine Arts to the GSB and demolish the Music Building and Sassin Building while repurposing the Fine Arts Building. As a result, this consolidation will reduce UMSL's footprint by 64,000 gsf, reduce operation expenses by $305K annually, and reduce the facilities needs by $10 million.

Funding for the $11,000,000 project will be provided by $5,500,000 from the State and $5,500,000 from the University.

3. <u>College of Education Consolidation, UMSL</u>

Renovation of Social Science Building (SSB) will include constructing offices, laboratories, classrooms, and common core areas to consolidate space for the College of Education to move from South Campus. The project provides new infrastructure (HVAC, electrical switchgear), classrooms, teaching labs and the associated technology required to teach and learn in today's modern-day world. The project will also include extensive renovation to common use areas to allow students to study and collaborate. This project will address ADA deficiencies with building access including; entryways, elevators, and restrooms. Exterior improvements include replacement/upgrade of signage, sidewalks, accessible routes, and stairs.

This project is aligned with UMSL's ten-year Master Plan, Space Survey, and ISES Report by addressing two major findings. First, all studies have identified UMSL as having excessive space compared to campus demands resulting with unsustainable operating. Second, the Master Plan has identified that UMSL is lacking common areas where students can study, learn, and collaborate with the peers resulting with loss enrollment to other state schools. This consolidation effort is vital to UMSL's survival, and will reduce UMSL's overall footprint, lowering the gross square feet (gsf), thus reducing operational expenses and addressing deferred maintenance across seven buildings while adding collaboration space to help retain and attract student enrollment.

The College of Education is primarily operating in two buildings on South Campus (South Campus Classroom Building and Marillac) where the FCNI index exceeds campus requirements and these buildings are at the end of life. Renovating underutilized space at the SSB Building (North Campus) will allow UMSL to consolidate these two colleges and reduce UMSL's footprint by an additional 152,000 gsf, reduce operation expense by $825K annually, eliminate $45 million in deferred maintenance due to removing buildings, and reducing deferred maintenance by $19.8M in the SSB building. and demolish the South Campus Classroom Building and Marillac Hall.

Funding for the $19,800,000 project will be provided by $9,900,000 from the State and $9,900,000 from the University.

4. **Thomas Jefferson Library/Computer Laboratory Consolidation, UMSL**
Renovation of the Thomas Jefferson Library will include a new entrance into the quad, that will support the north campus consolidation growth, and extensive renovations of common student areas will allow students additional new spaces to study and collaborate. This project will also include relocation of the existing snack area to the north side of the building, closer to the quad area for easier student access. Additionally, the project consolidates the computer lab on north campus, and provides new classrooms and the associated modern technology. Exterior improvements include the additional new entrance with improved signage, sidewalks, and improved accessible routes.

This project is aligned with UMSL's ten-year Master Plan by addressing the deficiency of common study areas and collaboration spaces. The Master Plan identified a lack of common areas where students can study, learn, and collaborate with the peers resulting with - lose enrollment to other state schools. In conjunction with the north campus consolidation, the quad area will be more densely populated which creates the need for an additional entry from the north allowing students access from the core classroom buildings. This renovation is vital to UMSL's future, by aiding in attracting new students and will help with student retention.

Funding for the $8,000,000 project will be provided by $2,000,000 in gifts, $3,000,000 from the State and $3,000,000 from the University.

5. **Welcome Center, UMSL**
Renovation of the underutilized space in the JC Penney Building and an upgraded façade will help welcome students, alumni, and the community. The project will consist of a new lobby, welcome area, large gathering space, and an outdoor plaza that will also include new infrastructure (HVAC, electrical switchgear) and technology to inspire additional student enrollment. The project will also include improvements to address ADA deficiencies with building access that include entryways, elevators, and restrooms. Exterior improvements include replacement/upgrade of signage, sidewalks, accessible routes and stairs.

This project is aligned with UMSL's ten-year Master Plan by focusing growth in the right location and leveraging underutilized space that will help increase student enrollment. JC Penney is located in a prominent and central location for welcoming a range of visitors to campus. Developing a new "front door" to the facility that welcomes visitors, to a new lobby and plaza that creates an inviting atmosphere that supports alumni, new students, and the community. Additionally, improvements to the restrooms and elevators will provide a needed refresh and will address accessibility deficiencies.

Funding for the $10,500,000 project will be provided by $5,000,000 in gifts, and $2,750,000 request from the State and $2,750,000 from the University.

University of Missouri – St. Louis
Strategic Projects Development Plan

April 21, 2022

FY 23 - University of Missouri –St. Louis: Strategic Development Projects Plan

Projects						Funding Strategy				
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Stadler Hall Renovation	RE	$30.0M	0.57	$38,500,000	$0	$0	$0	$0	$38,500,000
	Total				**$38,500,000**	**$0**	**$0**	**$0**	**$0**	**$38,500,000**

1. **<u>Stadler Hall Renovation, UMSL</u>**

   Renovation of Stadler Hall will include renovating existing research laboratories, offices, classrooms, restrooms, and common core areas. The project provides new infrastructure (HVAC, electrical switchgear, building envelope, etc.), and the associated technology required to teach and learn in today's modern-day world. The project will also include extensive renovation to common use areas to allow students to study and collaborate and will address life safety and ADA deficiencies. Exterior improvements include building envelope items, replacement/upgrade of signage, sidewalks, accessible routes, doors and steps.

   This project is aligned with UMSL's ten-year Master Plan, Space Survey, and ISES Report by addressing technology, life-safety, building code and accessibility deficiencies. UMSL's research department has been operating in a facility that is 50+ years old with infrastructure that is failing and out of date. In addition, technology in the building does not operate as designed, and research is being compromised as a result. This project updates the interior of the research complex with state-of-the-art research and technology that will align with survivability of UMSL's long term plans.

   This project will eliminate $30 million in facilities needs.

   Funding for the $38,500,000 project will be provided by the State.

GOVERNANCE, COMPENSATION AND HUMAN RESOURCES COMMITTEE

Michael Williams (Chair)
Julia Brncic
Keith Holloway
Robin Wenneker

I. Governance, Compensation and Human Resources Committee

The Governance, Compensation and Human Resources Committee (“Committee”) will review and recommend policies to enhance quality and effectiveness of the Board as well as compensation, benefits and human resources functions of the University.

II. Governance

1. Scope

   In carrying out its responsibilities regarding governance, the Committee has the central authority of ensuring that board members are prepared to exercise their fiduciary duties and assisting the Board to function effectively, efficiently and with integrity.

2. Executive Liaison

   The General Counsel of the University, or some other person(s) designated by the President of the University with the concurrence of the Board Chair and the Committee Chair, shall serve as executive liaison to the Committee on governance matters and be responsible for transmitting Committee recommendations related to governance.

3. Responsibilities

   In addition to the overall responsibilities of the Committee described above, and in carrying out its responsibilities regarding governance, the Committee shall review and make recommendations on the following matters:

   1. ensuring that Board members are prepared to carry out their fiduciary duties to the University;
   2. providing and monitoring a substantive orientation process for all new Board members and a continuous board education program for existing Board members;
   3. overseeing, or determining with the Board Chair and President, the timing and process of periodic Board self-assessment;
   4. establishing expectations and monitoring compliance of individual Board members;
   5. ensuring that the Board adheres to its rules of conduct, including conflict-of-interest and disclosure policies, and that it otherwise maintains the highest levels of integrity in everything it does;
   6. periodically reviewing the adequacy of the Board's bylaws and other Collected Rules and Regulations adopted by the Board that pertain to its internal operations (all recommendations for bylaws amendment shall first be considered by this Committee);
   7. identifying best practices in institutional and Board governance;
   8. monitoring and assessing external influences and relationships with affiliated entities;
   9. assessing areas of expertise needed in future Board members; and
   10. those additional matters customarily addressed by the governance committee of a governing board for an institution of higher education.

III. Compensation and Human Resources

1. Scope

   In carrying out its responsibilities regarding compensation and human resources, the Committee reviews and makes recommendations to the Board of Curators on strategies and policies relating to compensation, benefits and other human resources functions and associated programs.

2. Executive Liaison

   The Vice President and Chief Human Resources Officer of the University, or some other person(s) designated by the President of the University, with the concurrence of the Board Chair and the Committee Chair, shall serve as executive liaison to the Committee on human resources and compensation matters and be responsible for transmitting committee recommendations related to human resources and compensation.

3. Responsibilities

   In addition to the overall responsibilities of the Committee described above and in carrying out its responsibilities regarding human resources and compensation, the charge of the Committee shall include reviewing and making recommendations to the Board on the following matters:

   1. Performance and compensation of individuals reporting directly to the Board:
      1. President
      2. General Counsel
      3. Secretary of the Board of Curators
      4. Chief Audit and Compliance Officer, in conjunction with the Audit, Compliance and Ethics Committee
   2. Pursuant to Section 320.020 of the Collected Rules and Regulations, appointment or change of appointment of the following shall be reported to and approved by the Board before the effective date:

      1. Vice Presidents
      2. Chancellors
      3. Curators Professors
   3. Intercollegiate Athletics

      Pursuant to Section 270.060 of the Collected Rules and Regulations, contracts for Directors of Intercollegiate Athletics and Head Coaches may not exceed five (5) years and shall not include buyout clauses calling for the individual to receive more than the balance of the annual base salary the individual would have earned under the remaining terms of the contract, unless approved by the UM Board of Curators upon the recommendation of the President.

   4. Benefit, retirement and post retirement plans, including an annual benefits report, as further defined in Section 520.010, Benefit Programs, of the Collected Rules and Regulations.
   5. Additional employee benefits including the Education Assistance Program for University Employees, CRR 230.070, and Layoff and Transition Assistance, CRR 350.051.
   6. Labor Union Recognition and matters as further defined in Section 350.020, Labor Union Recognition, of the Collected Rules and Regulations.
   7. Employment related policies including those related to employee absences, conduct and grievances.
   8. Provide oversight over the University of Missouri System's diversity, equity and inclusion programs.
   9. Additional matters customarily addressed by the compensation and human resources committee of a governing board for an institution of higher education.

Approved by the Board of Curators: Feb 4, 2021

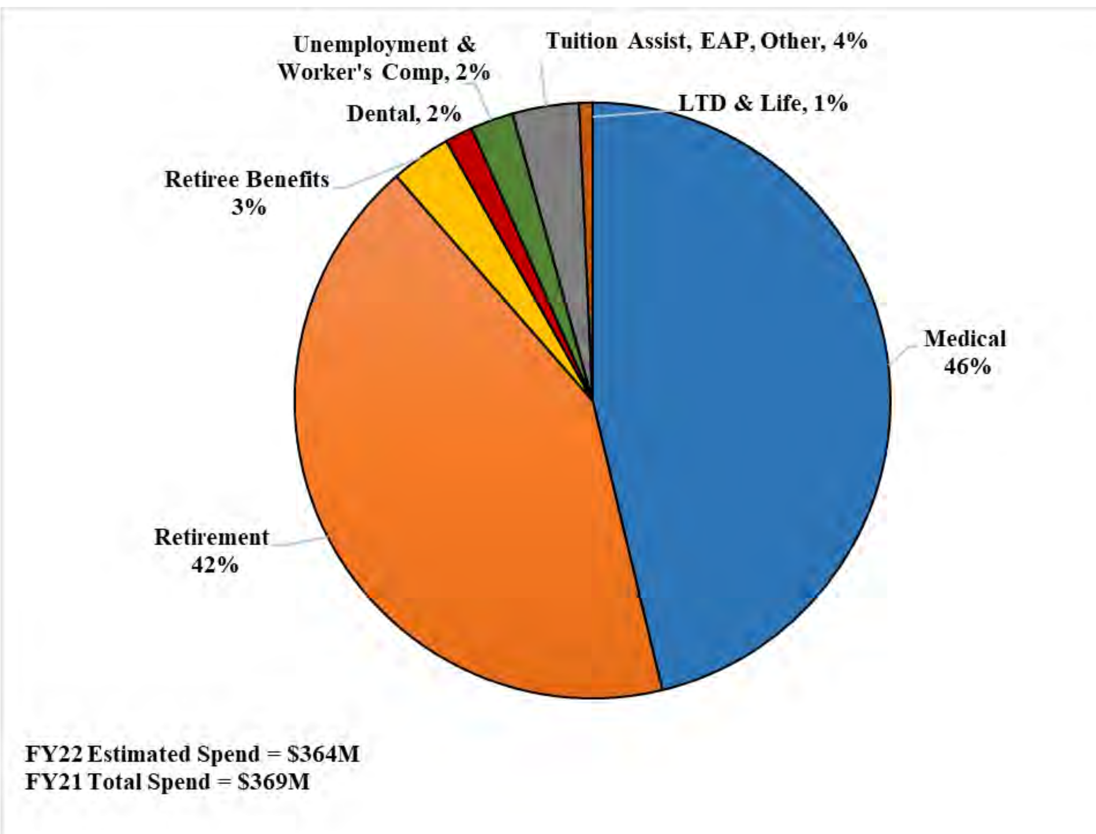
University of Missouri System 2021 Annual Benefits Report
April 2022

I. Introduction

This annual benefits report is provided to the University of Missouri Board of Curators pursuant to Section 520.010 of the Collected Rules & Regulations. Highlights include trends, costs and contributions, and an overview of the three-year roadmap to ensure UM's ability to be competitive in the recruitment and retention of top talent.

The University's contributions towards medical premiums and retirement plans continue to make up the largest portion of UM's benefit investment, accounting for 88% of total spend. The cost of leave plans is a direct cost to units, therefore not included in the benefit rate cost illustrated below in Chart 1.

CHART 1



In the past decade, but particularly during the past two years, the University has taken more aggressive measures to manage the total cost of benefits, while balancing competitiveness in the labor market. To ensure cost and market competitiveness, the University periodically conducts Request for Proposals (RFP) for employee benefit products. The RFP consists of a thorough review of providers, services, and fees to ensure we offer an affordable and accessible benefit package. Annually, Willis Towers Watson conducts a benchmark analysis of our benefit plans to review cost efficiency, cost sharing and plan design.

II. Overview of Current Plans

Benefit Plans for Active Employees

The University offers a comprehensive set of benefit options with flexibility for employees to choose plans that are right for them and their family. Summary of the plans include a choice of four different medical plans and ancillary plans:

- The traditional structure PPO Medical Plan is available to all employees and offers a broad network of providers, which may be ideal for those who desire flexibility for medical services at a higher cost. There are 3,162 employees enrolled in the PPO, covering 6,394 individuals.

- The Healthy Savings Plan is available to all employees and is coupled with a Health Savings Account (HSA). The University makes an annual contribution to help increase employee savings for qualified healthcare expenses. There are 4,996 employees enrolled in the Healthy Savings Plan, covering 10,042 individuals.

- The Custom Network Plans are available to employees in the eligible regions around Columbia and St. Louis and offers a focused network of providers, which improves the quality of services and share savings for those employees who are willing to limit their provider choices for a lower cost plan. There are 8,237 employees enrolled in the Custom Network Plans, covering 18,381 individuals.

- The Tiered PPO plan for Kansas City and Rolla was featured in January 2018. This plan utilizes the same broad network as the traditional PPO Plan, however, is designed to provide additional cost savings to employees who use providers who have been recognized as offering high-quality and cost-effective care. 1,505 employees are enrolled in the Tiered PPO plan covering 2,977 individuals.

- Ancillary benefits are available to employees such as dental, vision (employee paid), life insurance, accidental death & dismemberment, and long-term disability. For dental, 88% of benefit eligible employees (15,935) elect coverage, and 73% of benefit eligible employees (13,224) elect vision coverage.

Benefits Plans for Eligible Retirees

Retirees and surviving spouses may also be eligible for benefits. Eligible pre-65 retirees have a choice of two plans: the Retiree Health PPO Plan or the Retiree Healthy Savings Plan.

Eligible Medicare retirees have the option to enroll in the University sponsored Medicare Advantage Plan. Summary of the plans include:

- The pre-65 retiree plans are available to employees who had at least five years of service as of December 31, 2017, and are in Access Category A, B or C based on age and years of service upon retirement. 744 retirees are enrolled in the pre-65 retiree plans covering 1,274 individuals.

- The University sponsored Medicare Advantage Plan is available to retirees who are eligible for traditional Medicare coverage (by age or disability), and met the years of service and age requirements at the time of retirement. 6,045 retirees are enrolled in the Medicare Advantages Plans covering 7,847 individuals.

- If certain eligibility requirements are met at the time of retirement, ancillary benefits may also be available to retirees and surviving spouses such as dental, vision (retiree paid), life insurance, and accidental death & dismemberment. For dental, 83% of benefit eligible retirees (7,401) elect coverage, and 54% of benefit eligible employees (4,810) elect vision coverage.

<u>Retirement Plans</u>

Employees are enrolled in a core retirement plan based on their benefit eligible hire date. The following are the core retirement plans:

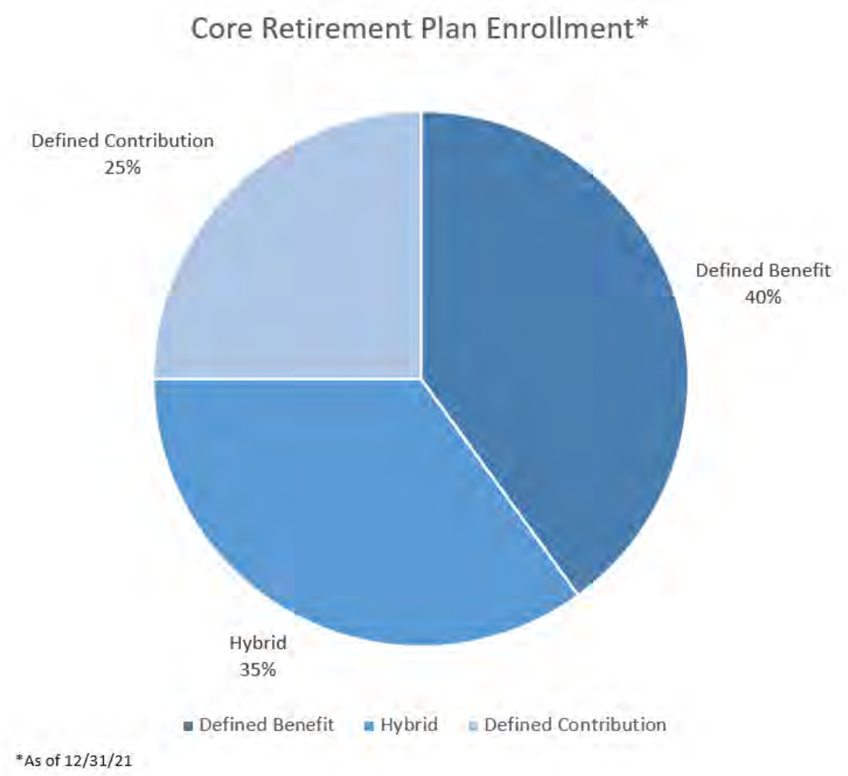
- Defined Benefit Plan – This is a typical pension plan.
    - Active, benefit-eligible employees hired before 10/01/2012, or returning employees hired on or after 10/01/2012 but before 10/01/2019 who were previously vested and did not take a distribution of their benefit.

- Hybrid Plan – This is a mixed pension and matching plan.
    - Active, benefit-eligible employees first hired on or after 10/01/2012 but before 10/01/2019 or returning employees during this time who either did not vest previously or who vested and took a distribution of their benefit.

- Defined Contribution Plan – This is an employer matching plan.
    - Active, benefit-eligible employees hired or rehired on or after 10/01/2019.

The University also offers voluntary retirement plan options for both benefit-eligible and non-benefit-eligible faculty and staff.

CHART 2



III. 2021 Cost Reduction and Administrative Efficiency Measures

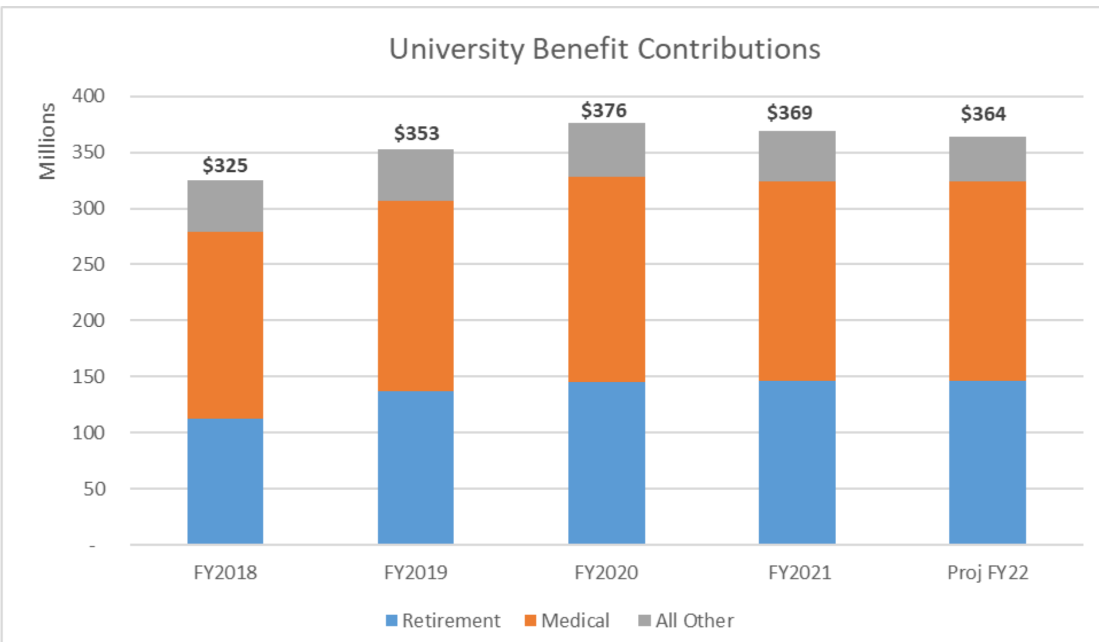
The increasing market competition for talent has further reinforced the need to maintain competitive, efficient Total Rewards programs. In response to this challenge, the following actions were completed in 2021 for the benefit and retirement programs.

Benefit Plans	Retirement Plans
▪ RFP process for Medicare Advantage resulting in integration of Part D prescription with Medicare Advantage Plans ▪ Analysis and review of Pre-65 Retiree Medical Plan coverage options ▪ Implemented a risk sharing arrangement with MUHC for Columbia Custom Network Plan ▪ Medical plan benefit coverage changes to align with higher education industry standards ▪ Implemented cost management programs with medical and pharmacy vendors	▪ Increased efficiency and FTE capacity through partnership with 3rd party retirement vendor, also enhancing the employee/retiree experience ▪ Completed study of longevity experience and expectations of Plan participants

To address the steady increase in medical cost prior to FY21 and the onset of the COVID-19 pandemic, the University targeted a 10% reduction of projected spend in the medical plans for calendar year 2021. The cost-savings efforts and medical plan design changes decreased utilization of the medical plans, but primarily transferred the cost to the employees who utilize the plans. See **Appendix A** for details of plan design changes implemented and plan comparison chart effective January 1, 2021.

For FY22, the University's total contributions to the benefit plans on behalf of employees and retirees is estimated to be $364M. Cost saving measures were taken during the 2021 calendar year. After multiple years of increasing benefit costs, the University realized $12M in cost reduction from $376M in FY20 to $364M in FY22. In FY20, the projected FY22 cost of total benefits, if no changes were made, was $392M, $28M above the actual FY22 cost. Note the 2021 calendar year cost saving measures impact both FY21 and FY22.

CHART 3



IV. Medical and Pharmaceutical Trends

As a self-insured plan, the University's medical fund includes the total cost of claims employees and retirees have experienced. The total claims cost is covered by the University's share and employee share of premiums. In the medical fund, the University experienced positive medical plan performance in 2021. The cost of medical claims decreased between plan year 2020 and 2021 by $17 million. The decrease in cost was mostly due to the plan design changes implemented in 2021 and partly the reduction in workforce. Total members covered under University's plan decreased by 5%.

Cost Reduction Actions

One-time saving measures:

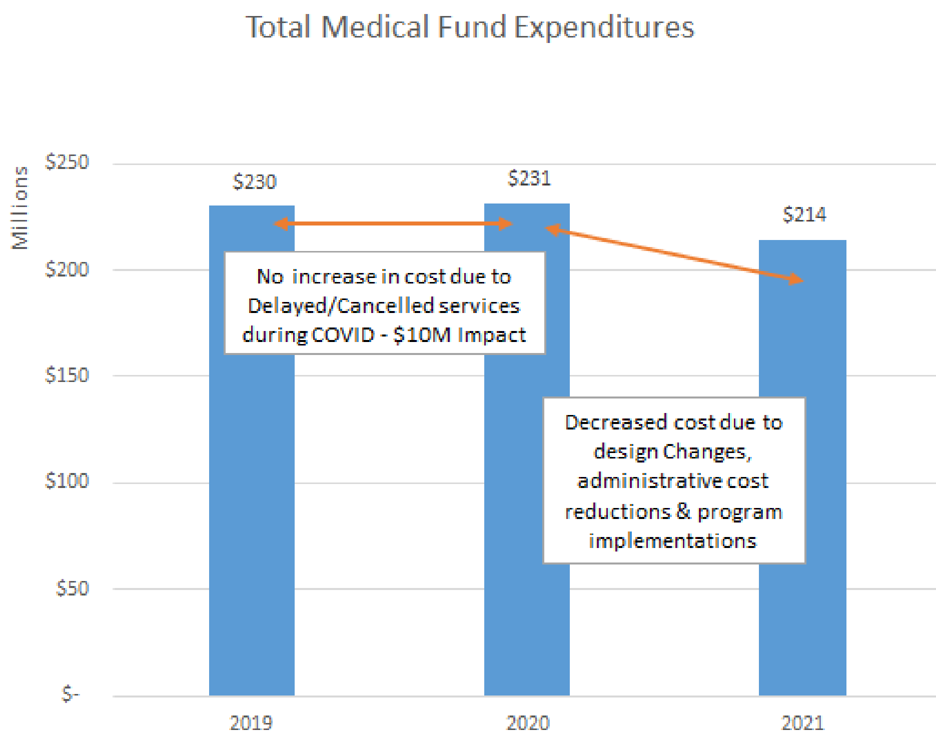
- United Healthcare administrative fee holiday negotiated during the RFP process
- Lingering COVID impacts

Reoccurring saving measures:

- Increased co-payments, deductibles, and out-of-pocket maximums
- Implementation of deductible in the Custom Network Plan
- Custom Network Plan Shared Savings Agreement
- Implementation of the SaveOn Pharmacy program
- Elimination of the wellness incentive

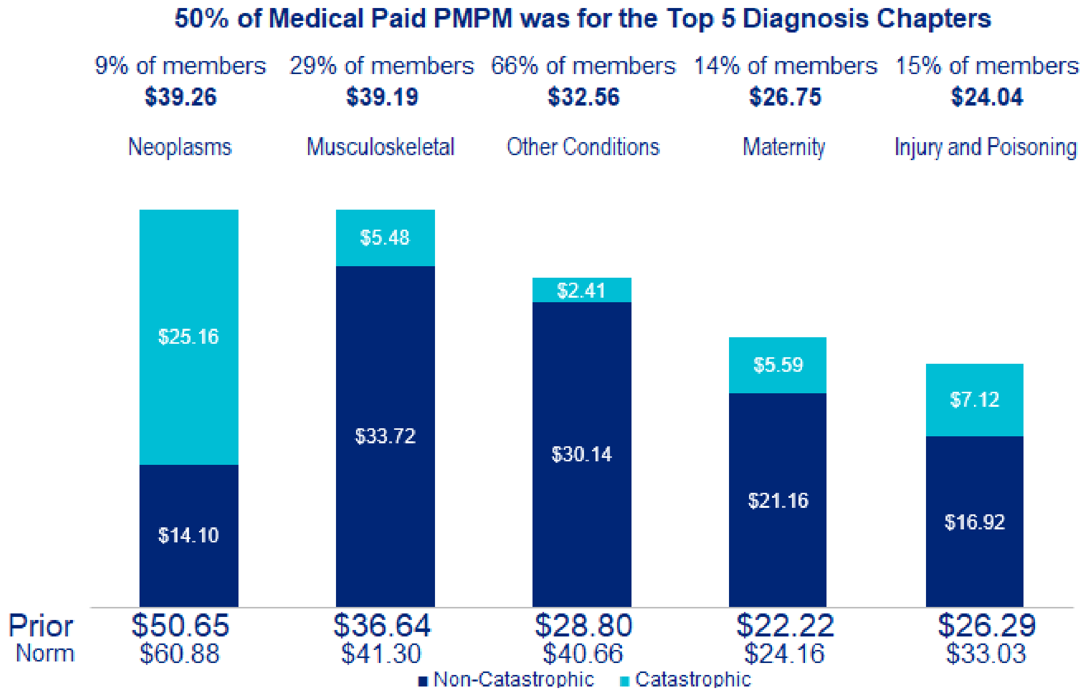
High-Cost Drivers

CHART 4



Medical claims spend in 2021 was primarily driven by five high-cost drivers: Neoplasms; Musculoskeletal System; Other Conditions; Maternity; and Injury and Poisoning. Neoplasms was the University's top medical spend in 2021 however per member per month claim costs were $11.39 lower than in 2020 due to lower catastrophic claim costs and lower chemotherapy treatment costs. Additional details of each high-cost drivers are highlighted in Chart 5 below.

CHART 5



Catastrophic Claims

A catastrophic claimant is a claimant who reaches $100k in medical claims. Each year, catastrophic claims comprise a significant amount of medical spend. The following were cost drivers for 2021:

- 27% of total spend in the medical plans was incurred by 190 catastrophic claimants**.** Of those 190, the top 10 highest cost claimants contributed $7 million, or 5% of total spend.
- Catastrophic paid per claimant decreased by 4.3% percent from the prior year. UM's PPO Plan was the top contributor to overall catastrophic cost, followed by the Columbia Custom Network Plan.
- Inpatient hospital costs are the single largest cost contributor for catastrophic events and related almost exclusively to the administration of radiotherapy/chemotherapy and inpatient room costs. Cardiac congenital was a large influencer as well due to the #1 claimant. Septicemia due to covid was the third highest catastrophic diagnosis category.
- The number of catastrophic claimants per 1,000 members increased from the prior period by 4.2%.

Mental Health

Benchmarking shows that the use of behavioral health services increased for most employers in 2021. The University experienced a 17.3% increase in per member per month costs for behavioral health services. While this is an increase for the University, cost remains below industry trend which is 22.4%.

Specifically, anxiety, depressive and stressor related disorders had the highest increase in the mental health category for 2021. The 2021 Aon Health Survey recognized mental health as the number one wellbeing issue in the workplace.

Through United Healthcare Behavioral Health Services, the University offers a nationwide provider network, virtual care options, as well as digital and online tools to help employees and dependents with mental health care. The University's employer-sponsored Employee Assistance Program offers free, confidential services for employees, their dependents and organizational work units.

Virtual Visits

While virtual care dropped in 2021 from 2020, virtual visits remain well above pre-pandemic norms. In 2019 there were 21,900 virtual visits, and in 2021 visits remained higher at 729,300. The shift from in-person to virtual visits, for which the cost is nearly half the cost of an in-person visit, has aided in mitigating the University's overall medical costs.

	Visits per 1,000				Paid PMPM			
Category Name	2019	2020	2021	2020 to 2021 Change	2019	2020	2021	2020 to 2021 Change
Virtual	**21.9**	**983.6**	**729.3**	**▼-25.9%**	**$0.07**	**$5.22**	**$3.69**	**▼-29.3%**
Physician and Allied Health	9.3	796.7	687.5	▼-13.7%	$0.03	$4.57	$3.57	▼-21.9%
Telemedicine Provider	12.5	72.4	24	▼-66.9%	$0.04	$0.21	$0.04	▼-81.0%
Other Non-Telemedicine Provider	0.1	114.5	17.8	▼-84.5%	$0.00	$0.44	$0.08	▼-81.8%

Urgent Care

Urgent Care visits increased by 21% in 2021 over 2020, almost exclusively from COVID testing and diagnosis visits. These visits also included testing that occurred for suspected COVID exposure.

Emergency Room Claims

Emergency room net cost per member per month, decreased by 7% in 2021 over 2020, mostly due to fewer cancer and heart disease related emergency room visits. The number of COVID related emergency room medical claims increased 11% in 2021 over 2020. The below diagnosis categories had the largest increases in emergency room claims, specific to COVID:

- Viral Infections: +69%
- Other Upper Respiratory Infections: +18%
- Nonspecific Chest Pain: +15%

- Other – mostly COVID tests: +493%

Increased Utilization

2020 utilization reflected a deferral of elective procedures, decreasing overall medical care utilization. 2021 utilization showed a return to care, particularly for preventive screenings such as colonoscopies, with the number of procedures in 2021 closer to 2019 levels. The highest utilization increases were in the following categories:

- Colonoscopies/GI Endoscopies: 15%
- Lens and Cataract Procedures: 23%
- Spondylosis/back procedures: 95%

V. Key Steps to Manage Plan Cost and Premium Increases

UM benchmarks its programs annually through participation in surveys and market checks. The University competitively bids benefit programs on a rolling basis to ensure benefits remain in line with market trends. In 2020 an RFP bid process was conducted for the health plan administrator. This resulted in a $2 million reduction in administration fees charged to the University in 2021.

Reoccurring administrative and benefit design programs which influence member behavior and mitigate cost increases on an annual basis, include:

New programs started in 2021

- **SaveOnSP** is a prescription copay savings program with Express Scripts that utilizes Affordable Care Act state benchmarks to maximize the value of manufacturer copay assistance programs for certain specialty prescriptions. The 2021 net savings is $3.3M. Cost of the program in 2021 was $1.3M.
- **Radiology/Cardiology Prior Authorization** is a program to consistently manage imaging and cardiac procedures through evidence-based medicine. The program helps promote appropriate utilization of imaging and cardiac procedures, addresses variations in the quality and safety of care provided to plan members, and delivers an average annualized net savings of $1.06 per member per month. The University's actual results shows a net savings for 2021 of $2.37 per member per month or $960,005. The cost for this program is $335,664 per year.
- **Onsite Wellness Coordinator** was added for 2021. The UnitedHealthcare onsite wellness coordinator engages employees in making better healthcare decisions, provides health education to group and individuals through in-person and virtual classes, coordinates on-site events, including health fairs, health screenings, weight loss and fitness challenges, and serves as point of contact for programs. Better health is

expected to reduce plan costs. The program cost is included in the United Healthcare base administration fee.

Ongoing existing programs

- **Mizzou Specialty Pharmacy as an in-network provider for the Columbia Custom Network Plan.** The annual savings to the benefit plan is $1M. There are no administrative costs for this program.
- **Real Appeal** is an online weight loss program focused on members' goals, nutrition, and exercise. It offers resources, personalized tools, and support and weekly coaching. The continued positive impact this program has on members with circulatory concerns, diabetes, pre-diabetes, and weight management is estimated to reduce cost drivers by a net savings of $1.5M over three years. 2,360 plan members have enrolled in the program from 2017 through 2021. There are no administrative costs for this program.
- **Advanced Analytics and Recovery Services** delivers a retrospective paid claim review where claims will be re-examined monthly for up to 12 months utilizing expertise in data analysis, investigation, identification, and recovery. The estimated net savings for 2021 is $519,450. The program cost is based on a percentage (24%) of realized plan savings.
- **Onsite Nurse Program** continues to help increase preventative care visits, assist members in utilizing appropriate care settings, and promote the use of United HealthCare and the University of Missouri tools and resources to help reduce claim costs. The program cost is included in the United Healthcare base administration fee.
- **Arthroscopy Medical Necessity Bundle** added for all medical plans. This is a process for determining whether services, tests and procedures are cost-effective, identifying opportunities to move from higher-cost hospital settings to an Ambulatory Surgical Center setting, when applicable. Estimated net savings for 2021 is $175,611. There are no administrative costs for this program.
- **Medical Necessity Review** for Genetic Testing, Inflammatory Medications, Functional Endoscopic Sinus Surgery, Hysterectomy and Sinuplasty was implemented on 1/1/2020 at no additional cost to the University. Genetic Testing estimated savings through 2021 is $309,000.

Premiums

In 2021, premium cost increases were less than 1% across active employee plans, and 13% across pre-65 plans. That was following increases in 2020 of 5.5% for active employee plans and 11.5% for pre-65 plans. A copy of the active employee premiums is available in **Appendix B**.

Premiums for retirees in the Medicare Advantage plans decreased 12% across the post-65 retirees. Medicare Advantage premiums decreased in 2020 over 2021 due to the US Congress waiving and ultimately permanently removing the Insurer Fee for all employers.

Prior to 2021, the Insurer Fee was a volatile fee, meaning each year Congress voted to charge or waive the fee annually.

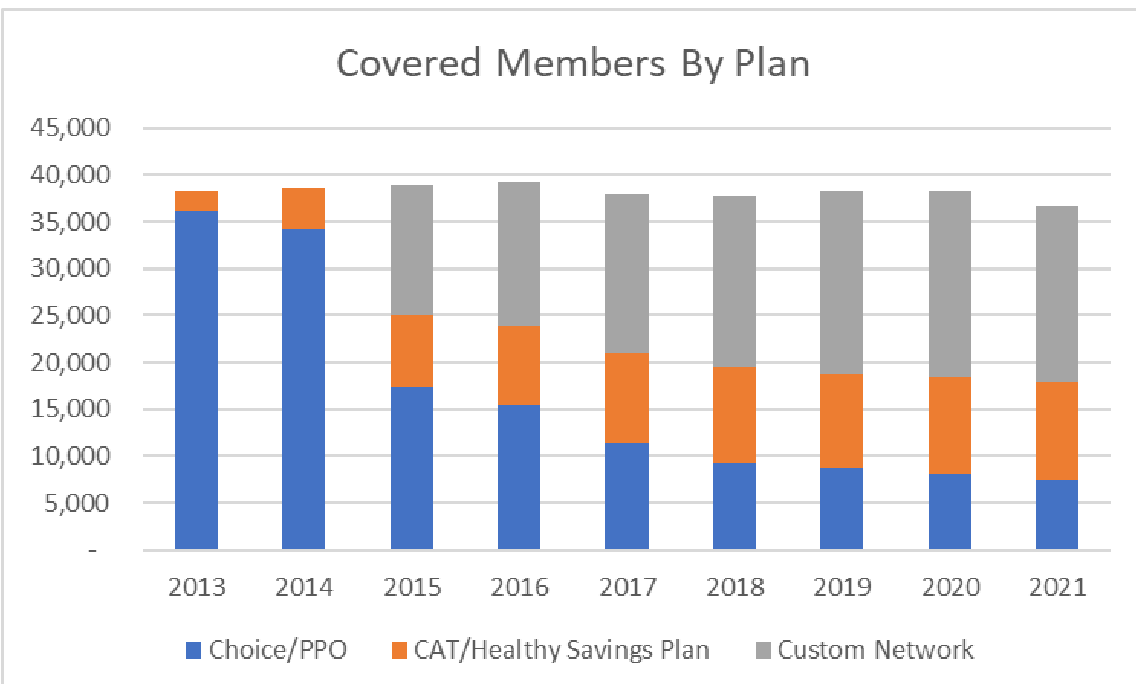
VI. Columbia Custom Network Plan Shared Savings Agreement

In 2021 a revised 3-year shared savings agreement was established between UM System and MU Healthcare (MUHC), updating the original 2015 agreement for a Custom Network Plan (CNP), that created a MU Healthcare-specific network plan for University employees. The 2021 agreement is focused on providing strategic direction for the Custom Network Plan, prioritizing work to increase quality, and reducing cost for the 62% of eligible employees who participate in the plan.

Components of the shared savings program include:

- Methodology for cost targets that if met allow for shared savings between the parties
- Established quality metrics and targets for patient care
- Established care management performance metrics and targets
- A governance structure that includes a Joint Operating Group and an Executive Governance Committee. Ongoing work groups to review and reduce out-of-network claims, lower prescription costs, and establish reporting deliverables for the Joint Operating Group.

CHART 6



VII. Retiree Medical

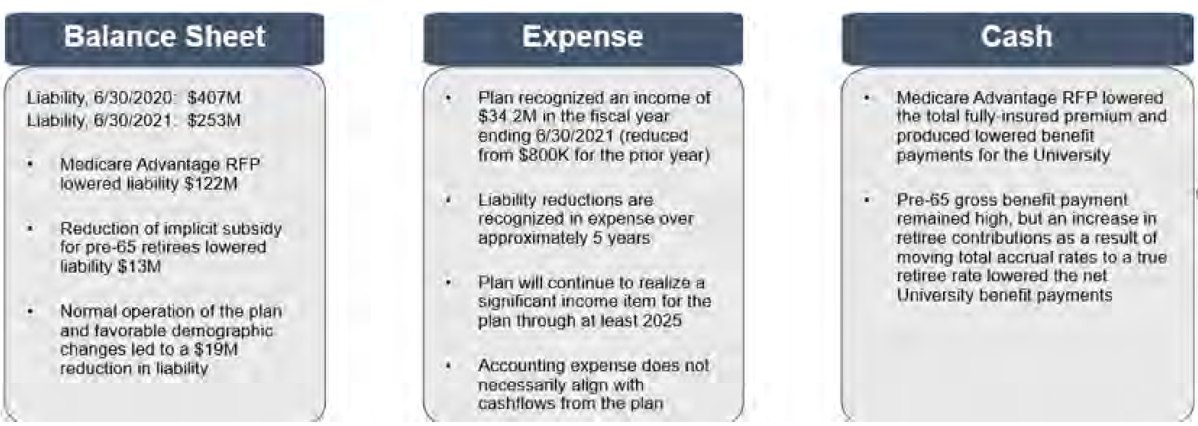
Pre-65 Retiree Plans

Historically, the pre-65 retiree premiums were developed based on blended experience of the active and retiree populations. This led to artificially low premiums for pre-65 retirees and created an implicit subsidy due to the blended rates and University contributions. This implicit subsidy increased medical costs for active employees in the University's medical plan. In 2018, the University implemented a phased approach for pre-65 retiree premium rates to move toward fully costed premiums eliminating the implicit subsidy. Since 2018 the University increased composite retiree rates by 54.4% while active employee rates increased 14.5%.

Medicare Retiree Plans

The University competitively bid the Medicare Advantage Plan and Part D prescription coverage for the Medicare retiree plans in 2021. The bid process integrated Part D coverage with the same vendor to drive a better price. The changes to Medicare plans resulted in a $3.3M annual reduction and shifts in accrual rate for the pre-65 retiree plans resulted in a $2.5M reduction. The total reduction in the annual cashflow is $5.8M. The financial impact is outlined in the next illustration.

Financial Impacts of 2021 Actions



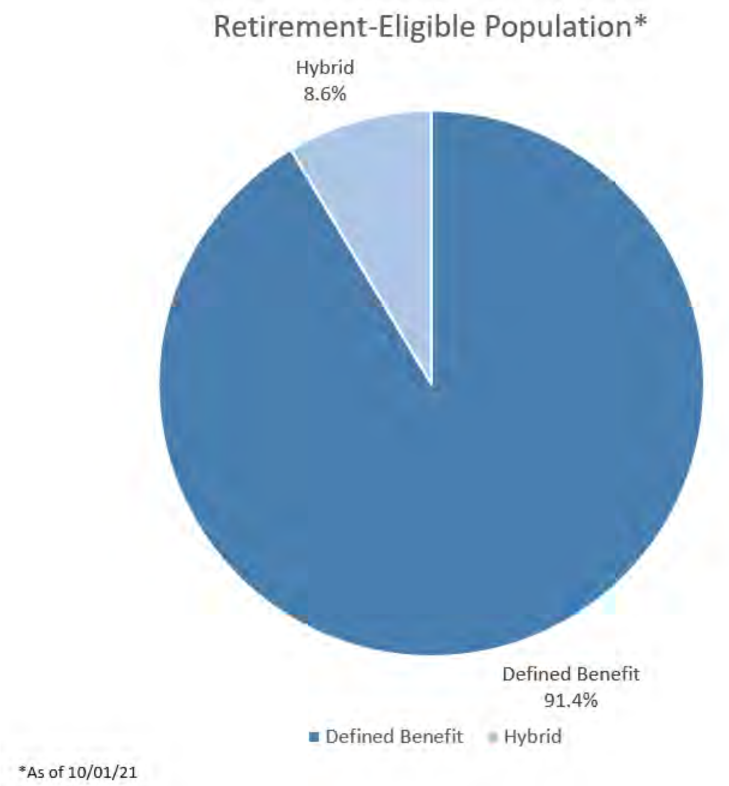
VIII. Retirement Plans

Retirement Eligible Population

As of 10/1/2021, a total of 23% of the University's population is currently eligible for retirement, which is comprised of 5.8% of the population (776 employees) at full retirement*, and 17.1% (2,302 people) eligible for early retirement**. The majority of retirement eligible employees are enrolled in the Defined Benefit Plan (91.4%). In fact, 40% of members enrolled in the Defined Benefit Plan are retirement-eligible compared to only 4% of those enrolled in the Hybrid Plan.

**Full retirement is defined as those age 65 with at least 5 years of service or age 62 with at least 25 years of service*
***Early retirement is defined as those age 55-59 with at least 10 years or service or age 60 with at least 5 years of service*

CHART 7



Actuarial Report: Defined Benefit Plan

Each year, the University completes an actuarial valuation report for the University of Missouri's core retirement plan, the Defined Benefit Plan (Retirement, Disability and Death Benefit Plan, or "RDD Plan"), which provides the required contribution for the upcoming fiscal year for this plan. Every five years the University conducts a quinquennium study to compare the past 5 years actual experience to assumptions. The results of that analysis impact the 2021 valuation which is still in progress as a part of the Defined Benefit Plan Financial Management Strategy (See action item in the April 2022 Board materials).

For more details, a copy of the 10/01/21 valuation report has been included in **Appendix D** as an attachment.

Environmental Impacts

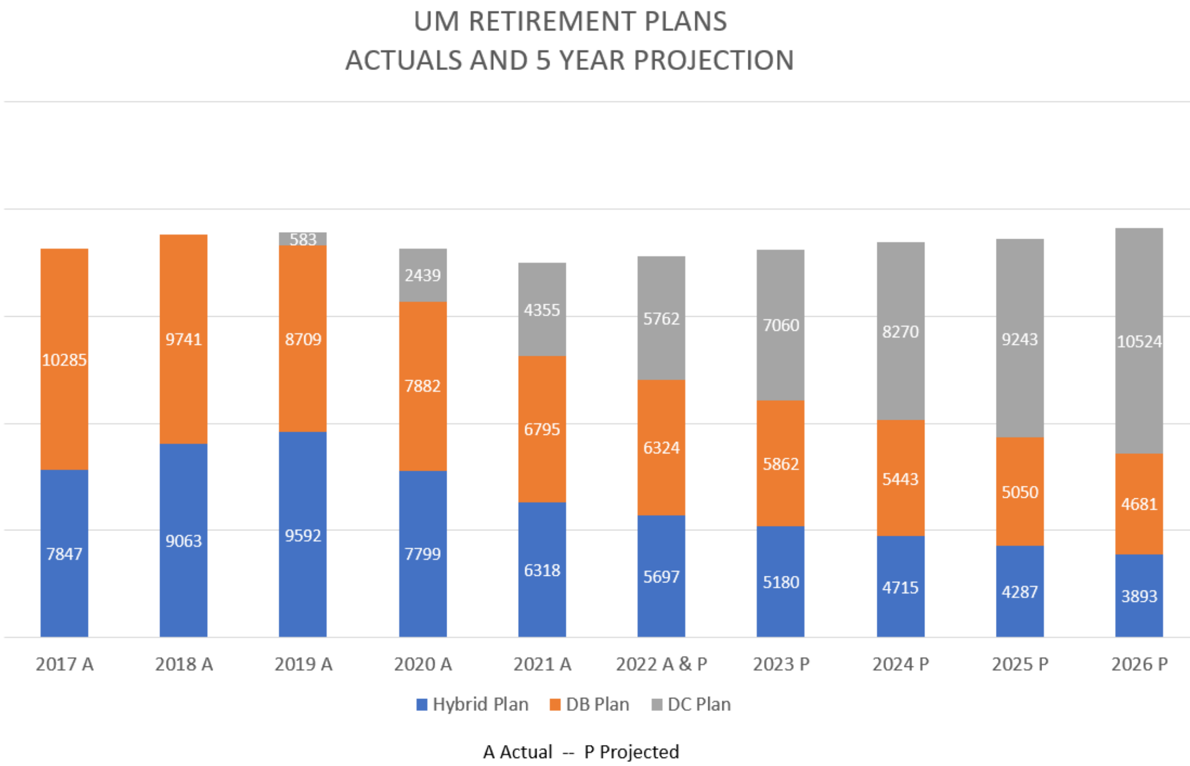
It is important the University continue to evaluate the long-term financial commitments of the plans, to perform routine reviews of the plan's assumptions, and to monitor industry trends to ensure the appropriate fiduciary compliance is maintained. These efforts have been ongoing since 2010:

- 2009 – Added an employee contribution requirement; established a stabilization reserve
- 2012 – Transition to 50% DB benefit in the Hybrid Plan for new employees
- 2019 – Transition to 100% Defined Contribution Plan for new and rehired employees

With the Board's approval, the University closed the defined benefit plan to new entrants and implemented a full defined contribution retirement plan effective 10/01/2019. Chart 8 shows that with closing the defined benefit plan to new or rehired employees, enrollment in the defined contribution plan will increase as the defined benefit population retires or terminates employment.

Within the materials for this April 2022 Board of Curators meeting, the Defined Benefit Plan Financial Management Strategy is presented. The pension remains the largest liability in total value for the University. Administration has, therefore, outlined a strategy to prioritize and protect University funding for contributions needed. This is being proposed through methods such as applying changes to asset allocation targets, adopting a new financial management policy, changes to actuarial assumptions, and establishing a framework to de-risk the Plan over time.

CHART 8



Administrative Improvements

Many administrative efficiencies were gained by engaging with pension platform vendor to further automate manual processes, allowing for outsourcing capabilities.

- Improved calculation capabilities allowing for more automation and less manual intervention by retirement analysts
- Outsourcing of administrative tasks such as mailing election packets
- Additional support to assist with future process improvements (electronic retirement options, outsourcing of some calculations, automated payment setups)
- Enhanced payroll capabilities including automation files to set up new payments/payment changes that will reduce the possibility of errors and monthly payment reconciliation

IX. Strategic Direction

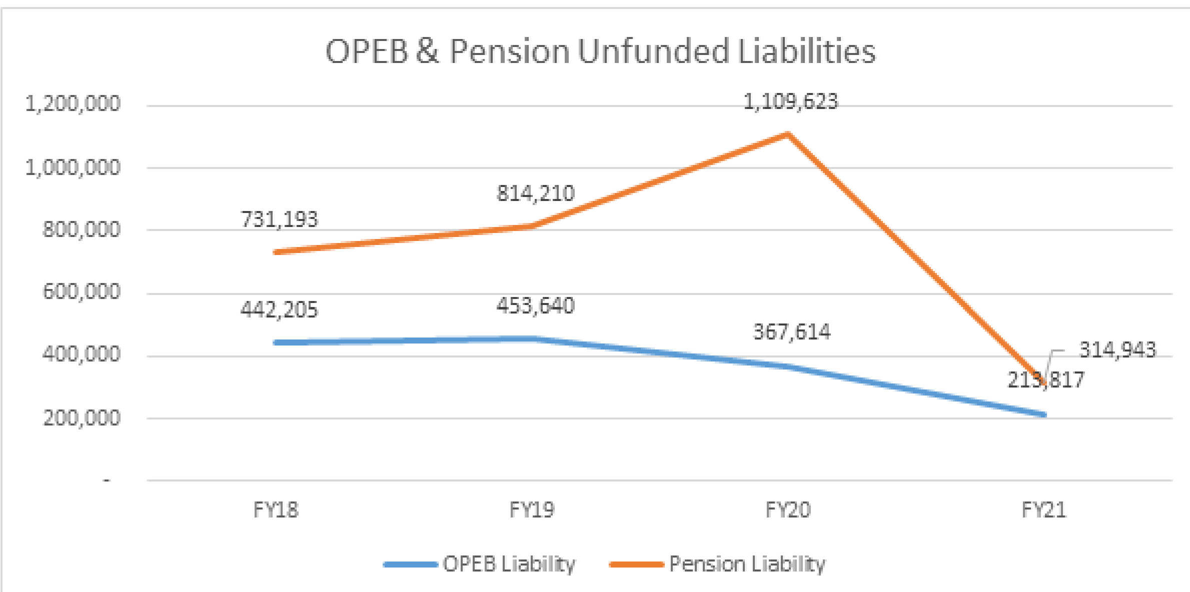
Roadmap

The Office of Human Resources developed a three-year road map to provide a line of sight over multiple years, ensuring we support the strategic direction of the University. The detailed Roadmap is available in **Appendix C**.

Impact Summary from Recent Changes

Results of previous years' roadmap priorities are summarized below.

Initiative	Cost Avoidance or Reduction	Liability Reduction	Added Cost	Comments
Retirement Plans	Risk Reduction	NA	NA	Closed the DB plan to de-risk the University's future financial state by no longer paying for market downturns which generates the unfunded liability - $314M
Medical Insurance Plans	$17M	NA	NA	2021 changes resulted in an annual reduction in medical costs for the university
Life/LTD Insurance Plans	$625,000 per year	NA	NA	An RFP resulted in cost reduction and included outsourcing of FMLA admin
Service Awards	$470,000 per year	NA	NA	Eliminated the gift card program for years of service
Pre-65 Post Retirement Ins	$5M over 2 years	$26M over 2 years	NA	Original changes implemented in 2018. 2021 liability projected to be >$1B. Current liability $213M (see chart below).
Tuition / Education Plans	NA	NA	$525k-$700k	In 2018, the vesting period for receiving tuition assistance was reduced from 5 years to one year to align with peers.
Staff Time Off Programs	In process	In process	In process	Recommendation to BOC



X. Acknowledgment of Total Rewards Advisory Committee (TRAC)

Thank you for the opportunity to provide this annual report. We look forward to continued improvements to ensure competitive and financially sustainable benefit and retirement programs for the University of Missouri System.

Input and feedback were received from the Total Rewards Advisory Committee (TRAC) on the actions in this report. TRAC is comprised of a faculty and a staff member from each campus, a hospital representative, and a retiree representative. Members continue to be actively engaged in benefit, retirement, compensation, policy analysis, and related discussions for the University of Missouri.

APPENDIX A – SUMMARY OF 2021 BENEFIT PLAN DESIGN CHANGES

MEDICAL PLAN DESIGN RECOMMENDATIONS FOR 2021

Due to a 10% targeted cost reduction, significant changes were made to all plans. Approximately 5% of the target was achieved through administrative changes with minimal impact to members, and approximately 5% of the target was achieved through plan changes, directly impacting out-of-pocket costs for members, which varied based on how much they used the plan. Cost reductions outlined below are permanent and will occur year over year.

PPO Changes:

- Deductibles
  - St. Louis and Columbia was $500/$1,500; increased to $800/$2,400
  - Kansas City and Rolla was $350/$1,050; increased to $500/$1,500
- Rx out-of-pocket maximum, was $4,650/$9,300; increased to $5,050/$10,100
- Co-insurance
  - St. Louis and Columbia was 10%/20%; increased to 20%/40%
  - Kansas City was 0%/10%/20%; increased to 10%/20%/40%
  - Rolla was 0%/20%; increased to 10%/40%
- Specialists visit co-pay
  - St. Louis and Columbia was $30; increased to $40
  - Kansas City was $25/$30/20%; increased to $35/$40/40%
  - Rolla was $30/20%; increased to $40/40%
- Primary care provider co-pay
  - Kansas City was $10/$20/20%; increased to $15/$25/40%
- Labs/Radiology
  - St. Louis and Columbia was 10%/20%; increased to 20%/40%
  - Kansas City was 0%/10%/20%; increased to 10%/20%/40%
  - Rolla was 0%/20%; increased to 10%/40%
- Inpatient Facility
  - St. Louis and Columbia was $300/20%; increased to 20%/40%
  - Kansas City was $300/20%; increased to 10%/40%
  - Rolla was $300/20%; increased to 10%/40%
- Outpatient Facility
  - St. Louis and Columbia was $100/20%; increased to 20%/40%
  - Kansas City was $0/$100/20%; increased to 10%/20%/40%
  - Rolla was $100/20%; increased to 10%/40%
- Ambulance and Medical Equipment
  - All PPO plans were $100/$100 copay for Ambulance; increased to $200/$200 copay
  - PPO plans vary in current copay for Medical Equipment; standardize to $75 copay

Custom Network Plan Changes:

- Applied a $200/$600 deductible for in-network providers: previously deductible was $0
- Increased out-of-network deductible: was $500/$1,500; increased to $1,500/$4,500
- Rx out-of-pocket maximum: was $4,650/$9,300; increased to $5,050/$10,100
- Co-insurance: was 0%/30%; increased to 10%/50%
- PCP visit co-pay: was $10/30%; increased to $15/50%
- Specialists visit co-pay: was $30/30%; increased to $40/50%
- Basic Labs/Radiology: was $0/30%; increased to $5/50%
- Advanced Labs/Radiology: was $0/30%; increased to $100/50%
- Medical Equipment: was $0/30%; increased to $75/50%
- Ambulance: was $100/$100; increased to $200/$200
- Inpatient Facility: was $300/30%; increased to 10%/50%
- Outpatient Facility: was $100/30%; increased to 10%/50%

Healthy Savings Plan Changes:

- Deductible: was $1,500/$3,000; increased to $1,750/$3,500
- Out-of-pocket maximum: was $3,000/$6,000; increased to $3,500/$7,000
- Co-insurance: was 10%/30%; increased to 15%/35%

RETIREE MEDICAL AND PHARMACY PLANS

There are two retiree health plans, the Retiree Health Plan (RHP) which cover just under 1,000 pre-65 retirees and is self-insured by UM and the fully insured Medicare Advantage (MA) Plan for post-65 retirees.

EXECUTIVE SUMMARY – RETIREES (PRE-65 AND MEDICARE)

The RHP has traditionally been subsidized by the active plan premiums. UM has a 7-year plan for transitioning the full employee premium cost to RHP members in order for the plan to be self-supporting. The following supports the recommendation for the premium increase to members in the RHP:

- RHP premiums are subsidized by premiums from two of the active employee plans, which increases the cost to members and makes it difficult to keep the active plans competitive.
- In addition to the active plan subsidy, UM contributes an additional implicit subsidy of $2.2 million.
- The cost of claims each plan year continue to exceed the premium collected.
- Immediately moving the full cost of these subsidies to the RHP plan would create a 37-54% increase for members or $40 to $732 increase per month to premiums, depending on the retiree’s level subsidy.

Retiree Health Plan (pre-65 retirees):
In addition to plan management administrative savings of $700,000 and an average 13% premium increase, the following benefit changes were implemented:

- Deductible: was $350/$850; increased to $700/$1,700
- Out-of-pocket maximum: was $2,400/$4,800; increased to $3,400/$6,800
- Co-insurance: was 20%/30%; increased to 30%/40%

Medicare Advantage Plan Changes:
There were minimal changes to the MA plan for 2021:

- Insurer fee: Previously added $25 to each member's premium on the buy-up plan. Congress eliminated the insurer fee for 2021, which reduced the member premium for the buy-up plan from $80 to $59 for 2021.
- Base plan: Continued to have a $0 premium for the medical portion of coverage
- Rx out-of-pocket maximum: was $3,250; increased to $4,130
- Rx deductible: was $75; increased to $200
- Total member cost for both medical and Rx: Previously there was a $128 premium for base plan and $208 for the buy-up plan; 2021 premium was $120 for base plan and $187 for buy-up plan resulting in reduction in member costs of $8 for the base and $21 for the buy-up.

HEALTHY SAVINGS PLAN | What You Pay for Covered Expenses in 2020/2021

		2020 HEALTHY SAVINGS PLAN		2021 HEALTHY SAVINGS PLAN	
		In-network	*Out-of-network***	In-network	Out-of-network**
DEDUCTIBLE	**Medical deductible** **Rx deductible**	*$1,500/self coverage $3,000/family* coverage (combined)*	*$3,000/self coverage $6,000/family* coverage (combined)*	$1,750/self; $3,500/family* (combined)	$3,500/self; $7,000/family* (combined)
SERVICES	**Preventive care**	*$0*	*30% or more after deductible*	$0	35% or more after deductible
	Primary care	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Specialist care	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Urgent care	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Lab and x-ray	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Outpatient care	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Inpatient care *(incl. maternity delivery)*	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Durable medical equipment	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Emergency room	*10% after deductible*	*10% or more after deductible*	15% after deductible	15% or more after deductible
	Ambulance	*10% after deductible*	*10% or more after deductible*	15% after deductible	15% or more after deductible
Rx	**Rx drug: Retail** ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
	Rx drug: Mail*** ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	*10% after deductible*	*30% or more after deductible*	15% after deductible	35% or more after deductible
OUT-OF-POCKET**	**Medical limit** **Rx limit**	*$3,000/self coverage $6,000/family* coverage (combined)*	*$6,000 or more /self coverage $12,000 or more /family* coverage (combined)*	$3,500/self; $7,000/family* (combined)	$7,000 or more/self; $14,000 or more/family* (combined)

*Considerations for "self" and "family" are different for the Healthy Savings Plan than for the Custom Network and PPO Plans. See the glossary (umurl.us/glossary) for details.
**Refer to the Summary Plan Description (SPD) for additional details on allowable and eligible expenses when using an out-of-network provider.
***90-day fill/refill at Mizzou pharmacies at same cost as mail order.

CUSTOM NETWORK PLAN | What You Pay for Covered Expenses in 2020/2021

		2020 CUSTOM NETWORK PLAN		2021 CUSTOM NETWORK PLAN	
		In-network	Out-of-network**	In-network	Out-of-network**
DEDUCTIBLE	Medical deductible	$0	$500/self coverage $1,500/family* coverage	$200/self; $600/family	$1,500/self; $4,500/family*
	Rx deductible	Retail: $50/person Mail order: $0/person	Retail: $50/person Mail order: $0/person	Retail: $50/person Mail order: $0/person	Retail: $50/person Mail order: $0/person
SERVICES	Preventive care	$0	30% or more after deductible	$0	50% or more after deductible
	Primary care	$10 copay/visit	30% or more after deductible	$15 copay/visit	50% or more after deductible
	Specialist care	$30 copay/visit	30% or more after deductible	$40 copay/visit	50% or more after deductible
	Urgent care	$50 copay/visit	$50 copay/visit or more	$50 copay/visit	$50 copay/visit or more
	Lab and x-ray*****	$0	30% or more after deductible	$5 (basic)/$100 (advanced)	50% or more after deductible
	Outpatient care	$100 copay/visit	30% or more after deductible	10% after deductible	50% or more after deductible
	Inpatient care *(incl. maternity delivery)*	$300 copay/confinement	30% or more after deductible	10% after deductible	50% or more after deductible
	Durable medical equipment	$0	30% or more after deductible	$75 copay	50% or more after deductible
	Emergency room	$250 copay/visit	$250 copay/visit or more	$250 copay/visit after deductible	$250 copay/visit or more after deductible
	Ambulance	$100 copay/occurrence	$100 copay/occurrence or more	$200 copay/occurrence after deductible	$200 or more copay/occurrence after deductible
Rx	Rx drug: Retail ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	Greater of (after Rx deductible): ▪ $7 copay/20% coinsurance ▪ $15 copay/25% coinsurance ▪ $30 copay/50% coinsurance	Greater of (after Rx deductible): $30 copay or 50% network costs after annual deductible****	Greater of (after Rx deductible): ▪ $7 copay/20% coinsurance ▪ $15 copay/25% coinsurance ▪ $30 copay/50% coinsurance	Greater of (after Rx deductible): $30 copay or 50% network costs after annual deductible****
	Rx drug: Mail*** ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	Greater of: ▪ $15 copay/20% coinsurance ▪ $30 copay/25% coinsurance ▪ $60 copay/50% coinsurance	Greater of: $30 copay or 50% network costs after annual deductible****	Greater of: ▪ $15 copay/20% coinsurance ▪ $30 copay/25% coinsurance ▪ $60 copay/50% coinsurance	Greater of: $30 copay or 50% network costs after annual deductible****
OUT-OF-POCKET**	Medical limit	$3,500/self coverage $7,000/family* coverage	$10,500 or more /self coverage $21,000 or more /family* coverage	$3,500/self; $7,000/family*	$10,500 or more/self; $21,000 or more/family*
	Rx limit	$4,650/self coverage $9,300/family* coverage		$5,050/self; $10,100/family*	

*Considerations for "self" and "family" are different for the Healthy Savings Plan than for the Custom Network and PPO Plans. See the glossary (umurl.us/glossary) for details.
**Refer to the Summary Plan Description (SPD) for additional details on allowable and eligible expenses when using an out-of-network provider.
***90-day fill/refill at Mizzou pharmacies at same cost as mail order.
****Member will be required to pay the difference between non-participating pharmacy and participating pharmacy charge.
***** For lab and x-ray services, "Basic" includes services such as x-ray, blood work, lipid panel, etc. "Advanced" includes services such as CT scan, PET scan, MRI, etc.

PPO Plan (Columbia, Rolla, St. Louis) | What You Pay for Covered Expenses in 2020/2021

		2020 PPO PLAN		2021 PPO PLAN	
		In-network	Out-of-network**	In-network	Out-of-network**
DEDUCTIBLE	Medical deductible	Rolla: $350/self; $1,050/family* Columbia and St. Louis: $500/self; $1,500/family *	Rolla: $700/self; $2,100/family* Columbia and St. Louis: $1,000/self; $3,000/family *	Rolla: $500/self; $1,500/family* Columbia and St. Louis: $800/self; $2,400/family *	Rolla: $1,000/self; $3,000/family* Columbia and St. Louis: $1,600/self; $4,800/family*
DEDUCTIBLE	Rx deductible	Retail: $75/person Mail order: $0/person	Retail: $75/person Mail order: $0/person	Retail: $75/person Mail order: $0/person	Retail: $75/person Mail order: $0/person
SERVICES	Preventive care	$0	20% or more after deductible	$0	40% or more after deductible
SERVICES	Primary care	$20 copay/visit	20% or more after deductible	$20 copay/visit	40% or more after deductible
SERVICES	Specialist care	$30 copay/visit	20% or more after deductible	$40 copay/visit	40% or more after deductible
SERVICES	Urgent care	$50 copay/visit	20% or more after deductible	$50 copay/visit	40% or more after deductible
SERVICES	Lab and x-ray	Applicable coinsurance after deductible^	20% or more after deductible	Applicable coinsurance after deductible^	40% or more after deductible
SERVICES	Outpatient care	$100 copay/visit after deductible	20% or more after deductible	Applicable coinsurance after deductible^	40% or more after deductible
SERVICES	Inpatient care (incl. maternity delivery)	$300 copay/confinement after deductible	20% or more after deductible	Applicable coinsurance after deductible^	40% or more after deductible
SERVICES	Durable medical equipment	Applicable coinsurance after deductible^	20% or more after deductible	$75 copay	40% or more after deductible
SERVICES	Emergency room	$250 copay/visit or more after deductible		$250 copay/visit after deductible	
SERVICES	Ambulance	$100 copay/occurrence or more after deductible		$200 copay/occurrence after deductible	
Rx	Rx drug: Retail ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	Greater of (after Rx deductible): ▪ $7 copay/20% coinsurance ▪ $15 copay/25% coinsurance ▪ $30 copay/50% coinsurance	Greater of (after Rx deductible): $30 copay or 50% network costs after annual deductible****	Greater of (after Rx deductible): ▪ $7 copay/20% coinsurance ▪ $15 copay/25% coinsurance ▪ $30 copay/50% coinsurance	Greater of (after Rx deductible): $30 copay or 50% network costs after annual deductible****
Rx	Rx drug: Mail*** ▪ Formulary generic ▪ Formulary brand ▪ Non-formulary brand	Greater of: ▪ $15 copay/20% coinsurance ▪ $30 copay/25% coinsurance ▪ $60 copay/50% coinsurance	Greater of: $30 copay or 50% network costs after annual deductible****	Greater of: ▪ $15 copay/20% coinsurance ▪ $30 copay/25% coinsurance ▪ $60 copay/50% coinsurance	Greater of: $30 copay or 50% network costs after annual deductible****
OUT-OF-POCKET **	Medical limit	$3,500/self $7,000/family*	$10,500 or more /self $21,000 or more /family*	$3,500/self; $7,000/family*	$10,500 or more/self; $21,000 or more/family*
OUT-OF-POCKET **	Rx limit	$4,650/self coverage $9,300family* coverage		$5,050/self; $10,100/family*	

^**2020 in-network coinsurance-** *Rolla:* 0%; *Columbia and St. Louis:* 10%; **2021 in-network coinsurance-** *Rolla:* 10% after deductible; *Columbia and St. Louis:* 20% after deductible.
*Considerations for "self" and "family" are different for the Healthy Savings Plan than for the Custom Network and PPO Plans. See the glossary (umurl.us/glossary) for details.
**Refer to the Summary Plan Description (SPD) for additional details on allowable and eligible expenses when using an out-of-network provider.
***90-day fill/refill at Mizzou pharmacies at same cost as mail order
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****Member will be required to pay the difference between non-participating pharmacy and participating pharmacy charge.

APPENDIX B – PREMIUM COMPARISON

	2020 Monthly Premiums			2021 Monthly Premiums			Cost Difference		
	Employee Premium	Employer Contribution	Total	Employee Premium	Employer Contribution	Total	Employee $ difference over 2020	Employer $ difference over 2020	Combined difference over 2020
PPO									
Self	$171	$657	$828	$176	$589	$765	$5	-$68	-$63
Self + Sp	$411	$1,325	$1,736	$417	$1,220	$1,637	$6	-$105	-$99
Self + Ch	$366	$1,204	$1,570	$374	$1,152	$1,526	$8	-$52	-$44
Family	$629	$1,933	$2,562	$632	$1,848	$2,480	$3	-$85	-$82
Custom Network Plan									
Self	$83	$487	$570	$84	$461	$545	$1	-$26	-$25
Self + Sp	$231	$966	$1,197	$232	$934	$1,166	$1	-$32	-$31
Self + Ch	$200	$880	$1,080	$203	$884	$1,087	$3	$4	$7
Family	$365	$1,403	$1,768	$366	$1,401	$1,767	$1	-$2	-$1
Healthy Savings Plan									
Self	$44	$445	$489	$58	$385	$443	$14	-$60	-$46
Self + Sp	$154	$873	$1,027	$160	$788	$948	$6	-$85	-$79
Self + Ch	$129	$798	$927	$133	$751	$884	$4	-$47	-$43
Family	$254	$1,263	$1,517	$258	$1,179	$1,437	$4	-$84	-$80
Retiree Pre-65 Health Plan									
Self	Varies	Varies	$659	Varies	Varies	$725	Varies	Varies	$66
Self + Sp	Varies	Varies	$1,383	Varies	Varies	$1,552	Varies	Varies	$169
Self + Ch	Varies	Varies	$1,252	Varies	Varies	$1,450	Varies	Varies	$198
Family	Varies	Varies	$2,042	Varies	Varies	$2,349	Varies	Varies	$307
Retiree Pre-65 Healthy Savings Plan									
Self	Varies	Varies	$511	Varies	Varies	$562	Varies	Varies	$51
Self + Sp	Varies	Varies	$1,073	Varies	Varies	$1,203	Varies	Varies	$130
Self + Ch	Varies	Varies	$971	Varies	Varies	$1,124	Varies	Varies	$153
Family	Varies	Varies	$1,584	Varies	Varies	$1,821	Varies	Varies	$237

APPENDIX C– BENEFITS AND RETIREMENT ROADMAP

Health Plan Roadmap

	2022	2023	2024
Health Plan Design & Network	Increased risk sharing and evaluate options to expand programming with MUHC Continue UM/MUHC work groups and governance structure Phase I of CNP-like plans for other campuses Explore enhanced network solutions to improve participant health and manage costs Explore requirements for provider cost transparency Conduct analysis of decreasing remaining UM implicit subsidy for pre-65 health coverage	Implement new shared programming with MUHC, including 340b pricing for Specialty Rx Extend or renegotiate CNP agreements Continue to evaluate and implement, as appropriate, enhanced solutions improve participant health and manage costs Fully funded pre-65 member premiums effective Ensure compliance with required provider cost transparency	Increase risk sharing and evaluate / expand programming with MUHC Extend or renegotiate CNP agreements Continue to evaluate and implement, as appropriate, enhanced solutions improve participant health and manage costs Continue to evaluate pre-65 options Evaluate Provider cost and quality transparency tools
Other Projects	Conduct and implement any changes from Dental/Vision RFP Evaluate simplified retiree premium structure Evaluate voluntary benefit plan programs Annual plan benchmarking with recommendations	Implement voluntary benefit programs Communicate simplified retiree premium structure FMLA / LTD / Life vendor RFP Evaluate overall effectiveness and Member experience of the Health Plan Annual plan benchmarking with recommendations	Continue to evaluate and implement voluntary plan offerings Implement simplified retiree premium structure Implement any changes to FMLA/LTD / Life vendor changes Annual plan benchmarking with recommendations

Retirement Roadmap

	2022	2023	2024
Plan Design & Investment Platform	Implement identified initiatives to align retirement plan cost, contribution, and benefit value Continue to evaluate impact of DB plan levers Continue DB discount rate actions Develop funding policy for unfunded DB liability Develop strategy and timeline for liability reduction measures	Continue to implement identified initiatives to align retirement plan cost, contribution, and benefit value Continue to evaluate impact of DB plan levers Monitor impact of DB discount rate actions Implement funding policy for unfunded DB liability Continue to strategy for liability reduction measures	Explore market trends such as phased retirement programs Explore long term de-risk strategies Monitor impact of funding policy for unfunded DB liability Complete actions for liability reduction measures
Administration	Outsource additional pension administration tasks to co-source partner Annual plan benchmarking with recommendations Evaluate automating pension option elections Automate Notice of Intent to Retire submission process	Achieve optimal balance for co-sourced/outsourced pension administration Annual plan benchmarking with recommendations Implement automation of pension option elections Implement Notice of Intent to Retire submission process	Review of Fidelity contract and terms Plan Administrator fee review Annual plan benchmarking with recommendations Perform compliance evaluation of transactional processes

Other Programs

	2022	2023	2024
Leave Programs	Socialize Committee recommendations Seek BOC approval for changes Determine impact for current employees Develop robust communication strategy	Conduct RFPs to select vendors (if applicable) System development and configuration Deliver training and education	Implement program changes for future and current employees
Employee Wellbeing	Plan and implement activities for Total Wellbeing initiative	Launch new program design and communication campaign	Evaluate overall effectiveness of redesign and identify new opportunities
Compensation	Assess benchmark jobs and refresh salary structure as appropriate Simplify Personnel Compensation Questionnaire (PCQ) Conduct compensation training with HR Service Partners	Complete full market review of benchmark jobs and recommend changes as appropriate	Continued implementation based on market changes
Continuous Improvement	Benchmark, evaluate and operationalize continuous improvement	Benchmark, evaluate and operationalize continuous improvement	Benchmark, evaluate and operationalize continuous improvement
Engagement	Evaluate engagement results from Annual Benefit Enrollment, Wellbeing Programming and Retirement participation	Conduct an Employee Preference Survey for benefits and retirement, to be used for next 3-5 years planning efforts	Communicate preferences and align program changes

APPENDIX D – Annual Retirement, Disability, and Death Benefit Plan Actuarial Valuation (as of October 1, 2021)

University of Missouri Retirement, Disability, and Death Benefit Plan

Actuarial Valuation and Review as of October 1, 2021

This report has been prepared at the request of the Board of Trustees to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Curators and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

Segal

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April 4, 2022

Board of Curators
University of Missouri
Columbia, MO 65211

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of October 1, 2021. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for the University's fiscal year July 1, 2022 – June 30, 2023.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement Plan. The census information and financial information on which our calculations were based was prepared by the staff of the University. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of Joshua Kaplan. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate, except as noted in *Section 4*. Further, in my opinion, the assumptions as approved by the Board of Curators are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,
Segal

Joshua Kaplan, FSA, FCA, MAAA, EA
Vice President and Actuary

Table of Contents

Section 1: Actuarial Valuation Summary

Purpose and basis

This report was prepared by Segal to present a valuation of the Plan as of October 1, 2021. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the Plan's benefit obligations. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board of Curators;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of September 30, 2021, provided by the University;
- The assets of the Plan as of September 30, 2021, provided by the University;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the University.

Certain disclosure information required by GASB Statements No 67 and 68 for a June 30, 2021 measurement date for the Plan is provided in a separate report.

Valuation highlights

1. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. Both the prior funding policy and most recent funding policy adopted by the University meet this standard.
2. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 79.9%, compared to the prior year funded ratio of 81.2%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 88.4%, compared to 79.2% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of the Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.
3. The Actuarially Determined Contribution (ADC) for the year beginning July 1, 2022 is $137.3 million, an increase of $14.1 million from last year. As a percentage of payroll the employer contribution rate is 14.93% for Level 1 members and 11.40% for Level 2 members (13.39% of total payroll) and is based on the newly adopted funding policy adopted by the University which includes level amortizations of the total plan liability as of October 1, 2021 and impact of the assumption changes over 20 years. The impact of the change in funding policy from a 22-year level dollar amortization of the unfunded accrued actuarial liability was an increase in the ADC of 0.39% of payroll.
4. The rate of return on the market value of assets was 24.8% for the October 1, 2020 to September 30, 2021 Plan Year. The return on the actuarial value of assets was 10.1% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial gain when measured against the assumed rate of return of 7.2% for the prior year. Given the low fixed income interest rate environment, target asset allocation and expectations of future investment returns for various classes, we advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments of 7.00%.
5. The following actuarial assumptions were changed with this valuation, following the completion of an experience study:
    - Net investment return
    - Pre and post-retirement mortality including allowance for future mortality improvement
    - Rates of retirement, severance of employment, and disability
    - Salary progression rates
    - Load for summer employment

   The total impact of the assumption changes was an increase in the ADC of 1.94% of payroll.

6. It is important to note that this actuarial valuation is based on plan assets as of September 30, 2021. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the plan year. Segal is available to prepare projections of potential outcomes upon request.
7. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition, but have included a brief discussion of some risks that may affect the Plan in *Section 2*. A more detailed assessment would provide the Board with a better understanding of the inherent risks. This could be important because relatively small changes in investment performance can produce large swings in the unfunded liabilities.

Summary of key valuation results

		2021	2020
Contributions for July 1 of the following year	• Actuarially determined employer contributions	$137,335,209	$123,154,852
	• Level 1 employer ADC as a percent of payroll	14.93%	12.66%
	• Level 2 employer ADC as a percent of payroll	11.40%	9.11%
	• Total blended employer ADC as a percent of payroll	13.39%	11.03%
Actuarial accrued liability for plan year beginning October 1:	• Retired members and beneficiaries	$2,634,671,676	$2,464,999,874
	• Inactive vested members	385,529,175	315,623,390
	• Active members	2,123,396,578	2,000,095,603
	• Inactive members due a refund of employee contributions	11,845,765	6,809,795
	• Total	5,155,443,194	4,787,528,662
	• Normal cost for plan year beginning October 1	56,435,663	59,384,615
Assets for plan year beginning October 1:	• Market value of assets (MVA)	$4,557,157,578	$3,792,152,115
	• Actuarial value of assets (AVA)	4,118,886,076	3,888,025,088
	• Actuarial value of assets as a percentage of market value of assets	90.38%	102.53%
Funded status for plan year beginning October 1:	• Unfunded actuarial accrued liability on market value of assets	$598,285,616	$995,376,547
	• Funded percentage on MVA basis	88.40%	79.21%
	• Unfunded accrued liability on actuarial value of assets	$1,036,557,118	$899,503,574
	• Funded percentage on AVA basis	79.89%	81.21%
Key assumptions	• Net investment return	7.00%	7.20%
	• Inflation rate	2.20%	2.20%
Demographic data for plan year beginning October 1:	• Number of retired members and beneficiaries	11,479	11,015
	• Number of inactive vested members[1]	6,098	5,417
	• Number of inactive members due a refund of employee contributions	11,095	10,689
	• Number of active Level 1 members	7,035	7,852
	• Number of active Level 2 members	6,374	8,031
	• Average salary for Level 1 members	$82,144	$77,026
	• Total payroll for Level 1 members	$577,882,493	$604,806,300
	• Average salary for Level 2 members	$70,248	$62,668
	• Total payroll for Level 2 members	$447,761,888	$511,316,498

[1] Includes participants on long term disability who are continuing to accrue service

Section 1: Actuarial Valuation Summary

Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast — the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.
Models	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Deterministic cost projections are based on a proprietary forecasting model. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the University. Segal is not responsible for the use or misuse of its report, particularly by any other party.
An actuarial valuation is a measurement of the Plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the Plan will be determined by the actual benefits and expenses paid and the actual investment experience of the Plan.
Actuarial results in this report are not rounded, but that does not imply precision.
If the University is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the Plan's provisions, but they may be subject to alternative interpretations. The University should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

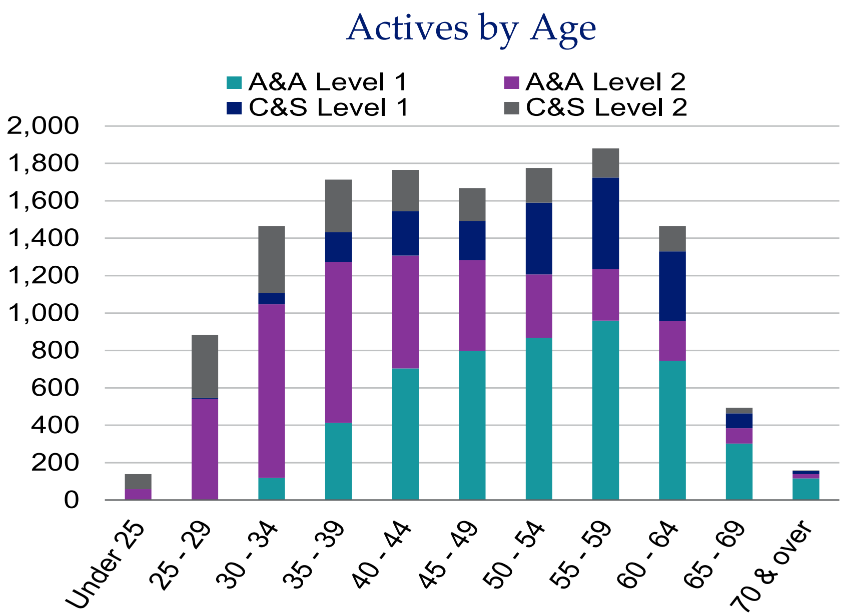
Section 2: Actuarial Valuation Results

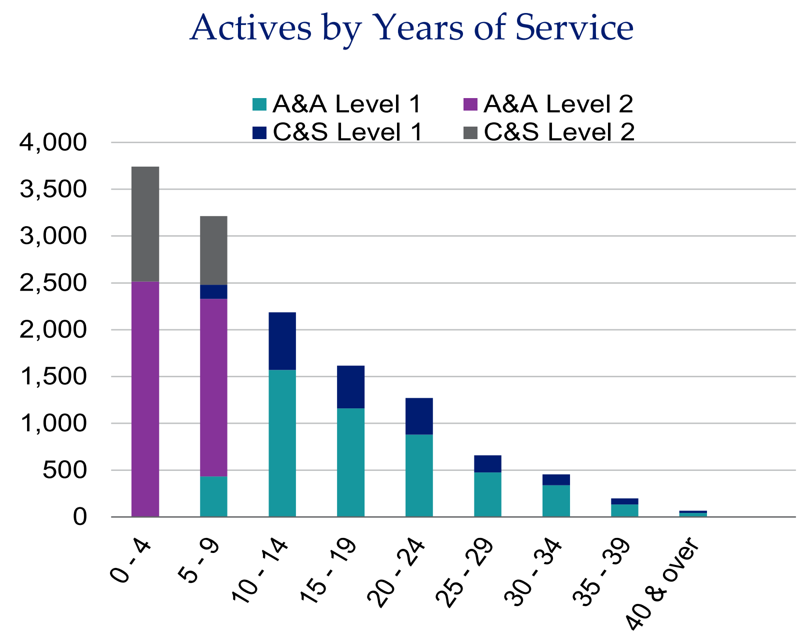
Active members

As of September 30,	2020	2021	Change
Active participants	15,883	13,409	-15.6%
Average age	45.6	47.1	1.5
Average years of service	10.6	12.0	1.4
Average compensation	$70,272	$76,489	8.8%

As of September 30, 2021, 70.3% of the active population is Academic and Administrative (A&A) and 29.7% is Clerical and Service (C&S). This compares to 68.1% and 31.9%, respectively, in the prior valuation.

Distribution of Active Members as of September 30, 2021





Inactive members

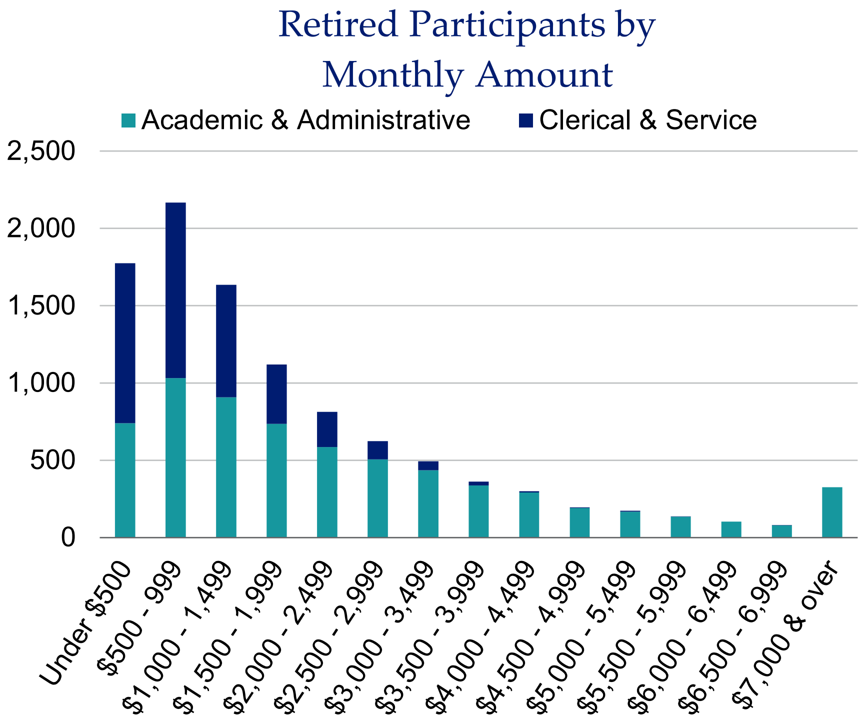
In this year's valuation, there were 6,098 members with a vested right to a deferred or immediate vested benefit. This includes members who are inactive due to long-term disability but who continue to accrue service. Of the 6,098 inactive vested members, 4,294 are Academic and Administrative and 1,804 are Clerical and Service.

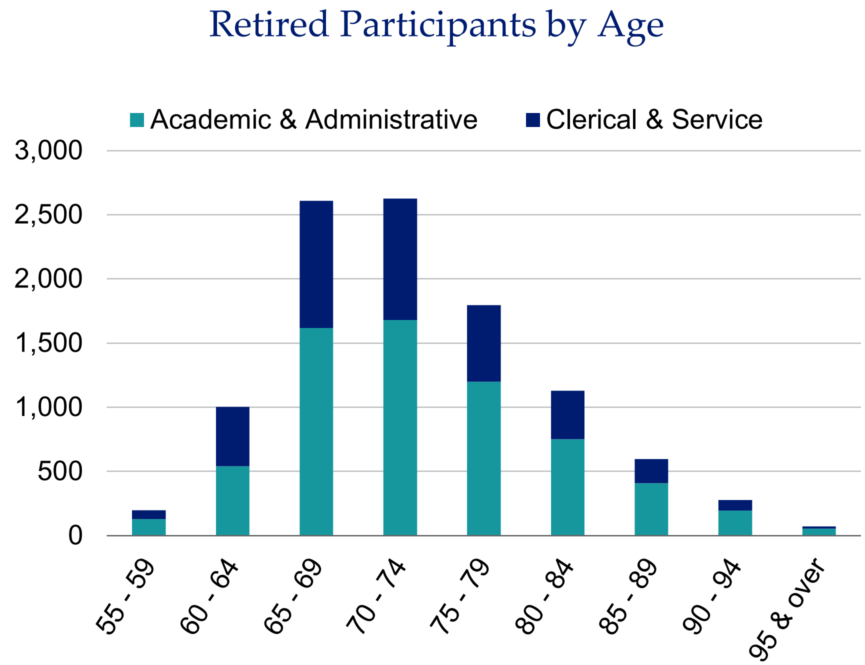
In addition, there were 11,095 members entitled to a return of their employee contributions.

Retired members and beneficiaries

As of September 30,	2020	2021	Change
Retirees	10,034	10,370	3.3%
Average age	73.0	73.0	0.0
Average amount for A&A	$2,537	$2,542	0.2%
Average amount for C&S	$1,025	$1,048	2.2%
Beneficiaries	1,000	1,109	10.9%
Total monthly amount	$21,175,811	$22,257,283	5.1%

Distribution of Retired Participants as of September 30, 2021





Financial information

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board of Curators has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Determination of Actuarial Value of Assets for Year Ended September 30, 2021

1	Market value of assets, September 30, 2021					$4,557,157,578
2	Calculation of unrecognized return		**Original Amount[1]**	**Percent Deferred[2]**	**Unrecognized Amount[3]**	
	(a)	Year ended September 30, 2021	$652,396,599	80%	$521,917,279	
	(b)	Year ended September 30, 2020	-71,077,937	60%	-42,646,761	
	(c)	Year ended September 30, 2019	-94,989,646	40%	-37,995,858	
	(d)	Year ended September 30, 2018	-15,015,791	20%	-3,003,158	
	(e)	Year ended September 30, 2017	119,947,402	0%	0	
	(k)	Total unrecognized return				$438,271,502
3	Preliminary actuarial value: **(1) - (2k)**					4,118,886,076
4	Adjustment to be within 30% corridor					0
5	Final actuarial value of assets as of September 30, 2021: **(3) + (4)**					4,118,886,076
6	Actuarial value as a percentage of market value: **(5) ÷ (1)**					90.4%
7	Amount deferred for future recognition: **(1) - (5)**					$438,271,502

[1] Total return minus expected return on a market value basis
[2] Percent deferred applies to the current valuation year
[3] Recognition at 20% per year over five years

Actuarial experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), any contribution requirement will decrease from the previous year. On the other hand, any contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience. If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

Actuarial Experience for Year Ended September 30, 2021

1	Net gain/(loss) from investments[1]	$111,349,270
2	Net gain/(loss) from salary	-27,043,627
3	Net gain/(loss) from other experience	1,388,974
4	Net experience gain/(loss): **1 + 2 + 3**	$85,694,617

[1] Details on next page

Investment experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the market value of assets was 24.76% for the year ended September 30, 2021.

For valuation purposes, the assumed rate of return on the actuarial value of assets for the year ended September 30, 2021 was 7.20%. The actual rate of return on an actuarial basis for the 2021 Plan Year was 10.12%. Since the actual return for the year was greater than the assumed return, the Plan experienced an actuarial gain during the year ended September 30, 2021 with regard to its investments.

Investment Experience

		Year Ended September 30, 2021	
		Market Value	**Actuarial Value**
1	Net investment income	$919,856,900	$385,712,425
2	Average value of assets	3,714,726,397	3,810,599,370
3	Rate of return: **1 ÷ 2**	24.76%	10.12%
4	Assumed rate of return for prior plan year	7.20%	7.20%
5	Expected investment income: **2 x 4**	267,460,301	274,363,155
6	Actuarial gain/(loss): **1 - 5**	$652,396,599	$111,349,270

Non-investment experience

Retirement experience

- During the year ended September 30, 2021, the number of retirements for both academic and administrative employees and clerical and service employees was greater than projected.

Salary experience

- Between the 2020 and 2021 actuarial valuations, the average salary increased by 5.8% for academic and administrative employees and increased by 7.0% for clerical and service employees. These patterns were greater than assumed producing an actuarial loss of $27.0 million.

Other experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among members,
- mortality experience (more or fewer deaths than expected), and
- the number of newly disabled members (more or fewer than projected)

Actuarial assumptions

This report reflects all recommended assumption changes from Segal's Experience Study for the period October 1, 2016 – September 30, 2020. These changes increased the total ADC as a percent of payroll by 1.94%.

Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan provisions

There were no changes in plan provisions since the prior valuation.

A summary of plan provisions is in *Section 4, Exhibit II*.

Section 2: Actuarial Valuation Results

Development of Unfunded Actuarial Accrued Liability for Year Ended September 30, 2021

1	Unfunded actuarial accrued liability at beginning of year			$899,503,574
2	Normal cost at beginning of year			57,201,244
3	Total contributions for year			-130,155,463
4	Interest on 1, 2 & 3			64,641,531
5	Expected unfunded actuarial accrued liability			$891,190,886
6	Changes due to:			
	(a)	Actuarial investment gain	-$111,349,270	
	(b)	Salary increases greater than expected	27,043,627	
	(c)	Other gain/loss	-1,388,973	
	(d)	Assumption changes	231,060,848	
	Total changes			$145,366,232
7	Unfunded actuarial accrued liability at end of year			$1,036,557,118

Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of October 1, 2021, the actuarially determined contribution is $137,335,209, or 13.39% of payroll in aggregate, or 14.93% for Level 1 members and 11.40% for Level 2 members.

The methodology used to calculate the actuarially determined contribution has been revised with this valuation from a closed amortization period of 30 years as of October 1, 2013 (22 remaining as of October 1, 2021) to a method that separately amortizes the initial unfunded liability as of October 1, 2021 over 20 years, the impact of the assumption changes over 20 years, and future experience gains and losses over 25 and 15 years, respectively. See Section 3, Exhibit G for a schedule of amortization bases established under this methodology.

Note that the Plan uses a level dollar amortization schedule. Since the Plan is closed to new entrants and the active population and payroll are declining, the percent of payroll contribution rates reported herein as of October 1, 2021 may amortize the unfunded liability slower than the scheduled period when applied to the reduced payroll in the period July 1, 2022 – June 30, 2023. Note that payroll only applies to those actives who are members in this Plan.

The contribution requirement as of October 1, 2021 is based on the data previously described, the actuarial assumptions and plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Actuarially Determined Contribution for Year Beginning October 1

Contribution Requirements	2021			2020		
	Total Plan	Level One % of Projected Payroll	Level Two % of Projected Payroll	Total Plan	Level One % of Projected Payroll	Level Two % of Projected Payroll
1. Normal cost	$56,435,663	7.08%	3.47%	$59,384,616	6.99%	3.35%
2. Amortization of unfunded liability[1]	94,838,030	9.25%	9.25%	78,604,764	7.04%	7.04%
3. Expected employee contribution	-13,938,601	-1.39%	-1.32%	-14,834,581	-1.37%	-1.28%
4. Net employer contribution	$137,335,092	14.93%	11.40%	$123,154,799	12.66%	9.11%

[1] Methodology varies for each year as explained above.

Reconciliation of actuarially determined contribution

The chart below details the changes in the actuarially determined contribution from the prior valuation to the current year's valuation.

Reconciliation of Actuarially Determined Contribution from October 1, 2020 to October 1, 2021

		Amount	% of Payroll
1	Actuarially Determined Contribution as of October 1, 2020	$137,989,434	12.36%
2	Effect of salary loss	3,553,292	0.32%
3	Effect of investment (gain)/loss	-9,911,184	-0.89%
4	Net effect of other gains and losses on accrued liability	-123,632	-0.01%
5	Net effect of other changes, including composition and number of members	-4,170,644	-.0.37%
6	Effect of assumption changes	19,929,978	1.79%
7	Effect of change in funding policy	4,005,957	0.36%
8	Total change	$13,283,767	1.57%
9	Total change in percentage due to compensation change	N/A	0.82%
10	Actuarially Determined Contribution as of October 1, 2021	$151,273,811	14.75%

Schedule of funding progress through September 30, 2021

Actuarial Valuation Date	Unfunded AAL (UAAL)	Funded Ratio MVA	Funded Ratio AVA	UAAL as a Percentage of Covered Payroll
10/01/2012	518,344,622	84.3%	84.3%	49.6%
10/01/2013	512,470,418	88.1%	85.2%	47.5%
10/01/2014	476,427,007	89.2%	86.9%	42.9%
10/01/2015	474,031,119	82.6%	87.4%	42.0%
10/01/2016	459,286,212	84.9%	88.2%	40.1%
10/01/2017	738,711,563	82.9%	82.9%	64.4%
10/01/2018	798,247,042	82.5%	82.1%	67.2%
10/01/2019	904,627,693	80.0%	80.6%	73.7%
10/01/2020	899,503,574	79.2%	81.2%	80.6%
10/01/2021	1,036,557,118	88.4%	79.9%	101.1%

History of ADC rates

A history of the most recent years of contributions is shown below.

History of Actuarially Determined Contributions: 2017 – 2021
Level One

Plan Year Beginning October 1	Normal Cost Percentage	Amortization Percentage	Total Contribution Rate	Employee Contribution Rate	Net Contribution Rate
2017	7.12%	5.37%	12.50%	1.34%	11.16%
2018	7.07%	5.69%	12.76%	1.36%	11.40%
2019	7.04%	6.33%	13.38%	1.37%	12.01%
2020	6.99%	7.04%	14.03%	1.37%	12.66%
2021	7.08%	9.25%	16.33%	1.39%	14.93%

History of Actuarially Determined Contributions: 2017 – 2021
Level Two[1]

Plan Year Beginning October 1	Normal Cost Percentage	Amortization Percentage	Total Contribution Rate	Employee Contribution Rate	Net Contribution Rate
2017	3.32%	5.37%	8.69%	1.23%	7.46%
2018	3.32%	5.69%	9.01%	1.25%	7.76%
2019	3.34%	6.33%	9.68%	1.27%	8.41%
2020	3.35%	7.04%	10.39%	1.28%	9.11%
2021	3.47%	9.25%	12.71%	1.32%	11.40%

[1] Does not include contributions to the defined contribution plan for Level Two employees. The blended contribution rates shown are based on the total employee population and salaries as of the valuation date.

Section 2: Actuarial Valuation Results

History of Actuarially Determined Contributions: 2017 – 2021
Blended Level One and Level Two[1]

Plan Year Beginning October 1	Net Contribution Rate[1]
2017	9.83%
2018	9.87%
2019	10.29%
2020	11.03%
2021	13.39%

[1] Does not include contributions to the defined contribution plan for Level Two employees. The blended contribution rates shown are based on the total employee population and salaries as of the valuation date.

Risk

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Plan. We recommend a more detailed assessment to provide the University with a better understanding of the risks inherent in the Plan. This assessment may include scenario testing, sensitivity testing, stress testing, and stochastic modeling.

- Investment Risk (the risk that returns will be different than expected)

  Since the Plan's assets are much larger than contributions, investment performance may create volatility in contribution requirements. For example, for each 1% difference in return from the assumed market return, the actuarially determined contribution would increase or decrease by approximately $4.9 million (0.5% of payroll) once fully recognized in the actuarial value of assets.

  The market value rate of return over the last 10 years has ranged from a low of -1.86% to a high of 24.76%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

  The Plan's funding policy requires payment of the actuarially determined contribution. As long as this policy is adhered to, contribution risk is negligible. Note, however, that the ADC as a percent of payroll shown in this report needs to be adjusted for the declining payroll base due to the plan closure. Simply paying the ADC percents shown in this report will create a small contribution risk.

- Demographic Risk (the risk that participant experience will be different than assumed)

  Examples of this risk include:

  – Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.

  – More or less active participant turnover than assumed.

  – Salary increases more or less than expected

Section 2: Actuarial Valuation Results

- Actual Experience Over the Last 10 years and Implications for the Future

  Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

  – The funded percentage on the actuarial value of assets has ranged from a low of 80.6% to a high of 88.4% since 2012.

- Maturity Measures

  As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

  Currently the Plan has a non-active to active participant ratio of 1.31. For the prior year benefits paid were $154,851,437 more than contributions received. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

Section 3: Supplemental Information

Exhibit A: Table of Plan Demographics

Active Members

Category	Year Ended September 30 2021	Year Ended September 30 2020	Change From Prior Year
Level One Academic & Administrative Members:			
• Number	5,023	5,493	-8.6%
• Average age	52.5	51.8	0.7
• Average years of service	18.5	17.6	0.9
• Average salary	$97,121	$92,040	5.5%
• Total payroll	$487,838,675	$505,573,964	-3.5%
Level One Clerical & Service Members:			
• Number	2,012	2,359	-14.7%
• Average age	52.8	52.2	0.6
• Average years of service	18.9	17.8	1.1
• Average salary	$44,753	$42,065	6.4%
• Total payroll	$90,043,818	$99,232,336	-9.3%
Level Two Academic & Administrative Members:			
• Number	4,409	5,323	-17.2%
• Average age	41.2	39.8	1.4
• Average years of service	4.8	3.7	1.1
• Average salary	$83,996	$77,905	7.8%
• Total payroll	$370,337,868	$414,685,878	-10.7%
Level Two Clerical & Service Members:			
• Number	1,965	2,708	-27.4%
• Average age	41.0	38.8	2.2
• Average years of service	4.6	3.5	1.1
• Average salary	$39,402	$35,683	10.4%
• Total payroll	$77,424,020	$96,630,620	-19.9%

Section 3: Supplemental Information

Non-Active Members

Category	Year Ended September 30 2021	2020	Change From Prior Year
Inactive vested members[1]	6,098	5,417	12.6%
Inactive members due a refund of employee contributions	11,095	10,689	3.8%
Retired members:			
• Number in pay status	10,370	10,034	3.3%
• Average age	73.0	73.0	0.0
• Average monthly benefit	$1,996	$1,973	1.2%
Beneficiaries:			
• Number in pay status	1,109	1,000	10.9%
• Average age	78.0	76.3	1.7
• Average monthly benefit	$1,406	$1,378	2.0%

[1] Includes participants on long term disability who are continuing to accrue service

Exhibit B: Members in Active Service as of September 30, 2021 by Age and Years of Service

Academic & Administrative, Level One

Age	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 and over
		Years of Service								
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	1	- -	1	- -	- -	- -	- -	- -	- -	- -
30 - 34	119	3	41	75	- -	- -	- -	- -	- -	- -
35 - 39	413	4	83	269	54	3	- -	- -	- -	- -
40 - 44	704	9	103	331	217	44	- -	- -	- -	- -
45 - 49	797	7	67	296	227	158	41	1	- -	- -
50 - 54	868	6	34	233	233	202	118	38	4	- -
55 - 59	959	4	27	210	210	250	152	122	37	1
60 - 64	744	3	23	136	136	154	121	118	54	5
65 - 69	302	- -	15	65	65	52	35	36	23	15
70 & over	116	- -	4	15	15	16	6	23	15	20
Total	5,023	36	398	1,568	1,157	879	473	338	133	41

Academic & Administrative, Level Two

Age	Total	Years of Service 0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 and over
Under 25	59	59	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	540	449	91	- -	- -	- -	- -	- -	- -	- -
30 - 34	927	563	364	- -	- -	- -	- -	- -	- -	- -
35 - 39	861	460	401	- -	- -	- -	- -	- -	- -	- -
40 - 44	604	299	305	- -	- -	- -	- -	- -	- -	- -
45 - 49	485	252	233	- -	- -	- -	- -	- -	- -	- -
50 - 54	339	167	172	- -	- -	- -	- -	- -	- -	- -
55 - 59	275	122	153	- -	- -	- -	- -	- -	- -	- -
60 - 64	213	96	117	- -	- -	- -	- -	- -	- -	- -
65 - 69	83	37	46	- -	- -	- -	- -	- -	- -	- -
70 & over	23	9	14	- -	- -	- -	- -	- -	- -	- -
Total	4,409	2,513	1,551	- -	- -	- -	- -	- -	- -	- -

Clerical & Service, Level One

Age	Total	Years of Service 0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 and over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	4	- -	- -	4	- -	- -	- -	- -	- -	- -
30 - 34	62	- -	22	39	1	- -	- -	- -	- -	- -
35 - 39	158	4	22	100	30	2	- -	- -	- -	- -
40 - 44	236	2	19	105	78	30	2	- -	- -	- -
45 - 49	210	3	16	57	66	51	17	- -	- -	- -
50 - 54	384	3	15	98	90	96	50	30	2	- -
55 - 59	491	2	24	95	83	117	69	59	35	7
60 - 64	372	- -	13	89	93	76	39	21	25	16
65 - 69	79	- -	5	28	15	15	8	3	2	3
70 & over	16	- -	- -	3	4	4	1	3	- -	1
Total	2,012	14	136	618	460	391	186	116	64	27

Clerical & Service, Level Two

Age	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 and over
		Years of Service								
Under 25	81	78	3	- -	- -	- -	- -	- -	- -	- -
25 - 29	337	261	76	- -	- -	- -	- -	- -	- -	- -
30 - 34	357	212	145	- -	- -	- -	- -	- -	- -	- -
35 - 39	282	172	110	- -	- -	- -	- -	- -	- -	- -
40 - 44	222	140	82	- -	- -	- -	- -	- -	- -	- -
45 - 49	176	93	83	- -	- -	- -	- -	- -	- -	- -
50 - 54	184	103	81	- -	- -	- -	- -	- -	- -	- -
55 - 59	155	88	67	- -	- -	- -	- -	- -	- -	- -
60 - 64	137	65	72	- -	- -	- -	- -	- -	- -	- -
65 - 69	30	16	14	- -	- -	- -	- -	- -	- -	- -
70 & over	4	2	2	- -	- -	- -	- -	- -	- -	- -
Total	1,965	1,230	735	- -	- -	- -	- -	- -	- -	- -

Exhibit C: Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended September 30, 2021		Year Ended September 30, 2020	
Net assets at market value at the beginning of the year		$3,792,152,115		$3,735,404,966
Contribution income:				
• Employer contributions	$115,319,994		$118,574,158	
• Employee contributions	14,835,469		16,304,444	
Total contribution income		*$130,155,463*		*$134,878,602*
Investment income:				
• Interest, dividends and other income	-$1,723,698		$40,905,523	
• Net gain/(loss) from sales of investments	550,049,508		88,406,352	
• Unrealized appreciation/(depreciation)	387,828,924		63,850,961	
• Expenses	-16,297,834		-195,541	
Net investment income		*$919,856,900*		*$192,967,295*
Total income available for benefits		**$1,050,012,363**		**$327,845,897**
Less disbursements:				
• Benefit payments	-$285,006,900		-$271,098,748	
Net benefit payments		*-$285,006,900*		*-$271,098,748*
Change in reserve for future benefits		**$765,005,463**		**$56,747,149**
Net assets at market value at the end of the year		**$4,557,157,578**		**$3,792,152,115**

Exhibit D: Table of Amortization Bases

Type	Date Established	Initial Period	Initial Amount	Annual Payment[1]	Years Remaining	Outstanding Balance
Initial Unfunded Liability	10/01/2021	20	$805,496,269	$71,059,018	20	$805,496,269
Change in Assumptions	10/01/2021	20	231,060,849	20,383,654	20	231,060,849
Total				**$91,442,672**[1]		**$1,036,557,118**

[1] This value is adjusted for timing when determining the ADC

Exhibit E: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Retirees and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing retirees and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.
Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The

	Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.
Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Plan is calculated, including: Investment return - the rate of investment yield that the Plan will earn over the long-term future; Mortality rates - the rate or probability of death at a given age for employees and retirees; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates - the rate or probability of disability retirement at a given age;

	Withdrawal rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.

Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Valuation/Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Section 4: Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions and Actuarial Cost Method

Rationale for Assumptions	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study for 2016–2020. The recommended assumption changes detailed in the referenced study were reviewed and adopted by the Board of Curators, in effect directing Segal to utilize those recommended assumptions to complete this actuarial valuation. Current data is reviewed in conjunction with each annual valuation and we have no reason to doubt the appropriateness of those mandated assumptions.
Net Investment Return:	7.00%

Salary Increases:

Age	Academic & Administrative Rate (%)	Clerical & Service Rate (%)
25	6.0	3.1
30	3.6	2.2
35	2.6	1.8
40	2.1	1.4
45	1.8	1.0
50	1.4	0.7
55	0.8	0.5
60	0.3	0.2

The salary increases shown above exclude assumed inflation of 2.20%.

Mortality Rates:

Academic & Administrative Members:

Healthy: Pub-2010 Teacher Healthy Annuitant Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Disabled: Pub-2010 Non-Safety Disabled Annuitant Mortality Table, weighted 95% for males and females, with generational projection using Scale MP-2020

Non-Annuitant: Pub-2010 Teacher Employee Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Surviving Spouse: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables projected generationally with Scale MP-2020

Clerical & Service Members:

Healthy: Pub-2010 General Healthy Annuitant Mortality Table, weighted 124% for males and 112% for females with generational projection using Scale MP-2020

Disabled: Pub-2010 Non-Safety Disabled Annuitant Mortality Table, weighted 95% for males and females, with generational projection using Scale MP-2020

Non-Annuitant: Pub-2010 General Employee Mortality Table, weighted 124% for males and 112% for females, with generational projection using Scale MP-2020

Surviving Spouse: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables projected generationally with Scale MP-2020

Section 4: Actuarial Valuation Basis

Academic & Administrative Annuitant Mortality Rates Based on Age at Valuation Date:		**Mortality Rates**		**Expected Years of Life Remaining**	
	Age	**Male**	**Female**	**Male**	**Female**
	60	0.35%	0.31%	28.0	29.6
	70	0.95%	0.71%	18.7	20.1
	80	3.34%	2.71%	10.7	11.7
	90	11.91%	10.02%	5.2	5.7

Clerical & Service Annuitant Mortality Rates Based on Age at Valuation Date:		**Mortality Rates**		**Expected Years of Life Remaining**	
	Age	**Male**	**Female**	**Male**	**Female**
	60	0.79%	0.46%	23.9	27.5
	70	1.77%	1.06%	15.5	18.4
	80	5.40%	3.52%	8.5	10.5
	90	17.21%	12.41%	4.0	5.1

Termination Rates Before Retirement:

	Withdrawal Rate[1] (%)	
Years of Service	**Academic & Administrative**	**Clerical & Service**
0	21.5	31.0
1	21.0	23.0
2	18.5	19.5
4	15.0	13.5
6	13.0	11.5
8	11.0	11.0
10	9.0	10.0
12	7.0	8.0
14	5.0	6.0
16	5.0	5.0
18	5.0	5.0
20	4.0	5.0
22	4.0	5.0
24	4.0	5.0

[1] Withdrawal rates do not apply at or beyond early retirement or 25 years of service

Age	Disability Rates (%)
40	0.04
45	0.10
50	0.19
55	0.37
60	0.61

Retirement Rates:	

	Academic & Administrative		Clerical & Service	
Age	**Under 25 Years of Service**	**Over 25 Years of Service**	**Under 25 Years of Service**	**Over 25 Years of Service**
55	5%	8%	7%	12%
56 - 58	3	4	5	6
59	3	4	5	12
60	5	8	10	18
61	5	12	10	24
62	10	25	20	50
63 - 64	10	12	15	30
65 - 66	25	25	40	40
67 - 79	20	20	35	35
80	100	100	100	100

Weighted Average Retirement Age	Age 65 for academic & administrative members and age 62 for clerical & service members, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active members included in the October 1, 2021 actuarial valuation.
Retirement Age for Inactive Vested Participants:	65
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Percent Married:	80%
Age of Spouse:	Female spouses are on average three years younger than male spouses
Benefit Election:	All members are assumed to elect the single life form of payment.
Load for Summer Appointments:	2.20% of Academic & Administrative active member liability

Section 4: Actuarial Valuation Basis

Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each participant.
Models:	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.
Changes in Actuarial Assumptions:	This valuation reflects the recommended changes to the following assumptions as detailed in the Experience Study Report for the period 2016 – 2020: • Net investment return • Rates of severance, retirement, and disability • Load for summer employment • Salary progression trends • Mortality rates and allowance for future mortality improvement

Exhibit II: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	October 1 through September 30
Plan Status:	Closed effective October 1, 2019
Membership:	Level One Member is one who was initially hired prior to October 1, 2012. Level Two Member is one who is hired or rehired on or after October 1, 2012 (except that a Qualified Member who was initially hired prior to October 1, 2012, earned a vested benefit, terminated service after earning such vested benefit, did not receive a lump sum payment, and is rehired by the University on or after October 1, 2012 shall be a Level One Member).
Normal Retirement:	• Age Requirement: 65 • Amount: – Level One Members: Total years of service multiplied by 2.2% of compensation base – Level Two Members: Total years of service multiplied by 1.0% of compensation base • Compensation base: Average regular annual salary, excluding any incentive compensation and including any shift differential pay, of the member for the five consecutive highest salary years of employment. Salary year is September 1 through August 31. • Minimum Value Accumulation for Level One Members Only: Members shall receive an annual minimum benefit of the actuarial equivalent annuity of an account crediting 5% of each year's pay accumulated at 7.5% interest annually.
Benefit for Summer Employment:	Academic Members who receive 9-month appointment designated as summer service earn separate benefit added to normal pension. • Amount: – Level One Members: Total number of summer appointments multiplied by 2.2% of compensation base – Level Two Members: Total number of summer appointments multiplied by 1.0% of compensation base • Compensation base: Average of the 5 consecutive highest summer salaries earned during the summers worked. Summer salary may not exceed 3/9 of regular compensation (2/9 of regular compensation prior to May 1, 2011).
Early Retirement:	• Age and Service Requirement: 60 with 5 years of credited service, or 55 with 10 years of credited service, with one year of credit earned after age 54 • Amount: Normal pension reduced 3-1/3% for each year younger than age 65, or younger than age 62 with 25 years of credited service

Section 4: Actuarial Valuation Basis

Disability:	• Benefit is deferred to Normal or Early retirement age and is equal to normal pension reflecting compensation base at time of disability and years of service that member would have had if they remained in employment until actual retirement
Vesting:	• Age Requirement: 55 • Service Requirement: 5 years of credited service • Amount: Normal retirement pension reduced 6 2/3% for each of the first 5 years younger than age 65 and 3-1/3% for each of the next 5 years • Normal Retirement Age: 65
Pre-Retirement Death Benefit:	Beneficiaries of members who die in active employment will receive the greater of the following: • One times (Two times for Level One Member) base salary at time of death limited to 100 times the monthly normal retirement benefit accrued at time of death • Actuarial present value of benefit accrued as of date of death (reflecting minimum value accumulation for Level One members) • Beneficiaries of terminated vested participants will receive the lump sum member was eligible to receive at date of death with interest from date of termination to date of death.
Post-Retirement Death Benefit:	If married, pension benefits are paid in the form of a joint and survivor annuity unless this form is rejected by the participant and spouse. If not rejected, the benefit amount otherwise payable is reduced to reflect the joint and survivor coverage. If not rejected, and the spouse predeceases the employee, a pop-up annuity has been elected, the employee's benefit amount will subsequently be increased to the unreduced amount payable had the joint and survivor coverage been rejected. If rejected, or if not married, benefits are payable for the life of the employee or in any other available optional form elected by the employee in an actuarially equivalent amount.
Optional Forms of Benefits:	Employee may elect any combination of 120-month certain and life annuity, 2 or 4% annual cost-of-living increases, or 50%, 75%, or 100% joint-and-survivor annuity with pop-up. Pension will be reduced accordingly for optional benefits added to form. Employees who terminate employment prior to eligibility for normal or early pension may elect to receive actuarial equivalent value of benefit as a lump sum payment Employees who terminate employment after eligibility for normal or early pension may elect to receive 10%, 20%, or 30% of actuarial equivalent value of benefit as a lump sum payment.
Credited Service:	Credited service is the number of continuous years and fractional parts thereof between date of employment and termination. A full year's credit shall be granted for twelve months of service with proportional credit for shorter periods of service. Special provisions are made for members on nine-month appointments.
Changes in Plan Provisions:	There were no changes in plan provisions with this valuation.

Exhibit III: Contribution Rates

Member Contribution Rates	Effective July 1, 2009, members are required to contribute 1% of their salary up to $50,000 plus 2% of their salary in excess of $50,000. Contribution account balances are refunded with interest at 4% per year if the member terminates prior to becoming a Qualified Member. If the member terminates due to death prior to becoming a Qualified Member, the refund of the account balance is paid to the member's beneficiary.
Employer Contribution Rates	Equal to actuarially determined contribution

ACADEMIC, STUDENT AFFAIRS,
RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE

Todd P. Graves (Chair)
Greg E. Hoberock
Jeff L. Layman
Robin R. Wenneker

The Academic, Student Affairs, Research and Economic Development Committee ("Committee") will review and recommend polices to enhance quality and effectiveness of academic, student affairs, research and economic development and align the available resources with the University's academic mission.

I. Scope

In carrying out its responsibilities, the Committee reviews and makes recommendations to the Board of Curators on strategies and policies relating to student and faculty welfare, academic standards, educational and instructional quality, intercollegiate athletics, degree programs, economic development, research initiatives, and associated programs.

II. Executive Liaison

The Senior Associate Vice President for Academic Affairs of the University, or some other person(s) designated by the President of the University, with the concurrence of the Board Chair and the Committee Chair, shall be the executive liaison to the committee and responsible for transmitting committee recommendations.

III. Ex Officio Member

The Student Representative to the Board of Curators shall be an ex officio member of the Committee.

IV. Responsibilities

In addition to the overall responsibilities of the Committee described above and in carrying out its responsibilities, the charge of the Committee shall include reviewing and making recommendations to the Board on the following matters:

A. Selection of Curators' Distinguished Professors;
B. Approval and review of new degree programs;
C. Intercollegiate athletics, as specifically outlined in Section 270.060 of the Collected Rules and Regulations with a commitment to the academic success, and physical and social development of student-athletes;
D. Changes to university-level admissions requirements, academic standards, student services, and graduation requirements;
E. Quarterly and annual reports providing information on academic programs that have been added, deactivated, or deleted;
F. Provide oversight over the University of Missouri System's diversity, equity and inclusion programs;
G. Highlight successful research and economic development efforts and partnerships; linking research and commercialization from the University with business and industry across the state and around the world.
H. Additional matters customarily addressed by the academic, student affairs, research & economic development committee of a governing board for an institution of higher education.

Approved by the Board of Curators: Feb 4, 2021

Executive Summary
Proposal for New Collected Rule and Regulation
Section 600.090 Digital Accessibility Policy

Background:

This new policy will focus on digital accessibility and create requirements for ensuring accessibility of information technologies and digital communications.

As an institution, we must ensure that all students, faculty, and staff have equal opportunity to use technology and our online communications. Just as we ensure that everyone can access our facilities by providing features such as ramps and automatic doors, it is important that our websites, online platforms, and online courses be designed with the accessibility features necessary to be usable by the many students, faculty, staff, and visitors who rely on various types of assistive technology.

The goal of the policy is to improve the accessibility of our "digital campus" in the long term and align with a changing legal environment by proactively incorporating digital accessibility into our policies and processes. Moreover, digital accessibility aids in student retention and student success and helps ensure that we purchase high-quality and well-designed information technology products.

Policies of this type have been widely implemented amongst peer institutions. In a review of 12 peer institutions, only one did not already have a digital accessibility policy in place (the University of Kansas). The majority of peer institutions had a system-level policy like the one proposed here. Peers adopting similar policies include the University of Virginia (2006), University of Alabama (2018), University of North Carolina (2019), University of Tennessee (2017), University of Georgia (2018), University of Arkansas (2019), University of Illinois (2018), and University of Colorado (2019).

This policy will require:

1. That each University in the UM System and UM System as a whole seek to purchase, to the extent feasible, technologies that are digitally accessible.
2. That each institution promote awareness and provide educational resources to faculty, staff, and students on digital accessibility.
3. The creation of a UM System Digital Accessibility Committee to advise the President, Chancellors, and CIOs.

Policy Creation:

This policy was drafted over the last year by the Digital Accessibility Task Force, which is composed of faculty, staff, and students from all four campuses and UM System. This policy has been thoroughly vetted by the University of Missouri Intercampus Faculty Cabinet (IFC), the Intercampus Staff Advisory Council (ISAC), and the Intercampus Student Council (ISC), as well as the Office of General Counsel, Chief Information Officers, and numerous faculty, staff, and students on each campus.

No. 1

Recommended Action – Approval of New Collected Rules and Regulation 600.090, Digital Accessibility Policy

It was recommended and endorsed by President of the University of Missouri Mun Choi, recommended by the Academic, Student Affairs and Research & Economic Development Committee, moved by Curator __________, and seconded by Curator __________, that the following action be approved:

> that Section 600.090, Digital Accessibility Policy, be added to the Collected Rules and Regulations of the University of Missouri, as attached.

Roll call vote of the Committee:	YES	NO
Curator Graves		
Curator Hoberock		
Curator Layman		
Curator Wenneker		

The motion ________________.

Roll call vote of Board:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion__________________.

600.090 Digital Accessibility Policy (Proposed)

A. Definitions

1. Digital Accessibility is the ability of a website, mobile application, or electronic document to be easily navigated and understood by a wide range of users, including those users who have visual, auditory, motor, or cognitive disabilities.
2. Assistive Technology is an adaptive device or software which assists persons with disabilities with interacting with technology. Examples include magnification software, screen-reading software, captioning, and speech to text or text to speech programs.
3. Accessible Information Technology is information technology that has been designed, developed, or procured to be usable by people with disabilities, including those who use assistive technology.
4. Disability means a physical or mental impairment that substantially limits one or more of the major life activities of an individual; a record of having such an impairment; or being regarded as having such an impairment.

B. UM System's Commitment to Accessibility

1. The UM System is committed to providing and supporting information technologies and digital communications that are accessible to all users, including those with disabilities, and to meeting or exceeding the requirements of state and federal law, including the Americans with Disabilities Act and Sections 508 and 504 of the Rehabilitation Act.
2. We seek to implement information technologies that are accessible to all users, including those who use assistive technologies. An accessible IT environment enhances inclusion and usability for everyone, helping to ensure that as broad a population as possible is able to access, benefit from, and contribute to our programs and services.
3. Our core goal is to ensure that users with disabilities will have equal opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as a person without a disability in an equally effective way, with substantially equivalent ease of use.
4. Technology and communications accessibility is an institution-wide responsibility that requires commitment and involvement from leaders across all units of the University.

C. Policy

1. Scope: All communications and information technologies operated by the University, including – but not limited to -- web-based communications, software, applications and services, mobile applications, videos and

multimedia, instructional materials and online learning modules, telecommunications, computers and computing devices, digital content and files, services, and other applicable and emerging systems or technologies. This scope generally encompasses all technology products used to deliver academic programs and services, student services, information technology services, and public- facing programs and services.

2. Requirements: We will seek to deploy to the extent feasible information technologies that have been designed, developed, or procured to be accessible to all users, including those who use assistive technologies. Under this policy, all UM locations must:
3. Develop, purchase, and/or acquire, to the extent reasonable, hardware and software products that are accessible.
4. Promote awareness of this policy to all members of the University community, particularly those in roles that are responsible for creating, selecting, or maintaining electronic content, communications, or applications.

D. Implementation

1. Each University's Chancellor, Provost, and CIO will facilitate implementation of the policy on each campus according to the unique goals, needs, and resources of their campus.
2. Implementation of digital accessibility will be a continuous and iterative process over the course of decades, and the approach will evolve as technology evolves. Thus, guidance on current accessibility standards, shared resources, prioritization guidelines, and training materials will be created and regularly updated to support the integration of digital accessibility into each University's daily processes and IT environments.
3. A UM System Digital Accessibility Committee will be created to advise the President, steer long-term implementation of the policy, and foster collaboration and shared resources across the UM System. The committee shall be composed of faculty, staff, and student members, with representation from each of the four campuses. Members shall be appointed by the Chancellor of each University, and each University will designate at least one committee member as a primary contact for their campus community.

No. 2

Recommended Action – Resolution for Executive Session of the Board of Curators Academic, Student Affairs, Research and Economic Development Committee Meeting, April 21, 2022

It was moved by Curator __________ and seconded by Curator ___________, that there shall be an executive session with a closed record and closed vote of the Board of Curators Academic, Student Affairs, Research and Economic Development Committee Meeting, April 21, 2022 for consideration of:

- **Section 610.021(1), RSMo**, relating to matters identified in that provision, which include legal actions, causes of action or litigation, and confidential or privileged communications with counsel; and
- **Section 610.021(3), RSMo**, relating to matters identified in that provision, which include hiring, firing, disciplining, or promoting of particular employees; and
- **Section 610.021(12), RSMo**, relating to matters identified in that provision, which include sealed bids and related documents and sealed proposals and related to documents or documents related to a negotiated contract; and
- **Section 610.021 (13), RSMo**, relating to matters identified in that provision, which include individually identifiable personnel records, performance ratings, or records pertaining to employees or applicants for employment.

Roll call vote of the Committee:	YES	NO
Curator Graves		
Curator Hoberock		
Curator Layman		
Curator Wenneker		

The motion __________________.

AUDIT, COMPLIANCE AND ETHICS COMMITTEE

Keith A. Holloway (Chair)
Julia G. Brncic
Jeff L. Layman

The Audit, Compliance and Ethics Committee ("Committee") will review and recommend policies to enhance the quality and effectiveness of the University's financial reporting, internal control structure and compliance and ethics programs.

I. Scope

In carrying out its responsibilities, the Committee monitors and assesses the University's financial reporting systems and controls, internal and external audit functions, and compliance and ethics programs.

II. Executive Liaison

The Chief Audit and Compliance Officer of the University or some other person(s) designated by the President of the University, with the concurrence of the Board Chair and the Committee Chair, shall be the executive liaison to the committee and responsible for transmitting committee recommendations.

III. Responsibilities

In addition to the overall responsibilities of the Committee described above and in carrying out its responsibilities, the charge of the Committee shall include:

A. Reviewing and making recommendations to the Board in the following matters:
    1. the University risk assessment, audit plan and compliance plan;
    2. in conjunction with the Governance, Compensation and Human Resources Committee, the appointment, compensation, annual performance evaluation and termination of the University's Chief Audit and Compliance Officer;
    3. the appointment, compensation, and termination of the university's external auditors.

B. Providing governance oversight regarding:
    1. development and monitoring a University code of conduct;
    2. effectiveness of the internal control framework;
    3. ensuring that the significant findings and recommendations are received, discussed and appropriately resolved;
    4. procedures for reporting misconduct without the fear of retaliation;
    5. university compliance with applicable laws, regulations, and policies that govern all aspects of University operations including but not limited to the following:
        1. Administrative compliance risks
        2. Healthcare compliance risks
        3. Research compliance risks
        4. Information security compliance risks
        5. Privacy compliance risks
    6. those additional matters customarily addressed by the audit, compliance and ethics committee of a governing board for an institution of higher education.

C. Reviewing periodic reports regarding:

1. the independence, performance, resources and structure of the internal audit, compliance and ethics functions;
2. audit reports and open audit issue status updates;
3. management's written responses to significant findings and recommendations by the auditors;
4. the adequacy of the University's information technology methodology with regards to security, internal controls and data integrity assurance;
5. annual external audit reports, including audited financial statements, single audit and required procedures; and
6. the effectiveness of the compliance and ethics program ensuring it has appropriate standing and visibility across the system.

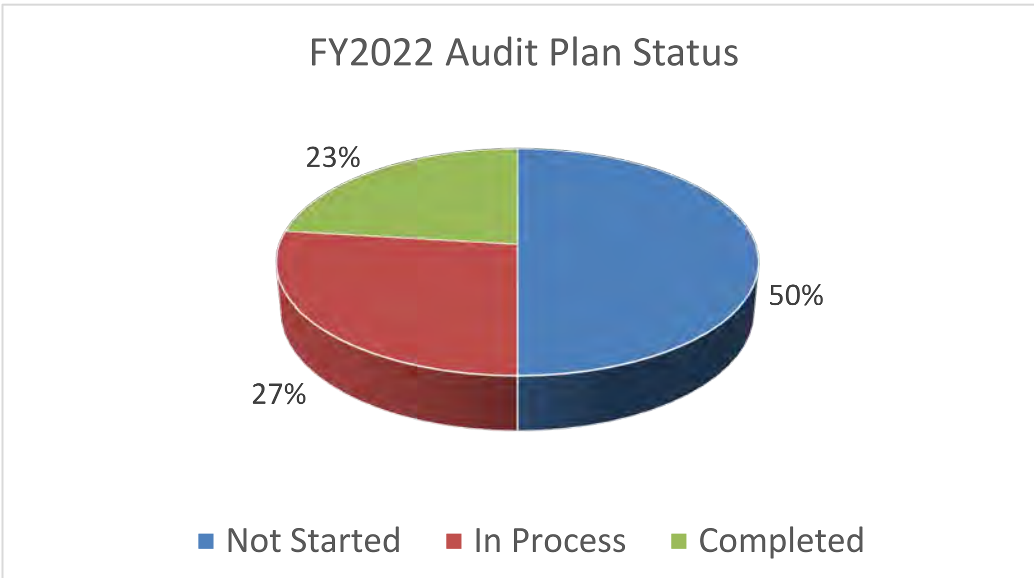
Approved by the Board of Curators: Feb 4, 2021

Audit, Compliance and Ethics Quarterly Report
UM

Status of the FY2022 Rolling Audit Plan

- Six audits/consulting projects completed
- Seven audits/consulting projects in process
- Thirteen audits/consulting projects not started

The following graph represents the status of the FY2022 Audit Plan.



Audit Performance
Since the February 2022 meeting of the Audit Committee, Internal Audit completed the Gramm-Leach-Bliley (GLBA) Gap Analysis, the MU Health Insurance Payor Website Audit, four investigations and the final verification of action plan implementation for prior audits for FY22.

GLBA Gap Analysis
Part of establishing a system-wide oversight compliance program is understanding what the organization does well and where improvement is needed for meeting compliance obligations. Data regulations is one of the three focus areas for conducting such an analysis. Internal audit recently completed a gap analysis for the Gramm-Leach-Bliley Act (GLBA).

GLBA applies to financial services organizations, including postsecondary educational institutions due to their engagement in certain consumer lending activities, such as making Federal Perkins Loans. GLBA, along with an institution's Program Participation Agreement (PPA) with the Department of Education, requires institutions to protect student financial aid information, with particular attention to information provided by the Department of Education or otherwise obtained in support of the administration of federal student financial aid programs. Institutions must ensure security and confidentiality of student financial aid records and information, referred to as "nonpublic personal information" (NPI). GLBA defines NPI as any personally identifiable financial information that is provided to the institution to obtain a financial product or service. Failure to comply with GLBA requirements could result in loss of funding provided by the Department of Education.

Upcoming Changes

The FTC published a revised GLBA Safeguards Rule on December 9 of last year, with many of the requirements going into effect on December 9, 2022. Some of the specific changes include:

1. Risk assessments are still required but must be conducted periodically and must include descriptions of how identified risks will be addressed.

2. Mandatory safeguards are now specified including maintaining a system inventory, encryption for data at rest and in transit, multi-factor authentication, system monitoring, secure development practices, etc.

3. Continuous system monitoring OR annual penetration testing and periodic vulnerability assessments are required.

4. Training programs must be tailored to address risks identified during assessments.

5. Service providers must be evaluated and continuously monitored based on the risk they pose to the organization's NPI.

Recommendations to close gaps

Due to the increasing need to protect sensitive information in today's environment, and to ensure compliance with GLBA requirements effective December 9, 2022, ECAS recommends the following to close the gaps identified:

1. *Centralized Coordination, Communication, and Training*
   Coordination of the GLBA compliance program is currently done independently at each university and consists of collecting and storing completed WISMs and training completion documentation. There is no review and verification of these materials and no coordination at the System level.

   ECAS recommends appointing a system coordinator for all data regulations. This will provide support to areas subject to these regulations (adjusting to regulatory changes, refreshing training consistent with risks identified, evaluating workflows to result in compliance, etc.) This person would work collaboratively with Information Security.

Regarding GLBA compliance, this individual will be responsible for the following:

- Assessing the WISM for relevance given that the GLBA focus has shifted to information systems security and the requirements do not spell out the need for physical controls. Physical controls are a less important focus when the OMB audits GLBA compliance. For the parts of the WISM that are still relevant, the process can be automated and streamlined.
- Refreshing GLBA required training tailored to address any risks identified during risk assessment. There is opportunity for centralizing and automating assignment, monitoring, and completion of compliance program training.
- Establishing a clear definition of NPI that should be protected and secured during collection, storage, processing, or transmission. This definition can be used to identify those departments using NPI that should be included in the GLBA compliance program.
- Communicating with departments responsible for GLBA compliance any pertinent information related to policies, procedures, and/or controls changes.
- Collaborating with the CISO to ensure appropriate and compliant information security risk assessment and related controls assessments are implemented and tested.
- Ensuring the university's compliance procedures remain current and relevant as regulations and requirements change.

2. *Risk Assessment—Information systems, processing, storage, transmission, and disposal*

   It would be beneficial to the organization if the CISO did an evaluation of all third-party risk assessments of central IT systems to understand if a combination of these assessments meets data regulation requirements; or if developing a risk assessment to be performed periodically that encompasses data regulation requirements is a better option. System compliance can assist the CISO in understanding which regulations require risk assessments.

Internal Audit Summary Report
MU Health, Insurance Payor Websites
March 2022

Report Risk Rating:
1 **(2)** 3 4 5

Background

MU Health Care (MUHC) receives payments for health care services from a variety of different payors, including electronic funds transfers (EFT) from patients' health insurance companies. EFTs are established by an MUHC administrator with access to an insurance company's website who enters routing information for the University's bank account. If insurance companies' websites, also referred to as portals, are not designed with appropriate controls to prevent "just anyone" from creating an account, payments could be re-routed to unauthorized bank accounts and/or electronic protected health information (ePHI) and other personal information could be exposed.

Payor websites are also used to look up pre-authorization requests, eligibility/benefits verification, and claims submissions. They are considered high risk due to the ePHI, personally identifiable information (PII), and financial information stored in the back-end databases. Therefore, it is critical to understand the functionality, ownership and management, and access administration of the multitude of payor websites MUHC uses.

Issues Summary

No evidence was found that unauthorized users could change EFTs/bank accounts.

Some weaknesses in input validation, access control, and governance were identified and recommendations were made for improvement.

1. Input validation controls safeguard against the ability to enter fabricated data (i.e.,123456789) and returning numerous, unrelated data that contain ePHI and PII. Two websites have weak and/or missing input validation controls. Input fields should be validated by the payor websites to protect patient information and records from unauthorized users.

2. A self-registration process that notifies the MUHC administrator that a new user has registered under the university's TIN and/or NPI improves monitoring effectiveness and ensures only authorized users are registered. Currently, the self-registration processes for two websites do not notify the MUHC administrator. This negatively impacts monitoring of the payor website by the MUHC administrator and may result in undetected access by an unauthorized user.

3. Actively managing user accounts on all payor websites, including deleting accounts of users who leave the organization, as well as periodically reviewing accounts to identify any unauthorized users, further protects ePHI and PII. Currently, payor website account access is not actively managed.

4. Effective governance of the insurance payor website program is important to identifying areas of improvement and factoring in additional contractual safeguards. The current governance program does not address payor website credentials storage and security; IT security reviews of payor websites; and availability of payor website information and processes to all interested parties.

Management Action Plan Summary

- Management will explore options for strengthening or improving technical and access controls with payors. Agreed upon suitable controls will be implemented.
- Management will continue to improve governance of the insurance payor website program.

Risk Rating Rationale

While issues with some of the payor websites tested could result in improper access to ePHI or PII, the probability of this occurring is low. Should it happen, the compliance violation would be on the part of the insurance payor, not the University. The impact to the University would potentially be adverse publicity.

Audits and Consulting Engagements Currently in Process

Audit Area	Overall Objective	Status	Risk Area(s)
UMSL – College of Business	Review of key business and academic processes.	Fieldwork	Operations
MUH – Missouri Telehealth Network	Validate the appropriate use of funding and the potential drivers behind the growth of the reserve fund.	Fieldwork	Compliance
MUH – School of Medicine Equipment Inventory	Determine if the School of Medicine departments have adequate controls in place to ensure capitalized and high-risk non-capitalized assets are guarded against loss and/or misstatement on financial records and that inventory records are accurate.	Fieldwork	Operations
UM System – Vendor Management Program	Consulting engagement to determine what vendor management practices are in place at UM System and MU Health. Compare to best practices and make recommendations to leadership on how vendor management can be strengthened.	Fieldwork	Operations

Audit Area	Overall Objective	Status	Risk Area(s)
All Universities – Scholarship Awards	Assessment of scholarship awards to donor restrictions and/or established criteria.	Planning	Compliance
UM System -Update of HIPAA Hybrid Covered Entity Designation	Perform due diligence needed to assess current covered components and work with OGC and management to make any needed adjustments.	In Process	Compliance
Fraud Monitoring Program	Using data analytics, identify anomalies in research grant expenses for further investigation.	In Process	Compliance

In addition, five investigations are in process.

Management Action Plan Status as of February 28, 2022

Follow-up procedures are performed twice a year to verify the status of management actions for previously issued audit reports. For this period, 31 action items were due for completion by February 28, 2022. Two (2) additional items were completed early, bringing the total management action plans reviewed for this period to 33.

The table at the end of this report lists audits with open action items. At least one action plan for the highlighted audit reports was due during the period July 1, 2021 - February 28, 2022. Twenty (20) action items were completed, which includes the items completed early. Nine (9) items were extended and assigned revised due dates, and four (4) items were determined to be past due.

Revised Due Date:

Nine (9) action items associated with the audits below were extended and assigned revised due dates. This activity is reported in the "Revised Due Date" column of the table on the last page of this report.

MU Lab Safety – High Risk

Four (4) action items related to policy implementation, verification of training, and effectiveness of new processes were extended to the end of 2022 to allow process and program changes to become fully implemented so effectiveness can be verified.

MU Conflict of Interest Process – Medium Risk

One (1) action item related to addressing the issue of new outside interests not being disclosed at the point they arise will be addressed through annual code of conduct training. Code of conduct training is in development and will be part of compliance education assigned for the Fall semester. Once Fall compliance training is completed this item can be closed.

Missouri S&T Lab Safety – Medium Risk

Four (4) action items related to improving systems and processes for lab discovery, inspection, inventory, issue resolution, and training were revised and assigned extended dues dates. Timely completion of these items was negatively impacted by staff reductions and turnover.

Past Due Items:

Four (4) action items associated with the audits below were determined to be past due. This activity is reported in the "Past Due" column of the table on the last page of this report.

UMSL Lab Safety – Low Risk

Three (3) action items related to inventory management and staff training have not been completed and are past due. These items are incomplete due to inconsistent communication and process coordination, and some were negatively impacted by staff turnover. New due dates have been determined to ensure process changes are fully implemented and consistently followed.

UMS One Card Process – Medium Risk

One (1) action item related to reviewing/selecting criteria for transaction review has not been completed. Completion of this item was delayed due to multiple high-priority implementations and upgrades necessary to the PeopleSoft system, which limited available resources to address this issue. A meeting to review and select criteria is scheduled in March 2022. Once implementation is verified, the item will be complete.

Management Action Plan Summary as of February 28, 2022

Entity	Report Name	Risk Rating	Total # of Action Plans in Report	Complete	Not Due	Past Due	Revised Due Date	Will Not Be Implemented
MU	**Lab Safety**	High	6	**2**			**4**	
	Conflict of Interest Process	Medium	5	4			**1**	
	Data Center	Low	1	1				
MUH	Controlled Substance Diversion Prevention	High	19	19				
	Organized Health Care Arrangement	Medium	3		3			
S&T	**Lab Safety**	Medium	7		3		**4**	
	Conflict of Interest Process	Low	4		4			
UMSL	**Lab Safety**	Low	6	3		**3**		
UMS	External Student-Funded Accounts	Medium	1		1			
	One Card Process	Medium	8	5	1	**1**		1
		Totals	**60**	**34**	**12**	**4**	**9**	**1**

KEY: Audits with action plans due between July 1, 2021, and February 28, 2022, are highlighted in GOLD. Audits in **BOLD** font have revised due dates; RED are past due.

April 22, 2021

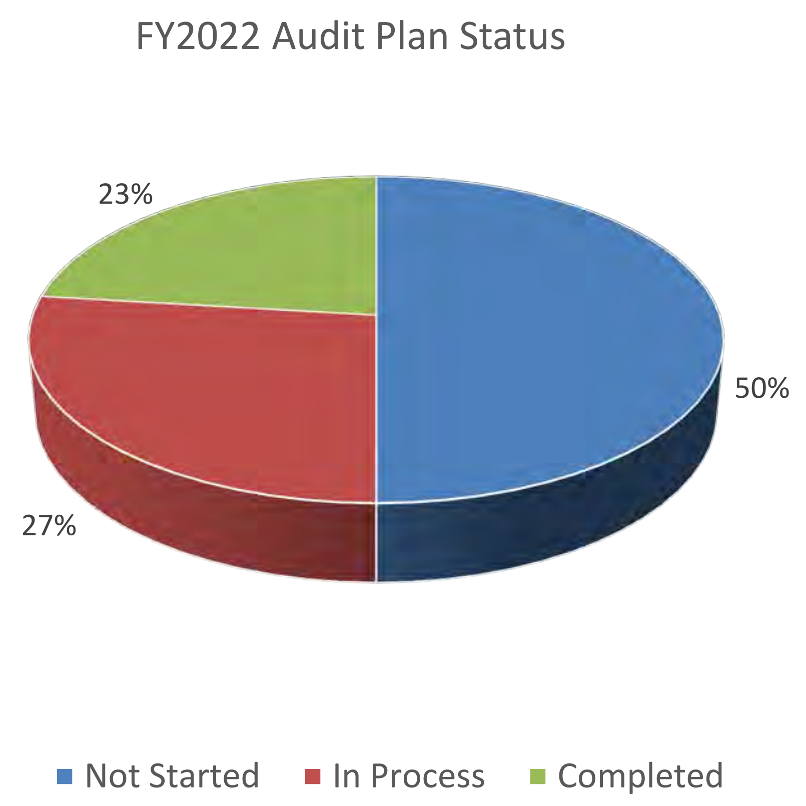
University of Missouri System Board of Curators

April 21, 2022

Audit, Compliance and Ethics Committee

Audit, Compliance and Ethics Committee
Quarterly Report
UM

Summary of Internal Audit Activity



- Six internal audits/consulting engagements completed
- Seven internal audits/consulting engagements in process
- Thirteen audits/consulting projects not started
- Four investigations completed
- Actively working five investigations

Gramm-Leach-Bliley Gap Analysis

- Refresh annual training and include any risks identified during risk assessment.

- Adjust practices to account for shift from physical controls over information to more emphasis on IT systems as the primary means of security.

- Establish regulatory change management for GLBA.

- Support information security in maintaining appropriate and compliant information security risk and controls assessments.

Insurance Payor Websites
MU Healthcare

Report Risk Rating:

1 2 3 4 5

Summary Observations

- No evidence was found that unauthorized users could change EFTs/bank accounts for the payor's websites tested.

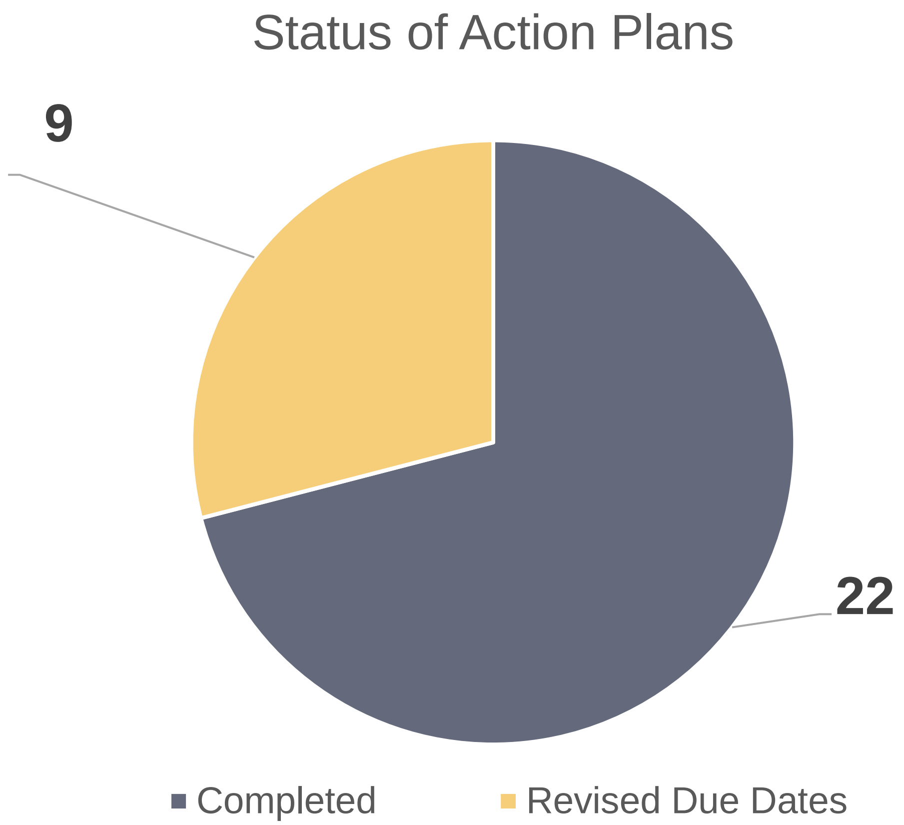
- While issues with some payor websites tested could result in improper access to protected health information, the probability is low.

Management Actions

- Management will explore options for strengthening or improving technical and access controls with payors. Agreed upon suitable controls will be implemented.
- Management will continue to improve governance of the insurance payor website program.

Status of Management Action Plans

As of February 28, 2021



- Thirty-one action plan items in six audits were reviewed for completion as of February 28, 2021.
- Twenty-two of thirty-one, or 71 percent were completed.
- Nine action plans in two audits were assigned extended due dates.

Questions?

No. 1

Recommended Action - Resolution for Executive Session of the Audit Committee Meeting, April 21, 2022

It was moved by Curator __________ and seconded by Curator __________, that there shall be an executive session with a closed record and closed vote of the Board Audit, Compliance and Ethics Committee meeting April 21, 2022, for consideration of:

- **Section 610.021(1), RSMo**, relating to matters identified in that provision, which include legal actions, causes of action or litigation, and confidential or privileged communications with counsel; and
- **Section 610.021(3), RSMo,** relating to matters identified in that provision, which include hiring, firing, disciplining, or promoting of particular employees; and
- **Section 610.021(12), RSMo,** relating to matters identified in that provision, which include sealed bids and related documents and sealed proposals and related documents or documents related to a negotiated contract; and
- **Section 610.021(13), RSMo,** relating to matters identified in that provision, which include individually identifiable personnel records, performance ratings, or records pertaining to employees or applicants for employment; and
- **Section 610.021 (17), RSMo,** relating to matters identified in that provision, which include confidential or privileged communications between a public governmental body and its auditor; and
- **Section 610.021(20), RSMo**, relating to matters identified in that provision, which include records that identify the configuration of components or the operation of a computer, computer system, computer network, or telecommunication network, and would allow unauthorized access to or unlawful disruption of a computer system.

Roll call vote of the Committee:	YES	NO
Curator Brncic		
Curator Holloway		
Curator Layman		

The motion ____________________.

HEALTH AFFAIRS COMMITTEE

Robin R. Wenneker (Chair)
Keith A. Holloway
Michael A. Williams
Ronald G. Ashworth (non-curator)
John R. Phillips (non-curator)

The Health Affairs Committee ("Committee") assists the Board of Curators in overseeing the clinical health care operations of the University and in coordinating those operations in furtherance of the University's teaching, research, and clinical missions.

I. Scope

The Committee provides oversight for the University's clinical health care operations in the areas of:

- Mission, vision, and strategy;
- Governance and operational oversight;
- Quality of care and patient safety;
- Regulatory compliance;
- Financial planning and performance; and
- Coordination of the clinical, teaching, and research missions.
- Specific projects that enable meaningful collaboration among UM universities.

II. Executive Liaison

The Executive Vice Chancellor for Health Affairs of the University of Missouri-Columbia or some other person(s) designated by the President of the University, with the concurrence of the Board Chair and the Committee Chair, shall be the executive liaison to the Committee and responsible for transmitting Committee recommendations.

III. Responsibilities

In addition to the overall responsibilities of the Committee described above and in carrying out its responsibilities regarding clinical health care operations, the charge of the Committee shall include:

A. Reviewing and making recommendations to the Board regarding:
   1. actions that are appropriate or necessary to assist the Board in overseeing clinical health care operations or coordinating the teaching, research, and clinical missions;
   2. significant actions related to health care which should require advance notice or approval by the Committee or Board; and
   3. other matters referred to it by the Board and University officers.

B. Requesting, receiving, and reviewing reports and other information from University officers and advisors regarding health care operations, coordination of the teaching, research, and clinical missions, and related matters, including meeting at least quarterly and receiving regular reports from appropriate officers of University of Missouri Health Care, the MU School of Medicine, and the MU Health Chief Compliance Officer.

C. Additional matters customarily addressed by the health affairs committee of a governing board for an institution of higher education.

IV. Committee Membership and Quorum Requirements

The Committee's membership may include non-Curator members in addition to Curator members. Subject to approval of the Board, the Board Chair shall determine the number of Curator and non-Curator members to appoint to the Committee and shall select individuals to serve as members of the Committee; provided that, the number of non-Curator members on the Committee shall not exceed the number of Curator members on the Committee, unless the Committee temporarily has more non-Curator members than Curator members because a Curator member of the Committee has resigned from the Board or the Committee. Non-Curator members may resign their Committee membership by providing written notice to the Board Chair. Non-Curator members of the Committee serve at the pleasure of the Board and may be removed by the Board Chair at any time, subject to approval of the Board.

A quorum for the transaction of any and all business of the Committee shall exist when:

1. Both a majority of all Curator members of the Committee and a majority of all members of the Committee are participating for Committee meetings which are held in conjunction with meetings of the Board; or
2. Both all Curator members of the Committee and a majority of all members of the Committee are participating for Committee meetings which are not held in conjunction with meetings of the Board; or
3. Both a majority of all Curator members of the Committee and a majority of all members of the Committee are participating for Committee meetings which are held solely for the purpose of reviewing and overseeing compliance matters.

Approved by the Board of Curators: Feb 4, 2021

EXECUTIVE VICE CHANCELLOR REPORT

There are no materials for this information item.

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

CAMPUS HIGHLIGHTS

There are no materials for this information item.

GOVERNANCE AND PROFESSIONALISM

There are no materials for this information item.

GOOD AND WELFARE

OF THE BOARD

There are no materials for this information item.

No. 1

Recommended Action – Resolution for Executive Session of the Board of Curators Meeting April 21, 2022

It was moved by Curator _________ and seconded by Curator __________, that there shall be an executive session with a closed record and closed vote of the Board of Curators meeting April 21, 2022 for consideration of:

- **Section 610.021(1), RSMo**, relating to matters identified in that provision, which include legal actions, causes of action or litigation, and confidential or privileged communications with counsel; and
- **Section 610.021(2), RSMo,** relating to matters identified in that provision, which include leasing, purchase, or sale of real estate; and
- **Section 610.021(3), RSMo**, relating to matters identified in that provision, which include hiring, firing, disciplining, or promoting of particular employees; and
- **Section 610.021(12), RSMo,** relating to matters identified in that provision, which include sealed bids and related documents and sealed proposals and related documents or documents related to a negotiated contract; and
- **Section 610.021 (13), RSMo**, relating to matters identified in that provision, which include individually identifiable personnel records, performance ratings, or records pertaining to employees or applicants for employment; and
- **Section 610.021(17), RSMo**, relating to matters identified in that provision, which include confidential or privileged communications between a public governmental body and its auditor; and
- **Section 610.021(20), RSMo**, relating to matters identified in that provision, which include records that identify the configuration of components or the operation of a computer, computer system, computer network, or telecommunication network, and would allow unauthorized access to or unlawful disruption of a computer system.

Roll call vote of the Board:	YES	NO
Curator Brncic		
Curator Chatman		
Curator Graves		
Curator Hoberock		
Curator Holloway		
Curator Layman		
Curator Wenneker		
Curator Williams		

The motion ________________.