Ohio Public Employees Retirement System
Investment Division

2007 Investment Plan
December 19, 2006
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Report from the Director—Investments

To the OPERS Retirement Board:

Attached for your review, please find the 2007 Investment Plan. As has become our tradition, the plan has been completed through the joint efforts of the management and staff of the Investment Division. The discipline and time taken to create the plan for the Investment Division is both appropriate and prudent. This plan clearly delineates our goals against which the Division’s yearly performance is benchmarked and how we will achieve those goals. The plan also establishes specific parameters against which other activities are measured to help us focus on productivity. This plan has been reviewed by three consultants, whose reviews can be found in the Appendix, starting on page 97.

The cornerstone goals of the Investment Division are:

- To generate target returns for the total fund, each asset class and portfolio;
- To maintain a competitive cost structure, relative to our peers;
- To hire, develop and retain top-caliber investment professionals who are aligned with the Division’s core values; and
- To develop innovative strategies to meet or exceed our investment goals and objectives.

Review of 2006

To provide a structure against which the 2007 strategy presented here can be fully understood, it is appropriate to frame our plan with the Investment Division’s 2006 accomplishments through October 2006. Of course, detailed information of the Investment Division’s actual 2006 accomplishments will be reported in the 2006 OPERS Comprehensive Annual Financial Report.

As forecasted in the 2006 Investment Plan, it is anticipated that both the Defined Benefit and the Health Care funds will achieve their respective actuarial rates of return for 2006. However, relative to their benchmarks, it is anticipated that the funds will likely underperform or meet their target return objectives, which are to outperform by 33 and 29 basis points, respectively.

On a more positive note, in the third quarter, the capital market rebounded, bolstered by solid earnings growth and an improved outlook for interest rates. The unexpected—and significant—pullback in oil, gold and other commodities supports the diminished expectation for inflation. It should be noted that neither the Defined Benefit nor Health Care fund engaged in any meaningful tactical asset shifts in 2006.

In reviewing the information garnered through the third quarter, there were many key accomplishments during the year, including:

- The completion of the investment policy review for the Defined Benefit fund. This review resulted in the creation of a dedicated long-duration fixed-income portfolio specifically designed to provide a partial hedge against this fund’s long-term liabilities.
- The progress-toward-completion of the Health Care fund’s transition to have a return-and-risk profile that is more reflective of the anticipated liabilities for the Health Care fund. This project is on target for year-end completion.
- The development of a Minority Manager program, which will be implemented by hiring an external manager of managers who will focus on identifying and hiring the best-in-class managers.
- The successful implementation of the Private Equity Ohio/Midwest discretionary funds program. This program requires private equity managers to focus on prudent investment opportunities within the state and region.
The continued enhancement of the Securities Lending program as a vehicle to add incremental returns within a low-risk framework by developing strategies to lend out mortgage-backed securities, asset-backed securities and commercial mortgage-backed securities.

The optimized lineup of external managers in the non-U.S. Equity asset class; the initial funding of hedge fund-of-fund managers within the Opportunistic assets and restructure of the high yield line-up.

The effective execution of the 2006 Russell Index reconstitution through utilization of internal investment management and trading capabilities. The reconstitution involved the transition of the internally managed Russell 3000 Index portfolio to hold the same securities as the updated Russell 3000 Index. The transition contributed 2.5 basis points of positive performance to the portfolio.

The successful implementation of the Eagle Pace data warehouse to improve and automate reports for investment management, performance and compliance.

Overview of 2007 Investment Plan
As always, the Investment Division’s goals reflect the ongoing Retirement Board directive of securing the best possible returns, while managing to an acceptable level of risk. Simply put, the primary goals outlined in this 2007 Investment Plan are:

- To continue the review of the Health Care fund’s asset allocation to ensure its ongoing appropriateness relative to its liabilities.
- To develop an internal process that facilitates a disciplined, tactical, asset allocation strategy within the Defined Benefit and Health Care funds.
- To establish where possible, more internal management of the passive Non-U.S. Equity portfolio. This strategy will minimize reliance on external managers, while enhancing control over assets.
- To evolve the Risk Management program so that performance is enhanced and risk is effectively managed. Strategies may also include operational risk management and an automated compliance system.
- To make use of derivatives as a vehicle to implement strategies in a cost-effective manner.
- To use direct lending of treasury and agency securities as a strategy to increase income and maintain portfolio control.
- To explore the viability of internal management for the Defined Contribution fund’s Stable Value investment option to reduce management fees.
- To continue the implementation of the minority manager program, including the hiring and funding of a manager of minority managers.
- To enhance the Retirement Board’s education through the annual investment forum and through the invitation of guest speakers to the Investment Committee meetings.

Managing Toward Our Goals
These goals are aggressive, but attainable—and will be accomplished through strategic asset management and thoughtful alignment of the Division’s resources.
Asset Management
As prudent managers of a portfolio with a long-term investment horizon, the Investment Division will continue to monitor and measure three distinct sources of return and risk: policy, tactical and active. Each source of return and risk plays an integral part toward achieving overall investment results. The Defined Benefit fund and Health Care fund sections presented later in this investment plan provide details about how policy, tactical and active returns will be generated within a managed risk framework.

In summary, the 2007 goals established for each source of return and risk for the Defined Benefit and Health Care funds are as follows:

- The total expected return of the OPERS Defined Benefit fund in 2007 is 7.64% and is composed of the expected policy return of 7.31% and active management return of 0.33%. The total risk that will be taken to achieve this return is 8.79%, which is derived from the combination of the policy risk of 8.98%, tactical risk of 0.04% and active risk of 0.38%.

- The total expected return of the OPERS Health Care fund in 2007 is 7.01% and is composed of the expected policy return of 6.70% and active management return of 0.31%. The total risk that will be taken to achieve this return is 7.10%, which is derived from the combination of the policy risk of 7.25%, tactical risk of 0.05% and active risk of 0.30%.

Resources
As stated previously, the Investment Division will thoughtfully align its resources against targeted priorities to ensure the success of our stated goals by year-end 2007.

As with any organization, our greatest asset—and significant expense—is found within our employee base. The Investment Division currently has 59 authorized positions, composed of 50 filled positions and nine vacancies. We will continue to evaluate open positions and assess personnel needs to optimize productivity.

The Investment Division submitted an operating budget (including personnel costs) for 2007 that is $15.8 million—slightly above the original 2006 budget. The budget reflects the Division-wide effort to maintain internal investment management where possible and to manage other administrative expenses.

It should be noted that we estimate that the total cost to manage the OPERS asset base in 2007 will be 22.6 basis points, or approximately $168.8 million. The increase is discussed in greater detail throughout this plan. Higher external management fees reflect the growth in the OPERS asset base in the last years. Clearly, the larger the asset base, the larger the management fee will be. Larger allocations to Private Equity and Real Estate are also likely to increase external management costs.

Summary
Sustained performance is the ultimate goal of all activities within the Investment Division. As you may imagine, such growth can only be accomplished through establishing goals and objectives, diligent monitoring of progress-to-goals and adherence to the Retirement Board policies that help mitigate risk—even as we positively position OPERS to take advantage of future opportunities.

Detailed information regarding how each of the initiatives will be achieved follows in this document, which is organized into three sections: Fund Strategies, Asset Class Strategies and Resources and Initiatives. We have a great team and we look forward to executing this plan.

Respectfully,

Jennifer C. Hom, CFA
Director — Investments
Structure

The Investment Division organizational chart is shown here; further detail is shown within the organizational charts included in the individual Resources and Initiatives sections.

Responsibility for oversight of the Investment Division is shared across the director—investments and the senior management team. The Division utilizes a somewhat flat, non-layered structure, which allows for a focused and efficient use of resources, while providing flexibility and accountability. By department, the responsibilities are:

- **U.S. Equity Internal Active**—provides internal management of U.S. equity large cap and real estate investment trust (REIT) securities.
- **Global Bonds Internal Management**—provides active internal management of global bonds portfolios, and securities lending activity.
- **External Management**—oversees the Division’s external managers across all asset classes.
- **Fund Management**—responsible for asset allocation strategies, U.S. Equity trading, internal U.S. Equity index management and risk management across asset classes.
- **Investment Administration**—supports the organization’s investment activities through compliance, reporting, operations and corporate governance.

In addition, the Division has an Investment Strategy Group (ISG), which is composed of the senior investment management staff and other staff, as appropriate. The ISG is the primary mechanism by which the Division evaluates, debates and determines key decisions affecting performance, policy and new initiatives. Due to its potential impact on, and importance to, the asset base, the ISG meets twice each month or as needed on significant topics such as investment outlook and strategy across asset classes, portfolio performance and risk analysis, portfolio rebalancing and implementation, sector over-weighting and under-weighting decisions and innovative investments.
Resources

Staffing
As stated previously, recruiting and retaining the best and most talented staff is a critical priority for the Investment Division. Staff is added only after careful consideration and analysis. The following chart provides a presentation of anticipated staffing projections for year-end 2007:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2006 Investment Plan Projected Staffing</strong></td>
<td>3</td>
<td>13</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td><strong>Current Staffing</strong></td>
<td>2</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td><strong>Vacant Positions - Fill in 2006</strong></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>2006 Target Staffing</strong></td>
<td>2</td>
<td>11</td>
<td>10</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td><strong>Vacant Positions - Fill in 2007</strong></td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>New Positions - Fill in 2007</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>2007 Target Staffing</strong></td>
<td>3</td>
<td>11</td>
<td>11</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

Of the 58 positions projected in the 2006 Investment Plan, three positions were discontinued, three positions were transferred in from the Corporate Governance department and one new position was added, to bring the 2007 target staffing to 59 positions. The Investment Division currently has 50 filled positions, expects to fill two positions by the end of 2006 and expects to fill seven additional positions by the end of 2007.

The following table lists the vacant positions to be filled throughout the balance of 2006 and 2007.

<table>
<thead>
<tr>
<th>Office of Director - Investments</th>
<th>Position</th>
<th>Vacant</th>
<th>Newly Budgeted</th>
<th>Target Hire Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity Internal Active</td>
<td>Deputy Director</td>
<td>X</td>
<td>December 2007</td>
<td></td>
</tr>
<tr>
<td>Global Bonds Internal Management</td>
<td>Senior Portfolio Manager</td>
<td>X</td>
<td>December 2006</td>
<td></td>
</tr>
<tr>
<td>Real Estate</td>
<td>Senior Portfolio Manager</td>
<td>X</td>
<td>April 2007</td>
<td></td>
</tr>
<tr>
<td>Private Equity</td>
<td>Portfolio Manager/Senior Analyst</td>
<td>X</td>
<td>April 2007</td>
<td></td>
</tr>
<tr>
<td>Fund Management</td>
<td>Portfolio Manager/Senior Analyst</td>
<td>X</td>
<td>April 2007</td>
<td></td>
</tr>
<tr>
<td>Investment Administration</td>
<td>Quantitative Analyst</td>
<td>X</td>
<td>June 2007</td>
<td></td>
</tr>
<tr>
<td>Investment Administration</td>
<td>Investment Administration Analyst</td>
<td>X</td>
<td>December 2006</td>
<td></td>
</tr>
<tr>
<td>Investment Administration</td>
<td>Investment Analyst</td>
<td>X</td>
<td>December 2007</td>
<td></td>
</tr>
<tr>
<td>Investment Administration</td>
<td>Corporate Governance Manager/Analyst</td>
<td>X</td>
<td>April 2007</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>9</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>
The following chart compares OPERS’ asset size and staffing as of June 30, 2006 to its peer group, comprised of several large state pension funds.

The chart above suggests that the Investment Division staffing is comparable to other funds, relative to its asset base. The ongoing focus of the management team is to effectively increase productivity without significantly increasing staff size.

The following table lists the public pension peer group referenced in the chart above and in other sections of this investment plan.

<table>
<thead>
<tr>
<th>11 Largest State Plans as of 6/30/2006 ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Public Employees Retirement System</td>
</tr>
<tr>
<td>California State Teachers Retirement System</td>
</tr>
<tr>
<td>New York State &amp; Local Retirement System</td>
</tr>
<tr>
<td>State Board of Administration of Florida</td>
</tr>
<tr>
<td>Texas Teachers Retirement System</td>
</tr>
<tr>
<td>New York State Teachers Retirement System</td>
</tr>
<tr>
<td>New Jersey Division of Investment</td>
</tr>
<tr>
<td>Ohio Public Employees Retirement System</td>
</tr>
<tr>
<td>State of Wisconsin Investment Board</td>
</tr>
<tr>
<td>North Carolina Retirement System</td>
</tr>
<tr>
<td>Ohio State Teachers Retirement System</td>
</tr>
</tbody>
</table>

Compiled using data from www.pfde.org (NASIO).
Staffing costs

The total cost of salaries and benefits for the Investment Division, at the estimated 2007 full staffing level, is shown in the following table.

By comparison, in 2006 the total cost of salaries and benefits was $9.409 million and 1.35 basis points of assets. Total compensation is expected to be higher in 2007 due to the expectation of filling budgeted positions earlier in the calendar year, higher incentive compensation budgeting, relocation of the Corporate Governance department to the Investment Administration department and the addition of one new position.

Budget

The Investment Division 2007 operating budget has been submitted at $15.8 million and includes compensation costs, less benefits. This represents an increase of $2.4 million, or 18.3% percent, from the 2006 budget. Approximately $1.6 million, or 67%, of the increase is attributed to transferring the Corporate Governance department and several software licenses and maintenance agreements into the Investment Division, increasing budgeted amounts for legal and consulting fees and budgeting for a new compliance system. As shown below, it is anticipated that internal operating costs will be 2.12 basis points of total assets in 2007.
The chart above shows the allocation of the operating expenses across major budget categories. The five main areas of operating expenses within investments are personnel services, consulting services, the combination of analytics, quotes and data feeds, research and training and travel.

- The primary expenses for Audit/Legal/Consulting services are for consulting fees for the Division, as well as for individual asset classes. In 2007, consulting fees are estimated to total $2.0 million.

- The primary expenses in the Quote and Data Feeds category are Bloomberg, Bridge and Factset terminals.

- In Analytics, the primary cost items are BARRA, a risk measurement package; StockVal, a company valuation package; Wilshire, Salomon Yield Book, Quantitative Services Group, Market QA and a post-trade compliance tool.

- In Research, the primary expenses are independent research services such as Thompson Financial, indices, Reuters Knowledge IM, Moody's Credit Reports, MSCI Index Service, Intex and Glass Lewis.

- Training and Travel expenses include all business travel with the majority of the focus on due diligence. On average, estimated travel and conference fees are anticipated to be $5,000 and $1,000, respectively, per professional employee in 2007.

More detailed explanations of each unit’s operating expenses can be found in the Resources and Initiatives section of the plan.
Total Costs

As shown below, the estimated total cost of the investment program in 2007 is projected to be $168.8 million or 22.6 basis points of assets under management. This compares to the total costs in the 2006 Investment Plan of $140.7 million, and 20.3 basis points.

<table>
<thead>
<tr>
<th>Estimated Total Costs for Investment Department</th>
<th>Estimated for Year End 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>($) millions</td>
<td></td>
</tr>
<tr>
<td>Office of Director Invest.</td>
<td>U.S. Equity Invest.</td>
</tr>
<tr>
<td></td>
<td>Global Bonds Invest.</td>
</tr>
<tr>
<td></td>
<td>External Public Markets</td>
</tr>
<tr>
<td></td>
<td>Real Estate</td>
</tr>
<tr>
<td></td>
<td>Private Equity</td>
</tr>
<tr>
<td></td>
<td>Fund Mgmt.</td>
</tr>
<tr>
<td></td>
<td>Invest. Admin.</td>
</tr>
<tr>
<td></td>
<td>Total Invest. Division</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
<tr>
<td>Compensation Costs</td>
<td>0.741</td>
</tr>
<tr>
<td>Operating Budget less Compensation</td>
<td>0.764</td>
</tr>
<tr>
<td>Manager Fees</td>
<td>0.673</td>
</tr>
<tr>
<td>Custody and Overhead</td>
<td>5.020</td>
</tr>
<tr>
<td>Total</td>
<td>6.525</td>
</tr>
<tr>
<td>Percent of Total</td>
<td>100.0%</td>
</tr>
<tr>
<td>Average Asset Size ($ b)</td>
<td>NA</td>
</tr>
<tr>
<td>Costs in Basis Points to Asset Class</td>
<td>3.7%</td>
</tr>
<tr>
<td>Costs in Basis Points to Total Fund</td>
<td>22.6%</td>
</tr>
</tbody>
</table>

Note that the last row shows the contribution of each unit to the total projected cost. The three units with external management fees, External Public Markets, Real Estate and Private Equity, account for approximately 87.1%, or 19.7 basis points, of the estimated total costs.

CEM Benchmarking, Inc., an independent benchmarking firm focusing on pension systems, estimated in its 2005 survey that the benchmark cost to run a comparable investment program with similar implementation characteristics to be $157.2 million or 23.5 basis points relative to OPERS’ $69 billion of assets at that time. The difference between the 2005 CEM estimate and OPERS 2005 actual costs of $118.8 million, or 17.8 basis points, reflected a net savings of $38.4 million. This is attributable to our greater use of internal management than our peers and the negotiation of lower external management fees.
Total Assets

The table below provides a summary of the expected asset growth for the Defined Benefit and Health Care funds across resources, recognized as cost centers for budgeting purposes.

<table>
<thead>
<tr>
<th>Actual and Estimated Assets</th>
<th>Combined Defined Benefit and Health Care Funds</th>
<th>($ billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of Director Invest.</td>
<td>U.S. Equity Internal Active</td>
<td>$7.0</td>
</tr>
<tr>
<td></td>
<td>Global Bonds Internal Mgmt.</td>
<td>$18.7</td>
</tr>
<tr>
<td></td>
<td>External Public Markets</td>
<td>$21.0</td>
</tr>
<tr>
<td></td>
<td>Real Estate</td>
<td>$4.6</td>
</tr>
<tr>
<td></td>
<td>Private Equity</td>
<td>$1.0</td>
</tr>
<tr>
<td></td>
<td>Fund Mgmt.</td>
<td>$19.2</td>
</tr>
<tr>
<td></td>
<td>Invest. Admin.</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Total Invest. Division</td>
<td>$71.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>July 31, 2006 Actual Unaudited</th>
<th>NA</th>
<th>$7.0</th>
<th>$18.7</th>
<th>$21.0</th>
<th>$4.6</th>
<th>$1.0</th>
<th>$19.2</th>
<th>NA</th>
<th>$71.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 31, 2006 Estimated</td>
<td>NA</td>
<td>$7.0</td>
<td>$19.7</td>
<td>$22.9</td>
<td>$3.6</td>
<td>$1.1</td>
<td>$19.3</td>
<td>NA</td>
<td>$73.6</td>
</tr>
<tr>
<td>Average 2007 Estimated</td>
<td>NA</td>
<td>$7.1</td>
<td>$19.7</td>
<td>$23.0</td>
<td>$4.1</td>
<td>$1.3</td>
<td>$19.6</td>
<td>NA</td>
<td>$74.8</td>
</tr>
<tr>
<td>December 31, 2007 Estimated</td>
<td>NA</td>
<td>$7.3</td>
<td>$19.6</td>
<td>$23.2</td>
<td>$4.5</td>
<td>$1.5</td>
<td>$20.0</td>
<td>NA</td>
<td>$76.1</td>
</tr>
</tbody>
</table>

Estimated assets for December 31, 2007 are based on December 31, 2007 target allocations and associated total Defined Benefit and Health Care fund estimated assets.

Cash management is a component of the Global Bonds Internal Management resources.
Defined Benefit

Asset Management

Asset Size and Expected Growth

The OPERS Defined Benefit fund had assets of $59.4 billion at July 31, 2006. These assets are projected to be $61.1 billion by December 31, 2006. The 2007 expected annual return is 7.64%, with an expected range of 3.64% to 11.63%. The 2007 net cash flow (contributions less benefit payments and administrative expenses) is estimated to be negative $2.3 billion.

The table below summarizes these statistics to arrive at a probability estimate and confidence interval of the ending value of the fund at December 31, 2007. There is a 66% probability that the ending value will be between the pessimistic estimate and the optimistic estimate of $61.0 billion and $65.9 billion, respectively. Statistically, there is a 17% chance that the ending value will be below the pessimistic estimate of $61.0 billion, and a 17% chance that the ending value will be greater than the optimistic estimate of $65.9 billion.

<table>
<thead>
<tr>
<th>12/31/06 Market Value ($ billion)</th>
<th>Pessimistic Case</th>
<th>Base Case</th>
<th>Optimistic Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>$61.1</td>
<td>$61.1</td>
<td>$61.1</td>
<td></td>
</tr>
<tr>
<td>Expected Total Return</td>
<td>3.64%</td>
<td>7.64%</td>
<td>11.63%</td>
</tr>
<tr>
<td>Expected Investment Gain ($ billion)</td>
<td>$2.2</td>
<td>$4.7</td>
<td>$7.1</td>
</tr>
<tr>
<td>Expected Cash Flow ($ billion)</td>
<td>($2.3)</td>
<td>($2.3)</td>
<td>($2.3)</td>
</tr>
<tr>
<td>12/31/07 Market Value ($ billion)</td>
<td>$61.0</td>
<td>$63.5</td>
<td>$65.9</td>
</tr>
</tbody>
</table>

The anticipated asset figure of $61.1 billion for December 31, 2006 is derived by a smoothing projection that incorporates both the actual Defined Benefit fund return through July 31, 2006 and the expected full year return for 2006 presented in the 2006 Investment Plan.

Ennis Knupp + Associates calculates Investment Policy return estimates for the OPERS Defined Benefit asset mix over a 15-year time horizon. The expected average annual return is 8.5% with an expected volatility of 12.8%.
Asset Allocation

The target asset allocation and ranges for 2007 are:

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>12/31/07 Target</th>
<th>Range</th>
<th>Peer Group*</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>45.2%</td>
<td>+/- 4%</td>
<td>41.9%</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>0.4%</td>
<td>0%-3%</td>
<td>NA</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>20.0%</td>
<td>+/- 4%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>8.0%</td>
<td>+/- 4%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>2.4%</td>
<td>1%-9%</td>
<td>4.6%</td>
</tr>
<tr>
<td><strong>Subtotal Equity</strong></td>
<td><strong>76.0%</strong></td>
<td></td>
<td><strong>69.8%</strong></td>
</tr>
<tr>
<td>Global Bonds</td>
<td>24.0%</td>
<td>+/- 4%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Cash</td>
<td>0.0%</td>
<td>0%-5%</td>
<td>1.9%</td>
</tr>
<tr>
<td><strong>Subtotal Debt</strong></td>
<td><strong>24.0%</strong></td>
<td></td>
<td><strong>30.3%</strong></td>
</tr>
<tr>
<td><strong>Total Fund</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

*Peer Group names previously provided in the Investment Program section

A key change in the investment policy approved for 2007 is the expansion of ranges around each of the asset allocation targets. As indicated to the Retirement Board in 2006, this is to allow the staff greater flexibility to manage the asset allocation within the target allocations. Following the development of internal processes, procedures, parameters and an internal control framework approved by the Retirement Board, staff intends to thoughtfully manage the allocation either toward or away from the target allocation.

<table>
<thead>
<tr>
<th>Actual Assets ($billions)</th>
<th>Estimated Assets ($ billions)</th>
<th>Target Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/31/06</td>
<td>12/31/06</td>
<td>2007 Average</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>$26.5</td>
<td>$27.2</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>$12.2</td>
<td>$12.6</td>
</tr>
<tr>
<td>Real Estate</td>
<td>$4.0</td>
<td>$4.1</td>
</tr>
<tr>
<td>Private Equity</td>
<td>$1.0</td>
<td>$1.0</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>$14.3</td>
<td>$14.7</td>
</tr>
<tr>
<td>Cash</td>
<td>$1.4</td>
<td>$1.5</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>$0.1</td>
<td>$0.0</td>
</tr>
<tr>
<td>Total Fund</td>
<td>$56.4</td>
<td>$61.1</td>
</tr>
</tbody>
</table>

Estimated assets for December 31, 2007 are based on December 31, 2007 target allocations and associated total Defined Benefit fund estimated assets.
Composition of Investment Portfolio

The table below shows the Defined Benefit fund’s internal and external asset management by asset class, and as compared to a peer group of the largest 11 public funds as of June 30, 2006.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Internal Management</th>
<th>External Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPERS</td>
<td>Peer Group</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>83.4%</td>
<td>65.3%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>0.0%</td>
<td>28.6%</td>
</tr>
<tr>
<td>U.S. Fixed Income</td>
<td>89.4%</td>
<td>88.6%</td>
</tr>
<tr>
<td>Non-U.S. Fixed Income</td>
<td>0.0%</td>
<td>46.7%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>27.3%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>0.0%</td>
<td>45.5%</td>
</tr>
<tr>
<td><strong>Weighted Averages</strong></td>
<td><strong>62.1%</strong></td>
<td><strong>60.2%</strong></td>
</tr>
</tbody>
</table>

The table shows that OPERS is similar to its peer group in the high use of internal management for U.S. Equity and U.S. Fixed Income and the high use of external management for the specialty asset classes such as Real Estate and Private Equity. The OPERS internal management of real estate is through real estate investment trust (REIT) securities. OPERS is somewhat dissimilar to the peer group in using external asset management exclusively in non-U.S. Equity. As noted in the Report from the Director—Investments, during 2007 staff will investigate the benefits and costs of managing passive non-U.S. equity internally.

OPERS’ use of internal asset management within the U.S. Equity and Fixed Income asset classes provides many advantages including:

- **Flexibility:** Rebalancing decisions are executed efficiently and effectively. Control over the assets enables us to reposition our portfolio when an opportunity occurs.

- **Cost control:** External asset management is a high-margin business, and over the long-term, asset management fees can create a material drag on net returns. As long as internally managed portfolios generate the expected excess return, there is a material benefit to OPERS in performance and cost savings. External asset management fees range from a multiple of 6 to 20 times the cost of managing assets internally.

- **Market insight:** Having some internal asset management provides important information across the marketplace to help in decision-making processes such as in the areas of:
  - External manager hiring and oversight—Staff is better able to assess external manager strengths and weaknesses.
  - Public/private markets—Frequently, staff can leverage information garnered from one asset class to aid decision-making in another asset class.
The table below shows OPERS’ active and passive asset management by asset class and in total, and compares the composition to a peer group of the largest 11 public funds as of June 30, 2006.

<table>
<thead>
<tr>
<th></th>
<th>Active Management</th>
<th>Passive Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPERS  Peer Group</td>
<td>OPERS  Peer Group</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>38.2%  44.8%</td>
<td>61.8%  55.2%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>80.0%  80.0%</td>
<td>20.0%  20.0%</td>
</tr>
<tr>
<td>U.S. Fixed Income</td>
<td>99.4%  88.2%</td>
<td>0.6%   11.8%</td>
</tr>
<tr>
<td>Weighted Averages</td>
<td>67.7%  65.5%</td>
<td>32.3%  34.5%</td>
</tr>
</tbody>
</table>

The table shows that OPERS is lower than the peer group in the use of active management in U.S. Equity while it is higher than the peer group in U.S. Fixed Income.

A list of the peer groups used in the analysis is found on page 6.

**Expected Fees**

Here are the expected annual external asset management fees by asset class for the Defined Benefit fund. The estimate of fees is based on the base-case estimate of an average market value of $62.3 billion.

OPERS anticipates $139.3 million in external management fees in 2007, representing a cost of 55.0 basis points. Of the total amount of external fees, 86% or $119.164 million is due to three asset classes, non-U.S. Equity, Real Estate and Private Equity. Over time, our external asset management fees will gradually increase in absolute dollars, and in basis points of the total fund, as we move toward the target allocation of 5% to Private Equity, a fee-intensive asset class. Non-U.S. Equity has the greatest dollar amount of external assets under management, resulting in its significant contribution to dollars paid in external manager fees—despite the fact that its fees are the lowest as measured in basis points.
Strategies

Return and Risk

The Defined Benefit fund’s performance objective is to earn a long-term rate of return that meets or exceeds the return of the Defined Benefit fund policy benchmark. Where markets are generally efficient, such as U.S. equity and U.S. fixed income, the outperformance goals are modest. In less-efficient markets, such as non-U.S. equity and private equity, the goals for incremental return above the indices are more aggressive.

The expected return of the Defined Benefit fund in 2007, based on internal estimates of asset class returns, ranges from 3.64% to 11.63%, with a single-point, base-case estimate of 7.64%.

The return estimates below were derived from the asset class return expectations developed by internal staff. The single-point estimate return of 7.64% is comprised of an expected return of 7.31% from the policy mix with an additional contribution of 0.33% through active management within the asset classes and individual portfolios.

<table>
<thead>
<tr>
<th>Asset Classes</th>
<th>2007 Return Assumptions</th>
<th>Variability Risk</th>
<th>Information and Sharpe Ratios*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pessimistic</td>
<td>Base</td>
<td>Optimistic</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>3.50%</td>
<td>7.50%</td>
<td>11.50%</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>3.00%</td>
<td>5.50%</td>
<td>8.00%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>4.00%</td>
<td>8.50%</td>
<td>13.00%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>6.00%</td>
<td>8.00%</td>
<td>10.00%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>6.00%</td>
<td>10.00%</td>
<td>14.00%</td>
</tr>
<tr>
<td>Cash</td>
<td>4.75%</td>
<td>5.25%</td>
<td>5.75%</td>
</tr>
</tbody>
</table>

Due to rounding, the total return may not appear to sum correctly from sources of return.

*The Information Ratio is derived by dividing the Active Return by its associated Tracking Error and is an appropriate measure of the relationship between Active Risk and Return. The Sharpe Ratio is derived by subtracting the Cash Return from the Policy and Total Returns, respectively, and dividing the difference by the associated Standard Deviation. The Sharpe Ratio is an appropriate measure of the relationship between Policy and Total Returns and Risks.
As stated in the Report from the Director—Investments, fund investments are measured and monitored within a specific framework, which identifies return and risk from three sources:

- **Policy**—the return and risk inherent in the policy asset mix adopted by the OPERS Retirement Board. The mix has expected return and variability characteristics that come from the underlying asset classes. The expected return of the OPERS Defined Benefit fund policy mix is 7.31% for 2007 with an estimated risk, or variability, of 8.98%. As such, two-thirds of the time, actual annual policy returns are expected to be in the -1.67% to +16.29% range.

- **Tactical**—the added return and risk introduced by allowing the actual asset mix to deviate from the policy asset mix. The previous table does not show any excess expected return from tactical asset allocation activities. However, staff may propose for the Retirement Board’s approval in 2007 changes in the fund policy that will allow staff the flexibility of using a tactical asset allocation strategy. Modeling indicates that the estimated variability in returns due to tactical risk is 0.04%.

- **Active**—the return and risk introduced through the use of active management within asset classes and portfolios, arising from asset class and portfolio compositions that are different than that of their benchmarks. Modeling of the expected composition of asset classes and portfolios indicates an expected active return of 0.33%, with an estimated variability of active returns of 0.38%. The estimated information ratio of active management is 0.87 (the expected active return divided by the expected variability of the active return).

In sum, the total expected return of the Defined Benefit fund in 2007 is the expected policy return of 7.31% plus 0.33% from active management, for a total of 7.64%. The estimated risk assumed in achieving this return is the combination of the policy risk of 8.98%, the tactical risk of 0.04%, and the active risk of 0.38%, for a total of 8.79%. The total risk is not the sum of the sources of risk due to the benefits of diversification. In fact, the total fund risk, or variability, inclusive of both tactical and active risk is lower than the policy risk due to the diversifying nature of these sources of risk.
**Active Return and Risk**

This chart details the expected excess performance (active return) over the respective indices and the tracking error (volatility of active returns) for each asset class, as well as the overall fund.

<table>
<thead>
<tr>
<th>Performance Objectives and Tracking Errors</th>
<th>2007 Policy Allocation in Percents</th>
<th>Active Return (Performance Objectives in basis points)</th>
<th>Active Return (Performance Contribution in basis points)</th>
<th>Target Tracking Error in basis points</th>
<th>Target Information Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>45.2%</td>
<td>24</td>
<td>11</td>
<td>34</td>
<td>0.71</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>24.0%</td>
<td>25</td>
<td>6</td>
<td>60</td>
<td>0.42</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>20.0%</td>
<td>65</td>
<td>13</td>
<td>130</td>
<td>0.50</td>
</tr>
<tr>
<td>Real Estate</td>
<td>8.0%</td>
<td>7</td>
<td>1</td>
<td>250</td>
<td>0.03</td>
</tr>
<tr>
<td>Private Equity</td>
<td>2.4%</td>
<td>100</td>
<td>2</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cash</td>
<td>0.0%</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>0.4%</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total Defined Benefit Fund</td>
<td>100.0%</td>
<td>NA</td>
<td>33</td>
<td>38</td>
<td>0.87</td>
</tr>
</tbody>
</table>

The table shows an anticipated active management contribution of 33 basis points to the fund’s return. The 38 basis points of estimated tracking error indicate a 66% probability that the active return will be in a range of -5 basis points to +71 basis points. This confidence interval is arrived at by subtracting the tracking error from, and adding the tracking error to, the expected active return. The target contribution to fund performance of 33 basis points is the same as that for 2006.

The active return for the U.S. Equity portfolio reflects an increase in the expected outperformance for the internally managed U.S. Equity Russell 3000 Index portfolio and changes to the current manager line-up. Given the historical performance exhibited by this index portfolio, greater flexibility for using derivatives and strategic alternatives to unlock the potential for garnering excess returns, the alpha expectation for this portfolio has been increased to five basis points from one basis point.

The decrease for the Global Bonds portfolio is reflective of the transition towards long-duration bonds. The portfolio is targeted to hold 40% long-term bonds having an expected outperformance of zero basis points by December 2007 due to transaction costs associated with transitioning to the new portfolio.

The statistics shown in the table above are rolled up from the individual asset classes. The tracking error that results at the fund level is lower than would be suggested by a simple weighted average due to the diversifying effects of the active return interaction among the asset classes.
Health Care

Asset Management

Asset Size and Expected Growth
The OPERS Health Care fund had assets of $12.0 billion at July 31, 2006 and anticipated assets of $12.4 billion for December 31, 2006. The 2007 expected annual return is 7.01%, within an expected range of 3.68% to 10.34%. The 2007 net cash flow (contributions less benefit payments) is estimated to be negative $0.6 billion.

The table below summarizes these statistics to arrive at a probability estimate of the ending value of the fund at December 31, 2007. The table provides a confidence interval of the ending value of the investments portfolio at December 31, 2007. There is a 66% probability that the ending value will be between the pessimistic estimate and the optimistic estimate of $12.2 billion and $13.1 billion, respectively. Statistically, there is a 17% chance that the ending value will be below the pessimistic estimate of $12.2 billion, and a 17% chance that the ending value will be greater than the optimistic estimate of $13.1 billion.

<table>
<thead>
<tr>
<th></th>
<th>Pessimistic Case</th>
<th>Base Case</th>
<th>Optimistic Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/31/06 Market Value ($ billion)</td>
<td>$12.4</td>
<td>$12.4</td>
<td>$12.4</td>
</tr>
<tr>
<td>Expected Total Return</td>
<td>3.68%</td>
<td>7.01%</td>
<td>10.34%</td>
</tr>
<tr>
<td>Expected Investment Gain ($ billion)</td>
<td>$0.5</td>
<td>$0.9</td>
<td>$1.3</td>
</tr>
<tr>
<td>Expected Cash Flow ($ billion)</td>
<td>($0.6)</td>
<td>($0.6)</td>
<td>($0.6)</td>
</tr>
<tr>
<td>12/31/07 Market Value ($ billion)</td>
<td>$12.2</td>
<td>$12.6</td>
<td>$13.1</td>
</tr>
</tbody>
</table>

The anticipated asset figure of $12.4 billion for December 31, 2006 is derived by a smoothing projection that incorporates both the actual Health Care fund return through July 31, 2006 and the expected full year return for 2006 presented in the 2006 Investment Plan.

Ennis Knupp + Associates calculates Investment Policy return estimates for the OPERS Health Care asset mix over a 15-year time horizon. The expected average annual return is 7.2% with an expected volatility of 8.8%.
Asset Allocation

The target asset allocation and ranges for 2007 are:

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>12/31/07 Target</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>30.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>15.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td>REITS</td>
<td>5.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td><strong>Subtotal Equity</strong></td>
<td><strong>50.0%</strong></td>
<td></td>
</tr>
<tr>
<td>Global Bonds</td>
<td>15.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td>TIPS</td>
<td>20.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td>Short-Duration</td>
<td>15.0%</td>
<td>+/- 3%</td>
</tr>
<tr>
<td>Cash</td>
<td>&lt;1.0%</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Subtotal Debt</strong></td>
<td><strong>50.0%</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total Fund</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
</tr>
</tbody>
</table>

There are no readily available peer universes for comparable health care funds run by similarly large public pension funds. The asset mix shown above was developed based on an asset-liability study completed in 2004, which established that the level of risk assumed in the asset mix is appropriate for OPERS’ characteristics and circumstances.

Throughout 2007 and beyond, staff will work with OPERS’ consultants to recommend certain enhancements to the asset mix and asset management strategies targeted at raising the expected return within acceptable risk. While not all of these actions have been identified, some are described in the Asset Class Strategies and Resources and Initiatives sections.

<table>
<thead>
<tr>
<th>Actual Assets ($ billions)</th>
<th>Estimated Assets ($ billions)</th>
<th>Target Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/31/06</td>
<td>12/31/06</td>
<td>Avg. 2007</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>$4.0</td>
<td>$4.1</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>$2.1</td>
<td>$2.1</td>
</tr>
<tr>
<td>REIT</td>
<td>$0.6</td>
<td>$0.6</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>$1.9</td>
<td>$1.9</td>
</tr>
<tr>
<td>TIPS</td>
<td>$1.9</td>
<td>$2.0</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>$1.3</td>
<td>$1.4</td>
</tr>
<tr>
<td>Cash</td>
<td>$0.2</td>
<td>$0.2</td>
</tr>
<tr>
<td><strong>Total Fund</strong></td>
<td>$12.0</td>
<td>$12.4</td>
</tr>
</tbody>
</table>

Estimated assets for December 31, 2007 are based on December 31, 2007 target allocation and associated total Health Care fund estimated assets.
Composition of Investment Portfolio
The table below shows the Health Care fund’s internal and external asset management by asset class, and in total.

<table>
<thead>
<tr>
<th></th>
<th>Internal Management</th>
<th>External Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPERS</td>
<td>OPERS</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>83.4%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Non U.S Equity</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>REITs</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>85.3%</td>
<td>14.8%</td>
</tr>
<tr>
<td>TIPS</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Weighted Averages</td>
<td>73.1%</td>
<td>26.9%</td>
</tr>
</tbody>
</table>

OPERS predominantly uses internal management for the Health Care fund, except for the non-U.S. Equity component, which is managed exclusively by external managers. Furthermore, the Health Care fund uses:

- A higher proportion of more liquid securities and no private-market securities due to the greater need for liquidity and the shorter duration of this fund, in comparison to the Defined Benefit fund.
- Inflation protected securities (TIPS) are used as a hedge against observed high inflation in health care costs.

OPERS’ use of internal asset management within the U.S. Equity and Fixed Income asset classes provides many advantages including:

- Flexibility: Rebalancing decisions are executed efficiently and effectively. Control over the assets enables us to reposition our portfolio when an opportunity arises.
- Cost control: External asset management is a high-margin business, and over the long-term, asset management fees can create a material drag on net returns. As long as internally managed portfolios generate the expected excess return, there is a material benefit to OPERS in performance and cost savings. External asset management fees range from a multiple of six to 20 times the cost of managing assets internally.
- Market insight: Having some internal asset management provides important information across the marketplace to help in decision-making processes such as in the areas of:
  - External manager hiring and oversight—Staff is better able to assess external manager strengths and weaknesses.
  - Public markets—Frequently, staff can leverage information garnered from one asset class to aid decision-making in another asset class.
The Health Care policy states that within the U.S. Equity, non-U.S. Equity, Global Bonds, and REIT asset classes, the fund will be managed in the same way as the Defined Benefit fund. Here is OPERS’ composition of active and passive asset management by asset class and in total.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Active Management</th>
<th>Passive Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPERS</td>
<td>OPERS</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>38.2%</td>
<td>61.8%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>80.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>REITs</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>99.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>TIPS</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Weighted Averages</td>
<td>73.1%</td>
<td>26.9%</td>
</tr>
</tbody>
</table>

Passive management is utilized in the more-efficient U.S. Equity market. The remainder of the fund is substantially actively managed.

**Expected Fees**

Here are the expected annual external asset management fees by asset class and for the Health Care fund. The estimate of fees is based on the base-case estimate of the average market value of $12.5 billion.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Average Assets External ($ billions)</th>
<th>Estimated Annual Fee ($ millions)</th>
<th>Fees of External Assets (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>0.777</td>
<td>1.926</td>
<td>24.8</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>0.270</td>
<td>0.943</td>
<td>34.9</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>2.021</td>
<td>4.981</td>
<td>24.6</td>
</tr>
<tr>
<td>REITs</td>
<td>0.000</td>
<td>0.000</td>
<td>0.0</td>
</tr>
<tr>
<td>TIPS</td>
<td>0.000</td>
<td>0.000</td>
<td>0.0</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>0.000</td>
<td>0.000</td>
<td>0.0</td>
</tr>
<tr>
<td>Cash</td>
<td>0.000</td>
<td>0.000</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Fund</td>
<td>3.068</td>
<td>7.849</td>
<td>25.6</td>
</tr>
</tbody>
</table>

In 2007, the external management fees are estimated at $7.849 million, representing a cost of 25.6 basis points. Of the total amount of external fees, 63%, or $4.981 million, is for the non-U.S. Equity asset class. Non-U.S. Equity has the greatest dollar amount of external assets under management, resulting in its significant contribution to dollars paid in external manager fees—despite the fact that its fees are the lowest as measured in basis points.
Strategies

Return and Risk

The Health Care fund’s performance objective is to earn a long-term rate of return that meets or exceeds the return of the Health Care fund policy benchmark. Where markets are generally efficient, such as U.S. equity and U.S. fixed income, the outperformance goals are modest. In less-efficient markets, such as non-U.S. equity, the goals for incremental return above the indices are more aggressive.

The expected return of the Health Care fund in 2007, based on internal estimates of asset class returns, ranges from 3.68% to 10.34%, with a single-point, base-case estimate of 7.01%.

The return estimates below were derived from the asset class return expectations developed by internal staff. The single-point estimate of return of 7.01% is comprised of an expected return of 6.70% from the policy mix with an additional contribution of 0.31% through active management within the asset classes and individual portfolios.

<table>
<thead>
<tr>
<th>Asset Classes</th>
<th>2007 Return Assumptions</th>
<th>Variability Risk</th>
<th>Information and Sharpe Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pessimistic</td>
<td>Base</td>
<td>Optimistic</td>
</tr>
<tr>
<td>U.S. Equity</td>
<td>3.50%</td>
<td>7.50%</td>
<td>11.50%</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>3.00%</td>
<td>5.50%</td>
<td>8.00%</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>4.00%</td>
<td>8.50%</td>
<td>13.00%</td>
</tr>
<tr>
<td>REITs</td>
<td>6.00%</td>
<td>8.00%</td>
<td>10.00%</td>
</tr>
<tr>
<td>TIPS</td>
<td>3.43%</td>
<td>5.89%</td>
<td>8.36%</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>4.27%</td>
<td>5.15%</td>
<td>6.02%</td>
</tr>
<tr>
<td>Cash</td>
<td>4.75%</td>
<td>5.25%</td>
<td>5.75%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources of Return and Risk</th>
<th>2007 Return Assumptions</th>
<th>Variability Risk</th>
<th>Information and Sharpe Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy</td>
<td>3.73%</td>
<td>6.70%</td>
<td>9.68%</td>
</tr>
<tr>
<td>Tactical</td>
<td>-0.05%</td>
<td>0.00%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Active</td>
<td>0.01%</td>
<td>0.31%</td>
<td>0.61%</td>
</tr>
<tr>
<td>Total Return</td>
<td>3.68%</td>
<td>7.01%</td>
<td>10.34%</td>
</tr>
</tbody>
</table>

Due to rounding, the total return may not appear to sum correctly from sources of return.

*The Information Ratio is derived by dividing the Active Return by its associated Tracking Error and is an appropriate measure of the relationship between Active Risk and Return. The Sharpe Ratio is derived by subtracting the Cash Return from the Policy and Total Returns, respectively, and dividing the difference by the associated Standard Deviation. The Sharpe Ratio is an appropriate measure of the relationship between Policy and Total Returns and Risks.

As stated in the Report from the Director—Investments, fund investments are measured and monitored within a specified framework, which identifies return and risk from three sources:

- Policy—the return and risk inherent in the policy asset mix adopted by the OPERS Retirement Board. The mix has expected return and variability characteristics that come from the underlying asset classes. The expected return of the OPERS Health Care fund policy mix is 6.70% for 2007 with an estimated risk, or variability, of 7.25%. As such, two-thirds of the time, actual annual policy returns are expected to be in the -0.55% to +13.95% range.
Tactical—the added return and risk introduced by allowing the actual asset mix to deviate from the policy asset mix. The previous table does not show excess expected return from tactical asset allocation activities. However, staff may propose for the Retirement Board’s approval in 2007 changes in the fund policy that will allow staff the flexibility of using a tactical asset allocation strategy. Modeling indicates that the estimated variability in returns due to tactical risk is 0.05%.

Active—the return and risk introduced through the use of active management within asset classes and portfolios, arising from asset class and portfolio compositions that are different than that of their benchmarks. Modeling of the expected composition of asset classes and portfolios indicates an expected active return of 0.31%, with an estimated variability of active returns of 0.30%. The estimated information ratio of active management is 1.03 (the expected active return divided by the expected variability of the active return).

In sum, the total expected return of the Health Care fund in 2007 is the expected policy return of 6.70%, plus 0.31% from active management, for a total of 7.01%. The estimated risk assumed in achieving this return is the combination of the policy risk of 7.25%, the tactical risk of 0.05%, and the active risk of 0.30%, for a total of 7.10%. The total risk is not the sum of the sources of risk due to the benefits of diversification. In fact, the total fund risk, or variability, inclusive of both tactical and active risk is lower than the policy risk due to the diversifying nature of these sources of risk.

Active Return and Risk
Shown here is the expected excess performance (active return) over the respective indices and the tracking error (volatility of active returns) for each asset class, as well as the overall fund.

<table>
<thead>
<tr>
<th>Performance Objectives and Tracking Errors</th>
<th>2007 Policy Allocation in Percent</th>
<th>Active Return (Performance Objectives in basis points)</th>
<th>Active Return (Performance contribution in basis points)</th>
<th>Target Tracking Error in basis points</th>
<th>Target Information Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>30.0%</td>
<td>24</td>
<td>7</td>
<td>34</td>
<td>0.71</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>15.0%</td>
<td>32</td>
<td>5</td>
<td>60</td>
<td>0.53</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>15.0%</td>
<td>65</td>
<td>10</td>
<td>130</td>
<td>0.50</td>
</tr>
<tr>
<td>REITS</td>
<td>5.0%</td>
<td>50</td>
<td>3</td>
<td>250</td>
<td>0.20</td>
</tr>
<tr>
<td>TIPS</td>
<td>20.0%</td>
<td>15</td>
<td>3</td>
<td>20</td>
<td>0.75</td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>15.0%</td>
<td>25</td>
<td>4</td>
<td>40</td>
<td>0.63</td>
</tr>
<tr>
<td>Total Health Care Fund</td>
<td>100.0%</td>
<td>32</td>
<td>31</td>
<td>30</td>
<td>1.03</td>
</tr>
</tbody>
</table>

It is anticipated that active management will contribute 31 basis points return to the fund. The 30 basis points of estimated tracking error indicate a 66% probability that the active return will be in a range of +2 basis points to +62 basis points. This confidence interval is arrived at by subtracting the tracking error (active risk) from, and adding the tracking error to, the expected active return.

The statistics shown in the table above are compiled from individual asset classes. The tracking error that results at the fund level is lower than would be suggested by a simple weighted average due to the diversifying effects of the active return interaction among the asset classes.
Defined Contribution

Asset Management
From its inception on January 2, 2003 through July 31, 2006, the Defined Contribution fund assets have grown to approximately $145 million. Asset growth has averaged approximately $40 million every 12 months. Future growth is expected to be equal to, or slightly above, historical averages.

Asset Allocation
The target asset allocation and ranges for the pre-mix portfolios are shown here. Target asset allocations for the pre-mix portfolio have not changed since the inception of the Defined Contribution fund.

Quarterly, the asset allocation of each portfolio is compared to its ranges, and rebalanced to target if outside the range. Rebalances occur more frequently in the more aggressive portfolios.
Composition of Investment Portfolio

Background
In 2002, OPERS staff and external consultants recommended the current Defined Contribution fund investment structure, which includes a multi-tiered investment option line up with pre-mix funds and core investment options. This continues to be a popular structure, particularly within the large-plan segment of member-directed pension plans.

The investment structure continues to satisfy the investment objective of the Defined Contribution fund, which is to offer an array of funds that provides participants the ability to construct a portfolio that is:

- Diversified by asset class and investment style,
- Spans the risk-return spectrum,
- Outperforms appropriate benchmarks,
- Avoids excessive risk, and
- Maintains low fees.

Plan Structure
As stated in the Defined Contribution fund’s Statement of Investment Objectives and Policies, creating Defined Contribution’s annual plan is the joint responsibility of the Investment Division and the Defined Contribution department. The Investments Division is primarily responsible for ensuring the plan meets the investment objectives of each investment option, and the Defined Contribution department is primarily responsible for ensuring the plan design meets the needs of members.

The Defined Contribution fund is composed of investments directed by members in the Member-Directed and Combined plans. At September 1, 2006, participation in the Member-Directed plan included approximately 7,000 members, while the participation rate in the Combined plan included approximately 6,000 members. The monthly percentage of new members defaulting to the Traditional plan has varied between 75% and 92%. New members who actively select a retirement plan consistently followed these allocations: Traditional plan, 74%; Member-Directed plan, 14%; and Combined plan, 12%.
Periodically, staff compares the OPERS Defined Contribution fund to peers that provide defined contribution investment options to participants to stay abreast of best practices and monitor industry trends. Current findings on marketplace trends include:

- Many plan sponsors continue to offer a large number of investment options (15 or more options). However, some plan sponsors are reducing the number of investment options to simplify the account management process for participants.

- Many plan sponsors offer a multi-tiered investment structure of balanced lifestyle and/or lifecycle funds and individual funds.

- Target retirement date (lifecycle) funds are quickly gaining acceptance.

- Self-directed brokerage accounts are used by some plan sponsors of corporate plans. However, participants do not utilize this service very often when it is available.

- Managed accounts continue to gain acceptance slowly.

Consistent with findings presented in the OPERS Defined Contribution annual review conducted by Ennis Knupp + Associates, staff is evaluating the alternative structures, benefits and costs of lifecycle funds. The evaluation will indicate whether OPERS should provide lifecycle funds, how they should be structured and methods to ensure the funds are appropriately utilized by members.
### Expected Fees

The information below shows the expected asset management fees for each investment option and underlying investment manager. The estimates of fees are based on a projected average of assets and expected basis points of fees for 2007 and reflect the benefit of consolidating portfolios across the Defined Benefit, Health Care and Defined Contribution funds.

### Expected Fees

<table>
<thead>
<tr>
<th>OPERS Investment Options</th>
<th>Average Assets ($ millions)</th>
<th>Fees ($ millions)</th>
<th>Fees (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Value</td>
<td>9.263</td>
<td>0.019</td>
<td>21</td>
</tr>
<tr>
<td>Bond</td>
<td>6.923</td>
<td>0.013</td>
<td>19</td>
</tr>
<tr>
<td>Stock Index</td>
<td>17.135</td>
<td>0.005</td>
<td>3</td>
</tr>
<tr>
<td>Large Cap</td>
<td>12.939</td>
<td>0.041</td>
<td>32</td>
</tr>
<tr>
<td>Small Cap</td>
<td>11.482</td>
<td>0.034</td>
<td>30</td>
</tr>
<tr>
<td>Non-U.S.</td>
<td>10.231</td>
<td>0.041</td>
<td>40</td>
</tr>
<tr>
<td>Conservative</td>
<td>10.796</td>
<td>0.022</td>
<td>20</td>
</tr>
<tr>
<td>Moderate</td>
<td>56.466</td>
<td>0.117</td>
<td>21</td>
</tr>
<tr>
<td>Aggressive</td>
<td>45.953</td>
<td>0.101</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>181.2</strong></td>
<td><strong>0.394</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

### Expected Fees by Manager Mandate

<table>
<thead>
<tr>
<th>OPERS Investment Options</th>
<th>Underlying Investment Manager Mandate</th>
<th>Average Assets ($ millions)</th>
<th>Fees ($ million)</th>
<th>Fees (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Value</td>
<td>Invesco Stable Value</td>
<td>20.251</td>
<td>0.036</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Goode Stable Value</td>
<td>8.679</td>
<td>0.030</td>
<td>35</td>
</tr>
<tr>
<td>Bond</td>
<td>Fidelity Broad Market Duration</td>
<td>11.965</td>
<td>0.024</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Smith Breeden Core</td>
<td>11.965</td>
<td>0.020</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Fort Washington High Yield</td>
<td>1.861</td>
<td>0.005</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Capital Guardian Emerging Market Debt</td>
<td>0.798</td>
<td>0.003</td>
<td>35</td>
</tr>
<tr>
<td>Stock Index</td>
<td>BGI Russell 3000 Index</td>
<td>46.333</td>
<td>0.014</td>
<td>3</td>
</tr>
<tr>
<td>Large Cap</td>
<td>GMO U.S. Core</td>
<td>13.616</td>
<td>0.063</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Wellington Large Cap Research</td>
<td>20.976</td>
<td>0.055</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>BGI Russell 1000 Index</td>
<td>2.208</td>
<td>0.002</td>
<td>10</td>
</tr>
<tr>
<td>Small Cap</td>
<td>Invesco Structured Small Cap</td>
<td>9.612</td>
<td>0.048</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>BGI Russell 2000 Index</td>
<td>9.612</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>Non-U.S.</td>
<td>Alliance Bernstein ACWI xU.S. Active</td>
<td>13.986</td>
<td>0.049</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Acadian ACWI xU.S. Active</td>
<td>6.993</td>
<td>0.038</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>BGI ACWixUS Index</td>
<td>2.331</td>
<td>0.005</td>
<td>22</td>
</tr>
</tbody>
</table>
Strategies

Pre-Mix Portfolios
The returns presented below are neither predictions of, nor guarantees for, future performance. The returns result from the performance objectives of the underlying Member-Directed funds stated in the Member-Directed funds policy, which provide a framework for the Investment staff to manage the funds.

Asset Class Return and Risk
The returns of the pre-mix portfolios are comprised of asset class returns and active returns. The asset class returns and risk (defined by standard deviations) are provided by Ennis Knupp + Associates, and are based on their capital markets modeling assumptions. Those assumptions are based on historical total returns, fundamental data and valuation levels. The Investments staff does not incur tactical risk in the management of the pre-mix portfolios and rebalances quarterly if the allocation is outside its range.

<table>
<thead>
<tr>
<th>Asset Class and Pre-Mix Portfolio Return &amp; Risk</th>
<th>Return</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Classes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stable Value</td>
<td>4.9%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Bond</td>
<td>5.9%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Stock Index</td>
<td>8.9%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Large Cap</td>
<td>8.8%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>9.8%</td>
<td>21.8%</td>
</tr>
<tr>
<td>Non-U.S. Stock</td>
<td>9.0%</td>
<td>18.8%</td>
</tr>
<tr>
<td><strong>Pre-Mix Portfolios</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservative Composite</td>
<td>6.4%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Conservative Active</td>
<td>0.2%</td>
<td>NA</td>
</tr>
<tr>
<td>Conservative Total</td>
<td>6.6%</td>
<td>NA</td>
</tr>
<tr>
<td>Moderate Composite</td>
<td>7.5%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Moderate Active</td>
<td>0.3%</td>
<td>NA</td>
</tr>
<tr>
<td>Moderate Total</td>
<td>7.8%</td>
<td>NA</td>
</tr>
<tr>
<td>Aggressive Composite</td>
<td>8.2%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Aggressive Active</td>
<td>0.3%</td>
<td>NA</td>
</tr>
<tr>
<td>Aggressive Total</td>
<td>8.5%</td>
<td>NA</td>
</tr>
</tbody>
</table>
Active Return and Risk
Active returns are estimated by applying the performance objectives of the Member-Directed funds to the target asset allocation for each pre-mix portfolio.

<table>
<thead>
<tr>
<th>Active Return and Risk</th>
<th>Pre-Mix Portfolios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Objective</td>
<td>Conservative</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Tracking Error</td>
<td>48</td>
</tr>
<tr>
<td>Information Ratio</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Member-Directed Funds Allocation

<table>
<thead>
<tr>
<th>Member-Directed Funds Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Value</td>
</tr>
<tr>
<td>Bond</td>
</tr>
<tr>
<td>Bond</td>
</tr>
<tr>
<td>Stock Index</td>
</tr>
<tr>
<td>Large Cap</td>
</tr>
<tr>
<td>Small Cap</td>
</tr>
<tr>
<td>Non-U.S. Stock</td>
</tr>
</tbody>
</table>

Member-Directed Funds

Stable Value Fund
Staff will explore the viability of internal management of the Stable Value Fund, to reduce management fees.

Bond Fund
Fort Washington and Capital Guardian were added in 2006 to provide dedicated high yield and emerging market debt exposure. Staff will investigate the benefits and costs associated with utilizing internal management of core bond assets.

Stock Index Fund
Staff will investigate the benefits and costs associated with utilizing internal U.S. equity index management.

Large Cap Fund
Staff will investigate the utilization of enhanced index management.

Small Cap Fund
Staff will continue to evaluate the benefits and costs of adding an additional active small cap manager.

Non-U.S. Stock Fund
The non-U.S. Stock Fund was restructured in October 2006 to include emerging markets exposure. The Alliance Bernstein and Acadian All Country World Index Excluding the United States (ACWI xU.S.) portfolios replaced the Capital Guardian and Goldman Sachs Europe, Australia, Far East (EAFE) portfolios. The BGI ACWI xU.S. index fund replaced the BGI EAFE index fund. The new structure will reduce fees from 48 basis points to 40 basis points, creating a savings of more than $18,000 annually.
### Performance Objectives and Risk Control

The performance objectives and risk controls below are neither predictions of, nor guarantees for, future performance. The performance objectives of the Member-Directed funds are defined by the Member-Directed funds policy, which provides a framework for the Investment staff to manage the funds.

<table>
<thead>
<tr>
<th>Stable Value</th>
<th>Target Allocation</th>
<th>Average Assets ($millions)</th>
<th>Benchmark</th>
<th>Performance Objective</th>
<th>Tracking Error</th>
<th>Information Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invesco Stable Value</td>
<td>100%</td>
<td>$28.9</td>
<td>Custom SV</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Goode Stable Value</td>
<td>70%</td>
<td>20.3</td>
<td>Custom SV</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Bond</td>
<td>30%</td>
<td>8.7</td>
<td>Custom SV</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Fidelity Core Bond</td>
<td>100%</td>
<td>$26.6</td>
<td>LB US Universal</td>
<td>30</td>
<td>70</td>
<td>0.43</td>
</tr>
<tr>
<td>Smith Breeden</td>
<td>45%</td>
<td>12.0</td>
<td>LB Aggregate</td>
<td>50</td>
<td>60</td>
<td>0.83</td>
</tr>
<tr>
<td>Fort Washington</td>
<td>45%</td>
<td>12.0</td>
<td>LB Aggregate</td>
<td>50</td>
<td>60</td>
<td>0.83</td>
</tr>
<tr>
<td>Capital Guardian</td>
<td>7%</td>
<td>1.9</td>
<td>LB High Yield</td>
<td>100</td>
<td>400</td>
<td>0.25</td>
</tr>
<tr>
<td>Stock Index</td>
<td>3%</td>
<td>0.8</td>
<td>JPM EMD</td>
<td>100</td>
<td>400</td>
<td>0.25</td>
</tr>
<tr>
<td>BGI</td>
<td>100%</td>
<td>$46.3</td>
<td>Russell 3000</td>
<td>0</td>
<td>15</td>
<td>0.00</td>
</tr>
<tr>
<td>Large Cap</td>
<td>100%</td>
<td>$36.8</td>
<td>Russell 1000</td>
<td>40</td>
<td>125</td>
<td>0.32</td>
</tr>
<tr>
<td>BGI</td>
<td>6%</td>
<td>2.2</td>
<td>Russell 1000</td>
<td>0</td>
<td>25</td>
<td>0.00</td>
</tr>
<tr>
<td>GMO</td>
<td>37%</td>
<td>13.6</td>
<td>Russell 1000</td>
<td>100</td>
<td>400</td>
<td>0.25</td>
</tr>
<tr>
<td>Wellington</td>
<td>57%</td>
<td>21.0</td>
<td>Russell 1000</td>
<td>84</td>
<td>300</td>
<td>0.28</td>
</tr>
<tr>
<td>Small Cap</td>
<td>100%</td>
<td>$19.2</td>
<td>Russell 2000</td>
<td>100</td>
<td>300</td>
<td>0.33</td>
</tr>
<tr>
<td>BGI</td>
<td>50%</td>
<td>9.6</td>
<td>Russell 2000</td>
<td>0</td>
<td>75</td>
<td>0.00</td>
</tr>
<tr>
<td>Invesco</td>
<td>50%</td>
<td>9.6</td>
<td>Russell 2000</td>
<td>120</td>
<td>500</td>
<td>0.24</td>
</tr>
<tr>
<td>Non-U.S. Stock</td>
<td>100%</td>
<td>$23.3</td>
<td>MSCI ACWIxU.S.</td>
<td>50</td>
<td>250</td>
<td>0.20</td>
</tr>
<tr>
<td>BGI</td>
<td>10%</td>
<td>2.3</td>
<td>MSCI ACWIxU.S.</td>
<td>0</td>
<td>125</td>
<td>0.00</td>
</tr>
<tr>
<td>Acadian</td>
<td>30%</td>
<td>7.0</td>
<td>MSCI ACWIxU.S.</td>
<td>350</td>
<td>600</td>
<td>0.58</td>
</tr>
<tr>
<td>Alliance Bernstein</td>
<td>60%</td>
<td>14.0</td>
<td>MSCI ACWIxU.S.</td>
<td>200</td>
<td>400</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Tactical Outlook

Currently, discretionary activity at the total fund level for the Defined Benefit and Health Care funds is limited to the rebalancing of the fund toward a target allocation. Furthermore, staff is required to take action when asset allocations fall outside of ranges. For 2007, the Division is developing a proposal for the Retirement Board’s approval to change its policy to provide for rebalancing away from targets.

Data gathered from a variety of sources was used to determine the investment outlook for 2007. Information considered includes the Macroeconomic Advisers’ (MA) outlook, research from investment banks, discussions with and research by investment managers, feedback from generalist and specialized consultants, discussions with peers and industry experts, and academic and informational periodicals.

Following are two overviews: The economic outlook and the investment outlook. The economic outlook was provided by our economic adviser, MA. The investment outlook, provided by OPERS Investment staff, is summarized by asset class.

Economic Outlook

- After slowing in 2006, Gross Domestic Product (GDP) growth is expected to pick up in the remainder of 2006, and is estimated to return to near-trend growth of 3.25% in 2007.
- Recent upward revisions for the growth of labor compensation are a double-edged sword: positive in that it suggests more support to consumer spending growth, near term; and on the other hand, raising upside inflation risks. If the inflation risk is realized and met by an aggressive response from the Federal Reserve, growth in 2007 and beyond might be less than projected.
- Core Consumer Price Index (CPI) inflation (excluding food and energy) is projected to decline from approximately 2.9% in 2006 to 2.6% in 2007. MA’s research suggests that there has been little, if any, pass-through of energy price increases to core inflation.
- The 10-year Treasury bond yield is expected to drift up from near 4.7%, its level at the time of this forecast (September 1), to near 5.15% by the second half of 2007.
- A resumption of trend growth in 2007 sees corporate profits rise a modest 4.7%. This is slightly below the expected growth of national income of 5.4% for 2007, and reflects the squeeze on margins we expect to begin in 2006 and extend through 2008.

The complete 2007 Economic Outlook by Macroeconomic Advisers is provided in this document, beginning on page 103 in Appendix B.
Investments Outlook

U.S. Equity Outlook

- Expected return is 3.5%-11.5% for the Russell 3000 with a target return of 7.5%.
- High end of the range would be accomplished by expansion in the valuation multiples, though stocks are currently in the fair-value range trading at a modest premium to long-term valuation levels.
- Dividend yield may make up a larger portion of the market’s return due to continued high corporate cash flow and profitability. This combination points to a potential increase in payout ratios or stock buybacks.
- Dampened expectations for continued Federal Reserve tightening offer a favorable backdrop for equity sentiment and returns.
- The late stage of the bull market makes significantly higher returns less likely and returns at the lower end of the range more statistically feasible.
- Energy markets and terrorist threats continue to raise the volatility of the marketplace.

Global Bonds Outlook

- Expected return is 3.0%-8.0% for the Lehman Universal Index with a target return of 5.5%.
- The Federal Open Market Committee has indicated any future changes in monetary policy will be data dependent. The Fed fund's target is likely to stay near the current level of 5.25%.
- Corporate bonds may slightly underperform treasuries and agencies. Corporate bond spreads may remain tight. Increasing leveraged buyout activity remains a concern.
- High-yield bonds may underperform as a slower pace of economic activity leads to a rise in default rates.
- Emerging market debt may lag with bond spreads near an all-time compression, and commodity spreads likely to moderate.

Non-U.S. Equity Outlook

- Expected return is 4%-13% for the MSCI ACWI x U.S. with a target return of 8.5%.
- Base case is 8.5% returns, based on mid-single digit capital market returns, and an extra 1%-3% on currency returns. Non-U.S. markets look to be fairly valued.
- Global growth is expected to moderate but continue in 2007. For the first time in decades, all major global economies are showing synchronized, positive growth. Optimistic case is that synchronized global growth leads to continued strong returns, with a possible tailwind from U.S. dollar weakening.
- Non-U.S. small cap stocks look overvalued relative to large cap. Non-U.S. small cap should remain close to neutral weight in 2007.
- Emerging markets remain attractive overall. While there are dangers of short-term volatility, including the chance of short-term corrections and negative returns, mid-term and long-term advantages in terms of growth, profitability and valuation remain.
Emerging markets overweight has been scaled back, but neutral-to-modest overweight position is recommended for 2007.

A long-value cycle in non-U.S. may finally be turning toward growth, but recommend remaining neutral value versus growth for 2007.

No strong currency views. Secular U.S. dollar weakness, particularly against Asian and developing market currencies, is more likely to continue than not, but it’s difficult to predict the timing, speed and magnitude of currency and current account adjustments.

Real Estate Outlook
- Expected return is 6%-10% with a target return of 8%.
- Core properties should trade at capitalization rates between 5.00% and 6.50%.
  - Leverage is neutral or slightly negative, which should put upward pressure on capitalization rates and continue to reduce the number of leveraged buyers.
  - The amount of capital that institutional investors are trying to invest in real estate will probably offset any pricing pressure caused by increased borrowing costs.
  - Dramatic shifts in capitalization rates are not expected in 2007.
- It’s anticipated that the appreciation component of the National Council of Real Estate Investment Fiduciaries Property Index (NPI) should contribute a smaller portion of the total return than it has contributed for the past three calendar years.
  - The appraisal lag effect should be substantially reflected in the current valuations.
  - Real estate investors can no longer count on falling cap rates as the predominant source of portfolio returns.
  - An increase in portfolio value will be driven by an increase in portfolio cash flow.
- Two major risks to the performance expectations for private market real estate are:
  - A dramatic shift in capital out of real estate would put upward pressure on cap rates.
  - A prolonged and widespread economic slowdown would put downward pressure on the demand for space and lead to decreases in property-level cash flows.

Private Equity Outlook
- Expected return is 6%-14% with a target return of 10%.
- Corporate finance investments should continue to experience gains through 2007, although rising interest rates may increase the cost of capital for new transactions.
- Venture capital investments are expected to show no significant gains or losses through 2007, as exit markets remain difficult.
U.S. Equity

Asset Management

Strategy

In 2007, the framework used in constructing the U.S. Equity portfolio will be reevaluated. The current approach considers the characteristics of large capitalization, small capitalization and index portfolios when categorizing portfolios. The benefits of evaluating the composition of the asset class portfolio based on categories corresponding to whether a portfolio is an index, enhanced index or actively managed portfolio will be analyzed.

The strategy for 2007 will continue to incorporate the use of both internal and external managers. The composition of the entire asset class will be evaluated to determine the appropriate managers to achieve goals, while working within the allotted risk budget. The investigation into new strategies or new manager searches is always considered in order to maintain an appropriate risk profile, and seek alpha (active return over the benchmark) where possible.

The following information provides an overview of the specific strategies employed by the internal index and active portfolios as well as the basic approach used for externally managed portfolios.

Active Portfolios—Internal

The R1000 Research portfolio represents 18.8% of the assets within the U.S. Equity asset class. This enhanced index product has been structured to achieve outperformance by utilizing a quintile ranking-based Stock Selection System (SSS), in combination with a risk management process and analytical judgment that results in a low tracking error. Stocks that pass this model ranking process are candidates to be overweighted, while issues that rank at the bottom of the SSS and the validation screens are candidates to be sold entirely or underweighted. The fundamental analysts and portfolio managers form a decision team for each benchmark economic sector. The Research portfolio was activated on October 10, 2002, and is benchmarked to the Russell 1000 Index.

Since the beginning of 2003, the Research portfolio has outperformed the Russell 1000 Index by more than 20 basis points on an annualized basis. The addition of a senior portfolio manager with assigned sectors will complete 2007 staffing needs. Maintaining an information ratio in the 0.45-0.50 range will result in an expected alpha of 47 basis points in calendar year 2007.

Active Portfolios—External

External managers represent approximately 20% of the U.S. Equity asset class. External managers are employed to supplement OPERS’ internal research and portfolio management capabilities by accessing different strategies than those managed internally.

The external managers envisioned for 2007 include eight large cap managers, which execute several different strategies for outperforming their respective benchmarks. AllianceBernstein and Wellington are considered to be more active than the other large cap managers due to their fundamental approach and tracking error targets that allow for greater divergence from the benchmark.

Barclays, JP Morgan, Piedmont, Goldman Sachs, PIMCO and the internal active portfolio each have lower tracking errors and are considered to be enhanced index managers. Each of the large cap managers, except for PIMCO, operates a stock-based, quantitatively oriented, risk-controlled product which results in low tracking error portfolios structured to closely match benchmarks.
PIMCO is not currently funded, but is anticipated to be included in 2007. This manager operates a cash-based, synthetic enhanced index portfolio, which employs equity futures contracts to obtain the exposure to the benchmark while managing the physical assets in the fixed income and over-the-counter derivatives markets. The manager of minority managers position has not been filled, but is anticipated to be funded in 2007.

The Standard and Poors 500 and Russell 1000 benchmarks are both large cap benchmarks used to measure relative performance for the large cap managers. The Russell 2000 is the benchmark used for the two external small cap managers. Fidelity and Invesco are the two external actively managed portfolios which have relatively high tracking error characteristics, although still considered to be core managers with no permanent or persistent style bias.

The U.S. Equity portfolio currently incorporates three Ohio-qualified firms and one minority-owned firm. Discussion on new manager mandates and searches is covered in more depth in the External Public Markets section of this document.

The size of each portfolio in dollars and as a percent of the asset class, as well as alpha objectives (net of fees) and tracking error for each external manager, are shown in the Schedule of Expected Performance and Volatility shown in the Performance Objectives and Risk Control section.

**Index Portfolio—Internal**

The U.S. Equity Index portfolio is internally managed by the Fund Management group, and represents 61.5% of the U.S. Equity asset class. The objective of the portfolio is to gain broad exposure to the U.S. equity market, deliver index-like returns plus five basis points and maintain a competitive profile. This portfolio is also generally used as the source of liquidity when the U.S. Equity asset class is involved with asset allocation changes.

Index management staff works in conjunction with the Trading and Quantitative research staff to develop and implement portfolio trading techniques and strategies designed to minimize transaction costs and portfolio turnover. The approach also results in low tracking error, or active risk, relative to the benchmark. The portfolio’s expected tracking error ceiling is 10 basis points—except during the period leading up to the Russell reconstitution when tracking error may increase to as much as 35 basis points. The index portfolio’s benchmark is the Russell 3000.

Staff will create a U.S. equity tactical asset allocation portfolio to manage large cap and small cap imbalances that occur from time to time.

**Performance Objectives and Risk Control—U.S. Equity Portfolio**

The U.S. Equity asset class benchmark is the Russell 3000 Index which is a broad-based index representing the U.S. equity universe. The allocation between actively managed (internal and external) and index portfolios is used to adjust the risk and return profile of the asset class portfolio. However, as stated earlier, this framework may be reevaluated by considering enhanced index as a category, in addition to active and index in structuring the portfolio.

The general asset class strategy is to construct a portfolio of individually managed portfolios that achieves the outperformance objective, while maintaining a balanced and risk-controlled profile that closely matches the benchmark. The internal index portfolio, with approximately 61% of the U.S. Equity assets, maintains a very low tracking error and therefore provides a foundation, or core, to the asset class with the performance for this segment expected to closely parallel that of the Russell 3000 benchmark.

The increase in aggregate portfolio tracking error from the benchmark occurs as a result of the actively managed portfolios within the asset class. When combining active portfolios with differing strategies, a diversification benefit generally is achieved. As such, managers and strategies are selected by considering interrelated risks and return characteristics, or correlations. This diversification benefit results in a lower tracking error estimate than would be implied by a simple weighted average of the individual portfolio tracking errors. Therefore, despite estimates of tracking errors of up to
450 basis points, the resulting aggregate tracking error is estimated at only 34 basis points. To monitor the degree to which the asset class portfolio varies from the benchmark, the tracking errors of the individual portfolios and the aggregate portfolio are measured on a regular basis.

The excess return, or alpha, expectation for the U.S. Equity asset class composite is 24 basis points as shown in the accompanying table. The allocation strategy among the portfolios, which have varying degrees of expected alpha, gives rise to the combined alpha expectation. The active managers have expected alphas in the 17 to 120 basis point range. These active return expectations are based on the confidence level with each manager as well as the specific strategy that each employs. When combined with the index portfolio in the proportions shown, the aggregate expected alpha for the U.S. Equity portfolio in 2007 is 24 basis points, which is unchanged from the 2006 level.

The expected excess return for 2007 is largely due to the performance objective for the index portfolio increasing from one basis point to five basis points being offset by changing allocations and transaction costs. The higher performance objectives for the index portfolio reflects historical returns demonstrated by the portfolio, the greater flexibility for using derivatives, and the pursuit of strategic alternatives for the approximately $19 billion in capital deployed in that strategy.

The portfolio composition and strategic allocation are carefully managed to optimize the risk-return trade-off and achieve an attractive risk-adjusted return. The aggregate portfolio excess return projection and tracking error are used to calculate the information ratio, a measure of the risk-return efficiency of the portfolio (alpha divided by tracking error). The 2007 portfolio is expected to have a lower tracking error, while simultaneously having a comparable alpha, or outperformance, expectation as in 2006. This results in a slightly improved expected information ratio from an expected 0.67 for 2006 to a 0.71 information ratio for 2007. The following schedule shows this metric, the tracking error target for each portfolio and the corresponding active return expectations.
U.S. Equity Portfolio Composition

The table below is a summary of the allocation of the U.S. Equity portfolio, showing the internal and external managers and the active and passive components.

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th>U.S. Equities</th>
<th>Internal</th>
<th>External</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18.8%</td>
<td>18.1%</td>
<td>36.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63.1%</td>
<td>0.0%</td>
<td>63.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>81.9%</td>
<td>18.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Est. Year End 2006</td>
<td>Active</td>
<td>18.8%</td>
<td>19.7%</td>
<td>38.5%</td>
</tr>
<tr>
<td></td>
<td>Passive</td>
<td>61.5%</td>
<td>0.0%</td>
<td>61.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80.3%</td>
<td>19.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Est. Year End 2007</td>
<td>Active</td>
<td>18.8%</td>
<td>19.7%</td>
<td>38.5%</td>
</tr>
<tr>
<td></td>
<td>Passive</td>
<td>61.5%</td>
<td>0.0%</td>
<td>61.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80.3%</td>
<td>19.7%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

This schedule details the average assets under management by individual portfolio and the expected costs associated with each. For internally managed portfolios, cost components consist of the unit’s total compensation and operating budget for 2007. The time spent by each staff member on the respective internal portfolios was the metric selected to allocate the total costs.

<table>
<thead>
<tr>
<th>Schedule of Portfolio, Size and Estimated Fees</th>
<th>Mandate</th>
<th>Benchmark</th>
<th>Average Assets Under Management ($ millions)</th>
<th>Estimated Annual Fee ($ millions)</th>
<th>Estimated Annual Fee (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>R1000 Research</td>
<td>Enhanced</td>
<td>Russell 1000</td>
<td>6,008</td>
<td>$3.662</td>
</tr>
<tr>
<td>Internal</td>
<td>R3000 Index</td>
<td>Index</td>
<td>Russell 3000</td>
<td>19,623</td>
<td>$1.379</td>
</tr>
<tr>
<td>Internal Total</td>
<td></td>
<td></td>
<td></td>
<td>25,631</td>
<td>$5.041</td>
</tr>
<tr>
<td>External</td>
<td>AllianceBernstein</td>
<td>LC Core</td>
<td>Russell 1000</td>
<td>1,337</td>
<td>$3.209</td>
</tr>
<tr>
<td>External</td>
<td>Wellington</td>
<td>LC Core</td>
<td>Russell 1000</td>
<td>1,361</td>
<td>$3.617</td>
</tr>
<tr>
<td>External</td>
<td>Barclays</td>
<td>Enhanced</td>
<td>Russell 1000</td>
<td>1,343</td>
<td>$2.284</td>
</tr>
<tr>
<td>External</td>
<td>JP Morgan</td>
<td>Enhanced</td>
<td>S&amp;P 500</td>
<td>22</td>
<td>$0.056</td>
</tr>
<tr>
<td>External</td>
<td>Piedmont</td>
<td>Enhanced</td>
<td>S&amp;P 500</td>
<td>51</td>
<td>$0.128</td>
</tr>
<tr>
<td>External</td>
<td>Goldman Sachs</td>
<td>Enhanced</td>
<td>S&amp;P 500</td>
<td>871</td>
<td>$1.481</td>
</tr>
<tr>
<td>External</td>
<td>PIMCO</td>
<td>Enhanced</td>
<td>S&amp;P 500</td>
<td>479</td>
<td>$1.340</td>
</tr>
<tr>
<td>External</td>
<td>Mgr of Minority Mgr</td>
<td>Enhanced</td>
<td>Russell 3000</td>
<td>150</td>
<td>NA</td>
</tr>
<tr>
<td>External</td>
<td>Fidelity</td>
<td>SC Core</td>
<td>Russell 2000</td>
<td>335</td>
<td>$2.077</td>
</tr>
<tr>
<td>External</td>
<td>Invesco</td>
<td>SC Core</td>
<td>Russell 2000</td>
<td>297</td>
<td>$1.365</td>
</tr>
<tr>
<td>External Total</td>
<td></td>
<td></td>
<td></td>
<td>6,276</td>
<td>$15.956</td>
</tr>
<tr>
<td>Total</td>
<td>Russell 3000</td>
<td></td>
<td></td>
<td>31,907</td>
<td>$20.597</td>
</tr>
</tbody>
</table>
Global Bonds

Asset Management

Strategy

The Global Bonds asset class is composed of one composite, containing 12 underlying portfolios, and three dedicated portfolios, each with a specific purpose:

- Global Bonds Universal composite—provides broad exposure to fixed income assets;
- Long Duration portfolio—dedicated elements of asset-liability matching against long-term liabilities;
- Treasury Inflation Protected Securities (TIPS) portfolio—dedicated hedge against inflation in health care costs; and
- Short Duration portfolio—dedicated liquidity for the Health Care fund.

The Global Bonds asset class uses both internal and external portfolio management. The majority of assets are internally managed. Internally managed portfolios employ risk-controlled strategies, focusing on investment-grade securities. External managers are used predominately for the high yield and emerging debt sectors.

Global Bonds Universal Composite—Defined Benefit and Health Care

The Global Bonds Universal composite is managed against the Lehman Universal Index and includes core, high yield, and emerging market debt portfolios:

**Core**
Internal staff, using a risk controlled core strategy, manages the majority of the core assets. Core portfolios seek to outperform the benchmark primarily through sector and security selection, and typically have small duration deviations relative to the index. The core portfolio focuses on the preservation of capital. The internal portfolio maintains a high level of issuer diversification, and has less than 5% duration deviations relative to the index. The internal portfolio has a target return objective of 23 basis points outperformance, and a tracking error limit of 60 basis points relative to its benchmark.

There are three external core bond managers: AFL-CIO, Smith Breeden and Fidelity. The AFL-CIO portfolio, which focuses on government and mortgage securities, has an objective of providing 40 basis points of active return over the return of the Lehman Brothers Aggregate Index.

Smith Breeden and Fidelity utilize duration-neutral strategies. The managers use a combination of quantitative and qualitative analysis with the objective of outperforming the Lehman Aggregate Index by 50 basis points with a relatively modest level of tracking error.

**High-Yield Debt**
High-yield securities represent approximately 6% of the Lehman Brothers Universal Index. The outperformance comes from security selection which is supported by a labor-intensive credit research. To take advantage of opportunities in the sector, portfolio guidelines are formulated to give the managers broad discretion within the high-yield universe.

The manager line-up is comprised of four managers: Shenkman, Fort Washington, Goldman Sachs Asset Management, and Post Advisory. The high-yield allocation also includes an internally managed passive portfolio consisting of Dow Jones high yield CDX securities. These securities provide broadly diversified exposure to the high-yield market, and allow internal staff to tactically adjust exposure to the high-yield sector. In addition, OPERS also utilizes a high-yield Commercial Mortgaged Backed Securities (CMBS) manager, ING Clarion.
Emerging Market Debt
Emerging market debt securities represent approximately 3% of the Lehman Brothers Universal Index. Emerging market debt managers primarily add value through country selection. OPERS employs two external managers, Stone Harbor and Capital Guardian.

Dedicated Portfolios

Long Duration—Defined Benefit
The internally managed Long Duration portfolio will be initiated in 2007 as a result of the review of the Defined Benefit fund asset allocation completed in 2006. The review recommended that 40% of defined benefit assets would be in the long duration portfolio, with the 60% remaining in the Global Bonds Universal composite. The portfolio is designed to meet or exceed the return of the Lehman Long Government/Credit Index with a low level of tracking error. The primary source of outperformance for the fund is security selection.

Treasury Inflation Protected Securities (TIPS)—Health Care
The internally managed TIPS portfolio started in 2005 as a result of the segregation of the pension and health care assets. This portfolio will be fully funded by the end of 2006. The portfolio is designed to meet the return of the Lehman TIPS Index with a low level of tracking error.

Short Duration—Health Care
The Short Duration portfolio received its first allocation in 2005, and will be fully funded by the end of 2006. The portfolio is structured to meet or exceed the return of the Lehman 1-3 Year Government Bond Index with a low level of tracking error. The primary source of outperformance is security selection.
Asset Class Strategies

Global Bonds

Performance Objectives and Risk Control
In the Defined Benefit fund, staff will be transitioning to a new benchmark in 2007. The benchmark by the end of 2007 will consist of 60% Lehman Universal Index; and 40% Lehman Long Government/Credit Index. Health Care assets do not have a combined Global Bonds benchmark; each segment (Global Bonds Universal, TIPS, and Short Duration) is measured against its own benchmark.

The portfolios will be rebalanced as needed in order for the overall portfolio structure to remain within the specified ranges. Staff may rebalance to take advantage of short and longer-term opportunities in the market. In implementing portfolio adjustments, economic benefits versus the transaction costs will be analyzed.

<table>
<thead>
<tr>
<th>Schedule of Expected Performance and Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Assets Under Management ($ billions)</strong></td>
</tr>
<tr>
<td>Global Bonds Universal</td>
</tr>
<tr>
<td>Internal TIPS</td>
</tr>
<tr>
<td>Internal Short-Dur Bonds</td>
</tr>
<tr>
<td>Internal Long-Dur Bonds</td>
</tr>
<tr>
<td>Total Defined Benefit</td>
</tr>
<tr>
<td>Total Health Care</td>
</tr>
<tr>
<td>Total Global Bonds Assets</td>
</tr>
</tbody>
</table>

*Benchmark is on a one-month lag.
Global Bonds Composition
Here is a summary of the allocation of the Global Bonds portfolio by internal and external managers:

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Bonds Composition</strong></td>
<td></td>
</tr>
<tr>
<td>Here is a summary of the allocation of the Global Bonds portfolio by internal and external managers:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Estimate of Internal/External and Active/Passive Composition</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Est. Year End 2006</strong></td>
<td><strong>Est. Year End 2007</strong></td>
</tr>
<tr>
<td><strong>Active</strong></td>
<td><strong>Passive</strong></td>
</tr>
<tr>
<td>Internal</td>
<td>85.2%</td>
</tr>
<tr>
<td>External</td>
<td>14.3%</td>
</tr>
<tr>
<td>Total</td>
<td>99.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Schedule of Portfolio, Size &amp; Estimated Fees</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Bonds Universal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Internal</strong></td>
<td></td>
</tr>
<tr>
<td>Internal Core</td>
<td>Core</td>
</tr>
<tr>
<td>Passive HY</td>
<td>High Yield</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td></td>
</tr>
<tr>
<td>Fidelity</td>
<td>Core</td>
</tr>
<tr>
<td>Smith Breeden</td>
<td>Core</td>
</tr>
<tr>
<td>AFL-CIO</td>
<td>Core</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>High Yield</td>
</tr>
<tr>
<td>Shenkman Capital</td>
<td>High Yield</td>
</tr>
<tr>
<td>Post</td>
<td>High Yield</td>
</tr>
<tr>
<td>Fort Washington</td>
<td>High Yield</td>
</tr>
<tr>
<td>Clarion CMBS</td>
<td>High Yield CMBS</td>
</tr>
<tr>
<td>Capital Guardian</td>
<td>Emerging Market Debt</td>
</tr>
<tr>
<td>Stone Harbor</td>
<td>Emerging Market Debt</td>
</tr>
<tr>
<td><strong>Total Global Bonds Universal</strong></td>
<td>Universal</td>
</tr>
<tr>
<td><strong>Internal TIPS</strong></td>
<td></td>
</tr>
<tr>
<td>TIPS</td>
<td>Lehman U.S. TIPS</td>
</tr>
<tr>
<td><strong>Internal Short-Dur Bonds</strong></td>
<td></td>
</tr>
<tr>
<td>Short Duration Bonds</td>
<td>Lehman Government 1-3 Year</td>
</tr>
<tr>
<td><strong>Internal Long-Dur Bonds</strong></td>
<td></td>
</tr>
<tr>
<td>Long Duration Bonds</td>
<td>Lehman Long Gov/Credit</td>
</tr>
<tr>
<td><strong>Total Global Bonds Assets</strong></td>
<td>20,777</td>
</tr>
</tbody>
</table>
Securities Lending

The Securities Lending program uses a combination of lending agents to optimize the incremental return from this investment strategy. The move towards the diversification of agents coincides with the increase in lending revenue for OPERS in recent years. OPERS seeks agents who provide competitive fee splits to the plan, while providing adequate risk controls and segment expertise in the asset class being loaned.

In 2006, changes were initiated in the securities lending program, which continued to add incremental income to the fund. These changes include:

- Moving U.S. corporate bond lending to an auction format conducted by eSecLending,
- Initiating the lending of Asset Backed Securities (ABS)/Commercial Mortgaged Backed Securities (CMBS) through Citibank, and
- Adding additional resources to the securities lending/cash management functions.

In addition, benefits continue to be realized from previously initiated programs such as internally managing a portion of the securities lending cash collateral, and lending Mortgaged Backed Securities (MBS) through Key Bank.

As changes are finalized, the Securities Lending program will have the following structure:

### Cash Management

The cash portfolios seek a low-to-moderate risk profile that results in principal preservation, while surpassing the respective benchmarks. The benchmark of the OPERS Short Term Investment Funds (STIF) is the 90-day Treasury bill. The benchmark for the Securities Lending STIF is the Fed Funds Open Rate. Each portfolio is run separately, targeting assets that best result in performance above the individual benchmarks.
Non-U.S. Equity

Asset Management

Strategy

The non-U.S. Equity program is 100% externally managed. OPERS does not currently have the ability to invest in any non-U.S. equity internally, although it is a 2007 initiative to research development of internal non-U.S. passive management.

The program is 80% actively managed and 20% passively managed. It is expected that active management can add value in the less-efficient, non-U.S. markets. The passive component is primarily to facilitate rebalancing.

The non-U.S. Equity program performance benchmark is the Morgan Stanley Capital International All Country World Index Free excluding the United States index (MSCI ACWIF x U.S. Index), which incorporates developed and developing markets.

The program includes a 5% allocation to dedicated emerging markets mandates and a 3% target allocation to dedicated non-U.S. small capitalization mandates. The program’s maximum aggregate exposure to non-U.S. equity emerging markets (including holdings in broad mandates and in dedicated emerging markets mandates) is limited to the MSCI ACWIF x U.S. Index emerging market weighting, plus 5%, or 15% of non-U.S. equity holdings, whichever is greater.

As discussed in the section on External Public Markets, the non-U.S. equity focus is on selecting a diverse group of managers, each of whom has the potential to add long-term value and on building a diversified portfolio that has no major structural mismatches or tilts that could overwhelm the non-U.S. equity asset class composite. The program seeks to use a prudently diversified mix of managers including:

- Passive, enhanced index and active strategies at various risk levels,
- Quantitative and fundamental strategies,
- Value and growth styles,
- All-country ex-U.S. broad mandates, specialist emerging markets and specialist international small cap.

Staff monitors non-U.S. markets and evolving strategies within those markets to identify potential improvements to the program.

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th>Non-U.S. Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>Target</td>
</tr>
<tr>
<td>Active</td>
<td>70%-90%</td>
</tr>
<tr>
<td>Passive</td>
<td>10%-30%</td>
</tr>
<tr>
<td>Total Non-U.S. Equity</td>
<td>-</td>
</tr>
<tr>
<td>ACWIFxU.S. Managers</td>
<td>88-95%</td>
</tr>
<tr>
<td>Emerging Market Managers</td>
<td>5-8%</td>
</tr>
<tr>
<td>Small Cap. Managers</td>
<td>2-5%</td>
</tr>
</tbody>
</table>
The current non-U.S. Equity program has:

- Approximately $14.3 billion under management as of July 31, 2006,
- More than 50% passive, enhanced index and core strategies,
- Tracking error between 100-150 basis points.

In addition, the current non-U.S. Equity program is:

- Modestly overweight emerging markets,
- Neutral to the program’s dedicated small cap allocation,
- Neutral on value vs. growth style.

An overview on positioning decisions follows:

**Enhanced index/core strategies**
The program uses both enhanced index managers and core managers. Enhanced index managers run portfolios with very tightly controlled risk management. Core strategies remain neutral to major risk factors such as value and growth styles. Core strategies have somewhat higher tracking error than enhanced index mandates, but lower tracking error than active strategies. OPERS continues to adhere to a program centered on enhanced index and core strategies as a proper match for OPERS’ risk tolerance.

**Emerging markets**
It is believed that emerging markets offer the potential for superior longer-term returns although there may be short-term volatility. Emerging markets continue to show more attractive growth, profitability and valuation than developed markets.

**Small capitalization**
Non-U.S. small caps are very expensively valued as a result of impressive returns over the last several years. In light of this valuation, staff has temporarily neutralized this position. Long term, it is expected that smaller companies may offer better growth opportunities.

The non-U.S. equity composite is neutral to value and growth biases. There is an argument for being neutral-to-positive long-term on value, based on absolute returns; that is, value will tend to protect absolute return better in down markets, and should deliver acceptable absolute returns in up markets even if it lags the benchmark in strong bull markets. However, value has outperformed growth for five consecutive years in non-U.S. markets. Because it’s impossible to predict when this will change, the value/growth tilt of the program remains neutral.
Performance Objectives and Risk Control

Staff and Ennis Knupp + Associates are recommending that the Non-U.S. Equity program maintains a tracking error of 110-150 basis points relative to its benchmark, the Morgan Stanley Capital International All Country World Index Free excluding the United States index (MSCI ACWI x U.S.). Given this level of tracking error, a value added expectation of 65 basis points annualized over a three- to five-year market cycle, net of fees, is reasonable. As a result, an information ratio (or a level of alpha per unit of risk) of 0.48 is expected, which is consistent with the expectation in other asset classes.

The following table illustrates each existing portfolio, expected performance objectives, and forecasted contribution to the total asset class return:

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th>Schedule of Expected Performance and Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Assets Under Management ($ billions)</td>
</tr>
<tr>
<td>Passive</td>
<td>3.404</td>
</tr>
<tr>
<td>Enhanced Index/Core</td>
<td>1.392</td>
</tr>
<tr>
<td>Barclays Enhanced</td>
<td>2.931</td>
</tr>
<tr>
<td>Baring</td>
<td>1.099</td>
</tr>
<tr>
<td>Barclays EnhancedCore</td>
<td>0.220</td>
</tr>
<tr>
<td>Active</td>
<td>0.733</td>
</tr>
<tr>
<td>Lazard</td>
<td>1.068</td>
</tr>
<tr>
<td>JP Morgan Fleming</td>
<td>0.410</td>
</tr>
<tr>
<td>Emerging Markets</td>
<td>0.733</td>
</tr>
<tr>
<td>Emerging Markets</td>
<td>0.586</td>
</tr>
<tr>
<td>Emerging Markets</td>
<td>0.750</td>
</tr>
<tr>
<td>Total Fund</td>
<td>14.655</td>
</tr>
</tbody>
</table>
**Non-U.S. Equity Composition**

The Non-U.S. Equity program uses external management exclusively.

Staff conducted non-U.S. searches for enhanced index/core, active value-oriented, and active emerging market managers in 2006. The resulting composition of managers demonstrates the ongoing effort to review and improve the program. As anticipated in the 2006 Investment Plan, the overall structure and risk profile of the program class have remained the same.

The following table details the size of and fees associated with each manager in the program. The manager fees are projected to be $36.1 million or 24.6 basis points on a portfolio of $14.7 billion.
Real Estate

Private Market Asset Management

This plan establishes the short and long-term approaches for achieving the performance objective consistent with the requirements of the Real Estate Policy.

Performance Objective
The Real Estate Policy establishes the private market objective as stated below:

The private market Real Estate performance is benchmarked against the National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index (NPI). The private market Real Estate portfolio is measured net of manager fees (not including overhead expenses) and the NPI is unadjusted. The private market Real Estate portfolio is expected to meet or exceed the NPI over five-year rolling periods.

Risk Controls
The Real Estate Policy establishes the program risk controls listed below. Please refer to the Real Estate Policy for details.

Private Market Risk Management

- Property Type Risk
- Life Cycle Risk
- Liquidity
- Geographic Exposure
- Single Investment Risk
- Manager Risk
- Leverage
- Currency Risk
- Valuations
- Vertical Integration
- Lease Maturities

Investment Philosophy
The portfolio consists of a mix of core and non-core assets. The objective of the core portfolio is to mirror NPI in property composition and gross returns. The objective of the non-core portfolio is to produce outperformance and seek high absolute returns.

The core portfolio will be the “keel in the water” and will constitute no less than 65% of the private market real estate portfolio. The core portfolio will be diversified by property type and geographic location, and is designed to mirror the construction and performance of the NPI. The core portfolio serves as a proxy for index-like returns, since the NPI is not an investable index. The core portfolio is expected to produce returns that after manager fees are consistent with the NPI, unadjusted.

The traditional property types, apartment, industrial, office and retail, will dominate the construction of the core portfolio. The core portfolio will use only a modest amount of leverage, where the loan to value percentage is envisioned to be less than 25%. The core portfolio will consist of operating properties with a goal of maintaining a portfolio occupancy rate of at least 80%.
The non-core portfolio will be constructed to produce high absolute returns. Investments will be selected for this portfolio if they are expected to produce the best risk adjusted net returns and provide diversification to non-core investment strategies. Non-core investments may constitute up to 35% of the private market real estate portfolio.

The non-core portfolio will consist of all private market real estate investments that are not in the core portfolio. The non-core portfolio will include both U.S. and international real estate investments. Investment strategies may include development, redevelopment or repositioning of the traditional property types, entity level investments, structured finance, as well as investments in non-traditional property types. Staff anticipates using the majority of the leverage budget in the non-core portfolio. Leverage is expected to average 65% to 75% loan to value for each closed-end fund relationship. Staff expects that the non-core portfolio will be dominated by commitments to closed-end fund relationships.

In summary, the staff’s successful implementation of this plan includes:

- Adhering to the policy parameters,
- Acquiring core assets through the separate accounts and open-end funds to achieve index-like (NPI) returns,
- Acquiring non-core assets through closed-end funds and separate accounts to generate outperformance,
- Using the best-in-class managers for investing capital and
- Maintaining a disciplined hold/sell approach to separate account assets.

**Current Portfolio Composition**

**Property Type**

Below is the composition of the portfolio by property type, as measured by the unaudited market value of the portfolio on July 31, 2006.

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Total (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$936</td>
</tr>
<tr>
<td>Industrial</td>
<td>$445</td>
</tr>
<tr>
<td>Office</td>
<td>$1088</td>
</tr>
<tr>
<td>Retail</td>
<td>$351</td>
</tr>
<tr>
<td>Other</td>
<td>$494</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,314</strong></td>
</tr>
</tbody>
</table>

The portfolio is in compliance with the Real Estate Policy relative to property type ranges. Below is the property type composition relative to the policy ranges.
Life Cycle
Below are the policy limits and the current mix of core and non-core investments.

<table>
<thead>
<tr>
<th>Type</th>
<th>Limit</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>&gt;65%</td>
<td>82%</td>
</tr>
<tr>
<td>Non-Core</td>
<td>&lt;35%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Geographic
Staff believes that opportunistic international investments will generate outperformance. Below is the policy limit on international investments and the current percentage.

<table>
<thead>
<tr>
<th>Type</th>
<th>Limit</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>&gt;75%</td>
<td>97%</td>
</tr>
<tr>
<td>International</td>
<td>&lt;25%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Leverage
Leverage will be used primarily in the non-core portfolio to enhance risk-adjusted returns. Below are the policy limit and the current portfolio loan to value percentage.

<table>
<thead>
<tr>
<th>Type</th>
<th>Loan-to-Value Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy Limit</td>
<td>40%</td>
</tr>
<tr>
<td>Actual</td>
<td>20%</td>
</tr>
</tbody>
</table>
Projected Investments by Channel
Staff uses a top-down approach to portfolio construction. Capital allocation decisions among the three investment channels: open-end funds, closed-end funds and separate accounts, are governed by an investment pacing model. Through an iterative process, Staff works with The Townsend Group (Townsend) to model multi-year acquisition and disposition activity among the managers in the three channels. Staff will manage the portfolio to maintain compliance with property type targets. The projected investment activity is subject to change.

Open-End Funds
Open-end funds provide OPERS with exposure to index-like returns. In 2007, staff anticipates new acquisitions of approximately $400 million to U.S. core open-end funds. By year-end 2007, staff anticipates that the value of the OPERS investment in open-end funds will be approximately $1 billion. The following table shows the anticipated 2007 investment activity through the open-end fund channel.

<table>
<thead>
<tr>
<th>Property Type</th>
<th>July 31, 2006</th>
<th>Dispositions</th>
<th>Acquisitions</th>
<th>December 31, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$104</td>
<td>$0</td>
<td>$85</td>
<td>$200</td>
</tr>
<tr>
<td>Industrial</td>
<td>$69</td>
<td>$0</td>
<td>$85</td>
<td>$163</td>
</tr>
<tr>
<td>Office</td>
<td>$214</td>
<td>$0</td>
<td>$95</td>
<td>$330</td>
</tr>
<tr>
<td>Retail</td>
<td>$125</td>
<td>$0</td>
<td>$85</td>
<td>$223</td>
</tr>
<tr>
<td>Other</td>
<td>$64</td>
<td>$0</td>
<td>$50</td>
<td>$121</td>
</tr>
<tr>
<td>Total</td>
<td>$576</td>
<td>$0</td>
<td>$400</td>
<td>$1,038</td>
</tr>
</tbody>
</table>

(subject to change)

Closed-End Funds
Staff anticipates committing approximately $300 million to closed-end funds in 2007. This activity is anticipated to include commitments to domestic and international funds. With the new commitments, plus the anticipated funding of the current commitments, staff anticipates that the value of the portfolio through closed-end funds will be approximately $950 million by year-end. The following two tables show the anticipated closed-end fund commitment activity and investment activity, planned for 2007.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Domestic</th>
<th>International</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationships</td>
<td>$150 - $200</td>
<td>$100 - $150</td>
<td>$250 - $350</td>
</tr>
<tr>
<td></td>
<td>3 - 5</td>
<td>1 - 3</td>
<td>5 - 7</td>
</tr>
</tbody>
</table>

(subject to change)
Separate Accounts
Staff is reducing the separate account assets in a disciplined manner and repositioning assets through the open-end and closed-end funds. The separate account activity is most susceptible to changing market conditions and will change throughout the year. Staff may undertake a search for a new apartment separate account in 2007 to complement the existing manager composition. By year-end 2007, staff anticipates that the value of the OPERS' investments through separate account relationships will be approximately $2.3 billion.

Anticipated Closed End Fund Investment Activity for 2007

<table>
<thead>
<tr>
<th>Property Type</th>
<th>August 1, 2006</th>
<th>Dispositions</th>
<th>Acquisitions</th>
<th>Projected January 1, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$2</td>
<td>$0</td>
<td>$65</td>
<td>$97</td>
</tr>
<tr>
<td>Industrial</td>
<td>$6</td>
<td>$0</td>
<td>$25</td>
<td>$55</td>
</tr>
<tr>
<td>Office</td>
<td>$60</td>
<td>$0</td>
<td>$225</td>
<td>$405</td>
</tr>
<tr>
<td>Retail</td>
<td>$102</td>
<td>$0</td>
<td>$65</td>
<td>$115</td>
</tr>
<tr>
<td>Other</td>
<td>$66</td>
<td>$0</td>
<td>$150</td>
<td>$278</td>
</tr>
<tr>
<td>Total</td>
<td>$235</td>
<td>$0</td>
<td>$530</td>
<td>$950</td>
</tr>
</tbody>
</table>

(subject to change)

Anticipated Separate Account Investment Activity for 2007

<table>
<thead>
<tr>
<th>Property Type</th>
<th>July 31, 2006</th>
<th>Dispositions</th>
<th>Acquisitions</th>
<th>Projected December 31, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$830</td>
<td>$350</td>
<td>$100</td>
<td>$615</td>
</tr>
<tr>
<td>Industrial</td>
<td>$371</td>
<td>$0</td>
<td>$150</td>
<td>$543</td>
</tr>
<tr>
<td>Office</td>
<td>$814</td>
<td>$400</td>
<td>$150</td>
<td>$598</td>
</tr>
<tr>
<td>Retail</td>
<td>$124</td>
<td>$0</td>
<td>$200</td>
<td>$336</td>
</tr>
<tr>
<td>Other</td>
<td>$364</td>
<td>$225</td>
<td>$50</td>
<td>$203</td>
</tr>
<tr>
<td>Total</td>
<td>$2,503</td>
<td>$975</td>
<td>$650</td>
<td>$2,295</td>
</tr>
</tbody>
</table>

(subject to change)
Projected Portfolio Composition
Staff seeks to assemble a diversified real estate investment portfolio. The table below shows the projected total portfolio activity for 2007. The remaining tables indicate that the program is projected to remain in compliance with the Real Estate Policy risk constraints through this transition.

### Anticipated Total Private Market Real Estate Investment Activity for 2007

<table>
<thead>
<tr>
<th>Property Type</th>
<th>July 31, 2006</th>
<th>Dispositions</th>
<th>Acquisitions</th>
<th>Projected December 31, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$936</td>
<td>$350</td>
<td>$250</td>
<td>$913</td>
</tr>
<tr>
<td>Industrial</td>
<td>$445</td>
<td>$0</td>
<td>$260</td>
<td>$761</td>
</tr>
<tr>
<td>Office</td>
<td>$1,088</td>
<td>$400</td>
<td>$470</td>
<td>$1,333</td>
</tr>
<tr>
<td>Retail</td>
<td>$351</td>
<td>$0</td>
<td>$350</td>
<td>$674</td>
</tr>
<tr>
<td>Other</td>
<td>$494</td>
<td>$225</td>
<td>$250</td>
<td>$602</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,314</strong></td>
<td><strong>$975</strong></td>
<td><strong>$1,580</strong></td>
<td><strong>$4,283</strong></td>
</tr>
</tbody>
</table>

*(subject to change)*

**Property Type**
The table below show the projected portfolio construction by property type as of year-end 2007. The projected 2007 property type exposure will be in compliance with the policy ranges.
**Life Cycle**
The table below shows the projected portfolio construction by life cycle as of year-end 2007.

<table>
<thead>
<tr>
<th>Life Cycle</th>
<th>Type</th>
<th>Limit</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core</td>
<td>&gt;65%</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>Non-Core</td>
<td>&lt;35%</td>
<td>19%</td>
</tr>
</tbody>
</table>

**Geographic**
The table below shows the projected portfolio construction by geography as of year-end 2007.

<table>
<thead>
<tr>
<th>Geographic</th>
<th>Type</th>
<th>Limit</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>United States</td>
<td>&gt;75%</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>International</td>
<td>&lt;25%</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Leverage**
The table below shows the projected portfolio construction by leverage as of year-end 2007.

<table>
<thead>
<tr>
<th>Leverage</th>
<th>Limit</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>33%</td>
</tr>
</tbody>
</table>

**Strategic Intangibles**
The following items describe additional approaches for maintaining a competitive Real Estate program.

**Staff Development**—Staff intends to participate in conferences with real estate investors, real estate operating companies, and developers to gain additional professional insights, and identify new investment opportunities.

**Active Participation in Partnerships**—Staff will participate on advisory boards and valuation committees, and participate in all meetings and actively monitor partnership compliance.

**Remain Opportunistic**—While working within the policy framework, Real Estate staff will rapidly assess and act upon unique opportunities. Staff will renew its efforts to seek, critically analyze, and offer up contrarian approaches and unique investment structures.

**Maintain Patience**—The policy performance objective for the Real Estate portfolio is to outperform the policy benchmark over rolling five-year periods. Staff will remain committed to the policy strategies and resist pressure, caused by short-term performance, to disrupt investment pacing or force sales.
Asset Management Fees
The Private Market Real Estate portfolio is invested through a combination of separate accounts, open-end funds, and closed-end funds. Separate account fees consist of an asset management fee, plus an incentive fee based on portfolio returns in excess of a return hurdle, and the total of the two averages 80 basis points on invested capital. The fees charged by the open-end commingled funds average 100 basis points on invested equity. Fees for closed-end commingled funds consist of two parts: the annual asset management fee, typically 150 basis points on the committed equity, and a carried interest taken from realized profits. By year-end 2007, the anticipated portfolio will consist of 64% separate accounts, 14% open-end funds and 22% closed-end funds. This mix is subject to change.

The following table summarizes the estimate of fees that OPERS will pay to real estate managers in 2007.

<table>
<thead>
<tr>
<th>Estimated Management Fees - 2007 ($ million and bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Average Portfolio Market Value</td>
</tr>
<tr>
<td>Estimated Percentage in Separate Accounts</td>
</tr>
<tr>
<td>Estimated Average Fee</td>
</tr>
<tr>
<td>Estimated Fees to Separate Accounts</td>
</tr>
<tr>
<td>Estimated Percentage in Open-End Funds</td>
</tr>
<tr>
<td>Estimated Average Fee</td>
</tr>
<tr>
<td>Estimated Fees to Open-End Funds</td>
</tr>
<tr>
<td>Estimated Percentage in Closed-End Funds</td>
</tr>
<tr>
<td>Estimated Average Fee</td>
</tr>
<tr>
<td>Estimated Fees to Closed-End Funds</td>
</tr>
<tr>
<td>Estimated Management Fees ($ millions)</td>
</tr>
<tr>
<td>Estimated Management Fees (bps)</td>
</tr>
</tbody>
</table>

Public Market Asset Management

Performance Objectives & Risk Control

The public market Real Estate performance is benchmarked against the Dow Jones Wilshire Real Estate Securities Index (WRESI). The public market Real Estate portfolio is measured net of fees (not including overhead expenses). WRESI is not adjusted for fees. The public market Real Estate portfolio is expected to exceed the benchmark returns by 50 basis points annualized over rolling five-year periods.

The Real Estate policy established the program risk controls and investable instruments listed below. Please refer to the Real Estate Policy for details.

Public Market Risk Management
- Liquidity
- Portfolio Composition
- Single Security Risk

Public Market Investable Investments
- Common Stock
- Exchange-Trade Funds
- American Depository Receipts
- Warrants
- Initial Public Offerings
- Preferred Securities
- Cash & Cash Equivalents, as necessary
Public market Real Estate has a targeted 1% allocation to the Defined Benefit Fund and a targeted 5% allocation to the Healthcare Fund. The public market Real Estate allocation serves as the real estate exposure in the Healthcare Fund. This plan establishes the short and long-term approaches for achieving the performance objectives consistent with the requirements of the Real Estate policy. The tracking error for the portfolio is not to exceed 200 basis points.

**Strategy**

The strategy for the public Real Estate securities is under review by staff. Staff is evaluating the merits of expanding to a global public market real estate focus as well as the possibility of using an internal passive portfolio to tactically over/underweight the public market real estate exposure. As part of the review, staff is determining the optimal mix of internal passive and external active management when combined with the internal active core portfolio that achieves the performance goal within the risk parameters stated in the Real Estate Policy. Staff is working with our external consultants, The Townsend Group and Ennis Knupp + Associates, to assess the strategy options for the portfolio along with the corresponding net return and risk parameters to determine the optimal mix.

**Internal Active REIT Portfolio**

The internal active REIT Portfolio is a blend of quantitative and fundamental disciplines combined to create a low turnover, diversified core portfolio that is able to produce consistent risk-adjusted returns. The portfolio utilizes a proprietary dynamic weighted quintile ranking stock selection system. The portfolio is managed with a relative value orientation and is focused on companies with conservative balance sheets, credible management teams and consistent earnings.
The Private Equity Policy establishes the asset class objective, which is restated below:

*OPERS Private Equity performance is benchmarked on a long-term, 7-10 year, rolling basis against the Russell 3000 plus 300 basis points with an internal rate of return (IRR) cash flow method.*

The Private Equity Policy establishes the program risk controls listed below. The Private Equity Policy has complete portfolio details.

### Risk Management
- Liquidity
- Vintage Risk
- Manager Risk
- Firm Risk
- Currency
- Industry
- Geography
- Leverage

### Securities and Restricted Investments
- Investment Types
- Co-Investments and Direct Placements
- Hedge Funds
- Derivatives
- Real Estate
- Ohio and Regional
- Stock Distributions
- Child Labor
- Privatization

### Composition

The Private Equity portfolio had an unaudited market value of $1,057.0 million as of August 31, 2006.

Here is an overview of the portfolio’s market value by geography and type:
### Actual Portfolio Fair Market Value vs. Target Fair Market Value at the Partnership (or Fund) Level

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th>Actual Portfolio Fair Market Value vs. Target Fair Market Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domestic</strong></td>
<td>Actual FMV</td>
<td>Target FMV</td>
</tr>
<tr>
<td>Corporate Finance</td>
<td>$418.7</td>
<td>$475.6</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>$103.6</td>
<td>$105.7</td>
</tr>
<tr>
<td>Special Situations</td>
<td>$153.1</td>
<td>$105.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$675.4</td>
<td>$687.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asset Class Strategies</th>
<th>Actual %</th>
<th>Target %</th>
<th>Difference %</th>
<th>Actual %</th>
<th>Target %</th>
<th>Difference %</th>
<th>Actual %</th>
<th>Target %</th>
<th>Difference %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Finance</td>
<td>39.6%</td>
<td>45.0%</td>
<td>-5.4%</td>
<td>27.2%</td>
<td>30.0%</td>
<td>-2.8%</td>
<td>66.9%</td>
<td>75.0%</td>
<td>-8.1%</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>9.8%</td>
<td>10.0%</td>
<td>-0.2%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>0.8%</td>
<td>10.6%</td>
<td>10.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Special Situations</td>
<td>14.5%</td>
<td>10.0%</td>
<td>4.5%</td>
<td>8.1%</td>
<td>5.0%</td>
<td>3.1%</td>
<td>22.6%</td>
<td>15.0%</td>
<td>7.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>63.9%</td>
<td>65.0%</td>
<td>-1.1%</td>
<td>36.1%</td>
<td>35.0%</td>
<td>1.1%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Strategy

OPERS seeks to maintain a top-tier Private Equity program that generates leading, risk-adjusted, long-term returns. The following information details the short and long-term strategic efforts for achieving this objective.

Targeted Portfolio Structure

The Private Equity portfolio will be built over time, and balances the need for exposure with investment opportunities and vintage risk. The figures presented within this section are best approximations and are designed to achieve the target portfolio structure by mid-year 2010. [Note that the targets are bounded by +/-10%.]

Targets by Percentage

The Private Equity policy target of the 5% private equity market value established by the asset allocation and the long-term target portfolio structure is shown in the following table which also shows long-term targeted portfolio exposure by asset class.

The chart below shows the long-term targeted portfolio exposure by asset class and geography. These targets are each bounded by +/- 10%.
Investment Pacing

Investment pacing controls the commitment budget. Multi-factor models are used to determine the rate of commitments to achieve a target market value exposure in a period of time. The graph below depicts the updated investment-pacing model in millions of dollars per year to achieve a 5% target, +/- 4%, market value exposure by mid-year 2010. Vintage year is the year in which a partnership (or fund) makes its first investment; this sometimes differs from the year in which OPERS makes its commitment. The information below shows the actual and projected commitments made each year, rather than vintage year commitments.

Vintage Year Commitment Pacing

The graph below illustrates aggregate commitments and fair market value for the portfolio, based on the actual and projected commitment schedule.

Projected Fair Market Value and Aggregate Commitments
Commitments in 2007

The 2007 investment pacing targets $800 million in commitments, with a range of $650-$950 million. Commitments are expected broadly across primary partnerships including domestic and international corporate finance, venture capital and special situations. The actual 2007 commitments are dependent on market opportunities and may vary from the anticipated commitments shown below.

<table>
<thead>
<tr>
<th>Anticipated commitments in 2007 ($ millions)</th>
<th>Domestic</th>
<th>International</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Finance</td>
<td>$300 - $400</td>
<td>$0 - $50</td>
<td>$325 - $425</td>
</tr>
<tr>
<td>Venture</td>
<td>$75 - $175</td>
<td>$0 - $0</td>
<td>$75 - $175</td>
</tr>
<tr>
<td>Special Situations</td>
<td>$75 - $175</td>
<td>$0 - $50</td>
<td>$100 - $200</td>
</tr>
<tr>
<td>Fund of Funds</td>
<td>$100 - $200</td>
<td>$0 - $0</td>
<td>$100 - $200</td>
</tr>
<tr>
<td>Total</td>
<td>$700 - $900</td>
<td>$25 - $75</td>
<td>$700 - $900</td>
</tr>
</tbody>
</table>

*Totals do not add due to interdependence of commitment selections.

Commitment Size

This table shows the typical commitment range for primary partnerships and discretionary mandates.

Typical Commitments

<table>
<thead>
<tr>
<th>Type</th>
<th>Typical Commitment Range ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Finance</td>
<td>$25 - $175</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>$25 - $50</td>
</tr>
<tr>
<td>Special Situations</td>
<td>$25 - $75</td>
</tr>
<tr>
<td>Discretionary Mandates</td>
<td>$50 - $150</td>
</tr>
</tbody>
</table>
Strategic Implementation and Number of Commitments

Capital will be invested through private equity partnerships and discretionary managers investing in private equity partnerships and direct investments (co-investments). Selecting the appropriate mix of primary partnerships and discretionary mandates requires balancing several factors including maximizing performance, creating appropriate diversification, increasing negotiating leverage and minimizing the administrative burden. Here are the estimated commitments for 2007:

<table>
<thead>
<tr>
<th>Anticipated number of commitments in 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discretionary Mandate</td>
</tr>
<tr>
<td>Corporate Finance</td>
</tr>
<tr>
<td>Venture</td>
</tr>
<tr>
<td>Special Situations</td>
</tr>
<tr>
<td>Fund of Funds</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*Totals do not add due to interdependence of commitment selections.

Discretionary Managers

Discretionary managers may be used to gain exposure to relatively small or niche portfolio components. Each discretionary manager will make commitments to multiple primary partnerships over several years, expected to further improve portfolio diversification.

Staff completed its first three discretionary commitments in 2004 and 2005 as shown below. During 2007, staff may consider further discretionary mandates for the Ohio Mid-West Fund, a venture capital fund, a co-investment program or smaller funds.

Commissions to Discretionary Managers

<table>
<thead>
<tr>
<th>Discretionary Mandate</th>
<th>Commitment ($ millions)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad Market</td>
<td>$100</td>
<td>2004</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>$ 75</td>
<td>2004</td>
</tr>
<tr>
<td>Ohio/Midwest</td>
<td>$ 50</td>
<td>2005</td>
</tr>
<tr>
<td>Total</td>
<td>$225</td>
<td></td>
</tr>
</tbody>
</table>
General Partners

General partner selection is critical for outperformance and we proactively seek relationships with experienced, top-tier general partners. Working with the Private Equity advisors, peers and all available resources, we filter and review the general partners in each subclass and initiate a dialogue regarding potential participation in their new partnerships. Further, we limit exposure to first-time general partners. The Private Equity general partner selection procedures describe the due diligence process and factors for consideration.

The number of general partners is limited for several reasons. We want to maximize our commitment size per general partner to increase the likelihood of advisory roles and improved negotiating leverage. Meaningful allocations also increase access to general partners, improving market knowledge and the opportunity for co-investment rights. Containing the number of general partners also minimizes the administrative burden and allows continued meaningful participation in a mature program. The vast majority of our commitments will be through primary participation in general partnerships.

Strategic Intangibles

The following items describe additional approaches for maintaining a competitive Private Equity program.

**Staff Development**—The Private Equity staff will continue to build core competencies. These will include performing due diligence, administering advisory roles and monitoring portfolio compliance. Longer-term, we anticipate developing capabilities to capture the economic advantages of co-investment opportunities.

**Networking**—Information is critical and we will maximize our market knowledge by participating in industry conferences and actively networking with peers, including public and corporate plans, endowments, foundations and financial institutions.

**Active Participation in Partnerships**—Partnership rights, including participation in advisory boards and valuation committees, will be fully exercised. We will also participate in all meetings and actively monitor partnership compliance.

**Remain Opportunistic**—While operating consistently with the Private Equity Policy, we will remain alert and rapidly assess unforeseeable opportunities. As markets evolve, situations may arise that require timely, critical analysis and/or contrarian approaches. We must remain open to new ideas and unique investment structures.

**Maintain Patience**—OPERS has a competitive advantage in the marketplace with the ability to provide long-term capital. We will remain committed to our policy and strategy and resist pressures to disrupt investment pacing or force sales.

**Asset Management Fees**

The fees for Private Equity consist of two parts, the annual management fee, typically ranging from 1.0% to 2.0% of commitments through the term of the partnership; and a carried interest, taken from realized profits. The management fees are generally paid through capital calls quarterly or semi-annually. Discretionary managers have an additional layer of fees, generally about 1%. Partnership management fees may be offset, deferred or waived periodically. Carried interest varies with time and success. The following table estimates the Private Equity asset management fees for 2007. Note that Private Equity fees relative to market value are skewed in formative years due to the lag between commitments and investments. Significant portions of the fees are recoverable before general partners receive carry.

<table>
<thead>
<tr>
<th>Estimate of Management Fees - 2007 ($ millions and bps)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Average Commitments</td>
<td>$3,850</td>
</tr>
<tr>
<td>Estimated Average Market Value</td>
<td>$1,281</td>
</tr>
<tr>
<td>Estimated Average Fee</td>
<td>1.25%</td>
</tr>
<tr>
<td>Estimated Management Fee ($ millions)</td>
<td>$48.1</td>
</tr>
<tr>
<td>Estimated Management Fee (bps)</td>
<td>376</td>
</tr>
</tbody>
</table>
Opportunistic

Asset Management

Strategy
Opportunistic investing allows OPERS to access investment strategies and new instruments that do not fit neatly into one of the traditional asset class categories. There is no overarching strategy for the asset class. Each potential strategy will be evaluated on its own merit and a decision will be reached if the strategy is feasible and whether to implement the strategy passively or actively and internally or externally.

The benchmark for this asset class is the weighted average of the benchmarks for each opportunistic strategy. The expectation is that the Opportunistic return should add to the total fund return over appropriate periods of time.

Opportunistic strategies have a target of 1% of the market value of the Defined Benefit fund with a range of 0-3%. Unused opportunistic allocations will be taken up by the U.S. Equity asset class. Opportunistic strategies are not used in the Health Care or Defined Contribution funds.

The Opportunistic strategies that have been approved by the OPERS Retirement Board are:

- Hedge Fund-of-Funds,
- Active Currency,
- Commodities.

Hedge Fund-of-Funds
Staff identified that Hedge Fund-of-Funds have the potential to provide attractive diversification for the traditional asset classes by offering:

- Consistent, positive, absolute returns,
- Low volatility of returns, and
- Low correlations with traditional asset classes.

This mandate was approved in late 2004 and a search conducted in 2005. This strategy is 100% externally managed by two managers: Crestline Investors, Inc. and Pacific Alternative Asset Management Company. Contract and fee negotiations were completed and each was funded $25 million in early 2006.

Active Currency
Initial research was presented at the August 2005 Investment Committee meeting on whether active currency mandates could be a source of alpha for OPERS, with additional research presented in August 2006. Active Currency was approved as an Opportunistic strategy at that meeting. Mandates will be 100% externally and actively managed. A search for active currency managers will be conducted in 2007.

Commodities
In 2004, staff researched real return investment strategies. TIPS (inflation-protected fixed income securities) were approved for the Health Care fund, and commodities were approved for the Opportunistic asset class in the Defined Benefit fund. It was anticipated that commodity exposure would be managed internally and passively. Staff is preparing for initial funding.

Additional Opportunistic Strategies
Staff is discussing potential strategies to add to the Opportunistic class, and anticipates bringing at least one new opportunistic strategy to the Retirement Board in 2007.
Performance Objectives and Risk Control

Performance objectives will be set for each strategy.

The limited size of the Opportunistic strategies is its primary risk-control mechanism. It is envisioned that once the asset class is mature, no single program or strategy within it will account for more than 35% of the total market value of the Opportunistic asset class. Each program or strategy is limited to a maximum of $100 million as an initial funding with a target initial funding of $25 million to $50 million.

The following schedule details the tracking error target for each portfolio and the corresponding active return expectations.

### Schedule of Expected Performance and Volatility

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Average Assets Under Management ($ billions)</th>
<th>% of Total Portfolio</th>
<th>Benchmark</th>
<th>Performance Objectives (net of fees) in bps</th>
<th>Target Tracking Error in bps</th>
<th>Target Information Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crestline Partners</td>
<td>0.025</td>
<td>16.7%</td>
<td>LIBOR + 400 bps*</td>
<td>0</td>
<td>400</td>
<td>0.00</td>
</tr>
<tr>
<td>PAAMCO</td>
<td>0.025</td>
<td>16.7%</td>
<td>LIBOR + 400 bps*</td>
<td>0</td>
<td>400</td>
<td>0.00</td>
</tr>
<tr>
<td>Active Currency</td>
<td>0.101</td>
<td>66.7%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total Fund</td>
<td>0.151</td>
<td>100.0%</td>
<td>Custom</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Benchmark is on a two-month lag.

Opportunistic Composition

The following table summarizes the allocation of the Opportunistic portfolio between the internal and external managers and the active and passive components.

### Estimate of Internal/External and Active/Passive Composition

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Est. Year End 2006</th>
<th>Est. Year End 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active</td>
<td>Passive</td>
</tr>
<tr>
<td>Opportunistic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>External</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

The following schedule details the average assets under management by individual portfolio along with the expected fees or costs associated with each of the portfolios.

### Schedule of Portfolio, Size & Estimated Fees

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Mandate</th>
<th>Benchmark</th>
<th>Average Assets Under Management ($ millions)</th>
<th>Estimated Annual Fee ($ millions)</th>
<th>Estimated Annual Fee (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crestline Partners</td>
<td>Hedge-Fund-of-Funds</td>
<td>LIBOR + 400 bps*</td>
<td>25.23</td>
<td>$ 0.318</td>
<td>125.0</td>
</tr>
<tr>
<td>PAAMCO</td>
<td>Hedge-Fund-of-Funds</td>
<td>LIBOR + 400 bps*</td>
<td>25.23</td>
<td>$ 0.252</td>
<td>100.0</td>
</tr>
<tr>
<td>Active Currency</td>
<td>NA</td>
<td>NA</td>
<td>100.9%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>NA</td>
<td>Custom</td>
<td>161.41</td>
<td>$ 0.668</td>
<td>112.5</td>
</tr>
</tbody>
</table>

*Benchmark is on a two-month lag.
Resources and Initiatives
Office of the Director—Investments

Organization

The organizational structure is as follows:

This office is currently composed of the director—investments and one executive assistant. The deputy director is a vacant position.

Staffing/Hiring

This office currently has two members on staff and one vacancy (as previously discussed). The vacancy is expected to be filled by December 2007.

<table>
<thead>
<tr>
<th>Compensation dollars in millions</th>
<th>Office of Director — Investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>0.489</td>
</tr>
<tr>
<td>Benefits</td>
<td>0.152</td>
</tr>
<tr>
<td>Incentive Compensation</td>
<td>0.100</td>
</tr>
<tr>
<td>Total Compensation</td>
<td>0.741</td>
</tr>
<tr>
<td>Average Assets in $ billions</td>
<td>NA</td>
</tr>
<tr>
<td>Cost in Basis Points</td>
<td>NA</td>
</tr>
</tbody>
</table>

Assuming full staffing levels at year-end 2007, the chart above details the annual cost of salaries, benefits and incentive compensation paid in 2007 for this office.
Operating Budget

The Office of the Director—Investments’ 2007 operating budget is set at $1.442 million, a 16% increase over the 2006 budget of $1.237 million. The increase in quotes and data feeds represents a Bloomberg terminal for the director and deputy director.

<table>
<thead>
<tr>
<th>Category</th>
<th>2006 Budget</th>
<th>2007 Budget</th>
<th>Dollar Change</th>
<th>Percent Change</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Expense</td>
<td>$505,491</td>
<td>$677,318</td>
<td>171,827</td>
<td>33.99%</td>
<td>46.99%</td>
</tr>
<tr>
<td>Audit/Legal/Consulting Services</td>
<td>$680,000</td>
<td>$690,000</td>
<td>10,000</td>
<td>1.47%</td>
<td>47.86%</td>
</tr>
<tr>
<td>Quotes &amp; Data Feeds</td>
<td>$0</td>
<td>$28,500</td>
<td>28,500</td>
<td>-</td>
<td>1.98%</td>
</tr>
<tr>
<td>Research Services</td>
<td>$0</td>
<td>$0</td>
<td>-</td>
<td>-</td>
<td>0.00%</td>
</tr>
<tr>
<td>Analytics</td>
<td>$0</td>
<td>$0</td>
<td>-</td>
<td>-</td>
<td>0.00%</td>
</tr>
<tr>
<td>Communications</td>
<td>$5,000</td>
<td>$2,500</td>
<td>(2,500)</td>
<td>-50.00%</td>
<td>0.17%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>$0</td>
<td>$0</td>
<td>-</td>
<td>-</td>
<td>0.00%</td>
</tr>
<tr>
<td>Office Equipment &amp; Supplies</td>
<td>$48,200</td>
<td>$41,240</td>
<td>(6,960)</td>
<td>-14.44%</td>
<td>2.86%</td>
</tr>
<tr>
<td>Training &amp; Travel Expenses</td>
<td>$1,238,691</td>
<td>$1,441,558</td>
<td>202,867</td>
<td>16.38%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Schedule of Budgeted Operating Expenses
The U.S. Equity Internal Active unit is currently organized with a total of seven equity analysts, two sector portfolio managers, and a senior portfolio manager. In addition, staff is complemented by a REIT portfolio manager who interacts frequently with the U.S. Equity staff.

The U.S. Equity Internal Active unit is responsible for the internally managed large cap portfolio (research portfolio). Started in October 2002, this portfolio has a Russell 1000 benchmark. A portfolio committee, consisting of the two sector portfolio managers, the REIT portfolio manager, and the senior portfolio manager, is responsible for the overall management of the research portfolio. The two sector portfolio managers oversee the analysts and are responsible for the day-to-day management of the fund.

The seven equity analysts oversee and make recommendations for active positions in the various economic sectors of the Russell 1000 benchmark portfolio. For oversight purposes, the analysts are divided into two groups under the supervision of the two sector portfolio managers. The senior portfolio manager provides general oversight, strategy input, and compliance monitoring. The REIT portfolio manager is responsible for actively managing the REITs in the Defined Benefit and Health Care funds and provides additional strategy input for the U.S. Equity portfolio.
Resources and Initiatives

U.S. Equity Internal Active

Staffing/Hiring

The unit has ten members on staff with one current vacancy, for a senior portfolio manager.

Assuming full staffing levels at year-end 2007, the chart above details the annual cost of salaries, benefits and incentive compensation estimated to be paid in 2007 for the U.S. Equity Internal Active unit.

The projected compensation costs of the U.S. Equity Internal Active staff, as a percent of total managed assets is 2.8 basis points.

Initiatives

- **Best Ideas Project**
  The staff will continue to explore the feasibility of more concentrated equity portfolios. Phase I of the Best Ideas Project focused on a best ideas portfolio derived from the existing enhanced index strategy to generate greater excess returns from existing structure and process. Phase II considers the conclusions of phase I and expands the scope to consider alternative approaches for a successful investing methodology.

- **Options and Futures**
  The staff will investigate the use of options and futures for the Internal Research Portfolio, identify the various return enhancement and risk reduction strategies that would fit with the risk and return objectives of the Research Portfolio and verify that appropriate trading, back office settlement, and accounting support are in place.
Operating Budget

The U.S. Equity Internal Active unit’s 2007 operating budget is set at $2.488 million. This amount represents 3.5 basis points of our total U.S. Equity Internal Active unit assets of $7.146 billion. The schedule of Budgeted Operating Expenses is presented below. This represents a decrease from the $2.708 million budget in 2006.

In the personnel expense category, the 2007 budget decrease reflects the removal of the senior portfolio advisor and senior analyst positions. The increase in quotes and data feeds is offset by the reallocation of services in the analytics category. The information technology category increase reflects the transfer of several software licenses and maintenance agreements into Investments. With respect to the other budget categories, the U.S. Equity Internal Active unit continues to find ways to be more efficient with its resources and to achieve the investment objectives detailed in this annual investment plan.

<table>
<thead>
<tr>
<th>Schedule of Budgeted Operating Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2006 Budget</strong></td>
</tr>
<tr>
<td>Personnel Expense</td>
</tr>
<tr>
<td>Audit/Legal/Consulting Services</td>
</tr>
<tr>
<td>Quotes &amp; Data Feeds</td>
</tr>
<tr>
<td>Research Services</td>
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</tr>
<tr>
<td>Information Technology</td>
</tr>
<tr>
<td>Office Equipment &amp; Supplies</td>
</tr>
<tr>
<td>Training &amp; Travel Expenses</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

The following table lists the total cost estimates for managing the U.S. Equity Internal Active unit. The total costs for internal management is projected to reach 3.7 basis points of the U.S. Equity Internal Active unit assets under management.

<table>
<thead>
<tr>
<th>Schedule of Estimated Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Year 2007</strong></td>
</tr>
<tr>
<td>Costs in $ Millions</td>
</tr>
<tr>
<td>Internal</td>
</tr>
<tr>
<td>Budget Operating less Personnel Expense</td>
</tr>
<tr>
<td>Manager Fees</td>
</tr>
<tr>
<td>Total Costs</td>
</tr>
<tr>
<td>Average Assets Under Management</td>
</tr>
<tr>
<td>Costs in Basis Points</td>
</tr>
</tbody>
</table>
Global Bonds Internal Management

Organizational Structure

The current organizational structure is as follows:

Staffing/Hiring

The Global Bonds Internal Management unit is currently organized with a total of four analysts, one lead analyst, four portfolio managers, a senior portfolio manager (vacant), and an investment assistant II. The senior portfolio manager will provide oversight of the unit and will be responsible for the strategic positioning of all the bond portfolios managed internally.

The leads of the different functional areas who are collectively responsible for the Global Bonds Internal Management investment decision-making process will report to, and support, the senior portfolio manager. They will also handle the day-to-day management of the internal portfolios. Authorized individuals in the Global Bonds Internal Management unit will handle the trade execution.

The non-structured securities portfolio manager/trader is responsible for trading the treasury, agency and credit securities; and for providing oversight to the securities lending/cash management function. The securities lending/cash management staff manages the OPERS securities lending programs across all asset classes. In addition, these individuals manage the short-term portfolios supporting OPERS’ operating liabilities and cash collateral resulting from securities lending activities.

The lead analyst provides oversight to the credit research group. The analysts are responsible for assigned industries in the corporate sector, which includes company analysis and the identification of relative value ideas. Currently, the Global Bonds Internal Management unit has three credit analysts. The credit analysts are responsible for assigned sectors, but also to provide backup to other sectors. This organization ensures that all sectors are monitored constantly so that OPERS is in the position to take full advantage of marketplace opportunities.
The structured portfolio managers are responsible for the mortgage-backed securities (MBS), commercial mortgage-backed securities (CMBS) and asset-backed securities (ABS) sectors. These two individuals are responsible for relative value within the structured sectors, individual security analysis and trading of securities within their assigned sectors. As with credit analysts, there are back-up responsibilities for each assigned sector.

Assuming full staffing levels at year-end 2007, the chart below details the estimated annual cost of salaries, benefits and incentive compensation for the Global Bonds Internal Management unit.

### Operating Budget

The Global Bonds Internal Management unit's operating budget is $2.688 million, or 1.4 basis points on estimated average assets of $19.659 billion. The schedule of Budgeted Operating Expenses is presented below. This represents an increase from the $2.058 million budget in 2006.

In the analytics category, the 2007 budget increase is mainly due to being under budgeted for one vendor in 2006. The information technology category increase reflects the transfer of several software licenses and maintenance agreements to the Investment Division.
Resources and Initiatives

Global Bonds Internal Management

The following table lists the total cost estimates for managing the Global Bonds Internal Management unit portfolio. The total costs for internal management of Global Bonds are projected at 1.5 basis points.

<table>
<thead>
<tr>
<th>Schedule of Estimated Total Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Year 2007</strong></td>
<td><strong>Costs in $ Millions</strong></td>
</tr>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Total Compensation</strong> 2.097</td>
</tr>
<tr>
<td></td>
<td><strong>Budget Operating less Personnel Expense</strong> 0.763</td>
</tr>
<tr>
<td></td>
<td><strong>Manager Fees</strong> -</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>Total Costs</strong> 2.860</td>
</tr>
<tr>
<td><strong>Average Assets Under Management</strong></td>
<td><strong>Costs in Basis Points</strong> 19,660</td>
</tr>
<tr>
<td><strong>Costs in Basis Points</strong></td>
<td><strong>Costs in Basis Points</strong> 1.5</td>
</tr>
</tbody>
</table>

Initiatives

- **Long-Duration Portfolio Implementation**
  The long-duration portfolio will be implemented through the transition of assets from other Global Bonds portfolios, as required by the new Defined Benefit Policy. The implementation of the long-duration portfolio will result in a decrease in high-yield and emerging market debt, which may result in a review of the current manager line-up.

- **Internally Managed Libor-based Portfolio**
  Staff will develop a proposal and guidelines for a new portfolio with a Libor-based objective. To accomplish this initiative, changes to the cash policy will be necessary, just as changes to the Exodus cash management system have already been made. This portfolio is expected to provide yield above the current cash portfolios, and provide returns that will permit investments in derivative-based initiatives where excess cash must be managed above the cost of Libor to provide alpha. Once approved and implemented, system costs, including staff time, will need to be dedicated to monitoring the purchased structured assets.

- **Securities Lending–Direct Lending of Treasury and Agency Securities**
  This initiative will explore the viability of lending assets internally, which may require additions to the current policy. Long-term, internal lending would increase income earned from securities lending. In addition, there would be greater access to and knowledge about the marketplace that would ultimately provide significant, beneficial insights for OPERS’ other internally managed portfolios. There will be some systems costs, whether developed internally or purchased to manage the lending function. In addition, significant staff time will be needed, as trading would occur daily. Operational staff dedicated to this process could also be needed.
External Management

Organizational Structure

External Management is composed of the External Public Markets, Real Estate and Private Equity units. Each unit is discussed in greater detail in the following three sections. The individual units are responsible for hiring and monitoring external investment managers and conducting due diligence activities.
External Public Markets

Organizational Structure

External Public Markets manages the assets placed with OPERS’ external investment managers in the publicly traded asset classes. As such, the unit handles the selection and monitoring of external managers across a variety of asset classes. The unit also develops strategies to efficiently use external management to maximize the portfolio’s return within its risk parameters.

The External Public Markets organizational structure for 2007 is as follows:

The SIO—external public markets provides guidance to the portfolio managers and oversees the total portfolio of external public market managers, including hedge funds and other opportunistic strategies. The portfolio managers are charged with selecting, monitoring and reporting on external public market managers. Staff also performs research and participates in division-wide initiatives.

Portfolio Structure

Here is an overview of the external public managers by asset class.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th># of External Managers</th>
<th>Mandates</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>10</td>
<td>2 large</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 small</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 enhanced index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 minority manager-of-managers</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>10</td>
<td>3 core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 high yield</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 emerging market debt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 commercial mortgage backed securities</td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td>16</td>
<td>1 passive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 enhanced index/core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 active</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 emerging markets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 infl small cap</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>4</td>
<td>2 hedge fund-of-funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 active currency managers</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

External Public Markets oversees almost 40 external managers. Some managers are used for more than one mandate. The decision regarding how many managers/mandates to use in each area is a function of many factors including diversification, capacity, and desire to fund some smaller Ohio-qualified and minority managers.
Portfolio Strategies

There are four primary strategies an external manager program employs to generate outperformance:

- **Strategic positioning**—This strategy uses long-term positions such as overweighting emerging markets within non-U.S. equity. Strategic positioning is addressed in each of the asset class strategy sections through a collaborative effort with the Fund Management department. Because of the long-term nature of strategic positions, adjustments are typically infrequent.

- **Tactical positioning**—Tactical positioning refers to shorter-term portfolio positioning. While External Public Markets will recommend some medium-term tactical strategies such as neutralizing our small cap weight within non-U.S. equity due to valuation concerns, staff remains cautious about short-term timing. Developing a methodology for internal tactical positioning is being considered as a 2007 division-wide initiative. Researching external managers who employ tactical asset allocation may also be considered.

- **Manager monitoring and selection**—Selecting a diverse group of managers each of whom has the potential to add value long-term, and building a robust diversified portfolio of such managers with no major structural mismatches or tilts, is the established, although not necessarily easy, strategy to add value.

- **Addition of new strategies**—By adding new opportunistic strategies such as hedge funds, active currency, global equity, or long-biased 130/30 mandates, external funds staff can add to the return and improve the risk/return ratio of the total fund.

Initiatives

**Review of Foreign Exchange (FX) Costs**

In 2007, staff will review the current process and the costs OPERS incurs in its foreign exchange conversions. Staff anticipates that we may be able to recommend changes that will significantly reduce FX costs.

For OPERS, *strategic* positioning is important but should be defined as long-term, with infrequent change. OPERS does not currently have a proven process for *tactical* positioning. Therefore, it’s been determined that External Public Markets can be most productive by concentrating on *manager monitoring/selection* and *new strategies*. With that in mind, the focus in 2007 will be on:

- Conducting thorough semi-annual portfolio reviews of all existing managers,
- Interviewing new, potential and/or high interest managers, and
- Seeking out new strategies.
Resources and Initiatives

External Public Markets

**Staffing/Hiring**

External Public Markets has two portfolio managers and one senior investment officer.

The chart above details the annual cost of salaries, benefits and incentive compensation to be paid in 2007 for the External Public Markets unit at full staffing levels. The projected compensation costs are expected to be 0.849 million, or 0.4 basis points of total managed assets.
Operating Budget

The External Public Market’s unit 2007 operating budget is set at $1.094 million. This amount represents 0.5 basis points of total External Public Markets unit assets of $23.042 billion. The schedule of Budgeted Operating Expenses is presented below. This represents an increase from the $0.940 million budget in 2006.

In the audit/legal/consulting category, the 2007 budget increase reflects the legal services associated with hiring active currency managers and hedge fund-of-funds managers.

The expense of operating the External Public Markets unit is estimated below. These figures incorporate both the department’s operating budget as well as projected external management fees. Total portfolio expense is forecasted to be 26.1 basis points, or approximately $60.243 million. Of this amount, 25.6 basis points, or 98% of the cost, is a result of external management fees.

<table>
<thead>
<tr>
<th>Schedule of Budgeted Operating Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Budget</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Personnel Expense</td>
</tr>
<tr>
<td>Audit/Legal/Consulting Services</td>
</tr>
<tr>
<td>Quotes &amp; Data Fees</td>
</tr>
<tr>
<td>Research Services</td>
</tr>
<tr>
<td>Analytics</td>
</tr>
<tr>
<td>Communications</td>
</tr>
<tr>
<td>Information Technology</td>
</tr>
<tr>
<td>Office Equipment &amp; Supplies</td>
</tr>
<tr>
<td>Training &amp; Travel Expenses</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Average Assets Under Management

Total Compensation

Budget Operating less Personnel Expense

Manager Fees

Total Costs

Average Assets Under Management

Costs in Basis Points

<table>
<thead>
<tr>
<th>Schedule of Estimated Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Year 2007</td>
</tr>
<tr>
<td>Costs in Millions of Dollars</td>
</tr>
<tr>
<td>Internal</td>
</tr>
<tr>
<td>Total Compensation</td>
</tr>
<tr>
<td>Budget Operating less Personnel Expense</td>
</tr>
<tr>
<td>Manager Fees</td>
</tr>
<tr>
<td>Total Costs</td>
</tr>
<tr>
<td>Average Assets Under Management</td>
</tr>
<tr>
<td>Costs in Basis Points</td>
</tr>
</tbody>
</table>
Private Real Estate

Organizational Structure

The following is the organizational structure for 2007.

Staffing/Hiring

The Private Real Estate unit has four members on staff, consisting of one lead portfolio manager, one portfolio manager, one analyst and one vacant position for a senior analyst/portfolio manager. Total staff compensation is estimated at $0.832 million, or 2.0 basis points, of assets under management.

Assuming full staffing levels at year-end 2007, the following chart details the annual cost of salaries, benefits and incentive compensation paid in 2007 for the Real Estate unit.

<table>
<thead>
<tr>
<th>Compensation dollars in millions</th>
<th>Real Estate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>0.560</td>
</tr>
<tr>
<td>Benefits</td>
<td>0.172</td>
</tr>
<tr>
<td>Incentive Compensation</td>
<td>0.100</td>
</tr>
<tr>
<td>Total Compensation</td>
<td>0.832</td>
</tr>
<tr>
<td>Average Assets in $ billions</td>
<td>4.063</td>
</tr>
<tr>
<td>Cost in Basis Points</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Operating Budget

The Real Estate unit’s 2007 operating budget is set at $1.510 million. This amount represents 3.7 basis points of our total Real Estate unit assets of $4.063 billion. The schedule of Budgeted Operating Expenses is presented below. This represents an increase from the $1.220 million budget in 2006.

In the audit/legal/consulting services category, the 2007 budget increase is mainly due to the under-budgeting of legal needs in 2006.

<table>
<thead>
<tr>
<th>Resources and Initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Real Estate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schedule of Budgeted Real Estate Operating Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Budget</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Personnel Expenses</td>
</tr>
<tr>
<td>Audit/Legal/Consultant Services</td>
</tr>
<tr>
<td>Quotes &amp; Data Feeds</td>
</tr>
<tr>
<td>Research</td>
</tr>
<tr>
<td>Analytics</td>
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<tr>
<td>Information Technology</td>
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</tr>
<tr>
<td>Training &amp; Travel Expenses</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

The total cost of operating the Real Estate asset class is estimated in the table below. These figures incorporate both the internal expenses as well as the external management fees projected for 2007.

<table>
<thead>
<tr>
<th>Schedule of Estimated Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Year 2007</td>
</tr>
<tr>
<td>Costs in Millions of Dollars</td>
</tr>
<tr>
<td>Internal</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Total Compensation</td>
</tr>
<tr>
<td>Budget Operating less Personnel Expense</td>
</tr>
<tr>
<td>Manager Fees</td>
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<tr>
<td>Total Costs</td>
</tr>
<tr>
<td>Average Assets Under Management</td>
</tr>
<tr>
<td>Costs in Basis Points</td>
</tr>
</tbody>
</table>
Private Equity

The following items describe additional approaches for developing a competitive Private Equity program.

Organizational Structure

Staffing/Hiring

The Private Equity unit currently consists of two analysts (one vacant) and a portfolio manager reporting to the SIO—external management. This structure allows a focused approach for deal flow and portfolio monitoring. Staff maintains lead and backup roles for each portfolio partnership.

The chart above details the annual cost of salaries, benefits and projected incentive compensation.
Operating Budget

The Private Equity unit’s 2007 operating budget is set at $1.854 million. This amount represents 14.5 bps of our total Private Equity unit assets of $1.281 billion. The schedule of Budgeted Operating Expenses is presented below. This represents an increase from the $1.531 million budget in 2006.

In the audit/legal/consulting services category, the 2007 budget increase is mainly due to under-budgeting legal needs in 2006. The information technology category increase reflects the transfer of several software licenses and maintenance agreements into Investments.

<table>
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<tr>
<th>Schedule of Budgeted Operating Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2006 Budget</strong></td>
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<tr>
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<td>Quotes &amp; Data Feeds</td>
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<tr>
<td>Total</td>
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</table>

The total cost of operating the Private Equity unit is estimated in the table below. These figures incorporate both the internal expenses as well as the external management fees projected for 2007.

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<tr>
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<tr>
<td>Total Compensation</td>
</tr>
<tr>
<td>Budget Operating less Personnel Expense</td>
</tr>
<tr>
<td>Manager Fees</td>
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</tr>
<tr>
<td>Average Assets Under Management</td>
</tr>
<tr>
<td>Costs in Basis Points</td>
</tr>
</tbody>
</table>
**Fund Management**

Fund Management works closely with other areas of the Division, and is responsible for both investment and non-investment activities. The team is responsible for:

- Reviewing, monitoring, and implementing changes to the asset allocations and related risk budgets for the Defined Benefit and Health Care funds;
- Performing research and analysis on investment allocations to asset classes, sub-asset classes and portfolios;
- Investment risk analysis and assessment for the Defined Benefit, Health Care and Defined Contribution funds;
- Providing quantitative research and analysis in support of internal asset management and other internal group activities;
- Equity index fund management;
- Equity and derivatives trading operations for internal portfolios and for asset allocation management.

**Organizational Structure**

This chart shows the organizational structure anticipated at the beginning of calendar year 2007.

The senior investment officer—fund management (SIO) reports directly to the director—investments, and is responsible for assuring all area responsibilities are performed. Assisting the SIO are four managers: the fund manager, index manager, quantitative manager and trading manager.

The fund manager manages risk budgeting and asset allocation activities, as well as analytical projects and ad hoc initiatives. The fund manager supervises two investment assistants—responsible for procedural documentation and reporting and analytical and administrative support for the team.

The index manager is responsible for managing the U.S. Equity Index portfolio, and provides assistance on other projects and initiatives.
The quantitative manager supervises three quantitative analysts. This team provides quantitative research and analytic support for the entire Investments Division. The group maintains databases and analytic tools for evaluating the risk-and-return characteristics of the funds and the asset class portfolios across the Division. This team also provides quantitative research, support and maintenance for the internally managed U.S. Equity Research portfolio’s quantitative model and for the REIT (Real Estate Investment Trust) portfolio’s quantitative model. This group also provides research and programming support for the algorithmic or rules-based trading platforms used in equity trading.

The trading manager manages two traders, and is responsible for executing trades for the internally managed index and active research portfolios and REIT portfolio. In addition, the trading manager may handle transition trades for the externally managed portfolios. The trading area executes trades using a variety of tools including electronic algorithmic and program trading systems and, as such, works closely with the investment portfolio managers and the quantitative research group to incorporate enhancements into the trading systems. The area also performs and reviews the analysis of internal transactions from a pre-trade and post-trade perspective using transactions cost-analysis tools and models.

Staffing/Hiring

The Fund Management group has 12 positions, 11 of which are filled. One quantitative analyst position is expected to be filled in 2007.

<table>
<thead>
<tr>
<th>Schedule of Estimated 2007 Salary and Benefit Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation dollars in millions</td>
</tr>
<tr>
<td>Fund Management</td>
</tr>
<tr>
<td>Salaries</td>
</tr>
<tr>
<td>Benefits</td>
</tr>
<tr>
<td>Incentive Compensation</td>
</tr>
<tr>
<td>Total Compensation</td>
</tr>
<tr>
<td>Average Assets in $ billions</td>
</tr>
<tr>
<td>Cost in Basis Points</td>
</tr>
</tbody>
</table>

The chart above details the annual cost of salaries, benefits and projected incentive compensation.
The Fund Management unit 2007 operating budget is set at $3.063 million. This amount represents 1.6 basis points of our total Fund Management unit assets of $19.623 billion. The schedule of Budgeted Operating Expenses is presented below. This represents an increase from the $2.930 million budget in 2006.

In the audit/legal/consulting category, the 2007 budget increase reflects the legal services associated with completing master agreements from the International Swaps and Derivatives Association (ISDA). The ISDA agreements are the over-the-counter derivatives legal documentation. The increase in quotes and data feeds is offset by the reallocation of services in the analytics category. The increase in research services is due to the addition of risk analytics. The information technology category increase reflects the transfer of several software licenses and maintenance agreements into Investments.

The table below lists the total cost estimates for the Fund Management resources. The total costs for Fund Management are projected to reach 1.7 basis points. The assets under management include only the internally managed index portfolio, while the Fund Management resources will impact asset management decisions across the division. As a percent of the total Fund Management costs, internally managed assets will account for 100% of costs.

<table>
<thead>
<tr>
<th>Schedule of Budgeted Operating Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel Expense</strong></td>
</tr>
<tr>
<td>2006 Budget</td>
</tr>
<tr>
<td>$1,969,209</td>
</tr>
<tr>
<td><strong>Audit/Legal/Consulting Services</strong></td>
</tr>
<tr>
<td>$0</td>
</tr>
<tr>
<td><strong>Quotes &amp; Data Feeds</strong></td>
</tr>
<tr>
<td>$401,000</td>
</tr>
<tr>
<td><strong>Research Services</strong></td>
</tr>
<tr>
<td>$51,300</td>
</tr>
<tr>
<td><strong>Analytics</strong></td>
</tr>
<tr>
<td>$370,200</td>
</tr>
<tr>
<td><strong>Information Technology</strong></td>
</tr>
<tr>
<td>$46,100</td>
</tr>
<tr>
<td><strong>Office Equipment &amp; Supplies</strong></td>
</tr>
<tr>
<td>$2,500</td>
</tr>
<tr>
<td><strong>Training &amp; Travel Expenses</strong></td>
</tr>
<tr>
<td>$88,370</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>$2,929,619</td>
</tr>
</tbody>
</table>

The table below lists the total cost estimates for the Fund Management resources. The total costs for Fund Management are projected to reach 1.7 basis points. The assets under management include only the internally managed index portfolio, while the Fund Management resources will impact asset management decisions across the division. As a percent of the total Fund Management costs, internally managed assets will account for 100% of costs.

<table>
<thead>
<tr>
<th>Schedule of Estimated Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Year 2007</strong></td>
</tr>
<tr>
<td>Costs in $ Millions</td>
</tr>
<tr>
<td><strong>Internal</strong></td>
</tr>
<tr>
<td>Total Compensation</td>
</tr>
<tr>
<td>Budget Operating less Personnel Expense</td>
</tr>
<tr>
<td>Manager Fees</td>
</tr>
<tr>
<td>Total Costs</td>
</tr>
<tr>
<td>Average Assets Under Management</td>
</tr>
<tr>
<td>Costs in Basis Points</td>
</tr>
</tbody>
</table>
The Fund Management group will lead the following initiatives in 2007:

- **Internal Tactical Asset Allocation Capabilities**
  Internal processes, procedures, parameters and internal control framework to facilitate tactical asset allocation activities will be developed. This will allow the funds to reposition asset exposures based on changes in risk or return expectations in a timely fashion and capture the associated benefits of enhanced returns and/or reduced risks. Developing the parameters will involve quantitative and market analysis from the Investments staff. Development of the processes, procedures and internal controls will be an interdisciplinary project that requires the involvement of many departments and divisions including Fund Management, Legal, Information Technology (IT), Investments Administration, Investment Accounting and Internal Audit.

- **Passive Non-U.S. Equity Investing**
  Following a thorough investigation of all components required to construct this fund; staff will trade and manage an index fund internally based on a non-U.S. equity index such as MSCI. All aspects of the portfolio construction and management process will be studied, from index construction through trading, operational and custodial issues. The benefits of this project include:
  - OPERS staff will become educated on international indexing and international securities,
  - The project provides independence from external managers and minimizes our reliance on the small pool of qualified external index managers, and
  - Creates the ability to react quickly to internal asset allocation strategies.

  Trading, portfolio management, securities lending, cash management, quantitative analysis, investment accounting, custodian, and investment technology will be involved to provide information about systems needs and costs, workflow and staffing.

- **Internally Managed Quantitative Model Portfolio**
  Staff will refine the model currently used to manage the U.S. Equity portfolio and develop a model-based paper portfolio to evaluate the benefits of managing a small portion of assets internally. Staff will employ an optimization tool from various vendors to construct/rebalance the portfolio. The portfolio is a low-touch portfolio, which requires minimal intervention or overrides. Staff will enhance the Quantitative Stock Selection (QSS) model from positive feedback by directly managing the paper portfolio. This strategy will employ optimization as a portfolio construction approach and be a proving ground for new model factors. Trading, Quantitative Research and Analysis, Investment Accounting, Custodian, and IT groups will be involved in setting up the activity. The portfolio will have a tracking error of approximately 100 basis points and a 1-3 month rebalancing period comparable to the internally managed research portfolio with a Russell 1000 benchmark.

- **Enhanced Risk Management**
  Staff will further develop the risk management efforts initiated in 2006 which include the evaluation of alternative approaches toward risk budgeting as well as evolving operational risk management through the use of the Operational Risk Management Committee and preparing for a mock-SEC audit. This will improve investment performance and reduce costs associated by effectively managing risks. The effort permeates throughout the Investment Division and related investment functions—Investment Accounting, IT, Internal Audit, Legal and Custodian.

- **Health Care Investment Policy Review**
  Staff will develop asset classes and asset class returns projections, and develop an investment policy tailored to the Health Care liabilities. This will ensure that the investment policy continues to be appropriate for the Health Care program. The effort requires involvement of Investment staff with investment advisor and actuary.
Investment Administration

Organizational Structure

The Investment Administration team supports the Investment Division’s asset management strategies by ensuring the fulfillment of its Defined Contribution fund, operational, compliance, reporting, and corporate governance investment requirements.

The Investment Administration team is responsible for:

- **Defined Contribution Fund Management**—Managing Defined Contribution fund investments and coordinating input from the Investments Division and Defined Contribution department.

- **Operational Risk Management**—Managing the Division’s budget, service level agreements, procedures documentation, and survey completion and coordinate the implementation of industry best practices for operational risk management.

- **Compliance**—Monitoring compliance with investment policies, portfolio guidelines, regulations and operational procedures and, independently from the Investment staff, reporting results to the Internal Audit department, Retirement Board, and senior management.

- **Investment Reporting**—Performing centralized reporting for the Investment Division and managing the data warehouse.

- **Corporate Governance**—Managing activities related to voting OPERS proxies, participating in shareholder resolutions and appropriate corporate governance organizations and generally applying good corporate governance principles to OPERS shareholder responsibilities.
The following is a projected organizational structure for 2007.

**Staffing/Hiring**

The Investment Administration team currently has seven members and three vacancies.

**Operating Budget**

The Investment Administration department 2007 operating budget is set at $1.690 million. This represents an increase from the $0.760 million budget in 2006.

In the personnel expense category, the 2007 budget increase reflects the transfer of Corporate Governance into the Investment division and the addition of an investment analyst position. The increase in audit/legal/consulting services, research services and training and travel expenses reflect the additional resources related to Corporate Governance. The information technology category increase reflects the transfer of several software licenses and maintenance agreements into the Investment division.

### Schedule of Budgeted Operating Expenses

<table>
<thead>
<tr>
<th></th>
<th>2006 Budget</th>
<th>2007 Budget</th>
<th>Dollar Change</th>
<th>Percent Change</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Expense</td>
<td>$709,031</td>
<td>$1,097,652</td>
<td>388,521</td>
<td>54.8%</td>
<td>64.9%</td>
</tr>
<tr>
<td>Audit/Legal/Consulting Services</td>
<td>$0</td>
<td>$60,000</td>
<td>60,000</td>
<td>-</td>
<td>3.5%</td>
</tr>
<tr>
<td>Quotes &amp; Data Feeds</td>
<td>$10,000</td>
<td>$0</td>
<td>(10,000)</td>
<td>-100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Research Services</td>
<td>$0</td>
<td>$171,000</td>
<td>171,000</td>
<td>0.0%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Analytics</td>
<td>$0</td>
<td>$100,000</td>
<td>100,000</td>
<td>-</td>
<td>5.9%</td>
</tr>
<tr>
<td>Communications</td>
<td>$1,480</td>
<td>$0</td>
<td>(1,480)</td>
<td>-100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>$0</td>
<td>$198,550</td>
<td>198,550</td>
<td>-</td>
<td>11.7%</td>
</tr>
<tr>
<td>Office Equipment &amp; Supplies</td>
<td>$39,375</td>
<td>$63,260</td>
<td>23,885</td>
<td>60.7%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Training &amp; Travel Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$759,885</td>
<td>$1,690,362</td>
<td>$930,476</td>
<td>122.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Initiatives

Comprehensive Front Office Systems Plan
To meet the Investment Division’s emerging needs over the next five years, staff will conduct a comprehensive assessment of front office trading, analytical and compliance systems. The assessment will define requirements, make recommendations and establish an implementation plan. The implementation plan will provide a comprehensive approach to improve access to markets, enhance settlement efficiencies, increase automation and improve reporting capabilities. The assessment will include consulting costs and staff time to evaluate current systems and define future requirements. Implementation may include costs for additional systems and resources.

Automated Compliance System
Staff will evaluate automated compliance systems to identify the best cost and benefit alternative. Staff will implement the system and provide automated reporting and tracking of portfolio guideline and policy compliance results. Results will be made independently available to the Retirement Board, senior investment management staff, Operational Risk Management Committee and internal audit department.

Operational Risk Management
Staff will continue to develop its internal processes and controls to meet the requirements of its Business Continuity Planning efforts and its anticipated Mock Investment Advisor audit.
Date: November 29, 2006
Subject: The Annual Plan
To: OPERS Board
Cc: OPERS Staff
From: Terry Ahern

The Real Estate Consultant to the Public Employees Retirement System of Ohio ("OPERS") has reviewed the 2007 Real Estate Department Annual Real Estate Investment Plan (the "Investment Plan"). The Investment Plan is consistent with accomplishing the goals and objectives set forth in the OPERS Real Estate Policy (the "Policy") which was revised and approved in October of 2005. We recommend that the Board approve the Investment Plan and we offer the following comments.

First, the market value of the private real estate program as of July 31, 3006 was $3.3 billion. The Investment Plan projects $1.6 billion of acquisitions and $975 million of dispositions during the remainder of 2006 and 2007. This investment activity will cause the market value at year end 2007 to be $4.3 billion; and the defined investment initiatives are consistent with developing the program in a manner that will have a lower risk diversified "keel in the water" and a higher risk alpha allocation that in the aggregate will enable it to achieve its benchmark return and to comply with its Policy constraints.

Second, the Investment Plan provides for $400 million dollars to be committed to Core open end commingled funds. This action item is consistent with providing the real estate program with a "keel in the water" that is well diversified by property type and location. And it will provide relatively near term exposure to Core real estate.

Third, the Investment Plan provides for $250 million to $350 million to be committed to Non-core pooled funds. This action item is consistent with providing the real estate program with the "alpha" necessary to achieve the benchmark return. We note that the Investment Plan provides specific amounts to be invested in a defined number of funds for domestic and international strategies. We agree that the Non-core component must be diversified by manager, fund and strategy. However, we believe that the actual number of funds and the amount to be invested in each fund will be determined in part by market conditions and the opportunity set. We also believe that OPERS should make investments in amounts that will "move the needle" when successful (again contingent upon the total Non-core program being diversified by fund, manager and strategy). Hence, we see these amounts as goals to establish pace and direction for new investments, but not hard targets. The program should remain flexible in implementation consistent with the opportunity set.

Fourth, the Investment Plan provides for a total of $2.2 billion to be committed to the separate account program through 2007. This is a continuation of the separate account initiatives that commenced during preceding years. As part of those initiatives the contracts with the managers have been prepared or revised to provide the manager with "managed discretion". This change will enable the managers to be more competitive in the marketplace and to be more accountable to OPERS; further, it will free Staff resources to address the development of the other elements of the real estate program. Also, the Investment Plan provides for a search for a separate account apartment manager. This is consistent with ensuring that OPERS has a team of separate account managers that in the aggregate have expertise in all of the primary property types.

Fifth, the Investment Plan projects the amount of capital that will be invested by property type for each investment channel (separate accounts, and open and closed-end commingled funds). We believe that it is important to ensure that the total program is developed in a manner consistent
with the Policy including diversification by property type. We also believe that it is important to have flexibility by investment channel in order to capitalize on the best investment opportunities then present in the market. The Staff uses property type targets by investment channel to promote the development of the program in a manner consistent with the Policy but has stated that it has the flexibility to amend the targets to capitalize on the best investment opportunities contingent with the total program being consistent with the Policy. We encourage adopting such a flexible approach.

Sixth, historically the real estate program has had a domestic focus. The program has made, and the Investment Plan continues to contemplate, international investments. Also, the Non-core investment universe is continuing to evolve and include non-traditional property types and strategies. Consistent with the evolution of the real estate program and the Non-core sector it may be necessary to further refine the definition of Non-core to capture the program’s investment universe.

We concur with taking advantage of the opportunity to capitalize upon the favorable market conditions. But we also believe in a disciplined approach. It is our opinion the Investment Plan is consistent with both these approaches and will develop the real estate program in a manner consistent with the Policy. Current market conditions will require diligent oversight and judgment on the part of Staff and Townsend.

I will be present at the Investment Committee meeting scheduled for December and will be pleased to answer any questions you may have. In the interim, do not hesitate to contact me.

Regards,

Terry Ahern
November 1, 2006

The Investment Committee of the Board of Trustees
Ohio Public Employees Retirement System
277 East Town Street
Columbus, OH 43215-4642

Dear Members of the Investment Committee:

We have reviewed the OPERS 2007 Investment Plan. The Plan addresses the execution of policies and programs approved by the Committee and provides for the exploration of enhancements to the investment program. The essential contents include:

- 2006 recap and review
- Governance structure
- Staffing
- Target asset allocation and ranges
- Performance benchmarks
- Expense budget
- Risk budget
- Major initiatives

In our opinion, it describes the investment program in prospect for 2007 in a manner consistent with existing OPERS policies and directives.

Sincerely,

Kristine L. Ford, CFA
Principal

KF:cm
MEMORANDUM

To: Ohio Public Employees Retirement System ("OPERS")
From: Hamilton Lane
Date: October 24, 2006
Re: 2007 Annual Investment Plan

Hamilton Lane has worked in conjunction with OPERS’ Staff in developing the 2007 Annual Investment Plan (the "Plan"). As part of our strategic planning process, we have employed our Horizon Model, a proprietary, multi-stage/multi-period model to plan investment pacing, based on the existing private equity portfolio and the overall objectives of the private equity program, including the targeted allocation of 5%. The inputs for this analysis, which employs multi-variable modeling, combines over 20 years of historical data in our investment database, Hamilton Lane’s and OPERS’ Staff's view of the private equity market risk and returns, commitment size, total number of relationships and asset sub-class diversification among other factors.

Hamilton Lane believes that the Plan is tailored to meet OPERS' long- and short-term objectives relative to the private equity asset class and is conformance with Policy restrictions and guidelines.
The Year Ahead: A Return to Trend Growth with Moderating Inflation

- By the fall of 2006 it has become clear that the U.S. economy has transitioned to a period of below-trend growth. We estimate that GDP rose at an anemic 1.8% pace in the third quarter, after the second quarter’s below-trend 2.6% increase.¹ We expect GDP growth to rebound to roughly 2¼% in the fourth quarter — still about ½ percentage point below trend. Nevertheless, we expect that the forces contributing to below-trend growth are not sufficiently strong nor persistent enough to prevent the economy from returning to near trend growth (roughly 3½%) in 2007, with trend-like growth continuing in 2008.

- The period of below-trend growth in 2006 results from a sharp decline in residential construction that is expected to subtract more than 1 percentage point from second-half growth, declining motor vehicle production, and the lagged effects of sharply rising energy prices and increases in borrowing costs through early summer.

- Core inflation is expected to subside from recently elevated readings. Temporary factors which may have been boosting inflation are expected to dissipate, and the period of below-trend growth generates some slack, which, combined with well-anchored inflation expectations, further helps relieve inflationary pressures. Core CPI inflation is projected to decline from 3.5% in the second quarter of this year to 2.9% over the second half, then slow to 2.5% in 2007.

- The Federal Reserve left the federal funds rate unchanged at 5.25% at its August and September policy meetings. MA expects this “pause” will extend to a “full stop” as incoming data confirm that growth remains below-trend and inflation slowly subsides. The 10-year Treasury note yield is expected to drift up to 5.05% by mid-2007.

- Equity markets have been buoyed by perceptions that the Fed is done tightening and an emerging consensus that growth, while sluggish in the near-term, will remain positive, and recession will be avoided. We expect broad equity indexes to rise roughly 5½% from June 30th to year’s end, and another 6½% over 2007.

We continue to view the underpinnings of the economic expansion as solid. Yet, over 2006 the U.S. economy faces several challenges — a sharp housing contraction, declining motor vehicle production, and lagged effects of higher energy prices and interest rates — that are combining to slow growth over the second half of this year to just 2¼% and especially in the third quarter when we estimate growth was below 2%. Nevertheless, we expect that following a couple of quarters of sluggish growth we will see growth move back toward trend in 2007. The unemployment rate is expected to drift up toward 5.1% by the spring of 2007. Increased slack in labor (and product) markets helps to cap cyclical pressures that might otherwise push inflation higher. Well-anchored inflation expectations and the dissipation of some temporary factors that had been raising inflation results in inflation subsiding from recently elevated levels. GDP growth in 2007 and 2008 is expected at 3.3%, while core CPI inflation is projected to drop from 3.5% this year to 2.5% in 2007 and 2.3% in 2008. With upside inflation risks present, this relatively benign inflation outcome requires that the Fed remain on hold in the near term, accepting the period of below-trend growth this year as helpful in capping those risks and in lowering inflation. Next year, with growth expected to rebound to just trend and with clear signs that inflation is subsiding, the Fed finds no compelling reason to tighten then either. Long-term yields are expected to drift

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higher as market expectations of near-term easing erode in favor of expecting no near-term change in policy. However, there is likely to be limited upside to longer-term yields if in fact the Fed is done tightening, as we expect. The 10-year Treasury note yield is expected to reach 5.05% in the spring of next year. Stocks continue to be buoyed by evidence that suggests the economy will ride out this near-term storm, aided by the recent sharp declines in energy prices, and perceptions that we are near the peak in interest rates. We expect gains in broad equity indexes on the order of 6% to 7% this year and in 2007 and 2008.

The period of sub-par growth projected in this forecast implies that the unemployment rate should soon be on a gradual upward trajectory that represents the easing of "tight" labor markets and the development of some economic slack. A perfect "soft landing" would have the economy slow from above-trend growth early in an expansion to trend growth, just as the unemployment rate converges to its non-inflationary level. In this expansion, growth remained stronger for longer, pushing the unemployment rate all the way down to 4.6%, a level consistent with rising inflation if maintained for too long and not offset by some other factors. Thus the Fed faced the task of not only getting growth down to trend, but also had to engineer a period of below-trend growth to ease the tightness in labor and product markets that threatens an unacceptable trend rise in inflation. As we have maintained for some time, the rise in interest rates at the Fed's hand, combined with rising energy prices and flattening home prices, would eventually do the job. However, the timing and precise degree of slowing was always somewhat uncertain. So far so good on this score.

This forecast foresees a 1/2 percentage-point rise in the unemployment rate by the spring of 2007, qualifying this as a bit of a bumpy landing, or for us "the glass is half full" types, a "not-so-soft" landing, but not a "hard landing." A rise in the unemployment rate of this magnitude has not occurred in the post-WWII era in the U.S. outside of a recession. Nevertheless, still quite accommodative financial conditions compared to those which preceded previous downturns suggest that the U.S. will skirt a recession this time around. Moreover, the forces contributing to the slowing in 2006, while sufficient to initiate the period of below-trend growth, are not strong enough and do not have sufficient staying power to keep growth below trend for long. Thus while there were good reasons to expect a second half slowing, there are equally good reasons to expect a rebound to trend growth in 2007.

So what accounts for the second-half slowing and the expected rebound to trend? First, the lagged effects of the rise in interest rates over the last couple of years are restraining near-term growth. This effect is not confined to the second half, but arguably has been at work for some time and will extend well into the forecast. In the aftermath of the stock-market meltdown that began in early 2000 and during the ensuing recession, the Fed quickly lowered interest rates to historically low levels — 1% for the federal funds rate. Real interest rates plunged, and remained low while the Fed sought to maintain exceptionally accommodative financial conditions. By the summer of 2004 the economy’s recovery had been aided by the 2003 tax cuts (advanced and enhanced previously legislated tax cuts) and appeared to be well entrenched. The unemployment rate had fallen from the cyclical peak of 6.3% to 5.5% by May of 2004, and real GDP growth over the year to the second quarter of 2004 had risen to 4.5%, which was then and remains the cyclical peak in four-quarter growth. While some structural drags may have been present — for example, persistent business and household caution in the aftermath of 9/11 and persistent declines in net exports due to low domestic saving, a strong dollar, and insufficient foreign demand — there was growing confidence that the expansion was self-sustaining and a perceived need to see growth slow to near trend before labor and product markets tightened too much further. The Fed obliged with seventeen quarter-point increases in the fed funds rate at consecutive meetings of the FOMC, which raised the real federal funds rate from -0.77% in the second quarter of 2004 to roughly 2.45% by the summer of 2006. Real long-term rates, which have more traction on aggregate demand than short-term rates, primarily through the channels of business fixed investment, residential construction, and consumer spending via the equity wealth channel, rose by less. The real 10-year

1\textsuperscript{1} Unless otherwise noted, all quarterly growth rates are expressed as compound annual rates, all components of GDP refer to chained 2000 dollar magnitudes, and all yearly growth rates are stated as fourth-quarter over fourth-quarter.
government note yield (calculated using a survey-based measure of long-term inflation expectations) rose from the cyclical low of 1.67% in early 2003 to 3.12% by the second quarter of this year.

Although modest, the rise in real interest rates does imply withdrawal of monetary stimulus. For example, we estimate that the rise in the mortgage rate over the last few years is reducing housing starts in 2006 by roughly 260 thousand units. The rise in real rates can also indirectly impact aggregate demand growth through the influence of interest-rate changes on asset values, and via wealth effects on consumer spending. Rising interest rates would be expected, other things equal, to lower equity values, and housing values. Hence, the rise in rates the last couple of years likely has played a role in restraining equity values and restrained consumer spending relative to the case with steady rates. While housing values have seemed to be immune to the rise in mortgage rates, this may be changing. We anticipate a flattening in nominal house prices which reflects both a correction of an estimated over-shooting of house prices and restraint on real house prices from rising interest rates. This slows the growth of non-equity household wealth and has a restraining effect on the growth of consumer spending.

Second, and more directly relevant to the second-half slowing, sharp declines in housing starts and construction will subtract slightly over 1 percentage point from GDP growth in the third and fourth quarters. As argued above, much of this decline is due to the aforementioned rise in interest rates. Housing starts are expected to fall 24% from a first-quarter average of 2.123 million units to 1.620 million in the fourth quarter. Of course, given the completion schedules through which starts are transformed to construction put-in-place, residential construction will also experience a sharp decline, falling roughly 11%, 18%, and 16%, at annual rates, over the second, third, and fourth quarters, respectively. This implies a direct drag on GDP growth of 1.2 percentage points in the third quarter and 1.0 percentage point in the fourth quarter. Residential construction also is projected to decline roughly 12% in the first quarter and 5% in the second quarter as housing starts are expected to decline all the way to 1.582 million units. The flattening of housing starts and residential construction at a sharply lower level implies less drag on GDP growth from this source in 2007.

Third, a decline in motor-vehicle production swiped another few tenths from growth in the third quarter. High levels of light vehicle inventories and attempts by the industry to wean consumers and itself from large sales incentives to clear inventories, is encouraging a move to a lower production level, for at least the near-term. The nearby chart shows the quarter-to-
quarter change in motor-vehicle production and the implied drag on GDP growth. A production decline of roughly $12 billion in the third quarter, we estimate, took the level of production well below sales, resulting in a whopping $9.4-billion decline in motor vehicle and parts inventories in the third quarter. Our assumption that production is roughly flat in the fourth quarter, inferred from announced production schedules, implies another huge inventory decline of $44 billion. Whether the industry ultimately follows through with these plans remains to be seen. However, we view the assumed level of production in the fourth quarter as quite lean relative to sales. This both suggests upside risk to our motor-vehicle production forecast (and our GDP forecast) in the fourth quarter and points to a rise in early 2007. That expected production increase in 2007 is a significant factor boosting GDP growth in early 2007 and helping to assure overall growth rebounds from roughly 2¼% to roughly 3¼%.

Fourth, lagged effects of the rise in energy prices over the last few years will likely restrain growth up through the third quarter and perhaps beyond. Sharp increases in energy prices over the last three years has eroded the growth of real disposable income. Over the nine quarters from the first quarter of 2004 through the first quarter of 2006, the rise in energy prices has restrained the growth of real disposable income by over 1 percentage point. In light of the lags on disposable (labor) income in the various consumer spending equations, this period of rising energy prices and restrained real income growth would be expected to restrain consumer spending through at least the end of this year. If not for the recent sharp reversal in energy prices the last two months, this would be more of a concern in the outlook. As seen in the nearby chart, for the first time in several years, declining energy prices are expected to boost growth of DPI relative to the case where energy prices rose at the rate of all other prices. The sharp decline in PCE energy prices implicit in this forecast in the fourth quarter (-38% annualized) “boosts” DPI growth from a counter-factual gain of 4.1% to 6.5% in the fourth quarter. Moreover, energy prices have fallen significantly since we completed the forecast, suggesting that the support to real income and wealth and consumer spending from this source will be even larger if that decline is sustained. In this sense, the swings in energy prices both have restrained growth up through the third quarter, and contribute to a rebound in growth after the third quarter.

Fifth, an assumed flattening in house prices alluded to above sharply slows the growth of household real estate values and wealth and restrains consumer spending. This effect has not yet been seen in the historical data but it is assumed to show up quickly in the forecast. As of the third quarter we assume a small nominal decline in house prices (in the HPI index from OFHEO), which puts the brakes on the growth of non-equity wealth and “restrains” consumer spending. However, with PCE estimated to have grown at a 3.4% annual rate, it can hardly be considered restrained. Importantly, while the assumed flattening of home prices will “restrain” growth of PCE going forward, relative to the case where house prices continued to rise at 10% to 12%, growth of other wealth and real income will more than offset it, keeping PCE rising at better than a 3% rate.

Some analysts fear that another potential spillover from weak or declining house prices on consumer spending will come in the form of a sharp decline in household mortgage borrowing against homeowners’ equity. Those analysts argue that the disappearance of what has been a gushing ATM used to finance rapid growth of consumer spending will put a sharp brake on that growth. It is worth emphasizing up front that we do not view changes in what is called “mortgage equity withdrawal” or MEW as having any material effect on consumer spending. Equity withdrawal occurs whenever homeowners’ equity is reduced by an increase in mortgage debt. This can occur by the homeowner refinancing their mortgage and taking on more debt in exchange for cash, a so-called cash-out refinancing, or by tapping a home equity credit line. A sale of a house that results in an increase in mortgage debt on that property is also MEW. In either case, MEW does not alter one’s income or net worth, simply the form in which that wealth is held. On the household’s balance sheet there is an initial increase in mortgage debt and an increase in cash. Some analysts make a distinction between equity withdrawal that occurs as a result of a sale, and that which occurs independent of a sale. The latter, referred to

Energy Price Impact on Real Disposable Income Growth

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<th>2003</th>
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<th>2005</th>
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<tr>
<td>DPI excluding energy price impacts</td>
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</table>

Chart excludes impact of Microsoft dividend in December 2006.
as "active MEW" is argued by some to be a kind of "hot money" that drives an increase in consumer spending. This would mean that the form in which wealth is held determines consumption, an assertion that is inconsistent with the tried and true Life-cycle Model of consumer spending. Some argue that previously liquidity constrained households, who are now able to tap the equity in their homes might now be freed to raise spending to the desired level consistent with the life-cycle theory. While a careful evaluation of this possibility suggests this effect should be small and a one-time effect in any case, this possibility suggests that whether MEW does or does not impact consumption in the aggregate is ultimately an empirical question. Our analysis fairly conclusively answers this question with the result that the rise in MEW did not, and a decline in MEW most likely will not, materially impact consumption. Changes in wealth, perhaps affected by declines in house prices, certainly might, but changes in MEW will play no significant role.

Our growth projections for 2007 and 2008 are for solid trend-like growth around 3.3%. A recent decline in energy prices, some recent declines in long-term interest rates, and slightly stronger equity values help to account for the sanguine growth outlook in 2007 and 2008. Slightly weaker near-term growth, owing primarily to the downward revision in the path of motor-vehicle production, leaves room for increasing motor vehicle production next year to contribute more to growth than in previous forecasts. Underneath this relatively steady growth outlook is some rotation among major components of GDP. (See the nearby chart.) We expect to loose the drag from housing, and gain a small positive contribution from net exports. This largely offsets smaller positive contributions from consumer spending and nonresidential fixed investment, compared to 2006.

This relatively upbeat forecast for US growth over the next couple of years is complemented by a forecast of generally solid growth most major overseas economies over the same period. Foreign GDP (on a US trade-weighted basis) is projected to rise 3.8% this year, followed by increases of 3.4% and 3.6% during the next two years. For some time we have seen generally encouraging economic performance in Latin America and in Asia, two regions that have led strong growth of overseas demand. Long the laggard among the most advance regions, the Eurozone experienced a marked upturn of real growth earlier this year. During the first half of 2006, GDP rose at a 3.5% annual rate, the strongest two-quarter performance in six years and well above the full-year increase during 2005 of 1.8%. Strong Eurozone growth this year reflects rapid expansion in traditionally faster-growing economies around the periphery of the Eurozone (Ireland, for example), as well as some improvement in the larger, "core" Eurozone economies, including Germany and France. External demand and investment spending have been important components of the expansion in Germany, where GDP rose 3.2% during the first half of 2006, while consumer spending has been more mixed. This is in partial contrast to France, where consumer spending has been an important factor in strong first-half GDP growth that averaged 3.4%. As of September, Eurozone business confidence was the highest in just over six years and at one of the highest levels in a generation. Consumer confidence has improved markedly from its cyclical low in 2003, but remains soft and well below previous cyclical peaks in 1989, 1995, and 2000. There is a very real possibility that some of the upturn in Eurozone growth could be reversed quickly. Domestic demand is likely to soften in response to planned fiscal belt-tightening in both Germany and Italy at the beginning of 2007. Recent European Central Bank rate increases aimed at capping any cyclical rise in inflation may also work to slow Eurozone growth in 2007 and 2008 toward that region’s trend of 2% - 2½%.
Returning to the US outlook, we remain optimistic that the recent upswing in inflation will not be sustained, and that core CPI inflation will fall back closer to 2.5%. In this forecast we show core CPI inflation for 2006 at 2.9%, slipping to 2.5% in 2007 and 2.3% in 2008. This path is slightly lower than what we were projecting a few months back and reflects our increasing appreciation of the role well-anchored inflation expectations may play in taming recently unruly inflation. The gravitational effect of low and steady inflation expectations helps to pull inflation down whenever it strays above the expectation.

Assuming no repeat of temporary factors pushing inflation higher, the forecast of a 2.5% rise in the core CPI in 2007 is more reflective of what we believe is the underlying pace of inflation.

It is difficult to know precisely how much of the recent rise in core inflation is the result of intensifying cyclical pressures and how much is the result of a pass-through from sharply rising energy prices to core inflation. To be sure there is plenty of anecdotal evidence that airlines, shippers, and others have been successful in passing on higher energy (and commodity price increases more broadly) into the prices of non-energy goods and service. The sharply lower energy prices in this forecast, including nearly a 40% decline in the PCE energy price assumed in the fourth quarter of this year, and the general stabilization of energy prices thereafter, would at least contribute to a more rapid dissipation of pass-through effects, beginning in 2007.

Recent sharp upward revisions to the level and growth of labor compensation are a double-edged sword in the outlook. On the one hand, they suggest more support to consumer spending growth over the near term — increasing the likelihood we will get through this soft patch without slipping into recession — and on the other hand, raising upside inflation risks as a result of the uncertainty about the persistence of the recent sharp increase in unit labor costs and the degree to which such costs will be passed on in higher prices.

In response to evidence that economic growth has slowed to below trend and encouraged that recently elevated core inflation readings would subside, the Fed paused at its August and September policy meetings following a string of rate hikes at seventeen consecutive policy meetings. We expect the pause to “mature” into a full stop, as the forecast of continued below-trend growth and moderating core inflation, to be confirmed by incoming data, would prove enough to forestall further tightening moves at least through year end. This leaves the fed funds target at 5.25% through year end. While the outlook beyond that is less clear, we expect that growth will be strong enough and inflation sticky enough near the high end of the Fed’s comfort zone to forestall any easing. On the other hand, we do not believe the Fed will take overt action, given this forecast, to attempt to push inflation lower. That leaves the funds rate at 5.25% through the short-term forecast horizon. That is, risks to the upside and downside around this forecast are roughly balanced!

Long-term interest rates are expected to drift higher. Key to this rate outlook is the resumption of trend growth next year, and the Fed remaining on hold at 5.25%. This forecast shows the yield on 10-year Treasury notes averaging 4.90% in the third quarter, rising to 5.00% by the second quarter of 2007, and to 5.05% by the summer of 2007.
Corporate profits continue to surprise on the upside. Solid growth this year is pretty well assured as a result of very strong profit gains over the first half of the year, when before-tax economic profits surged at a 60.8% (annual rate) in the first quarter and increased at a 5.9% pace in the second quarter. For the year as a whole, we expect profits to be up roughly 12%.

Below-trend economic growth over the second half of the year results in profits growth slowing sharply. In particular we expect a decline in profits in the fourth quarter. A resumption of trend growth in 2007 sees profits turn up, but trend growth generates only a trend-like rise in profits of 5.8%.

Equities started 2006 on a strong footing, but stumbled badly in mid-May, erasing most, if not all of the earlier gains. Most recently, as signs of moderating growth and core inflation were perceived to reduce the chances of additional rate hikes, equities have staged a solid recovery, in line with our expectations that corporate equity values will rise about 5½% from mid-year through year end, although recent gains suggest we might be a bit low. We expect trend-like gains of roughly 6½% in each of the next two years. The recent sharp declines in energy prices have energized equity markets. This positive supply shock boosts growth prospects, will help to unwind some of any energy price pass-through to core inflation, and reinforces the markets’ view that further Fed rate hikes are unlikely. The nearby chart shows the value of household holdings of equities, a series that tracks the Wilshire 5000 index fairly closely. Also shown in the chart is the “fair value” range predicted by our equity valuation model. The fact that we are projecting equity values running near the lower end of the fair value range suggests some upside risk to this forecast for equity values.

**Key Sectors in the Outlook**

In this section, we cover the driving forces behind our forecast of the major components of spending and production.

Consumer spending growth is in the process of broadly slowing from generally above-trend to trend growth. Personal consumption expenditures, or PCE, as consumer spending is formally known is expected to grow 3.6% in 2006, 3.5% in 2007, and 3.2% in 2008. From the third quarter of 2006 through the end of the short-term forecast, PCE is forecast to rise at “trend-like” rate of 3.4%, although growth is slightly stronger than this from late 2006 through 2007, and slightly weaker than this over 2008. Key to the continued solid growth of PCE is solid continued improvement in the underlying drivers of consumer spending. For example, over this period, population growth alone is expected to account for more than one-third of the growth in PCE.

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2 This is plus and minus one standard error of the equation of roughly 7%.
fourth of the 3.3% average annual growth of PCE (0.9 percentage point). Solid growth of per capita measures of real income is expected to account for 1.3 percentage points of average growth of PCE. Reinforcing this is a 0.5-percentage-point boost to PCE growth from growth of per capita household wealth. This is down considerably from 2005, when rapid growth of house prices led to a solid, 1.3-percentage-point contribution of per capita wealth to growth of PCE. (This decline in the contribution to PCE growth from rising non-equity wealth is seen in the nearby chart.) At the heart of the lower contribution in the forecast is our assumption that house prices decelerate sharply beginning in 2006, as conditions in housing markets cool.

Recent and prospective increases in interest rates, a downward adjustment of starts toward (and beyond) a level consistent with the “fundamentals,” and a broadly slowing economy together account for a substantial decline in housing starts over the next couple of years. The annual average of starts is forecast to decline from 2.074 million units in 2005 to 1.831 million this year and to 1.589 million in 2007. Starts are expected to remain near the 2007 level. The decline in starts this year is more than accounted for by recent increases in interest rates. The average rate on conventional 30-year mortgages has risen about 80 basis points since June 2005, and the 3-month T-bill rate has risen roughly 185 basis points over the same period. Rising mortgage rates are thought to subtract from starts by slowing the rate of net household formation, while rising short-term rates are thought to dampen the pace of building activity relative to the pace that would otherwise be supported by the underlying state of demand.

Business capital spending is on track to accelerate in 2006, growing 9.2% versus 5.6% in 2005. Some of this comparative strength in 2006 emanates from a temporary dip in vehicle sales in the fourth quarter of last year, which restrained growth of nonresidential business investment then but gave it a boost in the first quarter of this year. In addition, recent trends suggest robust growth of investment in computers and nonresidential structures over the second half of this year. Despite recent modest increases in interest rates, high utilization rates and still favorable corporate financial health are contributing to solid growth of capital spending. In 2007 and 2008, nonresidential business investment is projected to grow at more restrained rates of 5.2% and 6.2%, respectively — similar to the performance logged during 2005.

Declining inventory investment is projected to subtract roughly three-fourths of a percentage point from GDP growth in the second half of this year before turning up to contribute modestly to GDP growth in 2007 (0.3 percentage point) and 2008 (0.1 percentage point). The large negative contribution in the second half of this year primarily reflects a desire on the part of auto manufacturers to draw down unwanted stocks of inventories. Outside of this sector, inventory investment is forecast to subtract about 0.1 percentage point from GDP growth in the second half. Beginning in 2007, the pace of inventory drawdown in the auto sector diminishes and inventory building outside of motor vehicles remains fairly robust.

We anticipate that strong export growth and more modest import growth will result in a sustained upturn in real net exports at some point in the forecast. However, in light of recent developments that imply less of a slowing of import
growth in the near term than we had previously anticipated, we now expect that a sustained upturn in net exports won’t begin until the beginning of 2008. We expect net exports to be nearly flat over 2007, declining only $6 billion, followed by a $16-billion upturn over the four quarters of 2008. Aided by continued strong foreign growth and past and prospective declines in the dollar exchange rate, exports are projected to rise at approximately a 7% rate on average over the 2½ years covered by the forecast. Import growth is projected to average slightly over 4½% during the same period.
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Office of the Director—Investments

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<th>Name</th>
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<th>Experience</th>
<th>Education</th>
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<tbody>
<tr>
<td>Jennifer Hom</td>
<td>CIO</td>
<td>28 yrs</td>
<td>1975: B.S. Mathematics, College of the Holy Spirit</td>
</tr>
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<td></td>
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<td>1980: M.S., Mathematics, Purdue University</td>
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<td></td>
<td>1986 CFA Charterholder</td>
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<tr>
<td>Mary Ann Kabbaz</td>
<td>Executive Assistant</td>
<td>7 yrs</td>
<td>2004: A.S. Business, Ohio Dominican University</td>
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## Internal Active Equity

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<th>Name</th>
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<tr>
<td>Robert G. Ball</td>
<td>Portfolio Manager</td>
<td>23 yrs</td>
<td>August-99</td>
<td>1979: B.S. Business Administration, Miami University</td>
<td>1989 CPA (Inactive)</td>
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<tr>
<td>Steven F. Barker</td>
<td>Senior Investment Analyst</td>
<td>7 yrs</td>
<td>June-99</td>
<td>1993: B.S. Business Administration, Ohio State University</td>
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<td>1999: M.B.A., Ohio State University</td>
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<tr>
<td>Christopher Gregson</td>
<td>Investment Analyst</td>
<td>6 yrs</td>
<td>July-00</td>
<td>1992: B.A. Psychology, Indiana University</td>
<td>2000 CFA Charterholder</td>
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<td></td>
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<td>1993: B.S. Business Finance, Indiana University</td>
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<tr>
<td>Scott Murray</td>
<td>Senior Investment Analyst</td>
<td>16 yrs</td>
<td>June-05</td>
<td>1985: B.A. Political Science, University of Connecticut</td>
<td>2000 CFA Charterholder</td>
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## Internal Active Equity

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</table>
| Christopher O’Daniel | Senior Investment Analyst | 18 yrs     | June-05   | 1983: B.A. Political Science, College of Wooster  
1988: M.B.A., University of Dayton | 2001 CFA Charterholder         |
| Lewis Tracy     | Investment Analyst       | 6 yrs      | August-00 | 1980: B.A. Economics, U.C. Berkeley  
1994: PhD. Russian Literature, Ohio State University  
2000: M.B.A., Ohio State University |                                  |
1984: M.B.A., University of Akron | 1989 CFA Charterholder         |
| Stephen Stuckwisch | Portfolio Manager        | 11 yrs     | October-95| 1986: B.A. Economics, Hanover College  
1991: M.B.A., Ohio State University | 2000 CFA Charterholder         |
| Timothy J. Swingle | Senior Investment Analyst | 8 yrs      | August-98 | 1980: B.S. Business Administration, Ohio State University | 1983 CPA (Inactive)  
1988 CMA  
1995 CFA Charterholder |
## Internal Bonds

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<tr>
<td>Teresa Black</td>
<td>Cash/Securities Lending Analyst</td>
<td>11 yrs</td>
<td>Level II candidate in the CFA program</td>
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<td>November-00</td>
<td>1995: B.S. Finance, Ohio State University</td>
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<td>John C. Blue</td>
<td>Portfolio Manager</td>
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<td>October-93</td>
<td>1989: B.S. Business Administration, Ohio State University</td>
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<tr>
<td>Erik Cagnina</td>
<td>Portfolio Manager</td>
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<td>March-06</td>
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<td>1998: M.B.A., Case Western Reserve</td>
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<td>Mark Ehresman</td>
<td>Senior Investment Analyst</td>
<td>5 yrs</td>
<td>2005 CFA Charterholder</td>
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<td>1997: B.S. Finance, Miami University</td>
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<td>2002: M.B.A., Case Western Reserve</td>
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<td>Tony Enderle</td>
<td>Senior Investment Analyst</td>
<td>5 yrs</td>
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<td>January-02</td>
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# Internal Bonds

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<td><strong>Eric France</strong></td>
<td>Portfolio Manager</td>
<td>21 yrs</td>
<td>1968: B.A. European History, Yale University</td>
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<td>January-04</td>
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<td>1977: M.A. History, Ohio University</td>
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<td>1985: M.A. Finance, Ohio State University</td>
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<tr>
<td><strong>JoAnn Yocum</strong></td>
<td>Investment Assistant II</td>
<td>21 yrs</td>
<td>1987: A.S. Business, Bliss Business College</td>
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<td><strong>Todd Soots</strong></td>
<td>Senior Investment Analyst</td>
<td>6 yrs</td>
<td>1995: B.S. Finance, Ohio State University</td>
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<td>Senior Investment Analyst</td>
<td>8 yrs</td>
<td>1994: B.A. Accounting, Thomas More College</td>
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<td><strong>Jerry May</strong></td>
<td>Cash/Securities Lending Manager</td>
<td>15 yrs</td>
<td>1991: B. Business Administration, Abilene Christian University</td>
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<td>February-04</td>
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<td>2002: M.B.A., Ashland University</td>
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<td><strong>Kevin Martin</strong></td>
<td>Senior Investment Analyst</td>
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<td>1994: B.A. Accounting, Thomas More College</td>
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### External Management

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<tr>
<td>Greg Uebele</td>
<td>SIO - External Management</td>
<td>12 yrs</td>
<td>1988: B.S. Physics, Florida Institute of Technology</td>
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<td>1993: M.B.A., University of Houston</td>
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<tr>
<td>Julie Deisler</td>
<td>Investment Assistant II</td>
<td>2 yrs</td>
<td>2001: B.A. English and Psychology, Elon University</td>
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## External Public Markets

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<tr>
<td>Bradley E. Sturm</td>
<td>Investment Manager</td>
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<td>Heather Christopher</td>
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<td>Kenneth McDowell</td>
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<td>1984: B.A. Political Science, Ohio State University</td>
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</tr>
</thead>
<tbody>
<tr>
<td>Paul Rodgers</td>
<td>Senior Investment Analyst</td>
<td>8 yrs</td>
<td>1987: B.A. Finance, Duquesne University</td>
<td>1999 CFA Charterholder</td>
</tr>
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<td></td>
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<td>1990: M.B.A., University of Pittsburgh</td>
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<tr>
<td>Samir Sidani</td>
<td>Investment Analyst</td>
<td>5 yrs</td>
<td>2000: B.A. Economics, University of Rochester</td>
<td>2005 CFA Charterholder</td>
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## Fund Management

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Experience</th>
<th>Education</th>
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<tbody>
<tr>
<td>JG Lee</td>
<td>Quantitative Manager</td>
<td>10 yrs</td>
<td>1996: PhD. Economics, Ohio State University</td>
</tr>
<tr>
<td>Xinyang Gu</td>
<td>Quantitative Analyst</td>
<td>6 yrs</td>
<td>1982: B.S. Physics, Nanjing Institute of Technology China</td>
</tr>
<tr>
<td></td>
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<td>1989: M.S. Physics, Ohio State University</td>
</tr>
<tr>
<td>William Miller</td>
<td>SIO - Fund Management</td>
<td>25 yrs</td>
<td>1979: B.S. Mechanical Engineering, Kettering University</td>
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<td>1981: M.B.A., University of Pennsylvania</td>
</tr>
<tr>
<td>Cheryl Cade</td>
<td>Investment Assistant II</td>
<td>13 yrs</td>
<td>1999: B.A. Finance, Franklin University</td>
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<td>2003: M.B.A., Franklin University</td>
</tr>
<tr>
<td>Christy Ruoff</td>
<td>Equity Trader</td>
<td>24 yrs</td>
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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Matthew Sherman</td>
<td>Senior Equity Trader</td>
<td>12 yrs</td>
<td>May-06 1994: B.A. Economics, Ohio State University 2000: M.B.A., Otterbein College</td>
</tr>
<tr>
<td>Susan P. Sommerfeld</td>
<td>Index Manager</td>
<td>26 yrs</td>
<td>November-84 1979: B.S. Fashion Merchandising, Ohio State University 1987: M.B.A., Capital University</td>
</tr>
<tr>
<td>Joan Stack</td>
<td>Trading Manager</td>
<td>31 yrs</td>
<td>October-03 1974: B.A. Economics, Mount Holyoke College 1977: M.B.A., Fordham University</td>
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# Fund Management

<table>
<thead>
<tr>
<th>Name</th>
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</thead>
</table>
| Erick D. Weis   | Fund Manager     | 14 yrs     | 1990: B.S., Business Administration University of Toledo  
|                 |                  |            | 1994: M.B.A., Ohio State University                                     |
| June-94         |                  |            | 2001 CFA Charterholder                                                    |
# Investment Administration

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Experience</th>
<th>Education</th>
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</thead>
<tbody>
<tr>
<td>Roger Fox</td>
<td>Investment Administration Manager</td>
<td>15 yrs</td>
<td>1989: B.S. Mathematics, Purdue University</td>
</tr>
<tr>
<td></td>
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<td>2005: M.B.A., Franklin University</td>
</tr>
<tr>
<td>Alan J. Davidson</td>
<td>Investment Compliance Manager</td>
<td>42 yrs</td>
<td>1960: B.A. Political Science, Pennsylvania State University</td>
</tr>
<tr>
<td></td>
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<td>1963: J.D., Harvard Law School</td>
</tr>
<tr>
<td>Pat Edgington</td>
<td>Investment Reporting Manager</td>
<td>22 yrs</td>
<td>1985: B.S. Finance, Miami University</td>
</tr>
<tr>
<td>Carol Hoover</td>
<td>Investment Content Administrator</td>
<td>10 yrs</td>
<td></td>
</tr>
<tr>
<td>Lori Thiel</td>
<td>Proxy Voting Research Analyst</td>
<td>8 yrs</td>
<td>2006 Paralegal Certification</td>
</tr>
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## Investment Administration

<table>
<thead>
<tr>
<th>Name</th>
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<th>Hire Date</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kimberly Van Gundy</td>
<td>Investment Administration Analyst</td>
<td>5 yrs</td>
<td>April-99</td>
<td>1993: B.S. Accounting, University of Dayton 2001: M.B.A., Franklin University</td>
</tr>
<tr>
<td>Not pictured</td>
<td>Jennifer Williams</td>
<td>7 yrs</td>
<td>February-00</td>
<td></td>
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<td></td>
<td>Executive Assistant</td>
<td></td>
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