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The South Dakota Retirement System Generational Benefit Structure

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Abstract

Public sector retirement systems in the United States are currently significantly underfunded with generally increasing contribution requirements even after several years of outstanding investment returns since the great recession. The South Dakota Retirement System (SDRS) provides retirement income security for approximately 27,000 benefit recipients and close to 60,000 active and terminated members through a hybrid plan blending the budgetary certainty of a defined contribution plan with the cost efficiencies and risk pooling of a defined benefit plan. When SDRS was created in 1974 as a consolidation of numerous separate systems, policy makers wisely set a budget for member and employer contributions and most important, set statutory funding thresholds and requirements for changes when needed, ensuring the system would operate within the agreed upon budget. Numerous changes through the years have adapted benefits to changing economic conditions, all while remaining within the resources provided by the fixed, statutory contributions. The current plan provisions meet the SDRS retirement income replacement goals and include flexible benefit features that help ensure the fixed funding will continue to support the benefits. However, no system can function in all economic conditions without adjustments, and therefore the management of the SDRS adheres to specific funding thresholds that require changes when crossed and regular assessment of the risk of crossing the thresholds. The result is a funded status consistently near the top of all statewide plans. In short, through fixed contributions, flexible benefits, cost-efficient risk sharing and consistent long-term above market investment returns, the SDRS provides the maximum sustainable lifetime income possible within the fixed contributions available.

1. Introduction

The current funded status of state and local defined benefit pension plans is worrisome at best. After an extended period of favorable investment returns following the great recession, studies put the median funded ratio in the 70 to 75 percent range with rapidly increasing actuarially recommended contributions. These results are based on each plan's actuarial assumptions, including a median discount rate of 7.5 percent. In addition, approximately 24 percent of statewide plans receive less than 90 percent of the actuarially recommended contribution (NASRA, 2017). Frequently, the funding policy of a plan results in lengthy amortization periods of unfunded liabilities based on increasing member pay, which for many plans results in increasing unfunded liabilities for several years. If equity markets experience a correction, many more plan sponsors may find themselves unable (or simply unwilling) to adequately fund the retirement system at the expense of necessary government operations.

This dilemma has resulted in policy makers considering, and in some cases implementing, the conversion of defined benefit plans to alternative retirement designs that have a more stable contribution requirement for the employer. Defined benefit plans are frequently portrayed as unsustainable or resulting in unacceptable employer cost risks.

Under these same economic conditions, some plans have maintained a fully, or near fully, funded status, adopted more conservative assumptions than average, and continued to provide solid benefits. One such example is the SDRS. This paper presents an example of a defined benefit plan with hybrid and variable benefit features—a real-world solution that has worked over a sustained period.

SDRS is a cost-sharing, multiple employer retirement system covering essentially all public employees in the state. Several separate systems were consolidated into SDRS in 1974, and SDRS has a long history of fixed, statutory contributions, hybrid benefits, flexible benefits and comparatively high funded ratios—SDRS's funded ratio based on the fair value of assets is 100 percent as of June 30, 2017, and has been at or above 100 percent in 22 of the last 27 actuarial valuations dating back to 1986.

SDRS provisions and operations have evolved over the 40 plus years the system has been in operation. The model presented in this paper is based on the provisions applicable to members hired on or after July 1, 2017.

The fundamental features that have led to SDRS's financial stability are:

- Fixed, statutory member and employer contribution rates
- Flexible defined benefits designed to meet specified income replacement goals
- Statutory funding measurement thresholds requiring corrective actions
- Outstanding internal investment management
- Administration by a retirement board focused on its fiduciary responsibilities and advocating on behalf of the plan's sustainability
- Oversight by a bipartisan legislative committee working in partnership with the retirement board

Because SDRS operates with fixed, statutory contributions, benefits necessarily must have some variable features. Benefit reductions in the form of cost-of-living adjustments (COLA) have been upheld as permissible in South Dakota Circuit Court (Tice, 2012). This model is presented in the context of an environment of fixed contributions that permits benefit adjustments; however, many of the principles and processes can be adapted to function in more restrictive legal environments or different fiscal conditions.

Establishing and adhering to specific and measurable objectives applicable to funding, member benefits provided, system investments and expense management have been key to the SDRS success and are outlined in detail in this paper. Specific statutory funding thresholds requiring corrective actions have ensured SDRS stays on course.

In short, the SDRS design combines the budgetary certainty of a defined contribution plan with the cost efficiencies, risk sharing and lifetime income of a defined benefit plan and is based on several important principles.

2. Principle-Based Plan Design

2.1 Basic Retirement Plan Structure

General Principle

Both defined benefit and defined contribution plans have attractive features that should be considered in the plan structure.

A pure defined benefit plan provides fixed benefits and variable contributions based on the amount required to actuarially fund the benefits in accordance with the sponsor's funding policies. Actuarial assumptions are adopted to predict future experience as accurately as possible when setting contribution rates and determining funding progress. Experience that is different from what is assumed results in contribution requirement changes.

Contribution requirements will vary over time as environmental or demographic changes are reflected. Even with ideally set benefit levels, there may be political pressure to increase benefits during favorable economic periods and conversely, there will likely be stress on the sponsor's budget and pressure for reforms during unfavorable economic times.

Defined benefits typically become more valuable as employees get closer to retirement age. Employees who leave early in their career frequently receive little or no value from the employer contributions.

A pure defined contribution plan avoids the fluctuating contribution requirements by fixing the contribution rate. There is no need for actuarial assumptions. Contributions are defined and the benefits are variable as determined by the contributions and actual investment performance alone. All investment, longevity and benefit sufficiency risk is borne by the individual member. Benefits are typically provided as a lump sum at retirement, with the availability of an individual annuity purchase at the market price.

Defined contribution plans are touted as providing a more equitable distribution of employer-funded benefits between short, partial, and full career employees and providing fully portable retirement benefits.

SDRS Application

The SDRS design is a hybrid defined benefit plan with fixed, statutory contributions, significant benefit flexibility, and statutory funding thresholds requiring additional benefit changes. Early in its history, SDRS adopted hybrid plan provisions (see details under section 2.8, "SDRS Specific Provisions") to increase the value of benefits for employees who did not stay until retirement. This change corrected a weakness of defined benefit plans and provided a significantly more equitable distribution of benefits.

2.2 Budget

General Principles

Every retirement system should delineate an acceptable range of employer and member contributions and identify the specific plan provisions subject to change when the actuarial requirements of a plan exceed the range.

In any retirement system, contributions and investment return must support benefits and system expenses. In a typical defined benefit system, actuarial assumptions and funding methods determine contribution requirements based on member data and the fixed benefit provisions. Assumptions and methods must adhere to the applicable Actuarial Standards of Practice, but also reflect current conditions and opinions of future conditions. Economic, demographic and political conditions change over time. Investment markets and corresponding funding levels change over time. Public sector retirement systems operate over multiple decades that can include significant economic and demographic shifts.

Economic and demographic environment changes will require actuarial assumption modifications. If the environment has changed significantly, recommended funding costs may escalate significantly. An expectation of unlimited employer contributions to fund unalterable benefits is unreasonable and impractical. Without an explicit range of acceptable contributions, a steeply increasing contribution requirement could stress governmental budgets, crowd out essential government services and become prohibitively unaffordable for employees. An explicit, acceptable range delineates when benefit adjustments must be considered.

SDRS Application

Member and employer contribution rates are equal and fixed in statute, and system benefits must be managed within the resources provided by the fixed, statutory contribution rates. Actual contributions have always matched the statutory rates in South Dakota regardless of economic conditions.

Fiscal conservatism is a cornerstone of South Dakota government management and operations. When the consolidated system was formed in 1974, employers were concerned with the prospect of contribution increases that would stretch already limited employer budgets and employee affordability. By setting the employer contribution rate at an acceptable level (and maintaining it at that level), employers can budget effectively, managing both the government workforce costs and the budgetary needs of other government services. Equal member contributions ensure the shared responsibility for providing retirement resources and address the corresponding budgetary concerns of employees. Fixed contributions prevent a transfer of costs from one generation of workers to the next. Benefits were initially set with some conservatism based on the fixed and limited resources and recognizing the preference for increasing benefits when resources permit over reducing benefits when conditions require.

2.3 Benefit Efficiency

General Principle

Whether contributions, benefits, or both contributions and benefits vary, it is beneficial to both system members and employers to provide benefits as efficiently as possible.

The defined benefit plan structure allows pooling of longevity risk and investment timing risk and typically requires lower expenses than defined contribution plans. Multiple studies have demonstrated defined benefit plans provide more benefit per contribution dollar than defined contribution plans (Fornia, 2014).

In the past, subsidies have been included in the SDRS plan design. For this purpose, a subsidy refers to a benefit or feature that increases the value of the benefit and is available to only a portion of the membership meeting certain criteria. Notable examples are special early or early retirement features that provide an unreduced benefit or a benefit reduced less than an actuarially equivalent reduction. The rationale for including subsidies is typically to accomplish a secondary goal subordinate to the primary goal of efficiently and equitably providing retirement benefits. However, these secondary goals often change over time. For instance, providing a subsidized early retirement benefit may reduce employer payroll costs if it is possible to replace experienced, higher paid employees with newly hired employees. But a subsidized early retirement benefit may also encourage valuable employees to retire and seek employment elsewhere at a time of low unemployment and a scarce supply of potential new hires. In addition, subsidizing early retirement features can often lead to demands that result in institutionalized "double dipping" such as provisions that allow both retirement and the immediate return to employment or DROP type programs that "bank" retirement benefits while working.

In SDRS's experience, subsidies available to only a portion of the membership can be very expensive and inequitable and therefore should be avoided or minimized. SDRS provisions applicable to the original tier of benefits included special early retirement and early retirement subsidies. Those subsidies increased the total SDRS normal cost for retirement benefits by approximately 15 percent while providing increased benefit value only to those members who were eligible for special early or early retirement and otherwise prepared to retire prior to a typical full retirement age.

Certain other provisions can be subject to member or employer manipulation. For example, if benefits are determined using a final average pay formula, caution should be exercised to ensure compensation cannot be artificially increased in the period leading up to retirement. This type of manipulation can take many forms, including inclusion of optional or overtime pay, contracts intentionally structured to bump salary right before retirement, or any provision that gives members options to increase includable compensation. If salary manipulation cannot be avoided, longer final average pay periods, maximum pay increase limits close to retirement or a career average formula may be necessary to distribute benefits equitably.

SDRS Application

SDRS has revised numerous plan terms over the years as subsidies, inequities or unanticipated cost issues have been identified. Examples include:

- Removal of all terminal pay from the definition of compensation
- Elimination of an optional spouse benefit that proved difficult to adequately price
- Restructuring of return-to-work provisions
- Revision to disability and preretirement survivor benefits to avoid duplication with Social Security benefits
- Charging full actuarial cost for service purchases

These efforts have continued in the structure of the benefits applicable to employees hired on or after July 1, 2017. For example, no subsidized early retirement provisions are provided and early retirement benefits are reduced 5 percent per year for each year prior to age 67 normal retirement (which approaches an actuarially equivalent reduction while being simpler to communicate). A 5-year final average compensation period is used to dampen the impact of any significant late-career salary spikes.

In addition, compensation increases above 5 percent in the years approaching retirement are excluded from the calculation of retirement benefits. Finally, items that are includable in compensation are carefully defined and monitored.

2.4 Benefit Adequacy and Income Replacement Goals

General Principle

Plan benefits should be structured to replace a percentage of income in retirement considering benefit adequacy needs and resources.

Systems should define the income replacement that allows career employees to maintain the same standard of living in retirement that they enjoyed during employment. Most living expenses are periodic, so the goal should be expressed as lifetime income in retirement—not on the accumulation of wealth. The income replacement goal should consider the cost of maintaining a standard of living, changes between pre- and post-retirement needs, Social Security participation, the availability of health insurance coverage and other relevant factors. In most cases, income needs in retirement will be less than during employment because retirees no longer need to save for retirement and other work-related costs are higher than retirement-related costs (Purcell, 2012).

While meeting total income replacement needs may not be feasible, benefit accrual levels should be set based on resources available for members who work an entire career in positions covered by the system. Benefits should not be structured to fully meet the income replacement goals for a member who works less than a career. Exceeding the income replacement goal should not be a target.

The system's normal retirement age should be established considering traditional retirement ages, Social Security retirement ages and increasing life expectancies.

Inflation protection after retirement is a key element of benefit adequacy and should be specifically addressed.

Objectives should also be established for benefits upon disability, preretirement death, and termination of employment prior to retirement.

SDRS Application

The SDRS Board of Trustees has established income replacement goals to provide SDRS retirement income of 55 percent of final average compensation for career SDRS members and to promote total retirement income of 85 percent of final average compensation including SDRS benefits, Social Security and personal savings.

Virtually all SDRS members participate in Social Security. The SDRS benefit goals have been established considering the income replacement provided by Social Security at retirement, disability and pre-retirement death to provide an acceptable total benefit considering both sources. Benefits upon termination of employment are higher than typical as discussed in section 2.5 of this paper.

Career members are defined as general members who work 30 years, judicial members who work 20 years and public safety members who work 25 years. Benefit multipliers are sufficient to reach the 55 percent income replacement goals for career members.

SDRS's normal retirement age is set at age 67 for general and judicial members and age 57 for public safety members. No subsidized early retirement benefits are provided.

SDRS's goal is to provide partial inflation protection after retirement, but the COLA payable is limited to the resources available.

2.5 Benefit Equity

General Principle

Benefits should be distributed equitably among employees who leave public employment midcareer and those who stay to retirement.

As noted earlier, a fair criticism of a pure defined benefit plan is the very low benefit value for employees who leave employment relatively young and prior to reaching retirement eligibility.

SDRS Application

SDRS provides vested employees a choice at termination of employment between a lump-sum payment of accumulated member contributions and 85 percent of the employer contribution with interest if vested, or a deferred retirement benefit indexed with the SDRS COLA (including COLAs during the deferral period). Vesting occurs after 3 years of credited service. Nonvested employees receive the accumulated member contributions and 50 percent of the accumulated employer contributions.

2.6 Adjustable Benefit Features

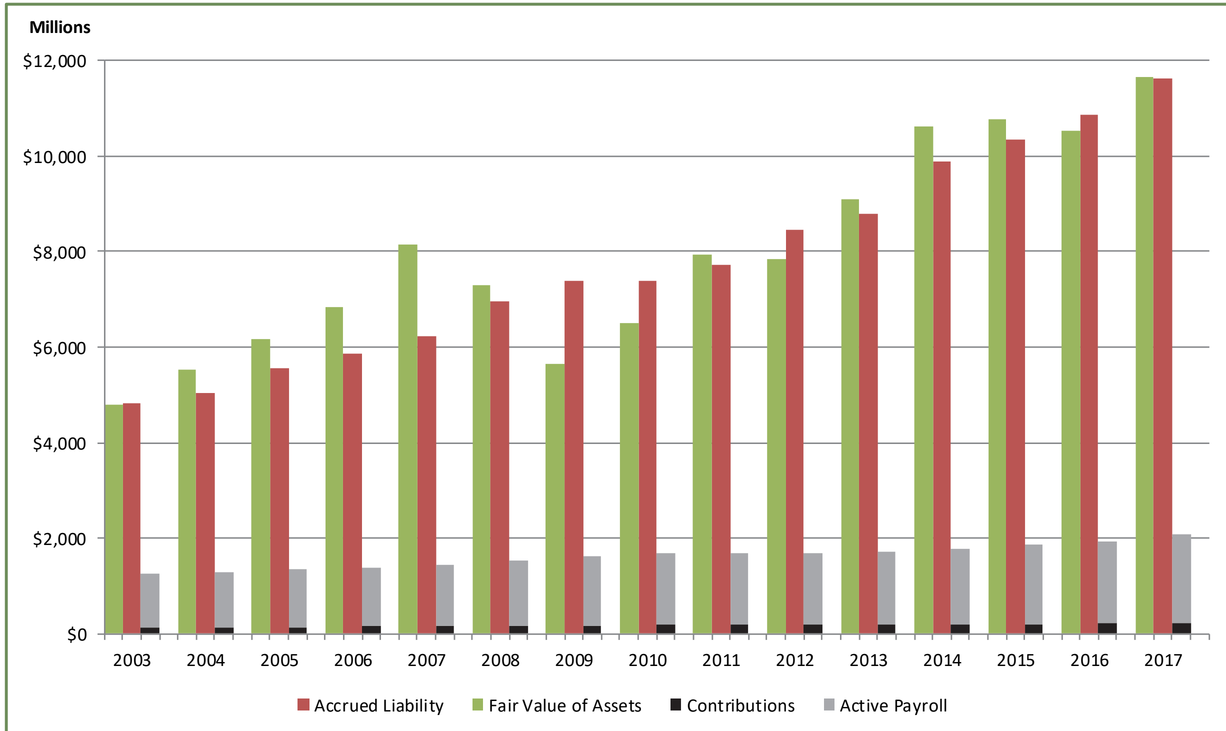
General Principle

Most public defined benefit plans have now significantly matured resulting in a high percentage of the plan's total accrued liabilities due to retired members.

As a result, liabilities and assets of plans are a high multiple of covered payroll, and an asset or liability loss of significant magnitude will now require a larger portion of payroll to fund. If a system has an established contribution budget, losses may push the contribution requirement above the budget. If a system does not have an established contribution budget, losses may push the contribution requirement above a practical limit, forcing choices between appropriately funding the system, funding essential government services, or even abandoning the defined benefit model. In short, mature traditional defined benefit plans may find it impossible to solve funding issues with contribution increases alone.

Since 2003, SDRS assets and liability have grown significantly faster than covered employee payroll (see Figure 1).

Figure 1. Comparison of SDRS Accrued Liability, Assets and Payroll



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fair Value Funded Ratio	99%	109%	111%	117%	131%	105%	76%	88%	103%	93%	103%	107%	104%	97%	100%
Contributions as % of AAL	2.9%	2.9%	2.7%	2.6%	2.6%	2.4%	2.4%	2.5%	2.4%	2.2%	2.2%	2.0%	2.0%	2.0%	2.0%
Fair Value of Assets/Payroll	4.28	4.74	5.11	5.57	6.29	5.36	3.89	4.36	5.32	5.22	5.98	6.68	6.51	6.10	6.30

This trend has been observed elsewhere (Boyd, 2016) and makes solving funding shortfalls through increased contributions alone exceedingly difficult.

Flexible benefit features that vary based on inflation and funding measures mitigate the impact of gains or losses on mature plans. An effective flexible feature adjusts system benefits and liabilities in coordination with system assets or contribution requirements. For example, COLAs can be linked to inflation and limited to an amount that accomplishes a specific funding goal. Adjustable benefit features can also be linked to investment return.

SDRS Application

SDRS has two main flexible benefit features, the COLA and the variable retirement account. The COLA varies with inflation, between 0.5 percent and 3.5 percent, but the maximum COLA is restricted to the percentage that is affordable on a long-term basis. The variable retirement account varies a portion of the member’s accrued benefit based on actual investment returns. Both are described more fully in the following pages.

2.7 Thresholds for Corrective Actions

General Principle

Defined benefit retirement systems are long-term enterprises that over time and changing economic conditions will experience changing funding measurements and contribution requirements.

If prudently managed, a retirement system can provide financial security in retirement for generations of members. However, without predefined acceptable limits, systems and their sponsors can face annual debates, and unclear needs for action, over a declining funded status or increasing contribution requirements. Much like setting an acceptable contribution budget, establishing a funding threshold that would require realignment of contributions and benefits is key to avoiding a gradual deterioration of funding and the need to make more substantial changes later.

SDRS Application

As stated previously, member and employer contribution rates are fixed in statute. Flexible benefit features will help maintain the funded status of SDRS in most economic environments. However, in a severe or sustained period when experience is worse than assumptions, the funded status could deteriorate requiring additional actions.

SDRS has two primary thresholds that require recommendations for benefit changes. The first is a requirement that the fixed, statutory contributions meet a minimum actuarial requirement to support the benefits. In alignment with the SDRS Board of Trustees funding policy, the fixed statutory contributions must be sufficient to pay normal costs and expenses and amortize any unfunded actuarial accrued liability over 20 years or less.

The second threshold is based on the system's funded ratio. Early on in SDRS's history, a funded status that remained below 80 percent for 3 years would require recommendations for benefit changes. In practice, the only time the funded ratio dropped below 80 percent, benefit reductions were immediately recommended and enacted. With the recent changes in COLA provisions that automatically adjust the benefits and funded ratio, the threshold for an acceptable funding ratio was increased to 100 percent.

South Dakota statutes require the SDRS Board of Trustees to immediately recommend benefit reductions to the legislature if either of these thresholds is not satisfied.

2.8 SDRS Specific Provisions

System provisions are described for general members who constitute 93 percent of SDRS membership. Public safety and judicial members have different contribution rates, retirement eligibility provisions, and benefit formulas. A brief, simplified description of the rationale for each provision is also provided.

- **Participation.** Virtually all public employers participate in SDRS. All full-time, permanent employees of participating employers are members of SDRS. Mandatory participation is key to ensuring a stable plan membership and growing asset pool that is large enough to provide economies of scale.

- **Contributions.** Member and employer contributions are each 6 percent of compensation. As described earlier, fixed contributions are relatively modest and equally shared between members and employers.
- **Normal retirement age.** Age 67 with 3 years of service. Aligned with Social Security and reflects increased life expectancies.
- **Final average compensation.** Average of highest 5 consecutive years within the final 10 years of compensation. Within the final 10 years of compensation, compensation exceeding 105 percent of the prior highest year compensation is excluded from the determination of final average compensation. The retirement benefit should be based on compensation near retirement to provide adequate income replacement. The 5-year averaging period and the compensation caps help prevent large, late career increases from generating unexpected liabilities that have not been properly funded.
- **Normal retirement benefit.** 1.8 percent of final average compensation times years of service. Approaches income replacement goal of 55 percent of final average compensation for a career (30-year) member and is affordable within fixed, statutory contributions.
- **Early retirement benefit.** Available 10 years prior to normal retirement age. Normal retirement benefit reduced by 5 percent per year before normal retirement age. Avoid subsidizing early exits and encouraging early retirement that exacerbates the South Dakota workforce shortage. Subsidies available to a portion of membership may lead to demands for higher benefits to others.
- **Surviving spouse benefit.** Optional joint and survivor benefits are available with actuarially reduced member benefit. Provide option for member to protect spouse, but avoid subsidies that would be available only to married members.
- **Variable retirement account.** Notional account credited with 1.5 percent of compensation each year and increased by the actual investment return of the SDRS trust fund. Employees are provided a minimum benefit of the amounts credited, effectively a career minimum 0 percent investment return. Payable at retirement, death or disability as a lump sum, rollover or converted to a supplemental retirement benefit. Contribution can be reduced or eliminated if fixed benefit normal costs approach fixed contributions. Links a portion of liabilities directly to asset performance, which avoids any adequacy risk to the plan. Provides source of onetime funds at retirement and is affordable within fixed, statutory contributions.
- **Supplemental retirement benefit.** Optional benefit based on the conversion of a rollover or variable retirement account to an annuity. The conversion rates are based on a discount rate set annually and intended to be between available commercial annuities and SDRS's assumed rate of investment return. The rate is based on an assumed investment return rate that can be achieved with a 75 percent likelihood. Allows members to convert retirement assets to additional guaranteed lifetime income. Rates set to protect the plan from added costs in most environments.
- **Vesting.** Members become vested with three years of service. Early vesting distributes benefits over the entire workforce except for very short-term employees.
- **Termination benefit.** Nonvested members receive a refund of member contributions and 50 percent of employer contributions, accumulated with interest (at a rate set annually based on the yield of a 91-day U.S. Treasury bill). Vested members can elect to take a normal or early retirement benefit after meeting the eligibility requirements. Their accrued benefit is increased

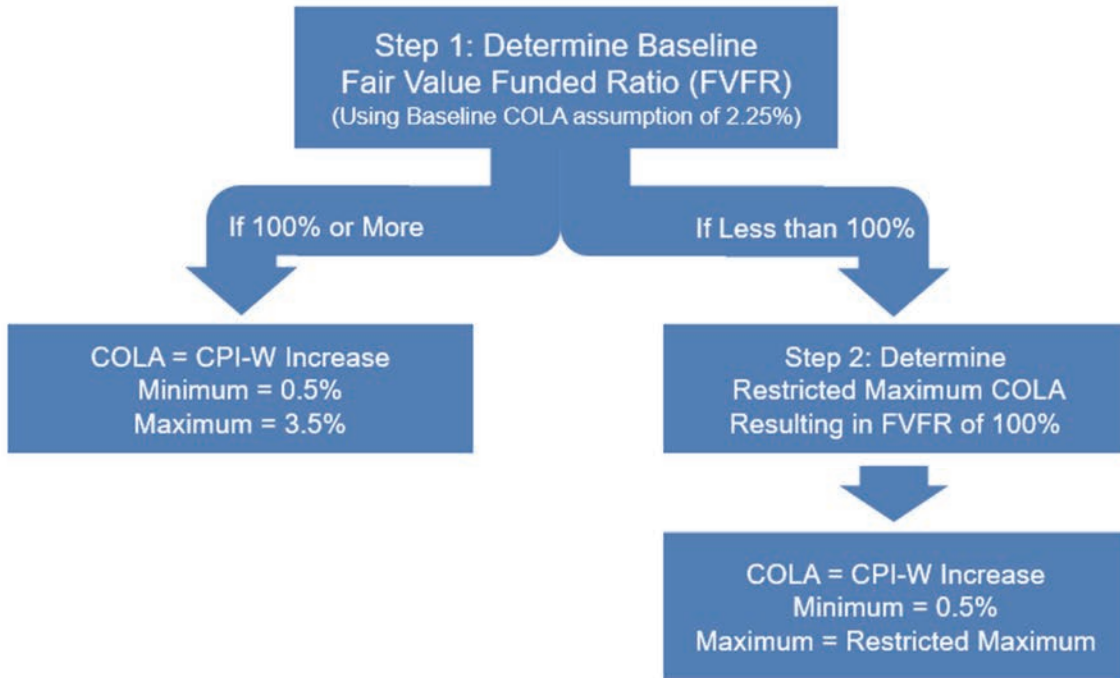
with the SDRS COLA before and after benefit commencement. Alternatively, vested members may elect to receive a refund of member contributions and 85 percent of employer contributions, accumulated with interest.

Benefits for short service members are competitive with benefits that would be provided by a defined contribution plan. Refund of employer contributions set at 85 percent to consider cost of disability and survivor benefits provided while active. COLA provided during deferral to prevent dilution of purchasing power.

- **Disability benefit.** Disabled members receive the greater of their accrued benefit or 25 percent of final average compensation at the date of disability. Provides adequate disability benefits considering available Social Security benefits.
- **Survivor benefit.** Surviving spouses of members who die while employed receive the greater of the member's accrued benefit, or 25 percent of the final average compensation at the date of death. Benefits are payable immediately while there are eligible children and again payable when the spouse reaches age 67 without eligible children (available 10 years earlier with 5 percent per year reduction). The benefit is increased with the SDRS COLA before and after benefit commencement. Provides adequate survivor benefits considering available Social Security benefits.
- **SDRS COLA.** All benefits except refunds of accumulated contributions are increased annually by the SDRS COLA. The COLA is paid each July 1 and is equal to the percentage increase in the third calendar quarter CPI-W and further limited as follows:
    - If the fair value of assets meets or exceeds the actuarial accrued liability calculated assuming future COLAs are equal to the baseline COLA assumption (currently 2.25 percent): CPI-W increase with a 0.5 percent minimum and a 3.5 percent maximum.
    - If the fair value of assets is less than the actuarial accrued liability calculated assuming future COLAs are equal to the baseline COLA assumption (2.25 percent): CPI-W increase with a 0.5 percent minimum and a restricted maximum determined as the maximum amount that, if future COLAs are equal to the restricted maximum, the fair value of assets exceeds the actuarial accrued liability.

This partially protects retirees from loss of purchasing power. Additionally, it is imperative to avoid COLA increases that cannot be afforded based on current fixed resources. The annual SDRS COLA determination process is shown in Figure 2.

Figure 2. Annual SDRS COLA Determination Process



2.9 Reflection, Evaluation and Next Steps for SDRS

SDRS is continually evaluating its benefit structure and cost, as well as its policies and goals.

Specific thresholds are in place to indicate when additional changes are needed to ensure benefits remain supported by the fixed, statutory contributions. In addition, actuarial gains and losses are examined annually to identify any sources of unexpected cost increases that may point to potential areas requiring reform.

Several features have been preliminarily identified for consideration if future changes are required. These include:

- Extending the final average compensation averaging period beyond 5 years, or even adoption of a career average basis
- Increasing the normal retirement age to reflect increased life expectancies (automatic increases will be considered)
- Suspending contributions to the variable retirement account
- Reducing or suspending the SDRS COLA
- Adding additional flexible benefit features

The board of trustees' policies allow consideration of benefit improvements if, after the prefunding of the total cost of any improvement, the funded ratio remains above 120 percent. Potential benefit increases have also been preliminarily identified, but would be subject to additional rigorous study prior to implementation if SDRS funding approaches the 120 percent threshold. Likely improvements would include onetime contributions to the variable retirement account or filling in any shortfall between COLA increases and inflation.

2.10 Potential Adaptations for Application to Other Systems

While many of the SDRS philosophies and approaches reflect the fiscal conservatism inherent in South Dakota government, they are transferrable to significantly different political and economic environments:

- Fixed, statutory contributions may not work in many situations, but contribution limits seem inevitable. It is unreasonable to expect support for unlimited contribution increases driven by the actuarial costs of absolutely fixed benefits. Establishing a threshold for contributions that, if reached, would drive mandatory benefit (or member contribution) adjustments may be a more palatable solution. Establishing the thresholds in advance is advisable.
- Contribution holidays and failure to make the agreed-upon contributions have clearly contributed to the growth in unfunded liabilities though are not as important as other factors (Munnell, 2015). A consistent funding practice is imperative.
- The variable SDRS COLA feature could be modified to target contribution rates or a funding period rather than a funded ratio. Researching and reconsidering the rationale for the existing COLA may provide insight into economic shifts that resulted in a COLA that is mismatched with inflation and/or the original purpose of the feature.
- The variable retirement account could be expanded or reduced as a percentage of the total benefits. SDRS has set the credits to the variable retirement account at approximately 12 percent of the total member and employer contributions. A higher allocation to the variable retirement account would necessarily reduce the fixed benefit provisions and directly allocate more investment risk to plan members.
- Of course, any of the other variables (contribution rates, benefit multipliers, normal retirement age, final average compensation periods) can be modified to fit specific needs.
- Spending “surpluses” on benefit improvements should be approached with caution to avoid adding liabilities to the plan at market highs. A procedure for considering when, and under what conditions, benefit improvements are advisable is essential.

In addition to the principle-based plan design considerations, major contributors to the SDRS success have been a clear, consistent, and responsible allocation of responsibility for governance as well as the establishment of policies for benefit delivery, funding, and overall management of SDRS.

3. System Governance

The structural authority over plan design and operation is critically important. For a public retirement system to be sustainable, plan benefits and design, actuarial assumptions and funding policies must periodically adapt to economic and demographic changes. Recommendations for change must consider long-term implications under a variety of economic scenarios and should therefore be initiated by an informed and objective body with the primary focus of sustainably delivering retirement income to plan members. The governing body must consider the impact of any changes on members, employers and any other stakeholders.

3.1 Governing Body Composition and Authority

Retirement plan governance takes many different forms. Most often, a retirement board is the primary governing body of the plan. Ideally, a retirement board will have representatives of members, employers, and other stakeholders to represent the various parties impacted by plan decisions.

However, the authority granted to retirement boards varies greatly. Some boards have authority only over the administration of the plan, with no ability to advocate for or against changes that may impact the plan's sustainability. Other boards routinely advocate with legislatures or councils on behalf of the plan.

To consistently and effectively act in the best interest of the plan and its membership, it is imperative that the entity with the most expertise and experience be an advocate for the plan to ensure the plan is operated in an efficient and sustainable manner. A retirement board is the logical choice for that advocacy role, and must then possess the knowledge, expertise and objectivity to advocate on behalf of the plan. This in turn requires individual board members to accept their fiduciary duty to operate the plan for the long-term benefit of all plan members. Board members must stay informed on current benefit practices and legal and actuarial matters and the financial condition of the plan.

The retirement board may also have authority over investment decisions. Because of the complexity involved and the critical importance of investment returns to the plan, bodies that oversee investment decisions should be composed of investment professionals. The most effective structure is two specialized boards, separately overseeing plan decisions and investment decisions, but acting cooperatively.

SDRS Application

The SDRS Board of Trustees is the governing authority of SDRS and is responsible for:

- Formulating and communicating a sound pension policy
- Establishing goals and objectives for SDRS
- Ensuring the financial integrity of the system
- Proposing legislative changes believed necessary or beneficial
- Adopting rules necessary to implement the governing statutes
- Adopting an administrative budget and submitting it to the executive and legislative branches of state government for approval
- Appointing an executive director as the chief executive and operations officer of the system

The SDRS Board of Trustees is composed of 16 voting members who represent specified groups of members, employers or the executive branch. The State Investment Officer is a nonvoting, ex officio member.

Investment decisions are overseen by a separate board of investment professionals. Additional discussion is in Section 4.

3.2 Legislative Oversight

State legislatures govern state retirement systems. In many states, one or more legislative committees that may have minimal experience with the complexities of retirement systems and have numerous

other responsibilities initially review legislation impacting retirement systems. Ideally, to avoid competing political agendas and to provide a source of knowledge and familiarity, a single committee should oversee a state retirement system. The committee should preferably be a standing, bipartisan, bicameral body with the primary shared interest of promoting the sustainability and affordability of the system. Any proposal to modify system provisions should be thoroughly vetted by this committee to analyze long-term cost and policy implications.

SDRS Application

Bipartisan, bicameral standing retirement laws committees (RLC) of the South Dakota Legislature oversee bills relating to the pensions, annuities and benefits of employees and officers in public service. Any potential legislation impacting SDRS is assigned to the RLC for initial consideration (South Dakota Legislative Rules).

SDRS board members or their representatives provide recommendations in testimony to the RLC for each bill with a significant impact on the system. Most important, the board is the SDRS expert and routinely advocates for or against any proposed legislation that materially impacts SDRS. The immediate and long-term cost impact of any significant proposals is analyzed prior to recommendations, considering the most likely future conditions, but also alternative economic conditions. Proposals are reviewed in the context of equity for the membership as a whole.

For the success of SDRS, a culture of collaboration and trust must exist among the board of trustees, the RLC and the executive branch. All parties must be committed to the long-term sustainability of the system and resist any urge to enact unfunded mandates or to use temporary surpluses to create permanent liabilities. The board of trustees works to maintain communication with the RLC members throughout the year, keeping them informed of upcoming and/or potential issues as well as the financial status of SDRS. An annual joint meeting of the RLC and the board is held and the RLC is provided with an annual update of the financial condition of SDRS at the start of each legislative session. In addition, SDRS annually prepares a formal report to the governor and legislature summarizing the funded status of SDRS as well as current issues and initiatives.

Legislation is rarely enacted without consensus among RLC and board of trustees members. While this seems impossible in today's politically charged environment, it has been achieved in South Dakota and is key to the success of SDRS. All stakeholders are committed to working together for the long-term sustainability of the system. Trust and confidence in the board of trustees' recommendations and stewardship of SDRS has been earned over time.

3.3 Potential Adaptations for Other Plans

Certain basic SDRS principles can be adopted and adapted for use in other constructs.

- Every potential plan modification must be evaluated for its long-term cost impact, including the potential costs if economic or demographic conditions change.
- Modifications that benefit only a portion of the plan membership should be critically evaluated and avoided.
- Temporary funding surpluses should not be used to fund permanent benefit increases.
- A single body of experts (ideally the retirement board) should be charged with ensuring the fiscal sustainability of the system and must therefore actively advocate on the plan's behalf.

- Legislative oversight should be assigned to a single standing committee that also accepts the responsibility, in partnership with the retirement board, for ensuring sustainability.
- Every defined benefit retirement plan should establish policies governing benefits and funding and should specify potential actions to take when the experience does not meet assumptions.

3.4 Governing Body Policies

To ensure consistency in actions, the plan's governing body should establish a mission statement and policies governing key positions. A mission statement should clearly establish the overriding purpose of the body.

Two equally important policies are a funding policy and a benefit policy. Whether the governing body establishes fixed benefits and has variable contributions, or establishes fixed contributions and has variable benefits, the policies defining the benefit goals and contribution limits should be explicit.

As noted earlier, the benefit policy should establish the target benefit for a career member based on an income replacement goal that allows a member to maintain the same standard of living in retirement as during employment. Ideally, benefit goals are also established for employees who leave midcareer, who become disabled or die while in employment, and for inflation protection after retirement

The funding policy should specify the actuarial funding method, the actuarial asset method, and the amortization period and method to be used. Ideally, the funding policy should also specify an acceptable range of employer contribution rates and objectives for funding measures.

SDRS Application

The SDRS board of trustees' mission statement:

> To plan, implement, manage and efficiently administer financially sustainable retirement income programs within the fixed resources available.

The mission statement acknowledges that SDRS operates based on fixed contribution rates. In addition, the system must be financially sustainable and must be efficiently managed.

The SDRS Board of Trustees' income replacement goal:

> Provide lifetime income replacement of at least 55 percent of final average compensation for career employees in each membership class.
>
> Promote total lifetime income replacement of at least 85 percent of final average compensation, including income from SDRS, Social Security, and personal retirement savings of at least one times annual compensation at retirement.

The total income replacement goal of 85 percent was based on a comprehensive study evaluating the required income level to maintain a standard of living into retirement, considering the changes that happen at retirement. No one set percentage will be the right percentage for the entire population. Lower paid members will need a higher percentage than more highly paid members, and other individual circumstances will vary considerably. As noted earlier, nearly all SDRS members also participate in Social Security. In addition, personal retirement savings is a necessity for employees who work less than a full career, retire early or have unusual income needs in retirement.

The SDRS funding and system management policies are shown in Table 1.

Table 1. Managing SDRS Based on Fixed, Statutory Contributions

Funding Objectives	Consideration of Benefit Improvements	Required Corrective Action Recommendations
A fair value funded ratio (fair value of assets ÷ actuarial accrued liability) of 100 percent or more A fully funded system with no unfunded liabilities under the entry age normal cost method Actuarially determined benefits that are variable and can be supported by fixed, statutory contributions that are equal to or greater than the actuarial requirement of: • Normal cost plus expenses when system is fully funded • Normal cost plus expenses, and payment of unfunded liabilities over a period not to exceed 20 years if system is not fully funded	A fair value funded ratio of over 120 percent is required before considering benefit improvement recommendations. The cost to fully fund the recommended benefit improvement is also limited to the net accumulated actuarial investment gains and losses, with gains recognized over a 5-year period and losses recognized immediately. After fully funding the cost of the benefit improvement, the fair value funded ratio must be at least 120 percent and all funding objectives must continue to be met. Proposed benefit improvement must be consistent with both the board's long-term benefit goals and sound public policy with regard to retirement practices.	The annual report to governor and retirement laws committee (RLC) will include corrective action recommendations if SDRS does not meet both of the following conditions: • Fixed, statutory contributions sufficient to meet the actuarial requirement • Fair value funded ratio of 100 percent or more The report shall include recommendations for the circumstances and timing for any benefit changes, contribution changes or any other corrective action, or any combinations of actions to improve the funding conditions.

Key components of the funding and system management policies are:

- An acknowledgment that the system will be managed within fixed, statutory contributions
- A target of 100 percent fair value funded ratio, including recommendations for corrective actions if the target is not met
- A benefit improvement policy that requires a funded ratio of 120 percent after fully funding the total cost of any improvement before considering any improvements

The funding and system management policies have changed over time, but the fundamental tenet of fixed contributions with specified thresholds for benefit improvements and corrections has been instrumental in SDRS' success.

Many of the Board of Trustees' positions are summarized in the following South Dakota Perspective on Public Employee Retirement Benefits and SDRS.

Benefit Policy Positions

- A defined benefit plan is preferred because it is the most efficient and advantageous design for members, employers, and taxpayers.
- Hybrid features that combine the advantages of both defined benefit and defined contribution plans are essential for an equitable distribution of benefits to both career and noncareer members.
- Variable benefits based on affordability measures are essential for sustainability, and the COLA is the most logical benefit feature to vary.
- Benefits should meet specific income replacement objectives; excessive benefits must be avoided.
- Provisions and practices that result in higher than intended and/or artificially inflated benefits must be avoided and corrected to protect scarce resources and to reinforce adherence to our goals.

Governance and Plan Management Positions

- The SDRS Board of Trustees must have the expertise, knowledge and resources and act as fiduciaries in accordance with SDCL 3-12-54 to recommend benefit and funding policies and to actively lead SDRS.
- Fixed contributions are a prudent financial decision, and SDRS benefits must be managed accordingly since:
    - Variable contributions may require significant and unpredictable higher costs.
    - Contribution increases alone are not adequate to solve funding issues for mature plans.
    - If costs are not controlled, SDRS will be replaced by a defined contribution plan.
- A realistic planning horizon for mature systems like SDRS is 10–20 years because of the duration of our liabilities.

Funding Policy Positions

- The SDRS funding policy must specify minimum funding standards to dictate when changes are required or should be considered.
- Reliance on our long-term past investment results exclusively is not realistic.
- Future mortality improvement must be considered in actuarial assumptions.
- Actuarial methods and funding policies that result in expected increasing unfunded liabilities (referred to as negative amortization) are unacceptable.
- Contribution rates with a 50 percent chance of funding actuarial liabilities are not acceptable unless accompanied with flexible benefits.
- Recommendations for corrective actions are required under SDCL 3-12-122 unless both the fixed, statutory contributions are sufficient to meet the actuarial requirement and the fair value funded ratio is 100 percent or more.
- Risk measures must be developed and communicated to provide transparent disclosure of the likelihood of meeting the funding policies and benefit goals of SDRS.

A well-funded defined benefit plan with fixed, shared member and employer contributions and hybrid, variable features is the most efficient and advantageous design for members, employers and taxpayers.

3.5 Actuarial Assumption Setting

Actuarial assumptions must adhere to the Actuarial Standards of Practice and should reflect the best possible estimate of future events that impact the timing and amount of benefit payments. Setting the discount rate is the biggest challenge.

Assumptions must consider the purpose of the measurement. For actuarial valuations used to determine a plan's funding requirements, the assumptions should reflect the estimated cost of funding benefits, and therefore, the discount rate should be based on the expected investment return for the plan's asset allocation.

Whether the benefits or the contributions are fixed, the purpose of the measurement is to determine if the current contributions with expected future investment returns will be sufficient to support current benefits.

For a plan with fixed benefits and variable contribution rates, a discount rate less than a reasonable estimate of plan investment return would result in higher current and lower future contributions. Likewise, a discount rate greater than a realistic estimate of plan investment return would result in lower current contributions, ultimately requiring increased future contributions.

For a plan with fixed contribution rates and variable benefits like SDRS, a discount rate less than a reasonable estimate of plan investment return would result in reductions in current benefits and increased future benefits. Likewise, a discount rate greater than a reasonable estimate of plan investment return would result in increased current benefit and require future benefit reductions.

The difficulty lies in establishing the best estimate for future investment return. The temptation to bias the assumption selection to protect the status quo, in either contribution rates or benefits, must be avoided. It is prudent to establish and commit to the assumption selection process independently before analyzing the cost or affordable benefit implications of potential assumptions. Ultimately, required contributions or affordable benefits will be determined by actual experience. Care must be taken to avoid the political lure of setting optimistic assumptions and thereby postponing benefit and/or contribution adjustments. Overly optimistic assumptions have never solved a plan funding issue; they only serve to delay and exacerbate the issue.

SDRS Application

Because contributions are fixed, actuarial assumption changes may require benefit adjustments. Assumptions should therefore be adjusted periodically, but not so often as to cause too frequent benefit adjustments. SDRS actuarial assumptions are reevaluated every 5 years in conjunction with an experience analysis. For SDRS, overly conservative assumptions could disrupt the balance of benefits between generations of retirees as easily as overly optimistic assumptions. Care must be taken to avoid both. Assumptions are set as realistically as possible and consider recent experience without completely disregarding prior experience.

The discount rate is set as the assumed investment return with significant credibility given to the forward-looking analysis of the state investment officer, but opinions of other investment professionals are also considered.

Assumptions are recommended by the staff actuary and must be adopted by the Board of Trustees. The external actuary reviews the recommendations for reasonableness and compliance with the Actuarial Standards of Practice.

SDRS's annual actuarial valuation assesses whether the fixed, statutory member and employer contributions are sufficient to support the current benefits. Annual adjustments to the COLAs paid to retired and terminated members are possible based on the results of the valuation. The assumed investment return must therefore be based on a realistic view of future investment performance, avoiding overly conservative or overly optimistic assumptions. While it is impossible to accurately predict the future, any bias in the estimation of future returns will distort the balance of benefits paid to current and future generations of retirees.

SDRS uses a discount rate of 6.5 percent in its annual actuarial valuations. The rate was established as the result of an experience study that analyzed the South Dakota Investment Council's benchmark asset allocations. The views of the South Dakota Investment Council on forward-looking return expectations for each asset class were used and were compared with the expectations of other investment and actuarial professionals. The SDRS Board of Trustees and staff believe the 6.5 percent investment return assumption is a realistic, forward-looking assessment of future investment returns given the South Dakota Investment Council's benchmark asset allocation and current economic conditions.

SDRS also uses the fair value of assets as the actuarial value, with no smoothing. Because of the variable benefits and the statutory requirements, immediate recognition of all experience variations is prudent.

3.6 Legal Framework

The plan must obviously comply with all applicable federal laws. In addition, plan details and structure must be established in statute. This includes the contribution and benefit structure, administration, oversight, investment authority and required financial reporting.

For a retirement plan to be sustainable through a variety of economic conditions, either contributions or benefits, or both contributions and benefits, must change to adapt to changing conditions. State statutes should specify the constraints on each and/or specific conditions that would require reconsideration.

SDRS Application

SDRS has received a current favorable determination letter from the Internal Revenue Service and meets all applicable requirements for a qualified plan under the Internal Revenue Code.

Member and employer contribution rates are equal and fixed in statue. Benefit provisions are defined in statute, as are statutory funding measurement thresholds that require recommendations for changes if crossed. When the thresholds were crossed in 2009, 2010 legislation reduced future COLAs. The change was challenged and upheld in South Dakota Circuit Court (Tice, 2012).

The composition of the board of trustees, election requirements, duties and responsibilities are all established in statute.

3.7 Administrative Costs

Administrative costs reduce the amount of contributions available to pay future benefits and therefore, operational efficiency is desirable. The cost efficiency of the plan and the quality of the administrative services should be evaluated periodically by an independent source. The impact of administrative expenses should be included in any annual cost calculation.

SDRS Application

Statutes limit administrative costs to 3 percent of member and employer contributions in any year. Provisions for expenses are included in the annual normal cost. For this purpose, they are assumed to be 2 percent of contributions. In practice, expenses are typically 1.7 percent to 1.8 percent of contributions.

SDRS also contracts with an outside benchmarking firm to annually assess the cost efficiency and customer service quality of SDRS administration. Areas of higher cost or lower rated service are targeted for improvement. The last evaluation for fiscal year 2016 showed SDRS administrative costs to be 7 percent less than its peer average despite significant costs of a new administrative system and a size disadvantage compared to the peer group. In addition, the SDRS service score of 85 exceeded the peer average of 83 (CEM, 2017).

3.8 Employee Communication

Members need to understand the benefits payable from the plan to build their own financial plan for retirement, as well as in the event of disability or death while working. Additional retirement savings are likely to be required for most members, particularly those who work less than a full career or elect to retire early.

In addition, when given a choice between different benefits members must be given adequate information to make an informed choice and to understand the financial consequences of each.

SDRS Application

SDRS maintains a website providing detailed material on the SDRS benefit structure as well as position papers on the philosophy of the SDRS benefit design. Additional retirement savings in the SDRS administered 457 plan are encouraged to meet retirement income needs. In addition, members are provided an annual benefit statement illustrating their accrued and projected retirement benefits. Group and individual counseling sessions are held around the state frequently, and the SDRS website provides an interactive benefit projection system.

SDRS members do not have an option with regard to participating in SDRS or an alternate plan design. However, vested SDRS members do have an option at termination of employment between a lump sum payment of employee and employer contributions or a deferred annuity. A personal detailed comparison of the benefits available under each option is provided to each terminating member to ensure a complete understanding of the financial implications of each choice. The vast majority of SDRS members wisely elect the deferred annuity. For example, 80 percent of terminating members with at least 15 years of service and 85 percent of terminating members with at least 20 years of service elect the annuity.

3.9 Moral Hazard Risk

Moral hazard is defined as a lack of incentive to guard against risk where one is protected from its consequences.

This can occur, intentionally or unintentionally, with public employee pension plans in several areas including:

- Advocating for or approving changes that personally benefit the individual
- Adopting generous benefits without the resources to fund them
- Avoiding, or delaying, adequate funding because of budgetary issues
- Political pressure
- Reluctance to present unwelcome news

Unintentional moral hazard can be minimized or eliminated through clear communication of the consequences of action or inaction and a thorough vetting of all proposals for change. Education, transparency and complete disclosure are essential to avoid misunderstanding.

Intentional moral hazard can also be minimized by the plan structure and operating procedures.

SDRS Application

SDRS has minimized the moral hazard risk through its governance structure, its operating policies and practices, and a clear delineation of fiduciary responsibilities. Board members consider the sustainability of SDRS to be their primary responsibility, not benefit increases.

The state has adopted a mandatory disclosure requirement for state employees and members of boards to report any conflicts of interest or compensation payable as a result of the position of responsibility.

The sound funded status of SDRS is a source of considerable pride to the state. The board of trustees, legislature, and executive branch operate in partnership to continue that success. Statutory contributions have always been paid. Changes are approached with caution and only after complete vetting of the consequences. Politics have not been a factor.

Actuarial assumption recommendations are made without regard to the consequences on SDRS's funded status and/or benefits provided, and the advice and recommendations of the South Dakota Investment Council as well as the reviewing actuary are required before action is taken.

In short, a culture exists in South Dakota to hold the system accountable for the management of SDRS, to avoid any protection of the consequences of actions involving SDRS, and to operate transparently.

4. Investments

Investment decisions should be the responsibility of investment professionals because of the complexity involved and the critical importance of investment returns to the assets of the plan. The most effective plan governance structure is two specialized boards, separately overseeing plan decisions and investment decisions, but acting cooperatively.

SDRS Application

The South Dakota Investment Council (SDIC) is responsible for the investment of SDRS funds. SDIC members are selected based on their finance and investment expertise and oversee the professional investment staff. The goal of SDIC is to add value over the long term compared to market indexes. Risk is managed by diversifying across multiple asset categories and reducing exposure to expensive asset classes.

After extensive study, SDIC established an asset allocation policy benchmark for the plan that is 70 percent equity-like risk and 30 percent bond-like risk. Equity-like risk is the percentage invested in stocks plus any embedded equity exposure of other asset categories, particularly during times of market stress. Bond-like risk is the percentage invested in investment grade bonds plus any embedded bond exposure of other asset categories. This allocation balances the expected long-term returns available from the market with the downside risks.

SDIC policy also establishes acceptable ranges around the benchmark allocation for each asset class. A valuation process drives allocations within the ranges based on the present value of estimated future cash flows. Disciplined adherence to the long-term value approach is essential especially during underperforming periods. Stakeholders' buy-in is critical to the success of any investment plan.

The primary investment objective for SDRS assets is to achieve and exceed over the long term the return of the council's capital markets benchmark. The capital market's benchmark reflects SDIC's benchmark asset allocation applied to index returns for each asset category. This objective has been accomplished for 91 percent of all rolling 10-year historical periods, as well as all such rolling 20- and 30-year periods (SDIC, 2017).

A secondary objective is to achieve and exceed over the long term the median return earned by peer funds. Comparison to peer funds can help in assessing performance as most peer funds have similar long-term return objectives. This objective has been accomplished for all rolling 10-, 20- and 30-year historical periods (SDIC, 2017).

Investment fees are kept low by internally managing most plan assets. Total costs are expected to average 40 basis points, including external managers used primarily for the real estate and private equity asset categories. This cost is below a benchmark of peer funds particularly after considering fund size and asset mix.

Over the 44 years since inception of SDRS, the annualized total rate of investment return on SDRS assets is 10.4 percent, compared to a benchmark return of 9.4 percent. Returns are before fees for periods before 2014 and after fees since then (SDIC, 2017). Over the last 10 challenging years, the SDRS annualized return has been 6.1 percent net of all investment expenses (SDRS, 2017).

The cooperative effort of SDRS and SDIC has worked well for South Dakota.

5. SDRS Experience and Future Issues

Much of SDRS's structure has been in place for decades while other features have been revised in recent years to adapt to changing economic and demographic conditions. The history of consistent

contributions, frequent benefit improvements and rare corrective actions, together with the current funded status, give the best indication of the viability of the system's sustainability.

5.1 Experience to Date and Current Funded Status

SDRS was consolidated in 1974. General member contributions were initially 5 percent of pay for both members and employers. In 2002, the legislature increased contributions to 6 percent of pay for both members and employers in conjunction with a corresponding proportional increase in future benefit accrual rates. SDRS contributions have never been changed in response to a funding requirement; the only changes have been in early efforts to better balance the contributions and benefits of general members with those of public safety and judicial members.

Since consolidation, experience better than assumed has allowed the board of trustees, in accordance with its policies, to recommend legislation to improve member benefits 12 times. Each time benefit formulas have been improved, the benefits of then retired and terminated vested members have been recalculated to reflect the improved provisions. All benefit improvements have been limited in scope, generally applying to a restricted period of service. The present values of all improvements have been fully funded in advance from reserves.

In 2009, the statutory funding thresholds requiring corrective actions were crossed for the first time after the historic market downturn in 2008–2009. Legislation in 2010 reduced future SDRS COLAs and linked them to inflation and the funded status, together with other, less significant changes. The changes brought SDRS funding measurements back in alignment with the statutory requirements. Subsequent market recovery brought SDRS's fair value funded ratio back over 100 percent by June 30, 2011. The COLA changes were challenged and upheld in South Dakota Circuit Court and the decision was not appealed.

Actuarial assumption changes were adopted in late 2016 to be first effective June 30, 2017, and would have again resulted in SDRS funding measures falling short of the statutory thresholds had they been effective for the June 30, 2016, actuarial valuation. Legislation was enacted in 2017 that changed the COLA to the current structure outlined above.

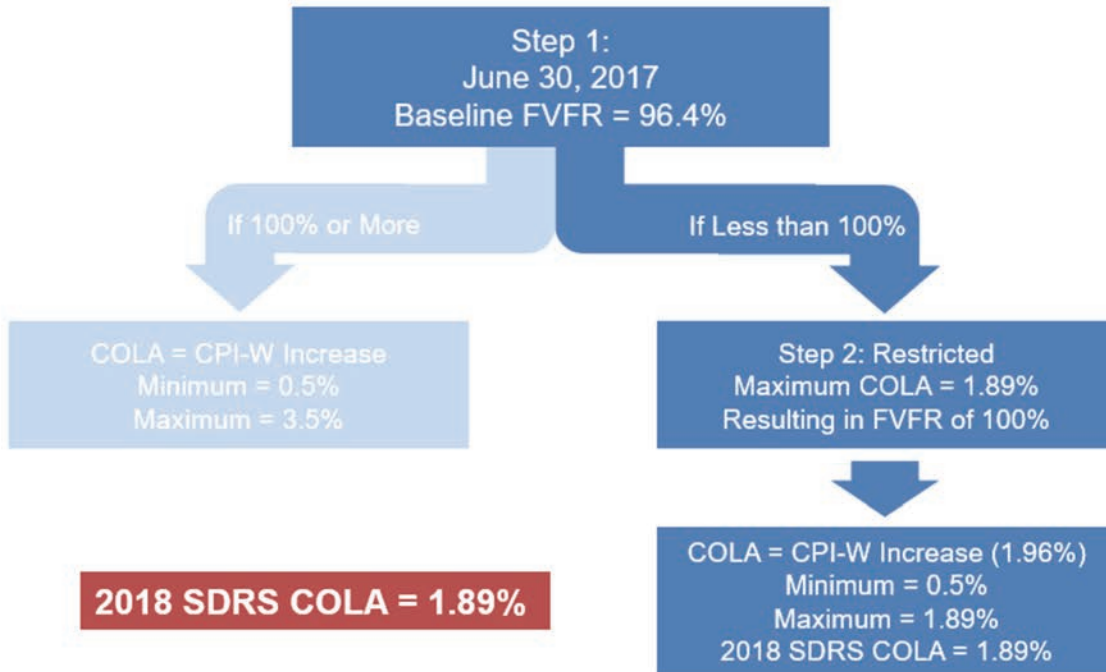
The June 30, 2017, actuarial valuation was the first based on the current actuarial assumptions that include a 6.5 percent assumed investment return, 2.25 percent inflation, and generational mortality based on the RP-2014 mortality table and MP-2016 improvement scale, and assets at fair value.

As noted previously, the determination of the COLA for 2018 was the first under new provisions and is a two-step process as illustrated in Figure 3.

1. The fair value funded ratio is first calculated assuming future COLAs are equal to the assumed long-term rate of inflation of 2.25 percent. That baseline fair value funded ratio was 96.4 percent as of June 30, 2017.
2. Because the funded ratio with the baseline COLA was less than 100 percent, a restricted maximum COLA is determined as the maximum COLA that if assumed for all future COLAs, the fair value funded ratio is at least 100 percent. The restricted maximum COLA was determined to be 1.89 percent.

The inflation measure used by SDRS, the increase in the third calendar quarter CPI-W from the prior year, was 1.96 percent and is the same basis used for Social Security COLA adjustments. As a result, the SDRS COLA will be 1.89 percent for the July 2018 increase.

Figure 3. The Determination of the 2018 COLA



SDRS 2017 actuarial valuation results were finalized assuming the restricted maximum COLA of 1.89 percent remains unchanged for future years, resulting in a published fair value funded ratio of 100.1 percent. Gains or losses would be required to increase or decrease future years' restricted maximum COLA.

5.2 Risk Measurement Reporting and Future Management Issues

SDRS is refining its risk management analysis and reporting to provide current and useful planning information to the board of trustees and the RLC of the likelihood of future COLA levels and the possibility of required additional benefit changes.

Future SDRS annual funding results will fall into three potential categories:

1. **Full COLA range.** Baseline fair value funded ratio is at least 100 percent; COLA is equal to inflation between 0.5 percent and 3.5 percent.
2. **Restricted maximum COLA.** Baseline fair value funded ratio is between approximately 84 percent and 100 percent; COLA is equal to inflation between 0.5 percent and the restricted maximum, that if assumed for all future COLAs, results in a fair value funded ratio of 100 percent.

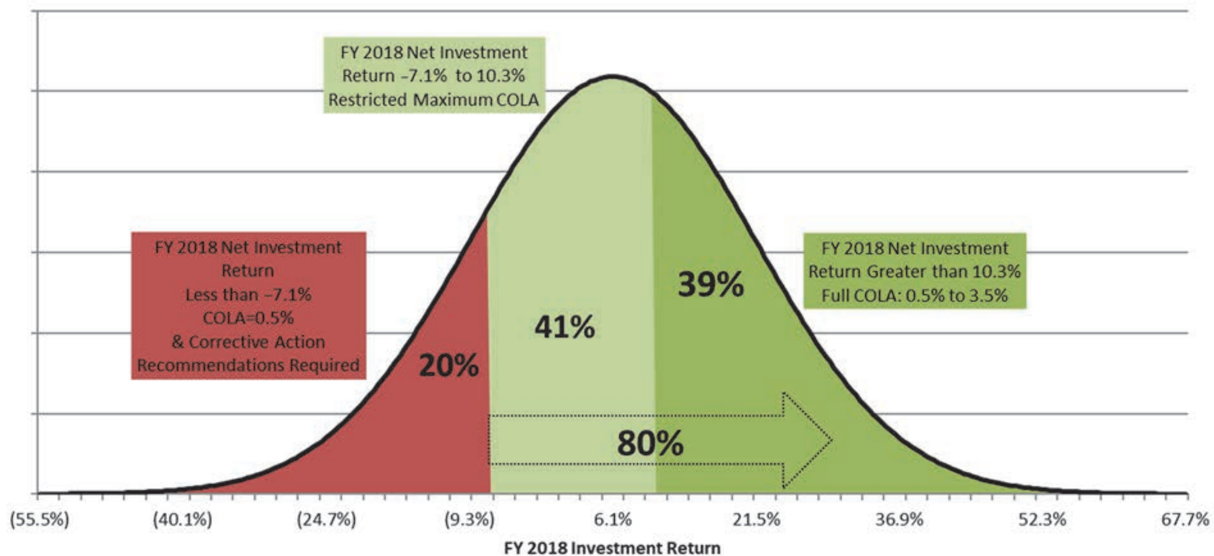
3. **Minimum COLA/corrective action required.** Baseline fair value funded ratio is less than approximately 84 percent; COLA is equal to 0.5 percent; corrective action (benefit reduction) recommendation required to be made to legislature.

SDRS reports quarterly on the minimum investment returns necessary for each potential funding result looking at 1-year, 2-year and 3-year periods. The South Dakota Investment Council's mean expected return and standard deviation assumptions for the benchmark asset allocation are then used to determine likelihoods for each of the three potential outcome ranges over each of the periods.

For instance, for fiscal year 2018 1-year net investment returns required for each result and the expected likelihoods for each, as shown in Figure 4, are:

1. **Full COLA range.** Net investment returns greater than approximately 10 percent; expected likelihood approximately 39 percent.
2. **Restricted maximum COLA.** Net investment returns between approximately −7 percent to 10 percent; expected likelihood approximately 41 percent.
3. **Minimum COLA/corrective action required.** Net investment returns less than approximately −7 percent; expected likelihood approximately 20 percent.

Figure 4. One-Year Forward Outlook



For fiscal year 2018, the automatic COLA adjustments are expected to result in a COLA above 0.5 percent and a published fair value funded ratio based on the restricted maximum COLA, if applicable, of 100 percent with a likelihood of approximately 80 percent (potential results 1 and 2). Conversely, there is an expected 20 percent likelihood that fiscal year 2018 investment losses are large enough that the automatically adjusting features will be exhausted and additional benefit reductions will be required to remain above the statutory funding thresholds. These likelihoods are based on the South Dakota Investment Council's assumed investment portfolio statistics for the benchmark asset allocation, which include a mean expected return of 6.10 percent and a 1-year expected standard deviation of 15.4

percent (note mean expected return is slightly less than the actuarially assumed net investment return of 6.5 percent but essentially equal after considering the excess of statutory contributions over the minimum statutory funding requirements).

The same results for 2-year and 3-year forward-looking periods are reported quarterly to the board of trustees (see Figures 5 and 6, respectively).

Figure 5. Two-Year Forward Outlook

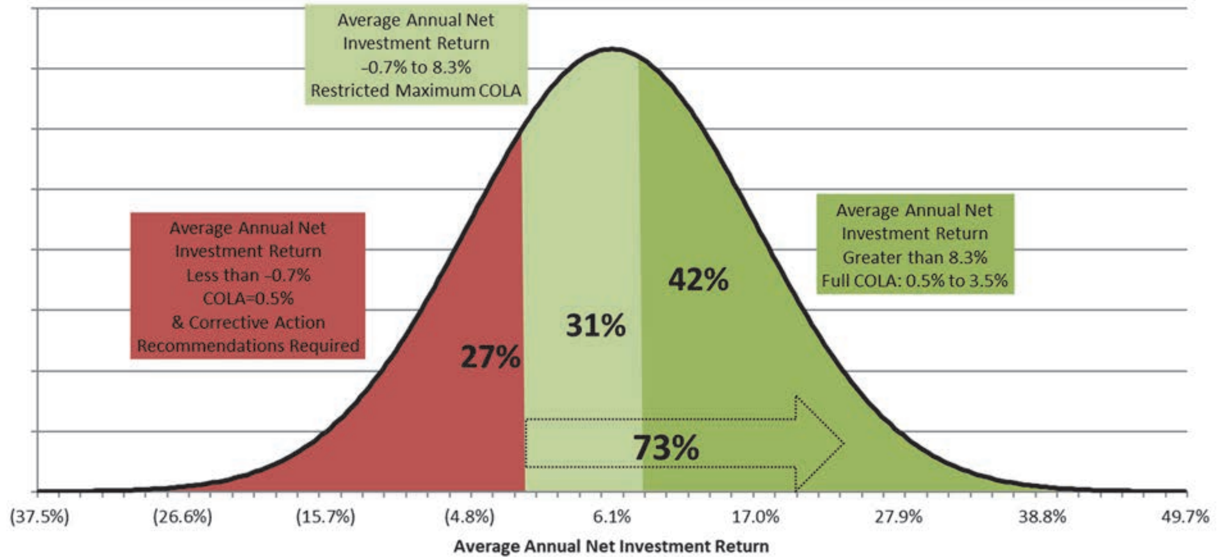
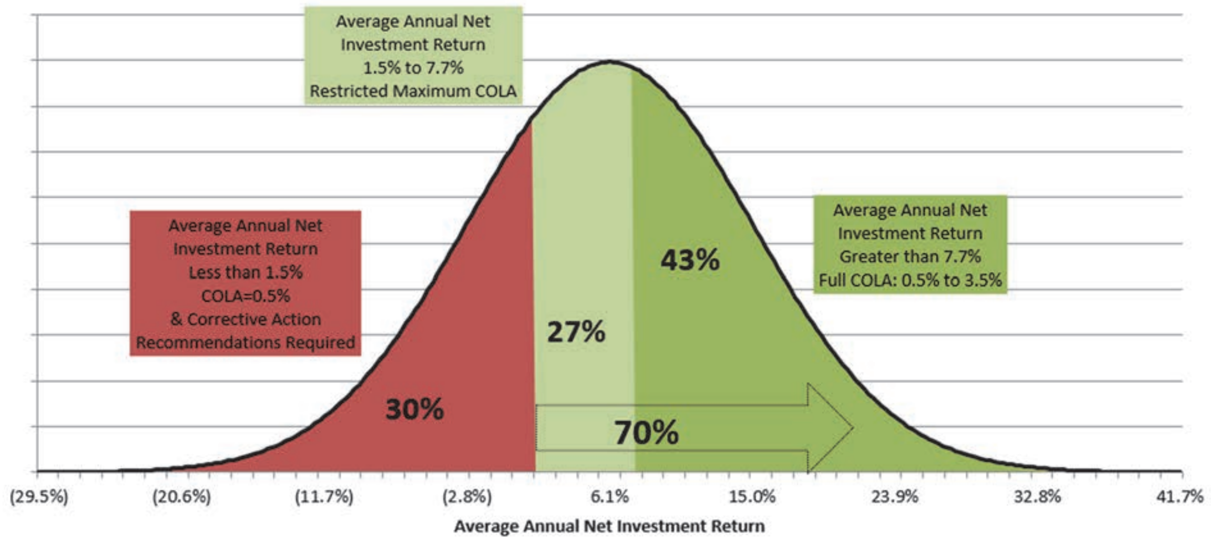


Figure 6. Three-Year Forward Outlook



The message to stakeholders is the automatically adjusting features will be adequate during most economic conditions, but in extreme economic events, additional legislative changes may be required to

remain above the statutory funding thresholds. Regardless of SDRS's flexible benefits and current funded status, the future will bring unexpected challenges and the board of trustees must remain diligent in managing the system for sustainability.

This risk analysis focuses on investment returns. Other metrics are still being developed for noninvestment related risks that will have an impact on funding measurements. However, the annual investment return has historically been the far greatest source of funding volatility. Demographic gains and losses have, at their highest, been only a fraction of the impact of annual investment volatility. In addition, only the newest system members have the variable retirement account as part of their benefit structure. As the population transitions to the new tier structure, the stabilizing impact of the variable retirement account on the plan's funded status will grow and lower the likelihood of required additional corrective actions.

Actuarial assumptions for public sector retirement plans are required to be reasonable assumptions with no significant optimistic or pessimistic bias (except if margins for adverse deviations are explicitly included and disclosed). If assumptions are indeed unbiased, they should be near the median of expected future results. In a defined benefit system with fixed benefits, contribution rates that change annually based on an actuarial recommendation, and assumptions set near the median of expected future results, contribution rates would be expected to increase from one year to the next with a likelihood of approximately 50 percent. Smoothing processes or contingency funding would mitigate some of the volatility.

While the typical defined benefit system has approximately a 50 percent chance of requiring increased contributions in any year, the automatically adjusting benefit features in SDRS reduce the likelihood of necessary corrective actions in the next year to approximately 20 percent.

6. Summary and Application to Other Systems

The basic tenets of the SDRS structure are a contribution budget, flexible benefit features that respond to investment returns and overall system experience, and statutory funding thresholds that require corrective actions. Each of these can be adapted to a plan sponsor's specific goals, but could be limited by legal or constitutional protections in some jurisdictions.

SDRS has a fixed contribution budget. Other plans may find a variable employer contribution with a specified maximum more appropriate; however, it would be beneficial to establish the maximum well before contribution requirements approach that limit. Required contribution increases above a specified threshold (but less than the maximum) could be allocated with a greater proportion to required member contributions than employer.

SDRS has two primary features that vary with investment performance and funded status. The variable retirement account grows with actual investment return and the COLA varies with funded status and inflation. Both adjust a portion of the liabilities based on the assets available to pay the benefits. The COLA is the most logical benefit feature to vary because of its cost significance and its application to current and future retirees. Other plans should consider a flexible COLA, particularly if past fixed COLAs have significantly exceeded inflation, as COLAs were generally designed to protect retirees from the loss of purchasing power due to inflation. SDRS's COLA is designed to vary based on a comparison of a baseline funded ratio to 100 percent. Other plans could consider varying the COLA based on a

comparison to a lower funded ratio or based on reaching a specified funding period or date to eliminate an unfunded liability.

Adding a cash balance feature like the variable retirement account, in conjunction with a scaled-back defined benefit, can also partially protect plan funding requirements from the impact of future investment volatility.

Finally, SDRS has specified funding thresholds that require plan benefit adjustment if not met. South Dakota law has allowed the adjustment of the COLA applied to all benefits, even those currently in pay status. Whether accrued or future benefits can be adjusted, it is critical for a plan's sustainability to establish funding thresholds that call for change in advance. Without such clearly defined markers, political expediency can easily force the delay of tough decisions until it is extremely unlikely for a plan to return to a responsible funding status and reasonable contribution requirement.

The SDRS model has worked well to date and will continue to evolve with changing conditions. Both members and policy makers have accepted the risk-sharing features as essential elements for a sustainable retirement system.

References

Boyd, Donald J., and Yimeng Yin. How Public Pension Plan Demographic Characteristics Affect Funding and Contribution Risk. *ROCKINST.org*, 2016, http://rockinst.org/wp-content/uploads/2018/02/2016-12-07-Pension_Demographic_Characteristics-1.pdf (accessed April 22, 2018).

CEM Benchmarking Inc. *South Dakota Retirement System Pension Administration Benchmarking Results Fiscal Year 2016.* Paper presented to the SDRS board of trustees, April 5, 2017.

Fornia, William, and Nari Rhee. Still a Better Bang for the Buck: An Update on the Economic Efficiencies of Defined Benefit Plans. *NIRSonline.org*, 2014, https://www.nirsonline.org/wp-content/uploads/2017/07/bangforbuck_2014.pdf (accessed April 22, 2018).

Munnell, Alicia H., Jean-Pierre Aubry, and Mark Carefelli. How Did State/Local Plans Become Underfunded? *Center for Retirement Research at Boston College*, State and Local Pension Plans, Brief Number 42, January 2015, http://crr.bc.edu/wp-content/uploads/2015/01/slp_42.pdf (accessed April 22, 2018).

National Association of State Retirement Administrators (NASRA). Public Fund Survey: Summary of Findings for FY 2016. Aggregate Actuarial Funding Level Percent, Median Investment Return Assumption, Average Percent of ADC Received, NASRA.org, 2017, http://www.nasra.org/publicfundsurvey (accessed April 22, 2018).

Purcell, Patrick J. 2012. Income replacement ratios in the health and retirement study. *Social Security Bulletin*, 72, no. 3, https://www.ssa.gov/policy/docs/ssb/v72n3/v72n3p37.html (accessed April 22, 2018).

South Dakota Investment Council (SDIC). 2017. Annual Report Fiscal Year 2017, *SDIC.SD.gov,*http://sdic.sd.gov/documents/Annual%20Report%202017.pdf (accessed April 22, 2018).

South Dakota 93rd Legislative Session Joint Rules (as adopted January 17, 2018). 2018, page 24, http://www.sdlegislature.gov/docs/legsession/2018/JointRules.pdf (accessed April 22, 2018).

South Dakota Retirement System (SDRS). 2017. Actuarial Valuation as of June 30, 2017, *SDRS.SD.gov*,http://sdrs.sd.gov/docs/2017SDRSValuationReport.pdf (accessed April 22, 2018).

Tice v. State of South Dakota, Civil No. 10-225 (Circuit Court of the 6th Judicial Circuit, Hughes County, Judge Mark Barnett), April 11, 2012, http://pensionlitigation.org/wp-content/uploads/2014/04/SD-Tice-v.-South-Dakota-Memorandum-Decision-April-2012.pdf (accessed April 22, 2018).

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