

North Carolina  
**Future of Retirement**  
Study Commission

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Retirement Plan Design Examples

We are providing these examples to help the Commission better understand the decisions it is making. Neither the Department of State Treasurer nor State Treasurer Janet Cowell is endorsing one of these alternatives over another.

1. Defined Benefit Plan

1a. Current North Carolina state and local plans as described in [the handbooks](#).

1b. South Dakota Retirement System

We picked this system to illustrate that DB plan designs are quite flexible. Contrary to common perception about DB plans, this system provides meaningful benefits to those who leave state employment early in their careers and in theory the employees bear the investment risk.

These are the main features of the benefits available to general employees:

- Benefits are unreduced at age 65 with 3 years of service or at age 55 if your age plus service exceeds 85.
- Primary formula is 1.7% x Compensation x Service before 7/1/2008 plus 1.55% x Compensation x Service after 7/1/2008.
- Automatic COLAs of 2.1% to 3.1% per year, depending on funded status.
- If you leave the state before retirement, your benefit is also indexed with COLAs until you start payment. This preserves a lot of the benefit value normally lost in a DB plan when someone leaves early in his or her career.
- If you choose to withdraw your contributions after 3 or more years of service, you receive 85% of the employer contributions. Before 3 years, you receive 50% of the employer contributions. This also evens out the benefit value across a career.
- Both employer and employee contributions are fixed at 6% of pay, for a total contribution of 12% of pay.
- If the funded status falls below 80%, then benefits must be cut back. Thus, the employee is bearing a lot of the investment risk. At 6/30/2009, the system was 91.8% funded using smoothed assets and 76.5% funded using market value of assets. The valuation report noted “Our calculations and analysis indicate that the system is not currently meeting its funding objectives.” “Changes in future benefits or contributions may be necessary for SDRS to be actuarially sound.”

The benefits are described in more detail in [this handbook](#).

[This document](#) discusses the philosophy behind the benefit structure.

2. DB/DC Choice

[This article](#) provides some general background on DB/DC choice in other states:

## 2a. UNC Optional Retirement Program

The main features of this plan are:

- Defined contribution plan
- Available only to faculty and certain senior administrators
- One-time election between ORP and TSERS within 60 days of hire. Default election is TSERS.
- 5-year vesting for employer contributions
- Employee contributions and any vested employer balance can be rolled over to another defined contribution plan or an IRA if you leave the university at any age
- 6.84% of pay employer contributions
- Mandatory 6% of pay employee contribution. Additional voluntary contributions are possible through other plans offered by the university.
- Choice between four providers offering over 75 funds in total
- Income at retirement is based on investment returns and how you choose to withdraw your money.
- Several lifetime annuity options are available
- Participate in NC Disability Income Plan
- Continue to participate in State Health Plan in retirement

[This website](#) has further details on the program.

## 2b. Florida Retirement System

The main features of this plan are:

- Members have a six-month election window after hire to choose between the DB and DC plans. They are allowed one subsequent change after that window. The calculation of benefits upon a change in election is described on p. 7 of the Florida Retirement System document linked to below.
- There are no employee contributions to either plan.
- The employer contributes 9% of pay to the DC plan. Employee contributions are not permitted to that plan, although employers may provide supplemental plans for employee contributions.
- At retirement, the DC account can be used to buy an annuity with a 3% COLA from a private company (The Hartford). Participants can also choose a variable annuity fund invested in TIPS, which may behave somewhat like an inflation-indexed annuity.
- DC accounts vest after one year. DB benefits vest after six years.
- The DB benefit is  $1.60\% \times 5\text{-year average salary} \times \text{service}$ , with a 3% automatic COLA. It is unreduced at the earlier of age 62 or 30 years of service.
- At July 1, 2009, the employer contribution to the DB plan was 8.69% for general employees.
- In the most recent year available, 26% of new hires elected the DC plan. The DB plan is the default if no election is made.

The Florida Retirement System provides [this document](#) to help employees with the choice.

## 2c. New Utah plan

For Tier II public employees (new hires after July 1, 2011), Utah will provide:

- Choice between a DC plan and a hybrid (combination of DC and DB).
- The employer contribution is always fixed at 10% of pay.
- Employees who choose the DC plan will receive a 10% of pay employer contribution.
- Employees who choose the hybrid plan will have the DB portion funded by the employer contribution; any excess between the 10% contribution and the cost of the DB portion will go into the employee's 401(k) account; if the cost of the DB portion exceeds 10% of salary, the employee must contribute the difference to fund the DB portion and no employer funds will go into the employee's 401(k) account.
- DB portion of hybrid plan formula is  $1.5\% \times 5\text{-year final average salary} \times \text{Service}$ . Retirement is unreduced at 35 years of service. Retirees receive a COLA equal to cumulative CPI, up to 2.5% per year.
- The employer contribution for public safety/firefighter employees is 12% of pay and they can retire after 25 years.

While the choice is interesting, the most interesting feature of this design may be the 10% fixed contribution under the hybrid option. This has several impacts:

- As noted in the May meeting of the Commission, when you give choice between a DC plan that costs 6.3% of pay and a DB plan that costs 6.3% of pay, the resulting hybrid will cost more than 6.3% of pay because the late-career hires and people who expect to stay for a whole career will choose the DB plan, driving up its cost. If this effect is really strong in the Utah system, the cost of the DB plan will exceed 10% of pay and employee contributions will increase to cover that, reducing the incentive to pick the hybrid plan. Through this mechanism, the Utah design avoids this classic problem with choice, although the employees making the choice may not understand this feature until it has played out for a while.
- The investment risk is entirely shifted to the employees. If returns are high, then the required contribution to the DB plan will be low, leaving a large surplus to go into 401(k) accounts. If returns are low, then the surplus to go into the 401(k) accounts will be much smaller. If returns are really low, then the cost of the DB plan will exceed 10% and the employee contribution will increase to cover the extra cost.
- Other systematic risks, including mortality and to some extent inflation, are also borne by the employees because of the fixed 10% employer contribution.

For more information, see [this webpage](#).

### 3. DB/DC Combination (Hybrid)

[This table](#) compares hybrid plans in other states.

#### 3a. Oregon

For new hires since August 2003, the program has the following features:

- The DB plan has a 1.5% multiplier for general employees and 1.8% for public safety.
- Benefits in the DB plan are unreduced at age 65 or at age 58 with 30 years of service.
- There is no employee contribution to the DB plan.
- COLAs are equal to the increase in CPI, capped at 2%.

- The DC plan has a mandatory 6% of pay employee contribution, although employers are allowed to pay this on behalf of the employee and many do.
- The DC contributions are invested in the DB fund and receive the same return as the DB plan. There are no other investment options, so employees bear the investment risk on this piece. This feature was intentionally designed to leave the investment decisions in the hands of professional investors, keep fees low, and give exposure to less liquid investments, although it also does not allow the participant to control the amount of risk they take.
- The DC account can be distributed as a lump sum or in equal installments. There appears to be no lifetime annuity option.

Oregon had a DB/DC hybrid prior to 2003, but guaranteed a high return on the DC component plus shared most gains when investment returns were good. The costs of that plan obviously surged in the 2000-2003 market downturn, leading to the design above.

Here is a [brochure](#) for the program.

### 3b. Georgia Employees Retirement System

For new hires since 2008, the program has the following features:

- The DB plan multiplier is 1%. Unreduced retirement is at age 60 with 10 years of service or at any age with 30 years of service. The benefit vests after 10 years.
- Employees contribute 1.25% of pay to the DB plan. Employers contribute the rest.
- In the DC plan, the employer matches 100% of the first 1% of salary and 50% of the next 4% of salary that the employee contributes, for a maximum employer contribution of 3% of salary.
- The employee is required to contribute at least 1% to the DC plan.
- The employees choose among 13 investment options in the DC plan.
- The DC plan offers a variety of withdrawal options, including a lifetime annuity
- Members prior to 2009 have a traditional DB plan, but may opt into the hybrid program at any time.

This [web page](#) provides more details on the new plan and the reasons it was adopted:

## 4. DC Only

### 4a. IBM 401(k) Plan

For new hires since January, 2008, the plan has the following features:

- IBM matches 100% of the employee contribution up to 6% of pay.
- Employees are automatically enrolled in the plan and contributions automatically increase along with raises in pay. Employees can opt out of either feature.
- Investment options include custom target-date funds for employees who do not like to manage their own money. These funds automatically adjust risk based on the number of years to retirement.
- Investment and administration fees average only 0.10% of assets.

- Free financial advice, including Financial Engines software for a 20-minute “checkup” and one-on-one consultations with money coaches at Ayco.
- Distribution options include a lifetime annuity. IBM negotiates institutional pricing with private insurance companies. The employee selects a particular annuity and provider through a competitive bid process.

The following articles describe the IBM plan and some of the reasons they adopted it:

[Businessweek](#)

[Workforce](#)

[CBS Moneywatch](#)

#### 4b. Automated DC Plan

Private-sector DC plans have been adding a lot of automatic features in recent years, including auto-enrollment, auto-escalation of contributions, and default investment in target date funds. The hypothetical plan described below takes that trend to its logical conclusion, which is a fully automated DC plan that will provide adequate, lifetime, inflation-protected income to an employee with no effort on the employee’s part.

This plan would use the legal and administrative structure of the existing state 401(k) and 457 plans, but add additional features to allow them to function as primary, instead of supplemental, plans.

This plan attempts to simultaneously address the needs of all three of the following types of employees:

- Those who will not spend any time on retirement planning. The default choices described below should prepare these employees for retirement.
- Those who are willing to spend 15 minutes per year to answer some simple questions. These employees will be able to tailor their contributions and future benefit to take into account benefits from previous/future employers, typical use of housing wealth, part-time work in retirement, and the effect of reduced dependent expenses.
- Those who are working with an advisor or wish to do extensive planning. These employees will be able to adjust their contribution to the desired level based on their own analysis.

The key automated features used to prepare the employee who does not wish to do any planning are:

- Auto-enrollment. Upon hire, the employee would be automatically enrolled in the 401(k) and/or 457 plan.
- Employee contribution set based on a financial modeling tool. Some inputs (e.g. age, salary, current 401(k)/457 balance) will be provided by the employer. All of the other inputs (e.g. desired retirement age, target replacement rate) will have a default answer that will be used if the employee does not go online and override the default.
- Employee contribution rates will be automatically updated once a year using new age, salary, and 401(k)/457 balance. If the investments lose value or the employee gets a significant raise, the contribution rate will automatically increase.

- Investment defaults to a version of GoalMaker® that gradually reduces investment risk over time, reaching zero at the point of retirement. The employee would face some investment risk early in his career, when he has many years to make adjustments, but would face little investment risk when nearing retirement.
- If the employee leaves the state or local government prior to retirement, she would be encouraged to leave her money in the plan.
- Upon retirement, the employee would be encouraged to annuitize most of the balance up to the recommended replacement rate. The annuity would be inflation-indexed and provided by transferring funds to the existing DB plan. The DB plan would be required to invest those funds in the appropriate mix of Treasury Inflation Protected Securities (TIPS).

Employer contribution: 6.3% of pay if mandatory and immediately vested.

The employee contribution will obviously vary depending on the particular situation. At the low end, someone who has already set aside a lot of money for retirement or has seen very strong investment returns could have a recommended employee contribution of 0%. The recommended contribution would be around 5% of pay for someone who starts work at age 25 and ultimately expects to stop working entirely at 65. Someone who joins the State late in life and has not saved a penny for retirement could have a recommended contribution rate of 40% or 50% of pay, but that is what is needed to overcome the lack of early savings. Note that all of these rates are recommendations coming out of the tool. The employee could choose to override the recommendation and contribute more or less than these amounts or choose not to contribute at all.

The main difference between this plan and the IBM 401(k) is how they set employee contributions and how they distribute the account in retirement for an employee who is unable or unwilling to do any retirement planning. The IBM 401(k) automatically enrolls the participant at a default starting contribution and then increases that with raises in salary. However, there is no tie between the contribution rate and the desired replacement rate in retirement. An employee who lacked financial expertise, but was willing to spend some time, could of course meet with one of the free financial advisors who would recommend a better contribution rate. In the Automated DC Plan, the contribution rate would be reset annually to the needed amount based on certain demographic information provided by the employer.

At retirement, the IBM 401(k) offers lifetime annuities, but they do not seem to strongly encourage this option and the annuities do not appear to be inflation-protected (although some do increase at a fixed rate). The Automated DC Plan would use a variety of techniques to strongly encourage annuitization and would index those annuity payments with inflation. The default investment option in the Automated DC Plan would also reduce investment risk to zero as the employee approached retirement. In contrast, IBM's SEC filings show that its 2010 target-date fund has 58% of assets in stocks.

The biggest challenges in this plan would be communicating and managing high and potentially volatile default contribution rates. As noted before, some employees would have high default contribution rates, for example the late-career hire who has no savings. Default contributions would also increase significantly after a large market drop like 2008, although this would be somewhat dampened by conservative default investments. Of course, anyone could opt out of these high contribution rates, but then they might be unprepared financially for retirement.

For a description of the existing GoalMaker® tool, see [this brochure](#).

## 5. Cash Balance

Cash balance plans exist in a few states, as well as many corporations. The state and local government systems in North Carolina were actually cash balance plans until 1963.

### 5a. Nebraska State Employees Retirement System

Until 2003, state employees in Nebraska participated in a DC plan. Despite significant efforts to educate employees and provide financial planning services, many employees made bad investment decisions and ended up with very little in savings at the time of retirement. A [design study](#) conducted in 2000 led the state to adopt the cash balance plan. The new plan has the following features:

- Participation is mandatory.
- Each employee has a notional account that looks like a DC plan.
- The funds are invested by the professional fund managers in a similar manner to a traditional DB plan. However, the investment return credited to the account is not the return on the underlying fund. The credited return is the greater of 5% or the federal mid-term rate plus 1.5%, plus a dividend credit if returns on the underlying fund are good. The crediting rate for 2003 through 2007 was:

2003	5.04%
2004	8.27%
2005	8.25%
2006	19.32%
2007	8.85%

- The benefit vests after three years.
- Retiring participants may annuitize any portion of the account balance, from 0 to 100 percent. Participants may select an annuity with a 2.5% COLA. The annuity factors are based on an assumed 7.75% return, rather than market rates. The annuities are provided through the pension fund, not a private company.
- Employees contribute 4.8% of pay and employers contribute 7.49% of pay. Employees wishing to contribute more may do so through a supplemental DC plan.
- Despite concerns in the previous DC plan about employees cashing out their accounts when they leave employment, employees are still allowed to cash out their cash balance accounts.

For further details, see [this handbook](#).

### 5b. Wisconsin Retirement System

The Wisconsin system provides a benefit that is the greater of two formulas, one of which is called a money purchase plan, which in this case is a type of cash balance plan. It has the following features:

- Each employee has a notional account that looks like a DC plan.
- The employee mandatory contribution for 2010 is 6.2% of pay for general employees. The employer may choose to pay this contribution as a fringe benefit and many employers do.
- The employer contributes 4.8% of pay for general employees

- Employees may make additional voluntary contributions, which are credited to the cash balance account.
- The minimum retirement age is 55 for general employees.
- Employees can choose between two investment options. One is about two-thirds invested in risky assets, but provides a crediting rate to employee accounts that is designed to be somewhat steadier than the underlying return. The other is 50% invested in the first fund and 50% invested in stocks.
- The investments are managed by a professional staff.
- At retirement, employees can take their benefit in the form of an annuity provided through the retirement plan and converted from the account balance with factors based on age and a 5% assumed investment return.
- COLAs are provided based on investment returns in each of the two funds. The COLAs can be negative, i.e. benefits can decrease, as they did in 2008.

This [handbook](#) describes the plan. This [report](#) describes how the funds are invested and how returns are credited.

## 6. Opt-Out

An opt-out would allow employees to choose not to participate in the retirement system and instead receive the employer contribution in the form of higher salary. This could work with any of the options above, although combining it with a DB Plan (option 1) or a DB/DC Hybrid (option 3) would generate the usual cost issues that arise with choice. When combined with any option other than the DC plan (option 4), the choice to opt-out would probably need to be offered only once or twice in a career to comply with federal tax law. When combined with the DC plan, the choice could be changed as often as monthly.

In most cases, the opt-out is the financial equivalent of paying a higher salary and offering no employer contribution. The state would need to decide how to communicate this to employees. Alternatives include:

- “The employer contribution is \_\_\_%, but you can opt out and receive it as cash.”
- “You are receiving a \_\_\_% adder to your salary to be competitive with other employers that offer an employer retirement contribution. By default, your employee contribution will be set to at least this level, but you can choose to contribute less or none at all.”

	2a. UNC ORP (replacement rates assume change ORP and only make required contribution)	2b. Florida Retirement System (choose DB)	2b. Florida Retirement System (choose DC)	2c. Utah Retirement System (choose hybrid)	2c. Utah Retirement System (choose DC)
	1a. TSERS/LGERS	1b. South Dakota			
Replacement rate for 30 year employee	55%	47%	48%	45% at age 60	16%
Replacement rate for someone who works from age 25 to age 40 (15 years) and collects benefit at age 65	10%	19%, assuming 3.1% COLA	9%	8%	11% at age 65
Replacement rate for someone who works from age 50 to age 65 (15 years)	28%	23%	24%	23%	7%
Does benefit increase during retirement years, as recommended by Commission?	Maybe, depends on investment gains and budget	Yes, 2.1% to 3.1% per year.	Yes, 3% per year	Yes	Optional
Target retirement age	Age 65. Age 60 if 25 years of service. Any age if 30 years of service, although benefit would not be adequate before age 62 without part-time work.	Age 65. Age 55 if age plus service equals 85, although benefit would not be adequate before age 62 without part-time work.	Age 62 or 30 years of service, although benefit would not be adequate before age 62 without part-time work.	Age 65. Age 60 if 20 years of service. Any age if 35 years of service, although benefit would not be adequate before age 62 without part-time work.	Not specified.
Who bears systematic investment risk?	Employees	Employees, although mechanism for reducing benefits is not fully tested.	Employees	Employees	Employees and retirees if they choose to do so.
Is longevity risk pooled?	Yes	Yes	Yes	Partially	No, unclear if annuity will be offered
Who bears inflation risk?	Mostly retirees, although higher inflation might lead to increased pressure for COLAs.	Retirees. While there is a COLA, it is not tied to CPI.	Retirees. While there is a COLA, it is not tied to CPI.	Retirees and employees. Annuity is indexed to inflation, but only up to 2.5%.	Retirees.
Which employees receive most value?	Young hire who stays for 30 years. Older hire.	Generally, young hire who stays for 30 years and older hire, although difference is smaller than in most DB plans.	Young hire who stays for 30 years. Older hire.	Generally, young hire who stays for 35 years and older hire, although difference is smaller than in most DB plans.	Everyone who vests receives the same value.
Which employees receive least value?	Young hire who leaves after less than 20 years.	Young hire who leaves loses a little value	Young hire who leaves after 5 to 29 years.	Young hire who leaves with less than 35 years.	Everyone who vests receives the same value.
How much effort and expertise are required from the employee (scale of 1 to 5)?	1	1	1	2	4
What choices do employees have?		Can choose between refund (including 85% of ER contributions) and future benefit.	Can choose to be in DB or DC.	DB or DC, contribution rate, investments, distribution	DB or DC, contribution rate, investments, distribution
Employee contribution	6%	6%	0%	Employee decision	Employee decision
Employer normal cost	6.30%	6% (assuming benefits will be cut back if funding is insufficient)	11.95%	10%	10%

Replacement rate for 30 year employee

Replacement rate for someone who works from age 25 to age 40 (15 years) and collects benefit at age 65

Replacement rate for someone who works from age 50 to age 65 (15 years)

Does benefit increase during retirement years, as recommended by Commission?

Target retirement age

Who bears systematic investment risk?

Is longevity risk pooled?

Who bears inflation risk?

Which employees receive most value?

Which employees receive least value?

How much effort and expertise are required from the employee (scale of 1 to 5)?

What choices do employees have?

Employee contribution

Employer normal cost

	3a. Oregon PERS	3b. Georgia ERS	4a. IBM 401(k)	4b. Automatic DC Plan (assuming EE accepts defaults)	5a. Nebraska SERS	5b. Wisconsin RS (Money Purchase only)
Replacement rate for 30 year employee	54% at age 58	49% assuming full match	29% at age 65	About 30% at age 65, 45% if use 30 years in planner	32%	36%
Replacement rate for someone who works from age 25 to age 40 (15 years) and collects benefit at age 65	15% at age 65	19%, assuming full match	21% at age 65	21% at age 65	18% at age 65	25% at age 65
Replacement rate for someone who works from age 50 to age 65 (15 years)	27%	23% assuming full match	13%	Around 45% if EE indicates no prior savings and accepts resulting contribution rate	15%	15%
Does benefit increase during retirement years, as recommended by Commission?	Yes	Maybe, depends on investment gains and budget	Optional	Yes	Yes, if choose COLA.	Yes
Target retirement age	Age 65 or age 58 with 30 years of service.	Age 60 with 10 years of service or any age with 30 years of service, although benefit would not be adequate before age 62 without part-time work.	Not specified, although IBM has mentioned that many retire around age 60.	Age 65, although EE could change this.	Age 55, although benefit might not be adequate before age 62 without part-time work.	Age 55 to 65
Who bears systematic investment risk?	Shared	Shared	Employees and retirees if they choose to do so.	Employees early in career when they can easily adjust to a market drop. After that, no one.	Mostly the employer	Shared
Is longevity risk pooled?	Partially	Partially. Fully if EE annuitizes DC.	Yes, if choose annuity	Yes	Yes, if choose annuity	Yes, if choose annuity
Who bears inflation risk?	Shared. Annuity is indexed to inflation, but only up to 2%	Mostly retirees, although higher inflation might lead to increased pressure for COLAs.	Retirees	No one	Retirees	Retirees. COLAs are tied to investments, not inflation.
Which employees receive most value?	Generally, young hire who stays for 30 years and older hire, although difference is smaller than in most DB plans.	Generally, young hire who stays for 30 years and older hire, although difference is smaller than in most DB plans.	Everyone who contributes at least 6% receives the same value.	Everyone who vests receives the same value.	Everyone who leaves their money to retirement receives the same value.	Everyone who vests receives the same value.
Which employees receive least value?	Young hire who leaves with less than 30 years, although difference is small.	Young hire who leaves with less than 30 years, although difference is small.	Everyone who contributes at least 6% receives the same value.	Everyone who vests receives the same value.	Everyone who leaves their money to retirement receives the same value.	Everyone who vests receives the same value.
How much effort and expertise are required from the employee (scale of 1 to 5)?	2	3	2	1	2	2
What choices do employees have?	Distribution of DC account.	Contribution rate, investments, distribution.	Contribution rate, investments, distribution.	Primarily retirement age, replacement rate, and investment risk.	Distribution of account.	Risky or less risky investment, distribution of account.
Employee contribution	6%, although ER often pays.	1.25% to DB, employee decision to DC.	Employee decision	Varies. Around 4% for career employee. Could be 50% for someone who has not saved and tries to make that up at the end.	4.8%	6.2%, although ER often pays.
Employer normal cost	6.16%	Around 8.5%	6% if full match	6.3%	7.49%, although this ignores several features	4.8%, although this ignores several features

Replacement rate for 30 year employee

Replacement rate for someone who works from age 25 to age 40 (15 years) and collects benefit at age 65

Replacement rate for someone who works from age 50 to age 65 (15 years)

Does benefit increase during retirement years, as recommended by Commission?

Target retirement age

Who bears systematic investment risk?

Is longevity risk pooled?

Who bears inflation risk?

Which employees receive most value?

Which employees receive least value?

How much effort and expertise are required from the employee (scale of 1 to 5)?

What choices do employees have?

Employee contribution

Employer normal cost