Staying Ahead of the Sustainability Curve
The Coming Actuarial Changes

November 19, 2013
Mark Randall, FCA, EA, MAAA
Maintaining sustainable benefits for all members and retirees is the top priority of TMRS staff, its Board of Trustees and the System’s retained actuary

- Since 2007, a series of changes have occurred to ensure TMRS continues to be well-funded and that members’ benefits stay secure
- Adopting a new, generational mortality table and funding method are parts of this continued effort.
What is changing?

- Annuity Purchase Factors beginning in 2015
  - No current retiree’s benefit will be affected
  - Will be phased in over a thirteen (13) year period (2015-2027, inclusive)

- Similar change as of December 31, 2013 to the Actuarial Valuation Mortality
  - Impacts City Contribution Rates for 2015

- Actuarial cost method changed from the Projected Unit Credit cost method to the Entry Age Normal cost method
Why a change was needed

- TMRS annuities provide a **retirement benefit for life**
  - People are living longer and will continue to live longer
  - So the pool of money that pays an individual’s monthly retirement benefit needs to stretch farther
- Higher city contributions have been effectively “subsidizing” these longer lifetime payments
  - Continued mortality improvement means these “subsidies” will continue to grow if no change is made
- Updating the Annuity Purchase Rate factors will help cities sustain current benefit levels
Mortality Assumption

As part of its 2012 Strategic Plan, the TMRS Board of Trustees requested an analysis of the mortality assumptions used in all of the actuarial processes of TMRS

► Valuation Mortality Assumption
  • Used in determining liabilities and employer contribution requirements

► Annuity Purchase Rates (APRs)
  • Used to convert member balances to annuities at retirement
  • Include partial lump sum and survivor options
History of Mortality Assumptions

**Valuation assumption:**
- In **1981**, UP 1984 mortality table (retiree -2, beneficiary -7)
- In **1988**, UP 1984 (retiree -1, beneficiary -8)
- In **2007**, updated to RP-2000 mortality table
- In **2011**, updated to RP-2000 mortality table, projected forward three years

**Annuity Purchase Rate:**
Since 2010, life expectancies continue to increase. The latest published rates (2012) are 20.5 years for females and 17.9 years for males, both from age 65.

Source: National Vital Statistics Reports
Mortality Rates by State

Overall rate in the United States is 746.2 deaths per 100,000.

Above data from National Vital Statistics
Actuarial Standards of Practice No. 35
Selection of Demographic and Other Noneconomic Assumptions
for Measuring Pension Obligations

From Background Section of the ASOP:

As mortality rates have continued to decline over time, concern has increased about the impact of potential future mortality improvements on the magnitude of pension commitments.

In the view of many actuaries, the guidance regarding mortality assumptions should more explicitly recognize estimated future mortality improvement as a fundamental and necessary assumption, and the actuary’s provision for such improvement should be disclosed explicitly and transparently.

From Section 3.5.3: Mortality and Mortality Improvement Assumptions:

The actuary should consider the effect of mortality improvement both prior to and subsequent to the measurement date.

With regard to mortality improvement, the actuary should do the following:

i. adjust mortality rates to reflect mortality improvement prior to the measurement date.

ii. include an assumption as to expected mortality improvement after the measurement date.

Note that the existence of uncertainty about the occurrence or magnitude of future mortality improvement does not by itself mean that an assumption of zero future improvement is a reasonable assumption.
Future Recommendation to Valuation Mortality Assumption

- GRS’ recommendation was to move to full generational mortality
  - Instead of a static assumption with margin, the goal would be to find a good fit for today’s experience and then project the rates using standard tables

- We recommended the RP-2000 table with blue collar adjustment, loaded by 109% for males and 103% for females
  - This recognizes the lower than average life expectancy in the general population of Texas

- With no other adjustments, contribution rates for employers would increase on average by about ten percent (10%)
  - For example, if the current employer contribution rate is 5.0% of payroll, this adjustment would increase the rate to 5.5%. If current rate is 15.0%, would increase to 16.5%
  - Would add approximately $750 million to the System’s Unfunded Actuarial Accrued Liability (UAAL), about a 25% increase. Current UAAL is $2.899 billion

- With this fully generational projection approach, a gradual and consistent improvement over time would be in the valuation process
  - Future rates would not have to be reset every 4-5 years
  - Keep future UAAL’s from being systematically created

- With no other changes, this would have been our recommendation in the next Experience Study, currently scheduled Summer 2015
Annuity Purchase Rate factors (APRs)

- The current factors are based upon the UP 1984 Unisex Mortality Table, setback two (2) years
  - A setback is a technique used to recognize some improvement in longevity
  - Setback two years means the mortality rate for a 65 year old member will be treated as if the member is 63 years old

- As discussed previously, the current factors were adopted in 1981

- The current factors are not gender specific
  - In 1981, approximately 90% of retiring members were male
  - Today, approximately 70% of future retirees are male

- Any improvement for longer life expectancies originally built into these factors is gone
  - Current factors underestimate life expectancy for a retiring 60 year old by approximately 13%, or 2.7 years
  - With a 5% discount rate, the current factors are underpriced by 10-11%
Annuity Purchase Rate factors

- Again, GRS recommended a projected, generational approach
  - Factors will change slowly over time to reflect mortality improvements
  - Projection scales would be put in place today so that members could plan their retirements
- The factors would be based on the same mortality assumption as used in the valuation process
- However, it was thought that it be prudent to “phase into” the new factors since no member should be provided an incentive to retire to protect a current benefit
  - Can create losses due to a high number of retirements
  - May also create human resource difficulties
- Once an active member retires, the monthly amount calculated at the time of retirement will not decrease
Phase In

- Changes to APR’s will have no impact on existing retirees

- If the factors changed overnight, members currently eligible to retire could see their annuity decrease by as much as 9% to 11%. The decrease from an immediate change in factors could take at least a year to make up, and many people may choose to retire immediately.

- Based on the current factors, once eligible to retire, the average member will realize an increase in their annuity at about 10% per year due to new contributions, a 5% interest credit on their prior balance, and a smaller annuity factor.

- GRS’ preferred method is to phase in the full implementation over 13 years effective for retirements after 1/1/2015:
  - Thirteen years was chosen because the average member would still receive a 9% increase in their annuity each year (1% less than the current growth rate) and a vast majority of cities would not have a contribution rate increase.
  - With the phase-in, no member would ever have a decrease month over month in their annuity.
A Member with a Joint and Survivor Annuity
Age 50 with 20 years of service, $45,000 salary, 7% and 2-to-1 match

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<tbody>
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<td>Current Factors</td>
<td>1,194</td>
<td>1,314</td>
<td>1,445</td>
<td>1,585</td>
<td>1,738</td>
<td>1,903</td>
<td>2,082</td>
<td>2,277</td>
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<td>3,237</td>
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<td>New Factors</td>
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<td>1,431</td>
<td>1,563</td>
<td>1,706</td>
<td>1,859</td>
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<td>2,828</td>
<td>3,072</td>
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A Member with a Life-Only Annuity
Age 50 with 20 years of service, $45,000 salary, 7% and 2-to-1 match

Current Factors
New Factors

<table>
<thead>
<tr>
<th>Year</th>
<th>Current Factors</th>
<th>New Factors</th>
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<tr>
<td>2014</td>
<td>1,392</td>
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<tr>
<td>2015</td>
<td>1,541</td>
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<td>2016</td>
<td>1,705</td>
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<td>2018</td>
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<td>2019</td>
<td>2,290</td>
<td>2,359</td>
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<tr>
<td>2020</td>
<td>2,523</td>
<td>2,568</td>
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<tr>
<td>2021</td>
<td>2,778</td>
<td>2,793</td>
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<td>2022</td>
<td>3,058</td>
<td>3,038</td>
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<td>2023</td>
<td>3,363</td>
<td>3,303</td>
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<td>2024</td>
<td>3,699</td>
<td>3,391</td>
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<tr>
<td>2025</td>
<td>4,068</td>
<td>3,906</td>
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<td>2026</td>
<td>4,474</td>
<td>4,248</td>
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<td>2027</td>
<td>4,920</td>
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Change in Cost Method

- Also as part of its Strategic Plan, the Board reviewed a potential change in funding method from Projected Unit Credit (PUC) to Entry Age Normal (EAN)
- For many reasons, it was preferable to move to EAN
  - Removes bias for increasing normal costs
  - Even more stability in contribution rates
  - Increased likelihood cities will be able to maintain current benefit levels
  - Improved transparency and predictability for cities joining TMRS
- With no other changes, the contribution rate for many employers would increase, and the funding ratio would decrease
- However, when combined with the changes in annuity purchase factors and the change in valuation mortality, the increases in the contribution rates are much less substantial and many cities will see no rate increase
- EAN provides greater rate stability going forward
  - However, it is impossible to remove all volatility. But, moving to EAN would remove the known upward bias in the normal cost
- Also, moving to EAN now would allow for a simplified transition to the new GASB standards
PUC Normal Costs over time for a sample employee
Comparison of Normal Costs over time for a sample employee
How the Actuarial Accrued Liability (AAL) accrues over the entire career of an employee

New Employee: Entry Age 25

% of Payroll

25 28 31 34 37 40 43 46 49 52

PVB AAL EAN AAL PUC
## Comparison of System-wide Funded Status

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Using EAN With updated Mortality and 13 Year Phase In</th>
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<tbody>
<tr>
<td><strong>below $ amounts are in millions</strong></td>
<td></td>
<td></td>
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<tr>
<td>Actuarial Accrued Liability (AAL)</td>
<td>$22,545</td>
<td>$24,335</td>
</tr>
<tr>
<td>Actuarial Value of Assets</td>
<td>$19,646</td>
<td>$19,646</td>
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<tr>
<td>Unfunded Actuarial Accrued Liability</td>
<td>$2,899</td>
<td>$4,689</td>
</tr>
<tr>
<td>Funded Ratio</td>
<td>87.1%</td>
<td>80.7%</td>
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<tr>
<td><strong>Full Retirement Contribution Rates:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight Average</td>
<td>8.34%</td>
<td>8.60%</td>
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<tr>
<td>Payroll Weighted Average</td>
<td>13.10%</td>
<td>13.22%</td>
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<tr>
<td>Normal Cost %</td>
<td>9.51%</td>
<td>7.20%</td>
</tr>
<tr>
<td>Prior Service %</td>
<td>3.59%</td>
<td>6.02%</td>
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Distribution of Impact on Rates - all TMRS Cities
Distribution of Impact on Rates for Cities with 100 or More Actives
With the potential changes in the Annuity Purchase Rate factors, GRS’ full recommendations to the TMRS Board of Trustees were as follows:

1. Annuity Purchase Rate factors used in determining retirement and disability annuities as of January 1, 2015 be calculated on the basis of a 70%/30% male/female blend of the RP-2000 Blue Collar Table with an overall 107.5% load, and with fully generational Scale BB projection

2. These updated factors be phased in over a thirteen (13) year period

3. In addition, for actuarial valuation purposes in determining actuarial liabilities and contribution requirements, GRS also recommends the use of the RP-2000 Blue Collar Table loaded 109% for males and 103% for females, and with fully generational Scale BB projection
4. GRS further recommended the actuarial cost method utilized in the preparation of the annual actuarial valuations be changed from the Projected Unit Credit cost method to the Entry Age Normal cost method.

5. Finally, in order to provide cities with as much contribution rate stability as a result of the above suggested changes, GRS recommends that any amortization periods as part of the prior service contribution rate be adjusted in accordance with established TMRS statutes and Board rules.

6. All of the above recommendations were adopted as a “package”, including any potential phase-in of employer rate increases to a maximum increase of 0.50% per year until the actuarially determined Annual Required Contribution (ARC) is reached, and first reflected in the upcoming December 31, 2013 actuarial valuation used in determining 2015 contribution rates.