Segal Consulting

COMPOSITE & LEGACY PLAN
Comparative Stress Testing

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This document has been prepared by Segal Consulting at the request of the NCCMP to assist in evaluating the potential outcomes of the Discussion Draft released on September 9, 2016, on pension funding under certain stressful scenarios. This document may not otherwise be copied or reproduced in any form without the consent of the NCCMP and Segal Consulting, except to the extent otherwise required by law and may only be provided to other parties in its entirety. The actuarial calculations have been prepared under the supervision of Bridget P. Orr, ASA, MAAA, EA.

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Stress Testing Goal and Methodology

GOAL: Measure Legacy/Composite Plan's ability to recover from major investment shock

- Mature DB plan
  - Actual construction industry plan with 4,000+ participants
  - Endangered (yellow zone), but projected to emerge from the Yellow zone in 2029
- 2026-2035 investment experience are presumed to repeat actual 2005-2014 median returns for multiemployer plan universe (*source: Segal Rogerscasey*)

Actual Year:	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Mapped Year:	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Median Investment Return:	***6.65%***	***12.15%***	***7.37%***	***-22.34%***	***17.12%***	***11.73%***	***1.70%***	***11.44%***	***14.99%***	***6.20%***

- Apply investment shock to replicate 2008 financial downturn
  - Re-evaluation of contribution requirements in current and legacy/composite plans

Stress Testing Goal and Methodology *continued*

GOAL: Measure Legacy/Composite Plan's ability to recover from major investment shock

- Assume transition to Legacy/Composite Plan in 2016
  - **Transition Scenario #1 – Minimum Legacy Plan Contribution**
    - Legacy plan assumed to get minimum required to satisfy both the Transition Contribution Rate (TCR) and Funding Improvement Plan (FIP) requirements, while using 25*-year amortization "fresh start"
    - Remainder goes to Composite plan, more than sufficient to satisfy 120% projected funded percentage rule
  - **Transition Scenario #2 – Maximum Legacy Plan Contribution**
    - Composite plan assumed to get only minimum contribution to satisfy 120% projected funded percentage rule
    - Remainder goes to Legacy plan, while using 25*-year amortization "fresh start"
- Allow new Legacy/Composite plan to slowly mature until shock – no gains/losses thru 2025
  - Assume 2026-2035 returns replicate 2005-2014 returns (median each year)
  - 7% assumed in other projection years

* *Note – Discussion Draft has 30 years; a 25-year fresh start is presumed to prevail*

Transition Scenario #1
Minimum Legacy Plan Contribution

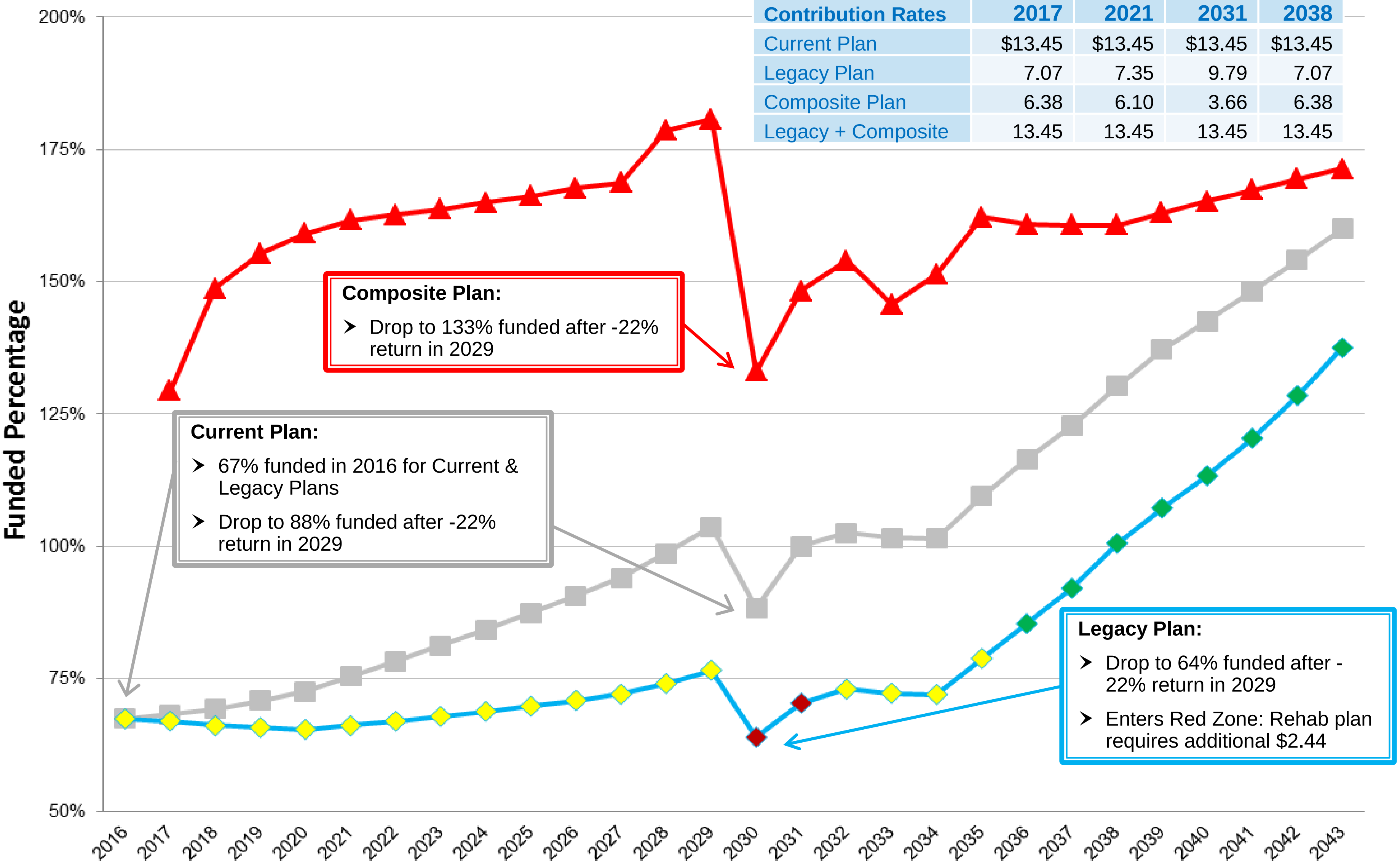
Summary of required hourly contribution rates:

- **Current Plan**: Contribution rate is set at $13.45 in 2017 to fulfill FIP goals, and avoid Red Zone in a few years.
  - Plan remains in the Green zone after 2029 shock; Plan stays well over 80% funded and credit balance stays positive after 2029. **By 2031, the Plan is 100% funded.**
- **Legacy Plan**: Calculated $5.68 TCR overridden: $7.07 is needed to satisfy current FIP
  - To avoid Early Red in 2021, updated FIP requires an additional $0.28 from Composite Plan
  - After 2029 shock, plan is certified in Red Zone beginning in 2030; rehab plan requires $9.79 in 2031
  - Gains result in early emergence to yellow zone (2032), then green zone (2036)
  - Rate drops back to original TCR of $7.07 in 2038
  - Funding recovers from low of 64% in 2030, reaching 85% by 2036, then **above 100% by 2038**
- **Composite Plan**: Contributions are the difference between Current and Legacy Plan.
  - The plan reaches 181% funding before the shock and drops down to 133% after the shock
  - $0.28 and $2.44 of contributions are diverted back to the Legacy Plan, in 2021 and 2031, respectively
  - After 2030, Plan stays well over 120% funded, hovering around **160-170% long term**

	2017	2021	2031	2038
Current Plan	$13.45	$13.45	$13.45	$13.45
Legacy Plan	7.07	7.35	9.79	7.07
Composite Plan	6.38	6.10	3.66	6.38
Total Legacy + Composite	13.45	13.45	13.45	13.45

Transition Scenario #1 – Minimum Legacy Plan Contribution

Contribution Rates	2017	2021	2031	2038
Current Plan	$13.45	$13.45	$13.45	$13.45
Legacy Plan	7.07	7.35	9.79	7.07
Composite Plan	6.38	6.10	3.66	6.38
Legacy + Composite	13.45	13.45	13.45	13.45



Transition Scenario #2
Maximum Legacy Plan Contribution

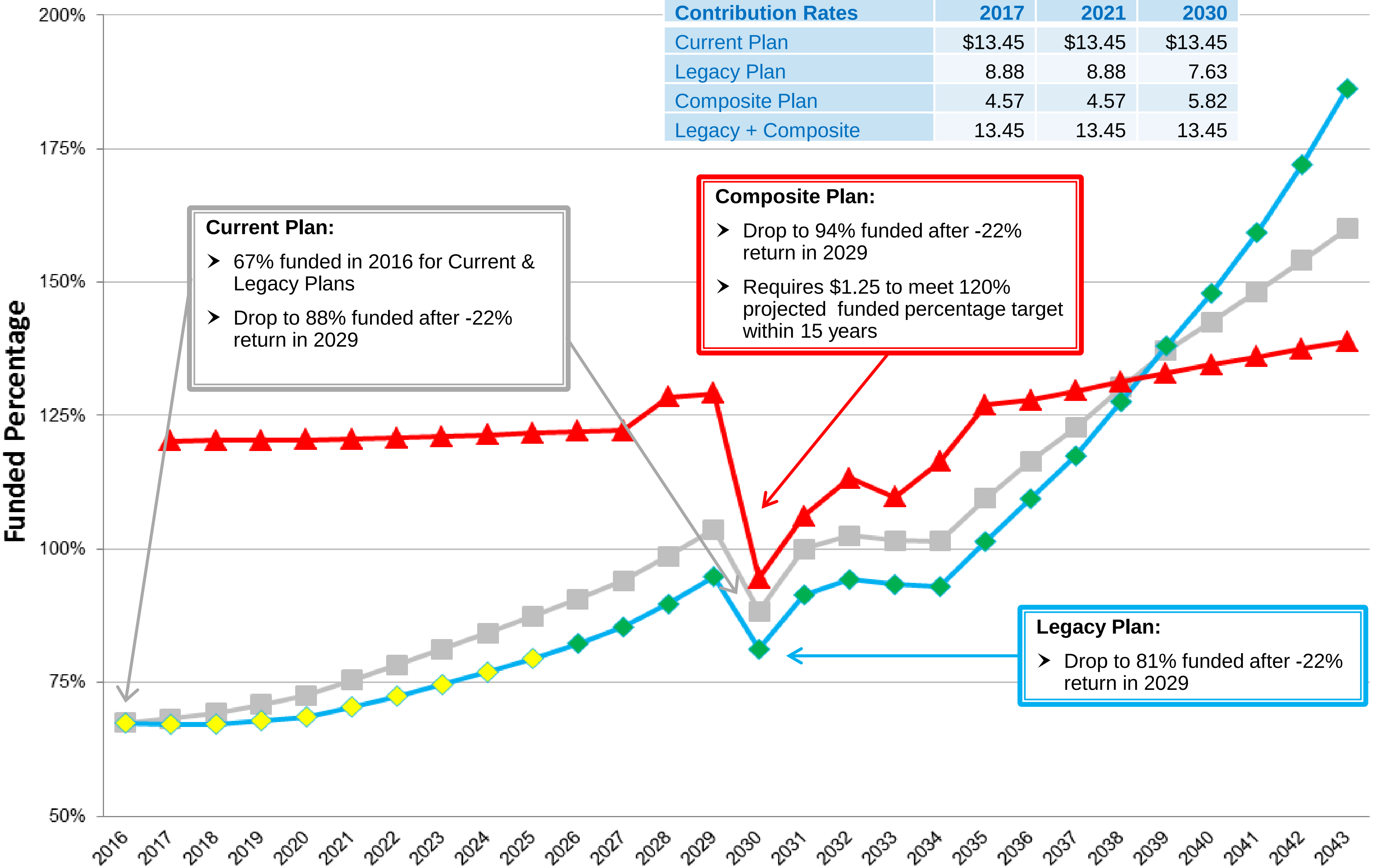
Summary of required hourly contribution rates:

- **Current Plan**: Contribution rate is set at $13.45 in 2017 to fulfill FIP goals, and avoid Red Zone in a few years.
  - Plan remains in the Green zone after 2029 shock; Plan stays well over 80% funded and credit balance stays positive after 2029. **By 2031, the plan is 100% funded.**
- **Legacy Plan**: Contributions are the difference between Current and Composite Plan Contribution rate of $8.88 is more than enough to meet TCR and FIP goals ($7.07)
  - After 2029 shock, funding percentage drops to 81% in 2030, but remains in the Green zone
  - $1.25 of contributions are diverted back to the Composite Plan in 2030 (see below)
  - Funding recovers and remains in the Green zone, reaching **100% by 2035**
- **Composite Plan**: Contribution rate of $4.57 is sufficient to satisfy 120% projected funded percentage target within 15 years
  - Plan reaches 129% funding before the 2029 shock and drops down to 94% after the shock
  - After 2029 shock, an additional $1.25 is diverted to satisfy 120% projected funded percentage target within 15 years. Funding recovers, reaching **120% by 2035** due to gains

	2017	2021	2030
Current Plan	$13.45	$13.45	$13.45
Legacy Plan	8.88	8.88	7.63
Composite Plan	4.57	4.57	5.82
Total Legacy + Composite	13.45	13.45	13.45

Transition Scenario #2 – Maximum Legacy Plan Contribution

Contribution Rates	2017	2021	2030
Current Plan	$13.45	$13.45	$13.45
Legacy Plan	8.88	8.88	7.63
Composite Plan	4.57	4.57	5.82
Legacy + Composite	13.45	13.45	13.45



Appendix: Current Endangered Plan Metrics

Plan of Benefits

- $120 accrual rate
- Normal Retirement Age: 65*
- Unreduced benefit at 60*/30
- Early retirement: 52/10, reduced 3%-6% per year
- Identical benefits and eligibility provisions for Composite plan
- $13.45 negotiated hourly contribution rate, effective 1/1/2017

* certain cohorts have lower normal & unreduced age requirements; assumed average retirement age = 61

Assumptions and Methods

- Industry activity: actives work an average of 1,500 hours every year
- Investment return: 7.0% except 2026-2035 experience replicates 2005-2014
- Contribution rate: static, unless required to fulfill funding improvement plan (FIP) or rehabilitation plan
- As employees terminate or retire, new entrants replace them with same demographic profile as current active population
- No future gains/losses on all other assumptions (mortality, turnover, retirement, etc.)

Current Funding Profile

- Actuarial liability:
  - Active = 32%
  - Inactive = 7%
  - Retirees = 61%
- 67% Funded Ratio
- Normal Cost = 5% of Active actuarial liability
- Active average age/service: 44/13
- Retiree average age: 69

Appendix: Assumed Expenses and Investment Returns

- 7% return (net of investment expenses) assumed for all years, except 2026-2035
- 2026-2035 returns are presumed to repeat actual 2005-2014 median returns for multiemployer plan universe (*source: Segal Rogerscasey*)

Actual Year:	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mapped Year:	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Median Investment Return:	***6.65%***	***12.15%***	***7.37%***	***-22.34%***	***17.12%***	***11.73%***	***1.70%***	***11.44%***	***14.99%***	***6.20%***

- Administrative expenses:
  - For Legacy plan = Current plan
  - For Composite plan = 20% of Current plan
  - All plans' expenses assumed to grow 3.5%/year
- Other assumptions (actuary's best estimate for minimum funding purposes) available upon request