

OVERVIEW OF ACTUARIAL REQUEST 4

Chris Rupe

Joint Fiscal Office

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Vermont Legislative
JOINT FISCAL OFFICE

Approach

- Actuarial analysis is based on FY20 valuation (unless otherwise noted).
- Additional revenue is immediately recognized in the ADEC calculation (leading to near-term budget relief).
 - If additional revenue was excluded from the near-term ADEC calculation, the funded ratios would improve more rapidly and the employer would save interest costs. However, there would not be near-term budget relief.
- Analysis assumes all future ADECs are fully funded, all assumptions are met moving forward, and that new non-employee recurring revenue sources cease upon the system reaching 100% funded.

Fiscal Targets per Act 75		
	25% of YOY FY21- FY22 Increase	100% of YOY FY21- FY22 Increase
VSERS - UAAL	\$56.3 million	\$225.0 million
VSERS - ADEC	\$9.0 million	\$36.1 million
VSTRS - UAAL	\$94.7 million	\$378.8 million
VSTRS - ADEC	\$16.1 million	\$64.1 million

November 12 Memo

- Three questions asked:
 - VSERS Group F Longevity Incentive: Provide general analysis on expected impact of offering a bonus for each year members continue working up to a max of 5 years. Bonus would not be included in AFC or come from pension assets.
 - VSERS Group C Risk Sharing COLA: If the actual investment return is greater than or equal to the assumed rate of return (7.0%), status quo COLA. If investments fall short of the assumed rate of return, COLA limited to 1%.
 - VSTRS Pension Freeze Option: Provide general analysis on impact of offering option to freeze benefits upon reaching normal retirement and continue working (but not paying pension contributions or accruing more benefits during the freeze).

November 12 Memo

- **VSERS Group F Longevity Incentive: Provide general analysis on expected impact of offering a bonus for each year members continue working up to a max of 5 years. Bonus would not be included in AFC or come from pension assets.**
 - *Behavioral assumptions are that 50% of members who take advantage of the option retire after 1 extra year, 10% after 2 extra years, 10% after 3 extra years, 10% after 4 extra years, and 20% after 5 extra years (max).*
- In general, when members retire later than assumed, the pension system is expected to see actuarial gains.
- Active members may see their AFC increase through salary adjustments during additional years worked. AFC increases will negate some of the gains from retiring at a later age.
- Actuaries assumed that individuals retiring at very early or very late ages would not delay retirement for an incentive payment. Therefore, they did not modify assumed retirement rates for ages lower than 55 or higher than 72.
- Actuaries ran 2 models – one with 100% of eligible members electing to take the incentive, and one with 50%.
 - 100% elect option: UAL savings of \$63.9 million, ADEC savings of \$7.6 million
 - 50% elect option: UAL savings of \$29.2 million, ADEC savings of \$3.4 million
- **Projections are highly sensitive to assumptions – if members have different behavior than assumed, the results will be different. The number of members electing to accept the incentive, and the ages at which their retirement rates change, impact the actuarial calculations.**

November 12 Memo

- **VSERS Group C Risk Sharing COLA: If the actual investment return is greater than or equal to the assumed rate of return (7.0%), status quo COLA. If investments fall short of the assumed rate of return, COLA limited to 1%.**
- Actuaries estimate that the pension system will meet or exceed its 7.0% assumed rate of return approximately half the time (53.1%), per the October 2020 experience study.
- The COLA assumption is currently 2.40%. To account for this risk sharing provision, the actuaries reduced the assumption to 1.75%. This change of assumptions results in modeled UAL savings of \$14.0 million and ADEC savings of \$2.1 million.
- Inflation may skew the plan experience in the near term, leading to higher actual costs/overstated modeled savings.
 - Modeled savings from changing assumptions is reflected in lower normal cost, accrued liabilities, and ADEC.
 - Experience deviating from those assumptions will be reflected in the unfunded liability (and future ADECs).
- **Uncertainty exists with respect to which year(s) the risk sharing provision would kick in, since we cannot exactly predict what investment performance will be in any given year. Therefore, there is also uncertainty regarding the timing and magnitude of realized savings.**

November 12 Memo

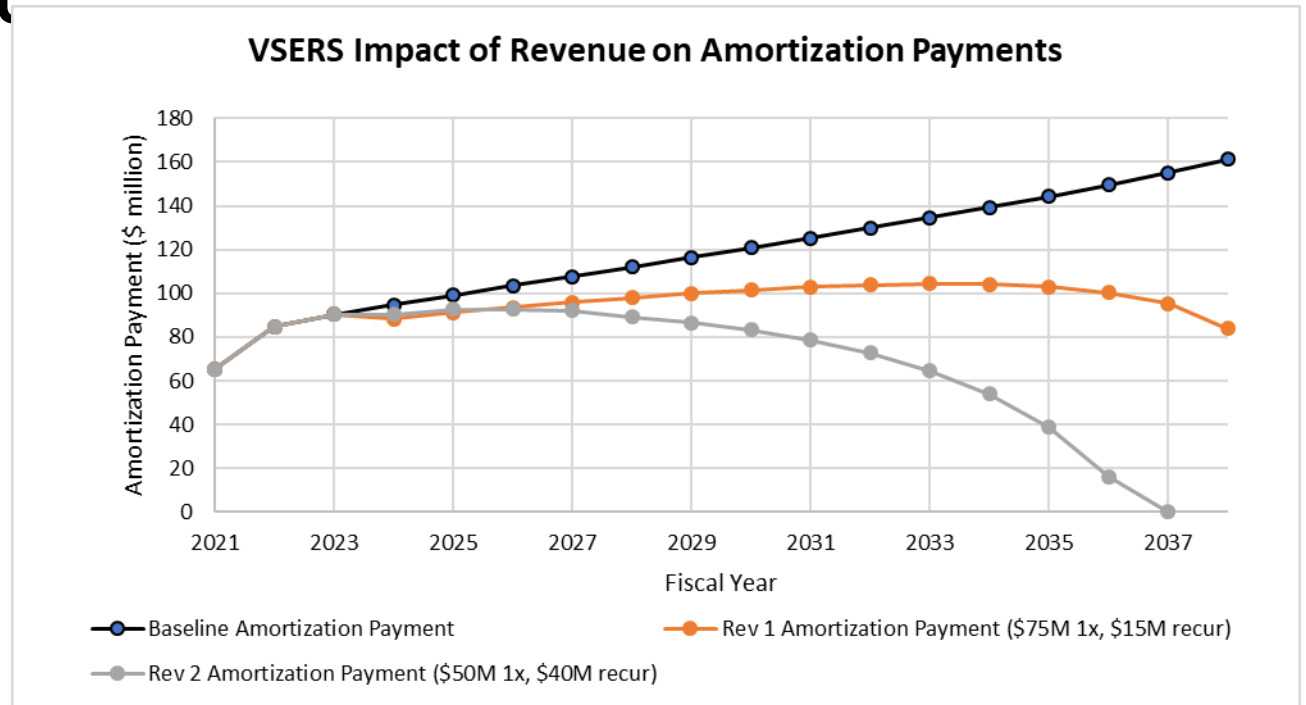
- **VSTRS Pension Freeze Option: Provide general analysis on impact of offering option to freeze benefits upon reaching normal retirement and continue working (but not paying pension contributions or accruing more benefits during the freeze).**
- Actuaries state that it is generally more financially advantageous to the member to continue paying contributions and accruing additional retirement benefits – even if the member already reached their max benefit cap and can only accrue additional benefits through salary growth (higher AFC) rather than additional years of service.
 - Example: A member hired at 25 with 34 years of service can retire at 59 under the Rule of 90. The member has enough service to hit the 60% max benefit cap, so future pension increases would be due to salary growth rather than extra years of service. Salary is assumed to increase at 3.60% for a member age 59. The PV of the additional pension benefits (over the course of the member's life) from working an extra year and seeing salary grow by 3.6% is worth in excess of 6x of the member's contribution amount in the first extra year worked. \
 - By Age 70, the PV of the additional pension is still nearly 3x more valuable than the value of the member contributions accumulated at 7% interest.
 - If the member has not hit their max benefit cap upon entering the freeze, the difference in value is even larger.
- Based on these assumed disparities in the value of pension benefits, the actuaries are skeptical that many/any members would choose the freeze option.
- **BUT**.....other factors besides the perceived loss of future pension value may weigh in on a member's decision whether to freeze their benefit:
 - Salary growth may occur at a lower-than-assumed rate in the final years of employment, or their AFC may be based on previous years of service rather than the "final" years (resulting in a lower than assumed loss of pension value).
 - Members may have more pressing needs for the money they pay in pension contributions.
 - Members may choose to invest their pre-tax pension contributions during the freeze according to strategies that may yield a higher return than 7.0% (resulting in a lower than assumed loss of pension value).
- **A freeze will likely result in actuarial gains, depending on who/how many choose to participate. But will anyone choose it? Can this choice be incentivized?**

VSERS (November 16 memo)

- Two state revenue scenarios modeled:
 - \$75 million one-time with a recurring \$15 million revenue source.
 - \$50 million one-time with a recurring \$40 million revenue source.
- In all scenarios: One-time is assumed to be paid on June 30, 2022, first lowering the ADEC beginning in FY24. Recurring revenue is assumed to be enacted in FY22, take effect in FY23 for a partial year (5 months of collections), experience a full year of “base” revenue in FY24, with 2% annual growth after that. Recurring revenue is presumed to be paid at the end of each fiscal year in addition to the ADEC payment previously made for that year.

VSERS Revenue Impact

VSERS		Option 1			Option 2		
Base		One-Time \$75M; Recurring \$15M			One-Time \$50M; Recurring \$40M		
FY	Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	Additional Revenue	New Amort Pmt	Savings from Base
2021	65.5	0.0	65.5	0.0	0.0	65.5	0.0
2022	84.8	75.0	84.8	0.0	50.0	84.8	0.0
2023	90.4	6.3	90.4	0.0	16.7	90.4	0.0
2024	94.8	15.0	88.2	-6.6	40.0	90.4	-4.4
2025	99.1	15.3	91.2	-7.9	40.8	92.7	-6.4
2026	103.4	15.6	93.7	-9.7	41.6	92.7	-10.7
2027	107.7	15.9	96.0	-11.7	42.4	92.1	-15.6
2028	112.0	16.2	98.0	-14.0	43.3	91.0	-21.0
2029	116.3	16.6	99.9	-16.4	44.2	89.2	-27.1
2030	120.8	16.9	101.5	-19.3	45.0	86.6	-34.2
2031	125.3	17.2	102.9	-22.4	45.9	83.2	-42.1
2032	129.9	17.6	103.8	-26.1	46.9	78.7	-51.2
2033	134.6	17.9	104.3	-30.3	47.8	72.7	-61.9
2034	139.4	18.3	104.1	-35.3	48.8	64.7	-74.7
2035	144.4	18.7	103.0	-41.4	49.7	54.0	-90.4
2036	149.6	19.0	100.4	-49.2	50.7	38.9	-110.7
2037	155.2	19.4	95.2	-60.0	0.0	16.3	-138.9
2038	161.2	19.8	84.0	-77.2	0.0	0.0	-161.2
		340.7		-427.5	653.8		-850.5
		One-Time: \$75.0M			One-Time: \$50.0M		
		Recurring: \$265.7M			Recurring: \$603.8M		



\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$123.7 mil	\$123.7 \$0	\$123.7 \$0
PV of Additional Member Contributions (FY23-38)	\$0	\$0
PV of Decrease in Employer Contributions (FY23-38)	(\$179.1)	(\$339.7)

Both scenarios result in ADEC savings beginning in FY24 (assuming 1x payment made 6/30/22). The PV of decrease in employer contributions reflects estimated savings FY23-38 in current dollars.

VSERS Group F Employee Contributions

Two employee contribution scenarios modeled:

Option 1:

- 0-24th percentiles: No change
- 25th-74th percentiles: 0.5%/yr increase for 3 years (beginning FY23)
- 75th+ percentiles: 0.5%/yr increase for 4 years (beginning FY23)

Option 2:

- 0-24th percentiles: No change
- 25th-74th percentiles: 0.5%/yr increase for 4 years (beginning FY23)
- 75th+ percentiles: 0.5%/yr increase for 5 years (beginning FY23)

\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$123.7 mil	\$116.8 (\$6.9)	\$115.4 (\$8.3)
PV of Additional Member Contributions (FY23-38)	\$70.6	\$84.0
PV of Decrease in Employer Contributions (FY23-38)	(\$68.6)	(\$81.7)

Higher employee contributions = ADEC normal cost savings under current policy.

Group F:
25th percentile: \$50,000
75th percentile: \$75,000

VSERS Group C Employee Contributions

Two employee contribution scenarios modeled:

Option 1:

- Increase contribution rates by 0.45%/yr for 3 years (beginning FY23).

Option 2:

- <25th salary percentile: No change
- 25th-49th percentile: Increase to 9.0%
- 50-74th percentile: Increase to 10.0%
- 75th+ percentile: Increase to 11.0%
- Contribution rates for entire salary amounts (not progressive)

\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$123.7 mil	\$123.4 (\$0.3)	\$123.2 (\$0.5)
PV of Additional Member Contributions (FY23-38)	\$2.5	\$4.3
PV of Decrease in Employer Contributions (FY23-38)	(\$2.5)	(\$4.3)

Higher employee contributions = ADEC normal cost savings under current policy.

Group C:

25th percentile: \$73,000
 50th percentile: \$89,000
 75th percentile: \$106,000

VSERS Revenue

- Combine each of the two revenue scenarios with each of the 4 employee contribution scenarios:

VSERS - Change to Amortization Schedule from Combining State Revenue with Employee Contribution Changes												
FY	Base	State Rev: One-Time \$75M; Recurring \$15M			Plus Group F Employee Contrib 1 (0.5%/yr for 3-4 yrs)		Plus Group F Employee Contrib 2 (0.5%/yr for 4-5 yrs)		Plus Group C Employee Contrib 1 (0.45%/yr for 3 yrs)		Plus Group C Employee Contrib 2 (25-49th pct: 9%; 50- 74th pct: 10%; 75+ pct: 11%)	
	Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base
2021	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0
2022	84.8	75.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0
2023	90.4	6.3	90.4	0.0	90.5	0.1	90.5	0.1	90.4	0.0	90.4	0.0
2024	94.8	15.0	88.2	-6.6	88.3	-6.5	88.3	-6.5	88.2	-6.6	88.2	-6.6
2025	99.1	15.3	91.2	-7.9	90.6	-8.5	90.5	-8.6	91.2	-7.9	91.1	-8.0
2026	103.4	15.6	93.7	-9.7	93.0	-10.4	92.9	-10.5	93.6	-9.8	93.6	-9.8
2027	107.7	15.9	96.0	-11.7	95.3	-12.4	95.1	-12.6	95.9	-11.8	95.9	-11.8
2028	112.0	16.2	98.0	-14.0	97.3	-14.7	97.2	-14.8	98.0	-14.0	98.0	-14.0
2029	116.3	16.6	99.9	-16.4	99.2	-17.1	99.0	-17.3	99.9	-16.4	99.9	-16.4
2030	120.8	16.9	101.5	-19.3	100.8	-20.0	100.7	-20.1	101.5	-19.3	101.5	-19.3
2031	125.3	17.2	102.9	-22.4	102.1	-23.2	102.0	-23.3	102.8	-22.5	102.8	-22.5
2032	129.9	17.6	103.8	-26.1	103.1	-26.8	102.9	-27.0	103.8	-26.1	103.8	-26.1
2033	134.6	17.9	104.3	-30.3	103.6	-31.0	103.4	-31.2	104.3	-30.3	104.3	-30.3
2034	139.4	18.3	104.1	-35.3	103.4	-36.0	103.2	-36.2	104.1	-35.3	104.1	-35.3
2035	144.4	18.7	103.0	-41.4	102.3	-42.1	102.1	-42.3	103.0	-41.4	103.0	-41.4
2036	149.6	19.0	100.4	-49.2	99.7	-49.9	99.5	-50.1	100.4	-49.2	100.4	-49.2
2037	155.2	19.4	95.2	-60.0	94.4	-60.8	94.3	-60.9	95.2	-60.0	95.1	-60.1
2038	161.2	19.8	84.0	-77.2	83.3	-77.9	83.2	-78.0	84.0	-77.2	84.0	-77.2
	2134.4	340.7	1706.9	-427.5	1697.2	-437.2	1695.1	-439.3	1706.6	-427.8	1706.4	-428.0
		One-Time: \$75.0M										
		Recurring: \$265.7M										

- One-Time and Recurring Revenue lower the amortization payments. Adding higher employee contributions (under current policy) minimally changes amortization payments and small changes are due to differences in liabilities/refunds of contributions.

VSERS Revenue

- Combine each of the two revenue scenarios with each of the 4 employee contribution scenarios:

VSERS - Change to Amortization Schedule from Combining State Revenue with Employee Contribution Changes												
FY	Base	State Rev: One-Time \$50M; Recurring \$40M			Plus Group F Employee Contrib 1 (0.5%/yr for 3-4 yrs)		Plus Group F Employee Contrib 2 (0.5%/yr for 4-5 yrs)		Plus Group C Employee Contrib 1 (0.45%/yr for 3 yrs)		Plus Group C Employee Contrib 2 (25-49th pct: 9%; 50- 74th pct: 10%; 75+ pct: 11%)	
	Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base
2021	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0
2022	84.8	50.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0
2023	90.4	16.7	90.4	0.0	90.5	0.1	90.5	0.1	90.4	0.0	90.4	0.0
2024	94.8	40.0	90.4	-4.4	90.5	-4.3	90.5	-4.3	90.4	-4.4	90.4	-4.4
2025	99.1	40.8	92.7	-6.4	92.1	-7.0	92.0	-7.1	92.7	-6.4	92.6	-6.5
2026	103.4	41.6	92.7	-10.7	92.1	-11.3	91.9	-11.5	92.7	-10.7	92.7	-10.7
2027	107.7	42.4	92.1	-15.6	91.4	-16.3	91.3	-16.4	92.1	-15.6	92.1	-15.6
2028	112.0	43.3	91.0	-21.0	90.3	-21.7	90.1	-21.9	90.9	-21.1	90.9	-21.1
2029	116.3	44.2	89.2	-27.1	88.4	-27.9	88.3	-28.0	89.1	-27.2	89.1	-27.2
2030	120.8	45.0	86.6	-34.2	85.9	-34.9	85.8	-35.0	86.6	-34.2	86.6	-34.2
2031	125.3	45.9	83.2	-42.1	82.5	-42.8	82.3	-43.0	83.2	-42.1	83.1	-42.2
2032	129.9	46.9	78.7	-51.2	77.9	-52.0	77.8	-52.1	78.6	-51.3	78.6	-51.3
2033	134.6	47.8	72.7	-61.9	71.9	-62.7	71.8	-62.8	72.6	-62.0	72.6	-62.0
2034	139.4	48.8	64.7	-74.7	63.9	-75.5	63.8	-75.6	64.7	-74.7	64.7	-74.7
2035	144.4	49.7	54.0	-90.4	53.2	-91.2	53.1	-91.3	54.0	-90.4	53.9	-90.5
2036	149.6	50.7	38.9	-110.7	38.2	-111.4	38.0	-111.6	38.9	-110.7	38.9	-110.7
2037	155.2	0.0	16.3	-138.9	15.5	-139.7	15.4	-139.8	16.3	-138.9	16.3	-138.9
2038	161.2	0.0	0.0	-161.2	0.0	-161.2	0.0	-161.2	0.0	-161.2	0.0	-161.2
	2134.4	653.8	1283.9	-850.5	1274.6	-859.8	1272.9	-861.5	1283.5	-850.9	1283.2	-851.2
		One-Time: \$50.0M										
		Recurring: \$603.8M										

- One-Time and Recurring Revenue lower the amortization payment. Adding higher employee contributions (under current policy) minimally changes amortization payments and small changes are due to differences in liabilities/refunds of contributions.

VSERS Group C Plan Changes

Option 1:

Increase Max Benefit Cap by **1% of AFC** for each year worked beyond reaching the later of age 50 or 20 years of service. Applies prospectively to service actually worked after 7/1/22. Increase mandatory retirement age from 55 to 57.

Option 2:

Increase Max Benefit Cap by **2% of AFC** for each year worked beyond reaching the later of age 50 or 20 years of service. Applies prospectively to service actually worked after 7/1/22. Increase mandatory retirement age from 55 to 57.

\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$123.7 mil	\$120.4 (\$3.3)	\$121.4 (\$2.3)
Unfunded Liability (FY20: \$1,040.5 mil)	\$1,018.0 (\$22.5)	\$1,025.1 (\$15.4)
Normal Cost (FY20: \$73.2 mil)	\$72.0 (\$1.2)	\$72.4 (\$0.8)

Retirement assumptions updated:

- 50% would retire at age 50.
- 10% would retire at each age from 51 through 53.
- 5% at each age from 54 through 56.
- 100% would retire at age 57.

VSERS Group F Plan Changes (indiv)

Option 1: COLA Threshold on first \$24,000 of annual pension income.

Option 2: COLA Threshold on first \$24,000, which is indexed to CPI from FY24 onward.

Option 3: CPI thresholds updated to reflect 0% minimum, 4% maximum.

Option 4: No COLA until retired at least 24 months.

Option 5: No COLA until retired at least 36 months.

Option 6: Increase Max Benefit Cap by 1% of AFC for each year worked beyond 30 years (Old Group F) and 36 years (new Group F), for service actually worked after 7/1/22.

\$ million	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
FY23 ADEC (est.) - \$123.7 mil	\$109.6 (\$14.1)	\$114.1 (\$9.6)	\$121.6 (\$2.1)	\$120.2 (\$3.5)	\$117.4 (\$6.3)	\$128.4 \$4.7
Unfunded Liability (FY20: \$1,040.5 mil)	\$941.0 (\$99.5)	\$970.4 (\$70.1)	\$1,026.5 (\$14.0)	\$1,017.2 (\$23.3)	\$998.5 (\$42.0)	\$1,080.6 \$40.1
Normal Cost (FY20: \$73.2 mil)	\$68.3 (\$4.9)	\$70.1 (\$3.1)	\$72.4 (\$0.8)	\$71.8 (\$1.4)	\$70.8 (\$2.4)	\$74.2 \$1.0

VSERS Plan Changes (individually)

COLA changes (individually) all result in actuarial savings. But the impact of increasing the Max Benefit Cap depends on assumptions.

- *Group C*: Actuarial **gains** based on changes to retirement assumptions (50% retire at age 50, 10% at each age from 51-52, 5% at each age 54-56, 100% at age 57).
- *Group F*: Actuarial **losses** because no changes to retirement behavior were assumed.

VSERS Impact of Individual Benefit Changes on Future Unfunded Liability Amortization Payments																	
FY	Base Amort Pmt (\$ mil)	Group C: Max Benefit Cap by 1% of AFC		Group C: Max Benefit Cap by 2% of AFC		Group F: COLA Threshold \$24,000		Group F: Indexed COLA Threshold (\$24K plus CPI after FY24).		Group F: CPI Thresholds 0% Min, 4% Max		Group F: COLA after 24 months		Group F: COLA after 36 months		Group F: Max Benefit Cap by 1%	
		New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings	New Amort Pmt	Savings
2021	65.5	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0	65.5	0.0
2022	84.8	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0	84.8	0.0
2023	90.4	88.5	-1.9	89.1	-1.3	81.9	-8.5	84.4	-6.0	89.2	-1.2	88.4	-2.0	86.8	-3.6	93.8	3.4
2024	94.8	92.6	-2.2	93.3	-1.5	84.8	-10.0	87.8	-7.0	93.4	-1.4	92.4	-2.4	90.6	-4.2	98.7	3.9
2025	99.1	96.8	-2.3	97.5	-1.6	88.7	-10.4	91.8	-7.3	97.6	-1.5	96.7	-2.4	94.7	-4.4	103.2	4.1
2026	103.4	101.0	-2.4	101.8	-1.6	92.7	-10.7	95.9	-7.5	101.9	-1.5	100.9	-2.5	98.9	-4.5	107.6	4.2
2027	107.7	105.3	-2.4	106.0	-1.7	96.7	-11.0	99.9	-7.8	106.1	-1.6	105.1	-2.6	103.0	-4.7	112.0	4.3
2028	112.0	109.5	-2.5	110.3	-1.7	100.6	-11.4	104.0	-8.0	110.4	-1.6	109.3	-2.7	107.2	-4.8	116.4	4.4
2029	116.3	113.8	-2.5	114.6	-1.7	104.6	-11.7	108.1	-8.2	114.7	-1.6	113.6	-2.7	111.4	-4.9	120.9	4.6
2030	120.8	118.1	-2.7	119.0	-1.8	108.7	-12.1	112.3	-8.5	119.1	-1.7	117.9	-2.9	115.7	-5.1	125.5	4.7
2031	125.3	122.6	-2.7	123.4	-1.9	112.8	-12.5	116.5	-8.8	123.5	-1.8	122.4	-2.9	120.0	-5.3	130.1	4.8
2032	129.9	127.1	-2.8	128.0	-1.9	117.0	-12.9	120.8	-9.1	128.1	-1.8	126.9	-3.0	124.5	-5.4	134.8	4.9
2033	134.6	131.7	-2.9	132.6	-2.0	121.3	-13.3	125.2	-9.4	132.7	-1.9	131.5	-3.1	129.0	-5.6	139.7	5.1
2034	139.4	136.5	-2.9	137.4	-2.0	125.8	-13.6	129.8	-9.6	137.5	-1.9	136.2	-3.2	133.7	-5.7	144.6	5.2
2035	144.4	141.4	-3.0	142.4	-2.0	130.3	-14.1	134.5	-9.9	142.5	-1.9	141.2	-3.2	138.6	-5.8	149.8	5.4
2036	149.6	146.5	-3.1	147.5	-2.1	135.1	-14.5	139.3	-10.3	147.6	-2.0	146.3	-3.3	143.6	-6.0	155.2	5.6
2037	155.2	151.9	-3.3	152.9	-2.3	140.2	-15.0	144.5	-10.7	153.1	-2.1	151.7	-3.5	149.0	-6.2	160.8	5.6
2038	161.2	157.9	-3.3	158.9	-2.3	145.8	-15.4	150.2	-11.0	159.1	-2.1	157.7	-3.5	154.9	-6.3	167.0	5.8
	2134.4	2091.5	-42.9	2105.0	-29.4	1937.3	-197.1	1995.3	-139.1	2106.8	-27.6	2088.5	-45.9	2051.9	-82.5	2210.4	76.0

Actuaries assume that some percentage of the workforce will continue to work beyond normal retirement eligibility. In the absence of changes to behavioral assumptions, the models process the max benefit cap increase as a benefit enhancement to the people who are already expected to continue working.

VSERS Group F Combined Scenarios

\$ million	Combo A	Combo B	Combo C	Combo D	Combo E	Combo F
	CPI Threshold - 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max
	COLA after 24 months retired	COLA after 36 months retired.	COLA Threshold - \$24K	COLA Threshold - \$24K	COLA Threshold - \$24K	COLA Threshold - \$24K
				COLA after 24 months retired.	COLA after 36 months retired.	Increase Max Benefit 1%
UAL Impact	-35.4	-52.7	-105.2	-115.6	-123.7	-72.9
ADEC Impact	-5.4	-8.0	-15.1	-16.8	-18.1	-11.3

* Excludes active employees who are within 5 years of normal retirement eligibility from COLA changes.

VSERS Group F Combined Scenarios

\$ million	Combo G	Combo H	Combo I*	Combo J*	Combo K	Combo L
	CPI Threshold - 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max
	COLA Threshold - \$24K	COLA Threshold - \$24K	COLA Threshold - \$24K	COLA Threshold - \$24K	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI
	Increase Max Benefit 1%	Increase Max Benefit 1%	Increase Max Benefit 1%	Increase Max Benefit 1%		COLA after 24 months retired.
	COLA after 24 months retired.	COLA after 36 months retired.	COLA after 24 months retired.	COLA after 36 months retired.		
UAL Impact	-83.3	-91.3	-27.0	-30.4	-77.8	-90.0
ADEC Impact	-13.0	-14.3	-6.7	-7.3	-10.9	-12.9

* Excludes active employees who are within 5 years of normal retirement eligibility from COLA changes.

VSERS Group F Combined Scenarios

\$ million	Combo M	Combo N	Combo O	Combo P	Combo Q*	Combo R*
	CPI Threshold - 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max	COLA Threshold – 0% min, 4% max
	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI	COLA Threshold - \$24K Indexed to CPI
	COLA after 36 months retired.	Increase Max Benefit 1%	Increase Max Benefit 1%	Increase Max Benefit 1%	Increase Max Benefit 1%	Increase Max Benefit 1%
			COLA after 24 months retired.	COLA after 36 months retired.	COLA after 24 months retired.	COLA after 36 months retired.
UAL Impact	-99.6	-45.4	-57.6	-67.3	-11.1	-15.6
ADEC Impact	-14.5	-7.1	-9.1	-10.7	-3.9	-4.7

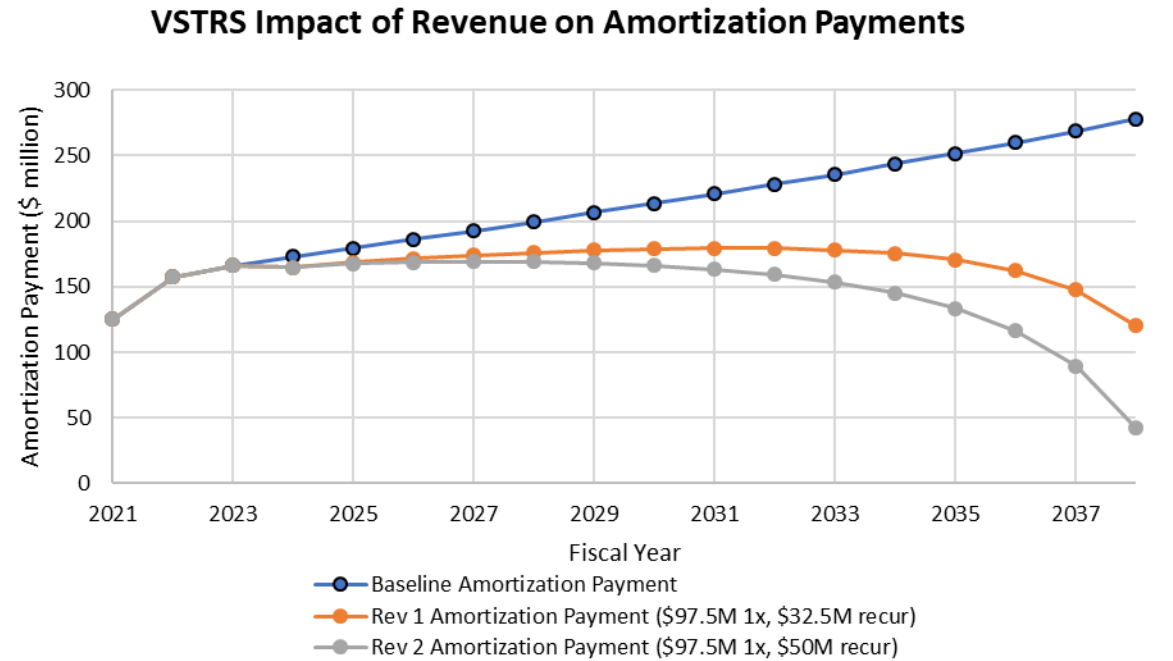
* Excludes active employees who are within 5 years of normal retirement eligibility from COLA changes.

VSTRS

- Two state revenue scenarios modeled:
 - \$97.5 million one-time with a recurring \$32.5 million revenue source.
 - \$97.5 million one-time with a recurring \$50 million revenue source.
- In all scenarios: One-time is assumed to be paid on June 30, 2022, first lowering the ADEC beginning in FY24. Recurring revenue is assumed to be enacted in FY22, take effect in FY23 for a partial year (5 months of collections), experience a full year of “base” revenue in FY24, with 2% annual growth after that. Recurring revenue is presumed to be paid at the end of each fiscal year in addition to the ADEC payment previously made for that year.

VSTRS Revenue Impact

FY	Option 1 One-Time \$97.5M; Recurring \$32.5M			Option 2 One-Time \$97.5M; Recurring \$50M			
	Base Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	Additional Revenue	New Amort Pmt	Savings from Base
2021	124.9	0.0	124.9	0.0	0.0	124.9	0.0
2022	157.3	97.5	157.3	0.0	97.5	157.3	0.0
2023	166.2	13.5	166.2	0.0	20.8	166.2	0.0
2024	172.9	32.5	164.4	-8.5	50.0	164.4	-8.5
2025	179.4	33.2	168.4	-11.0	51.0	167.5	-11.9
2026	186.0	33.8	171.3	-14.7	52.0	168.7	-17.3
2027	192.7	34.5	173.8	-18.9	53.1	169.1	-23.6
2028	199.4	35.2	176.0	-23.4	54.1	168.9	-30.5
2029	206.4	35.9	177.7	-28.7	55.2	168.0	-38.4
2030	213.4	36.6	178.9	-34.5	56.3	166.2	-47.2
2031	220.6	37.3	179.5	-41.1	57.4	163.4	-57.2
2032	228.0	38.1	179.3	-48.7	58.6	159.2	-68.8
2033	235.6	38.8	178.0	-57.6	59.8	153.3	-82.3
2034	243.5	39.6	175.2	-68.3	60.9	145.0	-98.5
2035	251.5	40.4	170.3	-81.2	62.2	133.2	-118.3
2036	259.9	41.2	162.0	-97.9	63.4	116.1	-143.8
2037	268.7	42.0	147.7	-121.0	64.7	89.5	-179.2
2038	278.1	42.9	120.1	-158.0	66.0	42.2	-235.9
	3784.5	673.0	2971.0	-813.5	983.0	2623.1	-1161.4
		One-Time: \$97.5M Recurring: \$575.5M			One-Time: \$97.5M Recurring: \$885.5M		



\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$202.1 mil	\$202.1 \$0	\$202.1 \$0
PV of Additional Member Contributions (FY23-38)	\$0	\$0
PV of Decrease in Employer Contributions (FY23-38)	(\$331.4)	(\$463.9)

Both scenarios result in ADEC savings beginning in FY24 (assuming 1x payment made 6/30/22). The PV of decrease in employer contributions reflects estimated savings FY23-38 in current dollars.

VSTRS Employee Contributions

Two employee contribution scenarios modeled:

Option 1:

- Members currently paying 5.0% see 0.25%/yr increases for 4 years beginning FY23.
- Members currently paying 6.0% see 0.25%/yr increases for 2 years beginning FY25
- *Members currently pay 6% if they had less than 5 years of service as of June 30, 2014.*

Option 2:

- Replace “flat” with progressive rates beginning in FY23.
- 5.50% on first \$40,000 of income
- 6.25% on income \$40,000-\$60,000
- 7.00% on income \$60,000-\$80,000
- 7.75% on income above \$80,000

\$ million	Option 1	Option 2
FY23 ADEC (est.) - \$202.1 mil	\$199.2 (\$2.9)	\$197.6 (\$4.5)
PV of Additional Member Contributions (FY23-38)	\$24.6	\$46.0
PV of Decrease in Employer Contributions (FY23-38)	(\$24.2)	(\$45.4)

Higher employee contributions = ADEC normal cost savings under current policy.

Total Income	Effective Rate (est.)
\$50,000	5.65%
\$60,000	5.75%
\$75,000	6.00%
\$100,000	6.40%

VSTRS Revenue

- Combine the first state revenue option with the first employee contribution option, and likewise pair the second options.

VSTRS Revenue Scenario 1 Impact to Amortization Payments						
FY	Base	State Rev: One-Time \$97.5M; Recurring \$32.5M			Plus Emp. Contribs increasing from 5.0% to 6.0% (FY23-26), 6.0% to 6.5% (FY25-26)	
	Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base
2021	124.9	0.0	124.9	0.0	124.9	0
2022	157.3	97.5	157.3	0.0	157.3	0
2023	166.2	13.5	166.2	0.0	166.2	0
2024	172.9	32.5	164.3	-8.6	164.4	-8.5
2025	179.4	33.2	168.6	-10.8	168.4	-11
2026	186.0	33.8	171.5	-14.5	171.3	-14.7
2027	192.7	34.5	174.1	-18.6	173.8	-18.9
2028	199.4	35.2	176.2	-23.2	176.0	-23.4
2029	206.4	35.9	178.0	-28.4	177.7	-28.7
2030	213.4	36.6	179.2	-34.2	178.9	-34.5
2031	220.6	37.3	179.7	-40.9	179.5	-41.1
2032	228.0	38.1	179.5	-48.5	179.3	-48.7
2033	235.6	38.8	178.2	-57.4	178.0	-57.6
2034	243.5	39.6	175.4	-68.1	175.2	-68.3
2035	251.5	40.4	170.5	-81.0	170.3	-81.2
2036	259.9	41.2	162.2	-97.7	162.0	-97.9
2037	268.7	42.0	147.8	-120.9	147.7	-121
2038	278.1	42.9	120.2	-157.9	120.1	-158
	3784.5	673.0	2973.8	-810.7	2971.0	-813.5

One-Time: \$97.5M
Recurring: \$575.5M

VSTRS Revenue Scenario 2 Impact to Amortization Payments						
FY	Base	State Rev: One-Time \$97.5M; Recurring \$50M			Plus Replacing Flat with Progressive Emp. Contribs. (FY23)	
	Amort Pmt (\$ mil)	Additional Revenue	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base
2021	124.9	0.0	124.9	0.0	124.9	0
2022	157.3	97.5	157.3	0.0	157.3	0
2023	166.2	20.8	166.2	0.0	166.2	0
2024	172.9	50.0	164.3	-8.6	164.4	-8.5
2025	179.4	51.0	167.9	-11.5	167.5	-11.9
2026	186.0	52.0	169.1	-16.9	168.7	-17.3
2027	192.7	53.1	169.6	-23.1	169.1	-23.6
2028	199.4	54.1	169.4	-30.0	168.9	-30.5
2029	206.4	55.2	168.5	-37.9	168.0	-38.4
2030	213.4	56.3	166.7	-46.7	166.2	-47.2
2031	220.6	57.4	163.9	-56.7	163.4	-57.2
2032	228.0	58.6	159.8	-68.2	159.2	-68.8
2033	235.6	59.8	153.9	-81.7	153.3	-82.3
2034	243.5	60.9	145.6	-97.9	145.0	-98.5
2035	251.5	62.2	133.8	-117.7	133.2	-118.3
2036	259.9	63.4	116.7	-143.2	116.1	-143.8
2037	268.7	64.7	90.2	-178.5	89.5	-179.2
2038	278.1	66.0	42.9	-235.2	42.2	-235.9
	3784.5	983.0	2630.7	-1153.8	2623.1	-1161.4

One-Time: \$97.5M
Recurring: \$885.5M

- One-Time and Recurring Revenue lower the amortization payment. Adding higher employee contributions (under current policy) minimally changes amortization payments and small changes are due to differences in liabilities/refunds of contributions?

VSTRS Group Plan Changes (Individual)

Option 1:

COLA Threshold – 50% of CPI on first \$48,000 of annual pension income, 25% of CPI on pension income exceeding \$48,000.

Option 2:

Tiered COLA – 100% of CPI on first \$20,000 of annual pension income, 50% of CPI on income between \$20,000-\$40,000, 25% of CPI on income above \$40,000.

Option 3:

Vested COLA – Member must have at least 15 years of service to receive COLA.

Option 4:

Increase Max Benefit Cap by 1% of AFC for each year worked beyond 33.34 years (Group C-2 only), for service worked after 7/1/22.

\$ million	Option 1	Option 2	Option 3	Option 4
FY23 ADEC (est.) - \$202.1 mil	\$200.0 (\$2.1)	\$207.3 \$5.2	\$201.0 (\$1.1)	\$206.0 \$3.9
Unfunded Liability (FY20: \$1,933.3 mil)	\$1,919.2 (\$14.1)	\$1,968.0 \$34.7	\$1,929.9 (\$3.4)	\$1,963.3 \$30.0
Normal Cost (FY20: \$74.6 mil)	\$73.8 (\$0.8)	\$76.6 \$2.0	\$73.9 (\$0.7)	\$75.7 \$1.1

VSTRS Plan Changes (individually)

- Out of the four options analyzed, Option 1 is the only one that reduces the amortization payments by more than \$1 million/year.
- Option 2 (tiered COLA) enhances benefits and results in actuarial losses.
- Vested COLA has minimal impact.

FY	Base	COLA Threshold - 50% CPI on first \$48,000 of benefit, 25% CPI on benefit above \$48,000		Tiered COLA - 100% CPI on first \$20,000 of benefit, 50% CPI on benefit \$20,000-\$40,000, 25% CPI above \$40,000		Vested COLA - No COLA unless at least 15 years of service		Max Benefit Cap by 1%	
	Amort Pmt (\$ mil)	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base	New Amort Pmt	Savings from Base
2021	124.9	124.9	0.0	124.9	0.0	124.9	0.0	124.9	0.0
2022	157.3	157.3	0.0	157.3	0.0	157.3	0.0	157.3	0.0
2023	166.2	165.0	-1.2	169.1	2.9	165.9	-0.3	168.7	2.5
2024	172.9	171.4	-1.5	176.3	3.4	172.5	-0.4	175.8	2.9
2025	179.4	177.9	-1.5	183.0	3.6	179.0	-0.4	182.5	3.1
2026	186.0	184.5	-1.5	189.7	3.7	185.6	-0.4	189.1	3.1
2027	192.7	191.1	-1.6	196.4	3.7	192.2	-0.5	195.9	3.2
2028	199.4	197.8	-1.6	203.3	3.9	199.0	-0.4	202.8	3.4
2029	206.4	204.7	-1.7	210.4	4.0	205.9	-0.5	209.8	3.4
2030	213.4	211.7	-1.7	217.5	4.1	213.0	-0.4	217.0	3.6
2031	220.6	218.9	-1.7	224.8	4.2	220.2	-0.4	224.3	3.7
2032	228.0	226.2	-1.8	232.4	4.4	227.5	-0.5	231.8	3.8
2033	235.6	233.7	-1.9	240.1	4.5	235.1	-0.5	239.5	3.9
2034	243.5	241.5	-2.0	248.0	4.5	242.9	-0.6	247.5	4.0
2035	251.5	249.5	-2.0	256.2	4.7	251.0	-0.5	255.7	4.2
2036	259.9	257.8	-2.1	264.7	4.8	259.4	-0.5	264.2	4.3
2037	268.7	266.5	-2.2	273.5	4.8	268.1	-0.6	273.1	4.4
2038	278.1	275.8	-2.3	283.0	4.9	277.5	-0.6	282.6	4.5
	3784.5	3756.2	-28.3	3850.6	66.1	3777.0	-7.5	3842.5	58.0

Like VSERS Group F, the Max Benefit Cap estimate did not change retirement behavior assumptions.

Actuaries assume that some percentage of the workforce will continue to work beyond normal retirement eligibility. In the absence of changes to behavioral assumptions, the models process the max benefit cap increase as a benefit enhancement to the people who are already expected to continue working.

What changes to retirement behavior should be assumed?

VSTRS Combined Scenarios

	Combo A	Combo B*	Combo C	Combo D*	Combo E	Combo F*
	COLA Threshold – 50% CPI on first \$48K, 25% CPI >\$48K	COLA Threshold – 50% CPI on first \$48K, 25% CPI >\$48K Excludes Actives Within 5 Yrs of NRE	Tiered COLA – 100% CPI on first \$20K, 50% CPI \$20-40K, 25% CPI >\$40K.	Tiered COLA – 100% CPI on first \$20K, 50% CPI \$20-40K, 25% CPI >\$40K. Excludes Actives Within 5 Yrs of NRE	Vested COLA – No COLA unless 15+ years of service	Vested COLA – No COLA unless 15+ years of service Excludes Actives Within 5 Yrs of NRE
	Increase Max Benefit by 1%	Increase Max Benefit by 1%	Increase Max Benefit by 1%	Increase Max Benefit by 1%	Increase Max Benefit by 1%	Increase Max Benefit by 1%
UAL Impact	14.7	17.8	63.6	44.6	26.6	28.6
ADEC Impact	1.7	2.0	8.9	6.4	2.8	3.4

* Excludes active employees who are within 5 years of normal retirement eligibility from COLA changes.

VSERS Revenue Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	PV of Additional Member Contribs FY23-38 (\$ mil)	PV of Decreased Employer Contribs FY23-38 (\$ mil)
\$75M 1x, \$15M recurring	0.0	0.0	-179.1
\$50M 1x, \$40M recurring	0.0	0.0	-339.7
Group F member contribs increase 0.5%/yr for 3 yrs (25 th -74 th percentile), 0.5%/yr for 4 yrs (75+ percentile)	-6.9	70.6	-68.6
Group F member contribs increase 0.5%/yr for 4 yrs (25 th -74 th percentile), 0.5%/yr for 5 yrs (75+ percentile)	-8.3	84.0	-81.7
Group C member contribs increase 0.45%/yr for 3 years	-0.3	2.5	-2.5
Group C member contribs increase to 9.0% (25 th -49 th percentile), 10.0% (50 th -74 th percentile), 11.0% (75+ percentile)	-0.5	4.3	-4.3

VSERS Revenue Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	PV of Additional Member Contribs FY23-38 (\$ mil)	PV of Decreased Employer Contribs FY23-38 (\$ mil)
\$75M 1x, \$15M recurring, Group C member contribs increase 0.45%/yr for 3 years	-0.3	2.5	-181.7
\$75M 1x, \$15M recurring, Group C member contribs increase to 9.0% (25 th -49 th percentile), 10.0% (50 th -74 th percentile), 11.0% (75+ percentile)	-0.5	4.3	-183.4
\$75M 1x, \$15M recurring, Group F member contribs increase 0.5%/yr for 3 yrs (25 th -74 th percentile), 0.5%/yr for 4 yrs (75+ percentile)	-6.9	70.6	-247.8
\$75M 1x, \$15M recurring, Group F member contribs increase 0.5%/yr for 4 yrs (25 th -74 th percentile), 0.5%/yr for 5 yrs (75+ percentile)	-8.3	84.0	-260.8
\$50M 1x, \$40M recurring, Group C member contribs increase 0.45%/yr for 3 years	-0.3	2.5	-342.2
\$50M 1x, \$40M recurring, Group C member contribs increase to 9.0% (25 th -49 th percentile), 10.0% (50 th -74 th percentile), 11.0% (75+ percentile)	-0.5	4.3	-344.0
\$50M 1x, \$40M recurring, Group F member contribs increase 0.5%/yr for 3 yrs (25 th -74 th percentile), 0.5%/yr for 4 yrs (75+ percentile)	-6.9	70.6	-408.1
\$50M 1x, \$40M recurring, Group F member contribs increase 0.5%/yr for 4 yrs (25 th -74 th percentile), 0.5%/yr for 5 yrs (75+ percentile)	-8.3	84.0	-421.1

VSERS Benefit Change Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	Individually Modeled Impact to UAL (\$ mil)
Group F Longevity Bonus	-3.4 to -7.6	-29.2 to -63.9
Group C Risk Sharing COLA	-2.1	-14.0
Group F COLA Threshold \$24K	-14.1	-99.5
Group F COLA Threshold \$24K indexed to CPI	-9.6	-70.1
Group F CPI Thresholds 0% min, 4% max	-2.1	-14.0
Group F COLA after 24 months	-3.5	-23.3
Group F COLA after 36 months	-6.3	-42.0
Group C Max Benefit Cap by 1%, Mandatory Retirement to 57	-3.3	-22.5
Group C Max Benefit Cap by 2%, Mandatory Retirement to 57	-2.3	-15.4
Group F Max Benefit Cap by 1%	4.7	40.1

VSTRS Revenue Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	PV of Additional Member Contribs FY23-38 (\$ mil)	PV of Decreased Employer Contribs FY23-38 (\$ mil)
\$97.5M 1x, \$32.5M recurring	0.0	0.0	-331.4
\$97.5M 1x, \$50M recurring	0.0	0.0	-463.9
Members currently paying 5%: 0.25%/yr increase for 4 years beginning FY23;	-2.9	24.6	-24.2
Members currently paying 6%: 0.25%/yr increase for 2 years beginning FY25			
Replace “flat” with “progressive” member contributions in FY23: <ul style="list-style-type: none"> • 5.50% on first \$40,000 of income • 6.25% on income \$40,000-\$60,000 • 7.00% on income \$60,000-\$80,000 • 7.75% on income above \$80,000 	-4.5	46.0	-45.4

VSTRS Revenue Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	PV of Additional Member Contribs FY23-38 (\$ mil)	PV of Decreased Employer Contribs FY23-38 (\$ mil)
\$97.5M 1x, \$32.5M recurring, 0.25%/yr member contribution increases.	-2.9	24.6	-355.5
\$97.5M 1x, \$50M recurring, progressive member contributions	-4.5	46.0	-509.4

VSTRS Benefit Change Options	Individually Modeled Impact to FY23 ADEC (\$ mil)	Individually Modeled Impact to UAL (\$ mil)
COLA Threshold – 50% CPI on first \$48,000 of pension income; 25% CPI on income above \$48,000.	-2.1	-14.1
Tiered COLA – 100% CPI on first \$20,000 of pension income; 50% CPI on income between \$20,000-\$40,000;25% CPI on income above \$40,000	5.2	34.7
Vested COLA – No COLA unless at least 15 years of service	-1.1	-3.4
Max Benefit Cap by 1%	3.9	30.0