Minnesota Legislative Commission on Pensions and Retirement

July 1, 2023 Public Retirement Plan Portability Assumptions Study

February 19, 2025




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February 19, 2025

Minnesota Legislative Commission on Pensions and Retirement
Centennial Office Building, 1st floor
658 Cedar St.
St. Paul, MN 55155

Re: Public Retirement Plan Portability Actuarial Study as of July 1, 2023

Commission Members:

This report presents the results of the recent Public Retirement Plan Portability actuarial study performed by VIA Actuarial Solutions. This study includes analysis based on Minnesota Statutes, Sections 356.30 Combined Service Annuity ("CSA") and 356.311 Coverage by More Than One Plan ("CBM"). These statutes are collectively categorized in Minnesota Statutes under "Public Retirement Plan Portability" and they describe how member benefits earned in a Minnesota statewide pension plan can recognize prior pay and/or service earned in another Minnesota statewide pension plan.

1-1 Purpose of the Study

This study was prepared at the request of the Legislative Commission on Pensions and Retirement (LCPR) for the benefit and use of the LCPR and the State of Minnesota. Its sole purpose is to review the actuarial liability load factors, generally referred to as the "CSA Loads". The unadjusted actuarial liabilities calculated by the statewide plans' retained actuaries are multiplied by the CSA load factors in order to approximate the value of Minnesota's public retirement plan portability provisions. The adjusted liabilities are used to complete various computations for pension financial reporting and funding/contribution purposes.

The CSA loads are calculated by the LCPR's actuary since it involves gathering and analyzing membership data from all the Minnesota statewide pension systems. The previous CSA loads shown in this report were calculated by the LCPR's prior actuary in their October 2016 report using July 1, 2015 data[1].

This report may not be used for any other purpose, and VIA Actuarial Solutions is not responsible for the consequences of any unauthorized use. Its content may not be modified, incorporated into or used in other material, or otherwise provided, in whole or in part, to any other person or entity, without our permission.

1-2 Data, Assumptions, and Methods Used in the Analysis

The results and recommendations in this report are based on July 1, 2023 census data for the Minnesota public retirement systems: Public Employees Retirement Association (PERA), Minnesota State Retirement

[1] https://www.lcpr.mn.gov/documents/otherpublications/2016_CSA_Study_Report.pdf

System (MSRS), Teachers Retirement Association (TRA), and St. Paul Teachers' Retirement Fund Association (SPTRFA). We also relied on the assumption and plan provision descriptions outlined in the July 1, 2023 actuarial valuations for each retirement plan. Although we have reviewed the census data and actuarial valuations for reasonability, we have not audited the data and are relying on its substantial accuracy. If any data supplied are not accurate and complete, our conclusions and recommendations may differ significantly.

The methods used to determine the updated CSA loads are summarized in section 3 of this report. We believe these methods are reasonable for the given purpose. Note that we used some approximation techniques if it was not practical to calculate the liability loads directly. The results are also highly dependent on our ability to correctly match records from different retirement systems and identify members with covered service in multiple plans. As noted in section 3, we developed an internal universal unique identifier to assist in matching records since the systems do not use a common unique identifier. Although our identifier may not match records with 100% accuracy, we believe it is reasonable given the scope of the project and lack of alternative options.

1-3 Actuarial Certification

To the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

Upon receipt of the report, the LCPR should notify us if you disagree with any information contained in the report or if you are aware of any information that would affect the results that has not been communicated to us. The report will be deemed final and acceptable to the LCPR unless you immediately notify us otherwise.

The undersigned credentialed actuaries are members of the American Academy of Actuaries and meet the Academy's Qualification Standards to render the actuarial opinion contained herein. We are available to answer questions on the material contained in this report or to provide explanations or further detail, as may be appropriate. We are not aware of any financial interest or relationship that could create a conflict of interest or impair the objectivity of our work.

Sincerely,

Mark W. Schulte, FSA, EA, MAAA
Consulting Actuary

Emily M. Knutson, FSA, EA, MAAA
Consulting Actuary

L/D/C/R:5/mjc/emk/mws/gng

2 Executive Summary

The purpose of this report is to provide updated actuarial liability load factors that estimate the effect of the Public Retirement Plan Portability provisions found in Minnesota State Statutes, Chapter 356. It also summarizes the data, methodologies, and assumptions used to develop the updated load factors.

2-1 Background

There are four Minnesota state statutes relating to Public Retirement Plan Portability that impact member benefits and plan liabilities:

- **Combined Service Annuity (CSA) provisions** in Minnesota Statutes,
  - Section 356.30 (benefits payable upon retirement)
  - Section 356.302 (benefits payable if disabled)
  - Section 356.303 (benefits payable to a survivor)
- **Coverage By More Than One Plan (CBM) provisions** in Minnesota Statutes, Section 356.311

The CSA provisions generally allow a member's benefit to be calculated with the same "high-five" salary (average salary in highest consecutive five years of public service) in all Covered Plans where they have a vested benefit. The CSA provisions also allow all public service to be considered when determining vesting, early retirement eligibility, and early retirement subsidies (e.g., Rule of 90). To be eligible for the CSA provisions, members must meet the following criteria:

- At least one-half year of service in two or more Covered Plans;
- Vested in two or more Covered Plans based on total service in all plans and each plan's separate vesting requirements; and
- Have not begun receiving an annuity from any Covered Plans.

The CBM provisions allow all public service to be considered when determining vesting. They do not change the accrued benefit amount but instead give non-vested members in an applicable plan the opportunity to elect an annuity instead of solely receiving a refund of contributions with interest. To be eligible for the CBM provision, members must meet the following criteria:

- Vested in two or more Covered Plans based on total service in all plans and each plan's vesting requirements; and
- Have not received a refund from any of the Covered Plans.

The Covered Plans for both the CSA and CBM provisions are summarized by retirement system below:

MSRS	PERA	SPTRFA	TRA
General	General	SPTRFA	TRA
Correctional	Correctional		
State Patrol	Police and Fire		
Judges			
Legislators			

The MSRS Unclassified plan is also a Covered Plan and any service earned in the Unclassified Plan is included in determining CSA eligibility for an applicable defined benefit pension plan. However, the MSRS Unclassified Plan itself is a defined contribution plan and does not have any actuarial liabilities affected by CSA loads.

2-2 Process

Section 3 of this report contains a detailed summary of the processes used to determine the updated liability loads. At a very high level:

- We cross-referenced the census data provided by each system's retained actuary to uniquely identify members potentially affected by CSA and CBM provisions.

- After reviewing the applicable Minnesota Statutes, we analyzed the potential impact of components of the CSA/CBM provisions separately on the plans' actuarial liabilities.

- **The load factors are the percentage adjustment to be applied to the liability amounts determined by the Systems' actuaries in the annual actuarial valuations.** For example, if the Vested Terminated load for MSRS General is 9%, then the retained actuary for MSRS General would increase their Vested Terminated member actuarial liabilities by 9% to reflect the estimated value of Minnesota's public retirement plan portability provisions.

2-3 Updated Liability Loads

The table below compares the current load factors to the updated load factors developed from our analysis. These load factors reflect the cumulative impact of the CSA and CBM provisions.

The current and updated load for all active members is 0%.

Plan	Vested Terminated Current Load	Vested Terminated Updated Load	Non-Vested Terminated Current Load	Non-Vested Terminated Updated Load
MSRS General	4%	9%	5%	51%
MSRS Correctional	17%	6%	6%	111%
MSRS State Patrol	13%	9%	0%	70%
MSRS Judges	0%	0%	0%	0%
MSRS Legislators	0%	0%	0%	0%
PERA General	15%	19%	3%	44%
PERA Correctional	35%	9%	1%	119%
PERA Police & Fire	33%	13%	2%	38%
SPTRFA	20%	28%	9%	58%
TRA	7%	6%	9%	13%

As summarized above, there are some substantial changes to the CSA/CBM load factors. We discuss the sources of these changes in Section 3 of this report. We believe that the primary reasons for the adjustments are:

- Since the prior 2016 study, there have been considerable census, assumption, and benefit provision changes (e.g., elimination of augmentation, vesting schedule updates) that affect the potential value of CSA benefits.

- We refined some of the methods used to determine the loads so that they're based directly on expected liability changes instead of the prior study's "average participant" estimates adjusted by relative headcounts.

- The updated loads reflect a different approach to measuring the value of potential member refunds which we believe is more consistent with how these refunds are valued in the annual actuarial valuations.

Although there are some substantial load changes, in most cases the effect on overall plan liabilities is very small. For example: the non-vested terminated load updates are significant, but these member liabilities are relatively small so the effect on total plan liabilities is minimal. We illustrate the estimated effect on plan liabilities below.

2-4 Estimated Impact on Actuarial Accrued Liability

The tables below compare each plan's 7/1/2023 Actuarial Accrued Liability (AAL) using the current CSA load factors versus the estimated AAL using the updated load factors. All results below and throughout this report are shown in $1,000.

Total Plan Member Liability[2] (liability results in $1,000)

Plan	AAL with Current Load	Estimated AAL with Updated Load	Estimated $ Change in AAL	Estimated % Change in AAL
MSRS General	17,597,063	17,653,683	56,620	0.3%
MSRS Correctional	2,134,092	2,123,747	(10,345)	-0.5%
MSRS State Patrol	1,170,196	1,169,810	(386)	0.0%
MSRS Judges	430,526	430,526	0	0.0%
MSRS Legislators	158,755	158,755	0	0.0%
PERA General	33,092,665	33,193,630	100,965	0.3%
PERA Correctional	1,112,405	1,062,645	(49,760)	-4.5%
PERA Police & Fire	12,765,798	12,696,778	(69,020)	-0.5%
SPTRFA	1,891,617	1,901,416	9,799	0.5%
TRA	35,008,293	35,003,358	(4,935)	0.0%

The largest expected liability change as a percent of total liability is for the PERA Correctional plan due to the substantial decrease in the Vested Terminated CSA load from 35% to 9%. This is because the Vested

[2] The MSRS General AAL excludes the small additional contingent liability related to Unclassified plan transfers.

Terminated liability is a very high proportion of the total PERA Correctional plan liability (roughly 24.4% of total liability). In comparison, the PERA Police & Fire plan had a similar load change but the Vested Terminated liability is only about 3.6% of total plan liability so the overall effect of the load change is relatively small.

2-5 Other Considerations

Recurrence of CSA and CBM Load Study – We recommend performing this study every four years, similar to the ongoing actuarial valuation experience studies. Consistent reviews should produce more gradual changes in the load factors vs. studies that are conducted at longer time intervals.

Future Assumption, Method, or Benefit Changes – We recommend reviewing the CSA loads if a future change is made in plan provisions related to vesting, augmentation, or early retirement subsidies. Changes in actuarial valuation methods or assumptions could also affect the CSA loads. A full study may not be necessary, but the potential effect on the load factors should be considered.

3 Process Description and Results Analysis

Below is a brief description of the data process used to determine which pension plan members may potentially be affected by the CSA and CBM provisions.

- During the 2024 legislative session, we received each Covered Plan's July 1, 2023 valuation data. This information was used for the purpose of identifying members with covered service in multiple plans.

- Since each System uses a different unique identifier, we created a new *universal* unique identifier based on the last four digits of Social Security Number and birthdate for each record.

- Using the universal unique identifiers, we created a database with a single record for each individual and determined which members potentially had service in more than one plan. Our analysis excluded any member with service in only one plan, members already in pay status, and anyone with insufficient information to create a universal unique identifier.

- For members with a missing or invalid birthdate, hire date, termination date, and/or salary, we created data based on the assumptions disclosed in the "unknown data" section of each plan's July 1, 2023 actuarial valuation report.

- The accrued benefit for vested terminated members in PERA plans was estimated based on the final average earnings and service provided, along with an estimated calculation of the member's augmentation factor. Accrued benefits for members in other Systems were provided in the data files.

- The universal unique identifier used in our analysis may not be as accurate as if all the Systems used a common unique identifier. However, given limited options, we believe our approach is reasonable for identifying records with covered service in multiple plans.

Within the combined database, members were identified as being potentially impacted by the CSA or CBM provisions if the following conditions were met in two or more plans.

- Plan service greater than zero

- Vested based on the vesting requirements for that plan and taking into account all public service

  - Members who are currently active were assumed to become vested in the future

  - Terminated members with a status of "vested" were assumed to be vested, regardless of service amounts provided in the data files

For the CSA provision, we separately measured the Present Value of Future Benefits ("PVFB") liability effect of (1) benefiting from the Rule of 90, (2) the potential value of other early retirement subsidies (e.g., 62 & 30), and (3) the value of a greater vested benefit due to recognizing higher final average salary or vesting service from other plans. We then determined a combined load factor by plan and member status. The process for each component is discussed on the following pages.

3-1 Combined Service Annuity – Rule of 90

In certain plans, members first hired before July 1, 1989 are eligible for an unreduced early retirement benefit once they meet Rule of 90 (age plus allowable service totals 90 or more). Impacted members are those who would be eligible for Rule of 90 (or meet Rule of 90 at an earlier date) after recognizing their earliest hire date and total years of service in all plans.

For active members, we calculated the estimated PVFB change in their current plan if they were indicated as eligible for Rule of 90 in any other plan. If there was a flag in the data indicating a member was first hired prior to July 1, 1989, the flag was used. Otherwise, hire date was used as the basis for determining potential Rule of 90 eligibility. The liability impact was determined by calculating the PVFB with and without all service, to determine potential Rule of 90 eligibility and probability of retirement.

For inactive members, the estimated liability impact was determined by comparing (1) the PVFB of an unreduced pre-July 1, 1989 benefit payable at attainment of Rule of 90 versus (2) the PVFB of a post-July 1, 1989 benefit payable at Normal Retirement Age. The calculation was completed for each plan using a "hypothetical member" approach based on the average age, plan service, and total eligibility service of all impacted members. The increase factor was then applied uniformly to members expected to be impacted by the CSA Rule of 90 provisions.

Because the number of employees hired before July 1, 1989 that have not commenced benefits is small and decreasing each year, there is no longer a recommended Rule of 90 CSA load for any participant groups. The tables below illustrate the minimal potential liability effect by plan for the different member status groups.

Active Member Results[3]

Plan	7/1/2023 Active Member Count	Number of Impacted Members	PVFB Change for Active Members
MSRS General	52,459	349	0.1%
PERA General	154,261	135	0.0%
SPTRFA	3,456	6	0.0%
TRA	84,983	95	0.0%

Vested Terminated Member Results

Plan	7/1/2023 VT Member Count	Number of Impacted Members	PVFB Change for VT Members
MSRS General	18,349	256	0.1%
PERA General	70,221	727	0.0%
SPTRFA	2,611	0	0.0%
TRA	19,418	0	0.0%

[3] Member counts shown here and throughout the report are based on member data from the July 1, 2023 actuarial valuation reports.

Non-vested Terminated Member Results

Plan	7/1/2023 NVT Member Count	Number of Impacted Members	PVFB Change for NVT Members
MSRS General	11,437	4	0.0%
PERA General	88,292	15	0.0%
SPTRFA	3,007	0	0.0%
TRA	40,089	54	0.0%

Note that the PERA General, MSRS General, TRA, and SPTRFA plans also provide early retirement subsidies for certain members hired before July 1, 1989 once they reach 30 years of service. This early retirement subsidy is also reflected in the active member results above. For terminated members, we believe any potential liability associated with the 30 years of service early retirement subsidies would be insignificant since there are so few impacted terminated members.

3-2 Combined Service Annuity – Vested Benefit

In addition to potential Rule of 90 eligibility, our understanding is that there are three other ways that CSA provisions could potentially affect member benefits.

1. Final average salary in one plan could be used to increase the benefit payable from another plan, if the increase is greater than applicable augmentation on their deferred vested benefit;
2. Additional service for members in certain plans[4] may make them eligible for early retirement subsidies; and
3. A non-vested member in an applicable plan could have an increase in their vesting percentage and/or become vested in that plan's benefit based on additional vesting service earned in another plan.

Note that, absent additional vesting due to CSA or CBM provisions, *non-vested* members may only receive a refund of accumulated employee contributions with interest. Our understanding is that they may elect to receive these refunds immediately or deferred until a later commencement age. In contrast, *vested* members may receive a contribution refund (immediately or deferred) or a deferred annuity. Our analysis of the CSA effect on the different member groups reflects the potential value of the deferred annuity available when a member becomes vested.

Active Members

The process used to calculate active member CSA loads was as follows.

- For the potential CSA final average salary impact, we used the following rationale to assume that an active member's final average salary would not be impacted by earnings from service with a prior plan.
  - For active members where all service is within one system, the final average earnings (FAE) provided in the data is the same across all plans and the highest FAE is automatically used for all records. This means no additional liability load is required.
  - For active members with a corresponding terminated record in another retirement system, we focused on records where current active salary is less than the FAE in the terminated plan since this could create a CSA liability. For these potentially impacted records in each plan, we calculated an average projected *active* FAE at retirement and compared it to their average *terminated* FAE. For all plans except TRA, the projected active FAE was higher so the CSA final average salary provision does not have an impact. For the potentially affected TRA records, the average projected active FAE was lower than the average terminated FAE so this could create a CSA liability. However, the pool of potentially affected TRA members is relatively small (fewer than 1% of active members) and we estimate that the CSA impact on TRA active PVFB would be minimal (less than 0.2% increase). Therefore, we believe it's reasonable to not recognize a CSA FAE load for this plan either.

[4] TRA and SPTRFA members hired on or after July 1, 1989 are eligible for early retirement subsidies when they reach age 62 and 30 years of service.

- For the potential CSA *vesting* enhancement, additional vesting service from a prior plan will only increase an active member's liability if it (1) increases the active member's projected vesting percent and thereby increases the value of their accrued annuity relative to the value of a contribution refund or (2) makes them eligible for an early retirement subsidy.

- We completed an analysis of sample records at various ages and determined that an active member's contribution refund is generally more valuable than the PVFB of a fully vested deferred annuity if the member is more than 15 years from their Normal Retirement Age (i.e., in this scenario, additional CSA vesting won't make a deferred vested benefit more valuable than the refund).

- Based on these conclusions, we limited our analysis to active members who were less than 15 years from NRA and not currently 100% vested. **After analyzing the number of potentially impacted active members and the probabilities of termination, we concluded that a load for active members is not required as we estimate the load would impact active liability by less than about 0.2% in all cases.**

The table below summarizes the number of affected active members for the applicable plans that do not have meaningful early retirement subsidies (i.e., non-teacher plans). The number impacted reflects the probability of terminating employment before becoming 100% vested. **The results illustrate that the maximum potential CSA load is very small, so we're recommending no load for these active members.**

Plan	7/1/2023 Active Member Count	Number of Impacted Members	% of Active Members Impacted	% of Active Liability that is Not Vested	Maximum Potential Increase Factor
MSRS General	52,459	142	0.3%	1.5%	0.0%
MSRS Correctional	4,426	78	1.8%	7.9%	0.1%
MSRS State Patrol	979	7	0.7%	17.0%	0.1%
PERA General	154,261	278	0.2%	1.7%	0.0%
PERA Correctional	3,786	85	2.2%	9.5%	0.2%
PERA Police & Fire	11,635	40	0.3%	6.0%	0.0%

For plans with meaningful early retirement subsidies (i.e., teacher plans), we calculated the potential PVFB change directly. The table below summarizes the number of affected active members and the estimated change in their PVFB due to additional CSA vesting service. **As with the other plans above, the expected liability change is minimal so we're recommending no load for these active members.**

Plan	7/1/2023 Active Member Count	Number of Impacted Members	PVFB Change for Active Members
SPTRFA	3,456	399	0.1%
TRA	84,983	6,643	0.2%

Terminated Members

We analyzed the increase in a terminated member's benefit for those meeting the following criteria:

- Potentially vested in at least two plans, based on all public service and the vesting requirements in the applicable plan as of the termination date
- At least six months of service in two or more plans
- If a terminated participant was active in another plan, it was assumed they would eventually earn enough service to be eligible for the CSA provision

We relied on a member's current status as determined by each system to categorize them as currently vested versus non-vested. Our understanding is that this is also the methodology used for the actuarial valuations.

Note that although the results tables on the following pages include the number of impacted members compared to total members, the updated liability loads are based solely on the PVFB change for the entire group. The member counts are provided as a reference point only.

In the prior CSA load study, the PVFB change was calculated for impacted members only and then prorated based on impacted vs. total headcounts. Our approach based on the total member liability change (without any headcount prorating) is different than the prior study, but we believe it produces a more precise estimate of the potential CSA costs than a headcount-weighted basis.

Current vested terminated members could have a greater benefit under the CSA provisions if either:

- Their vested percentage is greater using all public service;
- Their projected final average salary considering all public service is greater than the cumulative projected augmentation increases on their accrued termination benefit[5], if applicable; or
- Additional service would make them eligible for early retirement subsidies at age 62 with 30 years of service[6].

For each potentially affected vested terminated member, we calculated both baseline and adjusted PVFB's.

- The baseline PVFB is calculated as the greater of (1) the present value of the member's accumulated contributions or (2) the present value of the accrued benefit payable at the deferred member's assumed retirement age in the applicable plan's actuarial valuation.
- The adjusted PVFB with the CSA benefit is calculated similarly by comparing the value of accumulated contributions vs. the accrued benefit value. However, in this case, the accrued

[5] Augmentation of deferred vested benefits is only applicable through December 31, 2018 for most plans, and through June 30, 2019 for the teacher plans.

[6] TRA and SPTRFA only

benefit is the greater of (1) the amount provided by the applicable system or (2) the amount recalculated with the CSA provisions. The accrued benefit is recalculated with the CSA provisions as follows.

- For those that are not active in any other plan: using the highest final average earnings in all plans and updated augmentation based on the final termination date.

- For those that are active in another plan: their salary in the active plan is assumed to increase at the rates in the actuarial valuation of the active plan. Their adjusted accrued benefit is based on final average earnings projected to termination, assuming the retirement and termination probabilities in the actuarial valuation and no future augmentation.

- For members in SPTRFA, their PVFB is adjusted for the value of any potential 62 & 30 early retirement subsidies[7].

Vested Terminated Loads

Plan	7/1/2023 Vested Terminated Member Count	Number of Impacted Members	Updated Load (PVFB Change for VT Members)
MSRS General	18,349	4,200	9.4%
MSRS Correctional	1,544	447	6.4%
MSRS State Patrol	76	23	9.3%
MSRS Judges	17	2	0.4%
MSRS Legislators	19	1	0.0%
PERA General	70,221	23,924	18.9%
PERA Correctional	4,378	1,808	8.9%
PERA Police & Fire	1,966	537	12.5%
SPTRFA	2,611	1,521	28.3%
TRA	19,418	2,013	5.7%

Note that although the change in PVFB for the Legislators is not actually 0.0%, we are recommending no load because the single impacted participant is past normal retirement age. Therefore, a load is not applicable to the other vested terminated members.

There is not a consistent pattern to how the updated vested terminated CSA loads changed since the prior study. One likely reason is that plan demographics in many plans have changed since the 2016 study, and it appears more members are potentially affected by the CSA provisions. We also identified other potential reasons for these changes.

- For plans with increases (e.g., MSRS General, PERA General, and SPTRFA), part of the change may be due to the elimination of augmentation in 2018 and 2019. The cost to the plans of CSA benefits

[7] TRA also has a 62 & 30 early retirement subsidy, but their actuarial valuation assumes terminated vested members do not commence benefits until their first unreduced retirement age i.e., Normal Retirement Age (age 65) for members first hired after on or after July 1, 1989.

is greater when the rate of salary increase on a CSA benefit exceeds the rate of deferred augmentation on an accrued benefit. Deferred augmentation increases were frozen for all current terminated members effective in 2018 (non-teacher plans) and 2019 (teacher plans). Without augmentation, the baseline liability will be lower than it would have been with augmentation. This means that the adjusted liabilities after reflecting CSA increases will be higher compared to the current baseline liabilities calculated without augmentation.

- Another factor affecting former PERA General plan members is that these individuals often move to plans such as TRA where their average earnings are substantially higher than they were in the PERA General plan. In these cases, the CSA application of their subsequent higher pay rate to their prior service in the applicable plan can substantially increase their benefit value.
- For the correctional and safety plans, the load factors decreased since the prior study. One potential reason is that the data indicates many of these vested terminated members are subsequently moving to non-safety/non-correctional plans which generally have lower pay structures. If there has been an increase in correctional and safety turnover rates since the prior study, then this would cause the CSA final pay provision to have less effect on their accrued benefits in the applicable correctional and safety plans. The supplementary results analysis in section 4 of this report includes a summary of movement between plans for active and terminated members.

The table below summarizes the estimated effect that the updated load changes will have on the Vested Terminated liabilities for each plan.

Estimated Vested Terminated Liability Changes (liability results in $1,000)

Plan	Current Load Factor	AAL with Current Load	Updated Load	Estimated AAL with Updated Load	Estimated Change in AAL
MSRS General	4%	1,005,510	9%	1,053,852	48,342
MSRS Correctional	17%	164,213	6%	148,774	(15,439)
MSRS State Patrol	13%	16,044	9%	15,476	(568)
MSRS Judges	0%	8,167	0%	8,167	0
MSRS Legislators	0%	13,778	0%	13,778	0
PERA General	15%	2,440,290	19%	2,525,170	84,880
PERA Correctional	35%	271,783	9%	219,440	(52,343)
PERA Police & Fire	33%	463,204	13%	393,549	(69,655)
SPTRFA	20%	125,048	28%	133,385	8,337
TRA	7%	984,466	6%	975,265	(9,201)

Current non-vested terminated members could have a greater benefit under the CSA provisions if the PVFB of their accrued benefit, taking into account all public service (i.e., assuming they would become vested in an annuity), is greater than the present value of their accumulated member contributions.

For each potentially impacted non-vested terminated member we completed similar calculations as described for terminated vested members above. However, for non-vested terminated members, the baseline liability is always the present value of the member's accumulated contributions since this is the default form of payment for a non-vested terminated member. These baseline calculations are based on our understanding of the methodologies used in each plan's actuarial valuation.

- For all plans except TRA, the non-vested terminated PVFB is calculated assuming the contribution refund is paid at the members' assumed retirement age in the actuarial valuation (i.e. the current value is projected to deferred retirement with interest and discounted to the valuation date using the plan's discount rate.)
- For TRA, the present value of the accumulated member contributions is calculated assuming the refund is paid on the valuation date (i.e., no projection or discounting).

For the adjusted PVFB results, we calculated an estimated accrued benefit amount based on the applicable plan service data combined with any pay and vesting service data provided for a prior or subsequent plan.

The table below shows the percent change from the baseline PVFB to the CSA-adjusted PVFB. **Although the updated load factors increased significantly for most of the plans, the effect on each plan's total liability is relatively small (i.e., all plan liability increases are less than 0.25%).**

Non-vested Terminated Member Loads

Plan	7/1/2023 Non-vested Terminated Member Count	Number of Impacted Members	Updated Load (PVFB Change for NVT Members)
MSRS General	11,437	1,370	51.4%
MSRS Correctional	1,309	341	111.4%
MSRS State Patrol	54	12	70.4%
MSRS Judges	1	0	N/A
MSRS Legislators	0	0	N/A
PERA General	88,292	3,622	44.1%
PERA Correctional	2,604	412	119.1%
PERA Police & Fire	941	76	37.8%
SPTRFA	3,007	328	58.4%
TRA	40,089	2,227	12.8%

The change in PVFB for impacted non-vested terminated members is significantly higher than the prior study, except for TRA. There are several potential reasons for this change.

- The prior study used a "hypothetical member" approach to estimate the effect of vesting and pay adjustments on non-vested terminated members' liabilities. Our updated analysis calculates the loads directly based on individual member data instead.

- Our understanding of the prior CSA study is that it compared the present value of a deferred annuity to the **non-discounted** value of accumulated employee contributions with interest at various ages. *For non-TRA plans*, the current study makes this comparison for individual records using the ***interest-discounted present value*** of accumulated employee contributions projected with interest to the terminated members' assumed retirement age. Under this methodology, when the plan's discount rate is higher than the interest crediting rate (which it is for all plans), the actuarial liability for these contribution accounts will be less than the current value of the accounts. This decreases the baseline contribution refund value and increases the value of a CSA deferred annuity compared to the prior study.

- We used this approach because it's our understanding that the actuarial valuations for all non-TRA plans calculate the liability for non-vested terminated members assuming they receive a contribution refund at their deferred retirement age. Since the CSA loads will be applied to the actuarial valuation liabilities, we believe that our approach is consistent with the valuation methodologies.

- Our understanding of the TRA valuation methods is that they assume contribution refunds are paid immediately to non-vested terminated members (i.e., no projection and discounting). Therefore, we calculated the updated TRA liability loads using methods consistent with that approach. Note that this is the one plan where the non-vested terminated member loads did not change much from the prior study.

The table below summarizes the estimated effect that the updated load changes will have on the Non-vested Terminated liabilities for each plan.

Estimated Non-vested Terminated Liability Changes (liability results in $1,000)

Plan	Current Load Factor	AAL with Current Load	Updated Load	Estimated AAL with Updated Load	Estimated Change in AAL
MSRS General	5%	18,896	51%	27,174	8,278
MSRS Correctional	6%	5,143	111%	10,237	5,094
MSRS State Patrol	0%	260	70%	442	182
MSRS Judges	0%	20	0%	20	0
MSRS Legislators	0%	0	0%	0	0
PERA General	3%	40,408	44%	56,493	16,085
PERA Correctional	1%	2,211	119%	4,794	2,583
PERA Police & Fire	2%	1,798	38%	2,433	635
SPTRFA	9%	3,252	58%	4,714	1,462
TRA	9%	116,253	13%	120,519	4,266

3-3 Coverage by More than One Plan (CBM)

Members vested in two or more pension plans based on all public service are eligible for an annuity under the CBM provisions of Minnesota Statutes, Section 356.311. However, based on feedback from the pension systems, we understand that the CSA provisions produce most of the potential cost associated with service in more than one pension plan and they don't expect the CBM provisions to produce much additional cost. Below is a summary of our analysis.

- For non-vested terminated members with fewer than six months of service, there seems to be agreement among the systems that either (1) CBM does not apply to members with fewer than six months of service or (2) if it did, almost all these members choose a refund of their employee contribution accounts so the CBM vesting provisions wouldn't affect their actuarial liabilities.

- For vested and non-vested terminated members with more than six months of service, we assumed that the CSA's potential final salary increases and vesting provisions will provide a greater annuity than the CBM provisions.

Based on this information, we do not recommend any additional loads to reflect the CBM provisions of Minnesota Statutes, Section 356.311.

3-4 Cumulative Impact

Cumulative load factors by plan and member status were developed by compounding the load factors calculated for each impact component and then rounding the result to the nearest one percent[8]. Since there is no longer a recommended "CSA – Rule of 90 Load", the Updated Total Load below is simply the rounded value of the "CSA – Accrued Benefit Load".

Details for each plan are shown in the tables below. No results are presented for active members since we're not recommending a CSA load for these participants.

Vested Terminated Members Total Loads

Plan	CSA - Rule of 90 Load	CSA - Accrued Benefit Load	Updated Total Load	Current Total Load
MSRS General	N/A	9.4%	**9%**	4%
MSRS Correctional	N/A	6.4%	**6%**	17%
MSRS State Patrol	N/A	9.3%	**9%**	13%
MSRS Judges	N/A	0.4%	**0%**	0%
MSRS Legislators	N/A	0.0%	**0%**	0%
PERA General	N/A	18.9%	**19%**	15%
PERA Correctional	N/A	8.9%	**9%**	35%
PERA Police & Fire	N/A	12.5%	**13%**	33%
SPTRFA	N/A	28.3%	**28%**	20%
TRA	N/A	5.7%	**6%**	7%

Non-vested Terminated Members Total Loads

Plan	CSA - Rule of 90 Load	CSA - Vesting and Accrued Benefit Load	Updated Total Load	Current Total Load
MSRS General	N/A	51.4%	**51%**	5%
MSRS Correctional	N/A	111.4%	**111%**	6%
MSRS State Patrol	N/A	70.4%	**70%**	0%
MSRS Judges	N/A	N/A	**0%**	0%
MSRS Legislators	N/A	N/A	**0%**	0%
PERA General	N/A	44.1%	**44%**	3%
PERA Correctional	N/A	119.1%	**119%**	1%
PERA Police & Fire	N/A	37.8%	**38%**	2%
SPTRFA	N/A	58.4%	**58%**	9%
TRA	N/A	12.8%	**13%**	9%

[8] For example, if a plan's "CSA – Rule of 90" load was 1.5% and the "CSA – Accrued Benefit" load was 2.5% then the compounded load would be 1.015 x 1.025 = 1.0404 which would round to 4.0%

4 Appendix – Supplementary Results Analysis

For informational purposes, we're providing some additional data that may be useful to understand the prevalence of members with service in multiple plans.

The following table summarizes the number of active and terminated members in more than one plan based on the process described in Section 3. Note that these are total current members ***potentially*** affected by CSA/CBM provisions: they are members with service in more than one plan, but their benefits may not actually be increased by the CSA/CBM provisions or they may not have enough service to be impacted by the CSA provisions.

Summary of Members with Service in More than One Plan

Plan	Affected Active Members	Affected Vested Terminated Members	Affected Non-Vested Terminated Members	Total Affected Members	Total Plan Members (Active, VT, NVT)
MSRS General	9,432	6,924	2,777	19,133	**82,245**
MSRS Correctional	1,059	1,190	573	2,822	**7,279**
MSRS State Patrol	561	60	36	657	**1,109**
MSRS Judges	226	8	0	234	**339**
MSRS Legislators	3	12	0	15	**26**
PERA General	13,033	31,399	14,493	58,925	**312,774**
PERA Correctional	1,261	4,002	1,149	6,412	**10,768**
PERA Police & Fire	6,379	1,533	449	8,361	**14,542**
SPTRFA	1,894	2,180	2,067	6,141	**9,074**
TRA	23,408	5,946	11,193	40,547	**144,490**

This table shows that there is a substantial number of active and terminated members who have service in another Minnesota statewide pension plan and could ***potentially*** be affected by the CSA provisions. However, we know from the member analysis tables and load calculations earlier in this report that the ***actual*** number of these members impacted and the resulting liability effect is relatively small.

Another factor influencing the CSA loads is the pattern of movement between plans. For members that are currently active in one plan but have a vested terminated record in another plan, the table on the next page summarizes the distribution of these records among the Minnesota statewide pension plans.

Distribution of Members with Active and Vested Terminated Service in More Than One Plan[9]

		Active Plan								
		MSRS Gen	PERA Gen	MSRS Corr	PERA Corr	MSRS SP	PERA P&F	SPTRFA	TRA	Other
Vested Terminated Plan	MSRS Gen		67%	7%	1%	0%	2%	1%	19%	3%
	PERA Gen	23%		1%	3%	0%	11%	2%	59%	1%
	MSRS Corr	65%	18%		5%	1%	5%	0%	5%	1%
	PERA Corr	8%	46%	2%		2%	39%	0%	3%	0%
	MSRS SP	16%	22%	0%	0%		54%	0%	8%	0%
	PERA P&F	10%	38%	2%	6%	39%		0%	5%	0%
	SPTRFA	2%	11%	0%	0%	0%	0%		87%	0%
	TRA	14%	59%	2%	0%	0%	1%	24%		0%

This table provides some insight about the movement of Vested Terminated members that return to active employment in another Minnesota statewide pension plan. For example, the data shows that among MSRS General Vested Terminated members who later gain coverage under another plan, 67% become active members in PERA General while 19% become TRA active members. Note that each row sums to 100%.

[9] The "Other" category in the table includes the Judges, Legislators, and Unclassified retirement plans.

5 Appendix – Key Plan Provisions and Assumptions

5-1 Retirement Eligibility Provisions

Normal Retirement

Plans	Details
MSRS General, PERA General	First hired before July 1, 1989: Age 65 and three years of Allowable Service. First hired after June 30, 1989: The greater of age 65 or the age eligible for full Social Security retirement benefits (but not higher than age 66) and three years of Allowable Service. A Proportionate Retirement Annuity is available at Normal Retirement Age with one year of Allowable Service.
MSRS Correctional, PERA Correctional, PERA Police & Fire	Age 55 and at least partially vested.
MSRS State Patrol	Age 55 and vested.
MSRS Judges	First appointed as a judge before July 1, 2013 (Tier 1): (a.) Age 65 and five years of Allowable Service (b.) Age 70 (mandatory retirement age) First appointed as a judge after June 30, 2013 (Tier 2): (a.) Age 66 and five years of Allowable Service (a.) Age 70 (mandatory retirement age)
MSRS Legislators	Age 62 and vested.
SPTRFA, TRA	First hired before July 1, 1989 or retired after June 30, 2024: Age 65 and three years of Allowable Service. First hired after June 30, 1989 and retired prior to July 1, 2025: The greater of age 65 or the age eligible for full Social Security retirement benefits (but not higher than age 66) and three years of Allowable Service. Beginning July 1, 2024, the eligibility age is 65 for all members. A Proportionate Retirement Annuity is available at Normal Retirement Age with one year of Allowable Service.
MSRS Unclassified	N/A

Early Retirement

Plans	Details
MSRS General, PERA General, SPTRFA, TRA	First hired before July 1, 1989: (a.) Age 55 and three years of Allowable Service; or (b.) Any age with 30 years of Allowable Service; or (c.) Rule of 90: Age plus Allowable Service totals 90. First hired after June 30, 1989: (a.) Age 55 and three years of Allowable Service.
MSRS Correctional, PERA Correctional, MSRS State Patrol	Age 50 and vested.
PERA Police & Fire	Age 50 and at least partially vested.
MSRS Judges	Age 60 and vested.
MSRS Legislators	Age 55 and either six full years of service or service during all or part of four regular legislative sessions.
MSRS Unclassified	N/A

5-2 Vesting Provisions

Plans	Details
MSRS General, PERA General	Hired before July 1, 2010 or active on July 1, 2023: 100% vested after 3 years of Allowable Service. Hired on or after July 1, 2010 and terminated prior to June 30, 2023: 100% vested after 5 years of Allowable Service.
MSRS Correctional, PERA Correctional, PERA P&F	Hired before July 1, 2010: 100% vested after 3 years of Allowable Service. Hired after June 30, 2010: 50% vested after 5 years of Allowable Service; 60% vested after 6 years of Allowable Service; 70% vested after 7 years of Allowable Service; 80% vested after 8 years of Allowable Service; 90% vested after 9 years of Allowable Service; and 100% vested after 10 years of Allowable Service.
MSRS State Patrol	Hired before July 1, 2013: 100% vested after 3 years of Allowable Service. Hired after June 30, 2013: 100% vested after 10 years of Allowable Service.
MSRS Judges	Five years of Allowable Service.
MSRS Legislators	Either six full years of service or service during all or part of four regular legislative sessions.
SPTRFA, TRA	100% vested after three years of Allowable Service.
MSRS Unclassified	N/A

5-3 Augmentation Provisions

Plans	Details
MSRS General, MSRS Correctional	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971, to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier; (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; (e.) 2.00% from January 1, 2012 to December 31, 2018; and (f.) 0.00% thereafter.
MSRS State Patrol	Benefit is computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971, to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1, 2012; (d.) 2.00% after December 31, 2011, through December 31, 2018; and (e.) 0.00% thereafter.
MSRS Judges	N/A
MSRS Legislators	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1973; (b.) 5.00% from July 1, 1973, to January 1, 1981; (c.) 3.00% until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% until the earlier of January 1, 2012, and when the annuity begins; (e.) 2.00% from January 1, 2012 through December 31, 2018; and (f.) 0.00% thereafter.
MSRS Unclassified	N/A

Plans	Details
PERA General, PERA P&F	Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; or (e.) 1.00% from January 1, 2012 through December 31, 2018; and (f.) 0.00% thereafter. Members who terminate after 2011 will receive no future augmentation.
PERA Correctional	Benefit computed under law in effect at termination and increased by the following percentage (augmentation), compounded annually, if termination of employment is prior to January 1, 2012: (a.) 3.00% (2.50% if hired after June 30, 2006) until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (b.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; (c.) 1.00% from January 1, 2012 through December 31, 2018; and (d.) 0.00% thereafter. If a member terminates employment after 2011, they are not eligible for augmentation.
SPTRFA, TRA	Benefit computed under law in effect at termination and increased by the following percentage, compounded annually: (a.) 3.00% (2.50% if hired after June 30, 2006) until the earlier of January 1 of the year following attainment of age 55 and June30, 2012; (b.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and July 1, 2012; (c.) 2.00% from July 1, 2012 through June 30, 2019; and (d.) 0.00% thereafter.

5-4 Salary Increase Assumptions

By Years of Service

Year	MSRS General	MSRS Correctional	MSRS State Patrol	PERA General	PERA P&F	SPTRFA	TRA[10]
1	13.00%	11.50%	12.50%	10.25%	11.75%	8.00%	8.85%
2	9.00%	7.00%	8.50%	7.25%	9.25%	6.75%	7.10%
3	5.80%	5.00%	7.50%	6.00%	8.00%	6.50%	6.60%
4	5.40%	5.00%	7.25%	5.50%	7.00%	6.25%	6.35%
5	5.00%	4.75%	7.00%	5.00%	5.50%	6.00%	6.35%
6	4.90%	4.75%	6.75%	4.70%	4.80%	5.75%	6.20%
7	4.80%	4.75%	6.50%	4.50%	4.60%	5.50%	6.05%
8	4.60%	4.75%	5.50%	4.40%	4.30%	5.25%	5.90%
9	4.50%	4.50%	5.00%	4.30%	4.10%	5.00%	5.75%
10	4.20%	4.50%	4.50%	4.20%	4.00%	4.75%	5.60%
11	4.10%	4.50%	4.25%	4.00%	3.90%	4.50%	5.35%
12	4.00%	4.50%	4.00%	3.90%	3.80%	4.25%	5.10%
13	3.90%	4.25%	4.00%	3.80%	3.70%	4.00%	4.85%
14	3.80%	4.00%	4.00%	3.70%	3.60%	3.75%	4.60%
15	3.70%	3.75%	4.00%	3.65%	3.50%	3.50%	4.35%
16	3.60%	3.75%	3.75%	3.60%	3.50%	3.40%	4.10%
17	3.50%	3.75%	3.50%	3.50%	3.50%	3.30%	3.85%
18	3.50%	3.50%	3.50%	3.40%	3.50%	3.20%	3.65%
19	3.50%	3.50%	3.50%	3.40%	3.40%	3.10%	3.55%
20	3.40%	3.50%	3.50%	3.40%	3.40%	2.90%	3.45%
21	3.30%	3.25%	3.40%	3.30%	3.40%	2.70%	3.35%
22	3.30%	3.25%	3.30%	3.30%	3.30%	2.50%	3.25%
23	3.20%	3.25%	3.20%	3.30%	3.15%	2.50%	3.15%
24	3.20%	3.25%	3.10%	3.20%	3.00%	2.50%	3.05%
25	3.20%	3.00%	3.00%	3.20%	3.00%	2.50%	2.95%
26	3.20%	3.00%	3.00%	3.10%	3.00%	2.50%	2.85%
27	3.10%	3.00%	3.00%	3.00%	3.00%	2.50%	2.85%
28	3.10%	3.00%	3.00%	3.00%	3.00%	2.50%	2.85%
29	3.00%	3.00%	3.00%	3.00%	3.00%	2.50%	2.85%
>=30	3.00%	3.00%	3.00%	3.00%	3.00%	2.50%	2.85%

MSRS Legislators: 4.25%
MSRS Judges: 2.50%

[10] These are the salary increases assumed before July 1, 2028; different rates apply after June 30, 2028.

PERA Correctional

Age	Annual Increase
20	11.00%
21	10.50%
22	10.00%
23	9.50%
24	8.50%
25	7.75%
26	7.25%
27	7.00%
28	6.75%
29	6.50%
30	6.00%
31	5.75%
32	5.65%
33	5.60%
34	5.55%
35	5.50%
36	5.35%
37	5.20%
38	5.05%
39	4.90%
40	4.75%
41	4.60%
42	4.45%
43	4.30%
44	4.15%
45	4.00%
46	3.95%
47	3.90%
48	3.85%
49	3.80%
50	3.75%
51	3.70%
52	3.65%
53	3.60%
54	3.55%
55	3.50%
56	3.40%
57	3.30%
58	3.20%
59	3.10%
60+	3.00%