

# the end is just the beginning

Investing through a  
plan termination

## Key findings

- Building a plan termination investment strategy comes with a set of unique considerations that must be taken into account to have a successful outcome.
- This paper shows how following a formal five step framework to set, implement, and monitor the strategy can be a useful tool for actuaries and investment consultants/managers to employ.
- Flexibility, nimbleness and the ability to adapt the strategy as events unfold, data are updated, and market conditions change are critical.

## Abstract

With plan funded statuses at 15 year highs and plan terminations on the rise, plan sponsors and their investment consultants/managers need to be prepared to design appropriate investment strategies. While current hedging techniques are well known and employed, the unique situation that a plan termination presents requires differentiated solutions and a framework for addressing the challenges. In this article, we explore a five-step approach to hedging plan termination liabilities. We show how we believe a well-executed strategy can preserve funded status dollar amounts and limit financial surprises to plan sponsors upon ultimate liquidation of plan assets.

## Overview

When a plan termination is approved, the focus of the investment strategy changes to maintaining a tight asset-liability match to preserve the dollar funded status. The most important funded status measure to target also changes: rather than focusing on an accounting liability measure, the plan termination liability measure should be used.

The investment strategy must be prepared to pivot at certain key events throughout the plan termination process to ensure a tight asset-liability match is maintained. In particular, return-seeking assets should be liquidated soon after the plan termination style is initiated. Other portfolio adjustments should be made once the discount rates used to determine the lump sum payouts are locked into place, or when other new information becomes available.

Many interested parties will be involved in the successful completion of the plan termination. Regular reporting and clear and proactive communication is key to ensure the investment strategy is working as expected.

It is important to note that, while it is not possible to eliminate all risks, if a plan sponsor and their investment consultants/managers follow a clear and precise process and have full transparency with all parties involved, the likelihood that a plan termination investment strategy works as intended increases significantly.

## Background

Pension plan terminations are on the rise. According to the Mercer 2023 CFO Survey, over 62% of DB plan sponsors are considering terminating their defined benefit pension plans within the next 10 years. A key roadblock for many years has been the funded level of the plans – a pension plan typically needs to be overfunded on a financial reporting (e.g., US GAAP) accounting basis in order to terminate – and a lack of desire by plan sponsors to contribute additional cash to make up the difference. However, the significant rise in discount rates during 2022 increased plan funded status to its highest level in over 15 years. As of December 31, 2022, the average pension funded status for the S&P 1500 is 105%<sup>1</sup>, a 15-year high and an increase of nearly 10% during 2022, putting many plan sponsors in a position to terminate their pension plans without additional cash.

With more and more plan sponsors in a position to terminate their pension plans, it is important to have a framework for an appropriate investment strategy in place during the plan termination process. This paper outlines the key challenges that a plan termination brings relative to an ongoing or hibernating pension plan and how the investment strategy must adjust to accommodate these challenges. We will provide considerations for plan sponsors and investment consultants to develop a comprehensive road map and investment strategy in the context of a plan termination.

## What makes a plan termination investment strategy so special?

When a plan sponsor elects to terminate its defined benefit pension plan, the plan sponsor should also change its investment strategy approach. There are four key differences that make the investment strategy framework for a plan termination unique.

First, the objective of the investment strategy changes. For an ongoing or hibernating pension plan, the objective may be tied to increasing funded status or managing interest rate risk. During a plan termination, the objective changes to preserving the dollar funded status (e.g., preserving any surplus). Preserving the dollar funded status<sup>2</sup> is imperative as the plan sponsor does not want to be surprised when it comes time to liquidate the plan and pay lump sums to participants and purchase a group annuity from an insurer.

Second, the time horizon becomes very short. While an ongoing or hibernating plan may be operating under a time horizon extending for potentially decades, a terminating pension plan may only exist for 12 to 24 more months. This provides limited time to “course-correct” should adverse market conditions have a negative impact on an investment portfolio, which emphasizes the need to immediately reduce risk and preserve the funded status once the decision to terminate the plan has been made.

1. <https://www.mercer.us/newsroom/s-and-p-1500-pension-funded-status-increased-by-8-percent-in-2022.html>

2. Here we draw distinction between preserving funded status on a percentage basis and preserving funded status on a dollar basis. The investment strategies needed to accomplish either objective will be different unless the Plan is 100% funded. In a plan termination context, the dollar funded status is the most critical metric to control.

Third, the liability measure that is most important to track changes during a plan termination. For an ongoing or hibernating pension plan, an accounting liability metric (e.g., Accumulated Benefit Obligation, or “ABO”) is typically hedged as part of a liability-driven investment strategy. However, during a plan termination, the investment goalpost shifts to a plan termination liability (“PTL”) measure. The PTL should incorporate expected lump sums to be paid based on estimated lump sum conversion and take rates (or account balances in the case of a cash balance plan) and the estimated annuity purchase premium charged by an insurer for those remaining participants not taking lump sums. Because the PTL is typically higher than the accounting liability, continuing to use the accounting liability as the hedging liability once the decision to terminate the plan has been made results in the plan being underhedged and unknowingly exposed to additional interest rate risk.

Lastly, a plan termination investment strategy requires precise asset-liability matching and the nimbleness, even more so than in a standard hedging program mandate, to dynamically adjust as markets change and new information becomes available.

We lay out a framework for the design of a plan termination investment strategy that addresses each of these items.

## **How to design a plan termination investment strategy: A five step framework**

When setting, implementing, and monitoring a plan termination investment strategy, we believe in a five-step framework.

1. Characterize the liability
2. Identify the liability risk profile
3. Match the asset risk profile to the liability risk profile
4. Dynamically adjust over time
5. Provide regular reporting

We will discuss each step in more detail on the following pages.

### **Step One: Characterize the liability**

As previously mentioned, during a plan termination, the liability definition that the investment strategy should be managed against should shift away from an accounting liability to the plan termination liability (“PTL”).

The PTL is comprised of two distinct pieces: the annuity purchase portion (which is interest-rate sensitive throughout the entire plan termination process) and the lump sum portion (which is interest-rate sensitive through only a portion of the plan termination process, or not at all for cash balance plans).

The annuity purchase portion of the PTL should be developed with the methodology, assumptions, and regulatory requirements of the bidding insurance companies in mind. There are additional items that must go into the calculation of an annuity purchase premium (from the perspective of the insurer) compared to what must be included in a GAAP-type accounting liability. Some of these additional items include the present value of

future plan expenses, state guaranty association premiums, statutory capital requirements, and considerations for profit margin. In addition, insurance companies typically are more conservative in their assumption setting when valuing the plan's liabilities as compared to what the sponsor may have been recording in their financial statements. This is because the carrier has no recourse to receive additional funds if future experience emerges in an adverse way. This stands in stark contrast to ongoing plan assumption setting where adjustments can be made each year to better reflect emerging experience. In particular, plan actuaries should consider their mortality and discount rate assumptions. For example, a plan sponsor that uses an "above median" yield curve for the selection of a discount rate for financial reporting will see a higher annuity premium relative to the accounting liability of an otherwise equivalent plan that uses an unbiased bond universe to set their discount rate. This higher premium is simply the result of the plan sponsor using a higher discount rate assumption. While all steps should be taken to refine the estimate of the plan termination liability, the exact figure will not be known until the day final bids from the insurers are submitted, which unfortunately does not occur until the very end of the plan termination process in most cases<sup>3</sup>.

The lump sum portion of the PTL is primarily a function of two variables – how many participants will elect to take a lump sum (the "take rate assumption") and the discount rate used to convert the underlying annuity value to a lump sum (the "lump sum conversion rate")<sup>4</sup>.

In terms of the take rate assumption, when more participants elect to take a lump sum, the plan termination liability will generally be lower than if annuities had been purchased<sup>5</sup>. We often observe, in the context of a plan termination, the actual take rate for lump sums is higher than what might otherwise be observed in a plan-steady environment. However, take rates can vary widely depending on a number of factors, such as the plan's benefit formula, demographics, and whether the participants have had a chance to elect a lump sum previously. Because of the difficulty in estimating a precise take rate ahead of the lump sum election period, it is prudent to estimate a range of possibilities to get a sense of how the investment strategy may be impacted by varying take rates. If the actual take rate is lower than expected, there will be more liability required to be transferred to the insurer, and the plan sponsor may find themselves in a situation with lower funded surplus or a deficit ahead of the transfer of liabilities. If the actual take rate is higher than expected, there may not be enough cash set aside for lump sum payouts, requiring the liquidation of additional portfolio securities.

In terms of the lump sum conversion assumption, statutory provisions typically mandate the discount rate and mortality assumptions. Given that statutory requirements allow for lookback and stability periods for setting the discount rate used to calculate the lump sums, these rates will eventually lock into place in advance of actual payout – in some cases, as far as 17 months in advance. Once these discount rates are locked, the lump sum liability is no longer interest rate sensitive. At this point, the best hedge for the expected lump sums is very short duration fixed income instruments, such as T-bills or even cash. We provide additional detail regarding this event later in this paper. For a cash balance plan, the cash hedge can be implemented once a plan termination decision has been made based on expected account balance distributions.

When investment consultants are developing an investment strategy for a plan termination, there are typically two methods to convert the accounting liability into the PTL for hedging purposes. The first method involves developing a set of PTL-specific cashflows. These cashflows will incorporate loads to adjust the accounting liability for the annuity premium, lump sum take rate, and lump sum mortality/discount rate assumptions, pursuant to the above considerations, and would be discounted back with a typical pension liability yield curve (i.e., AA yield curve) to determine the PTL. The second method involves adjusting the yield curve itself, such as by utilizing a more market-based yield curve (i.e., the entire investment grade universe, including treasuries, rather than AA-only) and/or applying a haircut of some fixed spread (e.g., 75 bps). The adjusted yield curve can then be applied against the un-loaded liability cashflows to determine the PTL.

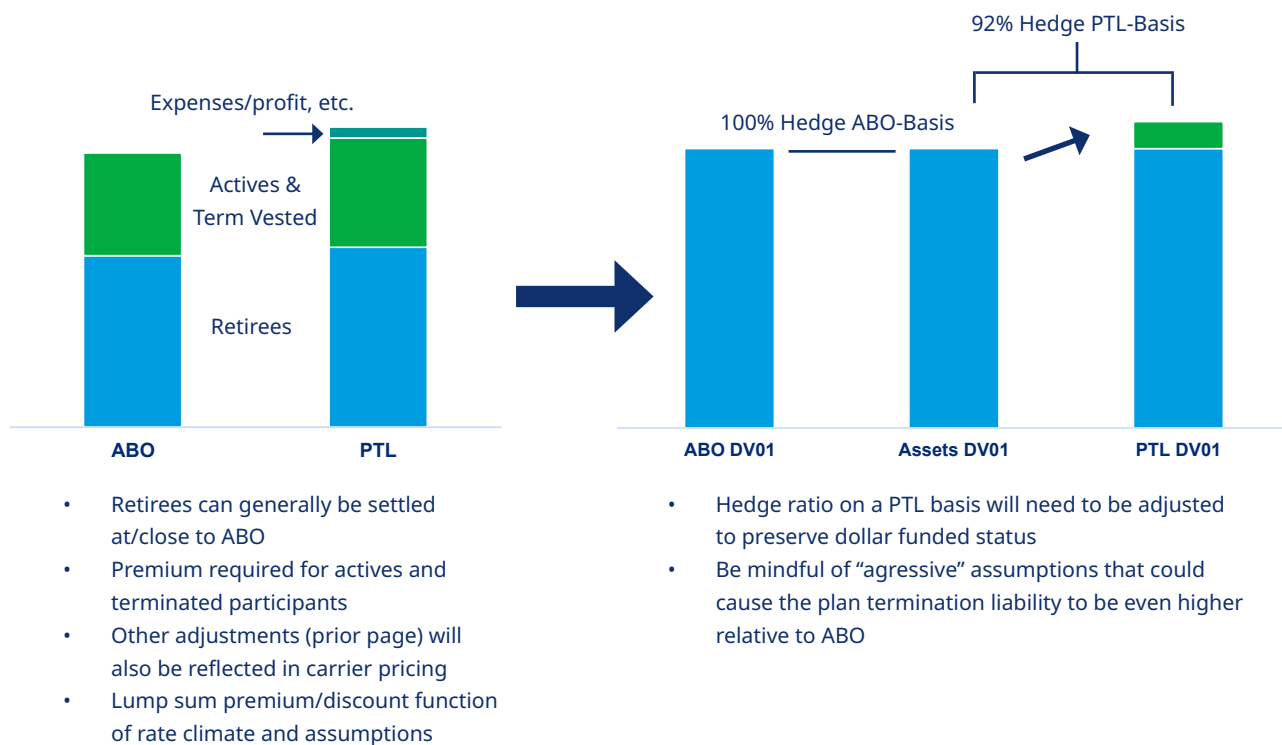
3. An emerging trend in plan terminations is the use of a buy-in transaction whereby annuity purchase premiums can be agreed to in advance.

4. In the case of a cash balance plan, the lump sums will be equal to the account balances and not subject to the interest rate basis.

5. This is because the valuation of a pension liability payable as a lump sum is generally lower than the valuation to secure that same pension liability via an annuity purchased from an insurance carrier. This phenomenon is driven by the factors discussed previously in this paper related to insurance carrier assumption setting.

Ultimately, changing from an accounting liability measure to a plan termination liability measure will have implications for the investment hedging strategy. Given that the PTL is typically higher than the accounting liability, a pension plan that may have been 100% hedged (on a dollar basis) targeting the accounting liability will now be underhedged against the PTL. This asset-liability mismatch will need to be corrected to maintain a tight hedge of the liability and preserve the funded status of the plan ahead of termination. We discuss the first part of this process in Step 2.

**Exhibit 1.** Illustration of hedging strategy before and after adjustment in liability from financial reporting to PTL



Source: Mercer. For illustrative purposes only.

## Step Two: Identify the liability risk profile

With the liability measure redefined, an analysis of how well the current investment portfolio aligns with the PTL should be performed.

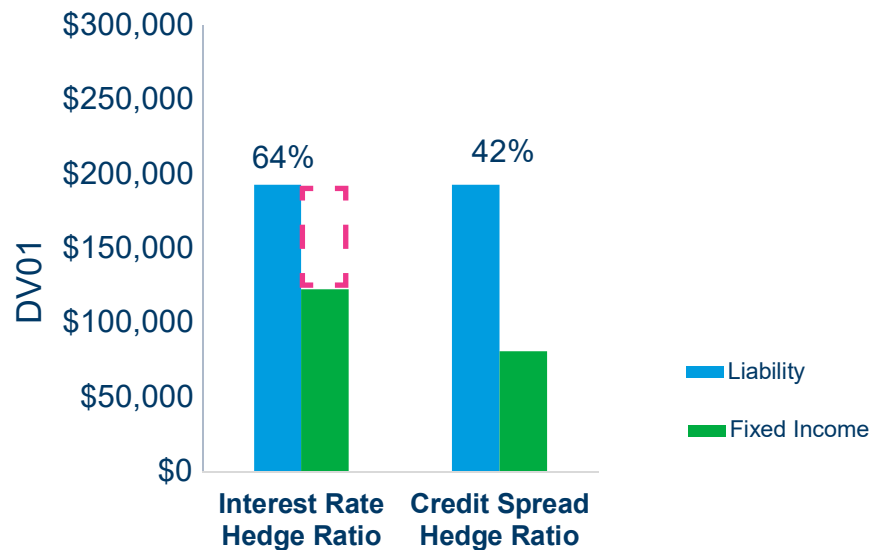
The key metric used to assess the asset-liability fit is the DV01. DV01 is a measure of interest rate sensitivity, defined as the dollar value change due to a 1 basis point parallel shift in interest rates. In a liability-driven investment program, dollar changes in the liability due to changes in interest rates are replicated in the liability hedging portfolio.

This allows the dollar movement of assets to closely mirror the dollar movements in liabilities as interest rates change, significantly reducing funded status volatility. Exhibit 2 shows DV01s and hedge ratios in a stylized

example for a plan that has changed their liability measure to PTL, but prior to adjusting the investment program.

In this example, a 64% interest rate hedge ratio means that for every \$1 change in liability due to parallel shifts in overall interest rates, the assets are expected to move about 64 cents. The credit spread hedge ratio further refines this to changes in corporate credit spreads rather than overall rate changes. Because accounting liabilities have a discount rate that is based on Corporate AA yield curves, the liability can change due to credit spread tightening or widening even if government bond yields remain unchanged. The degree to which the fixed income assets represent a similar credit spread sensitivity to the liability is represented by the credit spread hedge ratio.

**Exhibit 2.** DV01s and hedge ratios for interest rates and credit spreads



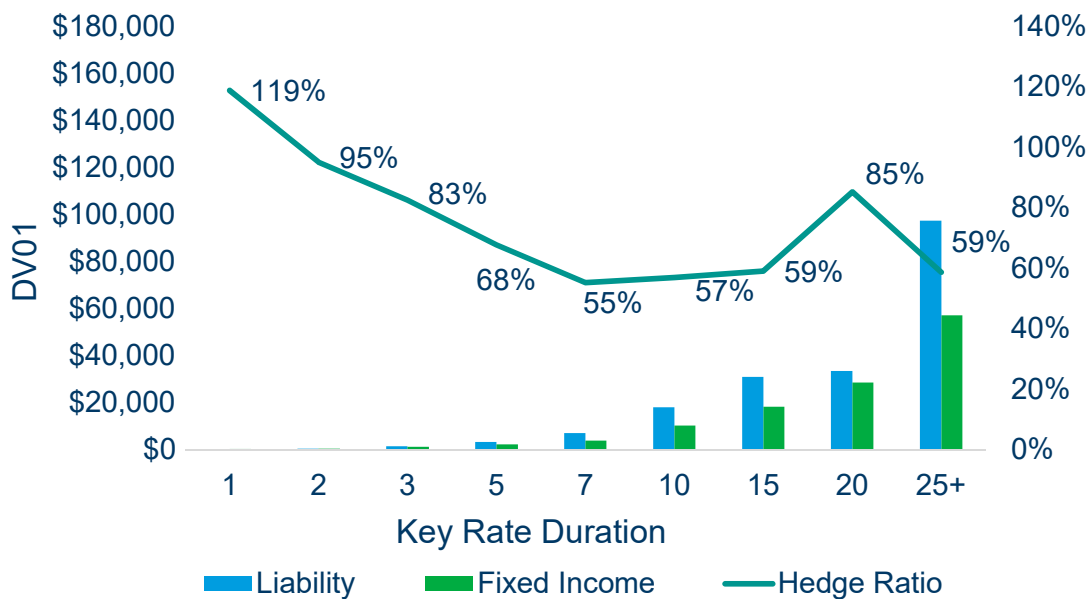
Source: Mercer. For illustrative purposes only.

In Exhibit 3, we observe how the DV01 sensitivities stack up at various points along the yield curve, also known as key rate durations. While the overall durations in Exhibit 2 provide sensitivity of the assets and liabilities for parallel shifts in the entire yield curve, key rate durations give us the interest rate sensitivities assuming the yields at key points in the yield curve change but other points along the yield curve remain fixed. For example, at the 1 year key rate duration, a 1 basis point shock to the 1 year interest rate will change assets by 119% of the change in liabilities. On the flip side, at the 25+ year key rate duration, a 1 basis point shock to the long end of the yield curve will change assets by 59% of the change in liabilities. The unevenness of the hedging profile across the yield curve exposes the hedging program to non-parallel shifts and yield curve re-shaping. This was a particularly acute issue during 2022 as the short end of the yield curve increased significantly relative to the long end of the curve (a flattening of the curve).

Ultimately, after updating the liability measure, performing the analysis, and reviewing the hedging metrics, this illustrative investment strategy leaves much to be desired. There is a significant mismatch in how the assets and liabilities will perform as a function of the three critical risk factors we reviewed: interest rate hedge ratio, credit spread hedge ratio, and key rate duration hedge ratios.

Now that we understand where gaps exist in the investment hedging program, we can take steps to remediate them. Step 3 will discuss options for optimizing the asset portfolio to match the plan termination liability risk profile.

**Exhibit 3.** Key rate duration profile



Source: Mercer. For illustrative purposes only.

### Step Three: Optimize the asset risk profile to match the liability risk profile

With portfolio gaps identified, steps should be taken to optimize the portfolio to help satisfy the ultimate goal of protecting the funded status of the plan.

The illustration on the following page (Exhibit 4) stylizes what we believe an optimal hedging strategy may look like. Once optimized, the DV01s are aligned across the curve at each key rate duration and in aggregate, with both the interest rate and credit spread hedge ratios at approximately 100%. With a 100% hedge ratio, the interest rate characteristics of the assets closely match those of the liability, insulating the plan from interest rate risk.



**Exhibit 4.** Optimized PTL hedging strategy



Source: Mercer analysis using data from Q1 2022 Mercer Stable Value survey, Federal Reserve Bank of St. Louis, Bankrate, MercerInsight

Before discussing options to achieve the better matching characteristics shown above, we would be remiss if we did not first discuss the role (or lack thereof) that return-seeking assets<sup>6</sup> play in an asset portfolio during the course of a plan termination. Return-seeking assets typically play no role once the decision to terminate has been made, and as a result, Exhibit 4 assumes that all return-seeking assets have been liquidated and re-deployed into the hedging portfolio. As previously noted, once plan termination has been approved, the plan may only exist for another 12 to 24 months, a period over which risk premiums are not reliably captured. In addition, the need for the asset portfolio to outpace the liability growth through asset return no longer exists as the plan sponsor typically expects to fund any remaining deficit with cash once a plan termination has been approved. For these reasons, the risk-return profile of return-seeking assets becomes unfavorable during a plan termination, so liquidation and re-deployment of any remaining return-seeking assets should take place as soon as administratively feasible once the decision to terminate the plan has been made.

With assets deployed or ready for re-deployment to liability hedging assets, several options exist for portfolio implementation to achieve the asset profile described in the above illustration<sup>8</sup>. Three of the most common implementation strategies include retaining the current manager line-up, adding a completion mandate, or consolidating managers to a single provider and building a custom credit portfolio.

6. Defined herein as any instrument that does not have exhibit hedging properties to the PTL. Stated differently, it would be all instruments other than Treasury bonds and corporate bonds.

7. While this illustration assumes a 100% credit spread hedge ratio, it may be reasonable to target a lower ratio (perhaps 80%) to protect against an asymmetric risk of widening spreads.

**Exhibit 5.** Common implementation approaches to implementing an optimal plan termination hedge strategy

Option	Pros	Cons
Retain current manager line-up	<ul style="list-style-type: none"> <li>Least disruptive</li> </ul>	<ul style="list-style-type: none"> <li>May not have enough precision in hedge portfolio</li> <li>May not need alpha generating managers given short time horizon and change in objectives</li> </ul>
Consider completion mandate	<ul style="list-style-type: none"> <li>Ability to fine tune hedging program</li> </ul>	<ul style="list-style-type: none"> <li>Use of derivatives/futures may introduce additional complexity</li> <li>Additional strategy to monitor and implement</li> <li>Additional fees</li> </ul>
Consolidate managers to single provider (custom credit)	<ul style="list-style-type: none"> <li>May provide tightest asset-liability match</li> <li>Single provider to facilitate execution of transaction</li> <li>May be cheapest fee</li> <li>Can implement custom credit in easiest fashion</li> </ul>	<ul style="list-style-type: none"> <li>Requires transition of assets from other providers to single vendor</li> <li>Manager concentration risk</li> <li>Results in additional transactional/trading costs to reposition the portfolio</li> </ul>

Source: Mercer

A reasonable first step to portfolio optimization by a plan sponsor may be to look to their current portfolio managers. If a plan sponsor is happy with its current manager line-up, and the managers have the ability to implement the plan termination portfolio, the plan sponsor may only need to adjust investment mandates or add additional strategies with the current managers to improve the liability hedging properties of the portfolio. This option is convenient, will not cause much disruption, and can be implemented quickly, perhaps even with passive strategies. However, the downside is that this option may not provide a tight enough asset-liability match, depending on the strategies and abilities of the current portfolio managers and the risk tolerance of the plan sponsor.

Another option to consider is a completion mandate. A completion mandate is an investment strategy in which a manager is hired to “complete” the portfolio by filling in the gaps in the hedging approach. This is most often done using derivatives, such as Treasury futures, and can be a powerful solution to fine tune a hedging strategy. However, the use of derivatives can add additional complexity and monitoring to the portfolio, as well as additional fees.

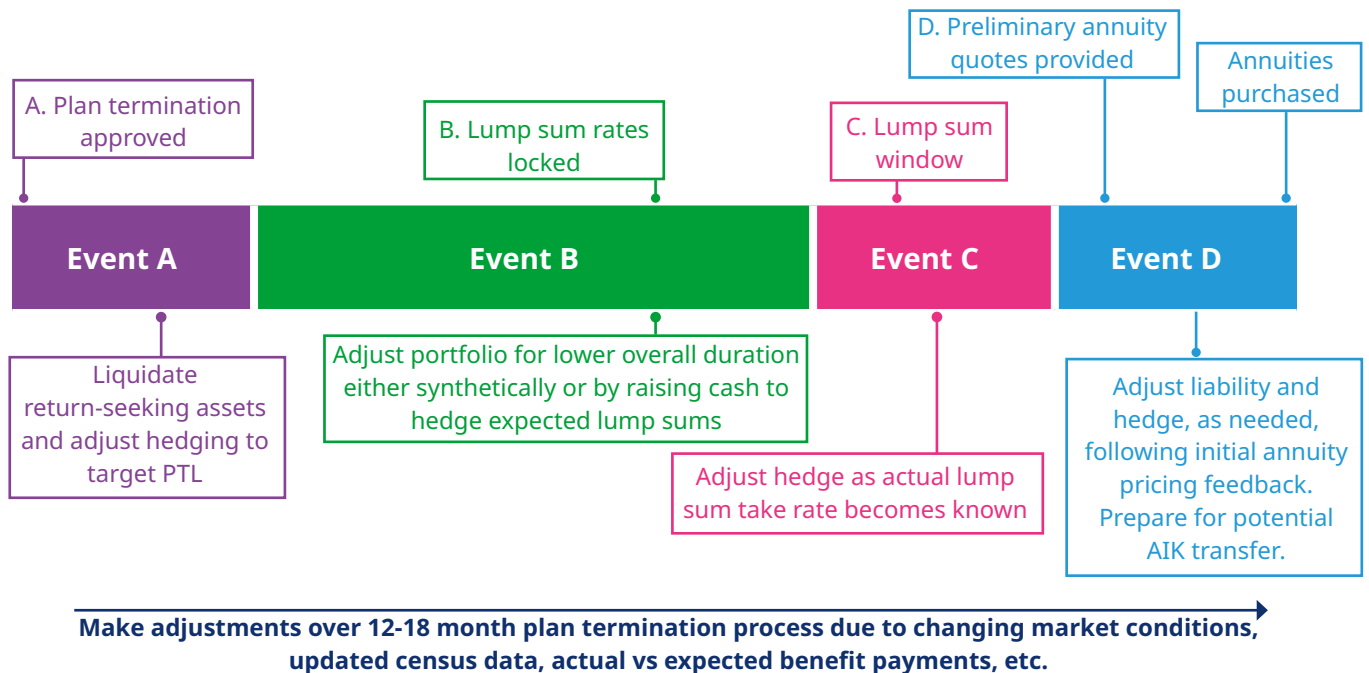
Lastly, the entire asset portfolio can be transferred to a single manager with the mandate to develop a custom hedging portfolio to the PTL benchmark – this is typically called a “custom credit” strategy. Due to the customized nature, this approach lends itself well to building the tightest portfolio to hedge the PTL as well as a simpler portfolio to eventually transfer in an asset-in-kind (AIK) transaction to an insurance carrier. It will also streamline reporting and management from the perspective of the plan sponsor. On the other hand, this strategy is one of the most disruptive as all portfolio assets will have to be transitioned away from multiple managers to one single manager. Due to the manager concentration risk that this strategy causes, the plan sponsor, as a fiduciary, must be comfortable with the single manager as they will become the sole provider responsible for managing the entire investment portfolio.

We generally see plan fiduciaries deciding between completion and custom credit and moving away from their current manager lineup. We therefore focus more on this comparison. When attempting to choose between a completion manager versus a custom credit strategy, several different criteria can be utilized including but not limited to: degree of desired customization to best replicate carrier annuity pricing which in turn is influenced by the carrier’s underlying investment portfolio, views on the benefits of manager consolidation, portfolio asset size, and the likelihood of the annuity purchase being executed via an asset-in kind (AIK) transaction as compared to a cash transaction. With regard to the last criteria, insurers may be more likely to offer premium discounts for AIK portfolios that include bonds with higher book yields and larger lot sizes. They may also place restrictions on certain sectors like the financial industry and have limitations on BBB-rated bonds.

### Step Four: Dynamically adjust over time

Once the portfolio is optimized, there is still a continual need to monitor and adjust as markets change and the liability measure itself changes. In particular, we believe there are four discrete events over the plan termination process that deserve special attention. Exhibit 6 below illustrates these events, which we will walk through individually in more detail.

**Exhibit 6.** Dynamic adjustments to hedging strategy at discrete events and over time



Source: Mercer. For illustrative purposes only.

Event A refers to the decision to terminate the plan. Once the decision to terminate has been made and approved, the primary objective of the investment strategy becomes preserving the funded status over the plan termination time horizon. To achieve this, soon after the decision to terminate has been made, return-seeking assets should be liquidated and the hedging program should be adjusted from hedging the ABO to hedging the PTL.

Event B refers to the locking in of the discount rates used to determine the lump sum payouts as part of the plan termination process. As previously mentioned, due to statutory requirements that allow for lookback and stability periods for determining the discount rate used to calculate lump sums, these rates may lock into place as far as 17 months in advance of actual payout. Once these discount rates are locked, the lump sum liability is no longer interest rate sensitive. Because of this, the overall duration of the PTL may decrease, potentially significantly, and adjustments must be made to the investment portfolio to compensate and maintain the proper hedge. The most common adjustment is to transition the amount of expected lump sum payouts into cash, but other strategies, such as synthetically reducing duration, are also available. For pure cash balance plans, this transition can occur at the outset of the plan termination process.

Event C refers to the actual elections and payout of the lump sums as part of the plan termination process (typically called a “lump sum window”). This is an important event as the actual amount of lump sum payouts will become known – as such, adjustments must be made to the hedging strategy depending on actual take rate. Recall that prior to the actual lump sums being paid, assumptions must be made about the take rate. More cash may be needed if more lump sums are elected than expected, or cash may need to be repositioned into liability hedging assets if fewer lump sums are elected than expected. In either case, as the lump sum window progresses, it is important to monitor lump sum elections and react accordingly.

Event D follows closely to the lump sum window and refers to the receipt of the preliminary annuity premium bids from insurers. In a typical annuity pricing process, there is at least one round of preliminary bidding that takes place. If there are significant aberrations or material differences between the estimated annuity pricing baked into the PTL and the preliminary bids that are provided by the insurers, a change in hedging strategy may be warranted. However, it should be noted that preliminary bids typically represent higher premium amounts than the best and final bids.

While these four events are significant enough to warrant special discussion, it is important to remember that the hedging strategy should be continuously monitored and adjusted as needed over the full 12 to 24 month plan termination process. For example, there may be changes in market conditions, census data, and liability assumptions that warrant an adjustment to the hedging program, especially when working under a compressed timeline. Clear communication and regular reporting with all interested parties will help to prevent any surprises and allow for timely adjustments. We will discuss communication and reporting in Step 5.

## Step Five: Provide regular reporting

A plan termination is a long and complicated process with many stakeholders directly or indirectly involved who have an interest in a successful outcome. Regular reporting is important to ensure that the project stays on track and that key goals, such as maintaining the funded status, are met.

There are numerous ways to report investment performance in a plan termination context. Usually, key committees will want to engage with regular standard performance reporting (typically quarterly but it can be more or less frequent), but with a shift in focus to the dollar funded status along with an attribution of changes from quarter to quarter to ensure that the hedging portfolio is performing as designed.

Outside of regular reporting, there may be additional reporting to various stakeholders, such as at each of the key events previously discussed. Ultimately, reporting should be regular and include accurate and appropriate information for the various stakeholders involved.

## Additional considerations

In addition to the investment strategy framework, there are several operational and procedural items that are investment-related and tend to arise in these types of transactions. We highlight them because, if not proactively addressed, they can derail the process and cause material slippage in the hedging portfolio.

First, consideration should be given to governance structure, particularly with investment committees who typically hold the authority to provide approval for changes to asset allocation. Often times, there are delays in decision making due to the time required to gather committees and make decisions when portfolio changes are needed in relatively short timeframes, which can create challenges down the road. Therefore, it is best to stay ahead of these changes, especially as the key events outlined above are approaching. This is where having clear lines of communication among all stakeholders is key so that all are on the same page and that any action steps required for the investment portfolio are not delayed.

Second, depending on the implementation strategy selected and manager structure, investment manager agreements and other contracts may need to be updated to reflect new mandates, new cash flows, and new hedging targets. While the updates may be relatively straightforward, they can take time and need to be completed correctly from a governance and fiduciary point of view.

Similarly, investment policy statements may also require updates to make them plan termination specific. This may include changing hedge ratio targets, performance metrics, or other items as needed.

Finally, consideration to the language and definitions used for communication purposes is important given the variety of stakeholders and third-parties involved in a plan termination. Clear, precise, and efficient communication and coordination across all parties is vital to a successful plan termination process and liability hedging program. The more integrated and aware that the various teams are, the better the investment strategy will perform.

## Case study<sup>9</sup>

To illustrate the framework and principles laid out in this paper, a brief case study is presented.

As background, the client sponsors a large pension plan, frozen in 2008, that is material to the overall company. Prior to 2020, the plan portfolio was invested in a 55% return-seeking, 45% liability hedging asset allocation.

In 2020, the funded status of the plan rose to approximately 100%. At that time, the client decided to rebalance to a 30% return-seeking, 70% liability hedging asset allocation, primarily driven by the desire to lock-in funded status gains. However, the client was not overly concerned about the hedging strategy and took a “blunt” approach to liability hedging as opposed to fine-tuning credit and curve fit.

In 2021, the client became more serious about considering plan termination and conducted a feasibility study, in part to get a refined estimate of the PTL. The PTL was estimated to be \$453 million, which was a premium of 4% over the ABO that had previously been used as the hedging target. The market value of assets were \$475 million, resulting in a funded surplus of \$22 million, on a PTL basis. The client decided to proceed with termination and passed a board resolution to approve the decision. As such, the investment strategy mandate now focused entirely on maintaining the \$22 million funded surplus throughout the rest of the plan termination process.

9. This case study is presented for information purposes only. The case study is an illustration of the type of investment services Mercer offers. Client results will vary and there can be no guarantee of similar results.

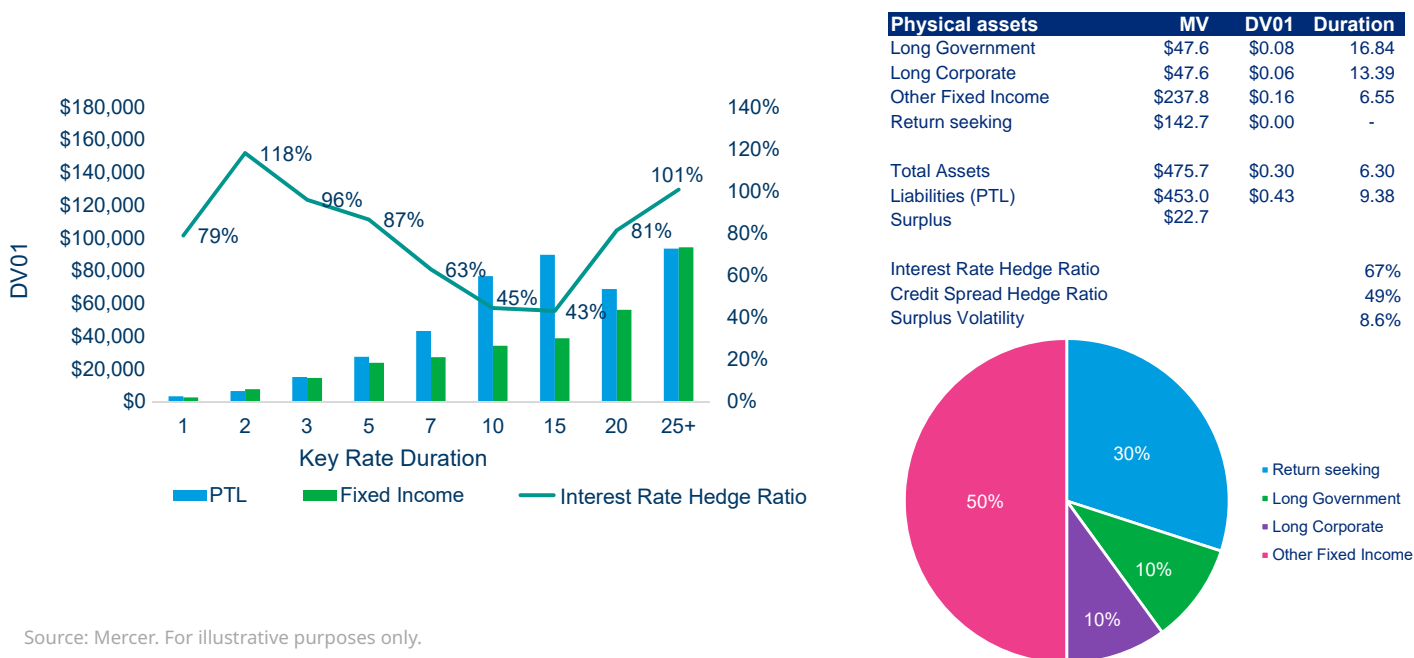
## Steps 1 and 2

Steps 1 and 2 of the framework outlined in this paper are combined here for convenience. Once the PTL estimate was provided by the actuary, the PTL became the new liability benchmark and the investment strategy needed to be adjusted to hedge the PTL.

At this point in time, the lump sum discount rates had not yet been locked into place. Therefore, the lump sum portion of the liability remained interest-rate sensitive. As such, the investment strategy needed to hedge both the lump sum and annuity portions of the PTL, and it would be premature to transfer the lump sum portion of the PTL to a shorter duration hedge, such as T-bills or cash.

With the PTL developed, a gap analysis was performed to determine how well the current asset portfolio stacked up against the PTL. We show the results in Exhibit 7. The overall interest rate hedge ratio was approximately 67% and there was significant mismatch along the various key rate durations across the yield curve. The surplus volatility (a measure of a 1 standard deviation change in funded status) was 8.6%. In other words, under a 1 standard deviation adverse scenario, the funded status of the plan (measured using the PTL) could decline from 105% to 96%, resulting in a loss of the entire funded surplus and creating a funded deficit. Given the client had not previously been focused on fine-tuning the hedging program, these results were not unexpected. Now with focus squarely on preserving the funded surplus of \$22 million, the portfolio needed to be repurposed.

**Exhibit 7.** Investment portfolio and hedging details pre-plan termination



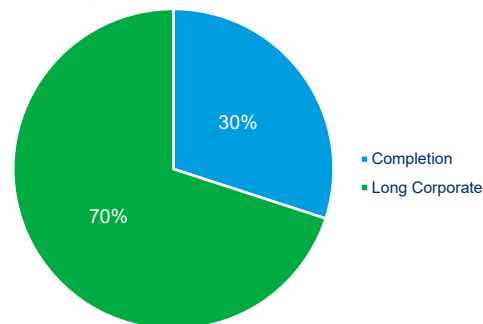
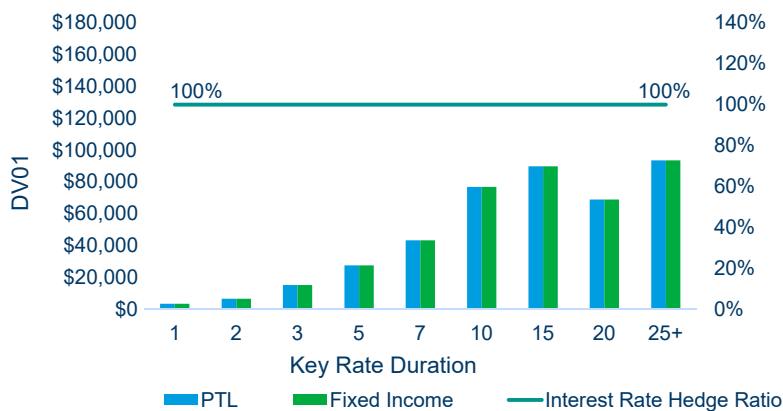
Source: Mercer. For illustrative purposes only.

### Step 3

To optimize the portfolio, the client elected to liquidate all return-seeking assets and increase long-duration hedging assets in the portfolio to better hedge the interest rate risk of the plan. In addition, the client decided to extend the investment mandate with one of its managers to include a completion portfolio in order to fill in remaining hedging gaps after performing an analysis of transaction costs and comparing with other implementation features, such as custom credit. Overall, the results of the hedging program were much improved, with the interest rate hedge ratio increasing to 100%, a tight fit across the curve, and the surplus volatility reducing to 3%. The credit hedge ratio also was improved from 49% to 80%.

**Exhibit 8.** Optimized investment portfolio for plan termination

Physical assets	MV	DV01	Duration
Long Corporate	\$333.0	\$0.45	13.39
Completion	\$142.7	-\$0.02	0.00
Cash	\$0.0	\$0.00	-
<b>Total Assets</b>	<b>\$475.7</b>	<b>\$0.43</b>	<b>9.38</b>
Liabilities (PTL)	\$453.0	\$0.43	9.38
Surplus	\$22.7		
Interest Rate Hedge Ratio			100%
Credit Spread Hedge Ratio			80%
Surplus Volatility			3.0%

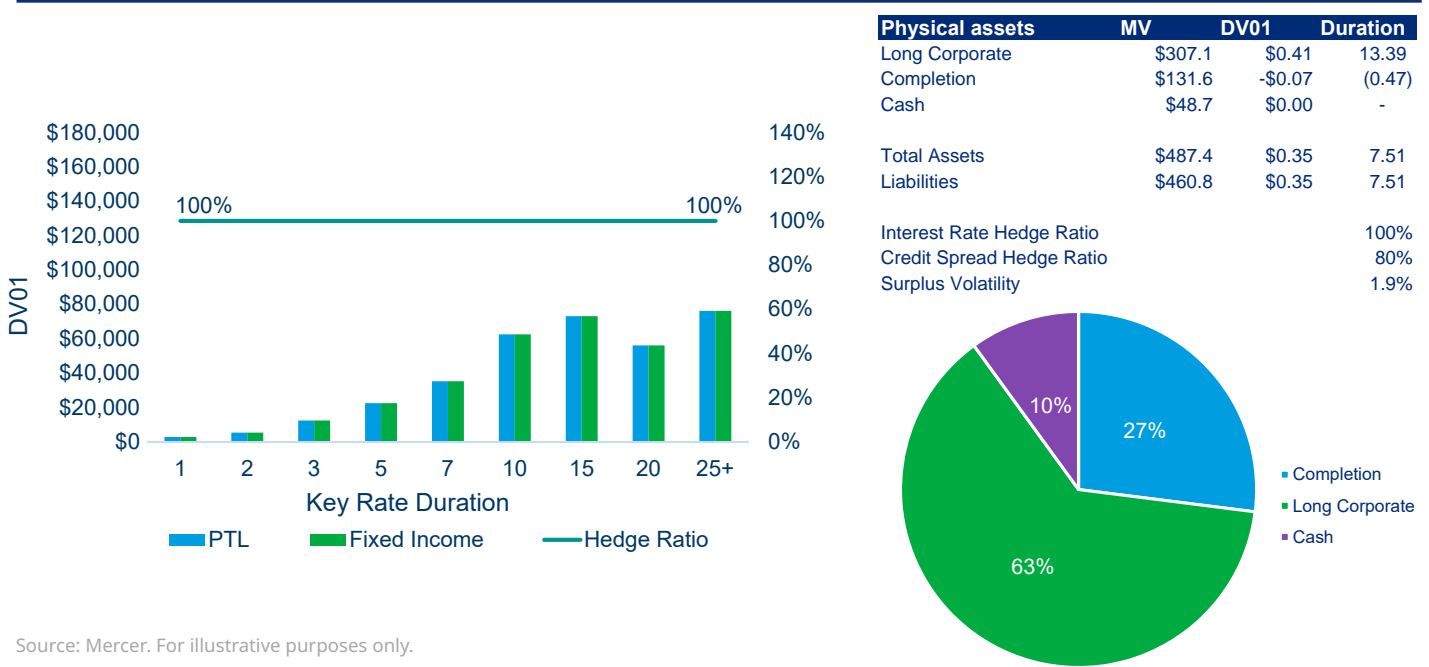


Source: Mercer. For illustrative purposes only.

### Step 4

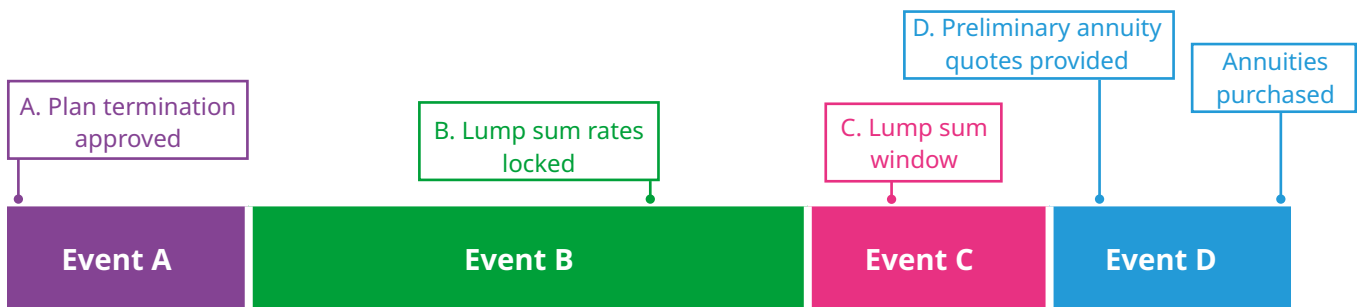
After some time had passed, the lump sum rates eventually locked into place, meaning the lump sum portion of the PTL was no longer interest rate sensitive. This caused a sharp decrease in liability duration (from 9.38 to 7.51), requiring a dynamic adjustment of the hedging portfolio. In this case, the client elected to sell a portion of the fixed income assets to raise cash to pay out expected lump sums. Because lump sum rates are actually based on a monthly average rather than a point-in-time, the portfolio was liquidated evenly throughout the month to better approximate the actual discount rates that will eventually be used to calculate the lump sums. This resulted in approximately \$49 million being transferred to cash, with the remaining assets rebalanced to realign the hedge post-lump sum rate lock.

**Exhibit 9.** Optimized investment portfolio for plan termination after lump sum interest rate lock



Source: Mercer. For illustrative purposes only.

At this point, the client had moved through two of the important steps in the plan termination process (plan termination approval and the locking of lump sum rates). However, additional adjustments will still be needed with more key events on the horizon (lump sum window and preliminary annuity bids). These events will occur over the next several months, and we will be closely monitoring the portfolio as they approach.



Source: Mercer. For illustrative purposes only.

↑  
Currently here



## Step 5

Throughout the entire plan termination process, reporting was simplified for the investment committee, who preferred clean and concise quarterly reporting of the funded position on a PTL basis. Hedging portfolio details were included in the appendices along with more detailed performance reporting. Some reporting examples are shown below, which show a range of potential annuity pricing outcomes and the resulting funded surplus.

December 31, 2021 (\$ Millions)	Downside	Base Case	Upside
1. Current Assets	487.4	487.4	487.4
2. Plan Term Liability	471.3	460.8	451.0
<i>a. Annuity Premium</i>	438.8	419.9	401.5
<i>b. Lump Sum</i>	32.5	41.0	49.6
<b>3. Cash (shortfall)/Surplus (1. - 2.)</b>	<b>16.0</b>	<b>26.6</b>	<b>36.4</b>

March 31, 2022 (\$ Millions)	Downside	Base Case	Upside
1. Current Assets	463.0	463.0	463.0
2. Plan Term Liability	447.8	437.8	428.4
<i>a. Annuity Premium</i>	415.2	396.7	378.9
<i>b. Lump Sum</i>	32.5	41.0	49.6
<b>3. Cash (shortfall)/Surplus (1. - 2.)</b>	<b>15.2</b>	<b>25.2</b>	<b>34.6</b>

June 30, 2022 (\$ Millions)	Downside	Base Case	Upside
1. Current Assets	416.7	416.7	416.7
2. Plan Term Liability	398.5	389.6	381.3
<i>a. Annuity Premium</i>	366.0	348.6	331.7
<i>b. Lump Sum</i>	32.5	41.0	49.6
<b>3. Cash (shortfall)/Surplus (1. - 2.)</b>	<b>18.2</b>	<b>27.1</b>	<b>35.4</b>

Source: Mercer. For illustrative purposes only.

## Conclusion

A pension plan termination is a complicated process with many moving parts. While the time horizon of the plan termination process is short relative to the overall life of the plan, these are arguably among the most important 12 to 24 months in the pension plan's existence. There is only one opportunity to get it right with very little time to course-correct. Therefore, it is imperative that the plan sponsor has a sound investment strategy in place to navigate the challenges that plan termination brings. Even if a plan sponsor already has a liability hedging strategy in place, the investment strategy should still be revisited and adjusted as needed to align with the different targets and goals of a plan termination. When all parties involved – the plan sponsor, actuaries, counsel, and investment consultants/managers – work together seamlessly on the plan termination process, it becomes much more likely that the process results in a successful outcome.

## Contributors

### Lead author

**David Cantor, CFA, FRM, ASA**

Principal, Pension Strategy & Solutions Group  
david.r.cantor@mercer.com

### Key contributors

**Kevin Armant, CFA, EA, ASA**

Partner, Pension Strategy & Solutions Group  
kevin.armant@mercer.com

**Nathan Benya, ASA**

Associate, Pension Strategy & Solutions Group  
nathan.benya@mercer.com

**Chris Ebersole, FSA, CFA**

Principal, Pension Strategy & Solutions Group  
chris.ebersole@mercer.com

**Patrick Graham, FSA, EA, CFA, CERA**

Principal, Pension Strategy & Solutions Group  
patrick.graham2@mercer.com

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