

California Debt and Investment Advisory Commission

Webinar Transcript

Understanding Cash Flow and Cash Flow Forecasting

February 21, 2019

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Title Slide – Understanding Cash Flow and Cash Flow Forecasting

ROBERT BERRY: Good morning, everyone, and welcome to the California Debt and Investment Advisory Commission's webinar *Understanding Cash Flow and Cash Flow Forecasting*. My name is Robert Berry, and I'm the deputy director here at CDIAC. Before proceeding any further, if you're experiencing any technical problems, please contact GoToMeetings at 1-877-582-7011, or you can try the website address on the screen. There's some troubleshooting tips there that could help you.

Understanding Cash Flow and Cash Flow Forecasting is a webinar built from a well-regarded session presented at CMTA and CDIAC's *Fundamentals of Public Funds Investing* program that we did back in January in Riverside, California. Cash flow forecasting was just a single subject amongst 14 separate sessions that we covered over a two-day program. And if you were not able to attend the investing fundamentals program back in January, and this webinar sparks your interest to know more about other investment-related investment management topics, CDIAC has a number of different resources that I want to point out to you available on our website.

First, the presentation slides for today's session are available in the Handouts section of your control panel, and then in a few days or shortly thereafter, we'll post them on the CDIAC website. Next, a replay of this webinar will be posted in our library of webinars on CDIAC website in two to three weeks. There's also quite a number of investment-related topics covered in our webinar library, including our 2015 webinar series that covered each permitted investment in the public portfolio. Also, the 2019 edition of CDIAC's *Local Agency Investment Guidelines* and our *California Public Investment Primer* are currently linked on CDIAC's main web page in the lower left hand column.

Just a few more notes before we begin the session. If you would like captioning during the program, you may paste the address into your browser that appears on the screen or click on the link in the Chat section at the bottom of the control panel.

Also, I want to draw your attention to an upcoming webinar – we'll talk a bit more about it at the end – an investment webinar on benchmarking. Registration and details on that webinar are available on CDIAC's website as well.

If you would like a certificate of attendance for CPE credit, you must be registered and logged into the webinar under your own name, and a certificate will be emailed to you in about a week.

You will have the ability to submit questions to the presenters using the box marked Questions near the bottom of your control panel. You may submit questions at any time. But for this session

we've decided to hold the questions for a Q&A session at the end of the presentation. If we run out of time for all the questions, we will follow up with responses after the webinar. So with the formalities out of the way I'd like to introduce our presenters for today.

Slide 2 – Presenters**03:39**

ROBERT BERRY: Carlos Oblites is a senior vice president and portfolio strategist at Chandler Asset Management. He is responsible for building and maintaining client relationships with public agencies along with participating actively in the portfolio management process. Mr. Oblites has over 20 years of investment and financial experience focused largely on managing short-term fixed income and pension strategies for governmental and institutional nonprofit clients. Prior to joining Chandler, Mr. Oblites served as the administrative services manager at the Central Marin Sanitation Agency and was responsible for all aspects of the agency's financial, human resources, administrative support and information systems activities.

And also joining us today is Genny Lynkiewicz. Genny is a vice president and portfolio manager at Chandler Asset Management. She is responsible for implementing portfolio strategy and securities trading and client accounts. Ms. Lynkiewicz has over 18 years of experience in the finance industry, specializing in fixed income investments. Prior to joining Chandler in 2015, Ms. Lynkiewicz worked at BMO Asset Management in Chicago, where she managed over \$8 billion in taxable money market funds, securities lending portfolios and separately managed accounts.

I think we'll kick this off. Carlos, I believe you're up first.

Slide 3 – Cash Flows Webinar – Cash Flow Analysis**05:02**

CARLOS OBLITES: Thank you very much. Let's go ahead and skip to the next slide so that we can start our conversation.

Slide 4 – How Much Liquidity Is Enough? Do your Investments Meet Cash Needs**05:06**

CARLOS OBLITES: Really, the purpose of today's slides and discussion is to get your mind thinking about how to approach answering some really crucial questions when you have idle cash, when you have reserves that need to be invested but you need to figure out how to structure those funds so that you have optimization and you have liquidity. And to that effect, I present to you our first slide, which is with a question at the top. Take a look at the way this particular portfolio is invested from a maturity perspective and also take a look at... that's matched up with the known cash outflows you have projected for the next coming five years or so. This is just for illustrative purposes, but in this particular case, you have a lot of funds in overnight, \$35 million. You've got \$20 million in one day out to one year, between one and two years \$10 million and so forth. And then you can see how that matches up against your cash flows. And the question here is: do your investments meet your cash needs? The answer to that, of course, is that given that you have so much liquid, so much of it in overnight investments, and even in the one day to one-year bucket, it seems like you have cash available, and it's there and available for future cash flow needs. Let's go to the next slide.

Slide 5 – How Much Liquidity Is Enough? Are Your Investments Optimized for Returns?**06:43**

CARLOS OBLITES: It's the exact same slide, but the question changes, which is: are your investments optimized for returns? So, again, it's the exact same amount. You have a lot of liquidity. You have a lot of funds available on demand or in a short time after overnight, but the question goes towards return.

So most of us are aware that when you look at interest rates and you look at fixed income investments, which is what California Government Codes are allowed to purchase for their investments, we generally know that when we chart out the yield of various securities, various maturities of securities, those yields are higher the longer that you lock up your money. That's just called the term structure of interest rate. If I put my money to work for me in a Treasury bond out in the five-year range, that should pay me a higher yield than if I keep it in a three-month T-bill, and simply because I'm locking up my money and there's an opportunity cost for locking up my money, and you should be compensated for that opportunity cost.

So we go back to the question of the slide, which is: are your investments optimized for return? Generally speaking, the answer to that is probably no. It is not because, with all this liquidity that you have in this example in overnight, you're getting paid the least amount of money for that amount of cash, and you don't need that much available as you can see when you match it up to the cash flows. So the idea here, let's go ahead and go to the next slide.

Slide 6 – How Much Liquidity Is Enough?

08:25

CARLOS OBLITES: You need to determine when you're going to build out your investment portfolio, you need to determine how much liquidity is enough because there's a cost to insufficient liquidity, and there is a cost to too much liquidity. I've listed down some examples. If you have insufficient liquidity, if there's not enough available when you need it, you may have a case where you have delayed payments to vendors and that's never good. That usually brings on some sort of penalty. You may have to do like the United States government does. They don't do a very good job of timing their cash flows. They have to borrow on the short-term to be able to cover those cash flows until cash actually comes in from planned revenue. So you may have additional borrowing costs associated with insufficient liquidity. If you don't have enough liquidity available, you may have to liquidate securities. Sometimes that incurs transaction costs. More often than that, it exposes your portfolio to forces in the bond markets, and maybe the markets moved in your favor but maybe they moved against you, and you may take losses to generate that liquidity. And obviously, sometimes, if you do this long enough and it's too egregious, you could get negative headlines as a result of it.

From an excess liquidity, if you're carrying too much liquidity, the cost there is that you are leaving money on the table. I had a longtime client who used to call that... it was the cost of doing nothing. You're not getting paid for that money, and if your portfolio is sizable, that lost income can be sizable as well. I don't know about too much bad press about having too much liquidity. Typically, you see that more in the private sector when people look at a corporation's cash and try to determine whether they're using that cash to generate their business activities. Less people look at a public agency at that manner, but indeed, you can be accused of having too many reserves.

Sometimes, it can go bad for you during negotiations with labor unions because they look at all the cash in your reserves and say, "Wow, look at all this idle cash and you have it available and

you're not able to concede what we're looking for." These are just some examples. This is an exercise in having enough liquidity to meet your needs. In fact, let's go to the next page.

Slide 7 – How Much Liquidity Is Enough? Most Crucial Questions

11:01

CARLOS OBLITES: This is an exercise in having enough liquidity but not leaving money on the table. So here are the questions you will ask yourself, which are: first and foremost, when you're investing, you have goals that are mandated by California Government Code. They are, in order, safety then liquidity and then return. So the first question you have to ask yourself is: when I build out my portfolio, am I meeting my mandated goals of safety and liquidity? And that's before I even think about return. Secondly, the question you want to ask is: when I structure out this portfolio, will I have cash available when I need it? And then the third question you're going to want to ask yourself is: am I earning as much as I could?

One crucial thing to state here, when we talk about liquidity, there are many definitions to liquidity. Liquidity can be a large secondary market where I can turn around and sell a security and I can have the cash available the next day and that's liquidity. Liquidity can mean a lot of things like there's a lot of investors who are willing to buy my securities from me. There's a lot of ways to put it, but what we're talking about here is specifically having the cash available when you need it. Let's go ahead and go to the next page.

Slide 8 – The Cost of Too Much Liquidity

12:24

CARLOS OBLITES: So as I stated, when you're building out a portfolio, if you carry too much liquidity and you're not pushing it out to longer maturities, just in general, because obviously the shape of a yield curve changes and the availability of yield, whatever maturities are paying you in yield, that fluctuates with economics and market forces and supply and demand and many other factors, but generally speaking, when you look at a fixed income portfolio over time, if you're shorter, you tend to earn a lot less money than if you're longer in your duration and in your average maturity. Shorter investments pay you lower yield, generally, and longer investments generally pay you higher yield.

Not only that, but these investments for a lot of you, although you focus on the yield, on the interest income of your investment, there's a market value of the principal amount of the portfolio which falls into play here. So what you're looking at in this particular slide is the returns and the duration of various indices in the fixed income markets. In the fixed income markets, we tend to divide up. We carve things out in terms of maturity ranges because those maturity ranges and their associated duration are the biggest determinants of risk and return in your fixed income portfolio.

As you can see there, the very top one is LAIF, the state pool, and that as of the date of this particular slide, which I think was December 31st, that duration was half a year – 0.57 years. And if I look back over the last ten years, the annualized return for LAIF was 68 basis points – 0.68%. That's a little bit over half a percent. That's what you earned on average had you kept your money in LAIF. That's the average return per year for each of those ten years, taking compounding into effect. So if you had \$100 million and you invested it in LAIF ten years ago, you would have ended up with \$107 million. You added \$7 million over those ten years to your \$100 million investment, earning 68 basis points on average per year. Some years it's higher than that. Some years it's lower, but on average, it's 68 basis points.

Had I gone a little bit longer, the one-year return, the one-year Treasury did not beat LAIF. It was a little bit lower. Look at the next one. If I kept my investments between one and three years – this is just looking at Treasuries – if I kept my investments between one and three years, the average duration of that would have been about 1.87 years, so somewhere between one and three quarter years to two years. Shorter than two years.

My average return per year for those ten years was 95 basis points. I now turn my \$100 million into almost \$110 million. I outperformed LAIF by nearly \$3 million – \$2.9 million. Had I done that between one and five years and averaged about two and a half years of duration, 2.62 to be precise, my total return would have become one and a third percent, 1.33, making it \$114 million. You added \$14 million above your \$100 million investment, and you outperformed LAIF by \$7.1 million. You get the idea here. The idea is that the longer you go, generally speaking, over long-term horizons, you tend to do better. Longer strategies tend to do better than shorter strategies. This is precisely why we, as an investment firm, we get called upon by a lot of our clients to help make this come together. Any investment advisor is called to do this. Let's go to the next page.

Slide 9 – Why Cash Flow Analysis?

16:25

CARLOS OBLITES: So what is a cash flow analysis? What are you trying to do? Well, I just pulled GFOA's quote. This is straight from their cash flow analysis. They have a statement on this on the best practices. I just went and googled it off their website. And it is:

“The analysis is intended to measure and assess the government's ability to meet its needs, to negate the need for any short-term borrowing or liquidation of long-term investments before maturity, and to identify any idle funds, and the duration of that idle period, to determine whether those funds could be invested over that time frame. Cash flow analysis is, therefore, an essential tool for informed management decision making.”

This is a tool to help you structure these investments so that you can earn the most money that you can, while at the same time having enough liquidity to meet your daily needs. Let's go ahead and flip to the next slide.

Slide 10 – Question 1

17:22

CARLOS OBLITES: I think we come to question one and Sandra, I think you take it away from here.

Poll Open for Responses

17:30

CARLOS OBLITES: The question is: liquidity has several definitions. Which of these is the most applicable for our cash flow discussion? So I think you have a polling opportunity. Let's go ahead and select the one you think is the best answer. One option is the investment has a sizable secondary market. Another option is the investment maturity coincides with cash needs. And then the third option is the investment has high credit quality and is widely held. Let's take a moment to poll.

And Sandra and Robert, how are we doing? Can we see the results of the poll?

Poll Results

18:24

CARLOS OBLITES: Okay. So you can see that the vast majority selected the middle one – the investment maturity coincides with cash needs. All the other definitions are correct. Liquidity – if I have a five-year Treasury, even though I'm locked up in five years, that is a liquid investment because it has a sizable market. So that definition is a correct definition. And if it has high credit quality and is widely held, that, too, is a correct definition. But for our purposes here today, for our purposes, we're trying to focus on making sure that you have money becoming available, having a maturity available at or around the time that you have a known cash need. Let's go ahead and go to the next slide from here.

Slide 11 – What Is Cash Flow Analysis?

19:14

CARLOS OBLITES: So what does this analysis look like? What is it and what does it look like? What you're going to be doing on your end is to develop the cash flow analysis, is that you're going to have to make a projection of the receipts that are coming into your treasury. So you have to take a look at all the cash receipts that your agency has. You're also going to have to have some knowledge in anticipation of what the disbursements are going to look like for a given period of time into the future.

In order to do that, you really have to take a look at all the funds available to you, and all the sources of revenue that you have at your fingertips, and all the vendors and all the services that you're paying for or payments that you may be making to CalPERS. If you're paying out your normal annual payment, if you're doing that in a lump sum at the beginning of the fiscal year, or if you're doing that along the way, you have to know what that means and what that looks like. You also have to consider the timing of all of this. You have to, like with the pension example, you have to understand whether you're going to be paying something out monthly or if you're making debt service on your bond borrowings. That may be semiannually. So you have to think about the timing in any case.

But basically you're going to try and take those factors and take a look at your existing balances of cash, and you're going to try and look at what that appears to be on a month-to-month basis. And what you're trying to boil down out of all of that is, you're trying to figure out how much on any given day, how much of a cash balance you have and how much is going out, how much is coming in. And from there, you're going to discern how much of that balance is available for investment – we'll call that the core fund – and how much of it is needed to be kept liquid – and we'll call that the liquid funds – so that you can meet daily cash needs. Let's go ahead and go to the next slide.

Slide 12 – What Cash Flow Analysis Is Not

21:26

CARLOS OBLITES: Real important to keep in mind when we're talking about cash flow forecasting, it really is cash. We're talking about maybe – you know cash flow has sort of a couple of different definitions when you run a cash flow analysis. For our purposes, we're talking about a cash budget, if you will. Maybe that's a better way to refer to it. We're talking about actual cash on hand, so it means that you can't look at accruals or something you budgeted for but the cash is not there. We're talking about greenbacks. These are actual, spendable dollars that you can tap into or that actually flow into your coffers. So if you're looking at revenues and maybe you accrue a certain revenue, that doesn't count. Or if you accrue certain payments but you still have the cash, that

doesn't count. And the reason it doesn't is because, again, we're trying to figure out what's on hand that can be invested. An accrual, unfortunately, can't be invested. Let's go ahead and go to the next slide.

Slide 13 – Identify Liquid & Reserve Balances

22:38

CARLOS OBLITES: So you need those three pieces. You're trying to come up with what's coming in, what's going out, and the impact to what's actually sitting in the bank account or at your custodian. So when you determine that, you can get certain trend information, which is very helpful. You can look and see if your balances are generally growing. You can develop some sort of seasonality out of the profile that you're going to generate, and you can actually use this information to not only just inform yourself on how much is available on hand to invest. Sometimes you can use this information to discern whether there are structural problems in your budget down the line.

But at the end of the day, what we're trying to do for our exercise is precisely what you have here in the graphic. And it's that you're trying to figure out how much is liquid that's needed and how much is core that can be invested long-term. If we take a look at the next slide really quickly, just go forward one more...

Slide 14 – Objectives of Cash Flow Forecasting

23:52

CARLOS OBLITES: We generally, just in rules of thumb, we want to ensure sufficient liquidity for at least six to twelve months down the line in cash needs. In fact, most of you probably prepare a treasury report, or someone in your finance department prepares some sort of treasurer's report. And one of the things that they place on that treasurer's report is a statement certifying that they have enough cash on hand to meet needs for some amount of time into the future. I typically see six months or longer. Six months or a year. But that's what you're trying to do. You're trying to make sure that money is there so you can certify that for policymakers such as city council members.

Another rule of thumb is, you try to match the source of your cash and the uses of your funds. It means that whenever possible – it's not always possible – but if you have timing of revenues, if you can time it, you want to time it with certain uses. For certain things you can't do that. That just doesn't work out. But it just means you'll have to accumulate certain reserves which are then available to make payments for outgoing funds.

Again, I mention that any reserve of core funds that you have that are sitting in your bank account – so those are the balances you really don't dip into – that's what's available, and you want to be able to invest that in longer-term securities, and you also want to make sure that it's diversified in all manners of sectors in the fixed income markets that are made available to you by California Government Code.

In this portfolio, you still have to apply the science of portfolio management, and you have to lay in those tools which will help you manage liquidity and market risk. Liquidity risk is just the risk that you don't have money available when you need it. Market risk is that the investment will fluctuate in value, and your revenues will fluctuate based on what the markets are doing and what you're able to reinvest into. So all I'm trying to say here is, yes, you're trying to align your portfolio

with known cash flows and cash needs, but you have to be governed by those things that make portfolios function and manage the risks that are associated with it.

The other rule of thumb is you want to make sure when you're looking at the discrepancy or the delta between what's available and the timing of when it comes in and what's going out the door in terms of payment, take a look and see if you can identify seasons where there may be deficits or it may be just a lean period. For most cities, that tends to be late summer/early fall. For counties, that tends to be... well, the rich periods are generally right around December, November/December, and then right around April, when they collect tax receipts. And then you get into the rest of the year. They make those pass-through payments to their local governments, they have expenditures of their own, and treasury pools kind of dip down. It really just varies. If your agency is a joint powers insurance authority, it's less driven by seasonality and more driven by the amount of claims that come in.

If you're a special district, if you have that wonderful magic ability to set rates and set the revenue that's coming in, then that may look a little bit different depending on what you have been able to structure if your revenue's coming directly from end users. It's just a revenue cycle. If you have member agencies that are pouring, that are making payments into your agency, then it will vary. It just varies on how you're set up. So it really changes from agency to agency, and as I mentioned earlier, if you have some deficits, it can warn you of impending budget problems. Let's go ahead and go to the next slide.

Slide 15 – Annual Cash Flow Forecasts

27:52

CARLOS OBLITES: I've mentioned this earlier. You want to estimate monthly cash position. You want to look at what's available particularly in the 30-day range. You want to use it to make decisions on how you're going to structure the investments. And generally, when we see these and when we help people prepare these, most of the projections that we see are going out one, two and even three years. Three years is a little bit less tenuous than one year because assumptions change, your growth patterns change, expenditures, they change, and if you have capital improvement projects [CIPs], the timing of the CIP program may change. So obviously, if you're doing it even out to one year, but definitely out to three years, you want to be revisiting this regularly and updating your cash flow analysis. Let's go to the next slide.

Slide 16 – Creating Annual Cash Flow Forecasts

28:54

CARLOS OBLITES: Okay, so how do we do it? Well, you start by taking a look at the beginning balance of your cash and investments. Include everything – what's with the custodian, whatever you have at the local bank, your operating funds, if you have local CDs or CDs at a local bank because you like to spread business around your community, if you have money in local government investment pools – there's some out there where you can invest – money at LAIF. You just want to make sure you have everything and you're including it in there. And you begin with adding all that up and you have a beginning cash balance. Then, you need to estimate what revenue is coming in for this month, the following month, or the month after that – however far out you're making your projection. And then do the same thing for the expenditures. And you're going to come up with a net projected change and also some sort of projected cumulative balance of what's sitting in cash and investments. That's where that balance analysis comes in.

And then you'll want to have on hand some sort of schedule or anticipation of current investments that you have and when coupons are being paid because that's a cash flow as well. So if you have investments, they are going to be fixed income investments. They are going to have coupons associated with it. Most coupons pay, most bonds pay you semiannually. You're going to want to have a schedule of what that looks like. Let's go ahead and go to the next slide.

Slide 17 – Identify Revenues and Expenditures

30:23

CARLOS OBLITES: I talked a little bit about this earlier. So what's feeding into the kitty and what's going out the door? For most of us, a lot of us get property taxes. Some cities get a lot of sales and use tax. Sometimes you get TOT, transit occupancy tax. Sometimes you have user fees, some sort of shared revenue stream. If you did some borrowing, you've got bonds proceeds coming in. That's a cash flow. Sometimes you're a growing city and you've got a lot of land that's being developed. You get development fees. It really just depends on the type of agency that you are.

In terms of expenditures, we all know that we have to pay for payroll. For some of us, that's our biggest expenditure. If you're a water or waste water district or mosquito abatement, you've got some operating expenses that are a big part of what you do.

A lot of us carry debt. We have debt service that has to be made. CIP, which are often driven down by or driven by draw down schedules, those tend to be very... they're not very accurate. I've never seen one that's very accurate. Or any sort of nonrecurring expenditure. Whatever you have, just know what your sources are because this is what's going to feed into your balance, and this is also what's also going to pull out of your balance. Let's go ahead and switch to the next slide.

Slide 18 – Sources of Information

31:48

CARLOS OBLITES: Some sources for you. You can look at historical data from the general ledger, but I always warn people make sure that, again, you don't include accruals. This just has to be actual receipts and actual payments. Look for balances. You're going to want to look at your bank statements, at your pool statement, at your LAIF statement. Just know what's in there. You can look at the market values from your statements from your custodian. If you have an investment advisor, they should be providing you an investment report. That can be a source as well. You can look at your current year budget, and you can use that as a proxy in terms of understanding what expenditures are going to have. Most budgets, unless you get down into the weeds, most budgets aren't going to give you the kind of month-to-month data that you will need. But some of us, a lot of us will prepare some sort of budget performance report just on a monthly or quarterly basis, where receipts and expenditures are relative to budgeted receipts and expenditures, and that can be used. But again you have to kind of understand the timing of those payments coming in and out.

You can look at CIP projections and that drawdown schedule, but like I said, that tends to be very inaccurate. I've never known a public works department or engineer at a special district that actually kept to their spending schedule based on anticipated CIP. Those usually just get very delayed. And of course as I mentioned earlier, that schedule of investment maturities and coupon payment. Let's flip to the next slide.

Slide 19 – Annual Cash Flow -- Example

33:29

CARLOS OBLITES: So, here's an example of what it might look like. So what we've done here is... I just want to maybe walk through what you're looking at. So take a look at the column on the left-hand side. So the inflows, those are some sample inflows and then beneath it the outflows. So there's receipts and disbursements, receipts and payments. And you have a beginning balance. Now, the way we did it here is we started with just the liquid component of the portfolio. So notice you have a beginning balance of – just look at January – \$94,422,259. So you had receipts coming in and then you had money going out, and the net change – so that is all the inflows added to all the outflows – the net change in this sample or example was \$1.120 million, so \$1,120,000,000. So just follow it down under the January '18 column. So you have all the inflows, the outflows, the net projected change of \$1.1 million. So there's that, again, that beginning balance the \$94,422,259 that came from the top.

The projected invested balance is the core. That's the piece that you don't really dip into. I just want you to follow that row, that \$141,565. Follow that row all the way across, and you can see that it's frozen, and the reason it's frozen is because in this example, this city made a determination that that's the amount of money that they never really dip into. The one that really fluctuates is the liquid piece. Now, you don't have to do that. You can take all these funds and look at them in the aggregate. But it's helpful here to see how this example has carved out the core piece that's never dipped into. But you have a total projected balance. So you basically augmented the \$94,422,000 by that net \$1.12 million, which brings you to your new liquid fund balance at the top of the February '18 column, which is \$93,301,000. If you have a calculator, you'll see that it will pull it out. And you'll do the same thing again for the following month and so forth and so forth.

Look at the section in the very bottom in the white, just the last five rows – or four rows, I should say. What we are doing here is we took a look at the actual liquid balance because everything above is a projection. You're doing this projection based on what you know or what you think is coming in and what you think is going out and how you're timing it for that particular month and the following month and the following month. If you look down at the bottom, this is a true-up and generally, you do this after the month has closed. You go back and you see what the actual balance was based on what actual expenditures came in. The invested balance is that core piece that doesn't change, again, so you have a true actual balance. You're coming up with a difference here, a difference between your projection and what actually came in. And this is very helpful because that amount can inform future months and future years. It gives you an idea of how accurate you're being in order to just get more accurate information down the line. Let's go ahead and go to the next slide.

Slide 20 – Funds Balance Cash Flow

37:03

CARLOS OBLITES: So in this example, what I've done here, I've put these – it's not the exact same numbers but they're put together in aggregate form. So whether you carve it out into a liquid portfolio or a core portfolio, basically you have it carved out here, and you can see the beginning balance, the inflow, the outflow and then the net change, which informs to the following month's balance and so forth. Why do you do this? You do this so you can get some sort of idea of the high and the low and then the average balance, which can give you some trend information. Let's go ahead and go to the next slide. We'll pick it up a little bit from here.

Slide 21 – Graphing Balances Over Time

37:39

CARLOS OBLITES: You can chart this out and model it. In this particular example, the entire chart is just a look at the two colors and the line. Everything is your actual balances, and the dips and the peaks and valleys at the top is cash coming in and out. You can start generating some trend information. You can see that it's growing. And the green is supposed to be the amount of money that is core that you're not dipping into. In this particular example, we identified that the actual portfolio security is up to where the white line is. So the delta, that difference between the white line and the top of the green area, was basically too much liquidity. They were invested to the white, where they could have been to the green, meaning they were leaving money on the table. Let's go ahead and go to the next slide.

Slide 22 – Statistical Forecast of Future Balances

38:30

CARLOS OBLITES: So you can take this kind of information and then forecast it into the future. We do this using a statistical model just looking at the growth trend and the average of those ins and outs and projecting them forward. But again, it can inform you on what the balances are going to look like and whether you're growing or whether you're shrinking, and you can adjust. Let's go ahead and go to the next slide.

Slide 23 – Challenges to Developing Forecasts

38:58

CARLOS OBLITES: So some challenges to putting this together. Systems – some of us keep this data on spreadsheets. Some public agencies keep this kind of data straight out of the GL, out of some sort of accounting system. Some folks keep... I haven't seen it on paper but I'm sure there's somebody out there that does that. So if you have limited computer systems to be able to run historical data, that's going to be a challenge. If you have to poll people just like you do when you enter budget season to get an idea of what different departments are going to spend. If you have people in different places, that can be a challenge. Sometimes it's challenging when there's political agendas, when you have a set budget but then all of a sudden, the direction of that budget changes because there may be a political agenda behind changing the expenditures or bringing down the balances or building reserves. That has an impact. And, of course, just getting good information from your department. I mentioned the case of public works never sticking to any draw schedule that I've ever seen. You just want to foster good communication to be able to get good data. It's important data. It helps you make important determinations on the balances of your cash. Let's go ahead and go to the next slide.

Slide 24 – Review and Maintain Cash Flow Forecast

40:19

CARLOS OBLITES: I mentioned that you want to compare actual results versus your forecast and adjust accordingly. You want to make sure you understand why there was a delta and why there was a variance. You want to be able to look at that data, and it should help you adjust your assumptions on certain cash flows, on the timing of the cash flows, or on the magnitude of the cash flows, and that should allow you to go back and talk to different department heads and understand whether the numbers they gave you were accurate or not, and you can sort of have a dialogue as to what that may look like in the future. But you always want to go back, compare the actual receipts and disbursements, and just keep track of it so that you can compare for projection. Let's go ahead and go to the next slide.

Slide 25 – How Do I Invest It?**41:11**

CARLOS OBLITES: From there, once you've informed what that balance is and how it grows or how it shrinks based on inflows and outflows, and whether it's generally trending higher or lower, and also understanding the seasonality – now you're getting to a point where you can make decisions on how to invest it. Okay, so there's the cash flow need. That's what you just did. You have to think about that. You have to think about code and what code allows you to purchase. Every one of you should have an investment policy. That policy should encompass California code requirement as well as best practices. You can't forget your objectives: safety first, then liquidity, then return. And of course you have to look at what the markets are offering you in terms of opportunities to be able to invest. So my colleague Genny is going to get into this aspect of it. Once you do your cash flow analysis and determine what you have available, what are some strategies to address that? Let's go ahead and go to the next slide.

Slide 26 – In Summary**42:17**

CARLOS OBLITES: I just want to summarize it and we're going to have another little mini-quiz. Again, determine how much to keep liquid. The rest of it is core by definition. That's the piece you want to optimize and push out into longer maturities, which pay higher yields, generally speaking. Make sure that you're looking at all your sources of information, all your revenues and expenditures, expected drawdown schedules, expected payments for debt service. You have to anticipate these things. As much as possible, you want to reduce liquidity to have enough cash on hand to meet those expenditures and maybe just a little bit more for any unexpected expenditures, just as a little safety cushion. And before you begin investing, always keep in mind that safety and liquidity come before return and optimization. Let's go ahead and go to the next slide.

Slide 27 – Questions 2, 3 & 4**43:17**

CARLOS OBLITES: And now we come to our last three questions.

Slide 28 – Sample Cash Flow Projection**43:20**

CARLOS OBLITES: So take a look at the chart in front of you. This is a simulated cash flow projection. So you're looking into the future three years, and you can see where the balances are. The peaks and the valleys, so the ups and the downs, are cash flowing in and out. So just take a moment and look at the chart and what it's doing, look at the trend, look at the seasonality, look at the magnitude, the changes. And the question is: just from looking at that chart, the chart shows us that either a) on average, the balances have been falling; b) the balances have been growing; or c) the balances have periodically fluctuated by about half a million dollars. Let's go ahead and set up a poll.

Poll Open for Responses**44:19**

CARLOS OBLITES: So you had a moment to take a look at the chart. Go ahead and plug in your answer if you will, please. Okay. Can we see the answer?

Poll Results**44:45**

CARLOS OBLITES: And that's right everybody noticed even though you have a lot of ins and outs, if you looked at the beginning of the chart, the left-hand side of the chart and you compared that to the further right-hand side of the chart, the end of the chart, you saw on average that balance was growing. If you averaged it out you could see there are 36 months there, if you took an average for those three years – 12, 12 and 12 – you probably saw that the average would have been higher towards the latter months than in the beginning months. So that's going to be informed by again anticipating what cash flow, what's flowing in and out of the portfolio and in and out of your bank account. The balances were fluctuating. The amount was actually closer to \$250,000. So the \$500,000 was a little bit beyond. And clearly, just from looking at the chart the balances were not falling. So let's go ahead and go to the next slide.

Slide 29 – Sample Cash Flow Projection

45:43

CARLOS OBLITES: Here's the third question. So the public agency that put this chart together can: a) can count on balances growing forever; b) they can count on at least \$4.7 million in core funds that will not likely be spent; or c) they can count on no discernible seasonality to the cash flow funds. Take a look at it, and let's go ahead and put the poll up.

Poll Open for Responses

46:26

CARLOS OBLITES: Go ahead and input your answer if you will, please. And let's go ahead and look at the answers.

Poll Results

46:49

CARLOS OBLITES: Okay. Yes, perfect. If your balances can keep growing forever, I salute you. That's a great agency to work for. Just make sure you're going to be growing and growing and growing and that's awesome, although that's just not reality for most people. There is a discernible seasonality to cash flows. You'll probably noticed it. It looks jagged. Those are the ins and outs and if you look closely those happen about every six months, so there's definitely seasonality. If you look at... if we could just look at that slide one more time.

I just want to highlight because I think this is a good example of it. If you looked at the bottom of the chart, you probably just looked at the Y axis, and Sandra are we able to see the chart? Well, while we work that out, if you looked at the Y axis, you probably saw that the ins and outs of the chart never dipped below \$4.8 million. So just to give yourself a cushion, you never know what is going to happen. If a policymaker asked you how much money we have on hand that can be invested, you could safely say that you had about \$4.7 million that you really weren't going to touch. And that's the core piece that you could invest in longer securities. Let's go ahead and go to the slide.

SANDRA KENT: Sorry, Carlos, we're having a bit of a technical issue. If you could bear with us for a moment.

CARLOS OBLITES: No problem. We'll just take a moment to let it reset. Those charts are... we generate that from looking at – if you remember the slide that we looked at earlier that had a spreadsheet on it and we looked at the inflows and the outflows and then that core piece and then the anticipated balance for the liquid component, and then we did a true up at the bottom – if you

remember that slide, that balance, that beginning or ending balance, you can chart that out. That's where you generate these particular charts. The charts are very useful because it can illustrate to somebody a lot easier than a spreadsheet. It can illustrate what's happening to the balances. When we generate these for our clients, that's what we typically work with. We'll run the numbers. We'll typically have some sort of discussion of the budget, so that we can get a flavor from staff as to what expenditures are occurring and what inflows are occurring, but we'll run a statistical model and we just look at the chart side of it. Anyway, how are we doing on the technical side here?

ROBERT BERRY: We just need a couple more seconds here. We're trying to get the poll off the screen. For some reason, it's not dropping off the screen and returning us to the presentation.

CARLOS OBLITES: Okay.

SANDRA KENT: Just a moment please. Okay.

ROBERT BERRY: We may need to relaunch this.

SANDRA KENT: We may need to do that, so I apologize. It's not... it is stuck.

CARLOS OBLITES: Sandra, what shall we do as folks that are viewing this? Should we just hang on here?

SANDRA KENT: Yes, if you could hang on for one moment, please. I'm trying to figure out.... We may just have to go to the next polling question without going back to the slides and see if that changes it.

CARLOS OBLITES: Let's do that.

SANDRA KENT: I'm sorry. Go ahead.

CARLOS OBLITES: Let's see if that does it. Yeah.

SANDRA KENT: Okay. Let's see if that changes it.

Poll Open for Responses

50:43

SANDRA KENT: Well, that changed it. You should now see the next polling question.

CARLOS OBLITES: So maybe you don't need to see the chart on this one. But this is just an intrinsic question you should be able to answer without the chart in front of you. To make this projection more accurate, what can you do? Would it be more accurate if you continued projecting growth of funds at the same historical growth rate? Would it be more accurate to lower the core balances by maybe 10 percent more to create a bigger cushion? Or would it be more accurate to go back and compare actual versus projected receipts and expenses and then make the adjustment? Please take a moment to input your answer.

Poll Results

51:46

CARLOS OBLITES: Okay, it looks like everybody answered: do the comparison of the actual versus projected. Looking at historical growth rates are great. That's a really good way to do it, but there's nothing like comparing it to actual events and adjusting likewise. So 10% cushion can also work in terms of making sure that you have enough liquidity because that just makes the core component of your portfolio smaller, but if you really wanted to hone in and optimize it, you have to look at the actual versus projected.

That's the end of my section of it. What I'd like to do is turn it back to our friends at CDIAC because I know Genny is about to speak about what to do with your funds going forward. I would just push it back to you Robert and Sandra.

SANDRA KENT: Let's see. For some reason, it is still showing the poll results. So, again, bear with us while we try to figure out what happened here. Just a moment please.

Slide 30 – Sample Cash Flow Projection **Skipped**

Slide 31 – Cash Flows Webinar – Investing Cash Flows **53:04**

SANDRA KENT: All right. Does it look like you can see the slides again?

CARLOS OBLITES: Yes, it does.

SANDRA KENT: I think we have it under control now. Sorry about that.

ROBERT BERRY: Looks like our polling questions were a little glitchy. We'll turn over the second section of the webinar to Genny Lynkiewicz. Genny?

GENNY LYNKIEWICZ: Great, thank you. Good morning, everyone, and thank you for tuning into the webinar today. So in this section we'll go into a little more detail on the investing side of your agency's funds. Once you formulate the cash flow forecast, if we can move to the next slide...

Slide 32 – Cash Flows Webinar – Investing Cash Flows **53:49**

GENNY LYNKIEWICZ: ...you could start to look at ways to optimize your agency's investment strategy. Now, Carlos already alluded to some of these things but it definitely bears repeating. We're going to look at some possible strategies for investing funds, always through the lens of California Government Code mandated investment objectives. And the first one is, obviously, safety of principle. That's always the first consideration. The second is maintaining adequate liquidity to meet anticipated cash flow needs. And your third priority is optimizing yield over time. So if we could move to the next slide.

Slide 33 – Implementation **54:20**

GENNY LYNKIEWICZ: We can look at some factors to consider when adopting a strategy. And the first consideration is going to be portfolio duration. And this is a measure of interest rate risk. It's basically the time, the term structure of your portfolio. So it's largely depending on your cash flow forecast that you've formulated. And you can select a benchmark to measure your performance ports or you can have multiple benchmarks, for example, if you have a liquidity portfolio and a portfolio where you're managing core funds, for example.

The next consideration you're going to look at is sector allocation. And for this, you're going to need to consider the risk tolerance of the agency. When we're looking at sectors, we might be looking at Treasuries or agencies and we might be getting into corporate bonds depending on what your policy allows, or asset-backed securities that are permitted by California code. And then once you've determined your investment universe, you can start to look for relative value opportunities in specific sectors, depending on market conditions at the time.

So the third consideration we're going to look at is term structure. And we'll discuss some strategies for this later on in the presentation. But once you've evaluated your cash flows and you can determine your maximum maturity that you're comfortable with, and you can allocate the investment across the yield curve depending on the market and depending on what your cash flow needs are when you anticipate needing to draw funds.

So another thing you want to be thinking about in the background is what your minimum credit quality is going to be. That's going to depend largely on your investment policy statement, your risk tolerance, and of course, California code. And I want to point out if you're taking credit risk in the portfolio, you're buying securities that aren't government guaranteed, then it makes sense to have a credit process or to either internally or outsourcing a credit process is a prudent thing to be doing.

And then finally, once your parameters have been set, you can start selecting securities. In this case, that's when you get to go out in the market and look for opportunities for securities that are undervalued and will offer you the greatest return in the given situation. So for this you're going to monitor the market, and you might do this through your broker/dealer network. If you have a Bloomberg, you might use Bloomberg as a tool to look for securities, or you might have an investment advisor that you outsource to.

So let's take a more detailed look at structuring the portfolio. If we can move to the next slide.

Slide 34 – Structuring General Funds

56:54

GENNY LYNKIEWICZ: So Carlos previously discussed methods to help you decide how much of your portfolio consists of short-term liquidity and how much of it consists of longer-term core funds. So when we're looking at the total portfolio, we can divide it up. You can look at it as one large portfolio that both meets your short-term liquidity needs and accommodates your long-term investing goals, or you can divide it into subaccounts, depending how you have it set up at your custodian or at your bank. So when you're looking at your total portfolio, you've got your liquidity component, and that's going to consist of your funds that you think might be needing in the next year or so, and also if you have an emergency fund or cushion, that will be also included in your liquidity bucket.

So there's several vehicles you can use. We'll talk in more detail about them later in the presentation, but a couple of things that you can use to invest liquidity is bank accounts, money funds. You might use local government investment pools. Those are all useful tools if you have a high degree of uncertainty as to when you're going to need the funds, if you think you're going to need them very soon but you're not sure exactly when.

Another method you can use is to match maturities to known expenditures, and we can do this with a separately managed account. Either you can manage it internally or you can outsource it. And you can use tools such as Treasuries, agencies, commercial paper, CDs, things like that to invest. And what a lot of our clients do is they'll get a lot of tax receipts and things like that in towards the end of the year in December and early January. And then they'll invest that out to August/September/October/November, when they start to have a big draw down in the funds.

So when you're making these types of investments, I want to point out that it's important to compare the yield that you're getting on the security versus a risk free rate. You want to see what a comparable Treasury security will give you in terms of yield and make sure you're getting some sort of reward if you're taking any kind of credit risk, and of course, you want to be monitoring that credit risk if you're taking it.

So for the core, for the funds you're not going to need in the next year, you can potentially look at targeting a longer duration if you want to try to get a higher yield or a higher return over time. When you're looking at core fund strategies, it's going to be not only taking interest income into account, but you're also going to have more pronounced market value changes in securities. When you have interest rates moving up and down in the market, that's going to change the price of the securities that you own. So that will be reflected not only in your investment performance but also on your CAFR and GASB 30. You just want to be cognizant of it and for these types of strategies you can invest in securities that are permitted by both government code and your investment policy.

So it might include things like money market securities might be included if those look attractive. You might have Treasuries, agencies, corporate bonds that are rated "A" or better by an NRSRO, a nationally recognized statistical rating organization. You might have asset-backed securities, supranationals like World Bank, things like that. So those are all different things that you can consider. So that's going to bring us to our first polling question in this section.

Slide 35 – Question 1 -- Investing

1:00:13

GENNY LYNKIEWICZ: And so we're going to have you think about... there's no right or wrong answer for this question.

Poll Open for Responses

1:00:19

GENNY LYNKIEWICZ: I just want you to be thinking in the back of your mind. What percentage of your agency's assets are considered liquid as opposed to core? If you're not sure or if you're not comfortable answering, you can just answer not sure. If you want to take a moment and input your answer.

Poll Results

1:01:02

GENNY LYNKIEWICZ: Okay. So 25% liquid was the most popular answer. Sounds like folks are looking to optimize their portfolio. So that's great. Okay. So if we can go to the next slide, Structuring Your Maturities.

Slide 36 – Structuring Your Maturities

1:01:20

GENNY LYNKIEWICZ: Now that we have an idea of your liquidity and you want to keep that in the back of your mind for the presentation, we can evaluate different portfolio structures that we can look at and different options for investing those. So first one we'll look at in more detail on the future side is liquidity alternatives, and then we'll look at some cash flow matching strategies that you can use to immunize your portfolio against interest rate movements in the market. And then we'll look at also some total return strategies if you have longer-term core assets that you're not sure when you're going to need them, you can look at from one-to-three and one-to-five year type total return alternatives.

So first let's consider options for your liquidity bucket. We talked a little bit about this in previous slides. If we could advance to the next slide, the Liquidity slide.

Slide 37 – Liquidity

1:02:05

GENNY LYNKIEWICZ: Okay, great. So one thing I want to just point out about liquidity is the importance of having some diversification even in terms of your cash and your liquidity and not having all your eggs in one basket. I think a prime example of why that's important, if you think back to the financial crisis when the reserve primary fund, a money market fund, broke the buck and it froze redemptions, and that caused some local agencies to run into problems meeting their payrolls and basic things like that because maybe they had all their liquidity invested in one fund, and that was having problems. So it's just something to consider that you want to have more than one outlet for liquidity, should you require it.

So a couple different vehicles you can look at – one is bank accounts. And when you're looking at these, you'll obviously want to pay attention to what rate you're getting or what kind of earnings credits you're earning. Another option which is useful are LGIPs, and it's important to keep in mind when you're investing in LGIPs that some are similar to LAIF and aim to have dollar in, dollar out. And some have floating rate NAVs where you can have realized gains and losses if the market is moving. So you just want to be cognizant of what type of vehicle you're purchasing here and what type of, you know, components – what they're investing in, are they all in governments or are they investing in some credit products, and to what extent are they doing that. And looking at the duration is also a useful thing to keep in mind.

Another vehicle you can look at are money market funds. Government money market funds are usually going to have a stable NAV; they're going to strive to have dollar in/dollar out; and they're investing only in U.S. government or agency securities. And then, you may see some prime money market funds out there that can buy credit products, and those are usually going to have a floating rate NAV now due to money market reforms that took place, and they could also have features such as delayed gates or delayed redemptions if they're under stress. But I think it's really important when you're evaluating money funds to make sure that you look at the ratings. It's helpful to know that there's another set of eyes looking at the investments and also to look at the sponsor and just what is their ability to assist the fund if the fund needs assistance.

And then the final thing we can look at for liquidity, and this is particularly if you don't require absolute daily liquidity, you can potentially start to look at enhancing your returns versus the pooled vehicle if you can buy similar securities that an LGIP or a money fund would buy directly from banks or brokers or through your investment advisor. Those are all different tools that you

have. Next, we can look at what we can do with core funds. If you have a longer time horizon, you can start to look at some additional strategies.

Slide 38 – Matching Cash Flows Maturity Structure

1:04:50

GENNY LYNKIEWICZ: So one of them is a simple cash flow matching strategy, and this is very useful if your cash flows are very defined or can be estimated with a fair degree of certainty. For example, you might have bond proceeds and then you might have a cash flow schedule, and in that case, you can look at immunizing your portfolio against interest rate fluctuations by matching your maturities with anticipated cash outflows. So it works as a hedge for you in case interest rates were to drop suddenly. So in the chart, obviously, the dark green bars are investments that you've made, and the light green bars are anticipated cash outflows. You can see in this example, everything is perfectly immunized. Another example of a way to invest funds is through a bond ladder. On the next slide, we have an example of that.

Slide 39 – Laddered Maturity Structure

1:05:43

GENNY LYNKIEWICZ: And you've probably heard about bond ladders in the past. It's a very straightforward and popular approach. So in this approach, you just divide up your assets, potentially evenly, and then invest the funds into equal buckets, and then as you get maturities that come due, you can either reinvest those proceeds at the end of the bond ladders – in this example that would be out three years – or you can take the cash if you need it for expenditures. So you've got some flexibility there. And there's also a liquidity component here. I think a few things you want to be mindful when you're using a bond ladder is that you can use different types of investments. It doesn't have to be all the same investment. You can use CDs, Treasuries, agencies, corporates, supranationals, or some combination of those if your policy allows for it. But you also just want to be mindful of things like call risk. If you've got all callables in your portfolio, you want to be mindful that if interest rates were to drop, then you might get your entire portfolio called away from you all at once, and you'd have reinvestment risk at that point. So it's good to be diversified not only across different types of assets, but also you want to make sure that you've got some call protection or some bullet bonds if you're buying a lot of callables in your portfolio.

Slide 40 – Bullet Maturity Structure

1:06:56

GENNY LYNKIEWICZ: Okay, the next type of structure we can evaluate is a bullet maturity structure, and this is similar to a bond ladder, but it starts to be a little more dynamic in that you can vary your strategy based on your market outlook, and you can start to really optimize your core funds, both based on interest rate forecast that you might have, what the yield curve looks like, or when your potential cash outflows are going to be. In this example that we have on this screen, the one-to-two year part of the yield curve might have been attractive to the investor so they opted to focus on investing in that bucket. There may have been a liquidity need there that caused the investor to invest heavily in the one-to-two year part of the curve. But it's important to note here that this type of strategy, it also maintains liquidity on the front end. So if you have unexpected cash flows those can be met, and it's also got some hedging going out. You've got a longer-term three-to-five year investment as well in case interest rates were to drop. It's also diversified across different buckets, but it's more focused on the one-to-two year in this case.

Slide 41 – Barbell Maturity Structure

1:08:04

GENNY LYNKIEWICZ: Another type of strategy we can look at, the third strategy, is a barbell, and this maintains liquidity, a substantial amount of liquidity, while locking in longer-term yields. This has been a very popular type of strategy in recent times. So we've got the three-to-five year bucket, and particularly you would use this if there was a normal yield curve, where it's upward-sloping and you're getting paid to take five-year investment risk. So then you might be buying five years and then keeping the rest short. So you've got your five-year component helping you maintain your benchmark duration, but then you've also got a lot of liquidity. In case rates are to rise, you have liquidity. If rates fall, you've got a lot of long-term exposure, so you can take advantage of that as well.

Slide 42 – Annual Benchmark Study

1:08:52

GENNY LYNKIEWICZ: The next strategy we want to talk about a little bit is total return. And this is going to come in handy, particularly if you have ongoing core balances and you're not sure when you're going to need them. So if you've got \$10 million and it's going to be there for the foreseeable future and you've got plenty of liquidity, you might want to consider a total return strategy. And this is going to be more dynamic. It's going to require active portfolio management. We have a benchmark comparison that shows three different strategies. We're going to focus more on the one-to-three and one-to-five year because that's most popular for California agencies. And you can see when we're looking at these benchmarks, they're 100% invested in Treasury and agency securities. So it's not taking into account the fact that you might be buying corporates or asset-backed or things like that. But these are popular benchmarks that are used by clients.

So the one thing we want to look at here is... one of the key factors is modified duration. It's sort of in the middle of the slide there. This is going to be a measure of interest rate risk, so for each unit of duration that you have – in the case of one-to-three, 1.87 – for a one percent change in interest rates, there's going to be one percent change in market value. So, for example, if interest rates were to suddenly rise one percent, you would see the portfolio value fall by 1.87% if that were to happen suddenly. So it's something to keep in mind when you're investing in longer strategies. So as you're increasing your duration, if you go to a one-to-five year, your duration would be in this example 2.6 years, or 2.6 rather. And as you're doing that and you're having more duration and more interest rate risk, you can see that the total return starts to increase the longer your strategy is. And this is going back about 10 years, and as you know the last 10 years have been a very low interest rate environment. So these returns are annualized and it's basically what you've been earning every year over time. So when cash was yielding next to nothing, so these types of strategies were earning about one percent for the one-to-three year and about 1.38 for the one-to-five year. And this takes into consideration not only your interest income but also market fluctuations on the values of the securities. So that's all incorporated in total return.

And then the other thing to think about with these strategies is your risk tolerance and the amount of volatility. So as you go from a one-to-three year to one-to-five year strategy, you see the volatility amount rise, and the number of negative return instances also goes up a little bit. So you can see for the quarters in the last 30 years, there was 13 negative quarterly returns for the one-to-three year and 23 for the one-to-five year. And interestingly, for a negative return for the whole year, there were not any occurrences in the last 30 years for the one-to-three year because it's a lot shorter. The interest rate risk is a lot less. And then for the one-to-five year, we had a couple of times in the last 30 years, where there was a negative return for the entire year, and those took

place in 1994 and 2013, when we had interest rates rise very quickly and the interest payments weren't able to keep up with that. But it's important to have with these strategies to have a long-term time horizon because over time you're going to expect to earn a higher yield over keeping liquid funds. So the next slide illustrates that.

Slide 43 – Developing Solutions Designed to Meet Your Goals

1:12:15

GENNY LYNKIEWICZ: We've got a growth of \$10 million, and you saw a similar slide to this in Carlos's section, but it shows the potential benefit. It shows the estimated additional income you would have gotten investing in a benchmark over the past 10 years. So the first line has the LAIF return. So it looks like if you had \$10 million, you would have \$10.7 [million] at the end of 10 years. If you had invested in a one-to-three year Treasury and agency index-type product, you would have expected to earn about \$400,000 more than that. And then if you had taken a little more risk and gone into a one-to-five year, you would have expected to earn about \$800,000 over a comparable LAIF investment. I just want to point out that benchmarks are only investing in government securities, so if your policy allows for it and your risk tolerance allows for it, there's also the potential to enhance returns using other products as well. If you're using corporate bonds or asset-backed or supranationals or things like that, you can potentially increase that by a greater amount.

Slide 44 – Normal Yield Curve

1:13:21

GENNY LYNKIEWICZ: So now let's look at some different types of yield curve scenarios, some market conditions that you might encounter when you're trying to invest. And so the first one I just want to look at is a normal yield curve, and this is what you'll typically going to see when interest rates are expected to rise. So in this case, it's upward-sloping. And this was taken from 2014, so you can see back then that on the left side of the chart, the short-term interest rate, the one-month Treasury, was very close to zero, so you're basically earning nothing on cash. I'm sure we all remember that. It was very painful. But if you were able to invest out as long as five years, you can see that you could have earned about 1.5% by investing in a five-year Treasury.

So in this case, the market is expecting that over time interest rates are expected to rise. It's kind of an optimistic type forecast in this scenario. This would favor using a bond ladder or a barbell, I would say. And that would allow you to take advantage of buying five-year or three-year securities, depending how long you're comfortable investing. And then, if the curve stays like this and rates stay like this, then as those roll down and gradually become shorter and shorter and shorter, they should increase in value, assuming rates stay the same and assuming the curve stays where it is. So the next slide is going to show us the situation pretty close to the situation that we're currently dealing with.

Slide 45 – Flattening Yield Curve

1:14:41

GENNY LYNKIEWICZ: And this is a flattening yield curve. And this is from December, so it's from a couple of months ago. But the Fed, as you know, has been raising short-term rates – they've done it about nine times since 2015 – whereas long-term rates have been relatively contained due to investor demand. So although short-term rates have increased quite a bit, we've seen long-term rates stay pretty well anchored.

So on this chart, you can see that rates are flat, basically, to slightly-inverted between two and five years. So there's not much of a difference between a two- and five-year investment there. In this type of scenario, you might want to go with a bulleted structure and have some flexibility, depending on where you think you should position your funds to come due. I want to point out that the credit curve is positively-sloped. So when we're investing in the current environment, even though Treasuries may not pay you extra for going out five years, you might be get paid more by buying a corporate bond by taking a five-year maturity rather than a two-year maturity. There's still ways to get rewarded for taking additional interest rate risk. So then the third scenario is kind of a dramatic one on the next slide.

Slide 46 – Inverted Yield Curve

1:15:55

GENNY LYNKIEWICZ: And this is the inverted yield curve, and this is something to watch out for. The inversion we have today is not nearly as dramatic as this. This was in 2007, so just prior to the financial crisis. The Fed had been raising rates aggressively, but longer yields were kept at bay, and it was largely by a very negative outlook in the bond market. So there was high demand for longer-term Treasuries and protection. You can see back then if you had purchased a six-month investment, you would have gotten about a little over five percent. So that would maybe be the temptation to just invest your money at five percent. Why would you go out farther and take interest rate risk when you can get five percent? Think about 2007, if you purchased five-year Treasury and gotten 4.65% and had that over the next five years, you can see why sometimes it makes sense to invest at a lower yield even though it's difficult to do that when you can get a higher rate for a shorter period of time. But you've got that reinvestment risk when it comes due in six months. You just don't know what rates are going to be at that time. They could be higher or they could be lower.

And I just want to point out, these inversions when they happen this dramatically, they typically indicate that there's likely to be a recession in the following 18 months or so. And so obviously it doesn't happen every time, but it's been pretty accurate at predicting recessions. We've seen it in 1991, in 2000, and then here again most recently in 2007, so it's something to pay attention to. And typically when you see the yield curve looking like this, historically speaking, the best response would be to extend your maturities a little bit.

Slide 47 – Yield Spread Between 2-Year and 10-Year Treasury Securities

1:17:43

GENNY LYNKIEWICZ: Another slide I'd like to take a look at is the yield spread between two- and ten-year Treasury securities. This is often looked at just in terms of what economic health is, and right now it's just gotten really flat. There's very little difference in the yield between a two-year Treasury at 2.5% and a ten-year Treasury at 2.65%. This was from a day or two ago, but at the time, the difference between the two securities is only 0.15%. So there was very little difference between those two, and we've seen the curve flatten. You can see on the left side it was a much bigger difference, and now it's kind of whittled down to 0.15%. There's a little bit of a reward for going out the curve but not as much as there was.

Slide 48 – Yield Levels as of February 13, 2019

1:18:29

GENNY LYNKIEWICZ: The next slide we want to look at recent yield levels. And this is from the 13th of February, so it's relatively recent. So it's a good picture of what's going on in the market.

And you can see for your liquid funds, if you're invested in LAIF, you're earning about 2.39% as of the 13th. If you invest in a one-year Treasury, you'd get about 2.55%, and if you invest in a five-year Treasury, you get a little bit less – it's 2.53%. So the temptation here might be keep all your funds liquid because you're not getting a reward in terms of higher interest rates by going out three years or four years or five years. So, this is going to bring us to the polling question for this section.

Slide 49 – Question 2 – Investing **1:19:13**

Poll Open for Responses **1:19:19**

GENNY LYNKIEWICZ: And I wanted to ask here, assuming you have a long-term time horizon, what is the main risk of keeping your core funds invested one year or less? So we've got a few different options here. Is your main risk interest rate risk, reinvestment risk, credit risk or liquidity risk. If you would take a moment to select your answer. Here again, there may be more than one answer that's correct but we're looking for the best answer.

Poll Results **1:20:07**

GENNY LYNKIEWICZ: Okay, reinvestment risk. Yes, I agree. If you keep all your funds short, or out one year or less, then whatever interest rates are in a year, that's what you're going to be dealing with for reinvestment, so I think reinvestment risk is definitely a consideration.

Slide 50 – Case Study **1:20:27**

GENNY LYNKIEWICZ: Okay, so we can move to the next slide, which is a case study. And then we're going to have a couple additional questions. This is going to take all that Carlos talked about and all that I talked about and sort of sum it up into a couple of questions.

So in this example we have a public agency with a total portfolio size that is generally fluctuating between \$80 million and \$100 million over the course of the year. The trend has been that total assets are growing slowly over time. The agency currently has \$50 million invested in an investment total return fund, and the remainder of the funds are in LAIF. So assuming – this is going to bring us to the next question – assuming there's \$100 million portfolio size, you're at the high water mark for the year, approximately how much of that money could be considered core funds and invested into a longer-term strategy?

Poll Open for Responses **1:21:19**

GENNY LYNKIEWICZ: So out of the \$100 million, how much would you consider core funds? Now, there's no right or wrong answer here. It's going to largely depend on how much of a cushion you like to have or how much variability you might be worried about. So if you want to take a moment and think about that. And if you were the treasurer for this agency, how much would you be comfortable treating as core funds out of \$100 million?

Poll Results **1:22:03**

GENNY LYNKIEWICZ: \$50 million. Okay, so it looks like the majority of the respondents would keep \$50 million in a total return and keep the remaining \$50 million liquid. You could

potentially, depending on how your risk tolerance is, you could potentially go up to \$70 million or \$80 million, but not everybody's comfortable doing that, and also it's just going to depend on the situation. If you think there might be expenditures coming, you might want to be conservative and keep it at \$50 million.

Return to Slide 50 – Case Study **1:22:32**

GENNY LYNKIEWICZ: Okay. So then the last question that we have here today is what strategy would you use for your core funds?

Poll Open for Responses **1:22:42**

GENNY LYNKIEWICZ: So if you've got \$50 million or \$60 million, what strategy in the current environment would you choose? And here again there's no one correct answer. This is going to be preference, and it might depend on how comfortable you are with cash flows and things like that. So if you want to take a moment to think about this answer. I'll be curious to see what everyone decides here.

Poll Results **1:23:24**

GENNY LYNKIEWICZ: Bond Ladder. Okay, and it looks like barbell and total return were also popular choices. Yes, absolutely, I think those are all very good approaches. So with that, that concludes my part of the presentation. I'd be happy to take any questions that you have for Carlos or for me.

Return to Slide 50 – Case Study **1:23:39**

ROBERT BERRY: So if anyone has any questions, they can put them in the question section in the tool bar at the right side of your screen. We don't have any questions just yet. Maybe give it a couple of minutes here or a few seconds and see if we do get anything. Well, Carlos and Genny, we've not gotten any....

Slide 51 – Questions 3 & 4 -- Investing **Skipped**

Slide 52 – Upcoming Webinar **1:24:41**

ROBERT BERRY: Oh wait. No. There's a question. Saved the day. On your ladder example, why wasn't there any investments in the two-to-five year range?

GENNY LYNKIEWICZ: Okay. So in the ladder maturity structure example, why was there not any investments in the three-to-five year.

Return to Slide 39 – Laddered Maturity Structure **1:25:10**

GENNY LYNKIEWICZ: Well, this is just an example, and I think that in this particular scenario, this investor might not have wanted to go beyond three years. I think if you have a good handle on your cash flows and you're willing to go out as long as four or five years, you would ideally have that... the ladder example would ideally have maturities coming due in each one of those buckets.

So that's an excellent question. And you could definitely have maturities coming due in three to five years if you felt that you had enough liquidity to last that long without needing to access the funds. Thank you for the question.

ROBERT BERRY: All right. That was our only question. You did such a great job in presenting.

Return to Slide 52 – Upcoming Webinar

1:25:55

ROBERT BERRY: We will move to close the webinar. Before we close, I would like to draw your attention to our next webinar coming up next week. Again, it's building upon our *Fundamentals of Public Funds Investing* program. CDIAC will present *Understanding Benchmarking* instructed by Kevin Webb, and the webinar will cover the purpose, development and use of benchmarks and their benefits and how to evaluate investments against benchmarks. Details on that webinar and registration instructions are posted on the CDIAC website, and registration is open.

So in closing, on behalf of CDIAC, I'd really like to thank Genny Lynkiewicz and Carlos Oblites for a terrific presentation, their dedication of their time and expertise in making this program a success. And a big thank you to our CDIAC Education team, especially Sandra Kent, who produced this great webinar for you. Thanks to everyone for participating today, and we hope to see you back here for our webinar next week.