



# WAYNE STATE UNIVERSITY



# Cash Flow Forecasting

How and Why?



*Provided by WSU – Executive & Professional Development*

# Why forecast cash?



# Why forecast cash?

- Don't run out of cash.



# Why forecast cash?

- Don't run out of cash.
- Interest is back.



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- Don't run out of cash.
- Interest is back.
- Cost control.
- Receivables management.



# Why forecast cash?

- Don't run out of cash.
- Interest is back.
- Cost control.
- Receivables management.
- Seriously, **don't run out.**



# Don't run out

## [Pennsylvania counties plan to miss big social-services payment as state budget stalemate drags on – WHYY](#) (Story from 21 July 2023)

Counties have experience struggling through stalemates, including a record-breaking impasse in 2015 that did not thaw until 2016.

During it, county governments and school boards waiting on billions in state aid burned through loans and emptied reserves. Social services organizations — largely non-profits that deliver state-mandated safety-net services administered by counties — shuttered programs, borrowed money and laid off hundreds of workers who care for the state's most vulnerable populations.

County officials say that ordeal taught them to sock away reserves to survive for a couple months, at least, as many try now to figure out how much state aid this impasse will ensnare while they take stock of their cash flow.



# Interest is back

Fed funds rate:



# Interest is back

How are your surpluses?

- \$1.5 million at 3.0% per year is \$45,000 annually
- \$3.0 million at 2.5% per year is \$75,000 annually
- \$5.0 million at 1.8% per year is \$90,000 annually



# Interest is back

How are your surpluses?

- \$1.5 million at 3.0% per year is \$45,000 annually
- \$8.0 million at 2.5% per year is \$200,000 annually
- \$15.0 million at 1.8% per year is \$270,000 annually

*Real Money*



# Controls

- Without a forecast:

The cash balance is what it is. “*What do I do?*”



# Controls

- Without a forecast:

The cash balance is what it is. “*What* do I do?”

- With a forecast:

*Why* is cash what it is? “What do I do” becomes easier to answer when you understand why you are there.



# Controls

## If you see...

- Tax receipts fell short of the forecast.
- Payments to suppliers was half the forecasted amount.
- Payroll costs exceeded the forecast.
- Pet licenses were triple what was forecast.

## You might say...



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## You might say...

- *Are we following policy on delinquent collections?*
- *Did we buy enough road salt for winter demand?*
- *That's a fairly stable number. Does the forecast need revision?*
- *That's a small and volatile source of cash. Probably nothing, but let's keep an eye on it.*



# Cash flow reporting

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  - Operating (day to day activities)



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- Cash flows are categorized as
  - Operating (day to day activities)
  - Non-capital financing (loans, interest, and repayments)
  - Capital and related financing (capital asset transactions and related loans)
  - Investing (debt and equity securities, making and collecting loans)
- The statement of cash flows reconciles the cash balance on the statement of net position (balance sheet) to its previous balance.



## WASHTENAW COUNTY

### Statement of Cash Flows

Proprietary Funds

Year Ended December 31, 2022

	Business-type Activities - Enterprise Funds			Governmental Activities - Internal Service Funds
	Delinquent Tax Revolving	Property Foreclosure Nonmajor Enterprise Fund	Total	
<b>Cash flows from operating activities</b>				
Cash received from customers	\$ 20,270,120	\$ 575,405	\$ 20,845,525	\$ -
Cash received from interfund services	-	-	-	60,484,855
Cash payments for delinquent taxes	(15,185,943)	-	(15,185,943)	-
Cash payments to employees	-	(380,560)	(380,560)	(6,307,176)
Cash payments to suppliers	(90,473)	(240,995)	(331,468)	(50,367,063)
Cash payments for interfund services	-	-	-	(46,038)
<b>Net cash provided (used) by operating activities</b>	<u>4,993,704</u>	<u>(46,150)</u>	<u>4,947,554</u>	<u>3,764,578</u>
<b>Cash flows from noncapital financing activities</b>				
Transfers in	-	-	-	1,560,323
Transfers out	(2,364,413)	-	(2,364,413)	(53,078)
Proceeds from issuance of long-term debt	11,400,000	-	11,400,000	-
Principal paid on long-term debt	(14,500,000)	-	(14,500,000)	-
Interest paid on long-term debt	(305,815)	-	(305,815)	-
<b>Net cash provided (used) by noncapital financing activities</b>	<u>(5,770,228)</u>	<u>-</u>	<u>(5,770,228)</u>	<u>1,507,245</u>



**Cash flows from capital and related financing activities**

Proceeds from sale of equipment	-	1,366	1,366	235,984
Payments for equipment acquisitions	-	(28,867)	(28,867)	(1,642,933)
Principal paid on long-term debt	-	-	-	(4,898)
Principal paid on leases	-	-	-	(1,058,294)
Interest paid on long-term debt and leases	-	-	-	(27,041)
				<hr/>
<b>Net cash used by capital and related financing activities</b>	<b>-</b>	<b>(27,501)</b>	<b>(27,501)</b>	<b>(2,497,182)</b>
				<hr/>
<b>Cash flows from investing activities</b>				
Investment loss	(79,993)	(16,450)	(96,443)	(68,292)
				<hr/>
<b>Change in cash and pooled investments</b>	<b>(856,517)</b>	<b>(90,101)</b>	<b>(946,618)</b>	<b>2,706,349</b>
Cash and pooled investments, beginning of year	14,548,515	3,086,147	17,634,662	13,738,456
				<hr/>
<b>Cash and pooled investments, end of year</b>	<b>\$ 13,691,998</b>	<b>\$ 2,996,046</b>	<b>\$ 16,688,044</b>	<b>\$ 16,444,805</b>



## WASHTENAW COUNTY

### Statement of Net Position

Proprietary Funds

December 31, 2022

#### Assets

##### Current assets:

Cash and pooled investments

##### Receivables:

Delinquent taxes

Interest and collection fees

Accounts

Due from other governments

Leases

Prepaid items

Total current assets

	Business-type Activities - Enterprise Funds			Governmental Activities - Internal Service Funds
	Delinquent Tax Revolving	Property Foreclosure Nonmajor Enterprise Fund	Total	
Cash and pooled investments	\$ 13,691,998	\$ 2,996,046	\$ 16,688,044	\$ 16,444,805
Receivables:				
Delinquent taxes	8,527,947	-	8,527,947	-
Interest and collection fees	1,417,743	-	1,417,743	-
Accounts	-	3,605	3,605	191,447
Due from other governments	1,184,089	-	1,184,089	6,251
Leases	-	-	-	82,022
Prepaid items	-	-	-	2,084,008
<b>Total current assets</b>	<b>24,821,777</b>	<b>2,999,651</b>	<b>27,821,428</b>	<b>18,808,533</b>



How do you forecast cash flows?



# How do you forecast cash flows?

In its simplest expression:

$$\begin{aligned} & \text{Beginning Cash Balance} \\ + & \text{Sources of Cash} \\ - & \underline{\text{Uses of Cash}} \\ = & \text{Ending Cash Balance} \end{aligned}$$

One period's ending cash is the next period's beginning cash balance. String them together as long as you like.



# How do you forecast cash flows?

- 12 month (or more) rolling forecasts are common. In a rolling forecast, actual cash flow numbers are entered into the forecast document every month, and a new forecast period added.



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- Shorter term weekly (or sometimes daily) forecasts are sometimes prepared for a period of a few months. Larger organizations usually benefit most from shorter forecast periods.



# How do you forecast cash flows?

- 12 month (or more) rolling forecasts are common. In a rolling forecast, actual cash flow numbers are entered into the forecast document every month, and a new forecast period added.
- Shorter term weekly (or sometimes daily) forecasts are sometimes prepared for a period of a few months. Larger organizations usually benefit most from shorter forecast periods.
- A cash flow forecast is not part of a financial reporting package to external users. There is no GASB standard format or one-size-fits all approach.



# A simple example

- Nondescript County has \$440,000 cash at June 30, 2023.
- As a matter of policy, Nondescript keeps enough cash on hand to cover the next two months' operating costs.
- Surpluses may be invested in 12 month CDs at 2.4% annual return (0.2% per month) or 30 day CDs and 1.2% annual return (0.1% per month).
- Semiannual property tax collections are expected to be \$500,000 in September 2023.



# A simple example

- Miscellaneous fee income (building permits, fishing licenses, etc.) average \$20,000 per month.
- Payroll is \$30,000 every other Friday. The next payday is July 7.
- Payments to contractors and other suppliers average \$45,000 per month.

Prepare Nondiscript County's cash forecast for July, August, and September of 2023. (See handout.)



	July 2023	August 2023	September 2023
Property tax collections			
Miscellaneous fee collections			
Maturities of investments			
Total sources of funds			
Salary and wage payments			
Payments to contractors and suppliers			
Investments in 12 month CDs			
Investments in 30 day CDs			
Total uses of funds			
Surplus/(deficit)			
Beginning cash balance	440,000		
Ending cash balance			



	July 2023	August 2023	September 2023
Property tax collections	-	-	\$500,000
Miscellaneous fee collections	\$ 20,000	\$ 20,000	20,000
Maturities of investments	-	-	-
Total sources of funds	20,000	20,000	520,000
Salary and wage payments	60,000	60,000	90,000
Payments to contractors and suppliers	45,000	45,000	45,000
Investments in 12 month CDs	-	-	-
Investments in 30 day CDs	-	-	-
Total uses of funds	105,000	105,000	135,000
Surplus/(deficit)	(85,000)	(85,000)	385,000
Beginning cash balance	440,000	355,000	270,000
Ending cash balance	\$355,000	\$270,000	\$655,000



	July 2023	August 2023	September 2023
Property tax collections	-	-	\$500,000
Miscellaneous fee collections	\$ 20,000	\$ 20,000	20,000
Maturities of investments	-	-	-
Total sources of funds	20,000	20,000	520,000
Salary and wage payments	60,000	60,000	90,000
Payments to contractors and suppliers	45,000	45,000	45,000
Investments in 12 month CDs	115,000	-	-
Investments in 30 day CDs	-	-	-
Total uses of funds	220,000	105,000	135,000
Surplus/(deficit)	(200,000)	(85,000)	385,000
Beginning cash balance	440,000	240,000	155,000
Ending cash balance	\$240,000	\$155,000	\$655,000



	July 2023	August 2023	September 2023
Property tax collections	-	-	\$500,000
Miscellaneous fee collections	\$ 20,000	\$ 20,000	20,000
Maturities of investments	-	85,085	-
Total sources of funds	20,000	105,085	520,000
Salary and wage payments	60,000	60,000	90,000
Payments to contractors and suppliers	45,000	45,000	45,000
Investments in 12 month CDs	30,000	-	-
Investments in 30 day CDs	85,000	-	-
Total uses of funds	220,000	105,000	135,000
Surplus/(deficit)	(200,000)	85	385,000
Beginning cash balance	440,000	240,000	240,085
Ending cash balance	\$240,000	\$240,085	\$625,085



# How do you forecast cash flows?

- No, I meant “how do *I* forecast cash flows?”



# How do you forecast cash flows?

- No, I meant “how do *I* forecast cash flows?”
- Simple examples have their purpose, of course. But it might not address more fundamental questions like
  - Where do I start?
  - What data do I need?
  - What tools should I use?



# The tools

- A sophisticated ERP system may have cash flow forecast functionality built in.
- Any commercial spreadsheet package (Excel, etc.) is well suited to creating and maintaining a cash forecast.
  - Build from scratch.
  - Use readily available templates (see links on last slide in this presentation).
- A reasonably sophisticated user of the software should be the main caretaker of the forecast.



# The data

- Current year to date and last full fiscal year sources and uses of cash are a starting point.
- The financial reporting function likely has rich detail. Recall the statement of cash flows in the annual report.
- Decide on the appropriate detail level.
  - More line items: more work, both in preparation and maintenance
  - Fewer line items: less actionable feedback, harder to predict



# Develop assumptions

Previous numbers are often a good starting point, but seldom a good ending point. A blanket percentage increase from prior years to capture increases in general price levels is good, but if the underlying activity is changing (headcount is going up, for instance), inflation will not be the only driver of changes. Consider dollars and prices of everything.



# Property Taxes

Consider

- Local real estate market: changes in market value will track changes in assessed value)
- New construction: more taxable property
- Passage/sunset of millages



# Labor

Consider

- Headcount
- Hourly wages and monthly salaries
  - Merit increases
  - Cost of living increases
  - Overtime
- How many pay periods in each month? Does it vary?



# Interest

Consider

- Upcoming planned borrowings
- Repayment of principal balances
- Interest rates (sometimes variable)



# Intergovernmental transfers

Consider

- Grants (new, continuing, ending)
- Arrangements with other governmental entities
- Interest rates (sometimes variable)



# Develop assumptions

The negative consequences of having too much cash are far less severe than having too little. So it is natural, and not necessarily wrong, to be conservative in making assumptions.



## Example: County Fair receipts

Year	Receipts
2018	\$2,253,000
2019	\$2,199,000
2020	\$2,467,000
2021	\$1,038,000
2022	\$2,591,000

2021 was a miserable run of unusually horrible weather. What should be forecast for 2023?



## Example: County Fair receipts

Year	Receipts
2018	\$2,253,000
2019	\$2,199,000
2020	\$2,467,000
2021	\$1,038,000
2022	\$2,591,000

Going with \$1 million “just to be safe” might damage the overall effectiveness of the forecast. It is possible to be too conservative.



Generic County														
2023 Cash Flows (actual)														
	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Annual	
Property tax collections				600,000						350,000			950,000	
Miscellaneous fees	68,000	74,000	63,000	55,000	66,000	61,000	60,000	56,000	51,000	60,000	54,000	52,000	720,000	
Federal grant	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	180,000	
Total sources of funds	83,000	89,000	78,000	670,000	81,000	76,000	75,000	71,000	66,000	425,000	69,000	67,000	1,850,000	
Salary and wage pmts.	125,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	1,555,000	
Payments to suppliers	20,000	22,000	19,000	17,000	23,000	21,000	19,000	15,000	20,000	25,000	18,000	21,000	240,000	
Interest payments		20,000			20,000			20,000			20,000		80,000	
Capital investments				125,000									125,000	
Total uses of funds	145,000	172,000	149,000	272,000	173,000	151,000	149,000	165,000	150,000	155,000	168,000	151,000	2,000,000	
Surplus/(deficit)	(62,000)	(83,000)	(71,000)	398,000	(92,000)	(75,000)	(74,000)	(94,000)	(84,000)	270,000	(99,000)	(84,000)	(150,000)	
Beginning cash balance	250,000	188,000	105,000	34,000	432,000	340,000	265,000	191,000	97,000	13,000	283,000	184,000	250,000	
Ending cash balance	188,000	105,000	34,000	432,000	340,000	265,000	191,000	97,000	13,000	283,000	184,000	100,000	100,000	



# Generic County, continued

- January, 2024 will be the last month of the federal grant program. The elimination of the grant will not be accompanied by a reduction in headcount or any other material cost savings.
- The local housing market in Generic County is in decline. Assessed property values are expected to increase only 0.5% on average in 2024. Further, miscellaneous fees, which consists principally of building permits, is expected to see its decline across 2023 continue through 2024.



# Generic County, continued

- Another 4% average salary and wage increase is expected to go into effect in February, 2024.
- A \$1 million capital investment project has been approved, and funds will be disbursed in March, 2024. A \$1 million bond issuance has also been approved, and the proceeds will be received February 1, 2024. Interest is 9% annually, with monthly payments starting March 1, 2024.



# Generic County, continued

- Quarterly interest payments on a \$2 million load are expected to continue in 2024.
- No substantial changes are expected in payments to suppliers and contractors.



	January 2024	February 2024	March 2024	April 2024
Property tax collections	-	-	-	\$603,000
Miscellaneous fee collections	\$ 50,273	\$ 48,776	\$ 47,279	45,783
Federal grant	15,000	-	-	-
Loan proceeds	-	1,000,000	-	-
<b>Total sources of funds</b>	<b>65,273</b>	<b>1,048,776</b>	<b>47,279</b>	<b>648,783</b>
Salary and wage payments	130,000	135,200	135,200	135,200
Payments to contractors and suppliers	20,000	20,000	20,000	20,000
Interest payments	-	20,000	7,500	7,500
Capital investments	-	-	1,000,000	-
<b>Total uses of funds</b>	<b>150,000</b>	<b>175,200</b>	<b>1,162,700</b>	<b>162,700</b>
Surplus/(deficit)	(84,727)	873,576	(1,115,421)	486,083
Beginning cash balance	100,000	15,273	889,849	(226,572)
<b>Ending cash balance</b>	<b>\$ 15,273</b>	<b>\$889,849</b>	<b>(\$226,572)</b>	<b>\$259,511</b>



# Trend Analysis

- A number moving steadily in one direction or the other can be estimated by various statistical tools.
- The “=FORECAST.LINEAR()” function in Excel was used to estimate miscellaneous fee collections here.



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# Interest

- Interest is always a function of outstanding loans, interest rates, and payment schedules.
- In this case, the quarterly interest payments from previously outstanding debt remain, and starting in March, monthly payments ( $\$1\text{M} \times 9\% \times 1/12$ ) begin on the new debt.



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# Capital Financing

- Even though the February loan delayed the shortfall position for a month, such loans are not “free money”, and the shortfall shows up when the loan has to pay for the budgeted capital project.



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So...

What do we do about the anticipated shortfall?



# Other Considerations

Consider second order effects.

If, for example, there is a large facility rental collection anticipated when the county fairground hosts a large concert festival, will there be other additional receipts (hotel taxes) or costs (uniformed officers on traffic control) involved?



# Other Considerations

Consider seasonality. A constant monthly amount is not appropriate for all things, even ongoing operating costs.

If, for example, the lawn and landscaping crew is furloughed in the winter months, that department's wages will be higher in the summer and lower in the winter.



# Other Considerations

Sensitivity analysis.

It is sometimes beneficial, especially across shorter time horizons, to prepare best case/worst case versions of cash forecasts.



# Okay, all that's great, but what happens when...

- the weather really is terrible at the county fair, and collections come in at half what was forecast?
- the waste collectors go on strike and outsourcing it costs five times what was planned?
- those bozos at the state capital changed the laws for property tax collections in the middle of a year that was already happening, and millions now have to be refunded?



# Unexpected events happen

Luck favors the prepared.



*Questions?*



*Provided by WSU – Executive & Professional Development*

*Thank you!*



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# Resources

- [Using Cash Forecasts for Treasury and Operations Liquidity \(gfoa.org\)](#)
- [Cash Flow Forecasting \(gfoa.org\)](#)
- [Municipal financial forecast software \(municast.com\)](#)
- [Building a Rolling Forecast in Excel – YouTube](#) (If your Excel skills are a bit above beginner level)

