

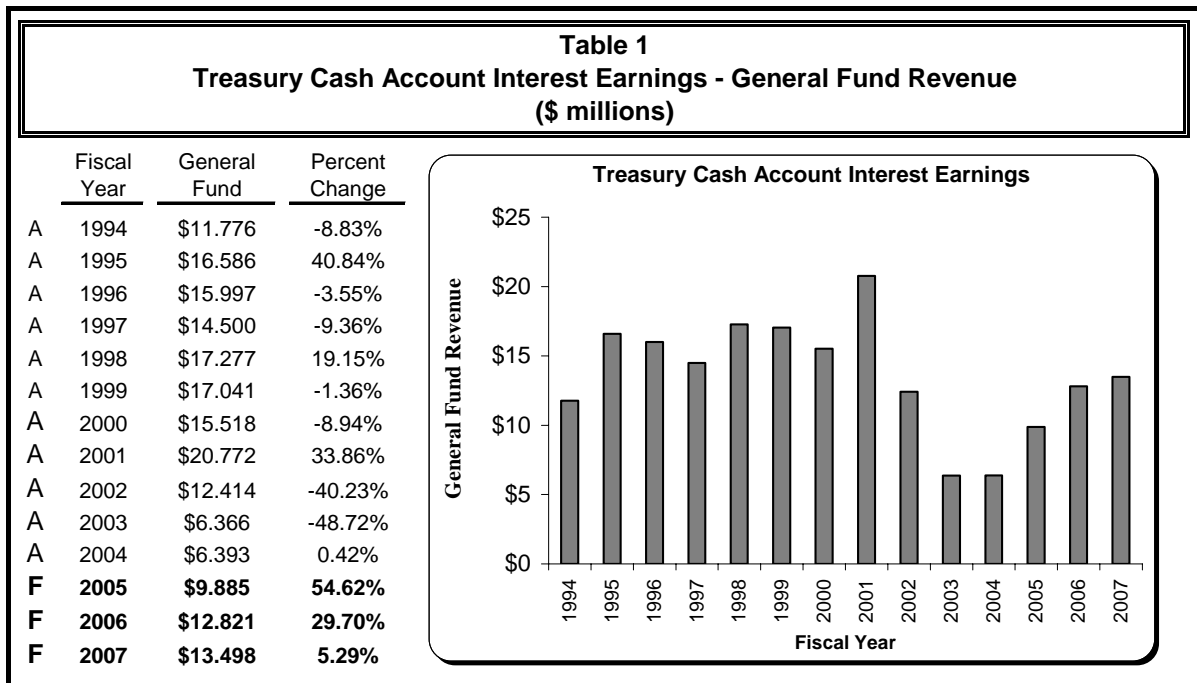
TREASURY CASH ACCOUNT INTEREST

Revenue Description

The state Board of Investments invests cash on hand in the state treasury. Interest earned on this Treasury Cash Account (TCA) is paid into the general fund (§17-6-202, MCA). The balance in the TCA increases in months when receipts are more than expenditures. It decreases in months when receipts are less than expenditures. In many years, the state borrows money to maintain a positive balance in the general fund by issuing tax or revenue anticipation notes (TRANS). TRANS are short-term bonds that are repaid in the same fiscal year that they are issued (§ 17-1-201, MCA). Issuing TRANS increases the average balance in the TCA and, therefore, increases the interest earned on the account. However, the state must pay interest on the TRANS.

Historical and Projected Revenue

Table 1 shows actual general fund revenue from TCA earnings for FY 1994 through FY 2004, and forecasts of earnings for FY 2005 through FY 2007.



In FY 2003 and FY 2004, interest rates were lower than at any time in the previous fifty years, and TCA interest earnings were significantly lower than in any of the previous ten years. Interest rates are projected to rise slowly through FY 2007. Average balances are projected to be higher than the average over the last ten

years due to recent legislation. TCA interest earnings are projected to increase significantly in FY 2005 and FY 2006, and then increase 5.29% in FY 2007.

Forecast Methodology and Projection Calculation

There are three steps to forecasting interest earnings on the Treasury Cash Account:

1. Projecting the average balance in the account;
2. Projecting the annual average yield; and
3. Multiplying the projected balance by the projected yield to give projected earnings.

Average Balance

The balance in the TCA changes over the course of a fiscal year. There are two reasons for this. One is that revenues and expenditures are not equal most months. General fund expenditures tend to be greater than revenues in the first months of the fiscal year, and general fund revenues tend to be greater than expenditures later in the fiscal year. This causes the balance of the TCA to fall during the first part of the fiscal year and recover in the last part of the fiscal year. Other funds have receipts and expenditures that vary over time. However, not all receipts and expenditures follow regular annual patterns, and the pattern of monthly TCA balances varies from year to year.

The other reason for changes in the balance during a fiscal year is that in many years the state issues TRANS. These are short-term bonds that the state issues and repays during the same fiscal year. They are issued to ensure that the balance in the general fund is never negative. When they are issued, the TCA balance increases by the amount of the TRANS issued. When they are repaid at the end of the fiscal year, the balance decreases by the same amount. Issuing TRANS increases the average account balance during years in which they are issued.

The account ending balance also changes from year to year when revenues and expenditures do not balance. In years when revenues exceed expenditures, the year-end balance in the TCA will be greater than the beginning balance. In years when revenues are less than expenditures, the ending balance will be less than the beginning balance.

Table 2 shows the average and ending balances in the TCA for FY 1990 through FY 2004.

The highest and lowest year-end balances in this period differ by more than \$200 million, but there was relatively little variation in the average balances. The average TCA balance in FY 1990 through FY 2001 was \$298.290 million. The average balance in FY 1992 was much lower than in the other years in this period. Excluding FY 1992, the average was \$304.034 million.

Recent legislation is estimated to have reduced the average balance by \$20 million in FY 2002. Without this legislative change, the average balance for FY 2002 would have been fairly close to the average for FY 1991 through FY 2001. Other legislation passed that was estimated to increase the average balance by \$42.685 million in FY 2003.

Table 2 TCA Average and Ending Balance (\$ millions)		
Fiscal Year	Average Balance	Ending Balance
1990	\$314.829	\$355.761
1991	\$284.911	\$292.950
1992	\$235.108	\$205.817
1993	\$283.886	\$255.314
1994	\$304.673	\$331.294
1995	\$305.502	\$275.808
1996	\$314.871	\$406.381
1997	\$289.989	\$289.501
1998	\$296.873	\$335.730
1999	\$310.518	\$394.460
2000	\$303.628	\$439.395
2001	\$334.705	\$417.768
2002	\$273.343	\$325.570
2003	\$273.929	\$347.503
2004	\$311.478	\$441.236

TRANS issues smooth out year-to-year variations in balances as well as variations in balances within a fiscal year. When general fund balances are lower than normal early in the fiscal year, more TRANS are issued. When general fund balances are higher than normal in the early months of the fiscal year, fewer or no TRANS are issued.

Cash balances in funds other than the general fund vary over time and often do not follow annual patterns. However, over time the average cash balance in all funds that are held in the TCA has been relatively stable.

There have been two changes in law that will affect TCA balances. With the passage of Legislative Referendum 115, the Department of Transportation cash holdings will no longer be part of the TCA. This reduced average balances by \$20 million beginning in FY 2002. HB 16 passed by the 2002 special session placed restrictions on loans between state funds. This was expected to reduce non-interest paying loans from the general fund to other funds and to increase the average TCA balance by \$42.785 million beginning in FY 2003. The net effect was a reduction of \$20 million for FY 2002 and an increase of \$22.8 million beginning in FY 2003.

Table 3 shows the calculation for the projected average TCA balance for FY 2005 through 2007.

The legislation impact is deducted from the average TCA balance for FY 2003 and FY 2004 to get an average balance for these fiscal years that is consistent with the prior years.

Then the adjusted average TCA balance for FY 1990 to FY 2004, excluding the outlier years 1992 and 2002 from the series is calculated.

Then the \$22.8 million legislation impact is added to the average TCA balance to reflect the recent legislation changes. This results in a projected average balance of \$321.584 million for fiscal years 2005 through 2007.

Table 3 Calculation of Average TCA Balance FY 2005 through FY 2007		
	FY 2003	FY 2004
Average TCA Balance	273.929	311.478
Subtract Legislation Impact	22.800	22.800
Adjusted Average TCA Balance	251.129	288.678
	Fiscal Year	Average Balance
	1990	\$314.829
	1991	\$284.911
	1993	\$283.886
	1994	\$304.673
	1995	\$305.502
	1996	\$314.871
	1997	\$289.989
	1998	\$296.873
	1999	\$310.518
	2000	\$303.628
	2001	\$334.705
	2003	\$251.129
	2004	\$288.678
TCA Average Balance		\$298.784
Add Legislative Impact		22.800
Projected Average TCA Balance		\$321.584

Yields

The TCA is managed by the Board of Investments. Part of the TCA balance is invested in the Board of Investments Short Term Investment Pool (STIP), which holds short-term commercial and government bonds. The rest of the TCA balance is held in short-term assets similar to those in the STIP portfolio. The forecast of the STIP yield is explained in the introduction to interest earnings.

Over many years, the average TCA yield is very close to the average STIP yield, but they can differ significantly in any one year. The TCA yield tends to be higher than the STIP yield in years when interest rates are falling and lower in years when interest rates are rising. This is consistent with the way that the Board of Investments manages the TCA.

The TCA balance changes by as much as \$100 million over the course of a fiscal year. The Board of Investments buys bonds in months when the TCA balance is increasing and sells them in months when the TCA balance is decreasing. It generally does not hold bonds to maturity. When interest rates change between the time the Board of Investments buys bonds and when it sells them, it realizes a

capital gain or loss on the sale. When interest rates fall, bond prices rise and there is a capital gain. When interest rates rise, bond prices fall and there is a loss.

The income earned on the TCA balance consists of interest earnings and gains or losses on bond sales. When interest rates rise, the annual yield on the TCA balance rises, but not as much as interest rates rise because of offsetting losses on bond sales. When interest rates fall, the TCA yield falls, but because of offsetting gains on bond sales, not by as much as interest rates fall.

Statistical forecasting models were estimated for FY 1979 through FY 2004 using several different short-term interest rates to predict the TCA yield. The model with the smallest margin of error predicts the TCA yield from the STIP yield and annual changes in the STIP yield. It predicts a higher TCA yield when the STIP yield has fallen from last year and a lower TCA yield when the STIP yield has risen from last year, and the effect is more than proportional to the change in the STIP yield. This model is shown in Table 4.

Table 4					
TCA Yield Forecasting Model					
TCA yield	=	0.8294%			
	+	0.8696	x	STIP yield	
	+	0.3992	x	Change in STIP yield	
	-	17.5184	x	Signed Square of Change in STIP Yield	
	-	0.4366	x	(Previous TCA Yield - Trend)	

The change in STIP yield is the difference in STIP yields between the present and the prior year. The signed square of change in STIP yield is calculated by squaring this difference and applying the sign of the original change to the result. The last step is necessary to preserve the sign of the change, because multiplying a negative number by itself gives a positive number.

Table 5 shows actual STIP and TCA yields for FY 2001 through FY 2004 and the model's forecasts for FY 2005 through FY 2007. Yields are expected to rise through FY 2007 due to predicted increases in short-term interest rates. The projected increases in TCA yield are smaller than projected increases in the STIP yield.

Table 5					
TCA Annual Yield - Actual and Model Forecasts					
Fiscal Year	STIP Yield	Change in STIP Yield	Signed Square of Change in STIP Yield	TCA Yield	Change in TCA Yield
A 2001	6.64%	11.60%	0.0048%	6.21%	21.53%
A 2002	2.84%	-57.23%	-0.1444%	4.54%	-26.89%
A 2003	1.54%	-45.77%	-0.0169%	2.32%	-48.81%
A 2004	1.10%	-28.52%	-0.0019%	2.05%	-11.69%
F 2005	2.12%	92.41%	0.0103%	3.07%	49.77%
F 2006	3.28%	54.86%	0.0135%	3.99%	29.70%
F 2007	3.68%	12.26%	0.0016%	4.20%	5.29%

TCA Interest Earnings

Table 6 shows actual TCA average balances, yields and earnings for FY 2003 and FY 2004 and the projected values for FY 2005 through FY 2007. TCA interest earnings are projected to be \$9.9 million in FY 2005, \$12.8 million in FY 2006, and \$13.5 million in FY 2007.

Table 6					
Calculation of TCA Earnings					
(\$ millions)					
<u>Fiscal Year</u>	<u>Average Balance</u>		<u>TCA Yield</u>		<u>Projected Earnings</u>
A 2003	\$273.929	x	2.32%	=	\$6.366
A 2004	\$311.478	x	2.05%	=	\$6.393
F 2005	\$321.584	x	3.07%	=	\$9.885
F 2006	\$321.584	x	3.99%	=	\$12.821
F 2007	\$321.584	x	4.20%	=	\$13.498