

Performance Update

As of June 30, 2024

Panorama Passage® Variable Annuity

- **Not a bank or credit union deposit or obligation**
- **Not insured by any federal government agency**
- **Not FDIC or NCUA-insured**
- **Not guaranteed by any bank or credit union**
- **May go down in value**

Panorama Passage®

A deferred variable annuity is a long-term investment designed to help you accumulate assets for retirement. It also offers a broad array of investment choices and asset classes, fixed accounts, death benefit choices and multiple methods to turn those assets into a stream of guaranteed income at some point in the future. (Guarantees are based on the claims-paying ability of the issuing company and do not apply to the investment performance or the safety of amounts held in the variable investment choices.) Variable annuities are not appropriate for everyone. There are fees and charges associated with owning an annuity. **Variable annuities are subject to market risk, including the potential loss of principal.** Also, withdrawals of earnings will be subject to income tax and may be subject to a 10 percent federal income tax penalty if taken prior to age 59 ½.

Panorama Passage first became available (in most states) on October 1, 1999, but many of the underlying funds were established before this date. For these funds, the total returns are computed using hypothetical variable annuity unit values which are based on the underlying fund's performance less separate account expenses for the periods shown, including periods before the product was available. For periods of one year or less, the total return is not annualized and is the percentage change in an Accumulation Unit. For periods greater than one year, the average annual total return for the time periods is shown.

Past performance is no indication of future results. This update contains the most recent month-end performance. Since performance changes daily, the current performance may be lower or higher than the performance reflected in this update. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. For the most recent month-end performance information, visit our website at www.massmutual.com or call the MassMutual Customer Service Center at (800) 272-2216, Monday – Friday, 8 a.m. to 8 p.m. Eastern Time.

Investing involves risk, including the loss of principal. Each investment choice underlying the variable annuity contract has broad risks that apply to all investment choices, such as market risk, as well as specific risks inherent in particular types of investment choices that may subject your variable annuity contract to greater risk and volatility than the general market.

Investors should carefully consider the investment objectives, risks, charges and expenses of the variable annuity contract before making additional purchase payments. For this and other information, obtain the [Panorama Passage prospectus](#) from your registered representative. The prospectus should be read carefully before investing or sending money. You may also obtain the [prospectuses \(or summary prospectuses, if available\)](#) for its underlying investment choices from your registered representative.

Market Indices as of June 30, 2024

	YTD	1 Year	3 Years	5 Years	10 Years
S&P 500 Index	15.29%	24.56%	10.01%	15.05%	12.86%
MSCI ACWI Ex USA NR USD	5.69%	11.62%	0.46%	5.55%	3.84%
Russell 2000 Total Return Index	1.73%	10.06%	-2.58%	6.94%	7.00%
Bloomberg U.S. Aggregate Bond Index	-0.71%	2.63%	-3.02%	-0.23%	1.35%

Market indices have been provided for informational purposes only; they are unmanaged and reflect no fees or expenses. Individuals cannot invest directly in an index.

The Standard & Poor's 500 Index is an unmanaged measure of common stock total return performance in the U.S.

The Russell 2000 Total Return Index is a broad based, unmanaged index comprised of 2000 of the smallest U.S. domiciled company common stocks (on the basis of capitalization) that are traded in the United States on the New York Stock Exchange, the American Stock Exchange, and NASDAQ.

The Bloomberg U.S. Aggregate Bond Index is an unmanaged index of U.S. corporate bond issues, U.S. Government Securities and mortgage-backed securities.

Total Returns

For the Period Ending: June 28, 2024

Total Returns reflect total annualized separate account expenses. For contracts (certificates in certain states) issued prior to May 1, 2003, the current total separate account expenses for contract/certificate years 1-10 is 1.49%; for contracts/certificates issued on or after May 1, 2003, the current total separate account expenses for contract/certificate years 1-10 is 1.65%. Performance including periods prior to May 1, 2003 reflects total separate account expenses of 1.49%. Performance as of May 1, 2003 and thereafter reflects total separate account expenses of 1.65%. These returns do not reflect the annual maintenance charge or premium taxes, if any. Their inclusion would reduce the returns shown.

Separate Account Sub-account	Fund Inception Date	Endnotes	Cumulative	Average Annual				Since Inception
			YTD	1 Year	3 Years	5 Years	10 Years	
Money Market								
Invesco V.I. U.S. Government Money <i>7-day yield 2.95%</i>	4/3/1985	1, 2	1.52%	3.10%	1.03%	0.15%	-0.48%	*
MML U.S. Government Money Market <i>7-day yield 3.13%</i>	12/15/1981	1, 3	1.59%	3.24%	1.07%	0.17%	-0.46%	*
Fixed Income								
Invesco V.I. Global Strategic Income Fund - SERIES I	5/3/1993	6	-1.28%	2.70%	-3.15%	-2.07%	-0.63%	*
MML II High Yield Fund - Service 1	5/3/2010	5, 4	2.57%	9.35%	-0.07%	2.15%	2.29%	*
MML II Inflation-Protected and Income Fund - Initial	8/30/2002		0.32%	2.54%	-2.92%	0.51%	0.32%	*
MML II Managed Bond Fund - Initial	12/16/1981		-0.03%	3.88%	-4.45%	-1.24%	-0.01%	*
MML Short-Duration Bond Fund - Service 1	5/3/2010	4, 5	1.53%	5.01%	-1.55%	-0.65%	-0.20%	*
MML Total Return Bond Fund - Service 1	5/1/2012	5	-2.15%	0.35%	-5.68%	-2.32%	-0.77%	*
Asset Allocation								
MML Aggressive Allocation Fund - Initial	8/31/2007	7	6.45%	12.03%	1.91%	6.90%	5.83%	*
MML Balanced Allocation Fund - Initial	8/31/2007	7	2.92%	7.27%	-0.97%	3.26%	3.18%	*
MML Conservative Allocation Fund - Initial	8/31/2007	7	2.15%	6.39%	-1.54%	2.42%	2.56%	*
MML Growth Allocation Fund - Initial	8/31/2007		5.10%	10.15%	0.85%	5.63%	4.88%	*
MML Moderate Allocation Fund - Initial	8/31/2007	7	3.74%	8.48%	-0.19%	4.05%	3.78%	*
Balanced								
MML II Blend Fund - Initial	2/2/1984		7.16%	13.07%	2.23%	6.49%	5.95%	*
Large Cap Value								
MML Equity Income Fund - Initial	5/1/2006	10	6.91%	13.34%	4.76%	7.83%	6.25%	*
MML Fundamental Value Fund - Service 1	5/1/2012	5, 4	9.22%	18.37%	6.57%	9.68%	6.74%	*
MML II Equity Fund - Initial	12/31/1973	11	9.05%	15.94%	5.53%	9.13%	6.82%	*
MML Income & Growth Fund - Initial	5/1/2006	10, 8	6.97%	14.58%	5.66%	8.79%	7.33%	*
Large Cap Blend								
Fidelity VIP Contrafund Portfolio - Initial	1/3/1995	8	24.03%	35.67%	9.54%	15.64%	11.54%	*
Invesco V.I. Diversified Dividend Fund Series I	3/1/1990	12	5.12%	10.03%	4.44%	6.22%	5.82%	*
Invesco V.I. Main Street Fund - SERIES I	7/5/1995		15.41%	20.10%	6.17%	10.79%	9.21%	*
MML Equity Index Fund - I	5/1/1997		14.09%	21.98%	7.73%	12.70%	10.55%	*
MML Focused Equity Fund - Service 1	5/1/2012	4, 5	3.41%	7.08%	4.81%	8.13%	8.53%	*
MML Fundamental Equity Fund - Service 1	5/1/2012	4, 5	15.41%	19.81%	5.87%	11.99%	11.38%	*
MML Sustainable Equity Fund - Initial	5/1/2006	10	12.93%	21.25%	7.03%	11.49%	10.03%	*
Large Cap Growth								
Invesco V.I. Capital Appreciation Fund - SERIES I	4/3/1985		22.62%	32.42%	6.16%	14.75%	11.39%	*
MML Blue Chip Growth Fund - Initial	5/1/2006	10	23.98%	36.16%	3.66%	11.84%	12.37%	*
MML Large Cap Growth Fund - Initial	5/1/2006	10	16.02%	26.39%	8.43%	14.83%	12.59%	*
Small/Mid Cap Value								
MML Mid Cap Value Fund - Initial	5/1/2006	10	0.06%	2.38%	2.23%	6.06%	6.12%	*
MML Small/Mid Cap Value Fund - Initial	5/1/2006	10	1.73%	10.57%	1.11%	6.93%	5.39%	*
Small/Mid Cap Growth								
Invesco V.I. Discovery Mid Cap Growth Fund - SERIES I	8/15/1986		10.74%	12.39%	-3.29%	7.59%	9.12%	*
MML Mid Cap Growth Fund - Initial	5/1/2006	10	2.22%	8.42%	-2.29%	5.55%	8.26%	*
MML Small Cap Growth Equity Fund - Initial	5/3/1999		1.58%	7.54%	-4.46%	5.76%	6.88%	*
Small/Mid Cap Blend								
MML II Small Cap Equity Fund - Initial	6/1/1998		2.11%	9.21%	0.37%	8.72%	7.13%	*
International/Global								
Invesco Oppenheimer V.I. International Growth Fund - SERIES I	5/13/1992	5	2.13%	6.19%	-3.75%	4.14%	2.16%	*
Invesco V.I. Global Fund - SERIES I	11/12/1990		13.07%	22.54%	1.03%	9.07%	7.62%	*
MML Foreign Fund - Initial	5/1/2006	10	2.51%	6.63%	-0.15%	3.52%	0.48%	*
MML Global Fund - II	5/1/2006	10	1.76%	4.33%	-1.22%	5.11%	5.42%	*
Specialty								
Invesco V.I. Health Care Fund Series I (4452)	5/1/1997		12.01%	11.30%	0.87%	6.49%	5.48%	*
Invesco V.I. Technology Fund Series I (4455)	5/20/1997		18.81%	30.22%	1.07%	12.34%	11.74%	*
MML Managed Volatility Fund - Initial	5/1/2000	13, 14	7.31%	9.91%	2.04%	4.25%	3.16%	*
PIMCO Commodity Real Return Strategy Portfolio	2/28/2006	5	3.72%	3.79%	2.03%	5.94%	-3.01%	*
VY CBRE Global Real Estate Portfolio - S	1/3/2006	4	-4.69%	3.75%	-4.30%	0.27%	1.04%	*

Standardized Total Returns - With Full Surrender

For the Period Ending: June 30, 2024

These standardized returns assume a single \$1,000 purchase payment made at the beginning of the periods shown, and full surrender on the last business day of the most recent calendar quarter. They assume that the contract (certificate, in certain states) is redeemed and reflect the annual maintenance charge (contract level charges) of \$40.00 allocated proportionately for each Sub-account, all fund level expenses, and total separate account expenses. For contracts/certificates issued prior to May 1, 2003, the current total separate account expenses for contract/certificate years 1-10 is 1.49%; for contracts/certificates issued on or after May 1, 2003, the current total separate account expenses for contract/certificate years 1-10 is 1.65%. Performance including periods prior to May 1, 2003 reflects total separate account expenses of 1.49%. Performance as of May 1, 2003 and thereafter reflects total separate account expenses of 1.65%. These returns do not reflect premium taxes, if any. Their inclusion would reduce the returns shown.

Separate Account Sub-account	Date Added Separate Account	Endnotes	Cumulative YTD	Average Annual				
				1 Year	3 Years	5 Years	10 Years	Since Date to Account
Money Market								
Invesco V.I. U.S. Government Money <i>7-day yield 2.95%</i>	8/31/1998	1, 2	1.43%	3.01%	0.94%	0.05%	-0.57%	0.09%
MML U.S. Government Money Market <i>7-day yield 3.13%</i>	5/1/2006	1, 3	1.50%	3.15%	0.98%	0.08%	-0.56%	-0.48%
Fixed Income								
Invesco V.I. Global Strategic Income Fund - SERIES I	8/31/1999	6	-1.37%	2.61%	-3.25%	-2.17%	-0.73%	2.54%
MML II High Yield Fund - Service 1	5/3/2010	5, 4	2.48%	9.26%	-0.17%	2.06%	2.20%	4.22%
MML II Inflation-Protected and Income Fund - Initial	4/30/2003		0.23%	2.44%	-3.02%	0.43%	0.23%	1.53%
MML II Managed Bond Fund - Initial	9/30/1999		-0.12%	3.79%	-4.55%	-1.33%	-0.10%	2.40%
MML Short-Duration Bond Fund - Service 1	5/3/2010	4, 5	1.44%	4.92%	-1.65%	-0.74%	-0.29%	0.03%
MML Total Return Bond Fund - Service 1	5/1/2012	5	-2.24%	0.26%	-5.78%	-2.41%	-0.86%	-0.54%
Asset Allocation								
MML Aggressive Allocation Fund - Initial	1/22/2008	7	6.36%	11.94%	1.81%	6.81%	5.75%	5.84%
MML Balanced Allocation Fund - Initial	1/22/2008	7	2.83%	7.18%	-1.07%	3.17%	3.10%	3.73%
MML Conservative Allocation Fund - Initial	1/22/2008	7	2.06%	6.30%	-1.64%	2.33%	2.47%	3.31%
MML Growth Allocation Fund - Initial	1/22/2008		5.01%	10.06%	0.75%	5.55%	4.80%	5.09%
MML Moderate Allocation Fund - Initial	1/22/2008	7	3.65%	8.39%	-0.29%	3.97%	3.70%	4.27%
Balanced								
MML II Blend Fund - Initial	4/30/1999		7.07%	12.98%	2.13%	6.41%	5.88%	7.64%
Large Cap Value								
MML Equity Income Fund - Initial	5/31/2002	10	6.81%	13.25%	4.66%	7.75%	6.18%	4.68%
MML Fundamental Value Fund - Service 1	5/1/2012	5, 4	9.13%	18.28%	6.47%	9.59%	6.66%	8.28%
MML II Equity Fund - Initial	4/30/1999	11	8.96%	15.85%	5.43%	9.05%	6.74%	4.02%
MML Income & Growth Fund - Initial	8/31/1998	10, 8	6.88%	14.49%	5.57%	8.71%	7.26%	3.74%
Large Cap Blend								
Fidelity VIP Contrafund Portfolio - Initial	8/31/1998	8	23.94%	35.57%	9.43%	15.57%	11.47%	8.22%
Invesco V.I. Diversified Dividend Fund Series I	4/30/2000	12	5.03%	9.94%	4.35%	6.14%	5.75%	11.92%
Invesco V.I. Main Street Fund - SERIES I	8/31/1999		15.31%	20.01%	6.07%	10.71%	9.14%	5.21%
MML Equity Index Fund - I	4/30/1999		14.00%	21.89%	7.64%	12.63%	10.48%	5.61%
MML Focused Equity Fund - Service 1	5/1/2012	4, 5	3.32%	6.99%	4.72%	8.05%	8.47%	10.35%
MML Fundamental Equity Fund - Service 1	5/1/2012	4, 5	15.32%	19.72%	5.77%	11.92%	11.32%	11.50%
MML Sustainable Equity Fund - Initial	4/30/2003	10	12.84%	21.16%	6.93%	11.42%	9.96%	5.72%
Large Cap Growth								
Invesco V.I. Capital Appreciation Fund - SERIES I	8/31/1999		22.52%	32.32%	6.05%	14.68%	11.33%	6.20%
MML Blue Chip Growth Fund - Initial	5/31/2002	10	23.89%	36.07%	3.54%	11.76%	12.31%	8.24%
MML Large Cap Growth Fund - Initial	8/31/1999	10	15.93%	26.30%	8.33%	14.76%	12.53%	6.61%
Small/Mid Cap Value								
MML Mid Cap Value Fund - Initial	8/31/1999	10	-0.03%	2.29%	2.14%	5.98%	6.04%	5.01%
MML Small/Mid Cap Value Fund - Initial	4/30/2003	10	1.64%	10.48%	1.01%	6.85%	5.32%	4.03%
Small/Mid Cap Growth								
Invesco V.I. Discovery Mid Cap Growth Fund - SERIES I	8/31/1999		10.65%	12.30%	-3.40%	7.52%	9.06%	4.74%
MML Mid Cap Growth Fund - Initial	8/31/1998	10	2.13%	8.33%	-2.40%	5.47%	8.20%	5.89%
MML Small Cap Growth Equity Fund - Initial	5/3/1999		1.49%	7.45%	-4.57%	5.68%	6.81%	5.26%
Small/Mid Cap Blend								
MML II Small Cap Equity Fund - Initial	8/31/1998		2.02%	9.12%	0.27%	8.65%	7.06%	5.74%
International/Global								
Invesco Oppenheimer V.I. International Growth Fund - SERIES I	8/31/1998	5	2.04%	6.10%	-3.86%	4.06%	2.07%	4.00%
Invesco V.I. Global Fund - SERIES I	8/31/1999		12.98%	22.45%	0.92%	8.99%	7.55%	7.21%

Separate Account Sub-account	Date Added Separate Account	Endnotes	Cumulative YTD	Average Annual				
				1 Year	3 Years	5 Years	10 Years	Since Date to Account
MML Foreign Fund - Initial	8/31/1999	10	2.42%	6.54%	-0.25%	3.43%	0.38%	0.85%
MML Global Fund - II	8/31/1999	10	1.67%	4.24%	-1.32%	5.03%	5.34%	3.38%
Specialty								
Invesco V.I. Health Care Fund Series I (4452)	4/30/2000		11.92%	11.21%	0.77%	6.42%	5.40%	15.62%
Invesco V.I. Technology Fund Series I (4455)	4/30/2000		18.71%	30.13%	0.96%	12.26%	11.67%	14.39%
MML Managed Volatility Fund - Initial	5/1/2000	13, 14	7.22%	9.82%	1.94%	4.16%	3.08%	2.58%
PIMCO Commodity Real Return Strategy Portfolio	5/1/2006	5	3.63%	3.69%	1.95%	5.86%	-3.15%	-2.25%
VY CBRE Global Real Estate Porfolio - S	5/1/2006	4	-4.78%	3.66%	-4.40%	0.18%	0.95%	2.18%

MML Asset Allocation Funds
For the Period Ending: June 30, 2024

The Panorama Passage variable annuity contract contains five MML Asset Allocation Funds ("funds of funds") that are designed to help investors meet their financial goals. These funds consist of certain, but not all, underlying funds available within the Panorama Passage variable annuity contract. The percentages below represent the approximation of assets as of the report date. The percentages may vary from the target allocation, which can be found in the corresponding fund prospectus. The percentages below are rounded so they may not total 100%.

	MML Aggressive Allocation Fund	MML American Funds Core Allocation Fund	MML Balanced Allocation Fund	MML Conservative Allocation Fund	MML Growth Allocation Fund	MML Moderate Allocation Fund
Fixed Income						
AMER FDS INS BOND FD		34.51				
INVESCO VI GLOBAL STRATEGIC IN	0.38		1.64	2.12	0.81	1.38
MML DYNAMIC BOND FUND	1.91		9.74	12.01	4.72	7.94
MML HIGH YIELD FUND	0.13		0.25	0.28	0.26	0.22
MML INFLATION PROTECTED BD FD	0.11		2.23	2.33	1.31	1.60
MML MANAGED BOND FUND	3.04		16.24	19.58	7.80	12.83
MML SHORT DURATION BOND FUND	0.99		4.44	5.37	2.18	3.60
MML TOTAL RETURN BOND FUND	2.68		14.06	16.72	7.00	11.17
PIMCO VARIABLE INSURANCE TRUST	0.64		1.31	1.54	0.86	1.20
Total Fixed Income	9.88	34.51	49.91	59.95	24.94	39.94
International/Global						
AMER FD INS INTERNATIONAL FD		9.92				
MML FOREIGN FD	3.92		2.25	1.81	3.22	2.61
MML GLOBAL FD	4.17		2.60	2.01	3.66	2.89
MML INTERNATIONAL EQUITY FUND	11.70		6.46	5.25	9.67	7.80
MML STRG EMERGING MARKETS FUND	1.74		0.96	0.86	1.46	1.15
Total International/Global	21.53	9.92	12.27	9.93	18.01	14.45
Large Cap Equity						
AMER FDS INS BLUE CHIP INC GRT		27.60				
AMER FDS INS GRWTH INC FD		27.96				
MML BLUE CHIP GROWTH FD	9.20		5.53	4.45	7.63	6.61
MML EQUITY INCOME FD	7.52		4.22	3.75	6.28	4.93
MML FOCUSED EQUITY FUND	13.37		7.78	4.82	11.12	8.85
MML FUNDAMENTAL GROWTH FUND	6.38		3.56	2.81	5.20	4.14
MML FUNDAMENTAL VALUE FUND	6.78		3.72	3.28	5.79	5.27
MML INCOME AND GROWTH FD	3.56		1.62	1.72	3.47	2.22
MML LARGE CAP GROWTH FD	7.08		3.89	2.97	5.95	4.28
Total Large Cap Equity	53.89	55.56	30.32	23.80	45.44	36.30
Mid Cap Equity						
MML MID CAP GROWTH FD	5.70		2.56	2.52	4.24	3.53
MML MID CAP VALUE FD	4.09		2.61	2.08	3.43	2.59
Total Mid Cap Equity	9.79		5.17	4.60	7.67	6.12
Small Cap Equity						
MML SMALL CAP GROWTH EQUITY FD	1.18		0.45	0.06	1.03	0.82
MML SMALL COMPANY VALUE FUND	2.40		1.26	1.09	1.88	1.49
MML SMALL/MID CAP VALUE	1.33		0.64	0.56	1.05	0.89
Total Small Cap Equity	4.91		2.35	1.71	3.96	3.20
Total Allocation	100	100	100	100	100	100

Credited Fixed Account Interest Rates Effective**For the Period Ending: June 30, 2024**

Current interest rates and guaranteed minimum interest rates vary by issue state and issue date. Credited rates will not be less than the minimum guaranteed interest rate as of a contract's issue date. Guarantees are based on the claims-paying ability of the issuing company.

	Previous	New	Change
The Fixed Account			
Not available for contracts issued on or after August 1, 2003			
New Money Rate	3.00%	3.00%	0.00%
Portfolio Rate	3.00%	3.00%	0.00%
Exchange Dollars from Flex Extra	3.00%	3.00%	0.00%
DCA Fixed Accounts			
Rates for all states, where available, except New York			
6 Month DCA	3.00%	3.00%	0.00%
6 Month DCA Effective Yield	0.66%	0.66%	0.00%
12 Month DCA	3.00%	3.00%	0.00%
12 Month DCA Effective Yield	1.40%	1.40%	0.00%
DCA Fixed Accounts			
Rates for New York			
6 Month DCA - NY	3.00%	3.00%	0.00%
6 Month DCA Effective Yield - NY	0.66%	0.66%	0.00%
12 Month DCA - NY	3.00%	3.00%	0.00%
12 Month DCA Effective Yield - NY	1.40%	1.40%	0.00%

Rates listed are applicable for new sales and subsequent payments. If a contract offered a guaranteed minimum interest rate different than the current applicable base interest rate listed, the contract holder will receive the higher of the two rates. The product, certain features and/or investment choices may not be available in all states or with all firms contracted with MassMutual.

1 Current rates on DCA Fixed Accounts are subject to change monthly. The 6-Month DCA Fixed Account rate is guaranteed for 6 months. The 12-Month DCA Fixed Account rate is guaranteed for 12 months. These rates are credited to the respective DCA Fixed Accounts and do not reflect the performance of any investment choices. Certain restrictions apply. The stated interest rate is not earned on the entire purchase payment amount due to regular transfers to the variable investment choices that will affect the daily accrual, lowering the effective yield. Additionally, any subsequent purchase payments applied to an existing DCA Fixed Account term will participate in only the remaining portion of that DCA term, lowering the effective yield further on the subsequent purchase payments. The effective yield is based on your initial deposit after the completion of your DCA Fixed Account transfers. Dollar Cost Averaging does not assure a profit or protect against loss in a declining market, and involves continuous investment in securities regardless of fluctuating prices. An investor should consider his/her ability to continue investing through periods of low price levels. See the appropriate product prospectus for complete details.

Endnotes

- 1 You could lose money by investing in the Fund. Although the seeks to preserve the value of your investment at \$1.00 per share, it cannot guarantee it will do so. An investment in the is not a bank account and is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The Fund's sponsor is not required to reimburse the Fund for losses, and you should not expect that the sponsor will provide financial support to the at any time, including during periods of market stress. The yield quotation for this more closely reflects the current earnings of the than the total return quotation. It is an annualized rate based on results over the last seven days of the period, and is net of all recurring contract fees and charges.
- 2 Although the Oppenheimer Government Money Fund/VA commenced operations on April 3, 1985, the information necessary to calculate the returns is available only for the year 1987 and subsequent periods. Oppenheimer Government Money is not available as an investment choice for contracts issued after January 18, 2008.
- 3 The MML U.S. Government Money Market Fund does not have a 12b-1 fee.
- 4 Performance reflects share classes with 12(b)-1 fees from inception which reduces the fund's performance. Please see the fund prospectus for more information about this fee.
- 5 The fund established a new class of shares, which is available with this contract, after it began its initial investment operations. The performance for the period prior to offering the new class shows the historical returns for the original class of shares, which were not subject to a 12b-1 fee. The performance shown from the inception date of the class available with this contract includes the fees and expenses of that share class, including a 12b-1 fee. A 12b-1 fee reduces a fund's performance.
- 6 Unavailable in contracts issued on or after May 1, 2009. For contracts issued prior to May 1, 2009, you may not allocate any new money to this fund via purchase payments or transfers.
- 7 Funds offered in a fund-of-funds structure may have higher expenses than a direct investment in the underlying funds because a fund-of-funds bears its own expenses and indirectly bears its proportionate share of expenses of the underlying funds in which it invests.

- 8 The fund established a new class of shares, which is available with this policy, after it began its initial investment operations. The performance for the period prior to offering the new class shows the historical returns for the original class of shares, which were not subject to a 12b-1 fee. The performance shown from the inception date of the class available with this policy includes the fees and expenses of that share class, including a 12b-1 fee. A 12b-1 fee reduces a fund's performance.
- 9 Unavailable in contracts issued on or after April 30, 2012. Due to ongoing market volatility, rates of return may be subject to substantial short-term fluctuations. Current rates of return may be lower than the rates of return shown. You will find updated rates of return published on a monthly basis at <http://www.massmutual.com/productsolutions/productperformance>.
- 10 The historical performance shown reflects a combination of the current underlying fund's performance, as well as the performance of a prior fund. The current fund's performance is reflected beginning on 5/1/06. The prior fund's performance covers the period between the date listed in the performance table and 4/30/06. This Allocation Fund does not make an investment in the underlying fund. The Fund's allocation is below 0.5%. When the fund has 10 years of performance history the Since Inception return is no longer shown.
- 11 Although the MML Equity Fund commenced operations on 9/15/1971, the information necessary to calculate returns is available only for 1974 and later years.
- 12 Effective April 29, 2011, Invesco V.I. Financial Services Fund merged into Invesco V.I. Dividend Growth Fund. Performance prior to that day reflects performance of the Invesco V.I. Financial Services Fund and performance on and after that date reflects performance of the Invesco V.I. Dividend Growth Fund.
- 13 The portfolio is classified as "non-diversified", meaning it has the ability to take larger positions in a smaller number of issuers than a "diversified" fund. Non-diversified portfolios may experience greater price volatility.
- 14 Formerly known as MML Large Cap Value Fund. The Fund's name, investment objective, and investment strategy changed on April 29, 2013. The performance results prior to April 29, 2013 would not necessarily have been achieved had the Fund's current strategy been in effect during that period.
- 15 Effective after the close of the New York Stock Exchange on April 26, 2024, the Invesco V.I. Conservative Balanced merged into the Invesco V.I. Equity and Income.
- * When the fund has 10 years of performance history the Since Inception return is no longer shown.

Panorama Passage® (Contract Form #: MUVA94) variable annuity contract was issued by Massachusetts Mutual Life Insurance Company in New York and by C.M. Life Insurance Company in all other states. C.M. Life Insurance Company, 100 Bright Meadow Boulevard, Enfield, CT 06082, is a subsidiary of Massachusetts Mutual Life Insurance Company, 1295 State Street, Springfield, MA 01111-0001.

Principal Underwriters:

MML Investors Services, LLC
MML Strategic Distributors, LLC

Subsidiaries of Massachusetts Mutual Life Insurance Company, 1295 State Street, Springfield, MA 01111-0001

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