THE WYATT COMPANY
1351 Washington Boulevard
Stamford, Connecticut 06902
(203) 356-1220

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

REPORT FROM THE ACTUARY AS OF JUNE 30, 1988

January 11, 1989

THE *Wyatt* COMPANY

ACTUARIES AND CONSULTANTS

EMPLOYEE BENEFITS
COMPENSATION PROGRAMS
EMPLOYEE COMMUNICATIONS
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1351 WASHINGTON BOULEVARD
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January 11, 1989

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State Teachers' Retirement Board
State of Connecticut
165 Capitol Avenue
Hartford, CT 06106

Re: Report from the Actuary on the State Teachers' Retirement System as of June 30, 1988

Dear Members of the Board:

In accordance with your instructions, we have developed the contribution requirement for the State of Connecticut for the fiscal year ending June 30, 1990 and have estimated the actuarial present value of accrued benefits as of June 30, 1988.

Under the supervision and direction of the undersigned, The Wyatt Company has reviewed the census data for Members of the System as of June 30, 1988. The results shown in this report have been based on this data, on the financial data provided by the State Treasurer's Office and the Board, and on the results of our June 30, 1987 actuarial valuation of the System.

We will be pleased to respond to any questions which may arise in connection with this report.

Respectfully submitted,

THE WYATT COMPANY

Brian F. Dunn

Brian F. Dunn
Associate, Society of Actuaries

Robert A. Rosati

Robert A. Rosati
Fellow, Society of Actuaries

BFD/RAR/AB

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

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STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

SUMMARY OF PRINCIPAL ACTUARIAL RESULTS

A. Contribution Requirement

In accordance with the instructions of the State Teachers' Retirement Board, no formal actuarial valuation of the System was conducted as of June 30, 1988. The results of the actuarial valuation of the System as of June 30, 1987 were used to develop the State contribution requirement for the fiscal year ending June 30, 1990.

Contribution Requirement for the Fiscal Year Ending June 30, 1990	$ 348,639,000

B. Estimated Funded Status of the System

The funded status of the System as of June 30, 1988 has been estimated by comparing the market value of assets with the estimated actuarial present value of accrued benefits as of that date.

1.	Actuarial Present Value for:	
	a. Retired Teachers, Beneficiaries, Survivors, Dependents, and Other Inactive Teachers	$1,793,946,000
	b. Active Teachers	3,911,159,000
	c. Member Contributions	1,151,567,000
	d. Total	$6,856,672,000
2.	Market Value of Assets	$3,422,467,000
3.	Estimated Funded Ratio:	
	Item 2 -:- Item 1.d.	49.9%

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

COMPARISON OF PRINCIPAL ACTUARIAL RESULTS

The following is a summary of the principal actuarial results for the current year and for the prior year.

	Actuarial Results as of June 30, 1987	Actuarial Results as of June 30, 1988
A. SUMMARY OF DATA		
1. Number of Members		
a. Active	39,014	39,958
b. Inactive	968	1,125
c. Terminated Vested	766	707
d. Retired and Beneficiaries	12,207	12,549
e. Survivors and Dependents	485	512
f. Total	53,440	54,851
2. Characteristics of Active Members		
a. Total Compensation	$1,193,463,000	$1,369,950,000
b. Average Annual Compensation	30,590	34,285
c. Average Age	43.4	43.8
d. Average Service	14.3	14.4
B. SUMMARY OF COSTS		
1. Normal Cost		
a. Amount	$ 151,005,000	$ 173,335,000
b. As a Percent of Covered Compensation	12.7%	12.7%
2. Actuarial Accrued Liability	$7,177,957,000	$7,797,302,000
3. Valuation Assets	$2,566,301,000	$3,009,196,000
4. Unfunded Actuarial Accrued Liability	$4,611,656,000	$4,788,106,000
5. State Contribution Requirement for Fiscal Year Ending 6/30/89, 6/30/90, Respectively	$ 302,917,000	$ 348,639,000

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

COMPARISON OF PRINCIPAL ACTUARIAL RESULTS

	Actuarial Results as of June 30, 1987	Actuarial Results as of June 30, 1988
C. ASSETS AND ACTUARIAL PRESENT VALUES		
1. Assets		
a. Actuarial Value	$2,566,301,000	$3,009,196,000
b. Market Value	$3,188,223,000	$3,422,467,000
2. Actuarial Present Value of Accrued Benefits		
a. Member Contributions	$1,021,663,000	$1,151,567,000
b. Retired Members, Beneficiaries, Dependents, and Other Inactive Teachers	1,821,695,000	1,793,946,000
c. Other Members	3,450,354,000	3,911,159,000
d. Total	$6,293,712,000	$6,856,672,000

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

THE FUNDED STATUS OF THE SYSTEM

As noted in the Summary of Actuarial Results, we have compared the market value of assets with the actuarial present value of accrued benefits to obtain one measure of how the System is meeting its obligation to fund benefits payable to its Members. These results are especially meaningful when compared with those of prior years:

Fiscal Year Ending June 30	Market Value of Assets	Actuarial Present Value of Benefits	Funded Ratio	Unfunded Actuarial Present Value of Benefits	Annual Compensation	Unfunded Ratio
1980	$ 1,049,306,000	$ 2,603,702,000	40.3%	$ 1,554,396,000	$ 692,547,000	224.4%
1982	1,154,963,000	3,244,804,000	35.6%	2,089,841,000	769,500,000	271.6%
1984	1,696,074,000	4,398,687,000	38.6%	2,702,613,000	886,409,000	304.9%
1985	2,157,914,000	4,882,540,000	44.2%	2,724,626,000	975,248,000	279.4%
1986	2,728,837,000	5,305,841,000	51.4%	2,577,004,000	1,065,077,000	242.0%
1987	3,188,223,000	6,293,712,000	50.7%	3,105,489,000	1,193,463,000	260.2%
1988	3,422,467,000	6,856,672,000	49.9%	3,434,205,000	1,369,950,000	250.7%

Analysis of the funded ratio over time indicates how the System is meeting its obligation to fund benefits. Generally, the greater this ratio, the stronger and more well-funded the System.

We have also compared the unfunded actuarial present value of accrued benefits with annual compensation to remove the effects of inflation and to aid in the analysis of the System's progress in accumulating sufficient assets to pay benefits when due. Generally, the smaller the unfunded ratio, the stronger the System.

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS

In order to reduce potential volatility in the market value of the System's assets, a smoothing technique is used to develop an actuarial value of assets. This value is then used to determine the unfunded actuarial accrued liability.

To develop the actuarial value of assets as of June 30, 1988, the actuarial value of assets as of July 1, 1987 was increased by contributions to the System and reduced by benefit payments made to former Members and their Beneficiaries. These amounts were then adjusted with interest to the end of the year, using the expected rate of return on assets. The resulting figure represents the expected actuarial value of assets, provided the assumed rate of return will be realized.

The expected actuarial value of assets at year end was then compared with the market value of assets as of June 30, 1988 and 20% of the difference was recognized. The resulting value would have been further adjusted if it had been less than 80% or greater than 120% of the market value of assets.

1.	Actuarial Value of Assets as of July 1, 1987	$ 2,566,301,000
2.	Contributions	331,257,000
3.	Benefit Payments	174,174,000
4.	Net Transactions: Item 2 - Item 3	157,083,000
5.	Expected Rate of Return (Change in CPI + 3.0%)	6.9%
6.	Expected Investment Return: Item 5 x (Item 1 + ½ Item 4)	182,494,000
7.	Expected Actuarial Value of Assets as of June 30, 1988: Item 1 + Item 4 + Item 6	2,905,878,000
8.	Market Value of Assets as of June 30, 1988	3,422,467,000
9.	Adjustments: 20% of the Difference between Item 8 and Item 7	103,318,000
10.	Preliminary Actuarial Value of Assets as of June 30, 1988: Item 7 + Item 9	3,009,196,000
11.	Limiting Values:	
	a. 80% of Item 8	2,737,974,000
	b. 120% of Item 8	4,106,960,000
12.	Actuarial Value of Assets as of June 30, 1988: Item 10, but not less than Item 11.a. or greater than Item 11.b.	$ 3,009,196,000

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DEVELOPMENT OF THE NORMAL COST AND THE UNFUNDED ACTUARIAL ACCRUED LIABILITY

In accordance with the instructions of the State Teachers' Retirement Board, no actuarial valuation of the System was conducted as of June 30, 1988. Consequently, the State contribution requirement was developed on the assumption that the normal cost would remain at 12.7% of the teachers' payroll and that the actual actuarial accrued liability as of June 30, 1988 would equal the expected actuarial accrued liability developed in the prior year's actuarial valuation.

A. Normal Cost

1. Normal Cost as a Percent of Annual Compensation from Prior Valuation	12.7%
2. Annual Compensation of Active Teachers	$ 1,369,950,000
3. Normal Cost as of July 1, 1988: Item 1 x Item 2	$ 173,335,000

B. Unfunded Actuarial Accrued Liability

1. Expected Actuarial Accrued Liability from Prior Valuation	$ 7,797,302,000
2. Actuarial Value of Assets	3,009,196,000
3. Unfunded Actuarial Accrued Liability: Item 1 - Item 2	$ 4,788,106,000

STATE OF CONNECTICUT
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DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1990

After detailed review of the Member census data as of June 30, 1988, we developed the State contribution requirement for the fiscal year ending June 30, 1990 using the principal results of our June 30, 1987 actuarial valuation of the System.

In the absence of significant changes in the census data for the System, we assumed that the normal cost would remain at 12.7% of the teachers' payroll and that the actual actuarial accrued liability as of June 30, 1988 would equal the expected actuarial accrued liability of $7,797,302,000, as developed in the prior year's actuarial valuation.

The formal development of the State contribution requirment for the fiscal year ending June 30, 1990 appears on the next page.

Table 1

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT FOR THE FISCAL YEAR ENDING JUNE 30, 1990

	Provisions in Effect June 30, 1980	Public Act 82-91	Public Act 87-381	Total
1. Unfunded Actuarial Accrued Liability as of 6/30/88	$ 4,757,506,000	$ 29,094,000	$ 1,506,000	$ 4,788,106,000
2. Normal Cost as of 7/1/88	173,335,000	0	0	173,335,000
3. Interest at 8% on (Item 1 + Item 2)	394,467,000	2,328,000	120,000	396,915,000
4. State Contributions	(301,197,000)	(1,645,000)	(75,000)	(302,917,000)
5. Interest to End of Year on Item 4	(14,915,000)	(81,000)	(4,000)	(15,000,000)
6. Expected Unfunded Actuarial Accrued Liability as of 6/30/89	$ 5,009,196,000	$ 29,696,000	$ 1,547,000	$ 5,040,439,000
7. Level Percent Amortization Payment (40/24/29 Years)	205,852,000	1,679,000	77,000	207,608,000
8. Estimated Normal Cost as of 7/1/89	190,669,000	0	0	190,669,000
9. Total: Item 7 + Item 8	$ 396,521,000	$ 1,679,000	$ 77,000	$ 398,277,000
10. 85% of Item 9 for Provisions in Effect 6/30/80; 100% of Item 9 for Subsequent Amendments	$ 337,043,000	$ 1,679,000	$ 77,000	$ 338,799,000
11. State Contribution Requirement: Item 10 Adjusted with Interest for Payment Quarterly in Advance	$ 346,832,000	$ 1,728,000	$ 79,000	$ 348,639,000

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1988

Table 2 and Table 3 on the next two pages show five-year projections of the State contribution requirement based on two alternative assumptions regarding the future growth of teachers' salaries.

For the purpose of the illustrations, we developed five-year projections based on an 8% and a 10% annual rate of salary increase, assuming the number of active teachers will remain at 39,958. Results shown for 1980-1988 (which correspond to contributions for fiscal years 1982-1990) are based on the actual actuarial results for the System. Results shown for the projection period from 1989 to 1993 (which correspond to contributions for fiscal years from 1991 to 1995) are based on estimates of future results.

Each line of the Tables contains the normal cost and unfunded accrued actuarial liability as of a particular valuation date followed by contribution information related to the appropriate fiscal year. The full contribution amount and the required contribution amount under PA 79-436 (as amended) are included both as a dollar figure and as a percentage of the historical or estimated future teachers' payroll, as applicable. For example, the June 30, 1987 valuation generated a normal cost of $151,005,000 and an unfunded actuarial accrued liability of $4,611,656,000. Together, those results were used in calculating both the full contribution of $378,216,000 and the required contribution of $302,917,000 for the fiscal year ending June 30, 1989. The above contribution requirements represent 28.6% and 22.9% of the teachers' payroll of $1,369,950,000 for the fiscal year ending June 30, 1989 respectively.

Table 2

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1988
(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 8% per Annum Starting July 1, 1990

Actuarial Results as of June 30,			Contribution Amounts for the Fiscal Year Ending June 30,						
	Normal Cost	Unfunded Actuarial Accrued Liability		Teachers' Payroll	Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of Payroll
1980	$61,032	$1,818,569	1982	$734,100	$216,933	29.6%	35%	$75,927	10.3%
1981	64,694	2,055,025	1983	769,500	238,861	31.0%	40%	96,798	12.6%
1982	69,601	2,284,380	1984	825,888	273,348	33.1%	45%	120,163	14.5%
1983	73,777	2,410,980	1985	886,409	289,579	32.7%	50%	145,959	16.5%
1984	107,293	3,261,067	1986	975,248	269,102	27.6%	65%	175,312	18.0%
1985	117,505	3,500,185	1987	1,065,077	290,771	27.3%	70%	203,987	19.2%
1986	132,310	3,818,585	1988	1,193,463	321,551	26.9%	75%	241,563	20.2%
1987	151,005	4,611,656	1989	1,369,950	378,216	28.6%	80%	302,917	22.9%
1988	173,335	4,788,106	1990	1,579,000	409,844	26.0%	85%	348,639	22.1%
1989	190,669	5,040,439	1991	1,705,320	435,893	25.6%	90%	392,493	23.0%
1990	205,923	5,283,693	1992	1,841,746	462,777	25.1%	95%	439,738	23.9%
1991	222,397	5,516,857	1993	1,989,086	490,468	24.7%	100%	490,468	24.7%
1992	240,189	5,736,881	1994	2,148,213	522,406	24.3%	100%	522,406	24.3%
1993	259,404	5,940,479	1995	2,320,070	556,532	24.0%	100%	556,532	24.0%

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Table 3

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1988
(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 10% per Annum Starting July 1, 1990

Actuarial Results as of June 30,			Contribution Amounts for the Fiscal Year Ending June 30,						
	Normal Cost	Unfunded Actuarial Accrued Liability		Teachers' Payroll	Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of Payroll
1980	$61,032	$1,818,569	1982	$734,100	$216,933	29.6%	35%	$75,927	10.3%
1981	64,694	2,055,025	1983	769,500	238,861	31.0%	40%	96,798	12.6%
1982	69,601	2,284,380	1984	825,888	273,348	33.1%	45%	120,163	14.5%
1983	73,777	2,410,980	1985	886,409	289,579	32.7%	50%	145,959	16.5%
1984	107,293	3,261,067	1986	975,248	269,102	27.6%	65%	175,312	18.0%
1985	117,505	3,500,185	1987	1,065,077	290,771	27.3%	70%	203,987	19.2%
1986	132,310	3,818,585	1988	1,193,463	321,551	26.9%	75%	241,563	20.2%
1987	151,005	4,611,656	1989	1,369,950	378,216	28.6%	80%	302,917	22.9%
1988	173,335	4,788,106	1990	1,579,000	409,844	26.0%	85%	348,639	22.1%
1989	190,669	5,040,439	1991	1,736,900	444,258	25.6%	90%	400,021	23.0%
1990	209,736	5,388,730	1992	1,910,590	480,700	25.2%	95%	456,764	23.9%
1991	230,710	5,738,396	1993	2,101,649	519,215	24.7%	100%	519,215	24.7%
1992	253,781	6,085,939	1994	2,311,814	563,609	24.4%	100%	563,609	24.4%
1993	279,159	6,427,344	1995	2,542,995	611,909	24.1%	100%	611,909	24.1%

STATE OF CONNECTICUT
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CENSUS DATA FOR MEMBERS IN THE SYSTEM

We were provided with census data on each active teacher who was in the System as of June 30, 1988. The data included name, sex, date of birth, service, salary, and the Member's contributions. Pertinent data was also provided for each retiree, beneficiary, survivor, and dependent as of June 30, 1988, including name, sex, date of birth, date of retirement, amount and form of monthly benefit, and beneficiary information, where applicable. In addition, we received data on former teachers who were no longer active in the System.

The table below gives a comparison of certain characteristics of Members in the System between this year and last year.

			June 30, 1987	June 30, 1988
1.	Active Teachers			
	a.	Number	39,014	39,958
	b.	Average Age	43.4	43.8
	c.	Average Service	14.3	14.4
	d.	Average Annual Compensation	$ 30,590	$ 34,285
2.	Terminated Vested Teachers			
	a.	Number	766	707
	b.	Average Monthly Deferred Benefit	$ 469	$ 465
3.	Survivors and Dependents			
	a.	Number	485	512
	b.	Average Monthly Benefit	$ 259	$ 258
4.	Retired Teachers and Beneficiaries			
	a.	Number	12,207	12,549
	b.	Average Monthly Benefit Inclusive of the $800 Minimum Retirement Benefit under PA 87-381	$ 1,099	$ 1,167

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

OUTLINE OF THE PRINCIPAL PROVISIONS OF THE SYSTEM

Outlined below are the principal provisions of the System which were reflected in the results shown in this report.

1. Covered Employees
   Any teacher, principal, superintendent or supervisor engaged in service of public schools, plus professional employees at State schools of higher education if they choose to be covered.

2. Salary
   Amount paid to a teacher as specified in a contract of employment excluding amounts paid for extra duty assignments, coaching, unused sick time, unused vacation or terminal pay.

3. Average Annual Salary
   Average of annual salary received during three years of highest salary.

4. Credited Service
   One month for each month of service as a teacher in Connecticut public schools, maximum 10 months for each school year. Ten months of credited service constitutes one year of Credited Service. Certain other types of teaching service, State employment, or war-time military service may be purchased at retirement, if the member pays one-half of the cost.

5. Normal Retirement
   Eligibility: Age 60 and 20 years of Credited Service in Connecticut or 35 years of Credited Service including at least 25 years of service in Connecticut.

5. Normal Retirement - continued

Benefit: 2% times years of Credited Service times Average Annual Salary (maximum percent is 75%)

plus

any additional amounts derived from 6th percent and voluntary contributions by the teacher.

Minimum Benefit: Effective January 1, 1988, Public Act 87-381 provides a minimum monthly retirement benefit of $800 to teachers who retire under the Normal Retirement provisions and who complete at least 25 years of full time Connecticut service at retirement.

6. Early Retirement

Eligibility: At any age after the completion of 25 years of Credited Service including 20 years of Connecticut service or at or after age 55 and the completion of 20 years of Credited Service including 15 years of Connecticut service, with the last 5 years in Connecticut.

Benefit: Reduced normal retirement benefit. The early retirement factors currently in effect are 6% per year for the first five years by which early retirement precedes the minimum normal retirement age and 4% per year for the next five years by which early retirement precedes the minimum normal retirement age.

7. Proratable Retirement

Eligibility: Age 60 and 10 years of Credited Service with the last 5 years in Connecticut.

Benefit: 2% less .1% for each year less than 20 years times years of Credited Service in Connecticut plus 1% times years of additional Credited Service times Average Annual Salary.

8. Disability Retirement

Eligibility: Disability prior to age 60 and after 5 years of Credited Service in Connecticut if not incurred in the performance of duty and without regard to service if incurred in the performance of duty.

Benefit: Lesser of:

- 3% times Credited Service to date of disability times Average Annual Salary;
- 1-2/3% times Credited Service projected to age 60 times Average Annual Salary;
- 50% times Average Annual Salary.

Not less than 15% times Average Annual Salary.

9. Termination of Employment

With less than 5 years of Credited Service: Return of 5% contributions with interest.

With 5 or more years of Credited Service: Return of 5% contributions with interest and 1% contributions without interest.

With 10 or more years of Credited Service: 100% vested. Member may elect return of all contributions plus interest on 5% contributions in lieu of vested benefit.

10. Pre-Retirement Death Benefits

A lump sum plus one of the following: survivor's benefit, return of all contributions with interest, surviving spouse's benefit, or automatic surviving spouse's benefit.

10. Pre-Retirement Death Benefits - continued

- Lump Sum: $1,000 for the first 5 years of Connecticut service plus $200 per year thereafter. Maximum benefit: $2,000.

- Survivor's Benefit: $300 per month to a surviving spouse or dependent former spouse (receiving child support), or to a dependent parent over age 65 if there is no surviving spouse, or dependent child, or to a legal guardian if there is no surviving spouse, dependent former spouse, or dependent parent. $200 per month to a single dependent child under age 18 or over 18 if disabled. $300 per month divided equally among two or more such children in a family.

- Accumulated contributions with interest plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.

- Surviving Spouse's Benefit: the 50% co-participant option plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.

- Automatic Surviving Spouse's Benefit: Prefiled co-participant option with the percent continued chosen from 33-1/3%, 50%, 66-2/3%, 75%, or 100%.

11. Form of Annuity

Normal: Partial Refund Option - 75% of total benefit is paid as a life annuity. If 25% of the benefits paid prior to death do not exceed the Member's 5% contributions plus interest frozen at the date of benefit commencement, the difference is paid to his beneficiary.

Optional Forms: 5-, 10-, 20-, or 25-year certain and life. 33-1/3%, 50%, 66-2/3%, 75%, or 100% co-participant annuity (if co-participant dies first, benefit reverts to unreduced amount).

12. Cost-of-Living Allowance

Pension benefit adjustments are made in accordance with increases in the Consumer Price Index, with a minimum of 3% and a maximum of 5% per annum.

13. Teachers' Required Contribution

Each teacher is required to contribute 6% of annual salary.

14. State Contribution

The State funds the balance of the liability for benefits with annual contributions (currently paid in installments at the beginning of each quarter) determined in accordance with Section 10-183(z) (which reflects Public Act 79-436 as amended).