

K-12 EDUCATION AND EXPERIENCE SCHEDULE

LEAP DOCUMENT #1

LEAP Office
03/19/79

K-12 EDUCATION & EXPERIENCE SCHEDULE

Introduction

We have constructed a hypothetical education and experience schedule for K-12 certificated employees. The enclosed documentation briefly discusses the approach that we used to develop the statewide schedule and also highlights the validity of the resultant schedule as it pertains to the total population of Washington State teachers.

We reviewed the actual 1977-78 negotiated salary schedules for five select school districts: Bellevue, Everett, Mercer Island, Seattle and Spokane. From these schedules we compiled statistical information relating to increases recognized for education, increases provided for years of service, number of years of service recognized at various levels of educational attainment, and advanced degree considerations. The composite averages of this statistical data provided the necessary baseline information to construct the proposed statewide education and experience schedule.

Another education and experience schedule, similar in form to the hypothetical schedule, was created by compiling the 1977-78 personnel/payroll information for all K-12 certificated teachers.

We then statistically compared the two schedules finding a very high incidence of commonality between the actual distribution of teacher salaries versus the five-district composite education and experience schedule.

In summary, we feel confident that the hypothetically constructed education and experience schedule very closely approximates the actual method of administering K-12 teacher salaries at a statewide aggregate level.

Supporting documentation follows.

Composite Education & Experience
Schedule for K-12
Certificated Employees

We reviewed the 1977-78 K-12 salary schedules for Bellevue, Everett, Mercer Island, Seattle and Spokane and constructed composite averages relative to the following categories:

- percentage increases recognized for increments of 15 credit hours of educational experience
- percentage increases recognized for years of service
- number of years of teaching experience recognized
- advanced degree considerations

The resulting composite averages were then applied to the construction of the education and experience schedule.

In reviewing the salary increases granted for additional schooling we considered only increments of 15 quarter credit hours. We found that the school districts treated the increases differently relative to the amount of prior schooling. For example, some school districts would give larger increases for the first increment of 15 credit hours above a BA degree than they would for an increment of 15 credit hours above a BA + 90. Other districts would do just the opposite.

In consideration of these differences we calculated the percentage increases provided relative to the categories of: 0 to 45 credit hours, 45 to 90 and 90 to 135.

For example, the following table shows Bellevue providing a 3.2% increase for each set of 15 credit hours completed up to 45 cumulative credits. They provide a 2.9% increase for each set of 15 credit hours completed between 45 and 90.

COMPOSITE EDUCATION & EXPERIENCE
FOR K12 CERTIFICATED EMPLOYEES

Education Experience Increases
Percents Represent Increases Given for
Each Increment of 15 Credit Hours

	<u>Up to 45</u>	<u>45 to 90</u>	<u>90 to 135</u>
Bellevue	3.2%	2.9%	2.7%
Everett	2.9%	4.4%	2.3%
Mercer Island	2.8%	1.2%	1.1%
Seattle	1.3%	.7%	.2%
Spokane	3.2%	4.4%	N.A.
TOTAL	13.4	13.6	6.3
AVERAGE	2.7%	2.7%	1.6%

For the years of service increment we calculated the recognized step increase relative to columns of educational attainment. You can see in the following table, the differences in the salary schedule philosophies where Everett provides larger step increases for the individuals in the BA column than they do for the succeeding columns and Seattle does just the opposite.

YEARS OF SERVICE INCREMENT

	<u>BA</u>	<u>BA+15</u>	<u>BA+30</u>	<u>BA+45</u>	<u>BA+90</u>	<u>BA+135</u>
Bellevue	4.4%	4.3%	4.1%	4.6%	4.3%	4.0%
Everett	4.5%	4.3%	4.1%	4.0%	3.6%	3.4%
Mercer Island	3.7%	3.6%	3.5%	3.4%	3.1%	2.8%
Seattle	2.2%	2.7%	3.2%	3.7%	4.3%	4.6%
Spokane	3.9%	3.8%	3.6%	3.5%	3.4%	
TOTAL	18.7	18.7	18.5	19.2	18.7	14.8
AVERAGE	3.7%	3.7%	3.7%	3.8%	3.7%	3.7%

In analyzing the selected schedules there was a consistency relative to the number of years of service recognized for the various columns of the schedule. Each of the school districts recognize fewer years of service in the BA column than they do in successive columns on their schedules. The compiled averages are displayed in the following table.

	<u>NUMBER OF YEARS RECOGNIZED</u>					
	<u>BA</u>	<u>BA+15</u>	<u>BA+30</u>	<u>BA+45</u>	<u>BA+90</u>	<u>BA+135</u>
Bellevue	10	10	10	11	12	14
Everett	11	12	13	14	14	14
Mercer Island	9	10	12	13	15	17
Seattle	6	8	10	12	14	14
Spokane	7	8	9	11	13	—
TOTAL	43	48	54	61	68	59
AVERAGE	8.6	9.6	10.8	12.2	13.6	14.7
	9	10	11	12	14	15

As is shown in the following table, advanced degrees are treated differently from district to district. For purposes of generating the salary schedule we made the masters degree equivalent to a BA + 90 and the doctorate equivalent to a MA + 90.

	<u>DEGREE RECOGNITION</u>	
	<u>MASTERS</u>	<u>DOCTORATE</u>
Bellevue	BA+90	10% of Base + MA+45
Everett	\$667 + BA+45 / BA+60	10%
Mercer Island	BA+90	+\$615
Seattle	+\$622	+\$1243
Spokane	+\$592	+\$1185

SELECTED FOR EDUCATION & EXPERIENCE SCHEDULE

Masters = BA+90

Doctorate = MA+90

The composite averages computed from the above four tables generate the following salary schedule.

STAFF MIX FACTOR TABLE DEVELOPED
BY LEGISLATIVE EVALUATION AND ACCOUNTABILITY PROGRAM

Years of Service	EDUCATION EXPERIENCE									
	BA	BA + 15	BA + 30	BA + 45	BA + 90	BA + 135	MA	MA + 45	PHD OR MA + 90	PHD + 45
0	1.000	1.027	1.055	1.083	1.173	1.231	1.173	1.244	1.305	1.368
1	1.037	1.065	1.094	1.124	1.217	1.276	1.217	1.290	1.353	1.419
2	1.075	1.104	1.134	1.167	1.262	1.323	1.262	1.338	1.403	1.471
3	1.115	1.145	1.176	1.211	1.308	1.372	1.308	1.387	1.455	1.526
4	1.156	1.188	1.220	1.257	1.357	1.423	1.357	1.438	1.509	1.582
5	1.199	1.232	1.265	1.305	1.407	1.476	1.407	1.492	1.564	1.638
6	1.244	1.277	1.312	1.355	1.459	1.530	1.459	1.547	1.622	1.701
7	1.290	1.324	1.360	1.406	1.513	1.587	1.513	1.604	1.682	1.764
8	1.337	1.373	1.410	1.460	1.569	1.646	1.569	1.653	1.745	1.830
9		1.424	1.463	1.515	1.627	1.707	1.627	1.725	1.809	1.897
10			1.517	1.573	1.687	1.770	1.687	1.789	1.876	1.968
11				1.633	1.750	1.835	1.750	1.855	1.945	2.040
12					1.815	1.903	1.815	1.924	2.017	2.116
13					1.882	1.973	1.882	1.995	2.092	2.194
14						2.046	1.951	2.059	2.169	2.275

Validation of Hypothetical Education & Experience Schedule

To test the validity of the constructed education and experience schedule we requested the 1977-78 payroll/personnel computer tape (S275) from the Superintendent of Public Instruction Office. We constructed a computer program that would array the teacher salaries and FTE counts relative to the education and years of service experience. The matrices below include both FTE counts and average salaries for all Washington State teachers excluding administrators and administrative support personnel.

The following matrix shows the distribution of the teachers average salaries.

LEAP-SPI		MATRIX OF AVERAGE SALARIES BY COUNTY/DISTRICT																		77-78 DATA	RUN DATE 01/30/79	PAGE NO 302
COUNTY NAME: STATEWIDE		DISTRICT NAME: ALL SCHOOL DISTRICTS																				
EXPER	< BA	BA	+15	+30	+45	+60	+75	+90	+105	+120	MA	+15	+30	+45	+60	+75	+90	+105	+120	FTE		
0	12243	10440	10594	11259	11592	12096	12260	13001	11077	11408	12944	15469	12777	13171	12037	15312	11764			17666		
1	13351	11667	11121	11471	11739	12003	12316	12602	13189	12502	12741	13675	12621	13085	12672		16013	10730	13371	16955		
2	14012	11557	11716	11906	12244	12590	13021	13077	13845	12753	13506	13156	13644	13553	14112	13632	14114			15677	13800	
3	12446	12592	12341	12557	12793	13195	13539	14045	14217	13964	14013	14324	14176	14167	14666	14095		17110		15971		
4	16761	13488	12820	13050	13262	13847	14303	14445	14903	14891	14563	14873	14600	15358	14684	15539				13679	18416	
5	17152	14061	13652	13740	13776	14436	15045	15045	15959	15471	15151	15489	15940	15739	16350	15745	17297	17536	17515	17538		
6	16377	15591	14139	14239	14183	14725	15306	15500	16225	16252	15789	16273	16044	16283	16667	16537	17137	15974	17113	18088		
7	16301	15713	14911	14763	14732	15276	15931	16082	16344	17411	16312	16752	16844	16978	16276	17123	17258	17277	17561	18009		
8	15715	16996	15495	15341	15255	15821	16429	16603	16920	17380	17022	17036	17543	17850	17140	18912	18649	16350	18608			
9	17644	16230	15745	15889	15788	16106	16952	17189	17653	18076	17492	17577	17926	18601	18422	18367	18135	18970	18746	18692		
10	16691	17066	15638	16312	16313	16612	17560	17917	17940	18121	18338	18366	18482	18056	17897	19324	19364	18922	19188	20678		
11	13350	17072	17040	16319	16527	17299	17785	18026	18326	19267	18791	18831	19017	19688	18210	18326	19709	19653	19536	19974		
12	17904	17616	16104	16333	16218	17517	18056	18448	19132	19467	19248	19143	19452	20223	19562	19864	19885	20100	20742	21248		
13	16350	18107	15920	17125	17007	17698	18477	18483	18960	20201	19407	19353	19481	20207	20634	19699	20644	20625	20951	21190		
14	15850	19189	16829	17019	16948	17818	18520	18925	19356	20117	19798	19891	19770	20314	19813	20274	20252	21301	20812	19344		
15	16848	17333	16590	17027	17112	17973	18281	18727	19224	20239	19979	19993	19933	20919	20591	19240	20959		20574	21727		
16	19256	18178	18571	17207	16875	17956	18691	19010	19113	20060	20181	19811	20364	20207	20788	18739	20117	20490	20096	21642		
17		17646	16231	17445	17161	17700	19012	18857	19282	20527	20088	20029	20150	20490	20535	19976	20230	21305	20823	20709		
18	14094	18822	17014	17474	17508	18058	18753	18957	19633	20451	20081	20213	20260	20666	20546	20800	21837	19219	22043	22833		
19	16554	17016	17038	17609	17534	18198	18913	18051	19507	20394	20311	19950	20205	20770	20416	20847	20506	20496	20752	23096		

The illustration below displays the distribution of FTE's relative to education and years of service.

LEAP-SPI MATRIX OF AVERAGE SALARIES BY COUNTY/DISTRICT 77-78 DATA RUN DATE 01/30/79 PAGE NO 302
COUNTY NAME: STATEWIDE DISTRICT NAME: ALL SCHOOL DISTRICTS

EXPER	< BA	BA	+15	+30	+45	+60	+75	+90	+105	+120	MA	+15	+30	+45	+60	+75	+90	+105	+120	PHD
0	28	1104	142	68	51	22	17	12	5	85	73	4	3	2	4	2	1			2
1	14	667	359	132	95	39	23	16	8	63	97	11	5	2			1	1	1	2
2	6	470	365	274	178	40	34	18	5	14	122	12	11	4	7	2	1		1	1
3	8	279	442	467	394	99	44	25	9	28	177	30	10	14	5	5		2	4	
4	9	165	290	500	519	183	61	44	10	16	271	49	21	16	8	3			2	1
5	6	101	189	365	541	204	84	51	19	19	249	44	24	27	14	6	3	1	6	1
6	7	61	117	296	577	248	95	68	15	25	294	54	35	25	8	8	3	1	5	5
7	8	45	76	234	559	259	119	86	30	28	255	61	33	28	8	11	11	5	7	4
8	6	43	66	218	511	254	164	106	25	35	301	96	64	43	19	6	7	2	2	
9	4	33	45	148	424	242	170	111	26	33	311	97	41	39	18	4	7	2	2	7
10	6	31	44	130	301	234	158	88	36	43	229	95	55	47	15	6	8	2	4	3
11	2	27	20	98	328	246	176	122	50	38	218	82	43	47	8	9	12	3	2	3
12	4	19	21	69	216	175	159	102	36	45	221	90	49	44	11	13	5	1	5	6
13	3	10	16	68	172	168	135	117	31	52	178	70	43	38	14	4	3	2	5	2
14	4	11	18	47	146	147	122	100	46	51	181	68	48	45	13	9	10	6	5	6
15	3	11	25	51	118	134	106	107	47	57	148	63	52	35	19	7	5		3	3
16	1	14	12	54	137	117	139	115	44	53	150	77	51	33	11	2	1	1	2	2
17		13	14	45	100	143	106	91	43	45	151	67	41	53	13	7	8	4	8	7
18	1	8	11	30	91	101	115	89	40	53	146	62	34	45	19	1	5	2	1	4
19	7	51	84	277	646	681	638	638	329	495	735	374	271	297	114	58	42	18	44	24

With the arrayed actual FTE counts and average salaries we can test to see if the actual statewide administration of teachers salaries approximates the hypothetically constructed schedule.

The following FTE count and average salary tables are the results of the extract from the payroll personnel tape displayed in a format consistent with the constructed salary schedule format.

K12
STATEWIDE FTE TEACHERS

DATE: 01/30/79
TIME: 17:33

*** EDUCATION EXPERIENCE ***

YEARS OF SERVICE	BA	BA+15	BA+30	BA+45	BA+60	BA+135	MA	MA+45	MA+60	PHD	PHD+45
0	1104	142	83	90	102		80	9			
1	867	359	132	157	87		113	2		2	
2	470	365	274	252	37		145	13		1	
3	270	442	467	537	62		217	24			
4	155	290	509	763	70		341	27		1	
5	101	189	365	829	89		317	47		1	
6	61	117	296	920	108		393	41		5	
7	45	75	234	937	144		349	47		4	
8	43	66	218	929	166		441	68			
9		45	149	835	170		449	61		7	
10			130	693	167		379	68		3	
11				750	210		343	64		3	
12					183		360	88		6	
13					200		291	56		2	
14							227	67		6	

R12
STATEWIDE AVERAGE SALARIES

DATE: 01/30/78
TIME: 17:34

BY EDUCATION EXPERIENCE

YEARS OF SERVICE	BA	BA+15	BA+30	BA+45	BA+60	BA+135	MA	MA+45	MA+60	M+0	M+45
0	10440	10594	11059	11841	11618		13984	13139			
1	11667	11181	11471	11889	12656		12827	12885		16955	
2	11567	11716	11906	12404	13958		13488	13666		13800	
3	12592	12341	12557	12928	14033		14084	14258			
4	13488	12829	13059	13488	14612		14618	15178		18416	
5	14061	13452	13740	14067	15331		15258	15922		17538	
6	15693	14138	14239	14445	15775		15954	16497		18088	
7	15713	14911	14763	15035	16395		16439	16892		18009	
8	16398	15495	15341	15817	16815		17077	17746			
9		15745	15889	16128	17432		17559	18533		18592	
10			16312	16699	17074		18366	18686		20678	
11				17075	18322		18829	19312		19974	
12					18333		19250	20047		21248	
13					19084		19485	20332		21190	
14							19815	20211		19344	

From the average salary schedule, if we divide each of the numbers in the table by 10,440 (the average salary for a BA with zero years of experience) we obtain the following schedule which emulates an education and experience schedule derived from the actual placement of all Washington State teachers. The table illustrates, for example, that the average teacher with a MA degree and six years of experience makes 52.2% more than a teacher with a BA and zero years of experience.

SCHEDULE DETERMINED BY STATEWIDE DISTRIBUTION

DATE: 01/30/70
TIME: 17:28

YEARS OF SERVICE	SEE EDUCATION EXPERIENCE SFS										
	BA	BA+15	BA+30	BA+45	BA+60	BA+135	MA	MA+45	MA+90	MA+135	MA+180
0	1.090	1.015	1.078	1.134	1.113		1.251	1.250			
1	1.060	1.065	1.099	1.139	1.212		1.229	1.732		1.624	
2	1.107	1.122	1.140	1.188	1.251		1.292	1.328		1.328	
3	1.206	1.182	1.209	1.238	1.344		1.347	1.368			
4	1.292	1.228	1.250	1.292	1.400		1.399	1.454		1.764	
5	1.347	1.289	1.316	1.347	1.468		1.461	1.525		1.680	
6	1.494	1.354	1.364	1.384	1.511		1.522	1.572		1.733	
7	1.565	1.428	1.414	1.440	1.570		1.575	1.618		1.725	
8	1.628	1.484	1.469	1.496	1.611		1.630	1.700			
9		1.508	1.522	1.545	1.670		1.681	1.775		1.790	
10			1.562	1.599	1.722		1.759	1.790		1.981	
11				1.636	1.755		1.804	1.850		1.913	
12					1.804		1.844	1.920		2.035	
13					1.820		1.859	1.947		2.030	
14							1.898	1.938		1.853	

We now have two schedules to compare. One derived from the actual distribution of teacher salaries and the other constructed from composite averages considering five districts.

HOW WELL DOES THE CONSTRUCTED SCHEDULE COMPARE WITH THE ACTUAL DISTRIBUTION OF WASHINGTON STATE TEACHERS?

The points circled below were selected as significant reference points to compare against the constructed schedule. These points were selected because they contained the highest incidence of FTE counts making up the average salaries. Large distortions could result from selecting reference points derived from a small sample of people since the individuals may come from districts not reflecting a proper cross-section of all districts.

SCHEDULE DETERMINED BY STATEWIDE DISTRIBUTION

DATE: 01/30/79
TIME: 17:28

228 EDUCATION EXPERIENCE 228

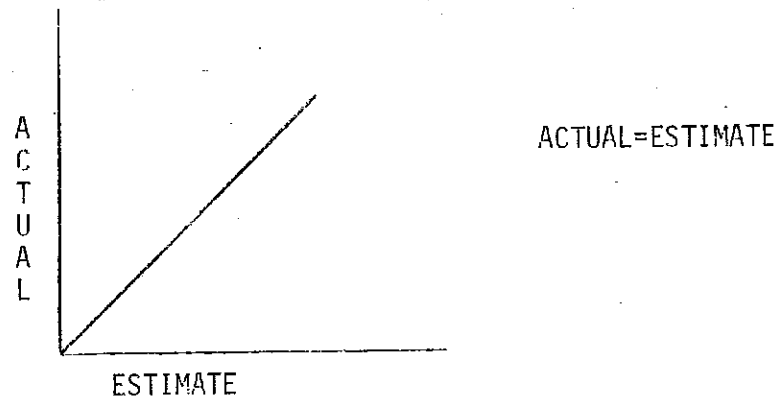
YEARS OF SERVICE	BA	BA+15	BA+30	BA+45	BA+60	BA+135	MA	MA+45	MA+90	PHD	PHD+45
0	1.000	1.015	1.078	1.134	1.113		1.251	1.250			
1	1.069	1.065	1.099	1.139	1.212		1.229	1.732		1.624	
2	1.107	1.122	1.140	1.188	1.251		1.292	1.328		1.328	
3	1.206	1.182	1.203	1.238	1.344		1.347	1.368			
4	1.292	1.228	1.250	1.292	1.400		1.399	1.454		1.764	
5	1.347	1.289	1.316	1.347	1.463		1.461	1.525		1.680	
6	1.494	1.354	1.364	1.384	1.511		1.522	1.572		1.733	
7	1.505	1.428	1.414	1.440	1.570		1.575	1.618		1.725	
8	1.628	1.484	1.469	1.496	1.611		1.636	1.700			
9		1.508	1.522	1.545	1.670		1.681	1.775		1.790	
10			1.562	1.590	1.722		1.759	1.790		1.981	
11				1.636	1.755		1.804	1.858		1.913	
12					1.804		1.844	1.920		2.036	
13					1.820		1.859	1.947		2.030	
14							1.898	1.936		1.853	

DATE: 01/16/79
TIME: 10:22

228 EDUCATION EXPERIENCE 228

YEARS OF SERVICE	BA	BA+15	BA+30	BA+45	BA+60	BA+135	MA	MA+45	MA+90	PHD	PHD+45
0	1.000	1.027	1.055	1.083	1.173	1.231	1.173	1.244	1.306	1.305	1.368
1	1.037	1.065	1.094	1.124	1.217	1.276	1.217	1.290	1.353	1.353	1.410
2	1.075	1.104	1.134	1.167	1.262	1.323	1.262	1.330	1.403	1.403	1.471
3	1.115	1.145	1.176	1.211	1.308	1.372	1.308	1.387	1.455	1.455	1.526
4	1.156	1.188	1.220	1.257	1.357	1.423	1.357	1.438	1.509	1.509	1.582
5	1.199	1.232	1.265	1.305	1.407	1.478	1.407	1.492	1.564	1.564	1.641
6	1.244	1.277	1.312	1.355	1.459	1.530	1.459	1.547	1.622	1.622	1.701
7	1.290	1.324	1.360	1.406	1.513	1.587	1.513	1.604	1.682	1.682	1.764
8	1.337	1.373	1.410	1.460	1.569	1.646	1.569	1.663	1.745	1.745	1.830
9		1.424	1.463	1.515	1.627	1.707	1.627	1.725	1.809	1.809	1.897
10			1.517	1.573	1.687	1.770	1.687	1.789	1.876	1.876	1.968
11				1.633	1.750	1.835	1.750	1.855	1.945	1.945	2.040
12					1.815	1.903	1.815	1.924	2.017	2.017	2.116
13					1.882	1.973	1.882	1.995	2.092	2.092	2.194
14						2.048	1.951	2.069	2.160	2.160	2.275

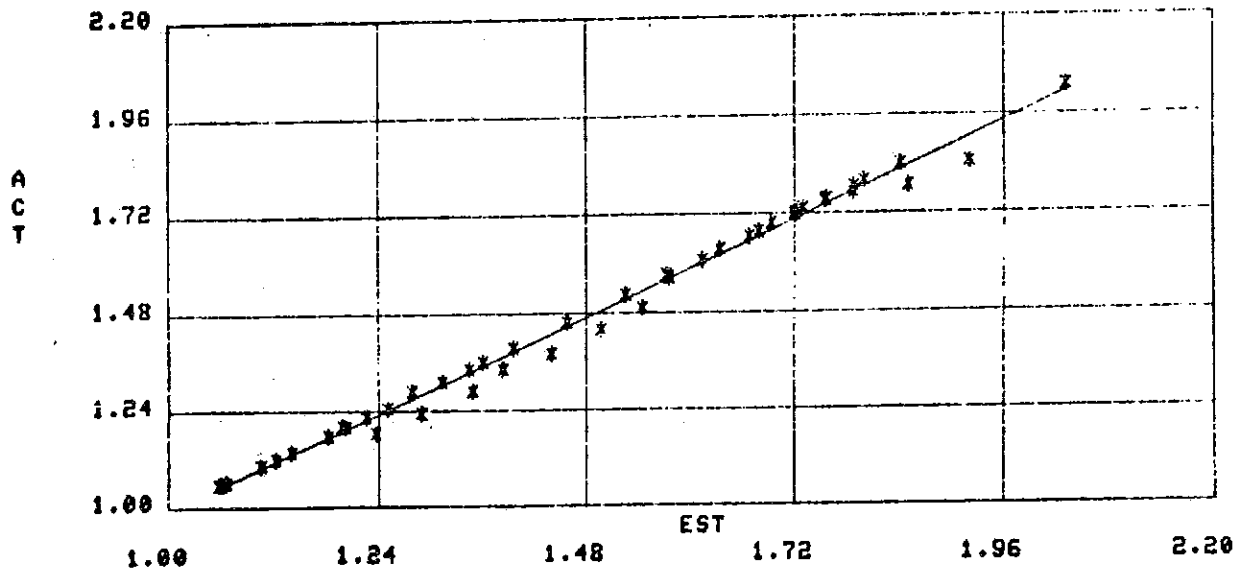
If the derived schedule from the actual distribution of teachers perfectly matched the corresponding points on the hypothetical schedule then we could say that the actuals are equal to the estimates (hypothetical schedule). Or, put in equation form would read:



Regression analysis was used to test how close the relationship between the actual distribution and the hypothetical schedule (estimate) conformed to the line "ACTUAL=ESTIMATE". The results of the regression analysis are presented in the following chart:

LEAST SQUARES REGRESSION FOR
 $ACT = -0.00055 + 0.992317(EST)$

DATA POINTS FOR REGRESSION	43
AVERAGE OF INDEPENDENT VARIABLE...EST	1.49
AVERAGE OF DEPENDENT VARIABLE.....ACT	1.48
CORRELATION COEFFICIENT SQUARED	0.992
STANDARD ERROR OF ESTIMATE	0.024



The results of the regression analysis tell us that the line which best approximates the relationship between the actual distribution and the hypothetical schedule is:

$$\text{ACTUAL} = - .00055 + .992317 * \text{ESTIMATE}$$

You can see that the best fit line from the regression analysis is extremely close to a perfect relationship of "ACTUAL=ESTIMATE". The correlation coefficient of .992 says, statistically, that the above equation is a very good predictor of the relationship between the actual distribution of teachers versus our hypothetical schedule. Since the best fit regression line is very close to "ACTUAL=ESTIMATE" and with our high correlation coefficient we can suggest, with a high degree of confidence, that the adjusted hypothetical schedule very closely approximates the method of administering K-12 teacher salaries at the statewide aggregate level.