
UNITED STATES DEPARTMENT OF LABOR

Frances Perkins, *Secretary*

BUREAU OF LABOR STATISTICS

Isador Lubin, *Commissioner*

in cooperation with

WORK PROJECTS ADMINISTRATION



Salaries and Hours of Labor
in Municipal Fire Departments

July 1, 1938

VOLUME IV

West North Central Cities



Prepared by the

DIVISION OF CONSTRUCTION AND PUBLIC EMPLOYMENT

HERMAN B. BYER, Chief



Bulletin No. 684

UNITED STATES

GOVERNMENT PRINTING OFFICE

WASHINGTON : 1941

For sale by the Superintendent of Documents, Washington, D. C. - - - - - Price 10 cents

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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., September 25, 1940.

THE SECRETARY OF LABOR:

I have the honor to transmit herewith the fourth of a series of nine reports on Salaries and Hours of Labor in Municipal Fire Departments. This report covers cities in the West North Central States. An explanation of the purposes of the survey was given in the preface to the first report on the New England Cities.

ISADOR LUBIN, *Commissioner.*

HON. FRANCES PERKINS,
Secretary of Labor.

v

Salaries and Hours of Labor in Fire Departments of 27 West North Central Cities¹

Summary

On July 1, 1938, the fire departments² of 27³ West North Central Division cities employed 4,265 people whose annual salaries totaled about \$8,327,000.

Ninety-three out of every 100 employees were in the fire-fighting divisions and the rest were in the fire-prevention, apparatus, fire-alarm, and clerical divisions. Of the 93 in the fire-fighting divisions, 73 were privates, drivers, and engineers; 17 were captains and lieutenants; and 3 were chiefs, assistants to the chiefs, and battalion chiefs.

The annual salaries of all employees were concentrated within a small range. Of every 100 employees, 86 earned between \$1,550 and \$2,250 a year. This concentration was due mostly to the relatively small differences in the annual salaries of the various occupations within a fire department.

More than one-fifth of all employees were officers or held supervisory positions. These employees received slightly less than one-fourth of the total salaries.

Of every \$100 spent in salaries \$93 went to the fire-fighting divisions. Of these, \$71 went to engineers, drivers, and privates; \$18 went to captains and lieutenants; and \$4 went to battalion chiefs, and to chiefs and their assistants.

As a rule the large cities paid higher salaries than the small cities. This was especially so for the supervisory occupations which entailed greater responsibility in the large cities.

¹ Analysis and presentation by Arthur Dadian. Editing and tabulation of data by Mahlon B. Buckman. Carol P. Brainerd, technical adviser.

² Relatively little general information is available on employment and salaries in city fire departments, in spite of the importance of their functions and the considerable number of their employees. A study of salaries and working conditions of fire-department employees in 1934 was made by the Bureau of Labor Statistics and was published in the *Monthly Labor Review* for November 1935. In the present study the Bureau of Labor Statistics, in cooperation with the Work Projects Administration, undertook to compile this information, as of July 1, 1938, for cities in the United States having a population of 25,000 or more. This report for 27 West North Central Division cities is one of a series which is being issued by geographic divisions.

³ This report covers only cities having a population of 25,000 or more. The U. S. Census of Population for 1930 is used to determine the size of the cities. See appendix for list of the States in the West North Central Division and the cities included in this bulletin.

The annual salaries of firemen are affected by such factors as vacations with pay, items supplied to firemen by the city without any charge, and the promotion policies of the fire departments.

The 27 fire departments gave their employees an average of 16 days of vacation with pay each year, sleeping quarters for firemen on night duty, and various items such as helmets, rubber coats, and rubber boots.

In this study data were obtained only for promotions of lower-grade privates. Of the 27 fire departments, 21 automatically promoted their lower-grade privates after a specified period of service, and 3 after civil service examinations. Only 3 cities had no promotion system for their lower-grade privates.

Twenty-five of the 27 fire departments and 92 percent of all employees worked under the 2-platoon system of assigning firemen to duty which averaged 84 hours on duty per week for 78 percent of all employees and 78 hours for 14 percent. The rest of the employees worked between 46 and 168 hours per week.

Seventy-three percent of all employees were on duty between an average of 3.3 and 3.5 days per week. The rest of the employees worked between 4.7 and 7 days per week.

On the basis of the 1930 population figures the fire departments of the 27 cities had approximately 12 employees for every 10,000 inhabitants, at a per capita salary cost of about \$2.39. The per capita salary cost was higher in the large than in the small cities because the large cities as a rule had a relatively greater number of firemen and paid higher salaries.

None of the 27 cities covered by this release had volunteer fire departments or fire departments with small permanent staffs supplemented by call men.

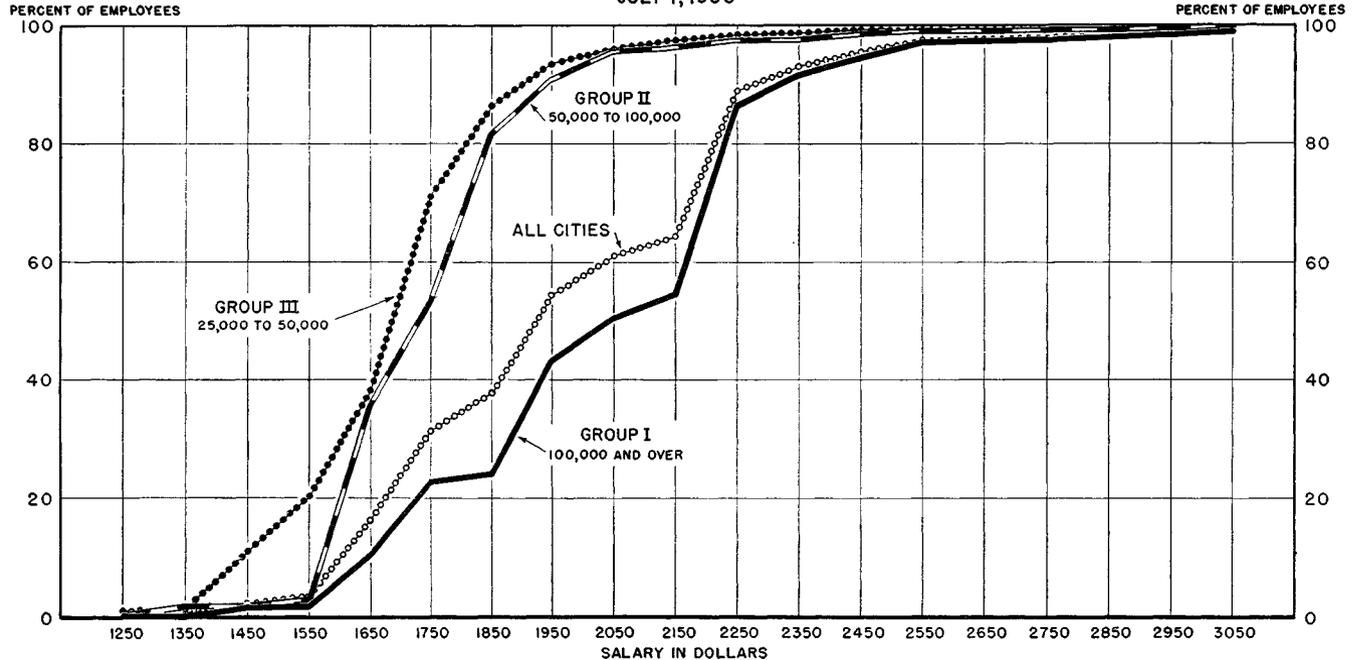
Annual Salaries

General Level of Salaries

The annual salaries in the fire departments of the 27 cities showed great concentration. Of all employees 3 percent received less than \$1,550 a year; 51 percent received between \$1,550 and \$1,950; 10 percent, between \$1,950 and \$2,150; 25 percent, between \$2,150 and \$2,250; and 11 percent, \$2,250 and over. Concentration was due to the relatively small differences in salaries of the various occupations within a fire department and of the same occupation with the 27 fire departments.

The annual salaries were somewhat higher in the large than in the small cities. Of every 100 employees in the group of cities having a population of 100,000 or more, 24 received less than \$1,850 a year,

EMPLOYEES IN FIRE DEPARTMENTS OF 27 WEST NORTH CENTRAL CITIES BY SALARY AND SIZE OF CITY JULY 1, 1938



U. S. BUREAU OF LABOR STATISTICS

compared with 82 in the group of cities having a population of 50,000 and under 100,000; and 87 in the group of cities having a population of 25,000 and under 50,000.

These somewhat higher salaries in the large cities were due, among other factors, to higher cost of living, more opportunities for other employment, greater ability of the cities to pay, and great responsibility entailed in supervisory positions in the large cities.

For the sake of brevity, and comparability with bulletins for the other geographic divisions, hereafter the group of largest cities mentioned above will be designated as group I⁴, the medium-sized cities as group II, and the smaller cities as group III.

TABLE 1.—*Distribution of employees in fire departments of 27 West North Central cities, by salary group and size of city, July 1, 1938*

Salary group	Number of employees				Percentage of employees			
	All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III
All groups.....	4,265	3,270	611	284	100.0	100.0	100.0	100.0
Under \$1,250.....	8	5		3	.2	.1		.8
\$1,250 and under \$1,350.....	11	1	9		.2	(²)	1.5	.2
\$1,350 and under \$1,450.....	76	38		38	1.8	1.2		9.9
\$1,450 and under \$1,550.....	52	8	8	36	1.2	.3	1.3	9.4
\$1,550 and under \$1,650.....	556	286	201	69	13.0	8.7	32.9	18.0
\$1,650 and under \$1,750.....	640	405	109	126	15.0	12.4	17.8	32.8
\$1,750 and under \$1,850.....	276	45	172	59	6.5	1.4	28.2	15.4
\$1,850 and under \$1,950.....	709	626	56	27	16.6	19.1	9.2	7.0
\$1,950 and under \$2,050.....	279	240	29	10	6.5	7.3	4.7	2.6
\$2,050 and under \$2,150.....	140	130	4	6	3.3	4.0	.7	1.5
\$2,150 and under \$2,250.....	1,051	1,040	8	3	24.7	31.8	1.3	.8
\$2,250 and under \$2,350.....	174	173		1	4.1	5.3		.3
\$2,350 and under \$2,450.....	103	97	5	1	2.4	3.0	.8	.3
\$2,450 and under \$2,550.....	87	84	3		2.0	2.6	.5	
\$2,550 and under \$2,650.....	7	7			.2	.2		
\$2,650 and under \$2,750.....	7	3	2	2	.2	.1	.3	.5
\$2,750 and under \$2,850.....	20	18		2	.5	.6		.5
\$2,850 and under \$2,950.....	13	10	3		.3	.3	.5	
\$2,950 and under \$3,050.....	19	17	2		.4	.5	.3	
\$3,050 and over.....	37	437			.9	1.1		

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² Includes only regular full-time employees, with the exception of the commissioner in Kansas City, Mo.

³ Less than 1/10 of 1 percent.

⁴ Includes 4 at \$3,120, 3 at \$3,180, 1 at \$3,181, 2 at \$3,192, 1 at \$3,240, 1 at \$3,300, 12 at \$3,420, 1 at \$3,567, 2 at \$3,600, 2 at \$3,720, 1 at \$3,900, 1 at \$3,960, 3 at \$4,000, 1 at \$4,020, 1 at \$5,000, 1 at \$5,600.

⁴ Except for St. Louis, the populations of the cities in this group were all under 500,000. St. Louis with a population of 821,960 in 1930, has been included in this group because the data for St. Louis did not vary sufficiently from the data for the other cities to justify separate treatment.

Salaries in Selected Occupations

The differences in annual salaries among the various occupations within a fire department were not great. Starting with the chief, the salary differences decreased sharply to a point where the occupations including a large majority of the employees (privates, engineers, drivers, auto mechanics, and fire-alarm operators) received approximately the same salaries. When the annual salaries for every occupation in table 2 were averaged, it was found that the chiefs, the highest-paid officers, received only \$955 more than the captains, \$1,030 more than the lieutenants, and \$1,158 more than the first-grade privates. The lieutenants, on the other hand, received only \$128 more than the first-grade privates.

As has been indicated, salary differences among the various occupations within a fire department were somewhat more pronounced in the large than in the small cities owing in part to the fact that in the large cities supervisory occupations entail greater responsibility. The difference between the average annual salaries of chiefs and captains was \$1,928 in group I cities compared with \$1,027 in group II cities and \$546 in group III cities. Similarly, the difference between the average annual salaries of lieutenants and all privates was \$187 in group I cities, \$183 in group II cities, and \$149 in group III cities.

For the same occupation, moreover, the large cities paid a somewhat higher salary than the small cities, the differences being more pronounced in the supervisory occupations. The average annual salary of chiefs in group I cities was \$1,290 higher than that of chiefs in group II cities, and \$1,804 higher than that of chiefs in group III cities. The average annual salary of lieutenants in group I cities was \$258 above that of lieutenants in group II cities, and \$354 above that of lieutenants in group III cities.

The salary ranges for the same occupation in the same city groups, however, clearly show the existence of many exceptions to the generalization that the annual salaries were higher in the large cities. For the same occupation some fire departments in group III cities paid higher salaries than some in group I cities. These exceptions were due mostly to factors such as proximity of the small city to a metropolitan center paying relatively high wages, the working hours of the fire department, and the wealth or ability of the given small city to pay high salaries.

TABLE 2.—Distribution of fire department employees in 27 West North Central cities, by selected occupations and salary group, July 1, 1938

Salary group	All occupations				Chiefs				Assistant or deputy chiefs			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
Number of cities reporting	27	9	7	11	27	9	7	11	25	9	7	9
Total number of employees	4,265	3,270	611	384	27	9	7	11	32	13	10	9
Under \$1,250	8	5		3								
\$1,250 and under \$1,350	11	1	9	1								
\$1,350 and under \$1,450	76	38		38								
\$1,450 and under \$1,550	52	8	8	36								
\$1,550 and under \$1,650	556	286	201	69								
\$1,650 and under \$1,750	640	405	109	126				1				1
\$1,750 and under \$1,850	276	45	172	59	1			3				3
\$1,850 and under \$1,950	709	626	56	27	1			1				1
\$1,950 and under \$2,050	279	240	29	10				4			2	2
\$2,050 and under \$2,150	140	130	4	6	1			3			2	1
\$2,150 and under \$2,250	1,051	1,040	8	3	3			2			2	
\$2,250 and under \$2,350	174	173		1	1			1				
\$2,350 and under \$2,450	103	97	5	1				3			2	1
\$2,450 and under \$2,550	87	84	3		1		1	2			2	
\$2,550 and under \$2,650	7	7										
\$2,650 and under \$2,750	7	3	2	2	3		1	2				
\$2,750 and under \$2,850	20	18		2	2			2	1	1		
\$2,850 and under \$2,950	13	10	3		3		3					
\$2,950 and under \$3,050	19	17	2		2		2	3	3			
\$3,050 and over	37	37			9	9	2	9	4	9		
Average annual salary	\$1,952	\$2,022	\$1,745	\$1,690	\$3,057	\$4,127	\$2,837	\$2,323	\$2,584	\$3,289	\$2,239	\$1,951

Salary group	Assistant deputy chiefs				Battalion chiefs				Captains			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
Number of cities reporting	8	2	3	3	7	7			26	9	7	10
Total number of employees	14	7	4	3	51	51			513	389	84	40
Under \$1,250												
\$1,250 and under \$1,350												
\$1,350 and under \$1,450												
\$1,450 and under \$1,550												
\$1,550 and under \$1,650									15			15
\$1,650 and under \$1,750	1			1					40		37	3
\$1,750 and under \$1,850	1			1					18		11	7
\$1,850 and under \$1,950									111	76	27	8
\$1,950 and under \$2,050	1			1					53	40	9	4
\$2,050 and under \$2,150	1		1						95	92		3
\$2,150 and under \$2,250	2		2		1	1			23	23		
\$2,250 and under \$2,350	1								10	10		
\$2,350 and under \$2,450	1		1		10	10			71	71		
\$2,450 and under \$2,550	2	2							77	77		
\$2,550 and under \$2,650	1	1										
\$2,650 and under \$2,750	1	1										
\$2,750 and under \$2,850	3	3			12	12						
\$2,850 and under \$2,950					6	6						
\$2,950 and under \$3,050					11	11						
\$3,050 and over					11	11						
Average annual salary	\$2,364	\$2,683	\$2,199	\$1,840	\$2,895	\$2,895			\$2,102	\$2,199	\$1,810	\$1,777

See footnotes at end of table.

TABLE 2.—Distribution of fire department employees in 27 West North Central cities, by selected occupations and salary group, July 1, 1938—Continued

Salary group	Lieutenants				Engineers				Drivers			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
Number of cities reporting	12	4	4	4	10	4	3	3	16	4	5	7
Total number of employees	212	147	42	6 23	7 293	229	44	20	337	222	36	79
Under \$1,250												
\$1,250 and under \$1,350									12			12
\$1,350 and under \$1,450									11			11
\$1,450 and under \$1,550									10			10
\$1,550 and under \$1,650	3			3	36		36					
\$1,650 and under \$1,750	17		11	6	24		8	16	141	100	6	35
\$1,750 and under \$1,850	39	29		10	4			4	41		20	21
\$1,850 and under \$1,950	37	15	18	4								
\$1,950 and under \$2,050	13		13		37	37			72	72		
\$2,050 and under \$2,150	26	26										
\$2,150 and under \$2,250					141	141			50	50		
\$2,250 and under \$2,350	77	77			51	51						
\$2,350 and under \$2,450												
\$2,450 and under \$2,550												
\$2,550 and under \$2,650												
\$2,650 and under \$2,750												
\$2,750 and under \$2,850												
\$2,850 and under \$2,950												
\$2,950 and under \$3,050												
\$3,050 and over												
Average annual salary	\$2,027	\$2,117	\$1,859	\$1,763	\$2,062	\$2,183	\$1,591	\$1,719	\$1,810	\$1,881	\$1,730	\$1,647

Salary group	Privates, all grades				Auto mechanics				Fire-alarm operators			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
Number of cities reporting	27	9	7	11	12	3	4	5	13	7	4	2
Total number of employees	2,492	1,973	342	177	8 32	21	5	6	9 53	39	9	5
Under \$1,250	3			3					3	3		
\$1,250 and under \$1,350	9		8	1								
\$1,350 and under \$1,450	57	33		24	1			1	1	1		
\$1,450 and under \$1,550	38	5	8	25								
\$1,550 and under \$1,650	455	257	150	48	9	8		1	5		5	
\$1,650 and under \$1,750	381	284	42	55	3	3			14	8	1	5
\$1,750 and under \$1,850	155	13	134	8	5	2	3		3		3	
\$1,850 and under \$1,950	515	502		13	1	1			15	15		
\$1,950 and under \$2,050	67	67			2	1	1		4	4		
\$2,050 and under \$2,150									1	1		
\$2,150 and under \$2,250	812	812										
\$2,250 and under \$2,350					10	10						
\$2,350 and under \$2,450					1		1		7	7		
\$2,450 and under \$2,550												
\$2,550 and under \$2,650												
\$2,650 and under \$2,750												
\$2,750 and under \$2,850												
\$2,850 and under \$2,950												
\$2,950 and under \$3,050												
\$3,050 and over												
Average annual salary	\$1,872	\$1,930	\$1,676	\$1,614	\$1,929	\$1,971	\$1,978	\$1,738	\$1,856	\$1,918	\$1,673	\$1,704

See footnotes at end of table.

TABLE 2.—Distribution of fire department employees in 27 West North Central cities, by selected occupations and salary group, July 1, 1938—Continued

Salary group	Electricians				Linemen				All others			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
Number of cities reporting	5	2	2	1	3	2	1	19	9	6	4	
Total number of employees	8	3	3	2	19	¹⁰ 18	1	182	149	24	9	
Under \$1,250								2	2			
\$1,250 and under \$1,350								2	1	1		
\$1,350 and under \$1,450								5	4		1	
\$1,450 and under \$1,550								3	3			
\$1,550 and under \$1,650	3	2		1	11	11		9	8		1	
\$1,650 and under \$1,750	1			1				17	10	4	3	
\$1,750 and under \$1,850								6	3	2	1	
\$1,850 and under \$1,950	2		2					26	18	8		
\$1,950 and under \$2,050								26	20	4	2	
\$2,050 and under \$2,150	1	1						12	10	1	1	
\$2,150 and under \$2,250	1		1		1		1	15	13	2		
\$2,250 and under \$2,350					7	7		18	18			
\$2,350 and under \$2,450								10	9	1		
\$2,450 and under \$2,550								5	5			
\$2,550 and under \$2,650								6	6			
\$2,650 and under \$2,750								3	2	1		
\$2,750 and under \$2,850								2	2			
\$2,850 and under \$2,950								4	4			
\$2,950 and under \$3,050								3	3			
\$3,050 and over								8	11	8		
Average annual salary	\$1,823	\$1,772	\$1,973	\$1,674	\$1,905	\$1,889	\$2,200	(¹²)	(¹²)	(¹²)	(¹²)	

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000; based on U. S. Census of Population for 1930.

² Includes only regular, full-time employees, with the exception of the commissioner in Kansas City, Mo.

³ Includes 1 at \$3,420, 2 at \$3,600, 1 at \$3,900, 2 at \$4,000, 1 at \$4,020, 1 at \$5,000, and 1 at \$5,600.

⁴ Includes 3 at \$3,180, 2 at \$3,192, 1 at \$3,567, 2 at \$3,720, and 1 at \$4,000.

⁵ Includes 11 at \$3,420.

⁶ Includes 3 sergeants in Burlington, Iowa, at \$1,560 each.

⁷ Includes 51 junior engineers in city group I and 7 in city group III. The rest are senior engineers.

⁸ Includes 1 assistant mechanic in city group III. Does not include master or assistant master mechanics.

⁹ Includes 4 telephone operators in city group I. Does not include chief operators.

¹⁰ Includes helpers.

¹¹ Includes 4 at \$3,120, 1 at \$3,181, 1 at \$3,240, 1 at \$3,300, and 1 at \$3,960.

¹² No averages computed, as this was such a heterogeneous group.

Salaries of Privates

Privates of all grades constituted 58 percent ⁵ of all employees and received 56 percent of the total salaries in the 27 fire departments. Ninety-six percent of the privates received between \$1,550 and \$2,250 a year. As in the case of the other occupations, the salaries of privates usually were higher in the large than in the small cities. Two percent of the privates in group I cities, as compared with 5 percent in group II cities and 30 percent in group III cities, received less than \$1,550 a year.

⁵ Usually privates form a larger percentage of the total number of employees because most cities do not distinguish between privates, drivers, and engineers, but designate them all as privates. Of the 27 cities in West North Central Division, 16 reported drivers and 10 reported engineers. The three occupations combined usually constitute about $\frac{3}{4}$ of all employees. In the West North Central Division they constituted 73 percent of all employees.

Ninety-one percent of all privates were first-grade privates and the rest were mostly of the second and third grades. Because of the relatively small numbers of their employees the small cities did not have so many grades as the large cities.

TABLE 3.—Distribution of privates in fire departments of 27 West North Central cities, by salary group and grade, July 1, 1933

Salary group	All grades								Number in each specified grade			
	Number				Percentage				First			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III
All groups	2,492	1,973	342	177	100.0	100.0	100.0	100.0	2,266	1,794	308	164
Under \$1,350	12		8	4	.5		2.3	2.3				
\$1,350 and under \$1,450	57	33		24	2.3	1.7		13.6	24			24
\$1,450 and under \$1,550	38	5	8	25	1.5	.3		2.3	14.1	24		24
\$1,550 and under \$1,650	455	257	150	48	18.2	13.0		43.9	27.1	359	185	140
\$1,650 and under \$1,750	381	284	42	55	15.3	14.4		12.3	31.1	337	252	34
\$1,750 and under \$1,850	155	13	134	8	6.2	.7		39.2	4.5	142		134
\$1,850 and under \$1,950	515	502		13	20.7	25.4		7.3	497	484		13
\$1,950 and under \$2,050	67	67			2.7	3.4			61	61		
\$2,050 and under \$2,150												
\$2,150 and under \$2,250	812	812			32.6	41.1			812	812		

Salary group	Number in each specified grade											
	Second				Third				Fourth		Fifth	
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		All cities ²
		I	II	III		I	II	III		I	II	
All groups	101	78	14	9	84	62	18	4	22	20	2	19
Under \$1,350	1			1	11		8	3				
\$1,350 and under \$1,450					26		26		7	7		
\$1,450 and under \$1,550	5		4	1	7		3					
\$1,550 and under \$1,650	74	69	2	3	7		4		2		2	3
\$1,650 and under \$1,750	14	2	8	4	16	16	6	1				14
\$1,750 and under \$1,850									13	13		
\$1,850 and under \$1,950	1	1			17	17						
\$1,950 and under \$2,050	6	6										
\$2,050 and under \$2,150												
\$2,150 and under \$2,250												

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² All of these are in group I cities.

Hours and Working Conditions

Average Hours and Days on Duty Per Week

A large majority of the employees in a fire department—all of the uniformed men except a few officers—work under a platoon system of assignment. The rest of the employees are either on “continuous” duty or have the working hours prevailing in the other city bureaus.

Under the platoon system of assignment, the hours of firemen are so assigned as to insure that the city is protected at all times. This system is analogous to the tour systems in industries operating 24 hours a day. There are 3 different types of platoon systems: (1) Single-platoon system, (2) 2-platoon system, and (3) 3-platoon system.

Under the single-platoon system, each fireman stays on duty continuously for 2 or more days, depending upon the variation of the system in use in the particular locality, and then has a day off. The off days are so arranged that the fire department is equally staffed at all hours.

The length of the period on duty between off-days determines the average weekly number of hours and days on duty under the single-platoon system. The shorter the period on duty the shorter the average weekly hours and days on duty. The shortest average number of hours and days on duty noted under the single-platoon system is the one with 2 days on and third day off. It averages 112 hours, or 4.7 days on duty per week. In no instance, however, does the single-platoon system ever reach 168 hours, or 7 days of duty per week, because under all variations of the single-platoon system the firemen are given a day off duty at regular intervals.

The single-platoon system used to be the most prevalent system, but now the greater part of the cities operate under the 2-platoon system.

Under the 2-platoon system the firemen are divided into 2 groups and work in 2 tours. While one group is at work the other is off duty. The firemen, however, do not work on the same tour constantly but change from day to night duty at regular intervals. Usually, before shifting from day to night duty, or vice versa, the men on duty stay on for 24 hours while those off duty remain off for 24 hours. Thus, the full day off duty is balanced by a full day on duty every change of tour. Hence, even with a full day off every other tour, each group stays on duty an average of 12 hours a day, or 84 hours a week.

In some fire departments, however, the firemen are given additional time off duty which is not compensated for by a like period on duty. In those fire departments the average hours on duty per week is less than 84, usually 78.

The interval of time between the change of tours is not the same in all cities operating under the 2-platoon system of assignment. Some cities change as frequently as every 24 hours whereas others shift as seldom as every 30 days. The frequency of the change does not affect the average hours on duty per week under the 2-platoon system because under all variations of this system the firemen average 12 hours a day, except in cities that give additional time off duty. The frequency of the changes under the 2-platoon system, however,

does affect and determine the average number of days on duty per week in the given fire department. The more frequent changes result in a fewer number of average days on duty per week. The tour with 24 hours on and 24 hours off averages the least number of days on duty per week, $3\frac{1}{2}$ days, and the tour with no time off duty averages the most, 7 days. Thus, the different cities operating under the 2-platoon system and having the same number of average hours on duty per week, 84 hours if no additional time off duty is given, may have different number of average days on duty per week, between $3\frac{1}{2}$ and 7 days.

The present trend is away from the 2-platoon system and to the 3-platoon system with shorter hours and days on duty per week. Under the 3-platoon system the 24-hour day is divided into 3 tours. Thus, 56 is the maximum average hours and 7 the maximum days on duty per week under the 3-platoon system. In fire departments that do not give time off duty, the firemen are usually divided into three groups each of which works 8 hours a day. In fire departments that periodically give time off duty, the three tours are divided among more than three groups of firemen so as to fill the gap left by those having the time off duty. At present no cities in the West North Central Division operate under the 3-platoon system.

In a very few fire departments a small number of the officers work under a different platoon system than the rest of the firemen, which fact results in a combination of two different platoon systems in the same fire department. However, such cases are rare. Almost every fire department operates wholly under either one of the three systems (single-platoon, 2-platoon, or 3-platoon system).

Almost every fire department has a small number of employees not included under the platoon system. These employees fall into two groups—those on "continuous" duty, and "other." In most of the fire departments the chief and a few of his immediate assistants including those in charge of the various divisions within the fire departments, such as the superintendent of fire-alarm division, are subject to call any moment and are therefore considered to be on duty continuously. The "other" group includes mostly nonuniformed employees such as clerks and maintenance men who are not required to fight fires. These employees usually have the working hours prevalent in private industry or the other departments of the city government.

Of the 27 fire departments in the West North Central Division cities, 2 operated under the single-platoon system, 24 operated under the 2-platoon system, and 1 large city operated under the 2-platoon system with 12 of its employees under the single-platoon system.

Twenty-three of the 25 cities operating under the 2-platoon system had the regular type of the 2-platoon system with an average of 84

hours on duty per week and 2 cities had the type with additional time off duty with an average of 78 hours on duty per week.

The single-platoon system included 1 percent of all employees and the 2-platoon system included 92 percent of all employees. The 92 percent under the 2-platoon system was made up of 78 percent under the regular type and 14 percent under the type with additional time off duty. Of the remaining 7 percent of all employees approximately 1 percent was on continuous duty and 6 percent had other working hours.

As shown in appendix table C all but 40 of the 3,988 employees working under a platoon system of assignment on duty were in the fire-fighting divisions. All of the employees on continuous duty were either chiefs or assistants to the chiefs. And all but 7 of the 257 employees having "other" working hours were outside the fire-fighting divisions.

TABLE 4.—Average hours and days on duty per week in fire departments of 27 West North Central cities, July 1, 1938

System of operation	Average hours on duty per week	Average days on duty per week	Number of cities reporting			Number of employees				Percentage of employees				
			All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
				I	II	III		I	II	III		I	II	III
All systems.....	-----	-----	-----	-----	-----	4,265	3,270	611	384	100.0	100.0	100.0	100.0	
Continuous duty.....	168	7.0	16	8	5	3	20	10	7	3	.5	.3	1.2	.8
Single-platoon ³	-----	-----	3	1	-----	2	50	12	-----	38	1.2	.4	-----	9.9
On 2 days, off 1 day.....	112	4.7	2	1	-----	1	28	12	-----	16	.7	.4	-----	4.2
On 3 days, off 1 day.....	126	5.3	1	-----	-----	1	22	-----	22	.5	-----	-----	-----	5.7
2-platoon-Regular ⁴	-----	-----	23	7	7	9	3,320	2,415	574	331	77.8	73.8	93.9	86.2
On 24 hours, off 24 hours.....	84	3.5	18	4	5	9	2,489	1,779	379	331	58.3	54.4	62.0	86.2
Shift 6th day.....	84	6.4	1	1	-----	-----	337	337	-----	9.1	11.8	-----	-----	
Shift 15th day.....	84	6.8	1	1	-----	-----	117	117	-----	2.7	3.6	-----	-----	
Shift each week.....	84	7.0	1	-----	1	-----	76	76	-----	1.8	-----	12.4	-----	
Shift twice each month.....	84	7.0	2	1	1	-----	251	132	119	5.9	4.0	19.5	-----	
2-platoon—with additional time off duty: ⁵	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
On 24 hours, off 24 hours—off 1 day every 2 weeks.....	78	3.3	2	2	-----	-----	618	618	-----	14.5	18.9	-----	-----	
Other ⁶	45.8	5.7	21	9	7	5	257	215	30	12	6.0	6.6	4.9	3.1

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² Includes only regular full-time employees, with the exception of the commissioner in Kansas City, Mo.

³ The average number of hours on duty per week for employees in each variation of the single-platoon system is arrived at by dividing the total number of hours on duty per year for each variation by 52.143. The average number of days on duty per week for each variation is arrived at by dividing the total number of days on duty per year by 52.143.

⁴ Under each variation of the regular 2-platoon system the employees work in 2 groups, 1 group is on duty while the other is off duty. Over a period of days, therefore, each group is on duty as many hours as the other, or an average of 12 hours a day and 84 hours a week. Each variation of the 2-platoon system however, spreads these 84 hours into different numbers of days on duty per week. The average number of days on duty per week for each variation is arrived at by dividing the number of days on duty per year by 52.143.

⁵ Under the 2-platoon system with additional time off duty the employees are on duty less than an average of 84 hours per week. The average number of hours on duty per week under this system is arrived at by deducting the number of additional weekly hours off duty from 84. The average number of days on duty per week is arrived at by dividing the number of days on duty per year by 52.143.

⁶ The average number of hours and days per week is arrived at by dividing the total weekly man-hours and man-days by the total number of employees under "other."

Under the single-platoon system the firemen were on duty either 112 or 126 hours per week. Under the regular 2-platoon system the firemen were on duty an average of 84 hours per week and under the 2-platoon system with additional time off duty the firemen were on duty an average of 78 hours per week. Those having "other" hours worked an average of 46 hours per week.

The average hours on duty per week were somewhat shorter in the large than in the small cities. None of the employees in group I and group II cities, with the exception of 12 employees in 1 large city, were under the single-platoon system, whereas 10 percent of the employees in group III cities were under this system. Also, 19 percent of the employees in group I cities were on duty an average of 78 hours a week under a variation of the 2-platoon system. All of the employees under the 2-platoon system in the other city groups were on duty an average of 84 hours per week. Further, 7 percent of all employees in group I cities compared with 5 percent in group II, and 3 percent in group III cities had other hours with an overall average of 46 hours per week.

The average number of days on duty per week was either 4.7 or 5.3 days for those under the single-platoon system and ranged from 3.3 to 7 days for those under the 2-platoon system. Those under "other" were on duty an average of 5.7 days per week.

The average of 3.5 and 3.3 days per week predominated and included 58 percent and 14 percent of all employees, respectively.

The average of 7 days on duty per week under the 2-platoon system occurred in the 2 variations under which the firemen were on duty the same number of hours during each day of each shift period and did not have one 24-hour period of duty in one shift period compensated for by one 24-hour period off duty in the following shift period.

The average number of days on duty per week was shorter in the small than in the large cities mostly because 9 of the 11 group III cities operated under the regular 2-platoon system with 24 hours on and 24 hours off duty which averaged $3\frac{1}{2}$ days on duty per week. Some variations of the 2-platoon system in group I and group II cities, on the other hand, averaged as much as 7 days a week on duty.

The 2-platoon system with 24 hours on duty followed by 24 hours off duty was the most popular system of assigning firemen to duty in the 27 West North Central Division cities. This system was in use in 20 of the 27 cities and included 73 percent of all employees. Eighteen of the 20 cities had the regular type and 2 cities had the type with an additional off-day every 2 weeks.

The popularity of this platoon system with 24 hours on duty followed by 24 off duty is due mostly to the fact that it is simple to operate and is practicable in any size city. Most of the other variations of the 2-platoon system require a large number of firemen for

smooth operation. The chief disadvantage of this system results from the fact that the firemen have to be on duty 24 hours at a time. This disadvantage, however, is partly compensated for by the fact that under this system the firemen work an average of 3 to 3½ days a week.

Perquisites Supplied to Firemen

The fire departments of all the 27 cities supplied their firemen certain specified items without charge. All the 27 fire departments supplied sleeping quarters to the firemen on night duty and 14 of the 27 supplied beds, bedding, and bed linen and laundry. Twelve cities supplied rubber coats, 11 supplied helmets, 5 supplied rubber boots, and only 1 city supplied uniforms. The small cities supplied a greater number of items than the large cities.

TABLE 5.—Perquisites supplied to firemen of 27 West North Central cities, July 1, 1938

City group ¹	Number of cities	Number of cities supplying—						
		Sleeping quarters for men on night duty	Beds, bedding, linen, laundry	Helmets	Rubber coats	Rubber boots	Uniforms	Minor items
All cities.....	27	27	14	11	12	5	2	9
Group I.....	9	9	6	2	1	1	2	4
Group II.....	7	7	4	4	4	4	1	3
Group III.....	11	11	4	5	7	—	1	2

¹ Group I includes cities having a population of 100,000 or more; group II cities having a population of 50,000 and under 100,000; and group III cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² This city supplied the cloth and trimmings only.

Vacations With Pay

Ninety-nine percent of all employees in the fire departments of the 27 cities covered by this survey received vacations with pay. The vacation periods ranged from 7 to 21 days and the average vacation period was 16 days a year. Vacation periods of 14, 15, and 20 days predominated and included 25, 34, and 22 percent, respectively, or a total of 81 percent, of all employees.

The average vacation period was longer in the large than in the small cities, the average for group I cities being 17 days; group II cities, 15 days; and group III cities, 14 days. This difference was due to the fact that in group I cities none of the employees receiving vacations with pay received less than 14 days and 43 percent received 20 and 21 days per year, whereas, in group II cities, 12 percent of the

employees received less than 14 days and 28 percent received over 15 days; and in group III cities, 16 percent received less than 14 days and none over 15 days.

TABLE 6.—Number of employees receiving specified vacation with pay in fire departments of 27 West North Central cities, July 1, 1938

City group ¹	Number of cities	Total number of employees	Number of employees having—								
			No vacation	7 days	10 days	12 days	14 days	15 days	16 days	20 days	21 days
All cities.....	27	24,265	61	30	70	30	1,067	1,442	95	933	537
Group I.....	9	3,270	57	.....	.....	.....	711	1,110	.....	933	459
Group II.....	7	611	4	.....	70	.....	165	199	95	.....	78
Group III.....	11	384	.....	30	.....	30	191	133	.....	.....	.....

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² Includes only regular full-time employees, with the exception of the commissioner in Kansas City, Mo.

Promotion of Lower-Grade Privates

In all the 27 fire departments covered by this survey privates just entering the service were ranked below first-grade privates. Some system of automatic promotion of these lower-grade privates existed in the fire departments of 21 of the 27 cities. In 18 of these 21 cities, lower-grade privates were automatically raised to the next higher grade after 1 year's service, and in 3, after 6 months' probation. In 3 cities, lower-grade privates were promoted after civil-service examinations. In 3 cities promotions were by appointment. Automatic promotions of lower-grade privates were more prevalent in the large than in the small cities.

TABLE 7.—Promotion of lower-grade privates in fire departments of 27 West North Central cities, July 1, 1938

City group ¹	Total number of privates	Number of cities	Number of cities with promotion after—			No promotion system
			6 months	1 year	Civil service examination	
All cities.....	2,492	27	3	18	3	3
Group I.....	1,973	9	1	7	1	.....
Group II.....	342	7	2	4	1	.....
Group III.....	177	11	.....	7	1	3

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

Percentage Distribution of Employees and Salaries

All Employees

Out of every 100 employees 93 were in the fire-fighting divisions. Of these, 3 were chiefs, assistant chiefs, assistant deputy chiefs, and battalion chiefs, 12 were captains, 5 were lieutenants, and 73 were privates, drivers, and engineers.

The higher-ranking occupations constituted a smaller percentage of the total number of employees in the large than in the small cities. Chiefs, for example, formed 0.3 percent of the employees in group I cities compared with 1.1 percent in group II and 2.9 percent in group III cities. On the other hand, privates, drivers, and engineers were 74 percent of the employees in group I cities compared with 69 and 72 percent in group II and group III cities, respectively.

Similarly, of the total salaries in the 27 fire departments, \$93 of every \$100 went to the fire-fighting divisions. Of this \$93, \$4 went to chiefs, assistant chiefs, assistant deputy chiefs, and battalion chiefs, \$13 to captains; \$5 to lieutenants; and \$71 to privates, drivers, and engineers. As in the case of the percentage distribution of employees, in the large cities the higher-ranking occupations received a smaller percentage of the total salaries than in the small cities. The differences decreased with the decrease in the rank of the occupation. Chiefs, for example, received 0.6 percent of the total salaries in group I cities compared with 1.9 percent in group II and 3.9 percent in group III cities. Privates, drivers, and engineers, on the other hand, received 71 percent of the total salaries in group I cities compared with 66 and 69 percent in group II and group III cities, respectively.

Comparison of the percentage distribution of the employees and salaries shows an almost identical distribution. Some of this similarity was the result of the counterbalancing of the distribution of the supervisory and nonsupervisory employees within the same divisions. In the fire-fighting divisions, for example, chiefs constituted 0.6 percent of the employees but received 1.0 percent of the salaries, and lieutenants constituted 5.0 percent of the employees and received 5.2 percent of the salaries. These differences in the supervisory occupations were absorbed by the privates, drivers, and engineers, who formed 73 percent of the employees and received 71 percent of the salaries. As is to be expected, the differences that were counterbalanced were more pronounced in the large than in the small cities.

TABLE 8.—Percentage distributions of employees and salaries in specified divisions in fire departments of 27 West North Central cities, July 1, 1938

Division ¹ and occupation	Percentage of employees				Percentage of salaries			
	All cities	City group ²			All cities	City group ²		
		I	II	III		I	II	III
All divisions.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Fire fighting.....	93.2	93.1	93.3	94.3	93.0	93.0	92.7	94.1
Chiefs.....	.6	.3	1.1	2.9	1.0	.6	1.9	3.9
Assistant or deputy chiefs.....	.8	.4	1.6	2.3	1.0	.7	2.1	2.7
Assistant deputy chiefs.....	.3	.2	.7	.8	.4	.3	.8	.8
Battalion chiefs.....	1.2	1.6			1.8	2.2		
Captains.....	12.0	11.9	13.7	10.4	12.9	12.9	14.2	11.0
Lieutenants ³	5.0	4.5	6.9	6.0	5.2	4.7	7.3	6.3
Engineers, fire engine.....	6.9	7.0	7.2	5.2	7.3	7.6	6.6	5.3
Drivers.....	7.9	6.8	5.9	20.6	7.3	6.3	5.8	20.1
Privates.....	58.4	60.3	56.0	46.1	56.0	57.6	53.8	44.0
Drill masters.....	.1	.1	.2		.1	.1	.2	
Fire prevention.....	1.0	1.0	.8	.8	1.0	1.0	.9	.8
Apparatus.....	2.2	2.3	1.8	1.5	2.3	2.4	2.0	1.6
Fire alarm.....	2.8	2.8	3.1	2.9	2.9	2.8	3.4	3.0
Clerical.....	.8	.8	1.0	.5	.8	.8	1.0	.5

¹ All fire departments assign men from the fire-fighting division to the other divisions and carry these assigned men on the fire-fighting division list. This is done to provide the fire department with a reserve for cases of emergency. As a result of this method of assignment, the fire-fighting division is always shown to be larger than it actually is on a routine day. Some other factors are also responsible for the small size of the non-fire-fighting divisions. In some cities, for example, the maintenance work is let to private contractors; part of the fire-prevention work is done by the building inspector's office; and the fire alarm work is done by the local telephone company or by a separate city bureau.

² Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

³ Includes 3 sergeants in Burlington, Iowa, at \$1,560 each.

Supervisory Employees

The concentration of annual salaries in the 27 fire departments within a relatively narrow range was due mostly to the small difference between the percentage of the total number of fire-department employees holding supervisory positions and the percentage of total salaries received by them. Supervisory employees constituted 21 percent of all employees and received only 24 percent of the total salaries. In the small cities the percentages were even more similar. The ratio of supervisory employees to salaries was 1.14 in group I cities, 1.10 in group II cities, and 1.11 in group III cities.

TABLE 9.—*Number and salaries of supervisory employees¹ as percentage of total fire-department employees and total salaries, in 27 West North Central cities, July 1, 1938*

Item	All cities	City groups ²		
		I	II	III
Supervisory employees as percentage of all employees.....	21.1	20.0	25.5	23.4
Supervisory salaries as percentage of total salaries.....	23.7	22.8	27.8	25.9
Ratio of salaries to employees.....	1.12	1.14	1.10	1.11

¹ Supervisory employees are those employees who have others working under them. The group includes the chiefs, assistant chiefs, assistant deputy chiefs, batallion chiefs, captains, lieutenants, marshals or wardens, superintendents, chief engineers, chief fire-alarm operators, assistants to these officers who also supervise the activities of others, master mechanics, and chief clerks, if they have others working under their direction, and others who direct other employees.

² Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

Per Capita Salary Cost of Fire Protection and Distribution of Employees

As a general rule, per capita costs of fire-department salaries were higher in the large than in the small cities. When the total salaries were put on a per capita basis it was found that the cost per person was \$2.50⁶ for the population of group I cities, \$2.25 for the population of group II cities, and \$1.81 for the population of group III cities.

The large cities, moreover, had a relatively larger number of firemen than the small cities. For every 10,000 inhabitants the fire departments in group I cities had 12 employees, in group II cities, 13 employees, and in group III cities, 11 employees.⁶ The larger number of firemen per inhabitant along with the somewhat higher salaries accounted for the higher per capita cost in the large cities.

⁶ These figures are based on the U. S. Census of population for 1930 and are presented primarily to facilitate relative comparisons rather than to give actual amounts. Therefore, the errors introduced by the changes in population from 1930 to 1938 do not appreciably affect any of the above conclusions.

Appendix

The listing of cities of 25,000 or more in the West North Central Division with their population, ratios of employees to population, and per capita costs is shown in table A. The West North Central Division includes the States of Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

TABLE A.—*Fire department employees and salary costs in relation to population in West North Central cities with a population of 25,000 or more,¹ July 1, 1938*

City	Popula- tion ¹	Em- ployees per 10,000	Per capita salary cost	City	Popula- tion ¹	Em- ployees per 10,000	Per capita salary cost
All cities.....	3,482,012	12	\$2.39	Group II—Continued			
Group I—Cities of 100,000 and over....	2,648,663	12	2.50	St. Joseph, Mo.....	80,935	16	2.56
Des Moines, Iowa....	142,559	14	2.78	Sioux City, Iowa.....	79,183	12	2.25
Duluth, Minn.....	101,463	16	3.13	Springfield, Mo.....	57,527	12	2.00
Kansas City, Kans....	121,857	12	2.36	Topeka, Kans.....	64,120	12	2.27
Kansas City, Mo.....	399,746	11	1.99	Group III—Cities of 25,000 to 50,000....	358,803	11	1.81
Minneapolis, Minn....	464,356	11	2.40	Burlington, Iowa....	26,755	11	1.71
Omaha, Nebr.....	214,006	14	2.51	Clinton, Iowa.....	25,726	9	1.57
St. Louis, Mo.....	821,960	12	2.61	Council Bluffs, Iowa..	42,048	9	1.65
St. Paul, Minn.....	271,606	15	2.95	Dubuque, Iowa.....	41,679	13	2.35
Wichita, Kans.....	111,110	12	2.05	Fargo, N. D.....	28,619	10	1.73
Group II—Cities of 50,000 to 100,000....	474,546	13	2.25	Hutchinson, Kans....	27,085	14	2.07
Cedar Rapids, Iowa....	56,097	11	2.03	Joplin, Mo.....	33,454	10	1.57
Davenport, Iowa....	60,751	12	2.27	Ottumwa, Iowa.....	28,075	7	1.15
Lincoln, Nebr.....	75,933	14	2.19	Sioux Falls, S. D.....	33,362	15	2.51
				University City, Mo..	25,809	7	1.30
				Waterloo, Iowa.....	46,191	11	1.90

¹ Based on U. S. Census of Population for 1930.

TABLE B.—Number of employees and annual salaries in fire departments of each of July 1,

Division and occupation		9 group I cities (population of 100,000 or over)												
		Total number of employees	Iowa		Kansas				Minnesota					
			Des Moines		Kansas City		Wichita		Duluth		Minneapolis		St. Paul	
			No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
1	Total number of employees.	23,270	198	141	128	161	502	411						
Fire fighting:														
2	Commissioners.....													
3	Chiefs.....	9	1 \$4,000	1 \$3,600	1 \$3,420	1 \$3,600	1 \$5,000	1 \$4,000						
4	Assistant or deputy chiefs.	13	1 3,000	1 3,000	1 2,820	1 3,000	2 3,720	1 3,567						
5	Assistant deputy chiefs.	7	3 2,820				3 2,520 to 2,700							
6	Battalion or district chiefs.	51		3 2,800	1 2,160		11 3,000	9 2,801						
7	Captains.....	389	10 2,280	23 2,160	11 1,980	26 2,130	71 2,400	66 2,090						
8	Lieutenants.....	147	26 2,100		15 1,860									
9	Engineers, senior	178		3 2,160										
10	Engineers, junior	51												
11	Drivers.....	222		38 1,980			34 1,950							
Privates:														
12	1st grade.....	1,794	145 1,920	61 1,980	75 1,740	64 1,920	244 2,160	275 1,859						
13	2d grade.....	78	2 1,740	1 1,920	4 1,620		6 2,040							
14	3d grade.....	62			3 1,500	16 1,740	17 1,920							
15	4th grade.....	20			7 1,350		13 1,800							
16	5th grade.....	17				3 1,620	14 1,680							
17	Probationary	2				2 1,500								
18	Drill masters	3	1 2,820											
Fire prevention:														
19	Marshals or wardens	7	1 2,100	1 2,160			1 2,040	1 2,418						
20	Assistant marshals or wardens.	2					1 1,920	1 1,996						
21	Chief inspectors.....													
22	Inspectors.....	19		3 1,980	2 1,860		(4)	7 1,859						
Miscellaneous:														
23	Arson investigators.	4						2 2,400						
24	Fire prevention consultants.	1												
Apparatus:														
25	Superintendents of machinery.	9	1 2,280	1 2,400	1 1,980	1 2,460	1 3,240	1 3,181						
26	Assistant superintendents of machinery.	8	1 2,100	1 1,980	1 1,740	1 1,740	1 2,640	1 2,418						
27	Machinists.....	14											4 2,000	
28	Machinist helpers	2												
29	Auto mechanics	21						10 2,340						
General mechanics:														
30	Auto trimmers.....	1											1 1,996	
31	Carpenters.....	1												
32	Painters.....	6			(4)								1 2,090	
33	Shop helpers.....	12											2 1,859	
34	Wheelwrights.....	1												
35	Superintendents of repair.	1											1 2,090	

See footnotes at end of table.

27 West North Central cities with population of 25,000 or over¹ by occupations, 1938

9 group I cities (population of 100,000 or over)—Continued						7 group II cities (population of 50,000 and under 100,000)									
Missouri				Nebraska		Total number of employees	Iowa						Kansas		
Kansas City		St. Louis		Omaha			Cedar Rapids		Davenport		Sioux City		Topeka		
No.	Salary	No.	Salary	No.	Salary		No.	Salary	No.	Salary	No.	Salary	No.	Salary	
458		964		307		611	64		73		95		80	1	
(2)														2	
1	\$3,900	1	\$5,600	1	\$4,020	7	1	\$2,460	1	\$3,000	1	\$3,000	1	\$2,880	3
3	3,180	1	4,000	2	3,192	10	2	2,100	1	2,220	2	2,400	1	2,484	4
						4			1	2,100			1	2,376	5
10	2,400	11	3,420	6	2,880										6
76	1,920	77	2,520	29	1,980	84	12	1,860	7	1,920	9	2,040	8	1,932	7
		77	2,280	29	1,830	42			10	1,890	13	1,980	9	1,872	8
			2,280			44									9
		51	2,160												10
100	1,680	50	2,160			36			17	1,830			3	1,764	11
185	1,620	568	2,160	177	1,680	308	34	1,740	23	1,800	62	1,800	49	1,764	12
45	1,560			20	1,560	14	3	1,680	1	1,680	4	1,680	2	1,620	13
				26	1,440	18	5	1,620	2	1,500	1	1,560	2	1,500	14
						2	2	1,560							15
															16
															17
		1	2,520	1	2,880	1			1	2,040					18
1	2,400			1	2,880										19
															20
							1								21
4	1,608			3	1,680	4	1	1,860					1	1,872	22
				2	2,040										23
1	2,400														24
1	1,920	1	3,000	1	2,880	2							1	2,160	25
1	1,680			1	2,288	1							1	1,836	26
1	1,920	8	2,040	1	1,680	2									27
		2	1,500												28
8	1,620			3	1,680	5	1	1,920	1	2,040	1	2,400			29
															30
				1	1,680										31
		1	2,496												32
		3	3,120	1	1,680	1									33
		10	2,160												34
		1	2,080												35

TABLE B.—Number of employees and annual salaries in fire departments of each of July 1, 1938

Division and occupation	9 group I cities (population of 100,000 or over)										
	Total number of employees	Iowa		Kansas			Minnesota				
		Des Moines		Kansas City		Wichita	Duluth		Minneapolis	St. Paul	
		No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
36	Fire alarm:										
37	6	1 \$2,280			1	\$1,980	1	\$2,950	1	\$3,300	
38	3							1	2,700		
38	1										
39	35	4 1,920			4	1,740	3	1,920	7	2,400	
40	4			3	\$1,200						
41	3						1	2,100			
42	9										
43	9										(e)
44											
44											
45	4										
46	1										
47	2										
48	1										
49	1										
50	12								4	2,340	
50											
51	7	1 2,820	1	2,160	1	1,920			1	3,120	1 \$2,418
52	3								1	2,500	1 1,859
53	7								1	2,100	
54	2								1	2,340	
55	8						1	1,020	(*)4	{1,800 to 2,520}	
56							(7)				

See footnotes at end of table.

27 West North Central cities with population of 25,000 or over by occupations,
—Continued

9 group I cities (population of 100,000 or over)—Continued						7 group II cities (population of 50,000 and under 100,000)								
Missouri				Nebraska		Total number of employees	Iowa						Kansas	
Kansas City		St. Louis		Omaha			Cedar Rapids		Davenport		Sioux City		Topeka	
No.	Salary	No.	Salary	No.	Salary		No.	Salary	No.	Salary	No.	Salary	No.	Salary
1	\$2,400	1	\$3,960			4	1 \$2,100	1	\$2,700			1	\$1,932	36
1	1,980	1	2,580			1	1 1,860							37
		1	2,580											38
8	1,920	* 9	{ 1,440 to 2,040 2,080			9		3	1,800					39
2	1,608	1	2,080			3		1	2,200	2	\$1,860			40
2	1,620	7	2,288			1		1	2,200					42
		9	1,638					1	2,400					43
						1								44
1	1,920	3	2,600											45
		1	2,340											46
		2	1,560											47
		1	1,320											48
1	960													49
		8	2,340											50
1	2,700	1	2,880			5	1 1,860	1	2,040	(?)		1	1,320	51
		1	2,168											52
2	1,440	2	1,560	1	\$1,680	1								53
1	1,890	1	1,800											54
1	1,440	1	1,518	1	1,440									55
														56

TABLE B.—Number of employees and annual salaries in fire departments of each of July 1, 1933

Division and occupation	7 group II cities (population of 50,000 and under 100,000)—Continued.						11 group III cities (population of 25,000 and under 50,000)				
	Missouri				Nebraska		Total number of employees	Iowa			
	St. Joseph		Springfield		Lincoln			Burlington		Clinton	
	No.	Salary rate	No.	Salary rate	No.	Salary rate		No.	Salary rate	No.	Salary rate
1 Total number of employees ¹	126		70		103		384	30		22	
2 Fire fighting:											
3 Chiefs.....	1	\$2,940	1	\$2,700	1	\$2,880	11	1	\$1,800	1	\$2,160
4 Assistant or deputy chiefs.....	1	2,460	2	2,004	1	2,220	9	1	1,740	1	1,980
5 Assistant deputy chiefs.....	1	2,160			1	2,160	3				
6 Captains.....	29	1,710	8	1,680	11	1,764	40	1	1,620	3	1,860
7 Lieutenants.....					11	1,680	20				
8 Sergeants.....							3	3	1,560		
9 Engineers, senior.....	14	1,590	8	1,680	22	1,560	13			2	1,800
10 Engineers, junior.....							7			2	1,800
11 Drivers.....	6	1,590	6	1,680	4	1,560	79			5	1,800
12 Privates—											
13 1st grade.....	68	1,590	40	1,620	32	1,560	164	24	1,500	8	1,800
14 2d grade.....					4	1,482	9				
15 3d grade.....					8	1,302	4				
16 Fire prevention:											
17 Chief inspectors.....					1	1,980					
18 Inspectors.....			1	1,728	1	1,764	3		(7)		
19 Apparatus:											
20 Superintendents of machinery.....					1	2,160					
21 Machinists.....	2	1,860									
22 Auto mechanics.....					2	1,764	5		(11)		
23 Assistant mechanics.....							1				
24 Painters.....	1	1,710									
25 Fire alarm:											
26 Superintendents.....			1	2,004			3				
27 Assistant superintendents.....							1				
28 Operators, fire alarm.....	{	1, 590	2	1,620	2	1,560	5		(4)		
29 Electricians.....	{	1, 710					2				
30 Clerical:											
31 Secretaries.....	1	1,710	1	1,896			2		(7)		
32 Clerks.....					1	1,680					

¹ Based on U. S. Census of Population for 1930.

² Totals include regular, full-time employees, but not part-time employees, call men or volunteers. Neither do they include the commissioner for Kansas City, Mo., (receives \$6,000 per year).

³ Includes 2 at \$2,520, 1 at \$2,580, and 1 at \$2,700.

⁴ Men from uniformed force assigned to this work.

⁵ Combination police and fire-signal system.

⁶ Includes 1 at \$1,440, 4 at \$1,740, and 4 at \$2,040.

27 West North Central cities with population of 25,000 or over by occupations,
—Continued

11 group III cities (population of 25,000 and under 50,000)—Continued																		
Iowa								Kansas		Missouri			North Dakota		South Dakota			
Council Bluffs		Dubuque		Ottumwa		Waterloo		Hutchinson		Joplin		University City		Fargo		Sioux Falls		
No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	No.	Salary rate	
39		56		19		49		38		35		17		30		49	1	
1	\$2,160	1	\$2,760	1	\$1,920	1	\$2,760	1	\$2,160	1	\$2,100	1	\$2,700	1	\$2,328	1	\$2,700	2
1	1,920			1	1,800	1	2,100	1	1,800	1	1,800	1	1,800	1	2,016	1	2,400	3
1	1,800							1	1,740							1	1,980	4
		{	5 1,860	3	1,728	3	1,980	8	1,620	6	1,620	3	2,100	3	1,764	4	1,800	5
		{	1 1,980															6
10	1,800	6	1,740			4	1,860											7
																		8
		5	1,740													6	1,680	9
		5	1,680															10
16	1,770			8	1,680	16	1,740	12	1,380	11	1,500					11	1,680	11
6	1,740	24	1,680	6	1,680	15	1,740	11	1,380	13	1,440	13	1,890	21	1,572	23	1,620	12
3	1,620	1	1,500			4	1,680	1	1,260									13
						1	1,620			3	1,200							14
(7)		{	1 1,740	(7)		{	1 1,740	1	1,620			(7)		(7)		(10)		15
																		16
																		17
1	1,800	1	1,980					1	1,440	(12)		(4)		{	1 1,764	1	1,800	18
														{	1 1,644			19
																		20
		1	1,950			1	2,100									1	1,680	21
		1	1,800															22
		3	1,680			2	1,740											23
										(13)				{	1 1,644			24
														{	1 1,704			25
(4)		{	1 1,980					1	1,440	(4)		{						26

7 Part-time employee.
 8 Includes 2 at \$1,800, 1 at \$2,280, and at \$2,520.
 9 Totals include only regular, full-time employees.
 10 Under supervision of State fire marshal.
 11 Work performed by private company.
 12 Done by driver at \$5 per day.
 13 Done by a private at \$3.30 per day.

TABLE C.—Average hours and days on duty per week in fire departments of 27 West North Central cities, by division, July 1, 1938

System of operation	Average hours on duty per week	Average days on duty per week	Number of employees working under specified systems in—							
			All divisions				Fire-fighting division			
			All cities	City group ¹			All cities	City group ¹		
				I	II	III		I	II	III
All systems.....			² 4,265	3,270	611	384	3,975	3,043	570	362
Continuous duty.....	178	7.0	20	10	7	3	20	³ 10	⁴ 7	⁵ 3
Single-platoon ⁶			50	12		38	50	12		38
On 2 days, off 1 day.....	112	4.7	28	12		16	28	12		16
On 3 days, off 1 day.....	126	5.3	22			22	22			22
2-platoon—regular ⁷			3,320	2,415	574	331	3,283	2,403	561	319
On 24 hours, off 24 hours.....	84	3.5	2,489	1,779	379	331	2,458	1,789	370	319
Shift 6th day.....	84	6.4	387	387			387	387		
Shift 15th day.....	84	6.8	117	117			117	117		
Shift each week.....	84	7.0	76		76		74		74	
Shift twice each month.....	84	7.0	251	132	119		247	130	117	
2-platoon—with additional time off duty: ⁸										
On 24 hours, off 24 hours—off 1 day every 2 weeks.....	78	3.3	618	618			615	615		
Other ⁹	45.84	5.66	257	215	30	12	7	¹⁰ 3	¹¹ 2	¹¹ 2

See footnotes at end of table.

TABLE C.—Average hours and days on duty per week in fire departments of 27 West North Central cities, by division, July 1, 1938—Continued

System of operation	Number of employees working under specified systems in—															
	Fire-prevention division				Apparatus division				Alarm division				Clerical division			
	All cities	City group ¹			All cities	City group ¹			All cities	City group ¹			All cities	City group ¹		
		I	II	III		I	II	III		I	II	III		I	II	III
All systems.....	41	33	5	3	94	77	11	6	120	90	19	11	35	27	6	2
Continuous duty.....																
Single-platoon ⁶																
On 2 days, off 1 day.....																
On 3 days, off 1 day.....																
2-platoon—regular ⁷	2		1	1	20	12	3	5	11		7	4	4		2	2
On 24 hours, off 24 hours.....	2		1	1	16	10	1	5	9		5	4	4		2	2
Shift 6th day.....																
Shift 15th day.....																
Shift each week.....					2		2									
Shift twice each month.....					2	2			2		2					
2-platoon—with additional time off duty: ⁸																
On 24 hours, off 24 hours—off 1 day every 2 weeks.....	3	3														
Other ⁹	36	30	4	2	74	65	8	1	109	90	12	7	31	27	4	

¹ Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

² Includes only regular full-time employees, with the exception of the commissioner in Kansas City, Mo.

³ Includes 8 chiefs and 2 assistant chiefs.

⁴ Includes 5 chiefs, 1 assistant chief, and 1 assistant deputy chief.

⁵ Includes 3 chiefs.

⁶ The average number of hours on duty per week for employees in each variation of the single-platoon system is arrived at by dividing the total number of days on duty per year by 52.143.

⁷ Under each variation of the regular 2-platoon system the employees work in 2 groups, 1 group is on duty while the other is off duty. Over a period of days, therefore, each group is on duty as many hours as the other, or an average of 12 hours a day and 84 hours a week. Each variation of the 2-platoon system, however, spreads these 84 hours into different numbers of days on duty per week. The average number of days on duty per week for each variation is arrived at by dividing the number of days on duty per year by 52.143.

⁸ Under the 2-platoon system with additional time off duty the employees are on duty less than an average of 84 hours per week. The average number of hours on duty per week under this system is arrived at by deducting the number of additional weekly hours off duty from 84. The average number of days on duty per week is arrived at by dividing the number of days on duty per year by 52.143.

⁹ The average number of hours and days per week is arrived at by dividing the total weekly man-hours and man-days by the total number of employees under "Other."

¹⁰ Includes 3 drill masters.

¹¹ Includes 2 chiefs.

TABLE D.—Total salaries and total number of employees of fire departments in 27 West North Central cities, by occupations, July 1, 1933

Division ¹ and occupation	Number of employees				Total salaries			
	All cities	City group ²			All cities	City group ²		
		I	II	III		I	II	III
					Dollars	Dollars	Dollars	Dollars
All occupations.....	34,265	3,270	611	384	8,326,695	6,611,851	1,066,076	648,768
Fire fighting.....	3,975	3,043	570	362	7,744,575	6,145,437	988,716	610,422
Chiefs.....	27	9	7	11	82,548	37,140	19,860	25,548
Assistant or deputy chiefs.....	32	13	10	9	82,699	42,751	22,392	17,556
Assistant deputy chiefs.....	14	7	4	3	33,096	18,780	8,796	5,520
Battalion or district chiefs.....	51	51	-----	-----	147,669	147,669	-----	-----
Captains.....	513	389	84	40	1,078,446	855,360	152,010	71,076
Lieutenants ⁴	212	147	42	23	429,786	311,130	78,096	40,560
Engineers, fire engine ⁵	293	229	44	20	604,312	499,912	70,020	34,380
Drivers.....	337	222	36	79	609,942	417,540	62,262	130,140
Privates.....	2,492	1,973	342	177	4,665,817	3,806,935	573,240	285,642
1st grade.....	2,266	1,794	308	164	4,302,283	3,514,765	521,436	266,082
2d grade.....	101	78	14	9	162,468	125,520	22,608	14,340
3d grade.....	84	62	18	4	133,716	102,420	26,076	5,220
4th grade.....	22	20	2	-----	35,970	32,850	3,120	-----
5th grade.....	17	17	-----	-----	28,380	28,380	-----	-----
Probationary.....	2	2	-----	-----	3,000	3,000	-----	-----
Drill masters.....	4	3	1	-----	10,260	8,220	2,040	-----
Fire prevention.....	41	33	5	3	80,643	66,339	9,204	5,100
Marshals or wardens.....	7	7	-----	-----	16,998	16,998	-----	-----
Assistant marshals or wardens.....	2	2	-----	-----	3,916	3,916	-----	-----
Chief inspectors.....	1	-----	1	-----	1,980	-----	1,980	-----
Inspectors.....	26	19	4	3	46,469	34,145	7,224	5,100
Miscellaneous.....	5	5	-----	-----	11,280	-----	-----	-----
Apparatus.....	93	76	11	6	191,440	159,538	21,474	10,428
Superintendents of machinery.....	11	9	2	-----	27,661	23,341	4,320	-----
Assistant superintendents of machinery.....	9	8	1	-----	18,422	16,586	1,836	-----
Machinists ⁶	18	16	2	-----	35,000	31,280	3,720	-----
Auto mechanics ⁷	32	21	5	6	61,716	41,400	9,888	10,428
General mechanics.....	22	21	1	-----	46,551	44,841	1,710	-----
Superintendents of repair.....	1	1	-----	-----	2,090	2,090	-----	-----
Fire alarm.....	121	91	19	11	241,938	186,364	36,176	19,398
Superintendents.....	13	6	4	3	31,336	16,870	8,736	5,730
Assistant superintendents.....	5	3	1	1	10,920	7,260	1,860	1,800
Chief operators.....	1	1	-----	-----	2,580	2,580	-----	-----
Operators.....	53	39	9	5	98,380	74,800	15,060	8,520
Electricians.....	8	3	3	2	14,584	5,316	5,920	3,348
Linemen ⁸	19	18	1	-----	36,198	33,998	2,200	-----
Inspectors.....	1	-----	1	-----	2,400	-----	2,400	-----
Miscellaneous.....	21	15	21	-----	45,540	45,540	-----	-----
Clerical.....	35	27	6	2	68,099	54,173	10,506	3,420
Secretaries.....	14	7	5	2	30,264	18,018	8,826	3,420
Chief clerks.....	3	3	-----	-----	6,527	-----	-----	-----
Clerks and bookkeepers.....	10	9	1	-----	17,490	15,810	1,680	-----
Stenographers.....	8	8	-----	-----	13,818	13,818	-----	-----

¹ All fire departments assign men from the fire-fighting division to the other divisions and carry these assigned men on the fire-fighting division list. This is done to provide the fire department with a reserve for cases of emergency. As a result of this method of assignment, the fire-fighting division is always shown to be larger than it actually is on a routine day. Some other factors are also responsible for the small size of the non-fire-fighting divisions. In some cities, for example, the maintenance work is let to private contractors; part of the fire-prevention work is done by the building inspector's office; and the fire-alarm work is done by the local telephone company or by a separate city bureau.

² Group I includes cities having a population of 100,000 or more; group II, cities having a population of 50,000 and under 100,000; and group III, cities having a population of 25,000 and under 50,000, based on U. S. Census of Population for 1930.

³ Includes only regular, full-time employees, with the exception of the commissioner in Kansas City, Mo.

⁴ Includes 3 sergeants in city group III.

⁵ Includes 51 junior engineers in city group I and 7 in city group II. The rest are senior engineers.

⁶ Includes 2 helpers in city group I.

⁷ Includes 1 assistant mechanic in city group III.

⁸ Includes 9 helpers in city group I.

