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Statistics of Fatal Traffic Accidents

In

Detroit, Mich.

Dec. 1, 1920 to April, 1925.

A Thesis Submitted to

The Faculty of

MICHIGAN STATE COLLEGE

OF

AGRICULTURE AND APPLIED SCIENCE

By

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Candidate for the Degree

of

Bachelor of Science

in

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PREFACE.

This thesis was undertaken by the candidate for several very specific reasons. First and foremost, it was necessary to comply with the requirements of the Department of Civil Engineering for the selection of a thesis topic. (For the specific topics which should be included in a properly written thesis, the reader is referred to "THESIS REGULATIONS", a set of instructions prepared for students by the Department). Second, this subject matter was suggested by Mr. Earl J. Reeder, of the Class of 1915, C.E., who is now in the Public Safety Division of the National Safety Council in Chicago, Ill. Mr. Reeder's work is along this line in particular, and it was his suggestion that a work of accumulation of data regarding traffic accident fatalities in Detroit, and a proper presentation of them, with perhaps some pointed conclusions and recommendations, would be quite an original study and one which would add a bit to the world's store of knowledge regarding existing facts, and which might in some way be of real benefit to mankind. A third reason for choice was the fact that no previous thesis on file in the Department had been along this line, which seemed to offer considerable leeway for original study in manner of presentation of data as well as for presenting an up-to-the-minute problem for solution. Detroit has had a very high accident rate, seemingly on the surface to be abnormally high for its population. The various Bureaus of the Police Department are doing their best

to decrease accidents, but as yet the traffic problem is far from settled.

In the collection of data, the organization of the work, and the working up of the material into presentable form a very considerable amount of credit is due to several people and organizations for assistance very willingly given the candidate. Mr. Reeder suggested the subject matter of the thesis, and gave very freely of advice throughout the whole work. Through his introduction, entree was made easier in the work of gathering data from the Police Department of Detroit. Mr. H. O. Rounds, Superintendent of the Bureau of Public Safety lent considerable advice and help, and, through him, access was had to the records of the Accident Investigation Bureau. Lieut. F. H. Croul, Commissioner of Police, very willingly gave assistance in the work when needed, and the courtesy and aid of those of his organization is certainly appreciated. To the Accident Investigation Bureau is due the credit for most of the original data included with this thesis. Mr. C. E. Brewer, Commissioner of Recreation, Detroit, gave some data concerning playgrounds, of which the number and location were particularly valuable in this thesis. The location of Public Schools was obtained from a street guide. A large portion of the work was based upon ideas gleaned from magazines and periodicals, even though such may not appear from the brevity of this report. The American City Magazine was especially helpful, and it

was through this that information concerning the Los Angeles Major Traffic Plan was obtained. Mr. Miller McClintock of the Traffic Commission of the City and County of Los Angeles, loaned a book giving completely the results of a traffic survey of that city by his organization, and also several pamphlets and booklets giving data regarding a new traffic code drawn up by the Commission and later put into actual operation by the City. This data is not directly adaptable to the subject matter of this thesis, but it should be extremely useful to the Department of Civil Engineering in particular should the Faculty or students have need in the future for data concerning traffic surveys, regulation, and laws. For this reason Mr. McClintock donated the book for deposit in the Michigan State College Library.

Last, but by no means least, the ~~candidate~~ candidate is indebted to Professor C. L. Allen, head of the Department of Civil Engineering, for his advice and guidance in the carrying on of the work, and for correction of the first manuscript.

June, 1925.

Myrl Elmer Newark

STATISTICS OF FATAL TRAFFIC ACCIDENTS
IN
DETROIT, MICH.

PART I.

NATURE AND SCOPE

As originally intended this thesis was meant to cover a great deal more ground than later developments in the work rendered possible. It was hoped that the first two or three weeks would see the work of gathering of statistics completed and that the time thereafter would be spent in study of the data, in the reading of material covering cities with similar problems, and in personal inspection trips to dangerous sections or corners in Detroit to determine what local factors, if any, were causing a high number of accidents at a particular place. It was also thought that there would be time to collect considerable facts regarding the population of Detroit for the different periods covered, ^{and} the characteristics of races or groups of people in various localities where accidents predominated, to see if there were any relation between them, and if so, how these people might be reached by a different concentration of effort on the part of the various organizations in Detroit which are given to this sort of work.

However, the time necessary to merely plot the data on the four maps which are enclosed in the back of this

report precluded the possibility of making so extensive a study of the situation. It was found that the bare mechanical work of collecting the facts and assembling them in proper form, plotting the maps, making the graphs, tables, and charts, would probably take considerably over the amount of time which was assigned to the work. Also the thesis was costing more in a financial way than seemed warranted for going to the expense of more than one trip to Detroit for the collection of data and statistics.

Consequently, at the suggestion of Mr. Allen as to the proper title for the work, the undertaking has been limited mostly to the gathering of data concerning individual fatal accident reports from the Accident Investigation Bureau of the Police Department; the location, age and sex of victim, type of vehicle or vehicles involved; the location of public schools and playgrounds; the location of carlines; and such data concerning the activities of the various agencies seeking to improve the traffic safety situation as could be obtained on a trip to Detroit during Spring Vacation, or by letter to the various organizations involved.

A major portion of the data collected has been worked upon and assembled in the form of graphs, charts, and spot maps which are included in this report. This data is commented upon at greater length in Part III. Moreover, considerable other material was gathered which at the time seemed necessary or of possible use in the thesis, but

which did not seem to show the facts in suitable form. This consists of several periodical reports and tables put out by the Accident Investigation Bureau, and of various pamphlets, etc. collected to show the scope of sundry organizations connected with the work. Those of any permanent nature are included in this report in the hope that they may some day be of use to another student who may choose a similar thesis, perhaps to extend the work of this thesis to a further benefit of public safety and assistance in the traffic problem. It may be wise to note at this point that fatal statistics procurable from the Accident Investigation Bureau began Dec. 1, 1920 and ended at the date of collection, April 1, 1925.

It is not pretended that this work is strictly an original study, nor that anything truly new is added to the world's store of knowledge. It is hoped, however, that the collection of facts here presented will show in a new light conditions in the traffic situation which may render possible a quicker and more decisive solution for increase in public safety and use of the streets.

It is not meet that this work should include, necessarily, any direct recommendations, nor attempt to present a solution of the problem. There are many organizations of men and women who are devoting their entire time and energies to this sort of work. These are fitted and qualified to make such recommendations, while the candid-

ate is not. Such agencies are now at work on various phases of Detroit's traffic problem, and it would be useless to superficially discuss what they are working out in detail.

With the limitations above outlined, the facts brought out by this thesis work are presented in the hope that they may be of some real benefit to the persons directly concerned, the people who will be saved from an untimely death due to avoidable traffic dangers.

PART II.

TRAFFIC CONDITIONS.

It will not be necessary to dwell at length upon the necessity for improvement in traffic conditions in Detroit, for even a casual glance at the newspapers from time to time suffices to give some idea of the great number of traffic accidents.

Detroit has, in great part, comparatively narrow streets and an abnormally big volume of traffic. The congestion is so great that it is a matter of considerable speculation as to what the condition will be in the near future unless matters are remedied. Like many other cities, Detroit has outgrown its street system. It has failed to provide an adequate city plan whereby the ever-increasing demands of traffic can be met. Perhaps, by methods of regulation, greater efficiency can be developed in the use of the streets. For studies in this line the reader is referred to the bibliography in the back of the report.

Detroit is already going to great expense to widen and straighten many of her streets, such as Woodward and Grand River Avenues, to broaden intersections and clear away obstructions to view, to separate grades at intersections of busy thoroughfares and railroads. Many plans for improvements have been offered, many of which are presented in popular and in technical form in various magazines. Recently the Mayor has appointed a committee

of eight prominent citizens to make a thorough traffic study for the purpose of framing definite plans for future regulation and handling of traffic. Mr. Arthur T. Waterfall of the Dodge Bros. Motor Co. is chairman of this committee.

The Police Department is striving at all times to cope with the matter, but it alone cannot mend matters, though it has a complete program for safety education and regulation which has considerable effect in helping to reduce the number and severity of accidents. The Accident Investigation Bureau maintains records of all accidents reported, and a city ordinance requires an immediate report of any and all accidents. It also presents this data in various forms to those agencies which are interested in its facts. Arrests are made when necessary, of course, and prosecutions follow when deemed advisable by the authorities. In this connection it might be to the point to say that on a cursory examination of the data in the "Fatals Books" it seemed that an unwarranted number of drivers were allowed to escape prosecution when apparently there was plenty of data to convict them of various degrees of negligence. In particular, it seemed that too many drivers were guilty of killing pedestrians who were standing in safety zones, or boarding, or descending from, street cars, due to the driver's going recklessly through such zones. Of course, all the facts may not have been

shown, and there were probably very good reasons why these were not prosecuted, but at least the matter should be investigated by proper authority to see why it is that a driver who has flagrantly violated some of the most important rules of traffic should be allowed to escape the penalties supposed to be attached to such violations. The most used safety zones on busy streets should be effectively blockaded so that there will be no chance of a driver's making a mistake and going through them.

In many respects Detroit's traffic code seems badly in need of revision, and of deletion of several features which are obsolete, and of insertion of a great many newer features than are covered by the present one. It would seem highly advisable to have more definite rules regarding when and how a pedestrian shall use the street and that he should be more safeguarded against vehicles when he is using the street properly. A thorough traffic survey such as the one recently made in Los Angeles should be conducted in Detroit by a competent authority.

Probably a complete revision of the traffic system and laws would be necessary. This is what Los Angeles did, and from the results she achieved the system is a highly worthwhile one. The Los Angeles survey is completely outlined in a book entitled "Major Traffic Street Plan, Los Angeles, California", kindly presented by Mr. Miller McClintock, of the Los Angeles City

and County Traffic Commission, to the writer for deposit in the Michigan State College Library. Included in this book are pamphlets and booklets giving the proposed new law, the finally adopted law, and traffic code. Such a revision of laws adopted in Detroit would probably relieve the situation immeasurably.

Reckless driving, speeding, ignorance of the law, intentional disregard of the rights of others, are all very manifest in Detroit as well as in other cities. Some attempt is made on the part of the Police Department to meet this by means of safety talks by various officials at public gatherings, picture shows, theaters, banquets, etc. Special films are shown, radio talks made, and many other means are being taken to stress the necessity of increased precaution on the part of each and every person for his own safety and that of others.

The Bureau of Public Safety is the agency which is carrying out the major portion of the work which reaches the people directly. Its program of education through safety talks in the schools, and through the formation of "School Patrols" has apparently had considerable effect in the numbers of accidents to school children. The School Patrols are organizations of the older boys and girls who are frequently designated to guard the younger children at street crossings, to see that they cross only when the street is safe, and that they do not play in it. Through proper recognition of their service, especially when such has been noticeably in such manner

as to save a life or an injury, and through a little sheet or pamphlet called to "Scho-pat" which is issued to each patrol each month, the idea has become very effective. The Bureau of Public Safety is an independent organization with a budget of \$7000 for the year July 1, 1924 to July 1, 1925. It has a regular force of about seven people, most of whom have been assigned from other sections of the Police Department, and who are not paid from the above budget. The aim is to have police officers regularly assigned to visit each school at least once a year (this seems too infrequent) to give safety talks and help in safety programs. Otherwise, the teachers are expected to carry out the major portion of the safety work as far as their classes are concerned. The school patrols were first organized in September 1922.

Reckless driving takes its toll of lives each year. It is, of course, a function of the Police to check this as much as possible. Whether or not the force is adequately handling the matter is not within the scope of this thesis. Such would need a great deal of study by more experienced persons than the writer. Probably here again is involved the matter of revision of the present traffic laws and code. Intentional disregard of the rights of others should be thoroughly guarded against by law and a proper enforcement.

The Police are endeavoring to lessen ignorance on the part of drivers by maintaining driver's schools. These are free of charge, occur six times a week, are compul-

sory for all applicants for driver's licenses who do not come up to a specified standard. The Auto Driver's License Bureau examines every applicant for a license as to his ability to read signs, and knowledge of the Traffic Ordinance. Applicants are also examined for eyesight and physical ability to handle a motor vehicle.

Mention has been made in several newspapers lately regarding the flagrant cases of law violations by drivers whose ability to read and understand English is severely questioned. This is entirely a matter of law enforcement and of efficiency in the various bureaus of the Police Department. As to inadequacy of laws, such is a matter illustrating the necessity of constant study and revision of existing ordinances. These matters are so far outside the scope of this thesis that no attempt is here made to in any way diagnose them. They are mentioned merely as suggestions of facts and conditions which should be investigated by competent authority.

PART III.

ACCIDENT TABLES AND STATISTICS.

The data from which the majority of these curves and tables are compiled is included in the pocket in the back of the original copy. It consists of a series of sheets of paper 8½x11" in size on which are tabulated the following facts concerning individual traffic accident fatalities: location, adult (male or female), child, age of victim, and miscellaneous data concerning the manner of occurrence of the accident.

Graph Sheet No. 1 at the end of this report consists of five individual graphs "Graphs Showing Number of Fatal Traffic Accidents, Detroit, Mich." for the five years 1920, 1921, 1922, 1923, 1924. These graphs show that 1921 and 1922 are low years in point of total fatal accidents. They also show a comparatively steady rate per month, with the same slight increase in accidents during the fall of the year. Years 1920 and 1924 show a great variation in the number of accidents which occurred each month. 1924 has the greatest total of all five years. The scale of ordinates is one inch equals 20 fatal accidents. That of the abscissas is one inch equals two months. It was hoped that by plotting the data in this manner it could be shown what period of the year the most accidents occurred. They seem to indicate no regularity, however.

Those of the Accident Investigation Bureau, when asked, could not account for the dips and rises in the graphs. Any one who has occasion to use this data later might be able to find a particular reason why the total accidents were lower in 1921 and 1922 than in the other years, also why they were more uniform throughout the year. The data from which this graph sheet was plotted was copied from a similar but unfinished table in the records of the Accident Investigation Bureau. It is shown in tabular form on the next page.

Graph Sheets Numbers 2 & 3 are an attempt to show at what ages the most accidents occur. The same data is shown in tabular form on page 14 of this report. It was compiled from the data before mentioned concerning the individual fatal accidents. It should be noted that these figures give total fatalities, irrespective of whether or not two or more fatals occurred in the same accident.

On examination of these graphs it is seen that there is a distinct concentration of fatalities to children below the age of ten years. This is shown to be true in every one of the four years. In fact, the period from 5 to 10 years of age has more fatalities than any other five year period, and exceeds the other periods for from about two to eight times. In every case, also, except 1924, the five year period below the age of five years has more fatalities than any other except the one from 5 to 10. The latter period is a particularly

FATAL TRAFFIC ACCIDENTS
BY YEARS AND MONTHS
DETROIT, MICH.

Months	1920	1921	1922	1923	1924	1925
Jan.	12	10	10	7	18	14
Feb.	6	5	7	16	15	20
Mar.	32	11	8	22	22	
Apr.	19	5	13	28	34	
May	32	14	18	23	24	
June	22	12	16	22	17	
July	24	11	20	21	17	
Aug.	13	12	15	25	32	
Sept.	21	13	15	21	25	
Oct.	26	18	23	28	28	
Nov.	27	15	18	26	27	
Dec.	6	8	22	27	30	
TOTALS	240	134	185	266	289	---

(The data for this table were copied from a similar table in the records of the Accident Investigation Bureau of the Police Department.)

(The data of this sheet are shown graphically on Graph Sheet No. 1.)

TRAFFIC FATALITIES

BY AGES

DETROIT, MICH.

Ages	1921	1922	1923	1924
Under 5	12	22	23	19
5 -	31	32	46	52
10 -	7	9	15	13
15 -	11	13	12	10
20 -	5	14	14	9
25 -	7	9	21	15
30 -	3	11	17	25
35 -	11	11	18	32
40 -	4	7	15	21
45 -	4	11	8	14
50 -	5	4	14	12
55 -	9	12	12	9
60 -	5	6	13	15
65 -	7	9	7	19
Over 69	13	12	17	21
Age not known				
Adult		3	16	
TOTALS	134	185	268	291

(This table was compiled from the data with which the spot maps were made, i.e., from the "Fatalis" book kept by the Accident Investigation Bureau.)

(The data of this table are plotted on Graph Sheet Nos ²²³ 4.)

dangerous because of the fact that the children are either just starting to go to school, or are at any rate inexperienced in the necessity of watching out for the dangers of traffic. The decided drop of fatalities occurring to children between the ages of 10 and 15 is all the more significant on account of the extremely high rate at the earlier period. The rate from 10 to 15 is actually as low and in several cases lower than fatalities to older persons. This may be accounted for in several ways, all of which probably have their influence. The efforts that the various safety organizations have put forth begin to have a decided effect on the children of this age. They listen to advice better than do the younger children, and also even better than many older people do. At this age the child is beginning to develop a little responsibility, and he can be more easily impressed by facts properly presented than he would be at any earlier or later time.

At the age from 5 to 10, a great proportion of fatalities occur to children who are crossing the street, not necessarily in play, but perhaps on their way to or from school. It is interesting to note at this point, by a study of Map No. 4 enclosed in the pocket at the back of this report, that a comparatively very few fatalities occur to such children within a block or so of the school, or within the same distance from a playground. This is quite significant in that it probably is due to the fact that vehicle drivers exercise considerably more

care in these districts than elsewhere, possibly because of signs posted, but probably because at the time when children come from schools or playgrounds they come in such numbers that the attention of the driver is more likely to be called to the fact that he must use more care. On the other hand, those which occur at greater distances are due most likely due to carelessness on part of both the driver and the child, and oftentimes because the children are playing in the street.

Spot Map No. 2 shows that there are also comparatively few fatalities to children along streets that may be classed as trunk line or heavy traffic streets. This low number of fatalities along such streets is most likely due to a proper selection of school zones and location of schools so that children do not have to cross these heavily traveled streets. In the region between Grand River Avenue and Baker there seems to be a heavy concentration of accidents. If Map No. 3 is examined it will be seen that this is also a district in which there is a large number of schools, indicating a fairly densely populated residence section. The schools also seem to be distributed in such a way that the children are compelled to cross Dix, Baker, ^{or} and Michigan, all of which have street car lines and are quite heavily traveled by factory workmen and trucks. The same sort of concentration will be noted along Canfield in the

district between Woodward and Gratiot Avenues.

Accidents to younger children are due also to the children's playing in the street, or running into the street after balls, or on roller skates, or in other special cases which are given in the original data sheets. Whether or not a more concentrated program of safety education could be directed toward the reduction of accidents of this type is a matter for proper organizations to decide. They should be able to tell from knowledge of the situation and the time and energy they have put on this work already.

In making these maps, all child fatalities were plotted, whereas in plotting for adults only the Fatal accidents were plotted. This should be taken into consideration in studying these maps.

One page 19 is given a table compiled from the individual accident data which shows the numbers of child fatalities occurring by months and years for four years, 1921, 1922, 1923, 1924, and also gives classification as to whether or not they occurred at intersections. An examination of the table indicates no definite increase in the number occurring at intersections over those not occurring at intersections. It would seem that perhaps the safety program of the schools were not proving as effective as it might in the elimination of indiscriminate crossing of the streets by children. A safety program should include a very strong emphasis of the necessity for pedestrians'

making all crossings at intersections or at properly designated crosswalks.

The number of child accidents shows a steady increase from year to year during this period. Can it be that the safety program through the schools is not accomplishing its purpose ? For the rest, this table is self-explanatory.

A series of tables showing concentration of traffic accident fatalities on certain arterial streets was also prepared. These tables are also self-explanatory except for certain code symbols used in classification of accidents, which are as follows,

P.	:	Automobile - pedestrian.
A.	:	Automobile - automobile.
S.	:	Automobile - street car.
R.	:	Automobile - railroad train.
V.	:	Automobile - other vehicle.
F.O.	:	Automobile - fixed object
N.C.	:	Automobile - no-collision.
O.V.	:	Other vehicular accident.
O.S.	:	Other street car accident.
O.R.	:	Other railroad accident.
H.T.	:	Heavy truck (Accident
		Bureau
L.T.	:	Light truck symbol)

A set of two tables is given on p. 25⁴, showing the of all fatal accidents into the above classes for the years 1921, 1922, 1923, and 1924. The first table

**CHILD FATALITIES IN
TRAFFIC ACCIDENTS
LOCATION, MONTHS, AND YEARS.
DETROIT, MICH.**

<u>Month</u>	<u>1921</u>			<u>1922</u>			<u>1923</u>			<u>1924</u>		
	<u>Int</u>	<u>Non</u>	<u>Tot</u>	<u>Int</u>	<u>Non</u>	<u>Tot</u>	<u>Int</u>	<u>Non</u>	<u>Tot</u>	<u>Int</u>	<u>Non</u>	<u>Tot</u>
Jan	1	1	2	1	1	2	-	-	-	2	2	4
Feb	-	1	1	2	-	2	1	1	2	1	-	1
Mar	3	2	5	1	2	3	9	-	9	4	6	10
Apr	-	1	1	4	1	5	7	2	9	4	6	10
May	3	3	6	4	3	7	6	2	8	6	3	9
June	5	3	8	2	5	7	2	9	11	3	7	10
July	3	2	5	2	9	11	4	2	6	3	5	8
Aug	3	1	4	3	4	7	3	5	8	3	5	8
Sept	1	5	6	5	2	7	2	7	9	4	3	7
Oct	4	5	9	2	4	6	6	3	9	2	7	9
Nov	2	-	2	-	2	2	4	1	5	6	6	12
Dec.	<u>2</u>	<u>-</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>4</u>	<u>7</u>	<u>1</u>	<u>8</u>	<u>-</u>	<u>2</u>	<u>2</u>
	<u>27</u>	<u>24</u>	<u>51</u>	<u>29</u>	<u>34</u>	<u>63</u>	<u>51</u>	<u>33</u>	<u>84</u>	<u>38</u>	<u>52</u>	<u>90</u>

	<u>Intersection</u>	<u>Non-intersection</u>	<u>Totals</u>
	27	24	51
	29	34	63
	51	33	84
	38	52	90
	<u>145</u>	<u>143</u>	<u>288</u>
Fatals Dec 1-31 1920	2	-	2
Fatals Jan 1 - Apr 1, 1925	<u>3</u>	<u>5</u>	<u>8</u>
	<u>150</u>	<u>148</u>	<u>298</u>

CONCENTRATION OF
TRAFFIC ACCIDENT FATALITIES
ON
EIGHT ARTERIAL STREETS FROM
DETROIT, MICH.

Dec. 1, 1920 to April 1, 1925.

CENTERING ON	ADULT	CHILD	TOTAL
Woodward Ave.	50	5	55
Gratiot Ave.	54	7	61
Jefferson Ave., E.	51	9	60
Jefferson Ave., W.	6	4	10
Grand River Ave.	40	4	44
Michigan Ave.	31	12	43
Dix (and Baker)	7	8	15
Fort, W.	38	4	42
	<u>277</u>	<u>53</u>	<u>330</u>
Per cent of Grand			
Total of fatalities	36.5	17.8	35.9

FATAL TRAFFIC ACCIDENTS ON
ARTERIAL STREETS LEADING FROM

DETROIT, MICH.
Dix Ave. (and Baker)

PERSONS	CLASS	1921	1922	1923	1924	TOTAL
Adult	P	1	1	1	-	3
"	S	-	1	-	-	1
"	V	-	1	-	-	1
"	O.V.	1	-	-	-	1
	O.S.	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>
		<u>3</u>	<u>3</u>	<u>1</u>	<u>-</u>	<u>7</u>
Child	P	2	1	2	-	5
	O.S.	<u>-</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>
		<u>2</u>	<u>2</u>	<u>2</u>	<u>-</u>	<u>6</u>
TOTAL		5	5	3	-	13

TABLES SHOWING FATAL ACCIDENTS
ARTERIAL STREETS LEADING FROM
DETROIT, MICH.

FORT STREET, W.

PERSON	CLASS	1921	1922	1923	1924	TOTAL
Adult	P.	1	5	7	4	17
	S.		2		1	3
	A.				3	3
	R.				1	1
	O.S.	1		2	1	4
	F.O.			1		1
	N.C.				1	1
		<u>2</u>	<u>7</u>	<u>10</u>	<u>11</u>	<u>30</u>
Child	P		1		2	3
	S		1			1
	O.S.	<u>—</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>5</u>
TOTAL		2	9	11	13	35

MICHIGAN AVENUE

PERSON	CLASS	1921	1922	1923	1924	TOTAL
Adult	P.	3	2	7	5	17
	S.	1				1
	V		2			2
	O.S.	<u>3</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>8</u>
		<u>7</u>	<u>6</u>	<u>9</u>	<u>6</u>	<u>28</u>
Child	P	1	5	3	1	10
	S.	2				2
	V.	<u>3</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>13</u>
TOTALS		10	11	13	7	41

TABLES SHOWING FATAL ACCIDENTS
ARTERIAL STREETS LEADING FROM
DETROIT, MICH.

WOODWARD AVENUE.

PERSON	CLASS	1921	1922	1923	1924	TOTAL
Adult	P.	4	6	14	8	32
	S.		1			1
	A.		1		1	2
	V.	1				1
	O.S.		4	3	3	10
	N.C.		1			1
	F.O.				1	1
		<u>5</u>	<u>13</u>	<u>17</u>	<u>13</u>	<u>48</u>
Child	P	2	1		1	4
TOTAL		7	14	17	14	52

GRAND RIVER AVENUE

PERSONS	CLASS	1921	1922	1923	1924	TOTALS
Adult	P.	5	8	3	8	24
	S.			3		3
	A.	1	1	1		3
	O.S.	1	3	3	2	9
	V.		1			1
	F.O.				1	1
		<u>7</u>	<u>13</u>	<u>10</u>	<u>11</u>	<u>41</u>
Child	P			2	1	3
TOTAL		7	13	12	12	44

TABLES SHOWING FATAL ACCIDENTS
ARTERIAL STREETS LEADING FROM
DETROIT, MICH.

GRATIOT AVENUE.

PERSONS	CLASS	1921	1922	1923	1924	TOTAL
Adult	P	2	1	8	6	17
	S			4	2	6
	A		3	1		4
	V				1	1
	O.S.	3	3	6	4	16
	O.V.			2		2
	F.O.	<u>1</u>				<u>1</u>
		<u>6</u>	<u>7</u>	<u>21</u>	<u>13</u>	<u>47</u>
Child	P	1	3			4
	O.R.				1	1
	O.S.			<u>1</u>	<u>1</u>	<u>2</u>
		<u>1</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>7</u>
TOTALS		7	10	22	15	54

JEFFERSON AVENUE (East & West)

PERSONS	CLASS	1921	1922	1923	1924	TOTAL
Adult	P	8	9	12	10	39
	S				4	4
	O.S.	3	1	4	2	10
	A		2			2
	N.C.			1		1
	F.O.	<u>1</u>		<u>1</u>	<u>1</u>	<u>2</u>
		<u>11</u>	<u>12</u>	<u>18</u>	<u>17</u>	<u>58</u>
Child	P.	2	2	3	1	8
	V			<u>1</u>		<u>1</u>
		<u>2</u>	<u>2</u>	<u>4</u>	<u>1</u>	<u>9</u>
TOTALS		13	14	22	18	67

CLASSIFICATION OF
ADULT TRAFFIC FATALITIES.

Class	1921	1922	1923	1924
P.	42	59	104	110
A.	5	16	18	21
V.	6	8	3	5
S.	3	13	14	17
R.		2	8	3
O.V.	3	1	3	3
O.S.	18	17	26	21
O.R.	5	4	3	8
N.C.	1	2	2	3
F.O.	2	1	3	11
TOTALS	85	123	184	202

CLASSIFICATION OF
CHILD TRAFFIC FATALITIES

Class	1921	1922	1923	1924
P.	43	55	73	79
A.	1	1	3	
S.	2	2		
V.	1		6	
O.S.	2	3	2	6
O.R.				3
O.V.		1		
F.O.				1
TOTALS	49	62	84	89
GRAND TOTALS	134	185	268	291

LOCATION OF
TRAFFIC ACCIDENT FATALITIES
DETROIT, MICH.

TABLE V.

Intersection				
PERSONS	1921	1922	1923	1924
Adults (15 & over)	65	89	155	149
Children (under 15)	23	27	48	36
Total	88	116	203	185
Non-intersection				
PERSONS	1921	1922	1923	1924
Adults (15 & over)	20	33	29	54
Children (under 15)	26	36	35	52
Total	46	69	65	106
GRAND TOTAL	134	185	268	291

(this data is shown diagrammatically
on Graph Sheet No. 6)

LOCATION OF
PEDESTRIAN
 TRAFFIC ACCIDENT FATALITIES
 DETROIT, MICH.

TABLE VI.

Intersection				
PERSONS	1921	1922	1923	1924
Adults (15 & over)	52	64	110	99
Children (under 15)	22	25	41	37
Totals	74	89	151	136
Non-intersection				
PERSONS	1921	1922	1923	1924
Adults (15 & over)	14	15	23	35
Children (under 15)	25	34	36	52
Totals	39	49	59	87
GRAND TOTALS	113	138	210	223

(This data is shown diagrammatically
 on Graph Sheets No. 5 & 6)

gives those occurring to adults (i.e. to persons 15 years old or over) and second, those to children under 15 years.

Another table on p. 25 gives the location of all traffic accident fatalities (whether at intersections or not) and also a classification in each case into adult or child fatalities. These are also classified by year for the four years given above.

The table on p. 26 is the same, except that this table is for pedestrian fatalities only, i.e., those classed as P or O.S. accidents.

From the table on p. 24 a series of eight pie charts was made, see Graph Sheet No. 4, to show graphically the proportion or percentage of each class that falls into the different kinds of accidents. It is to be particularly noted that in the case of adults from two thirds to almost three quarters of the fatal accidents involve pedestrians. The Charts show that the following are the proportions into which the accidents divide:

FATAL TRAFFIC ACCIDENTS

INVOLVING PEDESTRIANS.

(PER CENTS)

Year	Adult	Child
1921	70.7	91.9
1922	61.8	93.6
1923	70.6	89.4
1924	64.9	92.2
(see Graph Sheet No. 4)		

Graph Sheets Nos. 5 & 6 show the data of tables pp. 25 and 26 in a form that gives a better idea of the increasing number of accidents and their proportions to each other. These sheets are self-explanatory, and show the data in such a clear manner that further comment seems unnecessary.

Graph Sheet No. 7 is of a form which departs from the usual type or method of presenting data for popular use. It is what is called a "ratio chart", being made up on one-way logarithm paper, and is intended to show a comparison of the rates of increase in population, auto registration, and fatal traffic accidents in Detroit. The data for this table was taken from a little pamphlet put out early in the year 1925 by the Bureau of Public Safety, entitled "Think ! That you may live and let live, Think !" This pamphlet contains many other statistics of interest in connection with this report, and hence is included in the original data in the pocket at the back of the book. The theory of this method of graphing may be found in Harry Jerome's "Statistical Method", where it is described in detail. Suffice it to say here that if any two lines or portions of lines on this chart are parallel to each other, it means that the rate of change of the variable is the same for each. With this simple explanation an examination of the chart shows that the percent change of the population of Detroit has been fairly near constant since 1918 (because the Population Curve is

tion Curve is very nearly a straight line). The rate of increase^{of fatalities} has been about one fourth of the rate of increase of automobile registration, although its rate has been somewhat greater than that of the population.

The aggregate increase of the 1924 figures over the 1918 ones is,

	Population	Automobiles	Fatalalities
1918	986,699	77,213	172
1924	1,375,000	264,381	289
% increase	39.5	243.	68.
av. yrly. "	6.6	40.5	11.3

The slope of the lines of the graph indicates the rate of change of the variable. The reason for the sudden drop in 1921 was not found, though doubtless there was a very good reason. It should be remembered that the this is just about the time that the records of the Accident Investigations Bureau ^{was} ~~was~~ begun. There may be some very definite connection between these two facts.

PART IV.

CONCLUSIONS.

Detroit needs a thorough traffic survey made. This should be done by some party that is capable of judging where the organizations in the field are falling short in their work and what can be expected of them in the future. This means that the survey must be made by one in authority and one who has the confidence and backing of those in control of affairs in Detroit. The various safety organizations, traffic departments, city planning committees, and others of similar nature should somehow be brought into closer relationship and coordination. To just what extent such cooperation is already in effect the writer was not able to determine in the short time he was in Detroit. Such a study must needs be made by one who can be on the job for some time, and perhaps even work for a while with each organization separately.

What can be done in the way of better city planning in use of streets and in organization of a better system of handling traffic will perhaps soon be seen when the traffic committee recently appointed by the Mayor has had a chance to do its work. Comment has been made from many sources on the need of one-way streets, of a more stringent enforcement of the full-stop rule on through traffic streets. Here again the efficiency of the various departments of the city is brought up, and the writer is not competent to judge in this matter at all, especially with so little data as he has at present.

There should also be more rigid requirements concerning parking in the downtown districts, especially during the rush hours. Attention is here called to the report of the National Safety Council of its survey in Cleveland. It does not seem necessary to go at great length to repeat what has been so well worked out in that report, which is included in the original data of this thesis. The traffic problems are much the same in one city or another, and the general rules governing the rate of speed of vehicles, the attitude of drivers toward pedestrians, and vice versa, the rules regarding parking of vehicles, cutting corners and other rules of traffic should be uniform in one city or another. There are several city, state, and national organizations which are gradually growing in power of action^{and} which are gaining control of matters of this sort, and which will doubtless soon be enough in authority to enforce a greater uniformity of laws regarding traffic regulation from one city to another. An example of this is the recent Hoover Conference in Washington in which various ~~safety~~ measures were taken up. A resume of the report of this conference will be found in the original data. Various important points in this synopsis were underlined and the reader is referred to it if he is interested in what is being done in a national way to secure greater uniformity of methods, the greater or better safety measures being adopted in various places.

Another article in the January 1925 number of the

National Safety News, the number from which the above mentioned resume was taken, is entitled "Getting The Facts About Public Accidents", by Sidney J. Williams. This article is devoted entirely to methods of reporting and recording accidents and the importance of uniformity if nationwide results are to be secured.

Regarding the strictly engineering features of bettering traffic conditions in Detroit, there is a great variety of material to be found in the Engineering News-Record, especially for the year 1924. In that are to be found several articles on the project of depressing the Grand Trunk Railway tracks on Dequindre Street, and of the building of several other grade separation viaducts throughout the city. There are also plans for widening streets, provisions for rapid transit systems, surface, elevated, and subway; plans for future systems of high speed routes and other measures for improving the efficiency of the use of street areas.

These facts are not, however, a part of this thesis, and a mere passing mention is made of them to show that there are many plans being devised to provide for better and safer traffic systems in the future. What remains to be done is to decide which one to follow, and then prepare the way for it.

BIBLIOGRAPHY.

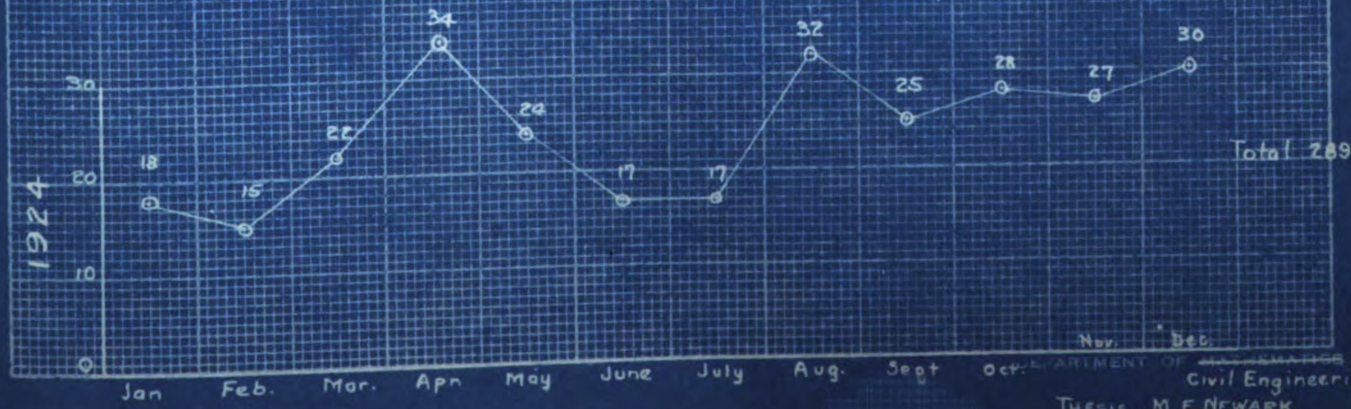
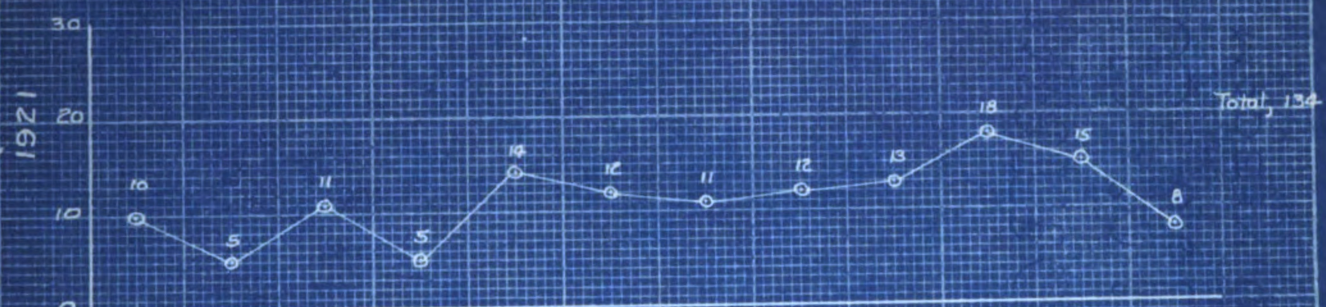
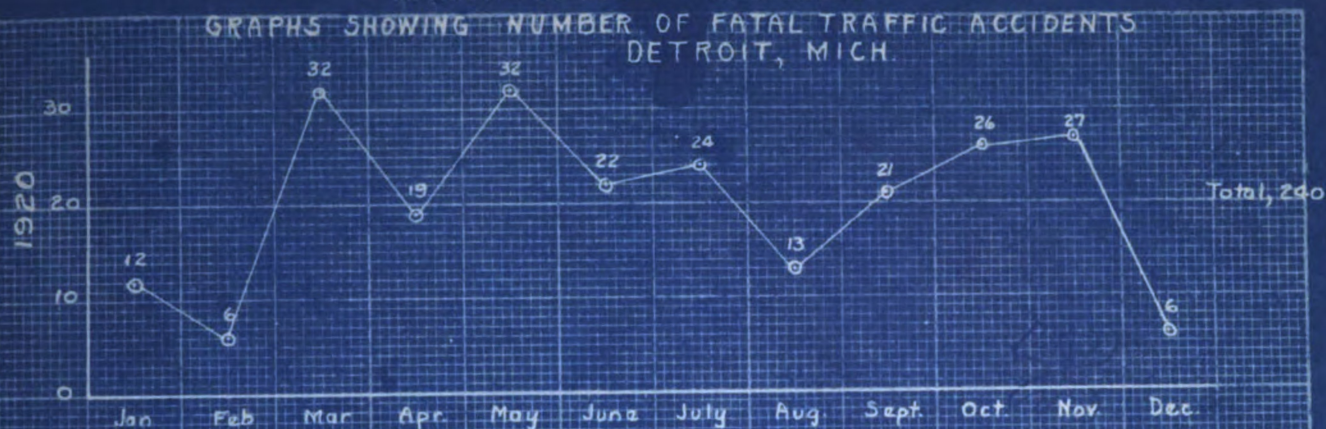
BOOK OR REFERENCE	WRITER
Major Traffic Street Plan.	Traffic Commission Los Angeles.
Traffic Ordinance	Los Angeles.
Detroit's Government	City Controller.
Recreation Bulletin June 23, 1924	Dept. Of Recreatio, Detroit
American City, Mar. 1925	
American City, May 1925	
Engineering News-Record (miscellaneous articles, 1924)	
National Safety News, Jan., Feb. Mar. Apr. and May, 1925.	
Statistical Method	Harry Jerome.

APPENDIX.

GRAPH SHEETS AND CHARTS.

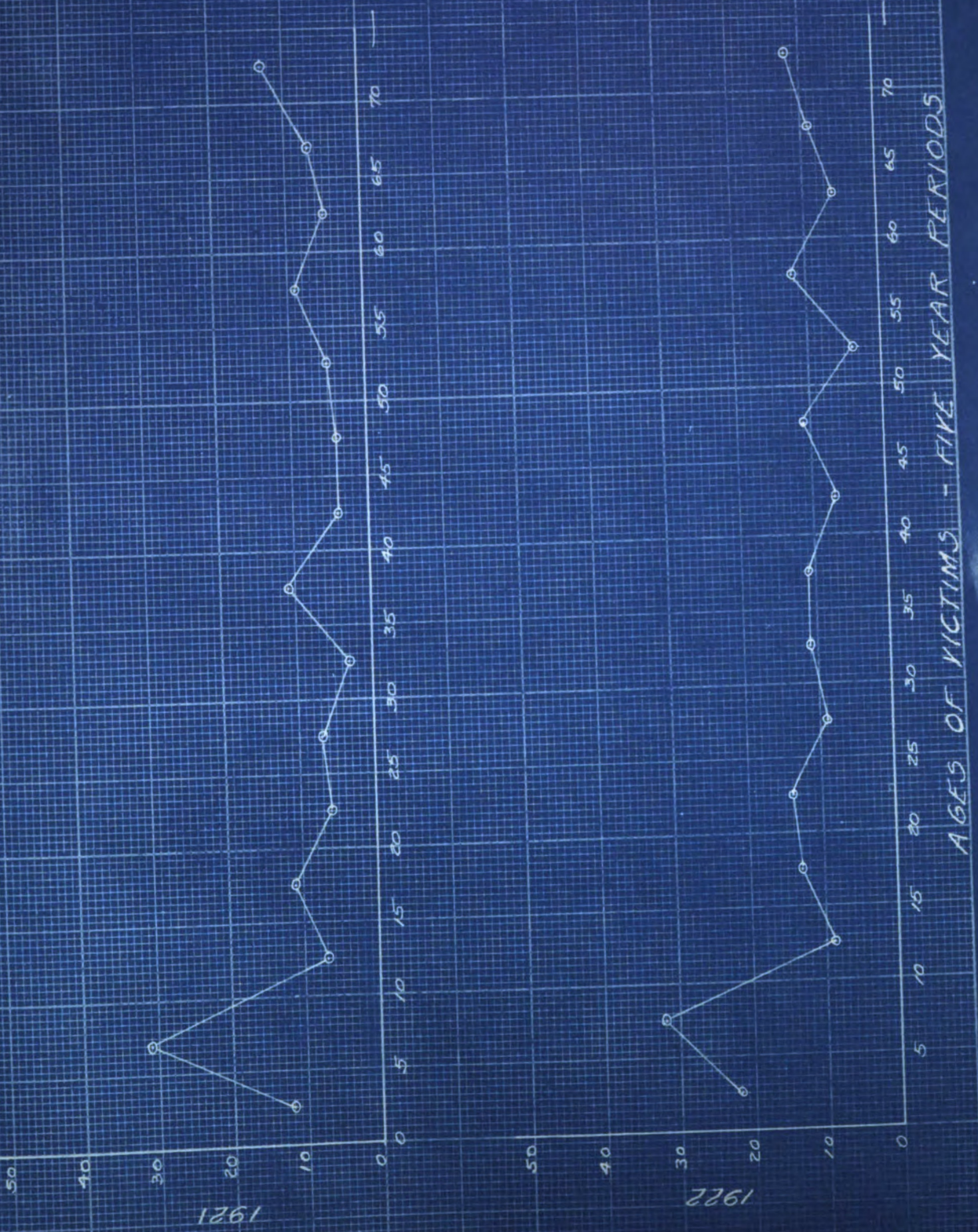
GRAPHS SHOWING NUMBER OF FATAL TRAFFIC ACCIDENTS
DETROIT, MICH.

FATAL ACCIDENTS (TRAFFIC)



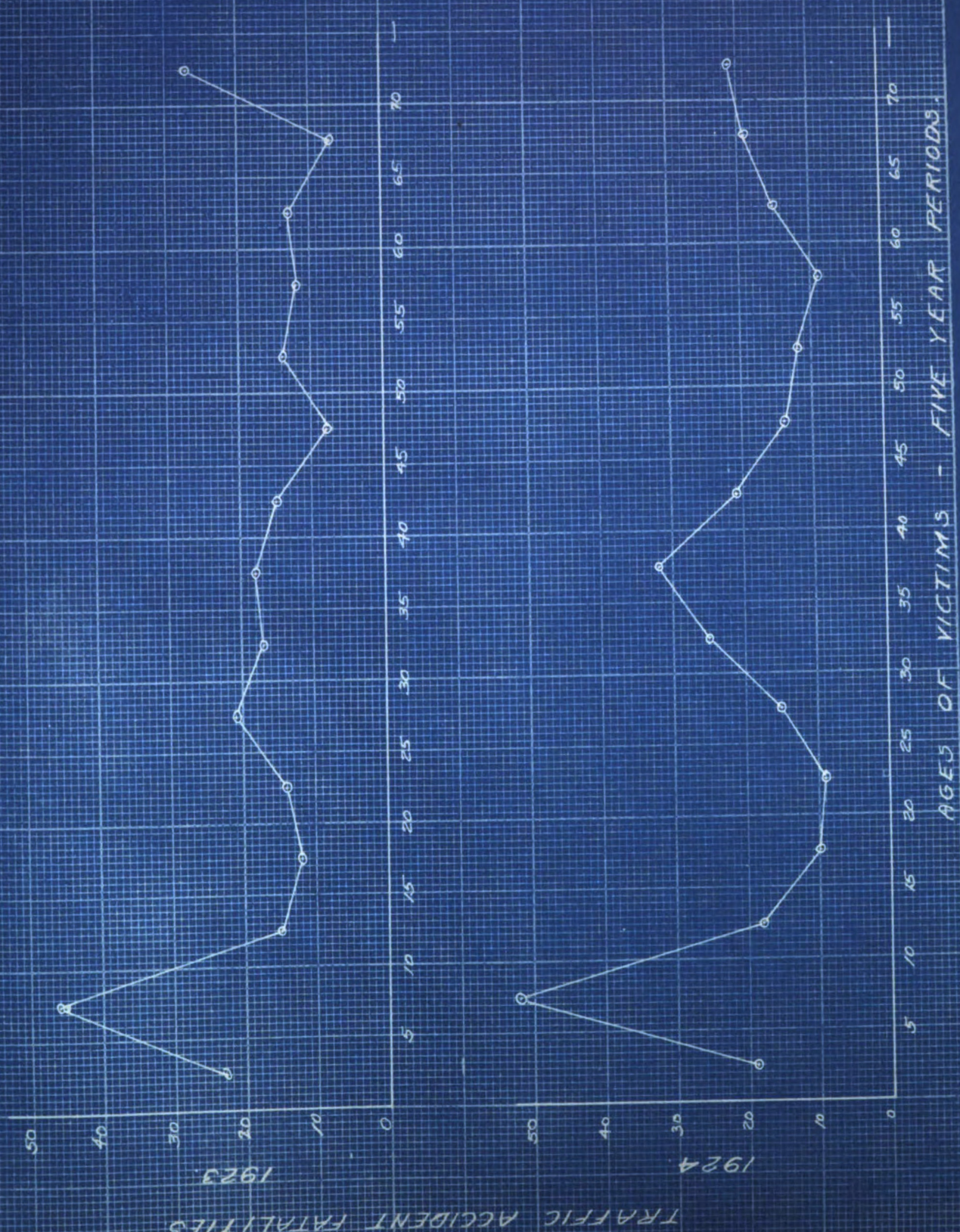
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FATAL TRAFFIC ACCIDENTS BY AGES. DETROIT, MICH.



TRAFFIC ACCIDENT FATALITIES

FATAL TRAFFIC ACCIDENTS
BY AGES
DETROIT, MICH.



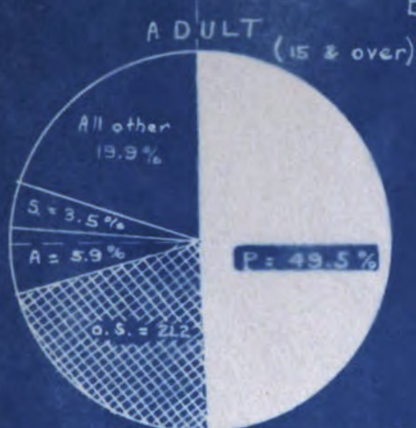
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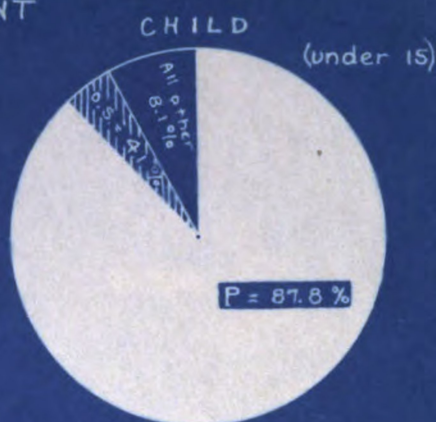


CLASSIFICATION OF FATAL TRAFFIC ACCIDENTS BY PERCENT

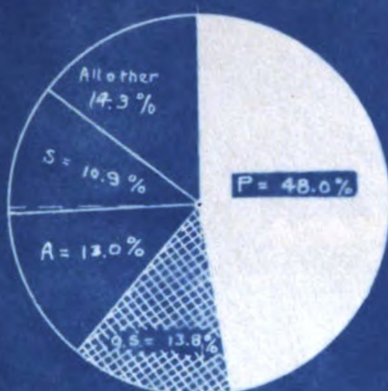
Graph Sheet No. 4.



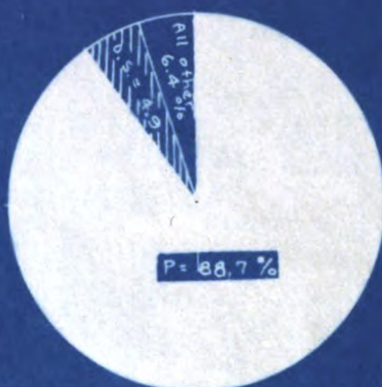
1921



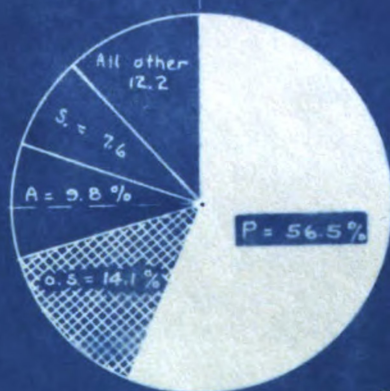
P = Automobile -
pedestrian



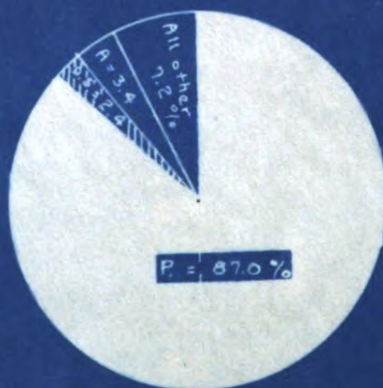
1922



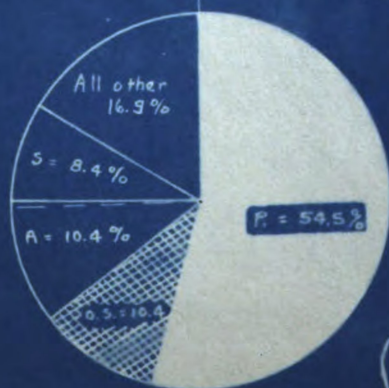
O.S. = Street car -
pedestrian.



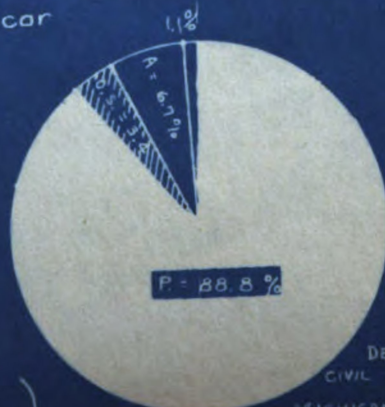
1923



A = Auto - auto
S = Auto - street car

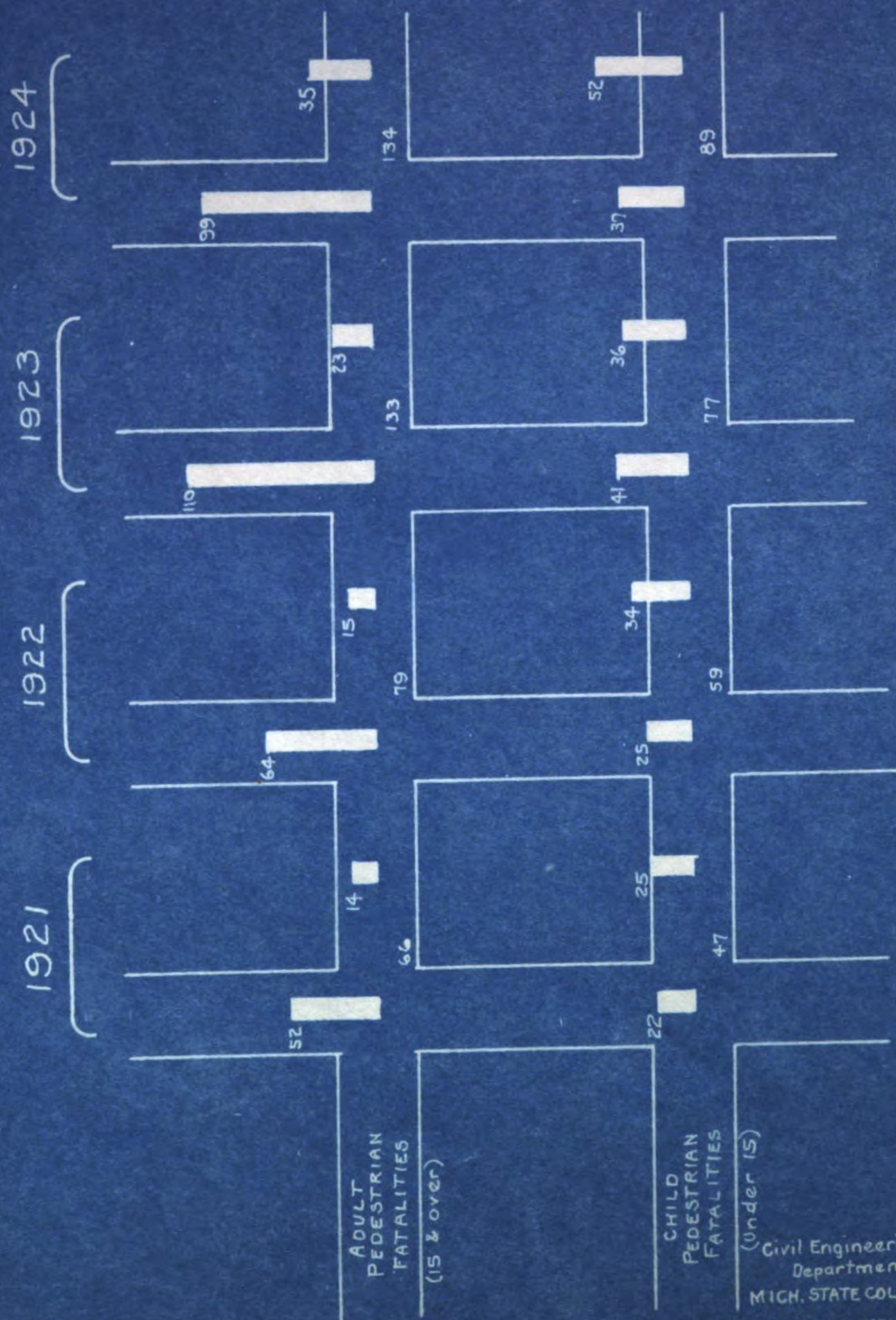


1924

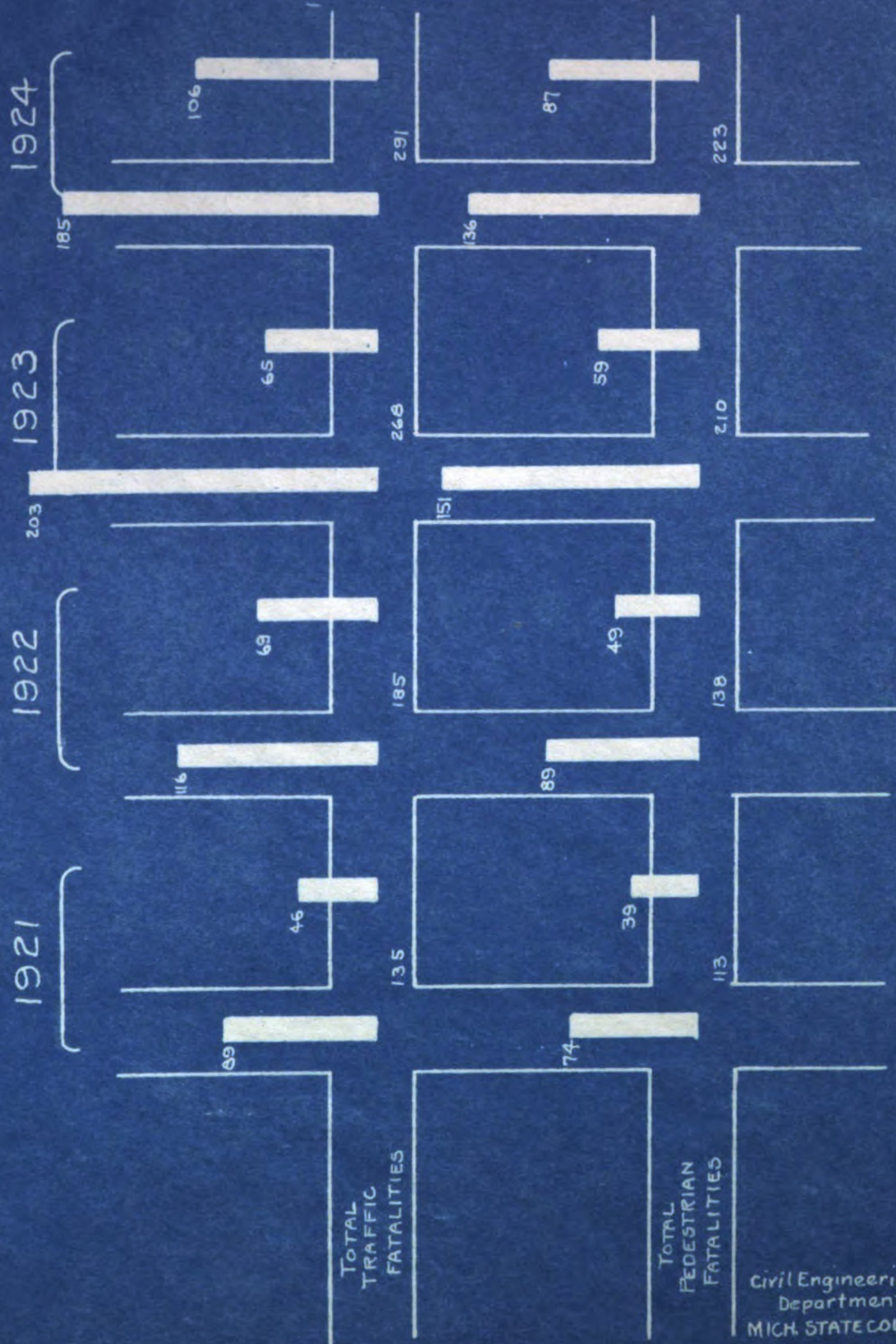


(For data see
Table Page No. 3.)

LOCATION OF PEDESTRIAN FATALITIES Detroit, Mich.



LOCATION
OF
TRAFFIC FATALITIES
Detroit, Mich.

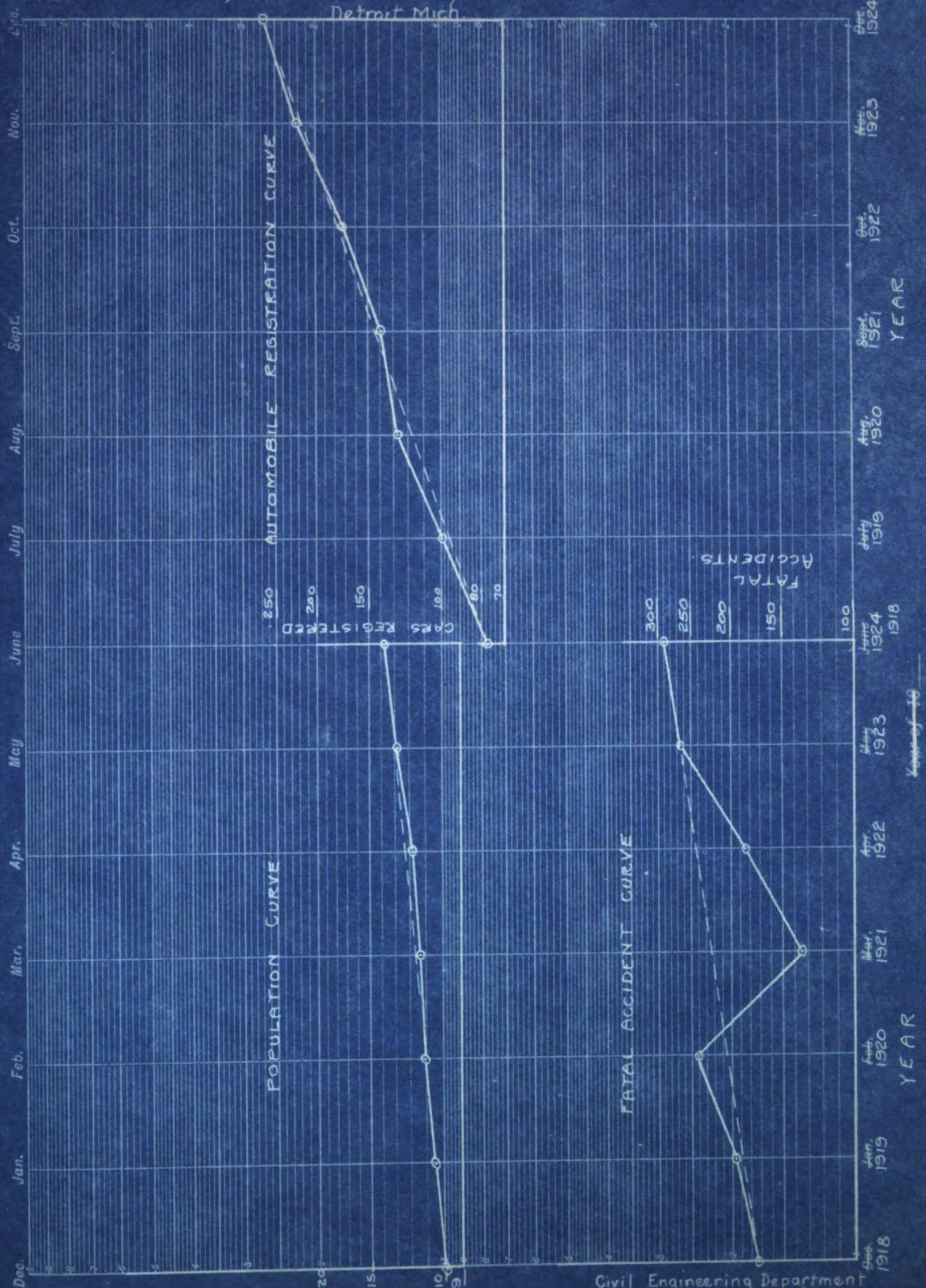


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Department
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Graphs Showing INCREASE

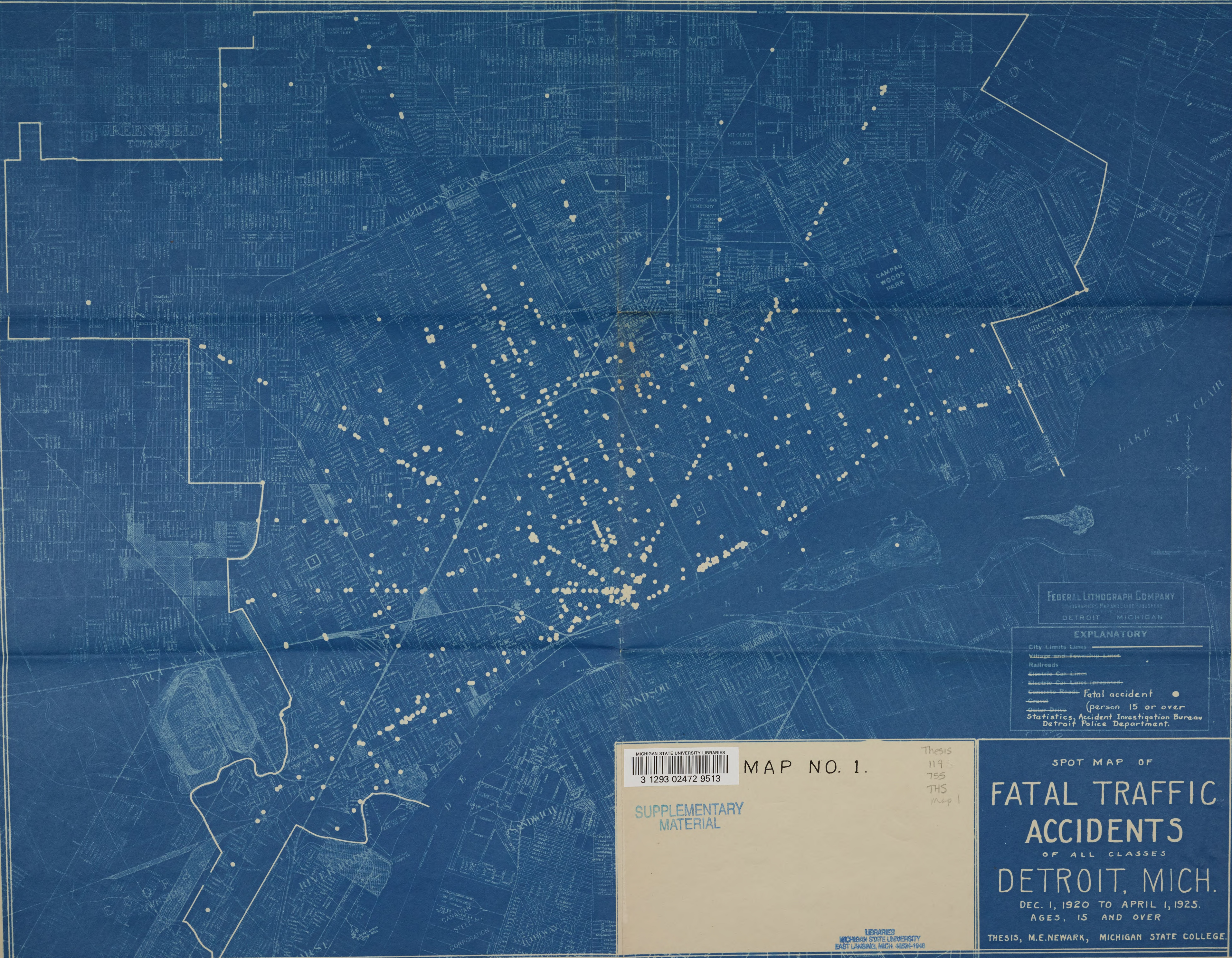
Graph Sheet No. 7

POPULATION, TRAFFIC FATALITIES, AUTO REGISTRATION
Detroit Mich.



POPULATION IN 100,000

Civil Engineering Department
MICHIGAN STATE COLLEGE
THESIS - M.E. NEWARK, 1925



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EXPLANATORY

- City Limits Lines
 - Village and Township Lines
 - Railroads
 - Electric Car Lines
 - Electric Car Lines (proposed)
 - Concrete Roads
 - Gravel
 - Water Drains
- Fatal accident ●
(person 15 or over)
Statistics, Accident Investigation Bureau
Detroit Police Department.

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MAP NO. 1.

SUPPLEMENTARY
MATERIAL

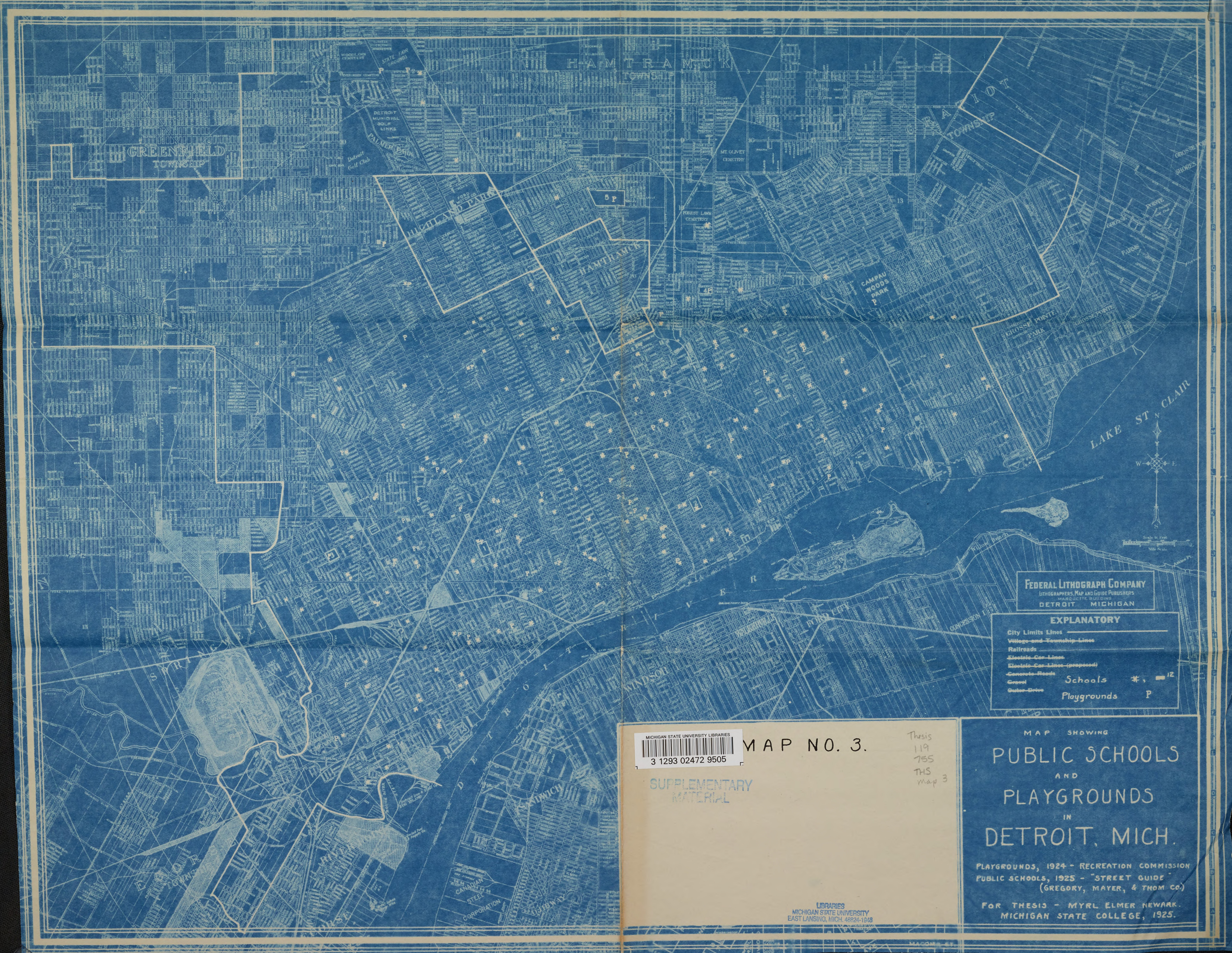
Thesis
119
755
THS
Map 1

SPOT MAP OF
**FATAL TRAFFIC
ACCIDENTS**
OF ALL CLASSES
DETROIT, MICH.

DEC. 1, 1920 TO APRIL 1, 1925.
AGES, 15 AND OVER

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EXPLANATORY

- City Limits Lines
- Village and Township Lines
- Railroads
- Electric Car Lines
- Electric Car Lines (proposed)
- Concrete Roads
- Gravel
- Outer Drive
- Schools * 12
- Playgrounds P

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MAP NO. 3.

SUPPLEMENTARY
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map 3

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MAP SHOWING
PUBLIC SCHOOLS
AND
PLAYGROUNDS
IN
DETROIT, MICH.

PLAYGROUNDS, 1924 - RECREATION COMMISSION
PUBLIC SCHOOLS, 1925 - "STREET GUIDE"
(GREGORY, MAYER, & THOM CO.)
FOR THESIS - MYRL ELMER NEWARK.
MICHIGAN STATE COLLEGE, 1925.



FEDERAL LITHOGRAPH COMPANY
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MARQUETTE BUILDING
DETROIT MICHIGAN

EXPLANATORY

- City Limits Lines
- Village and Township Lines
- Railroads
- Electric Car Lines
- Electric Car Lines - proposed
- Concrete Roads
- Child Fatality (Traffic) (age 1 to 15)
- Public School
- Playground

SUPPLEMENTARY MATERIAL MAP NO. 4.



Thesis
119
755
THIS
map 4

SPOT MAP OF
CHILD FATALITIES
RESULTING FROM
TRAFFIC ACCIDENTS
OF ALL CLASSES.
DETROIT MICH.

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STATISTICS, ACCIDENT INVESTIGATION BUREAU
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