

2) LOS ANGELES, CAL.

TRAFFIC REPORT

1924
CIVIL ENGINEERING DEPT.

H Pope.

HISTORICAL.

Los Angeles is one of the oldest cities on the Pacific Coast. The pueblo boasting an official population of 44 was founded by the Spanish Government September 4, 1781. At that time it occupied little more territory than the circular park known as the plaza does to-day.

From that date to the incorporation of the city in 1851, very little progress was made but due to the discovery of gold, the population began to increase, and for the next thirty five years it had a natural steady growth.

Since that time the increase in population has fluctuated considerably, but as a whole the growth has compared favorably with other large American cities.

The competition resulting from making Los Angeles the South West terminal of the Santa Fe Railroad, together with special excursion rates and widespread advertising has had much to do with its growth; until to-day it occupies fifth place in the scale of large cities and is the largest Western city in the Americas. The only times since its incorporation that the growth in population has suffered the slightest depression were during the famous nation wide panics of 1903 and 1907 (fig. 1A). Due to the fact that Los Angeles has grown so steadily and has become such an important commercial center, it is not likely that it will suffer depression within the next few years.

In fig. 2, the two imaginary curves represent the probable limits of the growth of Los Angeles. The curve showing the

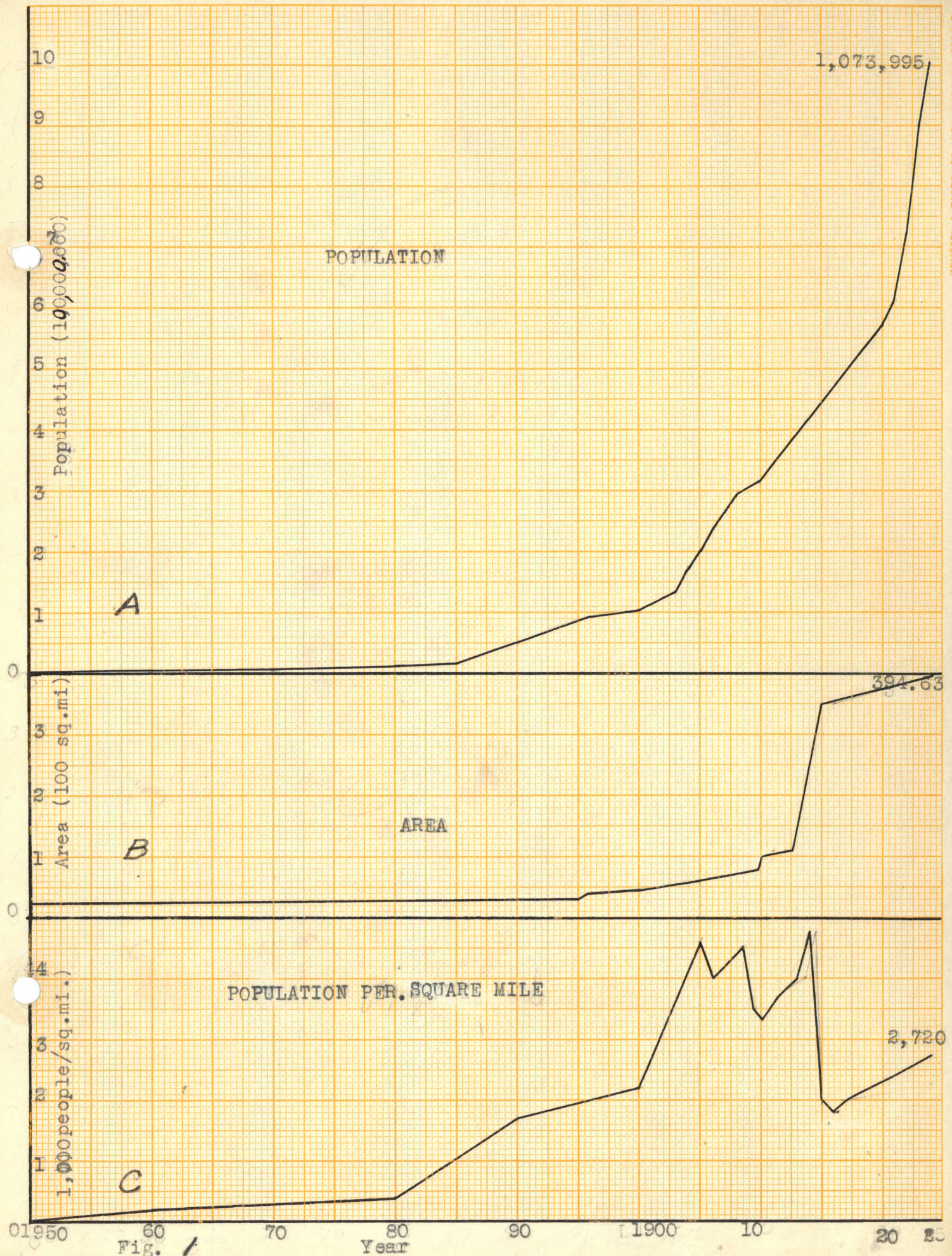


Fig. 1

- Boston ———
- Cleveland - - -
- Baltimore ———
- Detroit - - -
- St. Louis ———
- Chicago - - -
- Brooklyn ———
- Philadelphia ———

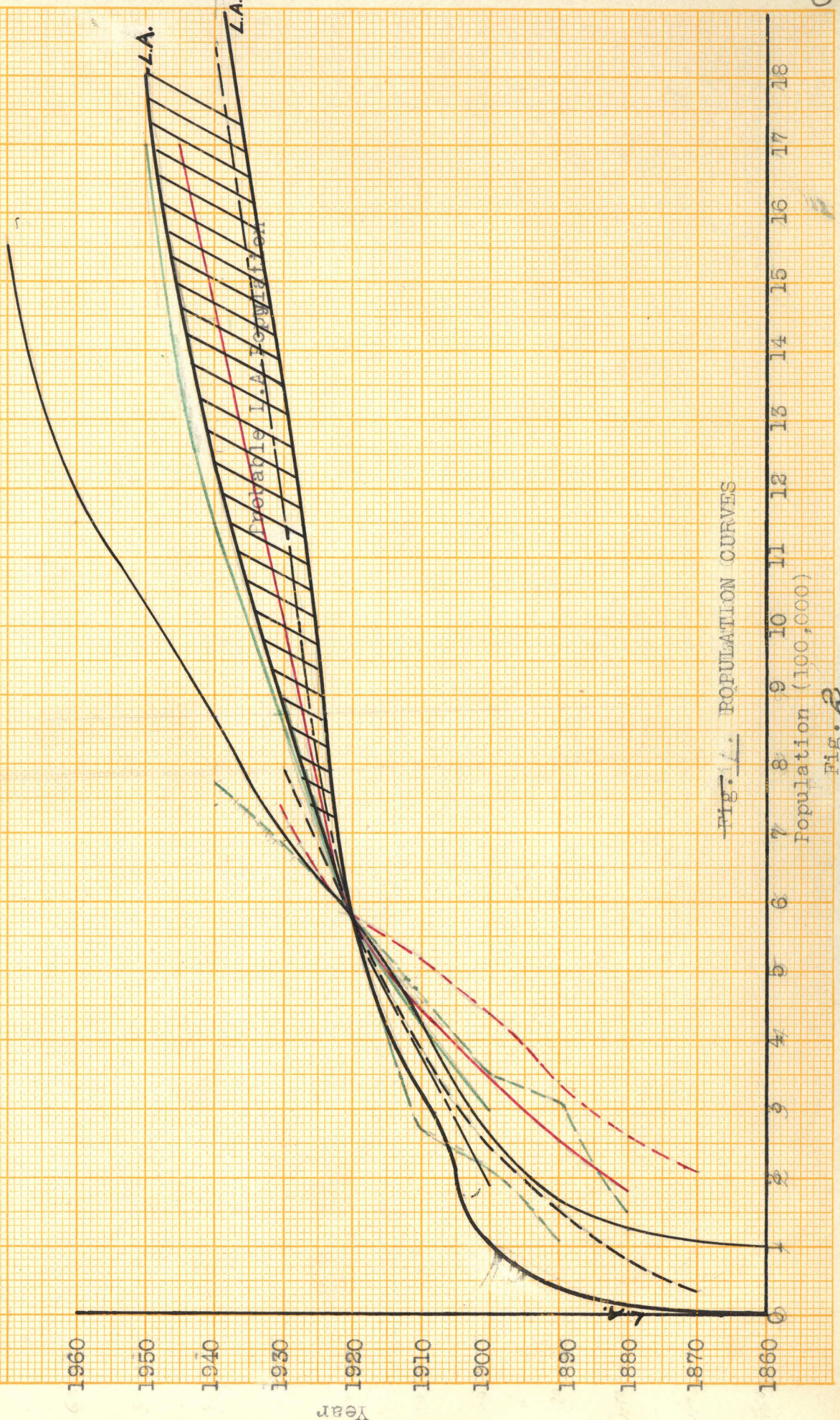


Fig. 1. POPULATION CURVES

Population (100,000)

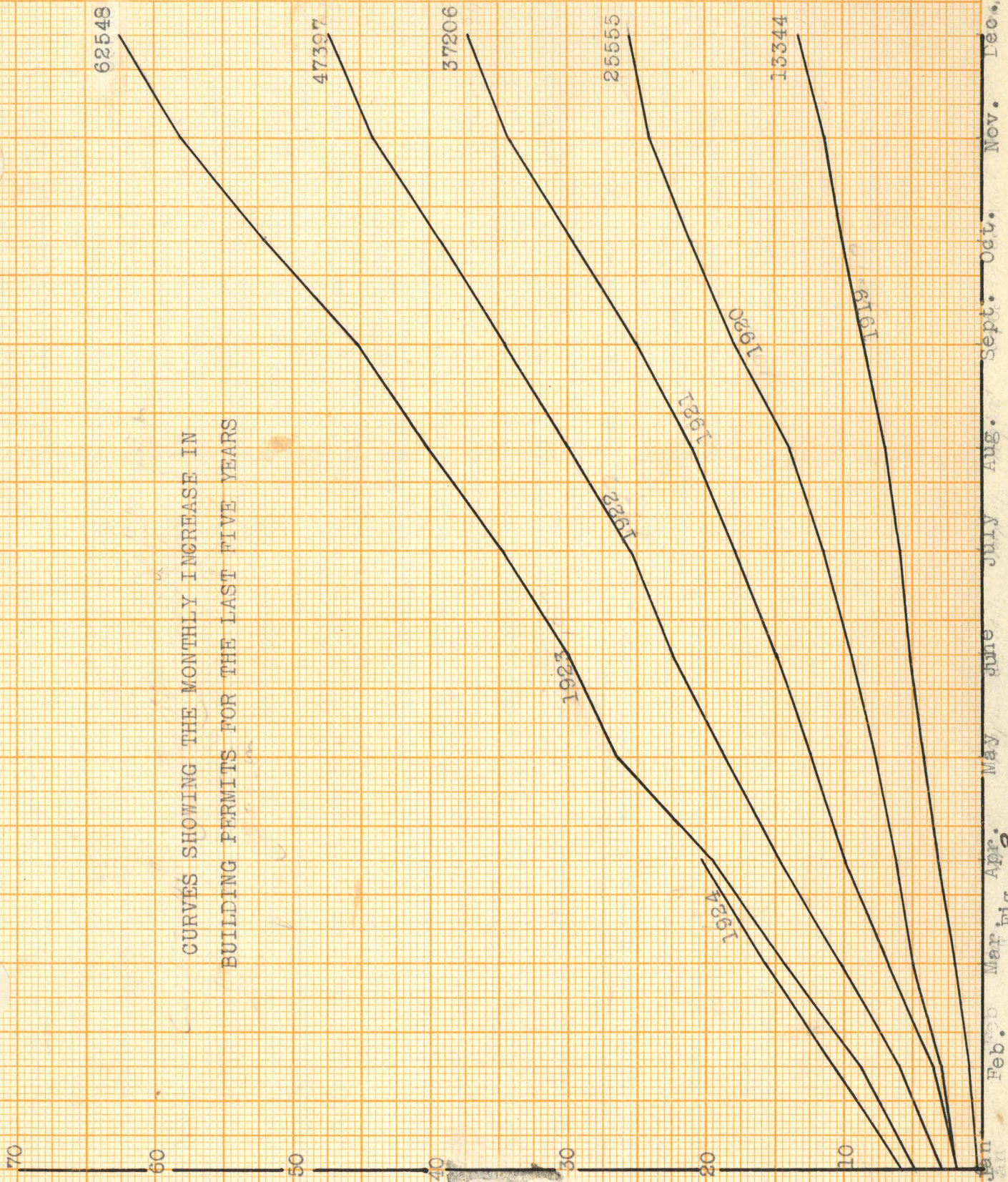
Fig. 2

smaller increase in population is based on the growth of eight other cities in the United States whose conditions for growth are similar to those confronting Los Angeles. The higher curve is one plotted by the engineers of the board of public utilities, and is based on the bank clearings, building permits, etc. Without a doubt this curve has a tendency to show a greater increase than will be realized altho since its creation in 1920 every year has shown a greater increase than the curve predicted.

That the growth has been steady and sound is shown by the curves of fig. 1. The area curve shows a fairly regular increase except for the jump occasionedⁿ by the annexation of San Fernando Valley on May 22, 1915. The population per square mile took a decided ^{drop}, which was due to this large annexation of farming land to use the aqueduct water but as a whole the increase has been steady. A good indication of the growth of any city can be had from its bank clearings and the business of its post office, both of which show a steady and healthy growth. (fig. 4)

Probably the most important of the curves are those showing the building activities of the past. (figs. 3&4). 1918 marked the beginning of a boom of building activity which has never been duplicated. This period of record breaking is shown in detail in fig. 3. with the exception of January 1921 every month shows an increase in the number of building permits issued over that of the preceding year. 1924 has not shown such an increase and it is debatable whether this is due to the temporary tightening of money that accompanies every presidential year, or whether the record break -

CURVES SHOWING THE MONTHLY INCREASE IN
BUILDING PERMITS FOR THE LAST FIVE YEARS



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ing is over.

The latter supposition is based on the fact that Los Angeles is primarily a tourist and residential city, with the result that altho it already has a large population the industrial activities are small in comparison to the number of people dependent on them for a livelihood. Either the industrial activities will increase or the growth of the city will be materially decreased.

FUTURE.

Already this need for industries is realized and much has been done for their future development. The result of the work already accomplished is shown by the two curves of fig. 4C which show the relative increase of the value of the permits over the number issued. This increase is due primarily to the large permits taken out by the different industries together with the increase in the number of office buildings, there being at present thirty new office buildings now actually under construction or in the process of being financed, which will cost in the neighborhood of \$40,000,000 despite the fact that the value of the total number of permits issued for the first four months of 1924 falls below that of the corresponding period of 1923. It is on these showings that the growth of Los Angeles industries should be based rather than on the figures showing the values of the manufactured products as there has been an abnormal increase in these values due to the motion picture and petroleum products. This may be clearly seen when it is realized that in 1922 the total annual production of all Los Angeles industries amounted to \$959,806,503; \$291,271,425 or 34.1% of which were motion picture and petroleum products both from fluctuating industries.

Before leaving the consideration of the future development of Los Angeles industries it is well to review the growth of Los Angeles Harbor. Altho San Pedro boasted of a landing place in the early history of California, yet the



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Port of Los Angeles, as a port, came into existence but a few years past. In the year 1900 the port was little more than a salt marsh and a river mouth. In 1914 it had attained no significance commercially being a part of call for only four or five maritime companies at the outbreak of the World War. For the fiscal year ending June 30, 1923, however, it ranked in fifth place with the other ports of the United States in total commerce handled, according to Government figures. The majority of the business passing thru the Port of Los Angeles is coastwise or coast - to - coast commerce as it ranked 24th in foreign exports and 17th in foreign imports. It is notable that foreign imports into Los Angeles are generally raw materials partially prepared for consumption from countries that have not been developed industrially. Los Angeles, therefore, in its commercially strategical location has ample sources of raw materials and in turn can utilize such sources of raw materials reciprocally as markets for its finished products.

The harbor development as now planned provides a 40 ft harbor at the old submarine base which will provide anchorage for any ship that floats and together with the other improvements more than double the present capacity of the port.

Therefore the estimate that Los Angeles will in 1950 have a population of greater than two million is conservative for Los Angeles has a good foundation started for the future development of industries, a harbor that will

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soon compare favorably with the other large harbors of the United States, a location that favors industries in getting their raw products and markets, a water supply sufficient for a population of 3,000,000, an ideal climate for the contentment of humanity which means better workers together with the possibility of in the near future have even cheaper power than now exists.

THE TRAFFIC PROBLEM.

Los Angeles to-day is the wonder city of the world. It is a city of splendid industrial structures and beautiful homes. It is the capital of the film world, and as such is the best advertised city on earth. It has more automobiles per capita than any other large city in America. Conditions show that development will continue with unceasing persistency. However, the future greatness of the city is confronted by a few obstacles the greatest being the solution of the traffic problems for Los Angeles is a city of narrow streets, narrow sidewalks, and dangerous grade crossings.

The narrowness of the streets is forcibly seen when we compare the the street area with that of other large cities. The proportion of the business districts devoted to roadway in the various cities is as follows: Washington, 44%; San Diego, 41%; Cleveland, 39.5%; Seattle, 37.5%; St Louis, 37%; Portland, Ore., 34.5%; San Francisco, 34.5%; Pittsburgh, 34.5%; Minneapolis, 30.5%; Detroit, 29.5%; Chicago, 29%; Denver, 27.5%; Salt Lake City, 25.5%; Toledo, 24%; Los Angeles, but 21.5%.

The city blocks in the business district measure 660 ft. north and south. These streets; curb to curb, average but 54 ft. in width. Some of the cross streets are too narrow to permit the movement of automobiles except on the car tracks if cars are parked on them. The worst offender is Sixth Street (fig. 5) which carries standard gauge tracks and measures only 48 ft. curb to curb.

The comparison is even more unfavorable when the number



Looking West from Olive St.



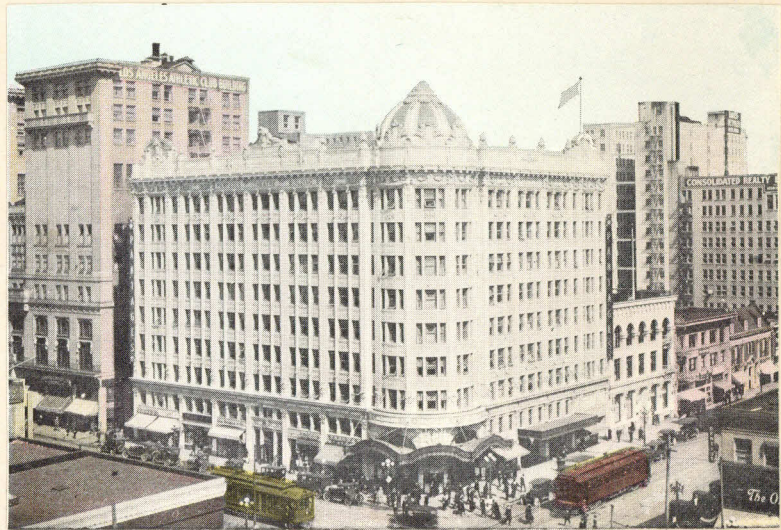
Looking West from Main St.

Fig. 5 SIXTH STREET



Looking North on Broadway
near Seventh St.

Corner of Hill and Seventh



Looking East on Seventh St.
near Grand Ave.



Fig. 6

of cars in Southern California and particularly in Los Angeles county is considered as there is probably no section of the country where motor vehicles are so numerous. Los Angeles county with an estimated population of 1,680,000 averages more than one motor vehicle to every four persons.

In congestion by automobiles is found the most serious cause of delay to all forms of traffic. A check of the central business district, covering approximately ninety blocks, showing the movement therein of all classes of vehicles from 6 a.m. to 6 p.m. on December 19, 1923, an average day, shows 263,110 automobiles, 48,556 trucks—a total of 311,666 automobiles of all classes, and 12,025 street cars. From 5p.m. to 6p.m. there was a total of 34,449 automobiles and trucks and 1,436 street cars. It is no wonder therefore that the common opinion of all visitors is that Los Angeles is the worst congested city in America and that there is an unsurpassed disregard of accepted rules of traffic.

Los Angeles has the doubtful distinction of killing more of its citizens and visitors with automobiles than any other city in the country. In Los Angeles in 1921 the death rate from automobiles per 100,000 population was 27.9 as against an average of 11.5 for the United States, 20.5 for Chicago, 18.8 for Manhattan and about 15 for an average of all the larger cities of the country.

The rapid rate at which the number of accidents is in-

creasing is startling. Fig. 7 shows this increase and also the relatively few, from point of traffic, that street cars are involved in. Surely it is time something is done to solve the traffic problem of Los Angeles.

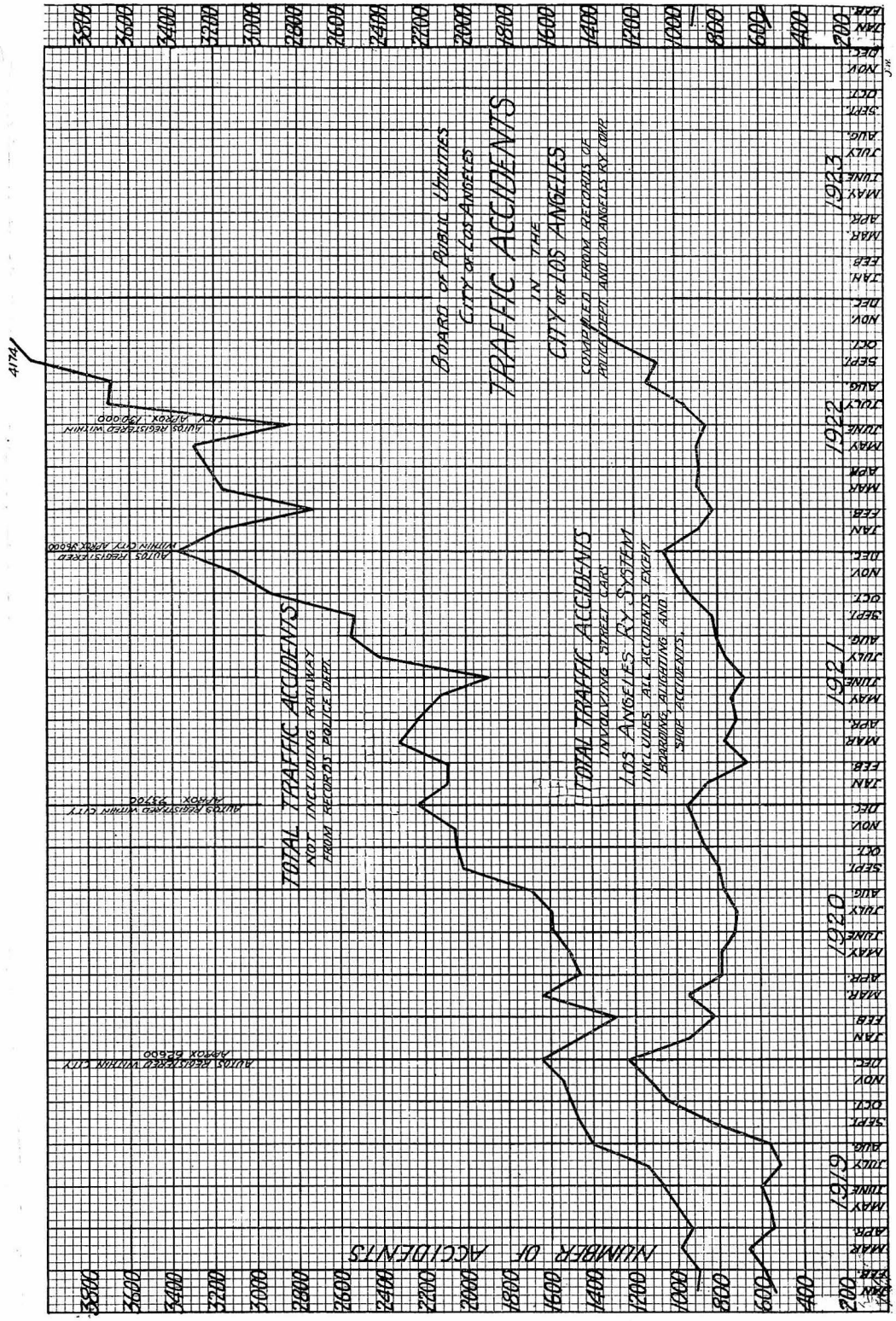


Fig. 7

VEHICLE TRAFFIC.

The street widening and opening program together with the handling of vehicle traffic appears at present to be in hands of capable men who have accomplished much thru their cooperation with the different organizations interested in this vital work. The traffic relief plan at present calls for a \$5,000,000 street widening program and the prohibiting of parking on the principle downtown streets. With the new city charter an even stronger body than is now operating is formed as it requires the City Council to provide for a traffic commission which will make a scientific study of the problems of street traffic as regards parking laws and places, right and left hand turns, crossing signals, one-way streets, boulevard stops, school stops, etc. and then make recommendations thereon to the City Council. This arrangement should place before the Council plans which when followed will greatly relieve the vehicle congestion, so that this report will be confined to the question of Los Angeles traffic as regards street car transportation.

THE NEED OF RAPID TRANSIT.

The traffic problem of Los Angeles or any other large city will never be solved till adequate street car service is provided despite the often heard statement that the automobile is taking the place of all other forms of transportation. That the street car will always be a necessity in every city is a fact easily proved tho in many cities it is not as evident as in Los Angeles with its insufficient street area. A check of the business district of Los Angeles from 5 p.m. to 6 p.m. on December 19, 1923 showed there was a total of 34,449 automobiles and trucks and 1,436 street cars entering or leaving this area. The average street car load for this period was 77.7 passengers and the average automobile load 1.67 passengers, including drivers.

During the time from 6 a.m. to 6 p.m. of this same day each person traveling in an automobile occupied in linear feet 14.3 times as much space as each person carried by a street car. At 1.67 passengers per auto to carry one average rush hour street car load of 77.7 passengers would require 47 automobiles, which in solid line of contact, would occupy 660 ft. while a street car occupies but 45 ft. on the average. Two and one half moving automobiles of average length occupy space the same as that of a street car, but the street car in the rush hour averages twenty times as many passengers. This greater carrying capacity is shown graphically in, in fig. 8. With the streets already overcrowded the increase in population must be carried by street cars.

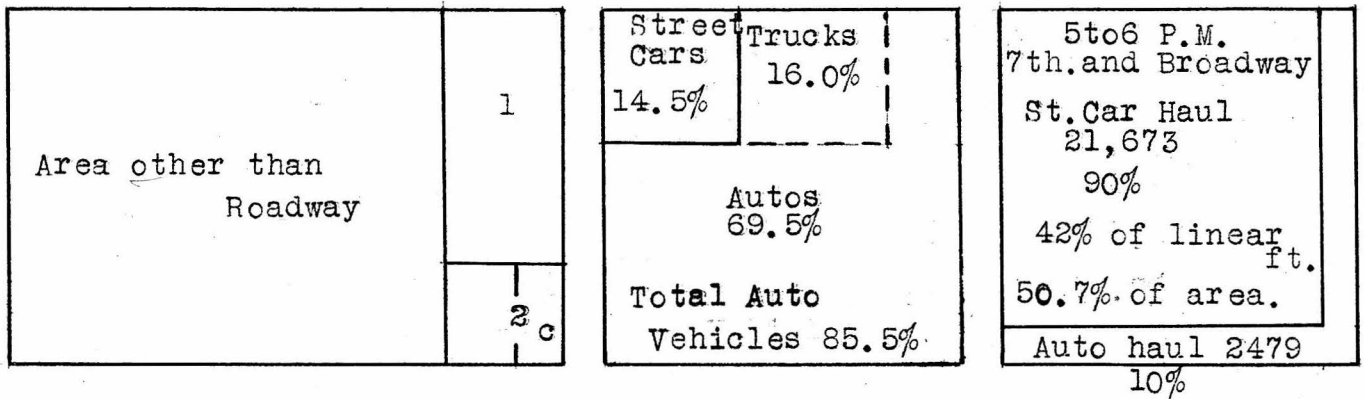


Fig.1 The main rectangle illustrates the total area checked in the business district. 1, 2 and C represents the area of the total roadway. 1 shows the roadway devoted exclusively to auto traffic, i.e. not street car tracks. This amounts to 76.1%. 2 shows the roadway open to both autos and street cars, 23.9%. C shows the proportion of the roadway occupied by street cars in transit, allowing 4 ft. outside of the outer rails for clearance. 41% of the roadway, or 9.8% of the roadway area in the entire district has car tracks.

Fig.2. This chart shows the apportionment of roadway in the entire district occupied by moving street cars, automobiles, trucks, from 6 a.m. to 6 p.m. on Dec. 19, 1923.

Fig.3. Comparison of passengers carried, linear feet occupied and area occupied on one of the downtown lines by street cars and automobiles during the rush hour from 5 to 6 p.m. on an average business day.

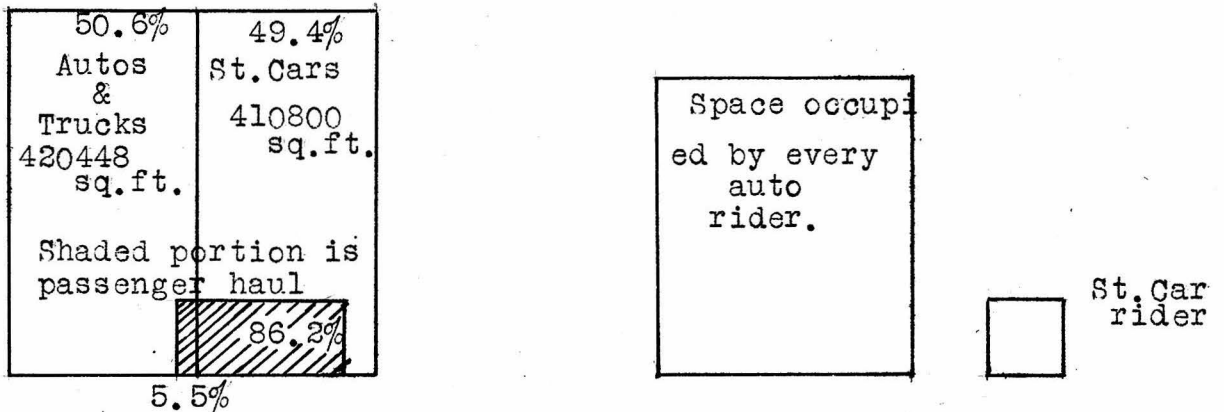


Fig.4. Comparison of roadway space occupied and passengers carried by st. cars and autos from 3 p.m. on a business day.
Fig.5. This chart is based on traffic north and south on Broadway between 5 and 6 p.m. Nov. 13, 1923.

Every large city must have a rapid transit system and Los Angeles is no exception to the rule tho there are several reasons why this is not such a crying need as is usually the case with a city its size. Frightened by the San Fran Francisco earthquake and the belief that all of the South Western portion of the United States was liable to earthquakes Los Angeles early limited the hieght of its buildings to 150 ft., approximately twelve or thirteen stories, and thus automatically produced a spreading of the business district and a subsequent lessening of traffic congestion.

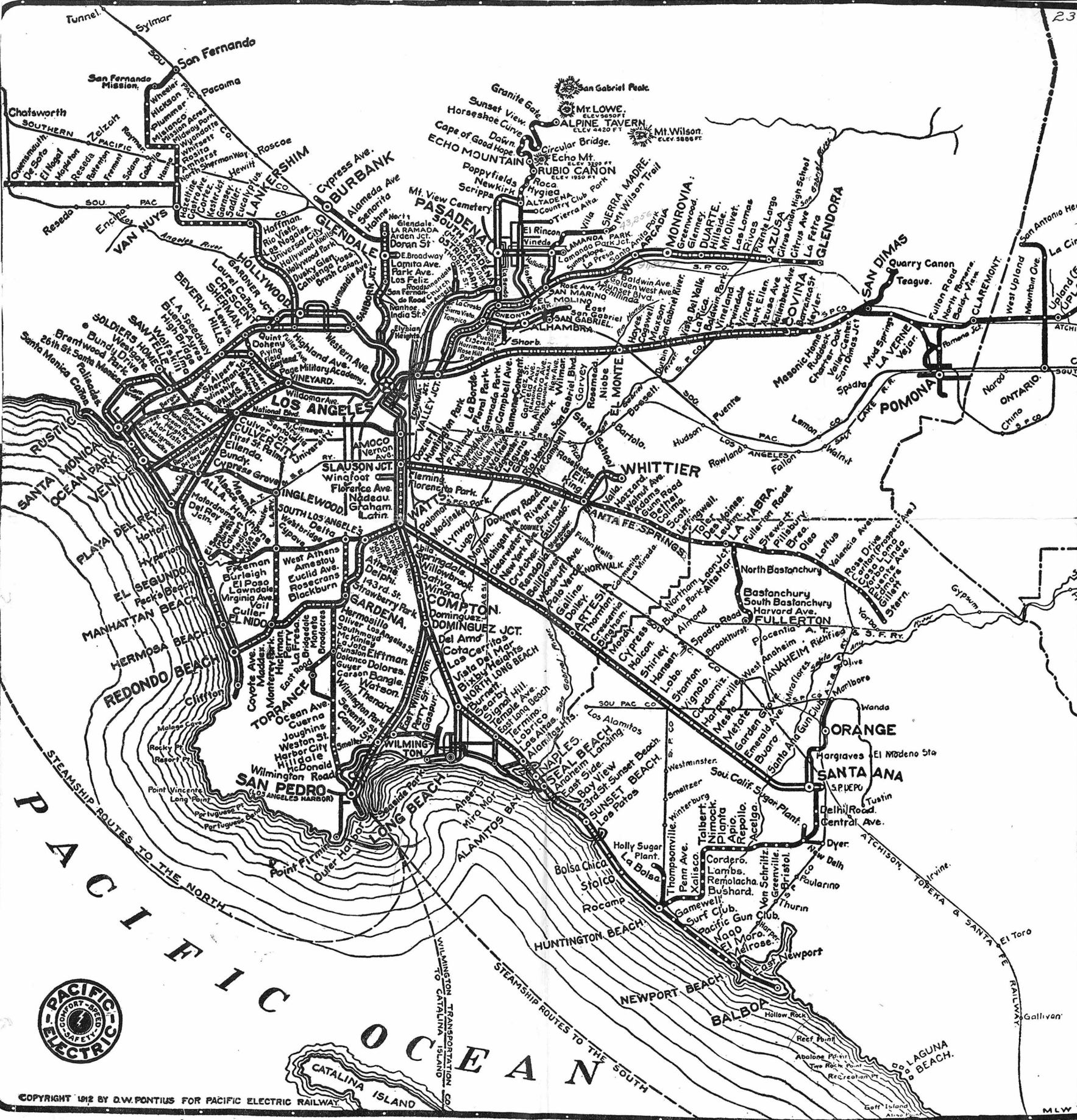
The second reason for the hitherto lack of subway need is the Pacific Electric, the largest interurban system in point of mileage in the world. This wonderful system had its beginning September 1, 1911 when the Southern Pacific purchased several of the small independent lines operating in and out of Los Angeles. The next year the company purchased the remaining electric railways operating to and in the cities of Southern California within a radius of 70 miles of Los Angeles, fig. 10. At present the system connects the larger cities of Los Angeles, Riverside, San Bernardino, and Orange counties with the city of Los Angeles and the large number of passengers carried may be seen from the accompanying letter , fig. 11, which was supplied by the Pacific Electric as the traffic carried during three average months. Whenever a city is served by as complete an interurban system as this the desire for an improved rapid transit system is not as urgent as where the city possess a sytem with insufficient mileage and equipment.

The third reason is the large area over which the population of the city is spread, resulting in numerous large areas upon which there are no buildings and even the sections that are considered built up contain many vacant lots. Fig. 9. This condition is rapidly being changed as shown by the accompanying map of the city, fig. 12, where every dot represents a residence, flat, duplex, apartment house, or hotel erected in 1923. The evenness of this distribution clearly shows that the vacant lots are being built up while each group of dots represents the building up of one of the vacant areas hitherto so noticeable in Los Angeles. In all there are 25,000 dots on the map.



Los Angeles' near in apartment district, looking East from
West Lake Park.

Fig. (9)



COPYRIGHT 1912 BY D.W. PONTIUS FOR PACIFIC ELECTRIC RAILWAY

Fig(10)

MLW

PACIFIC ELECTRIC RAILWAY COMPANY

OFFICE OF PASSENGER TRAFFIC MANAGER

O. A. SMITH
PASSENGER TRAFFIC MANAGER

IN YOUR REPLY PLEASE REFER TO
FILE NO. 600.

LOS ANGELES, CALIFORNIA February 26, 1924.

Mr. Harold F. Pope,
c/o California Institute of Technology,
Pasadena, California.

Dear Sir:

Referring to your call at this office several days ago requesting information as to the number of passengers carried on our various lines operating out of Los Angeles:

Following is list of passengers carried for the months of October, November and December 1923:

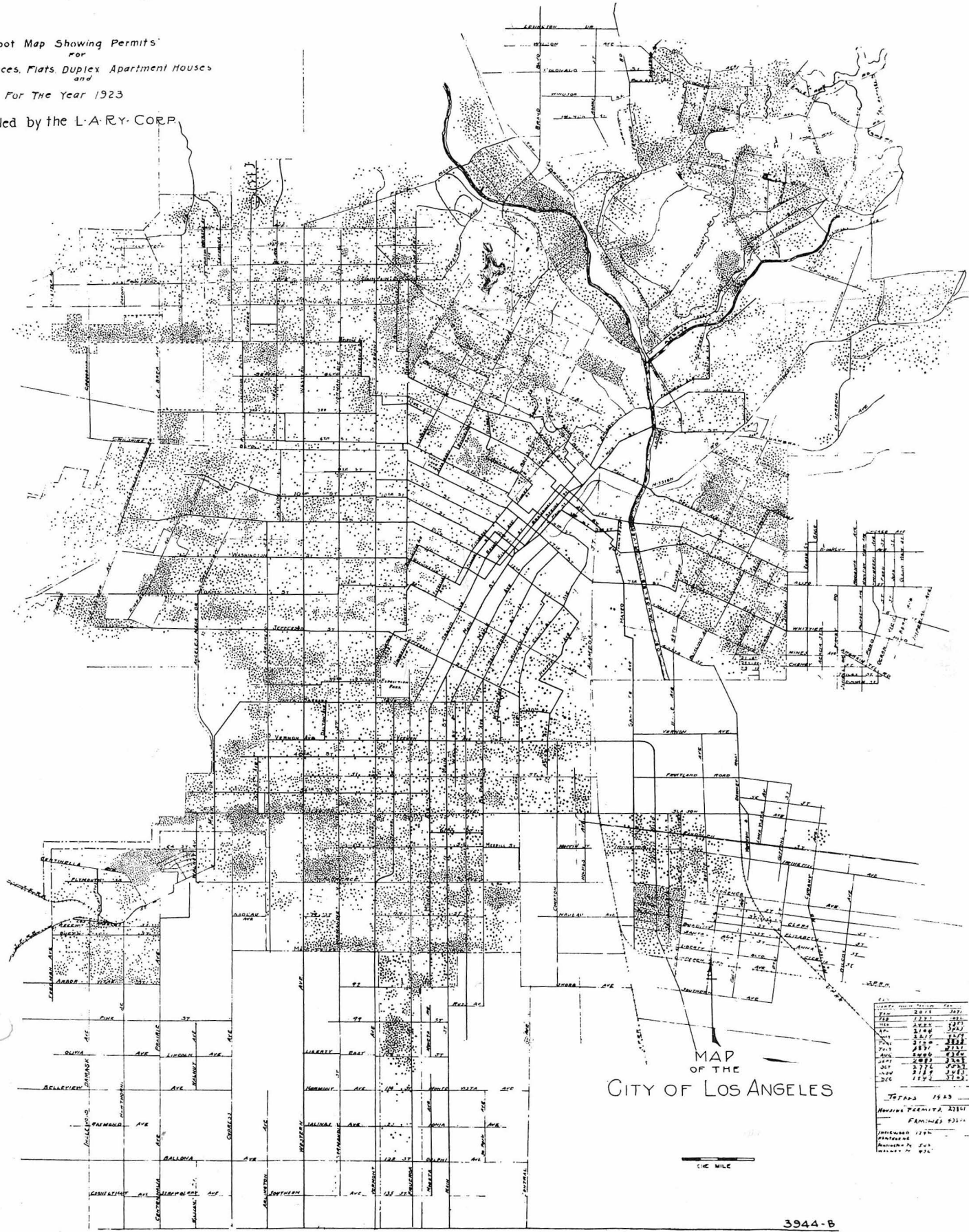
Alhambra - San Gabriel Line	429,261
Covina - Pomona Line	383,030
Monrovia - Glendora Line	275,600
Pasadena via Oak Knoll Line	500,626
Pasadena Short Line	851,618
L.A.-Riverside - San Bernardino Line	254,783
Sierra Madre Line	129,768
Sierra Vista Line	719,397
Glendale - Burbank Line	1,226,022
Redondo Beach via Del Rey Line	259,459
San Fernando - Owensmouth Line	251,110
South Hollywood - Sherman Line	2,165,370
Venice via Hollywood Line	655,556
Santa Monica via Sawtelle Line	529,468
Venice Short Line	1,172,521
Vineyard - Hollywood - Laurel Canyon Line.	4,525,330
Hawthorne - El Segundo Line	101,902
La Habra - Fullerton Line	54,488
Long Beach Line	1,134,448
Newport Beach - Balboa Line	165,566
Redondo Beach via Gardena Line	281,255
San Pedro via Dominguez Line	1,330,828
San Pedro via Gardena Line	322,309
Santa Ana Line	272,738
Whittier Line	326,523
Watts Line	1,678,553

Yours truly,

fig. (11)

Each Dot Represents a New Home Erected in Los Angeles in 1923

Spot Map Showing Permits
 for
 Residences, Flats, Duplex Apartment Houses
 and
 Hotels For The Year 1923
 Compiled by the L.A.R.Y. CORP.



MAP
 OF THE
 CITY OF LOS ANGELES

PERMIT CLASSIFICATION	NO. OF PERMITS	NO. OF HOMES
Single Dwelling	20,771	20,771
Flats	7,223	28,994
Hotels	1,006	1,006
Duplex	2,000	2,000
Apartment House	1,199	1,199
Hotel	1,199	1,199
Other	822	822
TOTALS	25,000	25,000

TOTALS 1923
 Residences Permits 23,000
 Families 23,000
 Hotels 1,000
 Duplex 2,000
 Apartment 1,000

3944-B

Fig. (12)

This Remarkable Map is the Work of the Engineering Department of the Los Angeles Railway. It Reveals the Fact that 25,000 Homes were Erected in this City during 1923 in single and double Dwellings, Flats, Duplexes, and Apartment Houses. Note the evenness of the distribution of construction in this record breaking twelve months.

RULES.

In making the following recommendations in this report the following rules were used as a bases of comparison of th different systems suggested.

1. Los Angeles continuing to follow her annexation program of the past, fig. 13, will in result in Los Angeles becoming Greater Lo^s Angeles City.

2. The present Pacific Electric system as laid out at present should constitute the backbone of any future rapid transit system to serve Greater Los Angeles.

3. Elongated terminals have proven to be better than stub terminals and especially is this true of Los Angeles as the business district is long and narrow.

4. Thru tracks rather than loop construction for the rapid transit lines as they require less time and less car mileage

5. There are four natural entrances to downtown Los Angeles from the surrounding country.

6. For a city with as widely a spread populatioⁿ as Los Angeles a subway for interurban lines only is required and on this subway the stations should be three or four blocks apart.

7. The lines should be so combined that the traffic is well balanced.

8. No grade crossings should ever exist in a subway.

9. A rapid transit system should possess the following advantages over surface lines:

- (a) Greater safety.
- (b) Greater speed.
- (c) Greater regularity.
- (d) Greater capacity.

10. Elevated lines are undesirable in commercial, hotel retail and residential sections as they are as a rule unsightly and noisy.

11. Open cut construction is less objectionable than elevated thru residential districts, is less expensive than subways, and simplifys the separation of grades.

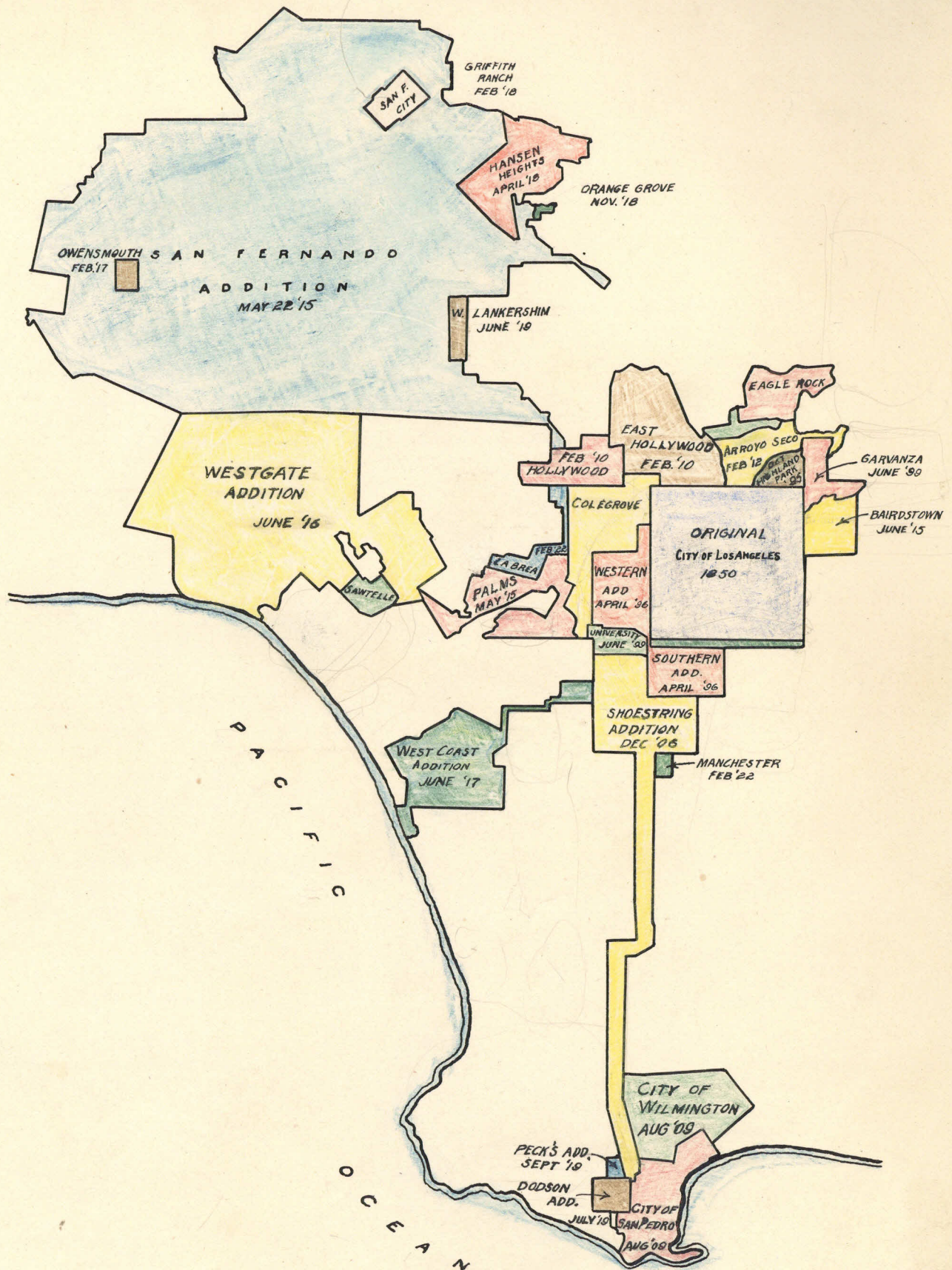


Fig. (13)

DIFFERENT SUBWAYS.

From the preceding discussion it appears that Los Angeles has reached the point where there is need for rapid transit of some kind. Many different proposals have been made by men of various experience and ability, two of these plans have been picked as typical of those so far suggested.

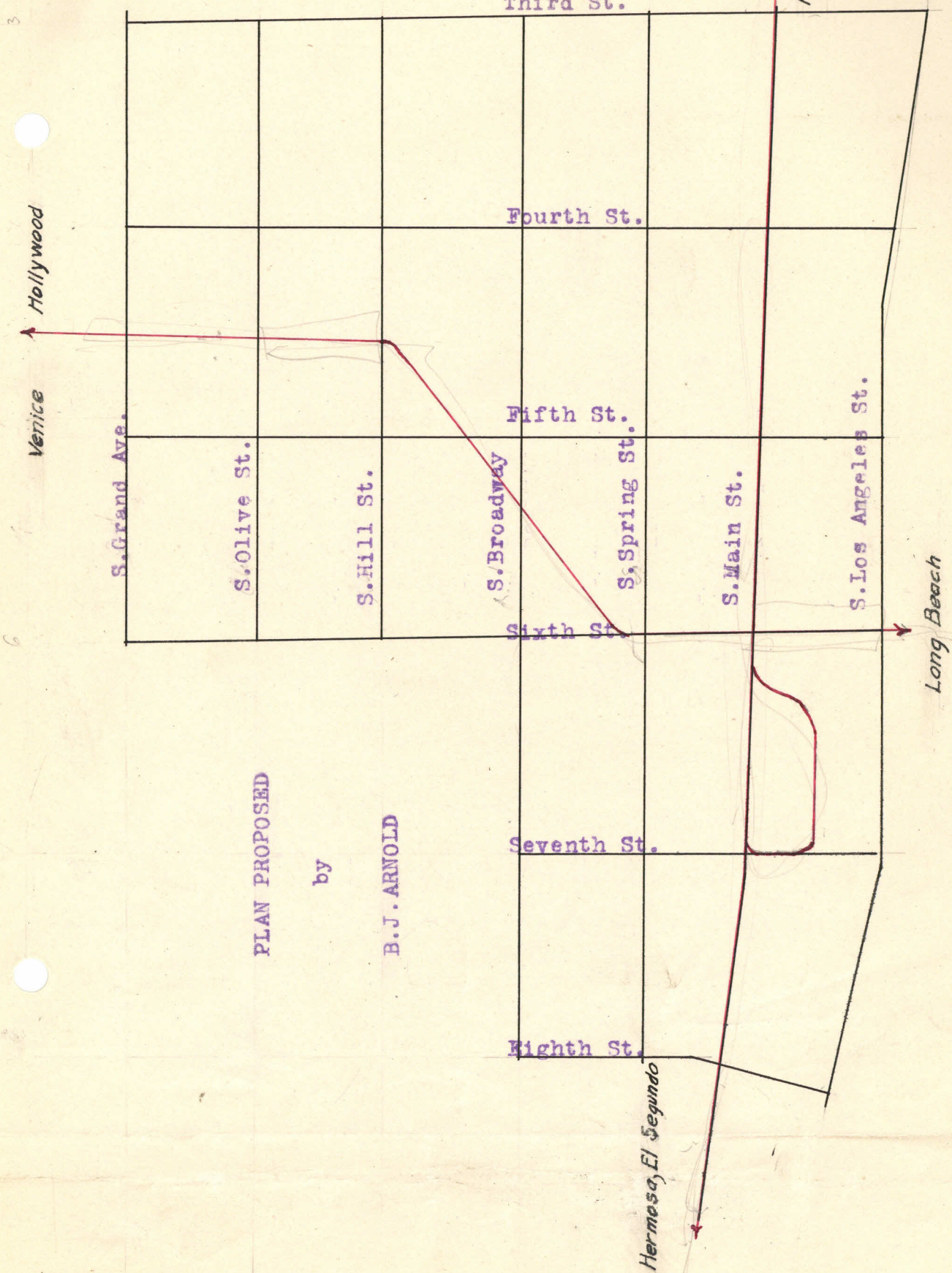
Plan by B.J. Arnold.

The systems that cross town have the advantage that they offer direct transfer but their disadvantages more than offset this. First the traffic is not balanced by the combining of the lines as suggested. As seen from the sketch of fig. 14, the cars from the Hollywood, Venice, Glendale-Burbank, and San Fernando Lines are to cross town and be routed to the Long Beach, Whittier, Watts, New Port, and San Pedro Lines and the Pasadena, Monrovia, Alhambra, Sierra Madre, Lines are to continue on the Redondo-Hermosa Beach Line. From fig. 11, it is seen that if this method is used many of the cars would have to be turned back in Los Angeles as there is nowhere a balancing of the traffic on the different lines combined. This necessitates the loop shown for the looping of excess Pasadena cars. The other big disadvantage is that at the intersecting of the two lines there is of necessity two levels of subway as there should never be grade crossings in a subway.

Pacific Electric Plan.

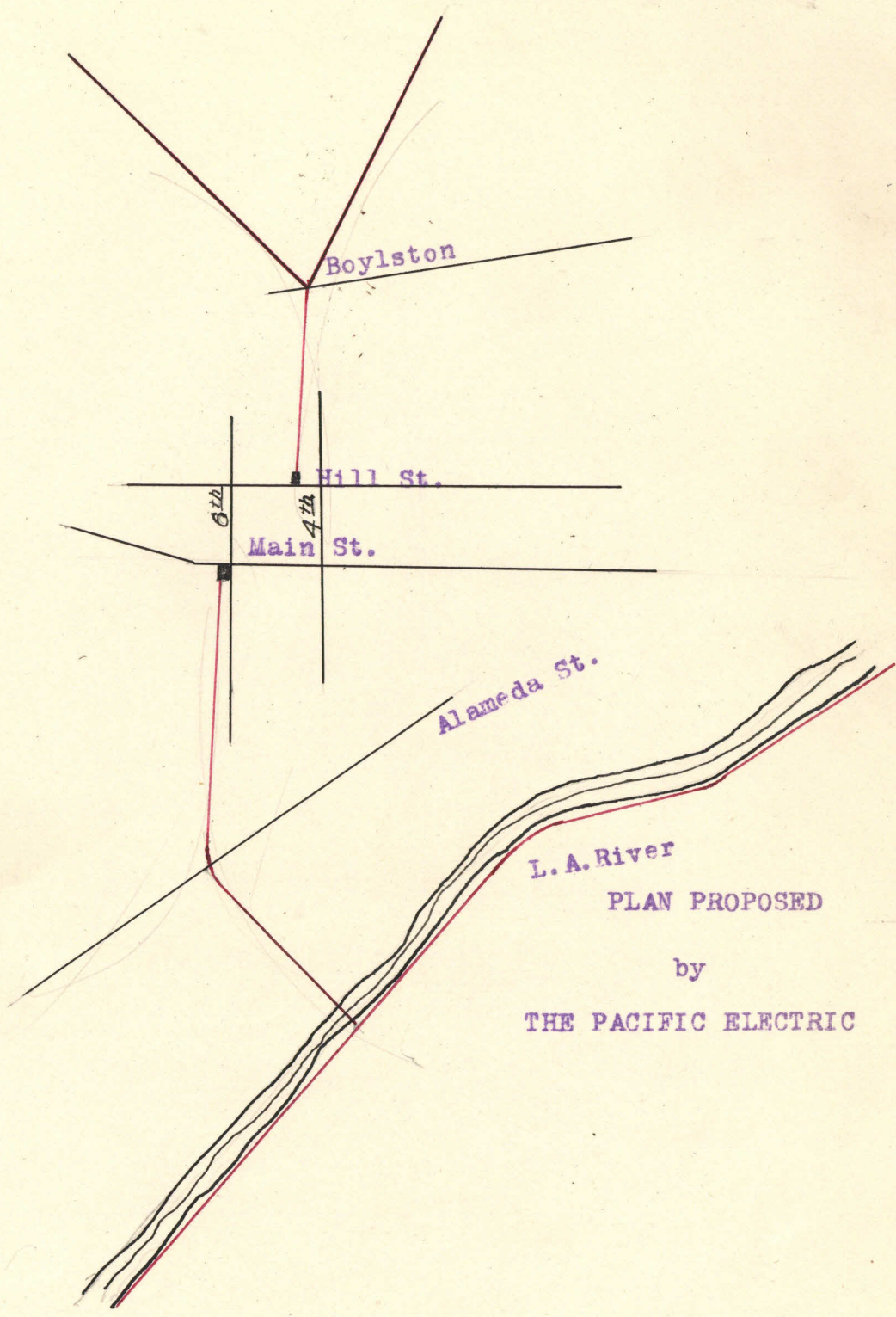
The Pacific Electric have a system, fig. 15, that has sever-

al advantages but none that are not possessed by systems without its disadvantage. This plan in substance is that the present Main Street station would be used and cars run from the rear as at present except that the elevated structure would continue till it crossed the Los Angeles River, at which point the lines running North would utilize the Salt Lake right of way along the east bank of the river to the present Pacific Electric right of way and those running South would continue on as elevated, joining the present right of way at 14th Street. This method gives only one loading point accessible to the downtown district, the Main Street station. The lines now operating from the Hill Street station would be routed thru a subway that would run West to Boylston and there branch one to Vineyard and the other to Sanborn Junction. This also has the objection that it is stub construction.



PLAN PROPOSED
 by
 B. J. ARNOLD

Fig. (1A)



L.A. River
PLAN PROPOSED
by
THE PACIFIC ELECTRIC

Fig. (15)

RECOMMENDED PLAN.

The plan recommended as that most nearly filling Los Angeles needs is similar to that of the public utilities. This plan is shown on the map accompanying this report, fig. 16, and follows in detail.

The lines at present operating from the Hill Street station of the Pacific Electric will be combined so that a majority of the cars loop thru Los Angeles and the Beach towns. This will necessitate a subway from Sanborn Junction to Fourth and Hill Streets, (using the tunnel now being built) South on Hill to Twelfth Street and then West to Vineyard. The track West from both Sanborn Junction and Vineyard will be depressed. A large loop will thus be formed with Los Angeles and the Beaches of Venice, Santa Monica, and Ocean Park diametrically opposite.

The other subway will extend from Macy and the Los Angeles River under the new terminal to Main Street, South on Main to Ninth Street and then East to Long Beach Ave. From Long Beach Ave. and Ninth Street the track will be elevated to Watts and then depressed for the remainder of the way. The tracks issuing from the North end of the subway will cross the river on a bridge and be depressed on the present right of way of the Pacific Electric.

The present Vineyard-Hollywood line will be operated as a local line only with fewer cars than are run now. The South Pasadena Sierra Vista, Edendale, and Watts lines will continue to operate much as they do at present. Thus the sub-

way would only need be a two track tunnel.

In the down town district the subway will be high level subways, that is just under the street, and provision will be made to carry the public utilities in tunnels on either side of the tracks.

Transfer passenger tunnels will be built under Fifth and Ninth Streets which will necessitate a walk of only three blocks when transferring from one subway to the other.

As these subways will be for interurban trains only they will be of high speed construction with stations three or four blocks apart. For the downtown district the stations shall be; for the Hollywood-Venice subway at Fifth Street and Ninth Street, Twelfth Street; for the Pasadena-Long Beach subway at the Union Terminal, the Post Office, First Street, Fifth Street, and Ninth Street. Outside of this district the stations will be placed so as to best serve the public using them.

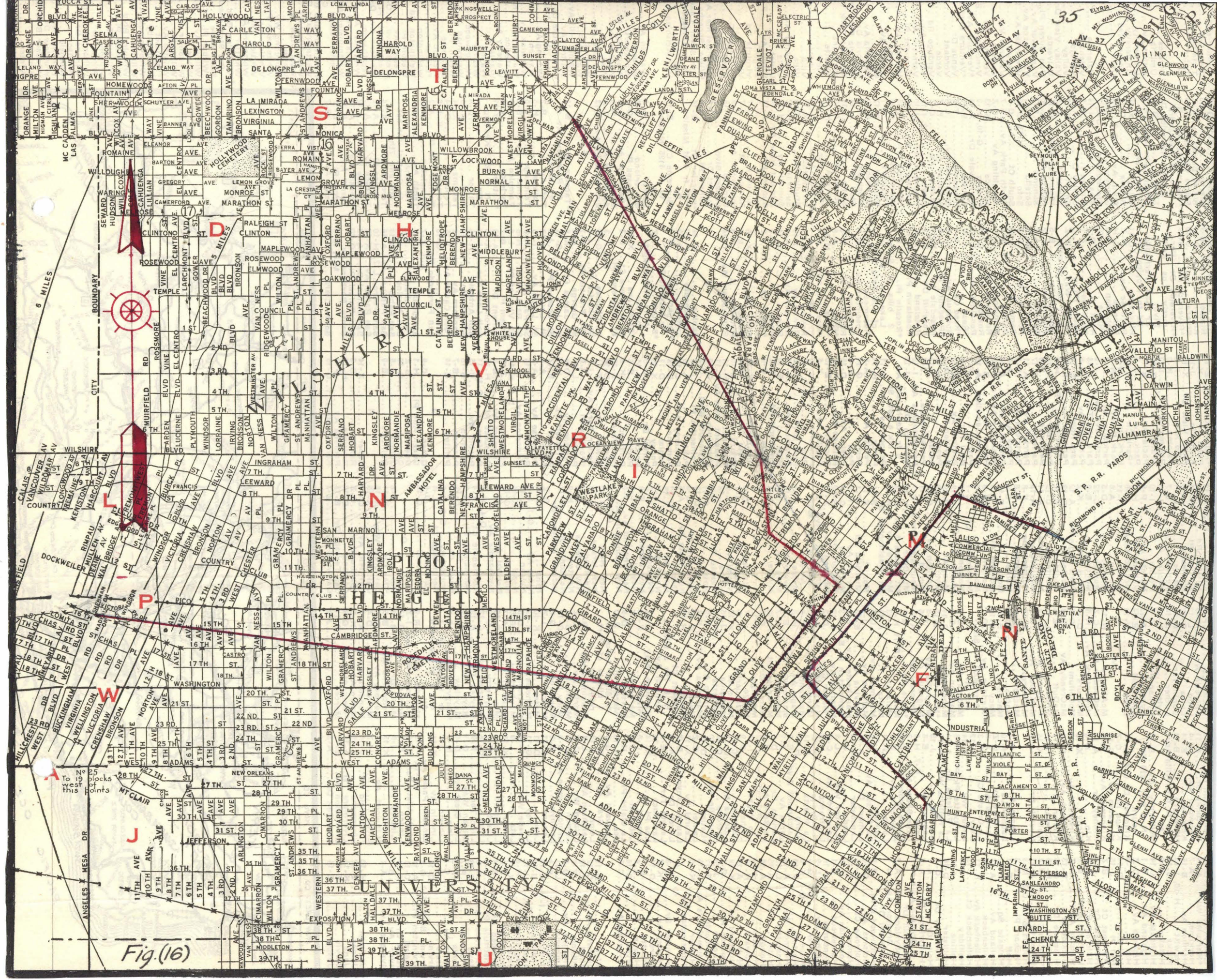


Fig. (16)

The curve of fig. (7) was plotted from the following data which was obtained by observation at First and Hill on different days during the month of May 1924. All periods were checked at least once and those for the peaks five times. The curve is for out bound Hollywood traffic.

Time	Passengers carried per hour.
a.m.	
2:15 - 4:00	no cars running.
4:00 - 5:00	50
5:00 - 6:00	150
6:00 - 6:30	1200
6:30 - 7:00	2800
7:00 - 7:15	3500
7:15 - 7:30	3200
7:30 - 7:45	2000
7:45 - 8:00	900
8:00 - 9:00	1000
9:00 - 10:00	500
10:00 - 11:00	500
11:00 - 12:00	700
p.m.	
12:00 - 1:00	1000
1:00 - 2:00	800
2:00 - 2:30	650
2:30 - 2:45	700

Time	Passengers carried per hour.
p.m.	
2:45 - 3:00	730
3:00 - 3:15	800
3:15 - 3:30	896
3:30 - 3:45	1168
3:45 - 4:00	1060
4:00 - 4:15	1124
4:15 - 4:30	1196
4:30 - 4:45	1840
4:45 - 5:00	2060
5:00 - 5:15	6900
5:15 - 5:30	3080
5:30 - 5:45	5060
5:45 - 6:00	1800
6:00 - 7:00	500
7:00 - 8:00	525
8:00 - 9:00	600
9:00 - 10:00	800
10:00 - 11:00	1000
11:00 - 12:00	1000
p.m.	
12:00 - 1:00	200
1:00 - 2:00	120
2:00 - 2:15	120

TRAFFIC DENSITY CURVE
FOR
THE PACIFIC ELECTRIC HOLLYWOOD LINE

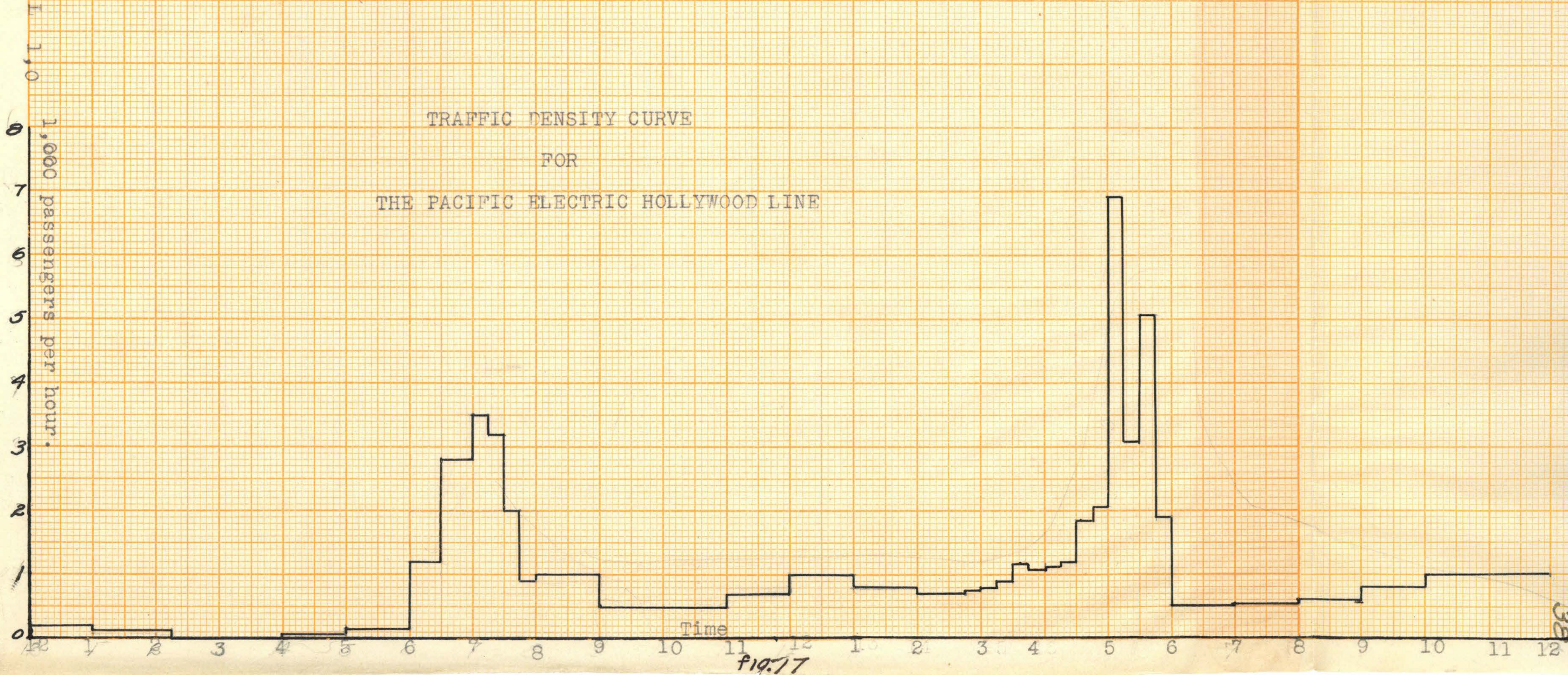


fig. 77

The following figures are from original data and show the percentage of total passengers carried on the Hollywood line of the Pacific Electric that travel into or out of the business district.

	P.M.		A.M.
1:00	$\frac{50}{62} = 80.6$		8:00 $\frac{78}{97} = 80.4$
			to
3:00	$\frac{58}{70} = 82.9$		9:00 $\frac{86}{98} = 87.9$
5:30	$\frac{61}{68} = 89.7$		$\frac{100}{125} = 80$
6:00	$\frac{24}{35} = 68.6$		$\frac{80}{105} = 76$
8:00	$\frac{36}{47} = 76.6$		$\frac{80}{100} = 80$
10:00	$\frac{72}{90} = 80.0$		10:00 $\frac{31}{45} = 71.1$
11:00	$\frac{61}{68} = 89.7$		12:00 $\frac{48}{61} = 78.7$

The average seems to be about 80% which figure will be used in all future computations.

Passengers carried from the curve Fig. ()

Time	passengers carried.
4:00 - 5:00	50
5:00 - 6:00	150
6:00 - 7:00	2000
7:00 - 8:00	2198
8:00 - 9:00	1000
9:00 - 10:00	500
10:00 - 11:00	500
11:00 - 12:00	700
12:00 - 1:00	1000
1:00 - 2:00	800
2:00 - 3:00	704
3:00 - 4:00	981
4:00 - 5:00	1305
5:00 - 6:00	4210
6:00 - 7:00	500
7:00 - 8:00	525
8:00 - 9:00	600
9:00 - 10:00	800
10:00 - 11:00	1000
11:00 - 12:00	1000
12:00 - 1:00	200
1:00 - 2:00	120
2:00 - 3:00	<u>40</u>

total 19882

Passengers carried from the P.E. figures.

Carried on the Hollywood Vineyard Line for the three months given (79 week days & 13 Sundays) 4,525,330

Every third car goes to Vineyard and assuming a new load for the cars Vineyard passenger would total 1,131,332

But approximately half are carried from Hollywood. 565,556

Beach Line carried 655,556

Assume one-half Hollywood to Los Angeles 327,778

Total carried on Hollywood Line between the City and Gardner Jct. 4,197,552

80% into or out of the City 3,359,042

Number of cars on Sunday equals approximately 18 x 15 = 270 each way. At 30 passengers per car = 210,600

Therefore week day passengers into L.A. = 3,148,442

Assuming equal number of passengers carried each way the total number of passengers carried each way per day would equal 19,950

Recommended Train Operation.

The present Hollywood traffic closely approximates the conditions that will exist on all lines in the future. This line was therefore taken as a basis for estimating the traffic that will be handled by the rapid transit system. A check was made of the passengers carried into and out of the business district, the results of which are contained in this report. All of this traffic would not be handled by the subways as the surface lines would still handle most of the traffic between the City and Sanborn Junction. From a careful analysis of the passengers handled by different Hollywood cars during the month of May 1924 it was found that about 40% of the present traffic into the city would be handled by cars running from the city to Sanborn Junction. As the traffic will at least double with the placing in operation of a rapid transit system the figures from the curve, fig. (7) will be assumed as those representing conditions that would exist in a subway of to-day.

The new territory traversed by the subway together with the increase that will take place between now and the five or ten years that must elapse before a subway will be in operation justifies the doubling of the figures assumed for the present conditions. It is upon these assumptions that the following figures are based.

Peak density 4,210 x 2 = 8,420

The present new cars seat 65 and would during rush hours be called upon to carry at least 80, requiring for the peak

105 cars

105/60

1.75 cars / min.

The traffic on the South Hollywood line is less than half this

.75

Both Hollywood 2.50 cars/min.

The Glendale Line now handles during the peak 1 car/min.

2.00 cars/min.

Operating 3 car trains on the Hollywood Lines and 4 car trains on the Glendale Line would mean a clearance of 45 seconds between trains. This would be reasonable for the Beach and Vineyard Line. No account was taken of the San Fernando Line which serves a growing section. Therefore I would recommend a minimum clearance for trains of 30 seconds. During the rest of the day this interval would be shifted to meet the traffic but at no time should any line be operated at intervals greater than 5 minutes.

Probable Cost of The Subway.

Tunnel construction.

\$3,500,000 is the cost of the 1 1/8 miles of tunnel now under construction. 7 miles of additional tunnel will be constructed in the system of this report

Cost 21,800,000

4 1/2 miles of high level subway at \$3,000,000 per mile

Cost 13,500,000

Elevated construction.

The Burlington recently constructed 1,400 ft. of reinforced concrete elevated structure at a cost of \$220,000. On the Long Beach Line there will be 6.5 miles of construction of like nature.

Cost. 5,400,000

Bridge across the Los Angeles River.

Cost 1,000,000

The cost of the open cut construction will vary.

Approximate Cost. 50,000,000

Probable Total Cost \$91,700,000

Payment.

No subway has ever paid for itself. The State law guarantees the Public Utilities a annual return of 6 1/4% on the money invested and therefore even with the transit company earning only this minimum the riders could not pay the increased fares. New York financed the subways of that city and found the burden so heavy that Los Angeles should not follow her example. Another plan is to have a holding company build the subways and lease them to the operating company. This method would mean that the traffic would pay most of the rent and the remaining portion would come from the city taxes. The most logical method and one to be recommended is that the portion of the construction cost that the operating company could not pay be divided among the land holders that are benefitted. It is known that there will be a rise in value of all land easily accessible to the new rapid transit system and this rise should help cover the cost of the system. This will still leave the these land holders a reasonable profit for the lower operating expenses and increased traffic will permit the operating company to pay a large portion of the cost. The Pacific Electric Company should be the operating company.

Harold J. Pope