

Wartime Transportation in Los Angeles

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AN indicated increase for 1943 of 36% in the total number of passengers carried in 1942, which in turn was an increase of 26½% over 1941—such is the outlook for the Pacific Electric Railway Company of Los Angeles. At the same time there is an indicated increase in freight—measured by gross ton-miles—for 1943 of 80% over 1942, which again had exceeded 1941 by 31%. Gross revenue in 1942 rose to 147% of the 1941 total and is expected to expand 60% in 1943. Yes, this picture looks bright indeed, but before we are swept away by these multiplying figures, (Fig. 1) let us consider the other side of the matter—the crowded facilities, the necessity of keeping equipment in constant service, and the difficulties in securing employees.

STAGGERED HOURS FOR BUSINESS

When it became apparent that there would be an abnormal traffic increase in Los Angeles, business men and civic authorities realized that the cooperation of all would be required, and a voluntary plan of staggered hours for business was made effective. This spread the morning and evening peak loads, although not to the extent hoped for.

Traffic increases resulted in decided changes in the established riding habits of patrons. There was an increase in off-peak travel during the day, also in night travel. Normally traffic was lightest on Sunday with Saturday next; Monday and Thursday were about equal as regards maximum loads carried. Saturday is now the heaviest day and Friday is next. While Sunday traffic has increased substantially, it is still the lightest day. Although much heavier, traffic on the remaining days now shows little relative difference.

Traffic on Fridays and Saturdays is materially affected by the need for handling military personnel on leave, moving into and out of Los Angeles, but the cooperation of Army officials has made it generally possible to handle these movements at times of light civilian travel and when the necessary equipment is available. This also permitted handling this class of traffic on rail lines on which passenger service had been abandoned, par-

WITH 22 billion passengers demanding space on transit facilities in 1943, transport utilities are exceeding all previous operation records. Especially in areas congested with war workers the provision of needed facilities been challenging. Such a center is Los Angeles, and such a utility is the Pacific Electric Railway Company. In that this company operates railroad, interurban, street car, and motor bus service, Mr. Batman's report gives an inclusive analysis of wartime transportation in the area. This paper was presented before the Engineering Economics Division at the Los Angeles Convention.

ticularly between Los Angeles and San Bernardino. The result has been a large saving in motor coach mileage, and is directly in keeping with the ODT policy of conserving rubber. The handling of inductees has required numerous special moves every day by both rail and motor coach. There are also numerous troop movements.

A large number of workers in defense plants located on the Company's lines are handled, but in the larger plants the greater proportion of the employees use private automobiles or special motor coach service provided by the plants. With

the aid of government officials, studies were made of possible extensions of rail passenger lines to serve major aircraft plants in the territory, but unless conditions as to the use of private automobiles change materially, these are not likely to be constructed.

SPECIAL SERVICE TO DEFENSE PLANTS

The Los Angeles Motor Coach Lines and the Los Angeles Railway (Fig. 2) furnish special contract motor coach service to some defense plants, operating from established rail heads on the Pacific Electric and Los Angeles Railway lines. The service is arranged to provide for return of the equipment for use during peaks of regular traffic.

The Los Angeles Motor Coach Lines, an operating agency, is owned jointly by the Pacific Electric and the Los Angeles Railway. In 1942 it handled 36,605,000 passengers, and the gross revenue was \$3,036,000. In general it serves the territory west of the central business district of the city.



ELEVATED RAIL AND MOTOR BUS TERMINAL CONSTRUCTED IN CENTRAL LOS ANGELES



A RAIL LINE CONSTRUCTED TO SERVE A SHIPYARD
Coin-Actuated Turnstiles Speed Loading

To provide special service for employees of the California Shipbuilding Corporation between Los Angeles or Long Beach and the yards on Terminal Island, the Company, under contract with the U.S. Maritime Commission, recently completed construction of 2³/₄ miles of double-track rail line from its Long Beach Branch to the Cal Shipyards and 1.8 miles of second track necessary to complete double tracking of the Long Beach-San Pedro Line. To provide the necessary power, two 2,000-kw mercury-arc rectifiers were installed in substations at Terminal Island and at Watts, and in addition a 1,000-kw portable substation was constructed from motor generator sets which the Pacific Electric had on hand. For this service the Maritime Commission requisitioned 61 cars formerly used by the Southern Pacific on the Bay Bridge between San Francisco and Oakland. The equipment was converted for use on Company lines at the general shops in Torrance by replacing pantographs with trolley reconnecting motors, changing the voltage from 1,200 to 600, and applying field shunt switches to the motors to increase speed. The total cost of the work covered

by the Pacific Electric contract was approximately one million.

This service, which was commenced March 19, 1943, is operated under contract. The Commission guarantees the operations, and the profits, if any, are divided equally between the Company and the Commission. The project was designed to handle a total of 10,000 passengers daily each way between Los Angeles and Terminal Island, and 5,000 passengers daily each way between Long Beach and the Island. It is now operating at approximately 20% of maximum capacity, and further increases will depend upon restrictions placed on gasoline, rubber, and the parking of automobiles on Terminal Island. Arrangements, not completed, also contemplate the use of the service by other government personnel. Equipment not required for present traffic is being

used by the Company under arrangements with the Commission.

Summarizing, we find the Company with 459 rail cars and 382 motor coaches, carrying passengers on 21 rail lines and 33 motor coach lines at the rate of about 140 million per year. This compares with 81¹/₂ million carried in 1941 with 408 rail cars and 317 motor coaches.

Exclusive Pacific Electric passenger operation involves daily 5,617 regularly scheduled trips, divided about equally between rail and motor coach lines, to which must be added the moves of the special traffic mentioned. As a major portion of all moves occurs in the 840 minutes between 5:00

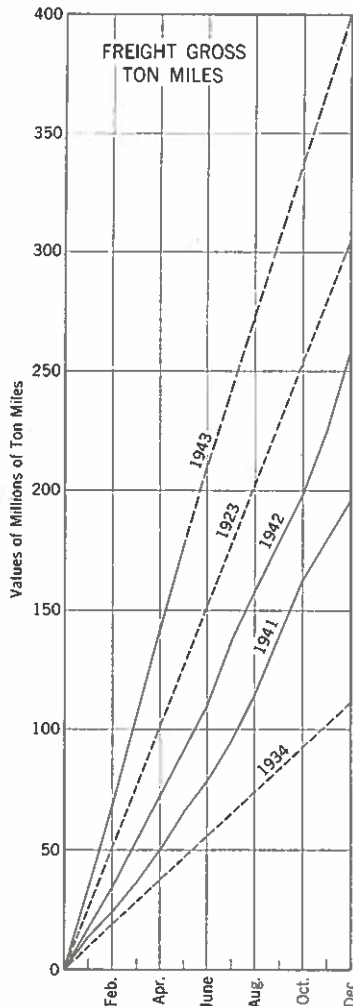
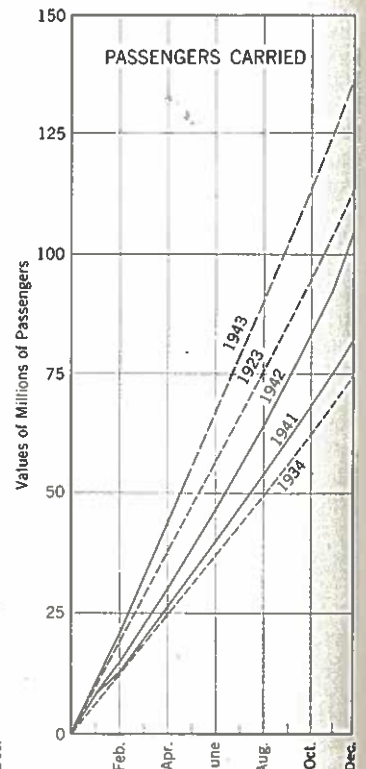
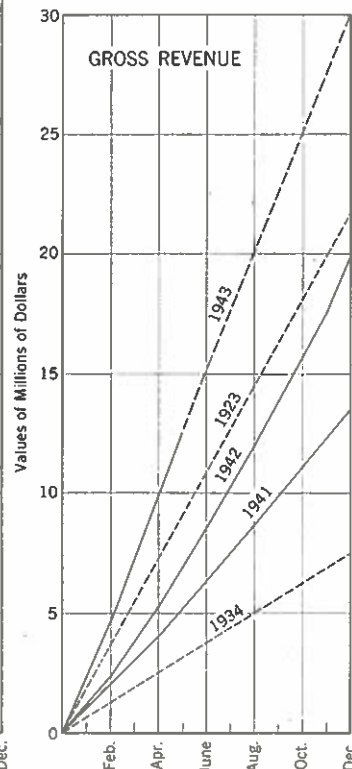


FIG. 1. OPERATING RECORDS OF PACIFIC ELECTRIC RAILWAY COMPANY





GARAGE FACILITIES WERE ERECTED NEAR RAIL SHOPS FOR CENTRALIZED MAINTENANCE PROGRAM

a.m. and 7:00 p.m., the passenger traffic alone provides a full-time job.

Restriction on tires, placed in effect in December 1941, had substantially increased traffic on longer rail and motor coach lines but did not greatly affect the shorter local lines; so that when gas was rationed in December 1942, it produced only about a 10% increase in traffic.

Careful analysis and study of increases that occurred in the 13 eastern states where gas rationing is more stringent indicates that similar restrictions here would necessitate handling about a 20% increase in traffic on the Company's lines. It is felt that by strict compliance with the staggered hour program, this additional traffic can be handled.

FREIGHT LOAD DOUBLES

In addition to the passenger load, there is the tremendously increased volume of freight, which for the first half of 1943 exceeded by 11½% the total for 1941—measured by gross ton-miles—with indications that the 1943 total would more than double the 1941 figure of 195 million gross ton-miles. In 1942, 256 million gross ton-miles were handled. Freight revenue is now closely approaching passenger revenue. Gross revenue promises to exceed the 1942 total of \$19,751,000 by 60%. In 1941, gross revenues were about 13½ millions.

Freight movement involves 120 regularly scheduled trains daily, in addition to numerous special trains and an extensive box motor service handling mail, express, and freight in less than carload lots.

The volume and increase in freight traffic are well illustrated by comparison of cars handled per month through the Company's Los Angeles freight terminal facilities, where cars are interchanged with the three connecting transcontinental railroads. In June 1941, 53,000 cars were handled through these terminals; in June 1942 the number had risen to 69,200; and for June 1943, it was 117,850.

Supplies for the armed forces and materials essential to the war effort form the major part of the freight traffic, the handling of which involves many varied and interesting problems. During normal times freight was moved during night hours with minimum interference with passenger traffic. Now maximum use must be obtained from both motive power and freight equipment, a

fact which necessitates prompt movement during all 24 hours of the day. It can be readily appreciated that, with the frequency of passenger and freight movements, intensive supervision is required. Supervisory forces are now about 2½ times the peacetime staff, and to handle the rail traffic, dispatching districts have been increased from 3 before the war to 5.

It has been necessary to supplement electric motive power with a number of steam engines. Handling of the heavy loads and the operation of steam locomotives on lines originally designed primarily as passenger lines has necessitated additional yard facilities and sidings, changes in existing layouts to provide easier turnouts and curves, and other miscellaneous facilities.

Increasing loads have required installation of heavier rail on the heavier freight lines. Approximately 16½ miles of track of 60 and 70-lb rail have already been relaid with 90-lb rail as part of the program for relaying about 50 miles of track.

PROPERTY AND PERSONNEL

A rehabilitation program, started in 1939, contemplated picking up deferred maintenance over a period of years, but heavy traffic has accelerated the plan. Difficulty in securing men and the large amount of new construction required to serve war industries prevented increasing the program as rapidly as desired. Track maintenance forces were gradually enlarged but a serious shortage in ties then developed, which has only recently been cleared up. The situation is now such that it is hoped in the near future to maintain tie renewals at the rate of not less than 12,000 per month.

The problems of securing and holding personnel under present conditions are of major importance, and it has been necessary to raise age limits and reduce experience requirements. It is anticipated that the War Manpower Commission's Employment Stabilization Plan, recently made effective in this area for all essential activities, and to which the Company subscribes, will improve the situation. Because of the character of the work and types of equipment operated, women have not been employed in train or motor coach service. In clerical work men have been largely replaced by women, the policy being to shift men to the heavier jobs when their work can be satisfactorily handled by women. Women



FREIGHT BEING MOVED BY 44-TON 380-HP DIESEL ELECTRIC LOCOMOTIVE
Trolley Actuates Wigwag Signals at Highway Crossings

and is of material help in meeting the present situation. Much of the older substation equipment, which was to have been scrapped, had to be put back in service. Some of this was utilized in the construction of three additional portable substations. Materials, especially copper, recovered from abandoned lines have helped greatly in maintaining the electric system.

Maintenance of way and structures, always a major problem, is doubly so now. The situation as to rail and ties has been mentioned, but the maintenance of bridges, buildings, signals, and interlocking plants, together with much new construction,

are employed in the shops in many capacities, and as operators of interlocking towers.

Employees entering train service, both at normal times and at present, are required to complete a thorough course of instruction. In other departments, new employees were generally required to meet experience requirements and were not given a course of training such as was given those entering train service. However, inexperienced employees are now accepted in all departments and trained. There are now about 6,000 employees in service, as compared to 4,100 in 1941. The present average turnover amounts to about 425 employees per month, or 7 1/4% of the total, which requires interviewing of about 1,200 persons a month by the Personnel Department.

Equipment is another important factor involved. The Company has had 90 motor coaches on order for over a year. An allocation from the ODT for 30 of these was secured and they are now in service. An allocation was also obtained for two 44-ton diesel electric switchers, which were recently placed in service. A gas electric passenger coach has been converted for use as a switching locomotive by reducing its over-all length from 72 ft to 43 ft. Work is now under way on four additional such units.

Despite heavy and continued use and shortage of parts, it has been possible to hold the "out-of-service" equipment down to about 8% of the total; this has been due in a large measure to the amount of new equipment secured and to the work done on the older equipment under the rehabilitation program.

OLD POWER EQUIPMENT IN SERVICE

Power consumption is now about 40% greater than in 1940. Prior to the war a program of conversion of manually operated substations for automatic operation and installation of additional units of equipment had been undertaken. This was recently completed,

is also greatly complicated by war conditions. This subject alone constitutes a most interesting story. Purchase and use of materials and supplies now present an apparently infinite number of complications. The necessity of training inexperienced help, of conforming to rules and regulations in ever increasing numbers, coupled with increased business, has created a situation in the general auditor's office almost as complex as the traffic problem.

TREMENDOUS INCREASES HANDLED SINCE PEARL HARBOR

It is worthy of note that despite the necessity for increasing the total number of employees approximately 50%, and for replacing a substantial percentage of experienced employees with personnel that was to a large extent inexperienced, it has been possible to handle the tremendous increase in business that has occurred since Pearl Harbor. In this period gross revenues have more than doubled, passenger traffic has increased 68%, and freight traffic, measured in gross ton-miles, has increased altogether 180%.

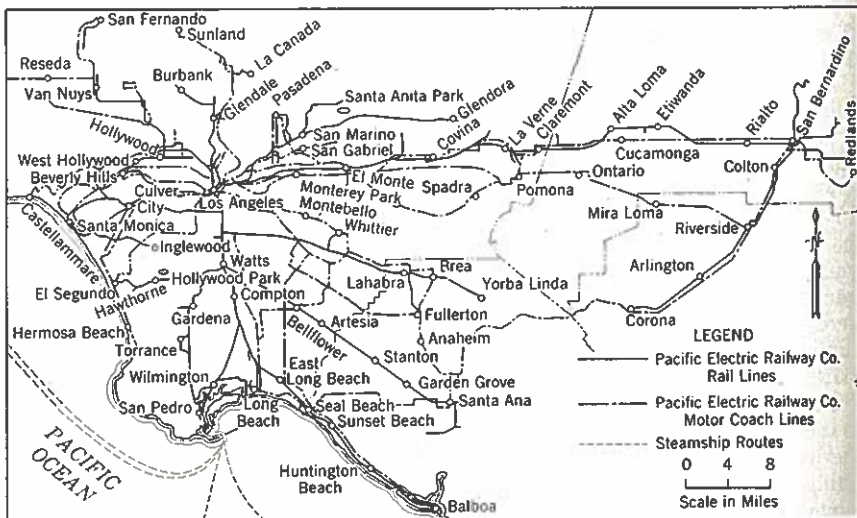


FIG. 2. RAIL AND MOTOR COACH LINES OF THE PACIFIC ELECTRIC COMPANY IN THE LOS ANGELES AREA