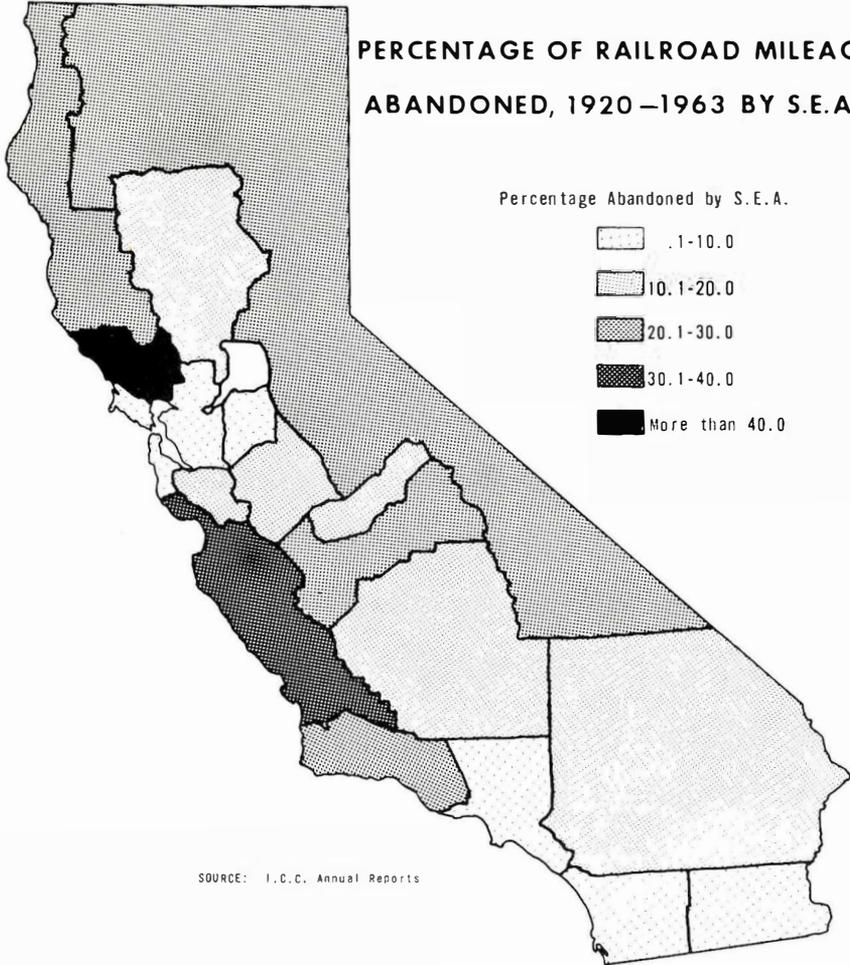


PERCENTAGE OF RAILROAD MILEAGE ABANDONED, 1920-1963 BY S.E.A.

Percentage Abandoned by S.E.A.

-  1-10.0
-  10.1-20.0
-  20.1-30.0
-  30.1-40.0
-  More than 40.0



SOURCE: I.C.C. Annual Reports

THE AREAL DISTRIBUTION OF RAILROAD ABANDONMENTS IN CALIFORNIA SINCE 1920

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THE HISTORY OF THE RAILROAD network of the United States can logically be divided into two broad periods. The first period, one of network expansion, extends from 1830 to 1916. During these years, the country's rail route mileage expanded each year without interruption until a peak of over 254,000 miles was achieved.¹ Since then the trend in railroad route mileage has been downward, and the figure today is closer to 210,000 miles.² Since some new construction took place after 1916, well over 40,000 miles have been abandoned since that date.

The history of California's rail networks shows a similar pattern of change. The peak of approximately 8,400 miles was achieved a few years after the national peak. The general contraction of the mileage since then has brought the current figure to about 7,000 route miles.³ The areal distribution of the approximately 1,500 route miles abandoned between 1920 and 1963 is the subject matter of this study. The purpose of the paper is to explain the areal variation in the rate of abandonment. It is hypothesized that this variation can be explained by differences in the characteristics of areal units in the state.

STUDY PROCEDURES AND LIMITS

At this point, explanations about the procedures and limits of the study are in order. First, data limitations dictated the temporal limits of the study. No published national data is available before 1920, and the Interstate Commerce Commission (I.C.C.) stopped publishing this information after 1963.⁴ Data for California alone is available for more recent dates, but the desire for comparability of results for California with those of the nation as a whole made 1963 a logical place to stop. More recent abandonments are briefly mentioned, however, near the end of this paper. Second, between 1920 and 1942 each abandonment case was reported in full in the I.C.C.'s *Finance Reports*, and valuable data on causes of abandonment was gleaned from this source. The areal units used in this study are Bogue and Beale's State Economic Areas, using the earliest classification available, that for 1950.⁵ These units, rather than counties, were used because they are relatively uniform areas and because they are appropriate to the scale of generalization desired. Noncommon carrier rail mileage, such as most logging lines, was not included in the study. Last, it should be noted that Interurban abandonments are also excluded from consideration. This exclusion was based on the fact that Interurbans largely had a different technology, function, and locational pattern than the so-called steam railroads, and thus should logically be studied separately.⁶

BACKGROUND TO ABANDONMENTS

One characteristic of the United States rail network at the beginning of the study period constitutes an important background to this study. The very uneven distribution of traffic densities within the rail network at this time was very striking. A 1928 study showed, for example, that 28 percent of the nation's route miles carried less than 2 percent of the freight ton-miles. About 40,000 route miles that year carried less than 100,000 ton-miles per mile of track annually.⁷ This is significant, because it was highly doubtful whether any of this mileage was being profitably operated. Thus, even during the prosperous twenties, about one-sixth of the nation's mileage was probably submarginal. These lines were obviously prime candidates for abandonment, and any further decrease in their traffic would constitute a considerable managerial incentive to work for their withdrawal from service.

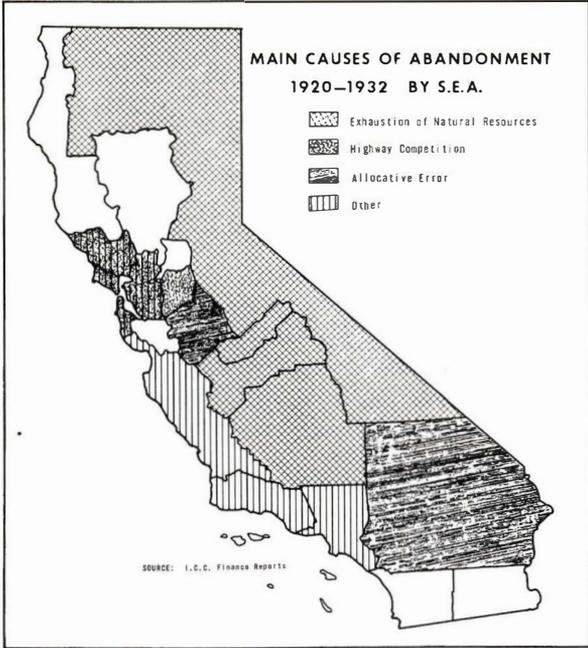


FIGURE 1

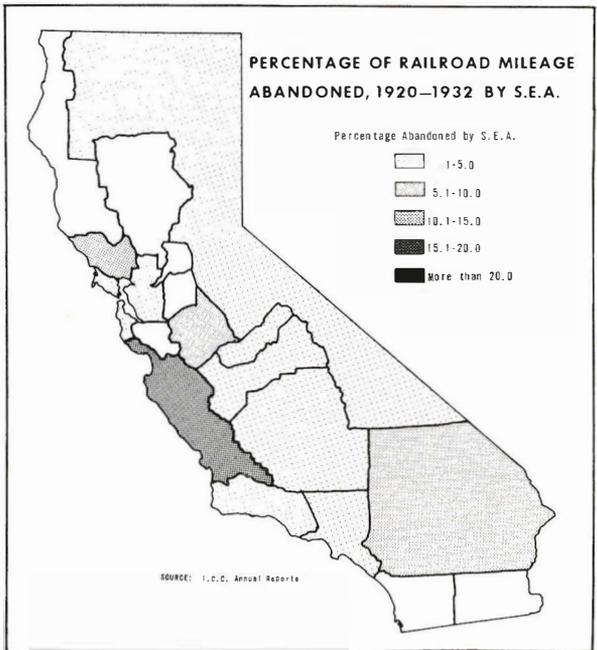


FIGURE 2

Several post-1920 developments led to traffic decreases on many of these marginal lines and thus led to their abandonment. The most important of these developments was the rise of other forms of transportation that diverted considerable rail traffic. Highway transportation was by far the most important of these modes, but pipe lines and barges also were effective in places. The truck took advantage of certain railroad weaknesses, such as slow speed, high costs for small and short shipments, and route inflexibility to divert considerable traffic, especially after about 1926. Passengers were also diverted to the highways in large numbers, primarily to private automobiles. This type of diversion, then, constituted a prime cause of abandonment for formerly marginal or submarginal lines.

The depletion of natural resources also led to a large number of abandonments. Many lines were built primarily to serve areas of lumber or mineral production, and disinvestment was often the only logical choice after the depletion of the resource. Such abandonment was a normal part of railroad network change well before 1920.

Several other causes of abandonment should also be mentioned. The recognition of an error in originally constructing a line, here called an allocative error, is one. Many investors were overoptimistic about the traffic prospects of line extensions, and the resulting abandonments were common well before 1900. The abandonment of one of two essentially parallel lines, here referred to as network rationalization, often followed either mergers or agreements for joint use of a section of track. The relocation of an important shipper and increased cost of operation have also led to abandonment. It should be noted that more than one cause of abandonment was involved in many cases.

Just under 1,500 miles of railroad were abandoned in California between 1920 and 1963. This figure represents 17.8 percent of the 1920 mileage. The comparable figure for the conterminous United States was just over 15 percent. The somewhat higher figure for California can be, at least partially, attributed to the very high rate of abandonment in southeastern California and the state's relatively sparse base year (1920) network. A total of 142 segments was abandoned, with an average length of just over 10 miles. The length of individual lines abandoned varied from 169 miles for the Tonopah and Tidewater Railroad (139 miles in California) to several only a fraction of a mile long.

In order to study the changing distribution of abandonments, the study years were divided into three periods. This division was based on findings for abandonment data for the conterminous United States. The first dividing line, between 1932 and 1933, marked a change in the major cause of abandonment, from the exhaustion of natural resources to highway competition. Since causal data was not available after 1942, the second division between periods had to be made on a different basis. The division was based on a great rate of change in the national abandonment frequency curve that occurred between 1943 and 1944.

ABANDONMENTS, 1920-1932

A total of 241 miles of railroad was abandoned in California between 1920 and 1932, approximately 3 percent of the 1920 mileage. This means that only about 20 miles a year were abandoned, on the average. Such a low figure is not surprising when it is remembered that railroads constituted a virtual overland transportation monopoly during most of this period.

The distribution of the leading causes of abandonments illustrates this situation quite well (Figure 1). As was true nationally, the leading cause was the exhaustion of natural resources, which was involved in approximately 38 percent of the mileage.⁸ Almost as much mileage was abandoned upon recognition of an allocative error in originally constructing a line. These two causes of abandonment were dominant in most parts of the state. Highway competition was a cause of abandonment in only 16 percent of the mileage, and appears as a co-leader in two areas around San Francisco Bay. This illustrates both the late efficacy of intercity truck competition and the fact that it first became effective in and around urban areas. A large variety of miscellaneous causes, or cases where the cause was unclear, accounted for the rest of the abandonments.

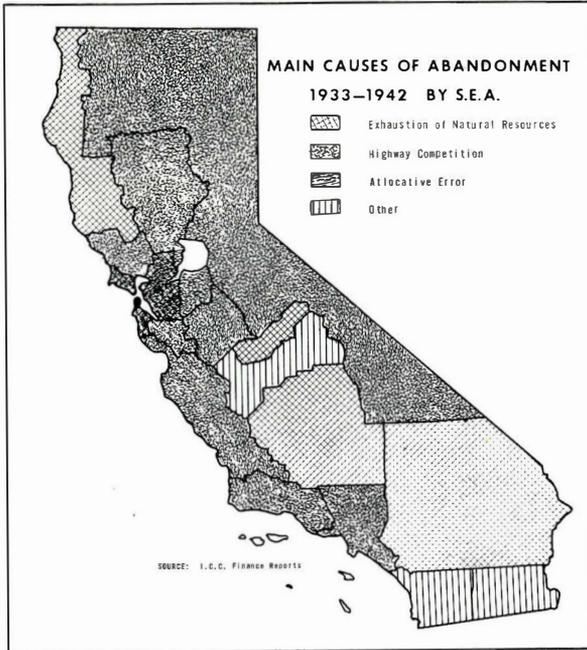


FIGURE 3

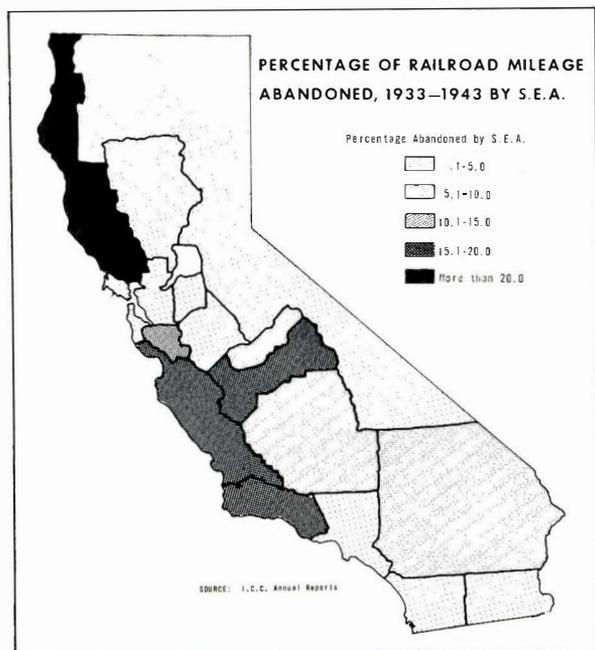


FIGURE 4

The map showing the percentage of rail mileage abandoned by State Economic Area (S.E.A.) illustrates this general lack of abandonments quite well (Figure 2). Only in the South Central California Coast Area was as much as 10 to 15 percent of the 1920 mileage abandoned. This relatively high rate is largely attributable to a single abandonment, the Pajaro Valley Consolidated Railroad, in the northern part of the area. Unfortunately, the cause of this abandonment was not clear from the record in the *Finance Reports*, one of the few cases where this was true.⁹ It appears likely, however, that an allocative error in construction was involved. The low original mileage in this largely mountainous S.E.A. is also important to the result.

Three other S.E.A.'s had between 5 and 10 percent of their mileage abandoned. Most of the abandonment in the North Central California Coast Area, some 36 miles, can be ascribed to a network rationalization program. A formerly competitive line to the Southern Pacific, the Northwestern Pacific, had become its subsidiary. Thus lines that formerly duplicated one another were "rationalized."¹⁰ It should also be mentioned that truck competition had lowered traffic levels sufficiently so that such a step became highly desirable. In the other two areas, some lengthy lines to unsuccessful mineral developments accounted for most of the mileage abandoned.

ABANDONMENTS, 1933-1943

The pace of abandonment increased greatly during the second period. Almost one-half of the 1920-1963 mileage abandoned, 715 miles, was withdrawn during these eleven years. The economic pressures of the Great Depression constituted a great incentive to cut fixed costs. In addition, truck competition became effective in all the state's S.E.A.'s. In places, trucks even replaced railroads in mining or lumbering operations. In general, highway competition changed both the rate and the distribution of abandonments.

The map of main causes of abandonments shows these changed conditions effectively (Figure 3). In those cases up to 1942 for which causal information is available, fully 56 percent of the mileage was abandoned, at least partially, because of truck competition. This cause led in many parts of the state, including the Los Angeles area, parts of the Central Valley, and in the Sierra. The exhaustion of natural resources was now the second leading cause of abandonment, contributing to one-third of the mileage. In the Northern California Coast Area and the Upper San Joaquin Valley and Tulare Basin Area, the exhaustion of timber resources led, while in the San Bernardino-Riverside Standard Metropolitan Area (S.M.A.), a long mine branch accounted for most of the mileage.

The percentage abandonment map reflects the higher general rate of abandonment and the change in its distribution (Figure 4). The North and North Central California Coast Areas had the highest rates. In the former, three long segments to areas of timber exploitation were abandoned, two because of resource exhaustion and one because of the diversion of traffic to trucks. The original sparse rail network of the area was basic to this high rate. In the North Central Coast Area, a continuation of the Southern Pacific-Northwestern Pacific rationalization policy and increased highway competition resulted in a high rate.

The Southern and South Central Coast Areas, along with the Fresno S.M.A., also had relatively high percentages of abandonment. The Southern Coast Area is the most interesting, as fully eleven segments were involved. Most of the mileage consisted of the piece by piece abandonment of the narrow-gauge Pacific Coast Railroad in and near the Santa Maria Valley. This line was greatly affected by truck competition, but its transfer problem was also a factor. Most of the abandonment in the South Central Coast Area constituted the northern extension of this same railroad. In Fresno County, the abandonment of the 56-mile San Joaquin and Eastern Railroad, built primarily for bringing supplies to the site of dam construction, dominated the total.¹¹

The next map summarizes the data on causes of abandonment that was available from I.C.C. sources from 1920 to 1942 (Figure 5). Highway competition was the overall leader, accounting for about 44 percent of the mileage. In general, abandonments in urban and largely agricultural parts of the state were caused by highway

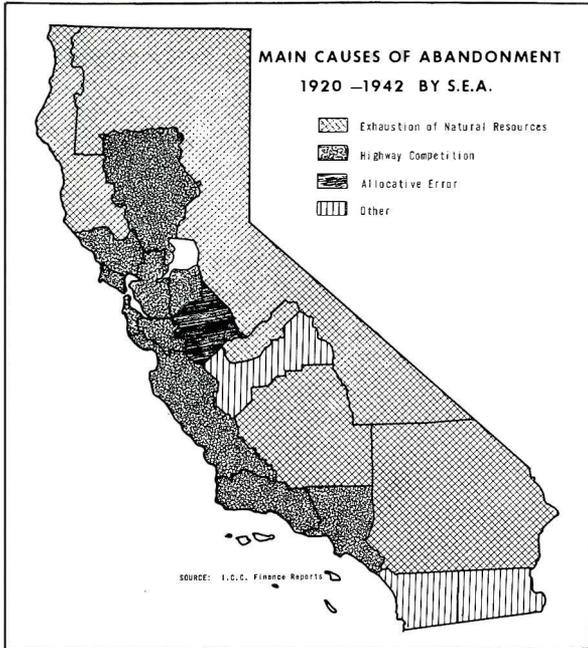


FIGURE 5

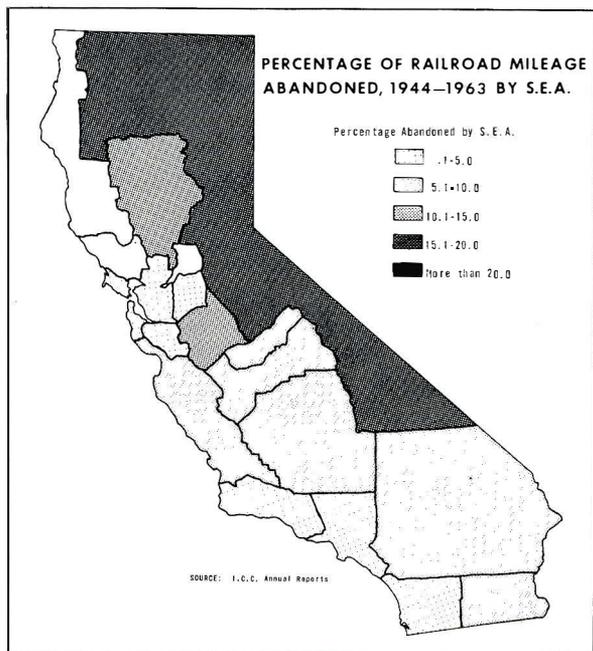


FIGURE 6

competition. In most of the rest of the state, where resource exploitation is an important part of the economy, the exhaustion of these resources was the leading cause. The seeming exception in the southern San Joaquin Valley is misleading, as most of the abandonments here took place in the Sierra portion of these areas.

ABANDONMENTS, 1944-1963

Some 535 miles of line were abandoned in California during the last period. Three outstandingly long cases accounted for fully 55 percent of this total. These three were the 78-mile Yosemite Valley Railway in Mariposa and Merced counties, the 139 miles of the Tonopah and Tidewater in Inyo and San Bernardino counties, and 75 miles of narrow-gauge Southern Pacific track in Inyo County. Fortunately, causal information on these three lines is available, something that is not true of the other abandonments of the period. In general, it is safe to assume that truck competition was still very important in abandonment, as was resource exhaustion. In addition, rapidly rising rail costs added a new reason for rail abandonment.

The East and North California Mountain and Valley Area had the highest rate of abandonment during the third period (Figure 6). Five long abandonments here had a combined total of 256 miles. Inyo County alone had 130 miles because of the Tonopah and Tidewater and Southern Pacific narrow-gauge abandonments. In both these cases, the decrease in mineral production was the basic cause, with a large supplemental role for highway competition.¹² The 52 abandoned miles of Yosemite Valley Railroad in this S.E.A. can largely be ascribed to a decline in lumbering activity.¹³ Two other long abandonments in the north of this S.E.A. were also most probably brought about by timber depletion. Spatially, then, a high rate of abandonment was associated with a decline in the main economic activity in parts of the area.

The Sacramento Valley and Lower San Joaquin Valley Areas were also quite prominent. In the former, most of the mileage withdrawn consisted of Southern Pacific branch lines in agricultural zones. It appears that this company undertook a systematic program here to eliminate many parts of a dense rural rail network more appropriate to horse and wagon days. The majority of the mileage abandoned in the San Joaquin Area consisted of a part of the Yosemite Valley line, and, as previously mentioned, was largely attributable to the depletion of timber.

SUMMARY MAP, 1920-1963

The summary map (page 34) shows the distribution of abandonments during the whole 44-year study period. Few areas in the state had less than a 10 percent rate, and very high rates were also rare. Only the North Central Coast Area had one exceeding 40 percent; this high rate was brought about by the simultaneous operation of resource depletion, a rationalization program, and effective highway competition. The South Central Coast Area had a somewhat lower rate. Areally, abandonments here were associated with a sparse original network in a largely mountainous S.E.A. and high rates in two agricultural valleys as a result of highway competition and (probably) an allocative error.

It is interesting to note that most of the Central Valley experienced a lower rate of abandonment than adjoining areas. Even Fresno County had a high rate only in its Sierra portion. In general, these areas had a higher original route density than nearby S.E.A.'s and abandonment here was largely associated with highway competition. Highway traffic diversion, because of its nature in progressively diverting a larger range of commodities over time, usually takes much longer to lead to abandonment than resource depletion. Logically, then, much higher rates can be expected here in the future. In addition, the leading urban areas also had low rates. These areas were, of course, appropriating an ever increasing share of the state's economic activity during the period, and the incentive to abandon was thus often missing. With the exception of the San Diego S.M.A., these areas also had a high 1920 rail density.

CONCLUSIONS

It appears, then, that spatial variations in the rate of abandonment can be associated with differences in areal characteristics. In particular, the nature of the dominant

economic activity of an area and its fortunes, the effectiveness of truck competition, the rate of growth, and the nature of the 1920 rail network are important variables in this explanation.

I would like to close with some observations on the likely future course of abandonments. Abandonment since 1963 has proceeded at a very moderate rate, with a total of about 100 miles withdrawn from service. I expect, and indeed hope, that this rate will greatly increase in the future. The railroads of the nation are burdened with too many unprofitable lines that are no longer needed. A vigorous abandonment policy should be followed so that they can restrict themselves to the function they perform so well, the line haul. If this policy is followed, the future pattern of abandonments will be very much like that of the network of today. Eventually the state should have perhaps 2,000 miles of railroad. The result of this great disinvestment will be, I believe, an economically sound railroad network. California and the nation will be better off for it.

REFERENCES

¹ United States Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1957* (Washington, D.C.: U.S. Government Printing Office, 1960), p. 429. Note that throughout this paper mileages refer to route miles, not total miles of track.

² Association of American Railroads, *Yearbook of Railroad Facts* (Washington, D.C.: Association of American Railroads, 1969), p. 60.

³ For data on state mileages, see for example the Association of American Railroads' "A Chronology of American Railroads" (n.d.).

⁴ This material was published in the appendices of the I.C.C.'s *Annual Reports*.

⁵ Donald J. Bogue and Calvin L. Beale, *Economic Areas of the United States* (New York: The Free Press of Glencoe, Inc., 1961). Note that the term Standard Metropolitan Area rather than Standard Metropolitan Statistical Area applied in 1950.

⁶ The problem of which railroads to classify as Interurbans was solved by accepting the listing of such lines found in George W. Hilton and John F. Due, *The Electric Interurban Railways of America* (Stanford, Calif.: Stanford University Press, 1960). The considerable mileage of Pacific Electric and Sacramento Northern trackage abandoned since 1920 is not, therefore, included in this study.

⁷ Harold G. Moulton and Associates, *The American Transportation Problem* (Washington, D.C.: The Brookings Institution, 1933), p. 159.

⁸ Multiple causes of abandonments were common. In these cases, the mileages involved were placed in more than one category. Thus the percentage figures for the different causes of abandonment do not add up to 100.

⁹ See *Abandonment of Operation by Pajaro Valley Consolidated Railroad Company*, 145 I.C.C. 511.

¹⁰ For example, see two cases, both entitled *Northwestern Pacific Railroad Company Abandonment*, 158 I.C.C. 736 and 193 I.C.C. 416.

¹¹ *San Joaquin and Eastern Railroad Company Abandonment*, 193 I.C.C. 217.

¹² David F. Myrick, *Railroads of Nevada and Eastern California* (Berkeley, Calif.: Howell-North Books, 1962), 2 vols., pp. 209-210 and 589-593. The T & T was authorized for abandonment in 1946, but had not been in operation for several years. The date of I.C.C. authorization for abandonment is used as a basis for temporal classification throughout this paper.

¹³ H. Johnston, *Railroads of the Yosemite Valley* (Long Beach: Johnston-Howe Publications, 1963), p. 72.