Interurban Railways and Urban America

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Abstract

Electric interurban railways emerged as a new transportation alternative for a brief period in the early decades of the twentieth century. The extent of this development varied widely, with some states getting extensive networks and others having little or nothing. Where present, interurbans shaped urban growth. Larger cites grew more rapidly in states with more interurbans. In Indiana, populations of cities and towns served by more interurban lines increased faster. Interurbans appear to have been associated with more suburban development in large metropolitan areas. The growth of the greater Los Angeles Angeles area was shaped by the vast Pacific Electric interurban system. Those cities that had interurban service grew at a faster pace than the rest of the area in the early decades of the twentieth century.

Introduction

The electric interurban railways were a fascinating but short-lived transportation innovation in the early twentieth century. The lines of the newly developed electric streetcars were extended beyond the cities into rural areas and on to neighboring urban areas. The small city trolleys were replaced by larger, faster equipment. The booming interurbans provided improved mobility for millions of urban and rural residents alike. But by the end of the 1930s, most of the interurbans had disappeared, displaced by the automobile.

Developments in transportation have greatly affected how cities in the United States and elsewhere have grown. Indeed, the development of urban America is often divided into epochs reflecting new forms of transportation such as the steamboat and the railroad. The electric interurban railway can be viewed as a small example of such a transportation innovation. Indeed, Borchert (1987) refers to the period from 1900 to 1930 as the “minor epoch” of the electric interurban.

Two characteristics of the interurban era make this an especially useful example for examining the relationships between transportation and urban development. The period of the interurban’s ascendancy was brief and relatively well-defined, making it
possible to consider the relationship of urban areas to the interurbans before, during, and after. In addition, the development of interurbans in the United States was highly uneven, extensive in some parts of the country and negligible or even nonexistent in others. This makes possible comparisons of urban development in areas with and without substantial interurban service.

This paper examines the relationship between the electric interurban railways and urban areas in the United States. The next section looks at the development of the interurbans and how this varied across the country. Next comes the consideration of the effect of the interurbans on the growth of cities both nationally and, in more detail in Indiana, a state with one of the most extensive interurban systems. Finally the paper examines the effect of interurbans in shaping the development of urban areas. Some general evidence for this occurring nationally is presented first, followed by a more specific examination of the influence of the great Pacific Electric interurban system on the growth Southern California.

The Development of Interurban Railways

The first successful deployment of the electric streetcar came in Richmond, Virginia, in 1888 and these trolleys quickly spread to cities throughout the country, replacing virtually all horsecars and cable cars by 1902 (U.S. Bureau of the Census 1905). It did not take long before lines were built connecting nearby cities and also serving the intervening rural population. These came to be called interurbans. Within the cities, the interurbans typically traveled on rails laid in the streets, often sharing these with the local streetcar lines. Beyond the cities, the interurban tracks would sometimes be laid at the sides of roads and in other locations would follow their own cross-country rights-of-way. Figure 1 shows a picture of an interurban car on a line through the Indiana countryside.

The first interurbans used the same trolley cars as the urban electric streetcar lines. But these soon proved inadequate for the longer distances, higher speeds, and sometimes greater numbers of passengers carried between cities. These were replaced by much larger and heavier cars, first constructed from wood and later from steel, that resembled standard railroad passenger cars. The earlier wooden cars were often especially handsome, even including arched windows, as can be seen in the example from Iowa shown in Figure 2. As the interurban industry evolved, freight became a more important part of their business. Many cars included baggage compartments for express shipments, and additional equipment was devoted completely to carrying freight.

The first interurban lines were constructed during the 1890s, soon after the first electric streetcars ran in Richmond. The real surge in interurban construction occurred in the first decade of the twentieth century, when the majority of the lines were built. Some
additional lines were added during the next decade, but that marked the end of new interurban development.

The electric interurban railways then began to decline, with this mode of transportation disappearing almost as rapidly as it emerged. Most interurban companies never made large profits. As early as the 1920s, facing increased competition from automobiles, some interurban lines were dropped. With the economic problems resulting from the Depression, the 1930s brought wholesale abandonments, with the largest portion of the industry gone by the start of World War II. Only a handful of lines continued operation after the war, with most of those remaining being closed down by the early 1960s. Only one of the original electric interurban lines remains in operation as a passenger carrier today. This is the South Shore Line running from Chicago to South Bend, Indiana. In many respects it has taken on more of the characteristics of an urban commuter rail line, but it still retains its historical origins running through the streets of Michigan City, Indiana.¹

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¹ The definitive history of the interurban industry is Hilton and Due (1964). Conway (1908-1909) provided a contemporaneous survey of the industry. A comprehensive popular account was provided by Middleton (1961).
The development of the electric interurban railways was very uneven across the United States. The 1917 Census of Electrical Industries (U.S. Bureau of the Census 1920) reported the number of miles of interurban railways by state. Virtually all of the interurban lines had been developed by that time, so this provides a good measure of the amount of interurban development among the states.

Ohio and Indiana had the most extensive interurban systems, with 2,781 and 1,798 miles of interurban lines respectively. The extent of the interurbans in these states is illustrated by the map in Figure 3. Illinois and Michigan were 2 other Midwestern states with over a thousand miles of interurban lines. New York and Pennsylvania had comparable interurban development in the East along with California in the West. The remainder of the Midwestern and Northeastern states and the states of the Pacific Northwest had moderate interurban development. Interurbans were relatively rare in the remainder of the nation with the exceptions of Texas and Utah.

Table 1 shows the distribution of the number of states by the number of miles of interurbans. As noted, 7 states had over 1,000 miles of interurban lines. At the other extreme, 21 states, nearly half, had fewer than 100 miles. The remaining 20 states fell somewhere between. Of course if one were to take into account either the population or
Figure 3. Interurban Lines in Indiana and Ohio 1908 (Electric Railway Journal via Internet Archive Book Images and Flikr).

The land areas of the states in making the comparison, rankings would be somewhat different but the degree of variation among the states would remain comparable. Considering miles of interurbans per 1,000 population, there were 7 states with greater than 500 miles and 20 states with fewer than 100 miles per thousand. For interurban miles per 1,000 square miles of area, 8 states exceeded 300 miles and 17 states had less than 1 mile per thousand square miles. And the correlations of interurban miles with miles per population and miles per area were 0.54 and 0.70 respectively.

The obvious questions is what factors accounted for the wide variation in the number of miles of interurban railways developed in the different states? During the interurban era, contemporaries offered hypotheses. The census report Street and Electric Railways 1902 (U.S. Bureau of the Census 1905) suggested that conditions favoring the development of interurbans included dense population, connection with a large city, and prosperity. These factors were echoed by Van Osdol (1926). A subsequent 1907 census report (U.S. Bureau of the Census 1910) stated that “the rapid development...of interurban railways in Indiana seems...to prove that a prosperous agricultural population, not too far removed from urban centers, is quite as ready to use transportation facilities.” In a volume on the economics of interurban railways, Fischer (1914) argued that the populations of the terminal cities and the intervening rural
population density were keys to the economic success of interurbs. Hilton and Due (1964) later said that cities, dense rural population, high farm income, and abundant medium-sized towns favored interurban development in Ohio.

To test these hypotheses regarding factors associated with interurban development, a simple multiple regression model was developed. The dependent variable is the density of interurban railways in a state, the miles of interurbs divided by the land area. The first predictor is the rural population density in 1900, at the beginning of the period of major interurban development. This is the rural population divided by the land area of the state. (U.S. Bureau of the Census 1921). While this includes the land devoted to urban use, that is a very small portion of the total land area so the result is a reasonable measure of rural population density. The second predictor is then the urban population in 1900, the population in those cities and towns that might be served by interurbs. The average value of farms in 1900 was taken as a measure of rural prosperity (U.S. Bureau of the Census 1975).

The regression model results are presented in Table 2. This simple model with 3 predictors accounts for over half of the variation in the density of interurban railways by state with an $R^2$ value of 0.58, highly statistically significant. An increase in rural population density of 1 person per square mile was associated with an increased interurban density of 0.42 miles per square mile. An additional urban population of 1,000 led to an increase of 6.8 interurban miles per square mile. Both of these regression coefficients were statistically significant. The coefficient for average farm value was not significant but still suggests increased interurban densities with higher farm values.

As would be expected, the extent of interurban service for cities depended on their size. An examination of cities and interurbs in Indiana confirms this. As mentioned above, Indiana had the second largest number of miles of interurban lines, 1,798 miles. Interurban lines covered much of the state as shown in the map in Figure 3.

<table>
<thead>
<tr>
<th>Number of interurban Railway Miles in 1917</th>
<th>Number of States</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-99 miles</td>
<td>21</td>
</tr>
<tr>
<td>100-299 miles</td>
<td>11</td>
</tr>
<tr>
<td>300-999 miles</td>
<td>9</td>
</tr>
<tr>
<td>1000-1,798 miles</td>
<td>6</td>
</tr>
<tr>
<td>2,781 miles</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: U.S. Bureau of the Census 1920*
This makes Indiana an especially good candidate for looking at cities and the development of interurbans.

Hilton and Due (1964) provided detailed maps and brief narratives enabling the determination of the interurban lines serving each city. The number of lines for each city and town were tabulated, with each line extending outwards counting as 1 line. Thus, an interurban line passing through a town and extending in both directions would be counted as 2 lines. This count of interurban lines is compared with the populations of the cities and towns in 1900 at the start of the period of major interurban development (U.S. Census Office 1901).

Of course the greatest number of interurban lines, 13, converged on Indianapolis, the state capital and the largest city, with a population of nearly 170,000 in 1900. These lines terminated at the greatest station of the interurban era, the Indianapolis Traction Terminal, illustrated in Figure 4.

A tabulation of the number of interurban lines by the 1900 populations of all of the cities and towns in Indiana is shown in Table 3. Of the 7 next-largest cities behind Indianapolis with populations ranging from 20,000 to 60,000, 6 were served by 3 to 5 interurban lines. For those cities in the next smaller group with over 10,000 people, half had this many interurbans and half had fewer, with 1 of those cities not served at all. The smaller cities and towns were far less likely to have more than 2 interurbans
(typically a line passing through the town). And only about a third of the towns in the smallest category having fewer than 3,000 people had any interurban service at all.

The mean number of interurbans increase steadily for the groups of cities and towns with larger populations. The relationships between number of interurbans and population, both for the mean numbers of lines and for the cross tabulation were not surprisingly highly statistically significant.

**Interurbans and the Growth of Cities**

Now to the effects of the interurban railways on urban areas. This section focuses on the relationship between the extent of interurban development and the population
growth of cities, especially the larger cities. This is examined first at the national level with state data, and then looking at the growth of cities and towns in Indiana.

That the growth of cities has been influenced by transportation is obvious. In the United States, the first cities grew at seaports. Most of the earliest cities in the Trans-Appalachian West were along the Ohio and Mississippi Rivers. The railroads were yet another force for urban growth. Two examples of studies show the relationship: In looking at the role of various forms of transportation influencing the growth of cities in the Puget Sound region, Guest (1977) stressed the “longitudinal importance of accessibility in the formation and growth of urban communities.” He found the location of transportation facilities to be associated with faster urban growth. Dahms (1981) showed that in the area around Geulph, Ontario, the use of the automobile caused the smallest settlements to lose establishments and the largest places to have the greatest gains.

The electric interurban railways allowed residents of rural areas and smaller towns to travel more easily and more frequently to the larger cities. Farmers found wider markets for their produce, especially more perishable products such as milk and eggs carried by the interurbans. Participation in social and cultural activities were increased. Educational opportunities expanded as students could travel to newly consolidated schools and even for higher education (U.S. Bureau of the Census 1905; Bogart 1906; Walmsley 1965; Grant 2016). Taylor (1915) suggested that for Homestead, Pennsylvania, the interurban allowed the more affluent to travel to Pittsburgh while

Table 3. Number of Interurban Railways Serving Indiana Cities and Towns by Population in 1900.

<table>
<thead>
<tr>
<th>Population 1900</th>
<th>Number of Interurban Railways</th>
<th>Mean Number of Interurban Railways</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1-2</td>
</tr>
<tr>
<td>Less than 3,000</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>3,000-10,000</td>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td>10,000-20,000</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20,000-59,007</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>169,164</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>49</td>
</tr>
</tbody>
</table>

Significance: $Chi-squared = 163.36, p < 0.001$

Sources: Hilton and Due 1964; U.S. Census Office 1901
those less well-off could not, which resulted in various facilities not being developed in Homestead.

Among the more important developments was the use of the interurban to travel to the larger cities for shopping (U.S. Bureau of the Census 1905; Due 1966). The general consensus was that this increased retail activity in the larger cities, causing declines for the smaller towns. Census reports described the increase in business for the larger cities (U.S. Bureau of the Census 1905, 1910). Hilton and Due (1964) quoted the manager of the Merchants Association of Detroit saying “the interurbans are the greatest asset that a retail center can have.” Middleton (2001) reported on a 1907 Chicago Tribune article saying that big department stores in large cities almost doubled their trade. On the other hand, business in the smaller villages suffered declines, abolishing country stores (U.S. Bureau of the Census 1905, 1910; Grant 2016).

For the intermediate-sized cities, the effects of the interurbans was more mixed. While they too lost business to the larger cities, they were also gaining trade from the residents of the smaller villages and rural areas (U.S. Bureau of the Census 1905, 1910). Bogart (1906) stated that “a canvas of a number of merchants in some of the smaller towns in northern Ohio seems to indicate that, on the whole, they have gained rather than lost by[the interurban’s] advent.” A report of the Federal Electric Railways Commission (U.S. Federal Electric Railways Commission 1919) quoted from a letter from the head of an Ohio interurban arguing that merchants in smaller towns benefited from being able carry a reduced stock and still provide prompt delivery of goods shipped by interurban from wholesalers in the larger cities. This effectively enabled those merchants to offer a wider variety of goods (Middleton 2001).

The potential effect of the interurbans on the growth of larger urban areas is first examined at the state level. As shown above, the extent of interurban railway development varied widely across the states. The number of miles of interurban lines is compared with the growth in population from 1900 to 1920, the period of interurban expansion, for cities with populations greater 25,000 in 1900 (U.S. Bureau of the Census 1921). Table 4 presents the mean percentage increase in population for those cities in the states grouped by the number of miles of interurban railway lines. The mean percentages increase steadily as the extent of interurban development rises, to highs of 14 and 18 percent for the top groups, while the range is 4 to 10 percent for the states with less interurban development. The differences in the means are statistically significant.

It is important to emphasize that these results and those that follow are not establishing that the presence of the interurbans caused the more rapid population growth in the larger cities in those states. Many other factors could be related to both interurban development and the rates of urban growth. The results in Table 4 illustrate an association between interurban development and the growth of the larger cities that is consistent with interurban influence.
Table 4. Mean Percent Increase in Population from 1900-1920 for Cities with Populations Over 25,000 in 1900 by State and Miles of Interurban Railways in 1917.

<table>
<thead>
<tr>
<th>Number of interurban Railway Miles in 1917</th>
<th>Number of States</th>
<th>Mean Percent Population Increase for Cities over 25,000, 1900-1920</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-99 miles</td>
<td>21</td>
<td>4.0</td>
</tr>
<tr>
<td>100-299 miles</td>
<td>11</td>
<td>8.2</td>
</tr>
<tr>
<td>300-999 miles</td>
<td>9</td>
<td>9.9</td>
</tr>
<tr>
<td>1000-1,798 miles</td>
<td>6</td>
<td>14.1</td>
</tr>
<tr>
<td>2,781 miles</td>
<td>1</td>
<td>18.0</td>
</tr>
<tr>
<td>Significance of Differences</td>
<td>—</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>

Sources: U.S. Bureau of the Census 1920, 1921

The relationship between interurban service and the growth of urban areas is considered in more detail by examining population growth in individual cities and towns. Once again the focus is on Indiana, a state with an extensive system of interurbans serving all of the larger and medium-sized cities. The first decade of the twentieth century, the period of major interurban development, saw the development of the large department stores in Indianapolis (Smerk 2001). W. E. Balch, the manager of the Indianapolis Mercantile Association, said in a letter that “no factor has done so much to increase downtown trade as have the interurban lines.” (U.S. Federal Electric Railways Commission 1919) Austin (1907) quoted the Indianapolis News saying, “It is a great thing for any city to have an extensive territory with several hundred thousand people added to its trading population, and that is what the interurban roads have done for Indianapolis.” Austin also noted that merchants in Indianapolis provided free fares to those buying $25 or more in merchandise and that 5,000 loaves of bread were shipped to surrounding cities and towns. As discussed above, the effects of the interurban on intermediate-sized cities was mixed. The head of the Indianapolis Merchants Association said that trade lost by outlying towns would be made up by increased sales to residents of hamlets and rural areas, possibly to reduce anger directed against Indianapolis for its growing market share (Austin 1907). The Census reported that Columbus, Indiana, merchants saw increased trade to people in smaller villages and rural areas. Similarly, merchants in Greenfield and Peru saw losses more than made up by increased rural trade (U.S. Bureau of the Census 1910).
Another effect of the interurbans in Indiana came in increasing the extent of labor markets (Smerk 2001). C. P. Ryan of the Indiana Railway and Light Company said that the interurbans allowed laborers in intermediate towns to take employment in larger cities (U.S. Federal Electric Railways Commission 1919). The discovery of natural gas in the 1890s led to a manufacturing boom in smaller towns. “Members of farming families could get to work in the mills at Anderson, Elwood, Gas City, and Kokomo, for example, and could still live at home, riding to and from work on the interurban cars.” (Central Electric Railfans Association 1950).

For cities and towns in Indiana, the number of interurban lines serving each urban area is compared with the percentage increases in population during each decade from 1890 to 1940. Table 5 shows the mean percentage change in population for cities served by different numbers of interurban lines. For each decade, the values greater than the mean for all cities are highlighted in bold. For the decades from 1900 to 1930, the period during which the interurbans played a major role, the highest percentage changes were for the cities with the most interurbans, 5 and 13 (Indianapolis being the latter, of course). These cities grew more slowly than other cities before 1900, before the interurbans were a significant factor, and after 1930, when the interurbans went into decline and were being abandoned. While it is again important to point out that this does not prove that the interurbans were the cause of the more rapid growth, this pattern of association over time strongly suggests that they may well have played a role.

Table 5. Mean Percent Change in Population for Cities and Towns in Indiana by Number of Interurban Railways, 1890-1940.

<table>
<thead>
<tr>
<th>Number of Interurban Railways</th>
<th>Mean Percent Change in Population (Values greater than mean for all cities bold)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1890-1900</td>
</tr>
<tr>
<td>0</td>
<td>43.3</td>
</tr>
<tr>
<td>1-2</td>
<td>105.5</td>
</tr>
<tr>
<td>3-4</td>
<td>90.4</td>
</tr>
<tr>
<td>5</td>
<td>39.2</td>
</tr>
<tr>
<td>13</td>
<td>60.4</td>
</tr>
<tr>
<td>All Cities and Towns</td>
<td>82.8</td>
</tr>
<tr>
<td>Significance of Differences</td>
<td>—</td>
</tr>
</tbody>
</table>

Sources: Hilton and Due 1964; U.S. Census Office 1901; U.S. Bureau of the Census 1921,1931, 1952
Interurbans and the Development of Urban Areas

The presence and location of various modes of transportation have always been credited with shaping the development of urban areas, from the strings of suburban settlements along commuter rail lines to the expansion of urban areas with the extension of horse-drawn and electric streetcar lines (Warner 1962; Glaab and Brown 1976; Jackson 1985). During their brief heyday, interurban railways played a similar role in influencing the growth of at least some urban areas. This section examines this effect, looking first broadly at metropolitan areas across the United States and then in more detail at the growth in the Los Angeles area.

Numerous observers have noted that the interurban railways extended service to suburban areas, increased commuting areas, and fostered the growth of suburbs (U.S. Bureau of the Census 1905; Schnore 1957; Due 1966). A census report stated, “One of the first effects of the application of electricity to street-railway traffic was to develop suburban passenger business and to build up widely scattered suburban districts.” (U.S. Bureau of the Census 1910). This effect was not limited to the United States. McKay (1976) said that tramways extending into the countryside allowed rural residents to work in cities in Germany and Belgium.

According to Middleton (1961), the interurbans “established the direction of suburban growth.” Glaab and Brown (1976) observed that “cities spread out along the lines of the trolleys and inter-urban railroads.” The interurbans increased the demand for homes farther out, increasing land values (Austin 1907). Bogart (1906) described how interurbans built up suburban areas around Cleveland, Columbus, and Cincinnati and caused land values to rise. Smerk (2001) suggested that the primary effect of the interurbans in Indianapolis occurred during the first decade of the twentieth century, before the growth of automobile use, expanding the commuter shed and increasing suburban development. In an early example, an interurban line was extended to serve a town to the north which later became a part of the city as Indianapolis expanded in that direction (Central Electric Railfans Association 1945).

The initial examination of the effect of interurbans on suburban growth is at the national level, looking at metropolitan areas throughout the United States. The first issue in doing this is the definition of what constitutes the suburban areas for purposes of looking at the rates of population growth. The standard approach is to consider as the suburbs the portions of metropolitan areas outside the major city or cities at the center of those areas, the rings around the cities. This is far from ideal, as those cities vary widely with respect to the extent of the urban area (and even areas not urban) included within their boundaries, and the boundaries of many cities change over time with annexation. Nevertheless this is the best that is possible with available data and reflects standard practice in examining such questions.
Next is the matter of establishing the extent of the larger urban or metropolitan area beyond the major city or cities to obtain measures of the suburban portion. Two sources of data were considered. The Bureau of the Census began defining Metropolitan Districts in 1910 to reflect these more extensive urban areas and continued to do so through 1940 (Thompson 1948). These consisted of the major cities plus adjacent cities and minor civil divisions meeting minimum density thresholds. The areas changed with each census but populations for Metropolitan Districts from the previous censuses have also been reported, making consistent measurement of change possible. Such areas were defined in 1910 for cities with populations greater than 100,000. However, the Metropolitan District boundaries were less inclusive than would be ideal for examining suburban growth over time.

In the 1940s the Bureau of the Budget first defined Standard Metropolitan Areas, the forerunners of today’s Metropolitan Statistical Areas. These used entire counties to delineate the areas (with the exception of New England, where towns were the basic units). The 1950 Census was the first to report data for these areas. The Housing and Home Finance Agency sponsored a report by Bogue (1953) that assembled data for the 1950 Standard Metropolitan Areas from 1900 to 1940. These areas are more inclusive than the Metropolitan Districts and the same areas are being used each year. These have been chosen for the present analysis.

This study looks at population changes in the Standard Metropolitan Areas from 1900 to 1930. The decision was made to include those Standard Metropolitan Areas with populations of at least 100,000 in 1900 as it was felt that smaller areas were less likely to see significant suburban development. Five very large areas—New York, Boston, Philadelphia, Chicago, and San Francisco—had suburban commuter rail service provided by steam railroads (Hilton 1967; Jackson 1985). Because such commuter rail was similar to the service that the interurbans could provide but was only practical and developed for the largest urban areas, these areas were excluded from the analysis.

The populations outside the central cities of these Standard Metropolitan Areas, in the metropolitan area rings, were considered to be the suburban populations. The percentage changes of these suburban populations for each decade from 1900 to 1930 are the focus of the analysis. The extent of interurban influence was taken to be the number of interurban lines serving the central cities from Hilton and Due (1964) in the same way this was determined for cities in Indiana.

One further issue complicates the analysis. The rate of growth of a metropolitan area is obviously affected by a variety of factors, making suburban growth dependent on many things beyond the level of interurban service. Presumably metropolitan growth rates also influence the growth of the central cities. So the question should be the extent to which interurbans affect suburban growth beyond the rate of overall metropolitan growth and the growth of the central cities. A multiple regression model is used to predict the percentage rate of growth in the suburban area rings using as
predictors the number of interurbans serving the central cities and the rate of central city growth. The analysis is therefore looking at the influence of interurbans controlling for central city growth.

The results for the regression models predicting the percentage growth of the suburban ring portions of the Standard Metropolitan Areas for each of the 3 decades from 1900 to 1930 are presented in Table 6. Both the number of interurbans and the percentage increase in the central city population were statistically significant in each decade. The models accounted for from 29 to 45 percent of the variation in ring population ($R^2$ from 0.29 to 0.45). The regression coefficients for the number of interurban lines ranged from 2.4 to 3.9, meaning that each additional interurban line was associated with over 2 to near 4 percent greater rate of population growth in the suburban areas, a substantial difference. Of course, as cautioned for the earlier analyses, this cannot establish that the interurbans were the cause of the suburban growth, but the strong association in consistent with such a relationship.

Southern California—the area centered on Los Angeles and served by the largest interurban system in the nation—is the ideal location in which to examine in more detail the effects of interurban railways on the development of metropolitan area. The vast Pacific Electric interurban system stretched from Santa Monica on the Pacific, 15

Table 6. Regression Models Predicting Percent Population Change in Metropolitan Suburban Area Rings, 1900-1930 (standard errors in parentheses).

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Percent Ring Population Change 1900-1910</th>
<th>Percent Ring Population Change 1910-1920</th>
<th>Percent Ring Population Change 1920-1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Interurban Railways</td>
<td>3.210 ***</td>
<td>2.384 *</td>
<td>3.884 ***</td>
</tr>
<tr>
<td></td>
<td>(0.844)</td>
<td>(0.936)</td>
<td>(1.056)</td>
</tr>
<tr>
<td>Percent Central City Population Change in Same Period</td>
<td>0.201 **</td>
<td>0.381 *</td>
<td>0.479 *</td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.147)</td>
<td>(0.197)</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.099</td>
<td>-5.551</td>
<td>7.403</td>
</tr>
<tr>
<td></td>
<td>(5.458)</td>
<td>(6.707)</td>
<td>(6.356)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.453 ***</td>
<td>0.288 ***</td>
<td>0.442 ***</td>
</tr>
</tbody>
</table>

* $p < 0.05$  ** $p < 0.01$  *** $p < 0.001$

Sources: Bogue 1953; Hilton and Due 1964
miles west of downtown Los Angeles, to San Bernardino, over 50 miles to the east. Its lines extended south to Long Beach and continued down to Santa Ana and Newport Beach in Orange County, and also reached north into the San Fernando valley. The extent of this interurban system is shown in the map in Figure 5.

The first Pacific Electric lines were built to Pasadena and Santa Monica in 1895 and 1896. Like interurbans nationally, the bulk of the system was constructed between 1900 and 1910. Final expansion occurred in the following decade, resulting in a system with over 1,000 miles of track. Peak operation in terms of routes and passengers carried came from 1923 to 1927. Figure 6 shows an example of the multiple unit trains that carried the high volumes of passengers. Again, following the experiences of interurbans across the country, ridership declined in the 1930s in the face of the increasing automobile use and the Depression. This was followed by a surge in ridership during World War II with the growth of war-related industries in Southern California and gasoline rationing. But large declines quickly followed, with major abandonments.

Figure 5. Lines of the Pacific Electric Railway 1912 (Wikimedia Commons).
beginning in 1950, and the last line to Long Beach being closed in 1961 (Hilton and Due 1964; Crump 1965; Friedricks 1992).

Fogelson (1967) said that the Los Angeles city streetcar lines and the Pacific Electric “had guided most subdividers and presently reached most settlements” and “were crucial as a means of stimulating the subdivision of the countryside, and the expansion of the metropolis through 1910.” This led Middleton (2001) to conclude that the Los Angeles metropolitan area “was largely built along the lines of the Pacific Electric.” A census report (U.S. Bureau of the Census 1910) said that Pacific Electric lines “reach every suburban town of importance within 35 miles.” This can be seen by looking at the locations of cities as they were established in the region. The Pacific Electric served a four-county area—Los Angeles County, Orange County, San Bernardino County, and Riverside County. Table 7 gives the counts of the number of cities comparing when they were established (the first census by which they had been incorporated) to whether or not they were ever provided with Pacific Electric service (Crump 1965; U.S. Bureau of the Census 1931, 1961, 1972). Most of the cities incorporated by 1920, during the heyday of the interurbans—39 out of 43—were
provided with Pacific Electric Service. But only 11 out of 20 of the cities incorporated during the following decade were on interurban lines.

Land prices soared along the new interurban lines. Assessed values in Santa Monica tripled in the decade after interurban service first came to the city (Crump 1965). Lot prices did much the same in Long Beach (Friedricks 1992). The relationship between the provision of Pacific Electric interurban service and the development of new subdivisions was direct. According to Wachs (1984) “the street railways made it possible for real estate speculators to develop low-density residential estates in outlying sections catering to the obvious preferences of the newcomers.” Henry Huntington, who played the major role in the development of the Pacific Electric, was also a major developer, purchasing land in advance of the construction of interurban lines (Jackson 1985; Friedricks 1992). Fogelson (1967) quoted Huntington as saying in 1904 that “railway lines have to keep ahead of the processions [of settlement]. It would never do for an electric line to wait until the demand for it came. It must anticipate the growth of communities and be there when the homeowners arrive—or they are very likely not to arrive at all, but to go to some section already provided with arteries of traffic.” The value of his Huntington Land Company increased from $100,000 in 1902 to $10,000,000 in 1912 (Glaab and Brown 1976).

Next is the examination of the extent to which the Pacific Electric influenced growth within Southern California. Brooks and Lutz (2014) saw that “because the system was built largely to unoccupied areas, it makes it easier to pinpoint the [Pacific Electric] red cars as a causal mechanism for development.” However they were looking at the effect of the interurban lines on the current pattern of development for which detailed spatially-disaggregated data are available. During the interurban era, the census only reported populations for incorporated cities, not for smaller areas. And

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Table 7. Number of Cities in Four-County Los Angeles Area Ever Served by Pacific Electric by Census by Which City Was Incorporated.

<table>
<thead>
<tr>
<th>Census by Which City Incorporated</th>
<th>Cities Served by Pacific Electric</th>
<th>Cities Not Served by Pacific Electric</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890 or Earlier</td>
<td>15</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>1900</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1910</td>
<td>12</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>1920</td>
<td>10</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>1930</td>
<td>11</td>
<td>9</td>
<td>20</td>
</tr>
</tbody>
</table>

Sources: Crump 1965; U.S. Bureau of the Census 1931, 1961, 1972
since nearly all of the cities in existence up through 1920 were served by Pacific Electric lines, little can be gleaned from a comparison of population growth in those cities with the few that were not. So instead, the rate of population growth in all of the cities with interurban service during each decade is compared with the growth of the remainder of the four-county area, the handful of cities without interurbans and the unincorporated territory of the counties outside any city. This is not perfect: Obviously some parts of the unincorporated territory were served by Pacific Electric lines traversing areas between cities. And by looking at the rate of growth of all cities served by interurbans taken together and the rate for the remaining territory, no statistical analyses are possible. But the results can certainly be informative.

Table 8 presents for each decade from 1890 to 1940 the percentage changes in the populations of the cities served by interurbans and the remaining more-or-less unserved portions of the area, unserved cities and unincorporated territory. During the first 2 decades, the cities with Pacific Electric service grew twice as fast as the unserved areas. The differences were 101 to 42 percent for 1890 to 1900 and 214 to 92 percent during the first decade of the twentieth century, the peak of interurban construction. Differences were much smaller in the following two decades as the automobile started having a significant impact. From 1910 to 1920, the Pacific Electric cities grew only slightly faster, 79 to 62 percent, followed by 123 to 102 percent in the following decade. By the 1930s, the areas not served by the interurbans actually grew more rapidly, at a 35 percent rate compared with 23 percent for the cities with interurbans. This is certainly

Table 8. Percent Population Change in Four-County Los Angeles Area for Cities Served by Pacific Electric During Decade versus Other Areas, 1890-1940.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Number of Cities Served by Pacific Electric During Decade</th>
<th>Percent Population Change</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cities Served by Pacific Electric During Decade</td>
<td>Areas Outside Cities Served by Pacific Electric</td>
<td>Total Four-County Area</td>
<td></td>
</tr>
<tr>
<td>1890-1900</td>
<td>4</td>
<td>101.2</td>
<td>41.9</td>
<td>66.2</td>
<td></td>
</tr>
<tr>
<td>1900-1910</td>
<td>11</td>
<td>214.0</td>
<td>91.7</td>
<td>158.4</td>
<td></td>
</tr>
<tr>
<td>1910-1920</td>
<td>30</td>
<td>79.2</td>
<td>61.8</td>
<td>75.1</td>
<td></td>
</tr>
<tr>
<td>1920-1930</td>
<td>40</td>
<td>123.0</td>
<td>102.3</td>
<td>118.5</td>
<td></td>
</tr>
<tr>
<td>1930-1940</td>
<td>51</td>
<td>22.7</td>
<td>34.9</td>
<td>25.2</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Crump 1965; U.S. Bureau of the Census 1931, 1961, 1972
consistent with all of the other information about the effect of the Pacific Electric on the
growth of Southern California.

Suggesting that those who say that the pattern of development in Southern
California was shaped by the automobile and the freeway have it wrong, Wachs (1984)
said that Spencer Crump was more accurate when he observed that “unquestionably it
was the electric interurbans which distributed the population over the countryside
during the century’s first decade and patterned Southern California as a horizontal city
rather than one of skyscrapers and slums.” And Crump (1965) makes the point that
“when the highways were built, they followed the travel routes already formed for the
electric railroad lines—further shaping the nature of the City of Southern California. In
many cases, the principal automobile arteries directly paralleled the electric tracks.”
Brooks and Lutz (2014) showed that in the Los Angeles area a correlation persists
between contemporary population densities and the locations of electric transit lines
(which they attribute to current zoning reinforcing that persistence).

Conclusions

The development of interurban railways in the United States was very uneven,
with the greatest growth occurring in states with larger urban populations and higher
densities of settlement in rural areas. The larger cities got the most extensive service,
which was be expected and was shown for Indiana. Contemporary accounts suggested
that the interurbans especially benefited the larger cities and these cities grew more
rapidly in states with more interurbans as did the larger cities with more interurban
lines in Indiana. The presence of the interurban lines influenced the growth of urban
areas, providing greater access to suburban areas, promoting faster population growth.
Cities in Southern California served by the Pacific Electric grew more rapidly than other
areas, especially during the early decades of the interurban era.

The interurban era was amazingly brief. The development of the interurbans
peaked during the first decade of the twentieth century. But they were already in
decline only two decades later. The interurban became popular because it was more
convenient and provided greater flexibility than the steam railroad. However the
automobile, which starting coming into widespread use just as the interurbans were
being completed, eclipsed the interurban in terms of convenience. Due (1966) states that
“unfortunately for the electric railroad, all of its advantages were possessed by the
motor vehicle to a much higher degree, once the latter was perfected and built.
Accordingly, the electric line, as an intermediate step in the direction of flexibility, was
ultimately destroyed by the form of transport that carried its advantages much farther.”
Hilton and Due (1964) dated the start of the decline of the interurban to 1918 and
suggested that the industry was essentially finished by the end of the decade from 1928
to 1937.
Contemporary observers recognized the role of the automobile in supplanting the interurban. An article in the *New York Times* (1914) saw the automobile as a superior option to the interurban for rural residents. It went on to observe the number of cars at the Indiana State Fair in Indianapolis, the city with the greatest number of interurbans in the country. Blackburn (1924) said that automobiles, buses, and trucks led to the decline of the interurban in the 1920s.

Many interurbans sought to prolong their operation by expanding their freight business. Ironically, one source of such traffic was the transport of stone, sand, and gravel for the construction of highways along the interurbans (Hilton and Due 1964). A letter from the president of the Western Ohio Railway to the Electric Railways Commission stated, “We have just concluded a contract for the hauling of about 2,000 carloads of cement, sand, and gravel for the building of a public highway which runs adjacent to our tracks.” (U.S. Federal Electric Railways Commission 1919)

The modern light rail transit systems being developed in many urban areas share some of the characteristics of the interurban railways in providing service within metropolitan areas. And some new commuter rail lines (not necessarily electrified) are connecting cities that are somewhat more widely separated. But the time of the interurban railways remains a unique historical era in which a new form of transportation emerged, was extensively developed in only some parts of the country, and lasted for a surprisingly short period of time.

References


