Digitally Mapping the Growth of the Railroads in the United States

Michael Weaver
Yale University, michael.weaver@yale.edu

Mapping the Rise of the Railroads

Digitizing 19th Century US Railways

Michael Weaver

Department of Political Science, Yale University

michael.weaver@yale.edu

Abstract

During the late 19th century, railroad networks in the United States exploded, drastically changing the economics, politics, and culture of the country. But our ability to examine how the expansion of the railroads affected the country is hampered by a dearth of data. Previous efforts to digitize the extent of the railways relied on tracing maps, but the lack of reliable maps means that this can only be done for every ten years. This only permits us to see snapshots of the rapid expansion that *quintupled* the miles of track between 1870 and 1910 and limits our ability to examine the connection between the railroads and other contemporaneous developments. I solve this problem by turning to textual sources. By digitizing and geocoding indices of railway stations from 1880 to 1910, I will be able to create maps that reveal the location of stations, rail lines, and the operators of those lines on a yearly basis.

Why map the railroads?

During the late 19th century, railroads...

1. drastically reduced transportation times
2. increased population mobility
3. connected the economies of distant places
4. made possible national political campaigns

We need maps to investigate how proximity to railroads changed local social, political, and economic life.

The need for more data

1. Previous digitization efforts traced maps
   - Depends on existence of quality maps
   - Can only be done for intervals of almost 10 years
2. Between 1870 and 1910, the miles of track in the United States quintupled.
3. Can only look at broad, long-term trends with data every decade.

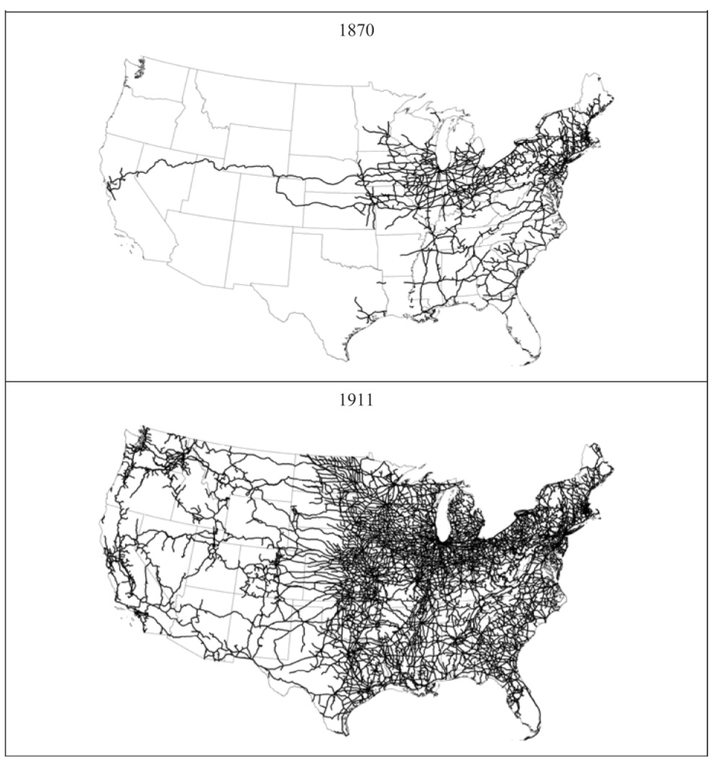


Figure 1: Extent of US railways in 1870 and 1911

A new data source

The Official Guide to the Railways

- Published at least quarterly from 1870 through today
- Used by station officers, businesses, and travelers
- Included **an alphabetical index of all railroad stations** and the companies that served them

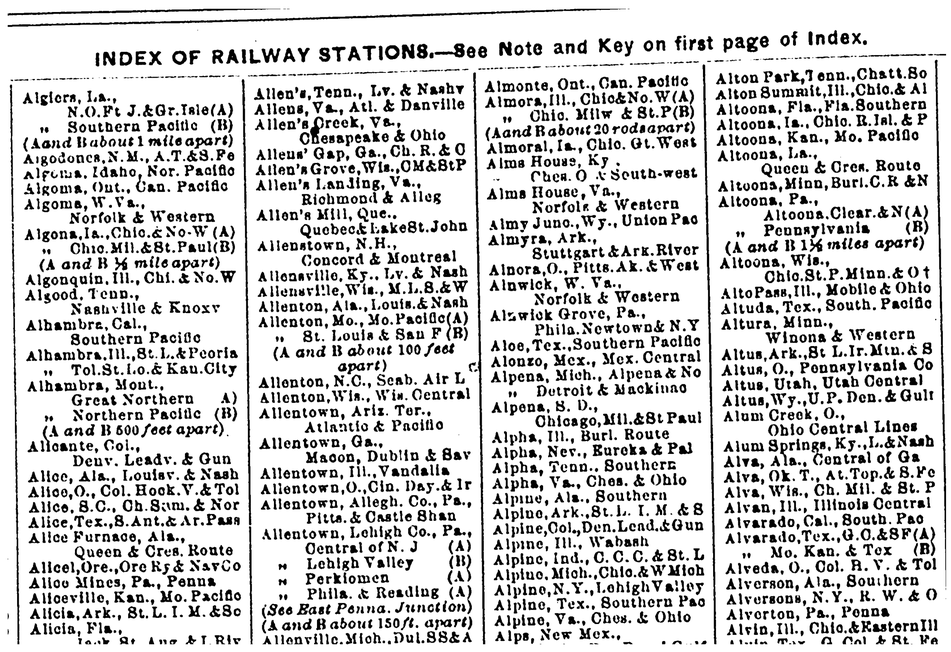
Index from each year from 1880 to 1910 can be geocoded to make yearly maps of stations

Using the station maps, I can work backwards from 1910 to see where lines were added by identifying new stations

Digitization process

Scanning the text

- Librarians helped obtain volumes from Stanford
- Library Scan and Deliver produced high resolution scans



INDEX OF RAILWAY STATIONS.—See Note and Key on first page of Index.

Algiers, La.,
N.O.Ft J.&Gr.Isle(A)
„ Southern Pacific (B)
(A and B about 1 mile apart)
Algodones, N.M., A.T.&S.Fe
Algoma, Idaho, Nor. Pacific
Algoma, Ont., Can. Pacific
Algoma, W.Va.,
Norfolk & Western
Algona, Ia., Chic.&No-W (A)
„ Chic.Mil.&St.Paul(B)
(A and B ⅓ mile apart)
Algonquin, Ill., Chi. & No.W
Algood, Tenn.,
Nashville & Knoxv
Alhambra, Cal.,
Southern Pacific
Alhambra, Ill., St.L.&Peoria
„ Tol.St.L.o.&Kan.City
Alhambra, Mont.,
Great Northern A)
„ Northern Pacific (B)
(A and B 500 feet apart)
Alicante, Col.,
Denv. Leadv. & Gun
Alice, Ala., Louisv. & Nash
Alice, O., Col. Hock.V.&Tol
Alice, S.C., Ch.Sum. & Nor
Alice, Tex., S.Ant.&Ar.Pass
Alice Furnace, Ala.,
Queen & Cres. Route
Alicel, Ore., Ore Ry & NavCo
Alice Mines, Pa., Penna
Aliceville, Kan., Mo. Pacific
Alicia, Ark., St.L. I. M.&So
Alicia, Fla.,

Allen's, Tenn., Lv. & Nashv
Allens, Va., Atl. & Danville
Allen's Creek, Va.,
Chesapeake & Ohio
Allens' Gap, Ga., Ch. R. & C
Allen's Grove, Wis., CM&StP
Allen's Landing, Va.,
Richmond & Alleg
Allen's Mill, Que.,
Quebec&LakeSt.John
Allenstown, N.H.,
Concord & Montreal
Allensville, Ky., Lv. & Nash
Allensville, Wis., M.L.S.&W
Allenton, Ala., Louis.&Nash
Allenton, Mo., Mo.Pacific(A)
„ St. Louis & San F (B)
(A and B about 100 feet apart)
Allenton, N.C., Seab. Air L
Allenton, Wis., Wis. Central
Allentown, Ariz. Ter.,
Atlantic & Pacific
Allentown, Ga.,
Macon, Dublin & Sav
Allentown, Ill., Vandalia
Allentown, O., Cin. Day.& Ir
Allentown, Allegh. Co., Pa.,
Pitts. & Castle Shan
Allentown, Lehigh Co., Pa.,
Central of N. J (A)
„ Lehigh Valley (B)
„ Perkiomen (A)
„ Phila. & Reading (A)
(See East Penna. Junction)
(A and B about 150 ft. apart)
Allenville, Mich., Dul.SS&A

Almonte, Ont., Can. Pacific
Almora, Ill., Chic&No.W(A)
„ Chic. Milw & St.P(B)
(A and B about 20 rods apart)
Almoral, Ia., Chic. Gt. West
Alms House, Ky.,
Ches. O. & South-west
Alms House, Va.,
Norfolk & Western
Almy Junc., Wy., Union Pac
Almyra, Ark.,
Stuttgart & Ark. River
Alnora, O., Pitts. Ak. & West
Alnwick, W. Va.,
Norfolk & Western
Alnwick Grove, Pa.,
Phila. Newtown& N.Y
Aloe, Tex., Southern Pacific
Alonzo, Mex., Mex. Central
Alpena, Mich., Alpena & No
„ Detroit & Mackinac
Alpena, S. D.,
Chicago, Mil.&St Paul
Alpha, Ill., Burl. Route
Alpha, Nev., Eureka & Pal
Alpha, Tenn., Southern
Alpha, Va., Ches. & Ohio
Alpine, Ala., Southern
Alpine, Ark., St. L. I. M. & S
Alpine, Col., Den. Lead. & Gun
Alpine, Ill., Wabash
Alpine, Ind., C. C. C. & St. L
Alpine, Mich., Chic. & W Mich
Alpine, N.Y., Lehigh Valley
Alpine, Tex., Southern Pac
Alpine, Va., Ches. & Ohio
Alps, New Mex.,

Alton Park, Tenn., Chatt. So
Alton Summit, Ill., Chic. & Al
Altoona, Fla., Fla. Southern
Altoona, Ia., Chic. R. Isl. & P
Altoona, Kan., Mo. Pacific
Altoona, La.,
Queen & Cres. Route
Altoona, Minn, Buri. C.R & N
Altoona, Pa.,
Altoona. Clear. & N (A)
„ Pennsylvania (B)
(A and B 1½ miles apart)
Altoona, Wis.,
Chic. St. P. Minn. & O †
AltoPass, Ill., Mobile & Ohio
Altuda, Tex., South. Pacific
Altura, Minn.,
Winona & Western
Altus, Ark., St L. Ir. Mtn. & S
Altus, O., Pennsylvania Co
Altus, Utah, Utah Central
Altus, Wy., U.P. Den. & Gulf
Alum Creek, O.,
Ohio Central Lines
Alum Springs, Ky., L. & Nash
Alva, Ala., Central of Ga
Alva, Ok. T., At. Top. & S. Fe
Alva, Wis., Ch. Mil. & St. P
Alvan, Ill., Illinois Central
Alvarado, Cal., South. Pac
Alvarado, Tex., G.C. & SF (A)
„ Mo. Kan. & Tex (B)
Alveda, O., Col. R. V. & Tol
Alverson, Ala., Southern
Alversons, N.Y., R. W. & O
Alverton, Pa., Penna
Alvin, Ill., Chic. & Eastern Ill

Figure 2: An example of the station index

Transcription

- 1910 volume transcribed by hand to provide dictionary for subsequent Optical Character Recognition (OCR)
- OCR trained on the images from each year
- Possible errors in OCR transcription checked manually
- Use Python to convert raw text into structured data

Geocoding

- Obtain latitude and longitude for list of station location using Geolocate and Google Maps APIs
- Locate remaining stations from books of state historic places

Mapping

- Combine dataset of station locations with 1911 GIS map of rail lines
- Use GIS to identify line segments along stations that exist in each year
- Create interactive online map that shows lines, stations, and railroad companies for each year

Proof of concept: mapping railroad stations in 1910: http://goo.gl/1TDQtm

Current Progress and next steps

- OCR dictionary is prepared and all images scanned and ready for digitizing text
- Once transcription is complete:
  - Ready to geocode full list of places using Python
  - Locate unidentified stations using books of historic places

Figure 3: Link to map of stations in 1910

Contributions

- First **yearly mapping of railroads** in the United States at **moment of greatest expansion**
- Rich source of **data on railroad lines, rail stations, and rail companies operating at stations**
- Full dataset will be a **boon to economic historians, sociologists, political scientists, and historians**
- **Interactive maps** displaying the data will be a **resource for public education**

Acknowledgements

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