Pennsylvania Trolley Museum

Reference Guide

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Thank you for being willing to serve as a Guide. Your efforts in this area will assure our future as one of the leading trolley museums in the country.

Transportation is the key; do not focus on the equipment. Trolleys were a part of everyday life during the first half of the twentieth century. People depended on these rails to get to work, school, entertainment, etc. Our museum provides the opportunity to compare life from then to now. Read books and view archival films to get a view of life at the turn of the century. The electric light, phonograph and telephone were new ideas. There were people alive who remembered when Jefferson and Adams were alive. The United States of America had become a world power and people had a higher standard of living than ever before. It was an optimistic age.

Tour Dynamics

Speak up. Make sure our guests can hear you. Do not try to talk over a noisy car. You are the teacher here.

Make eye contact with our guests.

Plan your talk. Are you telling a story or just a bunch of unrelated facts?

If you are not sure of something, tell the visitor you will try to find the answer. Do not make things up!

Do not bore them with technical data. Learn to read their faces.

Grammar and pronunciation are important.

Questions, Comments, Reflections???

Crew members should confine their talks to factual materials, leaving fabrications and opinions out of the speech.

Promote membership, upcoming events, the exhibits and the store.

Reference dates:

1830s Horsecar---New York
1870s Cable Car---San Francisco
1888 Frank Spraque---Richmond
1903 Washington & Canonsburg Railway Company
1903 Arden Valley right of way built
1906 purchased by Pittsburgh Railways
1909 line completed between Pittsburgh & Washington
1953 abandonment
1954 museum moves first three cars to site PRCo 3756, M1, WP 832
1963 museum opens to the public

WHAT WE EXPECT OUR GUIDES TO UNDERSTAND

What is the difference between a trolley line and a railroad?

It's a very difficult question that has many answers. And not an easy one to answer for the public.

Pennsylvania issued separate corporate charters for *railroads* and *passenger railways*. The urban and interurban electric railways fell under the passenger railway concept. Intercity railroads had railroad charters. After 1907 the passenger railways were also permitted to move freight, which further blurred the distinction. And most but not all of the passenger railways used electricity to propel cars; the line from Warren to Youngsville used steam locomotives!

The Interstate Commerce Commission in Washington DC had a different concept. For example, the Lackawanna and Wyoming Valley Electric Railway in northeastern Pennsylvania – predominantly a local passenger carrier – was considered a railroad. They not only interchanged freight to and from local industries with other railroads but also had a fair volume of outgoing anthracite coal; they also sold interline railroad passenger tickets.

A less academic comparison says simply that railroads use diesel and steam (and maybe heavy electric) locomotives to pull trains, and that streetcars are single units with trolley wire overhead.

No one answer is flawless.

What is a trolley car?

The name evolved from a troller, a device used to collect power on early electric cars in the 1880s. Both wires were above the street; the troller rolled on the overhead wires and was dragged along by the wires leading down to the car below it. The analogy here is a man trolling for fish.

The vehicles, called trolley cars or streetcars or interurban cars ride on steel wheels upon steel rails and are propelled by electric motors.

When did they first appear?

The first electrically propelled vehicle appears to have been the Siemens and Halske locomotive exhibited at a trade fair in Berlin, Germany, in 1879. Thomas Edison created an electric locomotive that he ran on the grounds of his "think tank" at Menlo Park, N. J. in 1880. There were some publicly used electric railways in Europe as early as 1881 or 1882. The first in North America for public use may have been an effort in East Cleveland, Ohio, in 1884.

The first electric railway in Pennsylvania opened in Scranton in 1886, and was used until 1954 from downtown to rural Green Ridge.

How did we get around before we had trolley cars?

We walked or rode on animals. Larger cities used horse drawn passenger cars on rails in streets by the mid-1800s. By 1886, horse drawn passenger railways operated in Allegheny, Allentown, Altoona, Beaver Falls, Bradford, Chester, Easton, Erie, Harrisburg, Johnstown, Lancaster, Philadelphia, Pittsburg (the "h" was missing then). Pittston, Pottsville, Reading, Scranton, Stroudsburg, Wilkes-Barre, Williamsport and York. At that time the statewide fleet included 2,362 cars operating over 576 miles of track.

Did we also have cable cars?

Twenty-nine cities in the United States operated cable systems, beginning with San Francisco in 1873. Ultimately 61 operators ran cars over 790 miles of track, but the systems were so incredibly expensive to build and operate that most vanished as soon as electric cars were proven to be reliable. Only those in San Francisco survive as a tourist attraction. To start the car, the gripman pulls a

lever to clamp a "grip" around a constantly moving cable. To stop, he releases the grip and applies the brakes.

In Philadelphia, the first cars ran in 1883; the last in 1895. Three companies operated cars in Pittsburgh during the brief period between 1888 and 1897.

Funicular or incline railways were constructed to haul people and wagons up steep hills. Usually, two cars were clamped to opposite ends of the same cable, reducing to an absolute minimum the energy needed to move the cars up and down hill. The two inclines in Pittsburgh are the last of many that once ran in this city.

Were there any other means of propelling passenger railway cars?

Storage battery cars achieved very limited acceptance except in New York City. In Pennsylvania, the Cambria and Indiana Railroad used them for passenger trains. The Ephrata and Lebanon Street Railway used them from 1912 to 1914. They were only practical for short, light density routes.

What were the principal advantages of electric cars compared to horse and cable drawn cars?

Economy, reliability, cleanliness, speed. Those 11,910 street railway horses (5 per car) in Pennsylvania dropped tons of solid and liquid pollutants on the streets, causing a distinct aroma and making walking treacherous. Horses, like humans, are subject to all manner of diseases. The Great Epizootic, a flu-type virus, wiped out horses by the tens of thousands in 1872. Horses also eat, working or not. The cars were small enough to be hauled by horses or mules, and could haul few passengers at once, and stable expense was not insignificant.

Cable systems were extremely expensive to build and operate. The estimated construction cost of cable in 1890 was $215,000 per mile versus only $20,000 for electric, while operating costs for Sprague electric installations were about one-half that of cable systems.

Why were streetcars and trolley lines important?

They allowed people to live in one neighborhood and work or shop in another farther from home. They allowed modern cities to develop and to expand.

They were also be used to haul freight and express shipments, particularly store-to-door deliveries.

Why were they built?

Because most of them were privately owned, they were built for only one reason: to make money for the investors. Those who bought stock felt they could make money by moving people. ["To haul people" is not the correct answer … it's too simplistic and too idealistic.]

New light rail systems have a totally different reason for construction. Again, idealism is not a part of the decision. They are built because elected politicians feel it is good for the community or that it will aid in their reelection or somehow increase their personal wealth. Profits are impossible.

Who rode the trolley lines?

In the early years, everyone who might have found them useful to reach a destination … entrepreneurs, managers, supervisors, factory workers, laborers, workers. Government workers in uniform and on duty such as letter carriers, police, firemen often rode free. Only the very wealthiest could afford to provide their own transportation.

Where did people go on the trolleys?

Any place you might go today in an automobile … to work, to shop, to church, to the doctor, to entertainment venues. Entertainment at the beginning of the 20th century often included operettas, stage shows and vaudeville theaters … movies came in 1905 and talking pictures in the late 1920s. Church attendance was high and for some families the rule was twice on Sunday and once in the middle of the week. Paying homage to our departed relatives was also very important, with visits to cemeteries being common.

Oscar Hammerstein testified that the Philadelphia Opera House was forced to close during the Philadelphia Rapid Transit Co. strike from Feb. 19 to April 17, 1912, owing to lost revenues. This demonstrates that even the moderately well to do used the trolleys.

How far did people go from home?

Before the automobile, most people played out their entire lives within a ten-mile radius of their homes. Trains, and later trolley cars gave people a way to travel farther, but the costs were often prohibitive. Zone fares were frequently used for longer trips, but in Lancaster, for example, only one in five went beyond the first fare zone, or more than about 2 miles. Trolley cars were clearly used primarily for local transportation.

Before the spread of labor unions, travel for pleasure by the masses was rare. The workingman was expected to labor for 5½ or 6 days a week, and up to 12 hours a day, 52 weeks of the year.

How often did people use trolleys?

The peak year in Pennsylvania was 1920. In that year, all of the electric railways in Pennsylvania transported approximately 1.84 billion people. There were 8.7 million people in the state then. A little number crunching shows us that almost 3 out of every 10 people made one round-trip a day. This declined to 1 in 8 by 1950, and most of those people were in Pittsburgh or Philadelphia.

Were trolley companies related to any other businesses?

Electric lighting and electric transportation developed in the same decade, the 1880s, and both were often intertwined. Railways often found they could make more money by selling off surplus electricity than by providing transportation, and they did just that. Mammoth utility holding companies were created and they often acquired trolley companies in their quest to expand power, gas and water company holdings.

In addition, trolley companies often owned amusement parks in remote locations as a way to stimulate evening and weekend trolley riding. Surviving amusement parks in the state that were owned at one time by trolley companies include Kennywood (West Mifflin), Lakemont (Altoona), and Dorney (Allentown), Hershey Park, like the rest of Hershey – including the trolley company – was owned by Milton Hershey, and remains a popular destination.

How much money did the investors make?

They didn't. Between 1900 and 1950 the passenger railway industry in Pennsylvania lost over $54 million dollars. That equates roughly to $30 billion in 2003 dollars.

Why did the trolleys disappear?

Reread the previous item. You cannot perpetually neglect to pay the bond holders, the power bill, other creditors, and your employees.

For all the companies in the state, liabilities (what they owed) exceeded cash and other current assets (the money to pay the bills) in 48 of the 53 years between 1897 and 1950.

Most of the small town and rural companies could not have survived no matter what happened. But the emergence of the automobile and paved roads, particularly between 1920 and 1930, simply made it impossible for any company to survive on fares alone … some just lasted longer than others.

What did it cost to ride the electric cars?

Most companies started out with nickel fares. A man working for $2.00 a day in 1900 spent a nickel to go to work and a nickel to come home. This was 5% of his daily income. In small towns, many people walked downtown to shop and paid the fare only when they came home laden with packages (and perhaps accompanied by fidgeting children).

It was common to pay for longer distance trips, like Pittsburgh to Canonsburg or Washington to the County Home, by the number of fare zone boundaries that were crossed.

Fares rose in most cities to a dime after World War II, to a dime and some additional pennies in the 1950s, and to somewhere between $1.00 and $2.00 today. Pennsylvania public transit authorities today get on average 30% of their operating income from the farebox, and as low as 20% in the small cities. The rest is made up from tax revenues.

Were women ever employed to run the cars?

Changes to the way we live are often a product of emergencies. A lack of men to work the cars in some cities during World War One prompted the hiring of women in 1918, most of whom were fired as soon as the men came home to reclaim their jobs.

During World War Two, women were again hired. Some remained for many years but most left after the war to resume the business of being a homemaker. While these women did exemplary jobs during both wars, wholesale hiring of women to operate transit vehicles followed Executive Order 11246 in 1964 which mandated non-discrimination by sex for federal contractors and government.

Were these hiring practices different from other industries?

No. In 1900 it was customary for women to work only until they married, at which time they were expected to vacate jobs. Nursing, school teaching, baby sitting, and store clerk positions were open to women. Men filled even office bookkeeping and stenographic jobs. Minorities were generally restricted to the most menial of jobs. Mass hiring of Blacks and other minorities occurred after the 1964 Executive Order barring government discrimination based on "race, color, religion, sex or national origin." Since most transit operations became government agencies (or received government monies) in the 1960s and '70s, the change was swift.

Where could you go by trolley?

Electric passenger railway mileage peaked in Pennsylvania in 1918 at 4,461. Most towns in the Commonwealth with 5,000 people in 1900 had a trolley line; the exceptions were mostly in the mountainous central parts of the state. In the southeast, tracks were more or less continuous from Newville (in Cumberland County) and Littlestown (in Adams County) to Philadelphia, Trenton, New York, Springfield, Boston, Portland and Lewiston, Maine. If you had enough nickels, you could also ride by connecting cars from Southwestern Pennsylvania to Rockford, Illinois and eastward from Erie to Utica NY.

Did people actually go these distances? Rarely. If one needed to go that far, railroads provided much faster service.

For additional information, study the map on the visitors' center wall.

What did the trolley companies mean to the economy of the communities?

These were private companies subject to taxation like any other corporation. From 1896 through 1950, they paid federal, state, and local governments more than 5 percent of their gross income. Local taxes included levies on each pole that held up the wires, taxes on cars run in a particular city or town licenses for operators, park taxes, taxes for police, and anything else the municipalities thought they could get. In addition, most companies were expected to remove snow and pave the streets over which they ran, and in some cities flush the streets to contain the dust.

The greatest number of traction employees was in 1913, when 33,096 Pennsylvanians were employed – enough people to fill a small city. About one out of every 50 wage earners in the state worked for trolley companies that year.

Newspapers around the turn of the last century praised the trolleys for the additional business they brought to downtown, especially intercity and suburban operators that dragged business from remote villages and towns into larger towns and cities. In some instances, rural trolley lines were also the ambulance … the fastest possible way to get an injured person to a hospital.

What defines rapid transit?

Rapid is a relative term. Philadelphia Rapid Transit Company was formed in 1902 and the modern electric streetcars, moving through streets congested with wagons at an average speed of 6 or 7 miles an hour, was truly rapid compared to walking.

Today the term "rapid transit" usually involves a service with limited stops in order to speed the ride. Passengers get on or off from platforms at floor level to eliminate delays caused by climbing up or down steps. Good examples are Philadelphia's subways and elevated railways.

What is light rail transit (LRT)?

It's indefinable!

In theory, LRT is a modern version of a trolley, using streets for rights-of-way and cars capable of mixing with traffic. In theory, LRT is cheaper to build than heavy rail (subway or elevated lines).

What is different between modern LRT and traditional streetcars? The equipment is quite similar but updated with air-conditioning and modern motor and control schemes. LRT stops are much less frequent to speed the ride. Cars must be accessible to the handicapped.

How fast will that streetcar go?

Average includes the total time from point A to point B. How fast a car has to go to maintain an average is probably about twice the average. But that varies with load factors, stop dwell times, passenger turnover, terminal dwell times, etc. Many companies adjusted running times so that the schedule frequencies were comprehensible, i.e. every hour, every 30 minutes, every 12 minutes, every 5 minutes...something that repeats every hour. The running times required operators to run more rapidly or slowly depending on the padding built into the schedule for a particular route. Operators also adjusted schedules to make their own day easier (never harder)...it was great if you could run fast so that you (and your conductor if there was one) had less to do because you were running on the heels of your leader. Needless to say, the companies frowned on this practice!

Approximate maximum speeds:

NOPSI 832 - 5326	**20-25 MPH**
66	**40 MPH**
PCC	**42 MPH**
3756	**50 MPH**
14-78	**55 MPH**

Why Broad Gauge? Version 3

by Edward H. Lybarger, Archivist Emeritus

September 23, 2023

Recently a Trains Magazine article (September 2023, page 48) chronicling the arrival of the "Terrible Trolley" at PTM included the following sentence: "For reasons that have been lost to history, most traction companies in Pennsylvania used a 5-foot, 2-1/2 inch gauge."

Nothing in that sentence is correct. It is evident, however, that the author, a respected writer and historian, had never attempted to learn the true history of broad gauge trolley systems in Pennsylvania.This is my third writing explaining the subject since 1997!

Since I joined the museum in 1969, I have heard many explanations of how the "Pennsylvania Broad Gauge" came to be. For example:

1) The state legislature passed a law requiring it.
2) The Pennsylvania Railroad insisted upon it.
3) The politicians wanted no trains running down the streets in the middle of the night.
4) No one knows; the reasons have been lost to history

In the late 1990s, I researched this matter in some depth at the Pennsylvania Law Library in Harrisburg, where copies of early legislation are available. I found there were no statewide standards for street railways. Because of the way laws were enacted then, each municipality directly or indirectly determined the gauge of street railways within its governance.

Act 787, 1857, supplemented an 1854 act incorporating the Philadelphia and Delaware River Railroad Company. Section 1 of Act 787 specified that the company was to be used exclusively for a city passenger railway with horse locomotion, and that the gauge of the tracks was to be five feet, two inches. Section 3 dictated that the company could not connect with any railroad other than for passenger purposes and of the same gauge. This company became the Frankford & Southwark Philadelphia City Passenger Railroad, Pennsylvania's first horse-powered street railway, which began operations January 21, 1858.

Act 202, 1858, incorporated the Citizens Passenger Railway of Philadelphia. At the very end of Section 1, which outlined the incorporators and the streets over which tracks were permitted to be built, is the clause "...and no freight or burden trains, or locomotives, shall be permitted to pass over same. Section 7 begins "That the said railroad company [Citizens] shall not connect with any railroad, other than for passenger purposes, and of the same gauge, under the penalty of a forfeiture of their charter..."

The die had been cast, insofar as Philadelphia was concerned. There would have been no logic in having street railways of different gauges, since they were allowed to connect only with others of the same gauge. By specifically mandating a wider gauge for the horse cars, the owners of delivery wagons, carriages and buggies were also well served. Since their gauge was the same, they would have a much smoother ride by staying on the tracks, while all concerned would additionally benefit because there was less noise from these vehicles' wheels clattering over the cobbles. And with railroads outlawed from the streetcar tracks, the public's concern about trains on the streets was neatly addressed. In Pittsburgh, Act 208, 1859, incorporated the Citizens Passenger Railway Company of the city of Pittsburg. Section 11 is very specific about the gauge of road: "That the said railway shall be and they are hereby required to lay the track of their said road, of such a gauge as to be most convenient for the use of carriages and buggies passing over the said road..." Every other early (pre-1874) Pittsburgh company's enabling legislation had similar language.

But there is definitely substance to the thought that the politicians (and more likely their constituents) did not want trains running through the streets…

Act 91, 1860, was a supplement to the original charter of the Wilkes-Barre & Kingston Passenger Railway, a standard gauge road, stating the road could "never be used for the purpose of carrying anthracite coal."

In Harrisburg, Act 849, 1864, the charter for the first passenger railway, says nothing about gauge, though it authorizes carriage of "passengers and all kinds of produce." The city's street railways were broad gauge.

Erie was another standard gauge city, but Act 284 of 1867 specified that "No locomotive or freight cars may use the track except to cross." No wide gauge was required; the statute was clear without.

New Castle had street railway companies of both broad (Harmony Route) and standard (Penn-Ohio System) gauge; Act 424 of 1871 empowered the city council to prescribe "...the width of track and the kind of rail to be used..."

Act 346, 1873, authorized the passenger railway in Reading, mandating a 5" 2" gauge and disallowing construction of its track on streets occupied by steam railroads. The lateness of this charter recognized that the gauge requirement was to ensure the ability to connect with adjacent companies' tracks, since the railroads and passenger railway couldn't legally occupy the same space in any event. This company connected directly to operators in both Lancaster and Philadelphia.

And speaking of Reading, the Allentown & Reading Traction Company employed both standard and broad gauge trackage to match the companies at each end of its route. Passengers changed cars in Kutztown, where the company's power station and shops were located.

Because the majority of track miles lay in the big broad gauge systems of Philadelphia, Pittsburgh, Reading, Lancaster, Connellsville, Harrisburg and Altoona, it is easy to associate the state with the broad gauge and overlook the fact that most operating companies in Pennsylvania were built to standard gauge! Fred Schneider's research and analysis in 2000 revealed that there were 2895 miles (60.8%) of broad gauge track in the state, as opposed to 1841 (39.2%) standard gauge miles. However, there were 78 standard gauge operators (57.4%) but only 59 broad gauge companies (42.6%).

As far as the railroads' involvement in setting street railway gauges, the arguments for it don't make sense…if one examines Pennsylvania's topography, one will quickly understand that the railroads could not operate over many, if not most, street railway routes because of the grades involved. Likewise, the railroads were not generally interested in being the local delivery service within a small or medium-sized city…they wanted suburban and intercity shipments and passengers, though they did offer intercity service in the larger cities.

Also keep in mind that in Ida Tarbell's history of Standard Oil, (an 1870s creation), she opined that Standard did everything to the Pennsylvania Legislature but refine it. The Pennsylvania Railroad had all, and likely more, of the control over that same legislative body than Standard Oil did. If it wanted to be on streets, it would be (and was) on streets. In Pittsburgh, the PRR tracks occupied the center of Liberty Avenue from 11th Street to the Point from 1851

until 1906, with trolley tracks on either side. There were tracks on Smallman Street serving the produce yards well into the late 20th Century, and there are still tracks running down the middle of Main Street in West Brownsville, Washington County.

The West Penn System's early underliers in McKeesport (alongside those of Pittsburgh Railways) would have naturally been broad gauge in order to connect to PRCo, and would have set the gauge for most of its other underliers. One in Kittanning, however, was built as standard gauge and was never converted, as it was never connected to the rest of the system. Another short standard gauge line to South Connellsville was regauged early on, as was the first Greensburg company, the Greensburg & Hempfield. Both the Harmony Route and Butler Short Line, needing access to Pittsburgh, had no choice but to build to broad gauge.

There were good reasons for Pennsylvania Broad Gauge other than keeping trains off the street, which was easily done by law or ordinance. It is simply not historically correct to cite the railroads as the reason for the wider gauge associated this state, nor to claim that there was a state law requiring broad gauge. Likewise, it is absolutely false to state that the origin of broad gauge is "lost to history!"

The Myth

Trolleys quit because General Motors was buying trolley lines to get rid of the trolleys. We all know they were convicted of doing this. We've all seen the movie, *"Who Killed Roger Rabbit?"* It must be true. Everyone knows it.

In the court case *National City Lines versus U. S., 9th Circuit Court of Appeals, Chicago, 1950*, NCL was convicted of monopolizing the interstate sale of motor vehicles, tires, and petroleum products, and forcing its member companies to buy only from NCL stockholders (General Motors, General American Aerocoach, Firestone Tire and Rubber Co., Phillips Petroleum, et al). NCL was never tried and thus never convicted of illegally getting rid of trolley cars *because that in itself is not and was not illegal* as long as it had been previously approved by the local government regulatory bodies.

This is not a valid reason for why trolleys disappeared. Again, they disappeared because they did not make money. National City Lines was a corporation that preferred to make money, and if trolleys worked, the company continued to run them until they were no longer practical. But when they were no longer practical, then the company policy dictated from whom vehicles were to be purchased.

St. Louis was an NCL property that had no general plan for conversion from rail to bus; routes were converted individually when city or state plans for freeway or bridge construction made it impractical to continue rail service. The successor transit authority converted the last St. Louis route to bus. El Paso continued rail service until Mexico expelled the company. The last Baltimore routes were abandoned because of one-way street projects. Twelve rail routes were still in service in Philadelphia when SEPTA bought the property from NCL. In actuality, larger cities with NCL-owned trolley lines actually had cars longer than most that were non-NCL properties.

Another example of similar behavior was the ownership by General Electric of Electric Bond and Share Co., which in turn owned nearly 40 electric power companies and numerous electric railways in 18 states plus Guatemala, Cuba and Panama. Rail holdings in Pennsylvania included Scranton, Altoona, Allentown, Lancaster and Williamsport. Pennsylvania Power and Light Co. was part of this empire. Do you think this didn't also sell generators, transformers, switchboards, and power transmission and car hardware manufactured by General Electric? Westinghouse accomplished the same result through the ownership of the Westinghouse, Church, Kerr engineering and consulting firm.

SELECTED BIBLIOGRAPHY

Edward H. Lybarger

Arnold, Bion J. Report on the Pittsburgh Transportation Problem
Pittsburgh PA 1910

Bauer, John Modern Mass Transportation in Pittsburgh
New York NY 1935

Cheape, Charles Moving the Masses – Urban Public Transit in New York, Boston and Philadelphia, 1880-1912
Cambridge MA 1980

Foster, Mark S. From Streetcar to Superhighway – American City Planners and Urban Transportation, 1900-1940
Philadelphia PA 1981

James, William The History of Urban Transportation in Pittsburgh and Allegheny County
University of Pittsburgh Master's Thesis 1947

Kolko, Gabriel Railroads and Regulation
Princeton NJ 1965

Lougee, N. A. Co. Report on Advisability of Substituting Bus Service in Whole or in Part for the Street Car Service Presently Being Undertaken [in Pittsburgh]
New York NY 1949

Morse, E. K. Report of Transit Commissioner
Pittsburgh PA 1917

Tarr, Joel A. Transportation Innovation and Changing Spatial Patterns in Pittsburgh, 1850-1934
Chicago IL 1978

Taylor, A. Merritt Report of Transit Commissioner
Philadelphia PA 1913

Warner, Sam B. Streetcar Suburbs – The Process of Growth in Boston 1870-1900
Cambridge MA 1962

SELECTED BIBLIOGRAPHY

Dennis F. Cramer

Carlson/Schneider PCC:	The Car That Fought Back Interurbans Press	1980-1981
Fleming	Pittsburgh – How to See It Johnston	1916
Goddard	Getting There-The Epic Struggle Between Road & Rail University of Chicago	1994
Hilton	The Cable Car in America Stanford University	1982-1997
Hilton/Due	Electric Interurban Railways in America Stanford University	1960
Hood	722 Miles Building of the Subway Johns Hopkins	1993-1995
Middleton	The Interurban Era Kalmbach	1961
Middleton	Time of the Trolley Golden West Books	1987
Middleton	Traction Classics Vol I Golden West Books	1983
Middleton	Traction Classics Vol 2 Golden West Books	1985
Molloy	Trolley Wars - Streetcar Workers on the Line Smithsonian	1996

Trolleyology on YouTube

Wexford Station
When Bad Things Happen to Good Trolleys
Allegheny Valley Route
On the Warpath! Pennsylvania's Trolleys during WWII
A Look Back at the Trolleys of Irwin
A Ride to Charleroi
Small Town Trolley Along the Allegheny River
Johnstown: Last of the Small-Town Trolleys +
Munhall/Rte 65 on the Last Day of Service
Keeping up with the Joneses
Red Arrow Lines
Trolley Watches
Cleveland Transit - Years of Transition
Lessons Learned from PCC Car Restorations
Women in Transit
Shoes, Snack Foods, and Streetcars: The Electric Railways of Hanover, PA
Cincinnati & Its Inclined Plane Railways (Plus: A Look at the 2200 Series Streetcars)
Horsing Around - The Horsecar and the Origins of Urban Mass Transportation
Car Line Adventures - Trolley Tales from the Sublime to the Ridiculous
Trolleys in Chocolate Town - Hershey Transit
The Pittsburgh & Allegheny Valley - Two Places This Line Never Reached
The Laurel Line - Scranton to Wilkes-Barre
Schuylkill Railways - Trolleys through the Anthracite Coal Fields
The Isle of Man Transport System, British Isles
Shaker Heights Rapid Transit - The PCC Era
PCC Car 2168 - A Streetcar Survival Story
A Ride to Washington, PA
Car C-145 - The Story of a Wandering Snow Sweeper
Philadelphia Commuter Rails - A 40-Year Retrospective
The Short-Lived History of the PCC Car in Cleveland
Port Authority's Electric Bus Initiative
Pittsburgh: Streetcar City - The Making of the Book
Dayton's Interurban History
The Colorful Streetcars of Pittsburgh
Trolley Trails through the North Hills:
The Pittsburgh, Butler, Harmony & New Castle

Heading Home on the Main Line -
A Century of PRR Commuter Rail Operations in Philly
Ohio Electric Railway
Philadelphia's Subway-Surface Lines
Super Saturday Streetcar Specials
Jim Crow Streetcars - Challenging "Separate But Equal"
The Dayton & Xenia Railway, Plus How NOT to Abandon a Rail Line
Cleveland Transit 1955-1975: Mobility Redefined
The McKeesport Trolley Lines of Pittsburgh Railways PART 1 of 2
The McKeesport Trolley Lines of Pittsburgh Railways PART 2 of 2
The Mount Washington Transit Tunnel Disaster
Railroads, Art, and American Life: An Artist's Memoir
Where the Heck is Hecla?
Frank Who?
Cemetery Transit: A History of Death Riding the Rails
Hoosier Heartland Trolley Co- Preserving and Reviving Indiana's Electric Railway Story