The Mechanization of Pittsburgh Street Railways, 1886-1897

by Craig Semsel

THE GROWTH and decline of the U.S. street railway industry contains many fascinating chapters. Perhaps no single chapter was as important to the industry’s growth as the transition from animal to mechanically powered vehicles. During the late nineteenth century two major mechanical systems battled for dominance: the cable-drawn and the electrically powered streetcar. Pittsburgh offers an ideal case study of this phenomenon: even the industry’s trade magazine, Street Railway Journal, noted, “The country affords no better opportunity for studying the different systems than [Pittsburgh].”

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Mechanized streetcars rose out of a need to replace horse-drawn streetcars. The horse itself presented the greatest problems: horses could only work a few hours each day; they were expensive to house, feed and clean up after; if disease broke out within a stable, the result could be a financial catastrophe for a horsecar operator; and, they pulled the car at only 4 to 6 miles per hour.2

The expenses incurred in operating a horsecar line were staggering. For example, Boston’s Metropolitan Railroad required 3,600 horses to operate its fleet of 700 cars. The average working life of a car horse was only four years, and new horses cost $125 to $200. It was common practice to provide one stable hand for every 14 to 20 horses in addition to a staff of blacksmiths and veterinarians, and the typical car horse consumed up to 30 pounds of grain per day. Despite these disadvantages, horsecars, riding on rails, were better than the omnibus (running on any surface it encountered), so horsecar lines were eventually built in 300 U.S. cities.3

During the 1870s and 1880s, some streetcar officials began to look toward mechanical alternatives to the horsecar. The two most promising options were the cable car and electric streetcar, but both required special conditions to operate successfully. Cable car systems utilized a continuous cable that ran through a conduit dug into the street between the rails. A device called a “grip” extended from the bottom of a car into the conduit. To move, an operator called a “gripman” manipulated the grip so that it grasped the cable; the cable then pulled the car along the street. To stop, the cable was released and the gripman engaged a hand brake. Cable cars were twice as fast as horsecars, and could handle larger crowds. They could also climb steep hills, were not prone to disease, did not pollute city streets, and could operate in all kinds of weather. Between 1873 and 1893, over 300 miles of cable car lines were built in U.S. cities.5

The problem with cable car lines, however, was their inflexibility and high construction cost. Heavily reinforced conduits needed to be laid in the middle of city streets to house the cable and its complex network of guide pulleys. The more hills, curves, and underground utilities that were encountered along a route, the more elaborate and expensive was the conduit. Powerhouses to move the cable also had to be constructed along the line’s immediate route. As a result, lines tended to be constructed in heavily populated areas where large numbers of patrons could provide the street railway companies with a return on their investment.6

Electric streetcar lines, on the other hand, were not as expensive to build. Power could be distributed above ground either through overhead wires or third rails, eliminating the need for an expensive conduit. The flexibility offered by overhead transmission lines enabled powerhouses to be located anywhere, not just along a line’s immediate route. Unlike cable car lines, which had to be routinely shut down for inspection, electric lines could operate around the clock. Furthermore, streetcars powered by electric motors could travel in reverse if necessary, something cable cars could not do.7

Electricity was still in its infancy in the mid-1880s, and due to the wide variety of different electric railway systems, no single system had yet emerged as the industry standard. Early lines tended to be underpowered and prone to frequent equipment failure. The motors on electric cars tended to make them heavier than either horsecars or cable cars, requiring a company to replace its existing rails with heavier ones. Due to these circumstances, electric streetcars could not yet meet the demands of densely populated areas, and were best operated along short routes serving relatively small populations.

The development of two rival technological systems such as cable and electric streetcars can be explained by historian Thomas Parke Hughes’s model of system development. In this model, Hughes describes four distinct phases of system growth: invention and initial development, technology transfer from one region to another, growth, and a point where a system’s growth attains substantial momentum to move forward in a definite direction. Hughes notes that a system’s growth is sometimes impeded by what he calls “reverse salients;” a technological advance shows initial promise, only to slow the system’s overall advance. As a result, the system does not attain substantial momentum until “inventors, engineers, and other professionals” identify and correct the reverse salients.8

Historian George Hilton notes a similar pattern in the street railway industry with cable-drawn and electrically powered streetcars. The electric streetcar did not become an effective competitor against the cable car until 1888, when Frank Sprague synthesized the work of earlier pioneers in the field. Prior to Sprague’s work, less than 60 miles of electric street railways existed in the U.S., as compared to 90 miles of cable railways. Hilton further states that cable railways continued to expand until 1893, when standardized and improved motor control mechanisms made it possible for electric railways to dominate the industry.9

Both cable and electric systems were adopted in Pittsburgh at the same time, and the latter embraced both pre- and post-Sprague types. The transition from horsecars to cable and electric railways, and then entirely to electric railways, was remarkably swift, entailing only 10 years (1887-97).

**Pittsburgh: A Case Study**

Blessed with an ideal location at the junction of the Allegheny, Monongahela, and Ohio rivers and an abundance of bituminous coal, Pittsburgh had become a major industrial center by the middle of the nineteenth century. Pittsburgh’s original horsecar line, operated by the Citizens’ Passenger Railway Company, opened in 1859. It ran parallel to the Allegheny River eastward along Penn Street (now Penn Avenue) between downtown Pittsburgh and Lawrenceville.10

By the early 1860s, there were three horsecar lines in addition to the Citizens’ road, each headed by different local entrepreneurs. The Pittsburgh, Allegheny and Manchester Traction Co. ran northward from downtown Pittsburgh through neighboring Allegheny City to the town of Manchester. The Pittsburgh and East Liberty Passenger Railway Co. provided service between
downtown Pittsburgh and Oakland via Fifth Avenue. Finally, the Pittsburgh and Birmingham Traction Co. provided service for communities along the south bank of the Monongahela River. By the mid-1880s, the original four horsecar lines had expanded their routes and 10 additional companies were formed.11

During the late nineteenth century, Pittsburgh experienced tremendous growth in its population. Due to the arrival of new residents and the annexation of surrounding communities, Pittsburgh's population rose from 86,076 in 1870 to 238,617 by 1890.12 Although such an increase in population was beneficial to Pittsburgh's street railway operators, the inherent limitations of the horsecar prevented them from taking full advantage of this growth.

Contemporary accounts of Pittsburgh horsecar service were often less than glowing, and when mechanized street railway routes began to appear in the late 1880s, descriptions of the animal railways became outright hostile. The slow, monotonous pace of the horses and the shabby appearance of the conductors and drivers (sometimes the same person) made horsecar rides less than desirable. Furthermore, some companies dispensed with stoves for winter heating, choosing instead to keep hay and straw “...on the floor for keeping the feet warm and for collecting mud...”

Preceding pages: Car #9 of the Citizens' Passenger Railway, Pittsburgh's first horsecar line, is shown in front of the Butler Street Barn, the city's first street railway facility when it opened in 1859.

Above: Downtown Pittsburgh, Penn Avenue and Seventh Street, 1889. Bottom: Although the major horsecar lines were gone by 1895, the South Side's Sarah Street horsecar held out until August 1923.
Cable and Early Electric Railways in Pittsburgh

By the mid-1880s, Pittsburgh’s street railway operators began seeking mechanical alternatives for the horsecar. Pittsburgh’s East End was ideal for cable car service, since this area of Pittsburgh experienced the greatest increase in population for this period. Between 1870 and 1890, the population of this area increased from 42,700 to 55,282 in the wards closest to downtown, and from 29,998 to 103,091 in the eastern-most wards. Three cable car lines were constructed in the East End during the late 1880s.14

Pittsburgh’s first cable car line was built by the Pittsburgh Traction Co. in 1888. Obtaining most of its route from an earlier horsecar company (the Pittsburgh, Oakland, and East Liberty), Pittsburgh Traction operated along Fifth Avenue between downtown and East Liberty.15 The opening of a new cable car line was often greeted with overwhelming crowds of curious passengers during the initial weeks of service. Shortly after Fifth Avenue cable service began, the following appeared in the Pittsburgh Press:

....Rushing in haste to the cars together,
Hanging inside to the thongs of leather,
Hanging on outside by bar and rail,
Hanging on anyhow, by tooth and nail....
Punching with elbows and stepping on toes,
Injuring tempers and injuring clothes;
Wickedest thinking and wickedest talk—
Anything, anything rather than walk....16

Pittsburgh’s second cable car line, that of the Citizens’ Traction Co., went into service early in 1889. Like Pittsburgh Traction, Citizens’ Traction obtained most of its route from a horsecar line (the Citizens’ Passenger Railway Co.). It ran along Penn Avenue between downtown and Lawrenceville. In Lawrenceville, the line split at Butler Street, one half remaining on Penn Avenue to East Liberty and the other half going up Butler Street to the Allegheny Cemetery.17

In East Liberty, passengers could transfer to a horsecar line running to Wilkinsburg. At the Allegheny Cemetery, passengers could transfer to a horsecar line running across the Allegheny River to Sharpsburg. It was a common practice of the day for street railway operators to vary the colors of their vehicles in order to distinguish which cars ran along which lines due to the large number of illiterate and non-English speaking residents living and working near its lines. Citizens’ had its East Liberty cars painted red and its Butler Street cars painted yellow.18

Pittsburgh’s third and final cable car line was operated by the Central Traction Co. This line was considerably smaller than the other two, running only between downtown and Oakland via Wylie Avenue. Like Pittsburgh Traction and Citizens’ Traction, Central Traction obtained its route from an earlier horsecar line. The Central Traction Co. built most of its line in 1889 and completed it in early 1890.19

Cable car operation in Pittsburgh was a success. In its first year of operation, Pittsburgh Traction’s annual ridership increased 194 percent. Citizens’ Traction’s annual ridership increased 56 percent (6,953,131 passengers in 1888 and 10,832,192 in 1889). Both lines reduced the time of travel from the East End to downtown from 100 minutes to 32. Central Traction also experienced a considerable jump in its annual ridership: 187 percent between 1888 and 1890, from 1,062,235 passengers to 3,049,852.20

Unlike the cable car lines, which used the routes of former horsecar companies, Pittsburgh’s early electric lines were entirely new. As a result, they met with varying degrees of success. For instance, the Pittsburgh, Knoxville and St. Clair Street Railway Co. was formed in September 1886 with the intent of competing with the funiculars ascending Mt. Washington. The railway adopted the system of Leo Daft, a pioneer in electric street railways and an early advocate of overhead power wires. The car fleet consisted of one 35 horsepower electric locomotive and several trailers.21

The Pittsburgh, Knoxville & St. Clair never competed successfully with the Mt. Washington funiculars. Passengers apparently preferred the direct inclined planes of the latter to the winding, 2.5 mile route of the electric railway. The Daft road never expanded and was bought out and dismantled in 1892.22

Another Daft railway was constructed in the South Side in 1888 by the Suburban Rapid Transit Co. The line ran for 2.5 miles along

Pittsburgh Traction Co. cable cars pass on Fifth Avenue above High Street (now Sixth Avenue), Uptown. The number of cars visible in the background, two on each track, suggests the frequency of service.
the old Brownsville turnpike. Unlike the Pittsburgh, Knoxville & St. Clair, which used trailers pulled by a locomotive, the Suburban road’s fleet consisted of seven motorized passenger cars. Suburban Rapid Transit was considerably more successful than the other Daft road. The line eventually received permission to expand into downtown Pittsburgh via the Tenth Street Bridge and operated independently well into the 1890s.23

The third early electric railway in Pittsburgh was initially constructed in neighboring Allegheny City by the Observatory Hill Passenger Railway Co. The company’s founders intended to run a line between downtown Allegheny City and outer residential areas to the north.24 The system used was devised by Edward Bentley and Walter Knight. Unlike most electric railway systems of the day, Bentley and Knight favored underground power conduits similar to those of cable railways.25

The first major Bentley-Knight system was installed in Cleveland in 1884. It failed, mostly due to conduit problems. Learning from their mistakes in Cleveland, Bentley and Knight supplemented the Observatory Hill conduit with overhead wires. The Observatory Hill line was opened in February 1888, and met with great success. Within three months of opening, its fleet was expanded from four to 14 cars and the railway obtained ordinances allowing it to extend into downtown Pittsburgh using the Seventh Street Bridge.26

Despite the success of these cable and early electric railways, other Pittsburgh street railway operators were reluctant to mechanize. Cable railways were capital intensive, requiring high levels of ridership to justify their expense. The three existing cable lines already dominated the most heavily populated portion of the city, and other areas did not have sufficient density to support additional cable car lines. Although electric railway systems were not as expensive to build as cable systems, they were still capital intensive. In addition, the street railway operators were confronted with the problem of which electric railway system to choose.

Expansion of Electric Railways in Pittsburgh

This reluctance to mechanize changed rapidly after the convincing demonstration of an electric railway system designed by Frank J. Sprague. Sprague did not actually invent a new form of streetcar, but rather synthesized the work of his predecessors into a practical system.27 Like most systems before his, Sprague used overhead wires for power distribution. Unlike his predecessors, Sprague devised a new way of mounting the streetcar’s motors so that they were not shaken apart and so the gears remained ensnared with the axles.28

Sprague’s faith in his system and in electricity in general was unshakable. As he later stated before the American Institute of Electrical Engineers (AIEE), “Although electricity is a force of unknown nature… and powerful and mysterious as it is… it is at the same time the most tractable and law abiding agent with which we have to deal.”29 In 1884 he formed the Sprague Electric Railway & Motor Co. with the intention of marketing his new system. The system was first demonstrated in Richmond, Va., in 1888 and in Boston, Mass., in 1889. Sprague’s system soon became the industry standard, versions of which are still in use today.30

Only a few years after Pittsburgh’s early electric and cable car lines went into service, some dramatic changes had taken place among Pittsburgh and Allegheny City street railways. In June 1891, Street Railway Journal published a survey of street railways in the two cities. Twelve major streetcar companies were identified (see chart to left).

Approximately 30-40 miles of Pittsburgh’s street railways were mechanized by 1889. Of these, 23 miles were cable car lines and the remainder were electric. In 1891, approximately 140 miles of street railways in Pittsburgh were mechanized. Of these, only 31 miles were cable and the remainder were electric. Five major street railways either electrified or were built as such during this period. The remaining animal-powered railways were considering electrification at the time of the survey.32

The first major street railway in Pittsburgh to electrify was the Federal Street & Pleasant Valley Railway. The Federal Street & Pleasant Valley system was created in July 1889 when the Observatory Hill Railway merged with

| Major Street Railways in Pittsburgh and Allegheny City as of June 189131 |
|---------------------------------|-----------------|-----------------|
| Company                        | Miles of Track | Motive Power | Number of Passengers Carried |
| Pittsburgh & West End         | 0.50           | animal        | 1,854,836                   |
| Allegheny Traction            | 7.00           | animal        | 1,034,910                   |
| Citizens’ Traction            | 25.00          | cable         | 12,547,868                  |
| Pittsburgh Traction           | 2.67           | cable         | 8,649,788                   |
| Central Traction              | 8.00           | cable         | 3,116,000                   |
| Pittsburgh, Allegheny & Manchester | 18.00       | electric      | 5,789,510                   |
| Duquesne Traction             | 28.00          | electric      | Under Cons.                 |
| Pittsburgh & Birmingham       | 13.50          | electric      | 4,843,039                   |
| Federal Street & Pleasant Valley | 3.00            | electric      | 6,859,000                   |
| Schenley Park & Highland Branch | 1.00           | electric      | Under Cons.                 |
| Suburban Rapid Transit        | 2.25           | electric      | 140,000                     |
| Second Avenue                 | 0.25           | electric      | 1,808,993                   |
the Federal Street & Pleasant Valley Passenger Railway Co. and the People’s Park Passenger Railway. The company’s directors were encouraged by the success of Sprague’s system in other cities and by the local success of the Observatory Hill line.\(^{33}\)

When it installed the Sprague system, some reconstruction was necessary along the Observatory Hill route. Due to the greater weight of the electric cars, all of the old horsecar rails were replaced with heavier ones (a cost that was still less expensive than a deep cable conduit). The new system began operating in January 1890. One year after the merger, the Federal Street & Pleasant Valley reorganized its routes into four major divisions, using 32 motorized cars and 10 trailers. Two years after the merger, the fleet had been expanded to 60 cars and was operating 24 hours a day.\(^{34}\)

Federal Street & Pleasant Valley officials again reorganized their company, now into five major divisions. Like the management of Citizens’ Traction, they wished to make their system easy to use for those who could not read the destination signs on their cars. Unlike Citizens’, which had only two major routes, the Federal Street system’s five divisions made different car liveries a costly proposition. The Federal Street lines instead used a variety of symbols, each representing a different division: a red maltese cross, a gilt keystone, a blue shield, a green diamond, and a white eight-pointed star.\(^{35}\)

The success of the Federal Street & Pleasant Valley system greatly influenced the electrification of the Pittsburgh & Birmingham Traction Co., formed during the late 1880s by prominent local banker and glass manufacturer H. Sellers McKee. McKee purchased two small horsecar lines, the Pittsburgh & Birmingham and South Side Passenger Railways, both lines operating in the South Side. The new company had two routes, both originating at 33rd Street. The first route went to the Union Railroad Station via the Smithfield Street Bridge and Liberty Avenue; the second route was slightly longer, travelling downtown via the Tenth Street Bridge and Second Avenue.\(^{36}\)

The Pittsburgh & Birmingham originally intended to mechanize its horsecar routes using cable traction (McKee felt the combined patronage of the two horsecar routes would justify cable operation). To do so entailed widening the Smithfield Street Bridge’s deck, which the company began to do late in 1889.\(^{37}\)

When the Federal Street & Pleasant Valley railway began operating as an electric road in January 1890, Pittsburgh & Birmingham officials decided to examine the line. They were impressed by what they saw, and announced that they would electrify their lines rather than use cable cars. In mid-April, Miller Elliott, the Pittsburgh & Birmingham’s superintendent, announced that the company would continue widening the Smithfield Street Bridge and thus benefit from a private right-of-way across the Monongahela River.\(^{38}\)

The Pittsburgh & Birmingham’s first electric revenue trip took place at 10 p.m. on 18 June 1890. The trip was fraught with various difficulties, and it took the car well over an hour to reach Union Station via the Smithfield Street Bridge. By the end of the month, however, the company’s service was entirely electric and the Pittsburgh & Birmingham was able to sell its 350 remaining car horses at auction on 1 July.\(^{39}\)

The third major street railway company to electrify was also a horsecar operator that chose and then rejected cable traction. The Pittsburgh, Allegheny & Manchester Traction Co. was formed through a merger of two horsecar operators in 1890. Like the Pittsburgh & Birmingham, it was felt that the combined patronage of the two horsecar lines would justify the expense of cable traction. Unlike the Pittsburgh & Birmingham, the Pittsburgh, Allegheny & Manchester’s decision to adopt electricity instead of the cable was less dramatic. As early as January 1890, some company directors were voicing concern over the greater cost of building a cable system as compared to building an electric one.\(^{40}\) By April, the decision was made to electrify, and electrical operations commenced late in the summer of 1891.\(^{41}\)

Perhaps the street railway that benefitted the most from electrification was the Second Avenue Passenger Railway Co., formed in 1874 as a horsecar line operating in downtown Pittsburgh. Not much is known about the Second Avenue’s horsecar days, except that it was poorly managed and in danger of financial collapse (annual ridership averaged less than 120,000 passengers).\(^{42}\) In 1889, a group of gentlemen under the leadership of James D. Callery bought out the foundering operation. The new owners drastically rebuilt the line by extending it eastward to Glenwood and double-tracking and electrifying its entire length. The following year, the line expanded northwest to the Allegheny
The Pittsburgh, Knoxville, & St. Clair Street Railway competed with Mt. Washington’s inclines in the late 1880s. Traditional horsecars were hauled by an electric locomotive powered, in part, by a power rail, and elsewhere by overhead wires. Customers found they disliked the long track, sharp bends, and steep grade; in fact, in August 1888, a motorman’s mistake let the motor and car slide to the bottom. The South 14th Street trestle carried cars to Mt. Washington.

River. In 1891, the line was extended again from Glenwood across the Monongahela River to Homestead.43

The electrification and expansion of the Second Avenue line produced miraculous results. By running through major industrial centers such as Homestead, Second Avenue was able to capitalize on the large numbers of industrial workers residing in those areas. In less than three years its annual ridership jumped from 119,020 passengers to 1,808,993.44 By 1895, Street Railway Journal no longer referred to the Second Avenue railway as a streetcar operation but as an interurban line. By acquiring other street railway companies in the early 1890s, the Second Avenue railway came to own 55 miles of double track and 78 motorized cars. Passengers boarding a Second Avenue car in downtown Pittsburgh could travel as far east as McKeesport.45

The fifth major electric street railway to open in Pittsburgh was the Duquesne Traction Co. In addition to being a major electric railway, Duquesne Traction is significant because it was the only one of the five railways that competed directly with the cable cars.

Duquesne Traction was the creation of Christopher Lyman Magee, a prominent Pittsburgh politician and businessman. (Magee had made an earlier attempt to run a street railway between downtown Pittsburgh and the East End during the mid-
1880s. Intending to compete with Citizens’ Railway [later Citizens’ Traction], he was bought out by Citizens’ in 1887.) Once again, Magee intended to provide service between downtown Pittsburgh, East Liberty, and Wilkinsburg. His main line ran from downtown to Oakland via Forbes Avenue, roughly parallel to the route of the Pittsburgh Traction Co. Duquesne Traction also controlled 14 satellite railways, most of which were located in Oakland and the East End, totalling 35 miles of track. A substantial car barn was built on Craig Street near Fifth Avenue. This facility had storage tracks for 80 cars and maintenance facilities for an additional 22.46

Magee employed the firm of Booth & Flinn to build his lines. Booth & Flinn was a dominant public works contractor in Pittsburgh, and was controlled by Magee’s political partner, state senator William Flinn. Local street railway officials noted that Booth & Flinn constructed Duquesne Traction’s lines in record time — some new lines were completed in under a year.47

When the Duquesne line opened early in 1891, its standard fare was lower than that of Pittsburgh Traction. A rate war ensued and was not resolved until later that year when Duquesne Traction was leased by Pittsburgh Traction for 99 years. The latter company would operate all of the lines controlled by the former, and would take in 57 1/2 percent of all revenue. Major stockholders of the two companies were made directors of each other’s company. The agreement went into effect on 1 January 1892.48

On the surface, this appears to have been a considerable victory for Pittsburgh’s cable operators. Pittsburgh Traction officials were especially pleased with the arrangement because they could operate a 24 hour service from downtown Pittsburgh to East Liberty using the Forbes Avenue electric cars. (Their cable
was routinely shut down after midnight to allow for inspection and maintenance.) They could also make a substantial profit off of the many Duquesne lines serving other neighborhoods in the East End. However, the advantages of common management were not lost on Magee, who would eventually formulate a plan to consolidate all of Pittsburgh’s East End street railways into an all-electric system.

The electrification of the remainder of Pittsburgh’s horsecar railways did not go unnoticed by the cable railways. When considering the abandonment of horsecars along their outer branches, the cable car operators also realized the advantages of electrification. In an attempt to draw more ridership from the upper portion of its line, Pittsburgh Traction decided to build a short feeder line through Squirrel Hill. Due to the feeder’s small size (only 2 miles), it was felt that the costs of cable traction were not justified. The company electrified the feeder and operated two electric cars. The venture proved to be successful, as it added an additional 500-800 daily passengers to the Fifth Avenue cable line.49

More substantial electrification was undertaken by Citizens’ Traction. During the early 1890s, the company decided to electrify its Sharpsburg and Wilkinsburg branches. The first to be electrified was the Sharpsburg route, which began electrical service in December 1891 with a fleet of 10 cars. The East Liberty–Wilkinsburg route was electrified in 1893.50

The Central Traction Co. also expanded its service in 1892 with an electric line that ran approximately 1 mile up Centre Avenue. Central Traction originally intended to extend its Centre Avenue feeder all the way to Wilkinsburg (the company claimed such a route would be at least six minutes faster than existing routes to Wilkinsburg), but it was blocked by Duquesne Traction, which controlled trackage along part of Centre Avenue.51 Realizing they would probably not get their Wilkinsburg line in the near future, Central officials electrified its entire line in 1894. This eliminated a transfer point at the end of the cable portion of the line and provided additional service along the cable portion where service was most needed.52

Pittsburgh residents were proud of their street railways regardless of their motives, power, so long as it was not animal. The mechanized street railway seemed to symbolize the arrival of a new era. In 1895, the following appeared in the Pittsburgh Dispatch:

One of the strongest evidences of the development of modern Pittsburgh is the fact that the street railways number not a single horse car line, and it is little more than ten years ago since the patient streetcar mule and the long-suffering horse were the sole motive power of all the lines that then existed. Seeing the multitude of cable and electric cars running in every direction one can hardly realize that it is so short a time since they made their first appearance in America’s great manufacture center.53

The appeal of the cable car in Pittsburgh and elsewhere was severely crippled by the perfection of Sprague’s electric streetcar. No longer could cable proponents claim a superior street railway system. The consolidation of manufacturers and standardization of equipment during the 1890s made it easier for street railway companies to electrify, maintain, and upgrade their lines.

Cable technology was beginning to look very much like a
“reverse salient,” while the electric streetcar continued to gather momentum within the street railway industry. George Hilton notes that the greatest period of investment in cable traction took place from 1882 to 1893, when over 270 miles of cable railways were built (over 85 percent of all cable traction investment). From 1893 to 1906 almost all of the nation’s cable lines were either abandoned or electrified, dropping from 305.1 miles in 1893 to 29.3 miles in 1906. Post-Sprague electric street railways, on the other hand, experienced a growth during the 1890s that was nothing short of explosive. By the turn of the century 15,000 miles of electric railways had been built, representing a total investment of over $2 billion.\(^5^4\)

**Consolidation of Pittsburgh Street Railways**

Cable and electric streetcars co-existed peacefully in Pittsburgh for a few short years. On 13 May 1895, Philadelphia streetcar magnates P.A.B. Widener and William L. Elkins met with Christopher Magee, William Flinn, Colonel George W. Elkins (president of Pittsburgh Traction), and attorneys Charles McKee and George C. Wilson.\(^5^5\) Elkins later announced that there was going to be an attempt to consolidate all of the major East End street railways:

> The roads under consideration are the Pittsburgh, Central, Duquesne and Citizens. They comprise the principal lines of Pittsburgh...This will save expensive competition and very largely in economical management, and prevent struggling for future business; that is, prevent competitive lines seeking the same territory.\(^5^6\)

On 23 July 1895, the Consolidated Traction Co. was incorporated. Magee and Whitney were named trustees.\(^5^7\) The officers of the Citizens’ Traction Co. refused to join the combine. This is understandable, since Citizens’ was experiencing record levels of ridership. In 1894, Citizens’ Traction carried almost 15 million passengers, 14 million of which were carried by the cable cars alone.\(^5^8\)

Realizing that Citizens’ would never cooperate willingly with Consolidated, Magee chartered the Fort Pitt Traction Co. on 17 July 1895. Fort Pitt Traction was little more than a holding...
YOU CAN see actual trolleys, and learn more about them, at the Pennsylvania Trolley Museum in Washington, Pa. Celebrating its 40th anniversary this year, the museum has a new Visitor Education Center currently featuring the new exhibit, "Moving the Masses: Pennsylvania Trolleys and the Electric Age." Visitors can also enjoy a scenic 2.5-mile round trip on a vintage trolley.

The museum's collections include 40 electric railway vehicles, a half dozen railroad pieces, and thousands of photos, artifacts, and documents. Of the more than 500 members, over 50 regularly operate the trolleys for the public, working on building track and overhead trolley wire, restore trolleys, or give tours.

The museum is open noon to 5 p.m. daily in July and August, and on weekends and holidays in May, June, September and October. The museum is 30 minutes south of Pittsburgh. Take I-79 to Meadowlands Exit #8 and follow the blue "Trolley Museum" signs. Admission includes unlimited trolley rides that day, a guided tour of the carbarn and restoration shop, and viewing the current exhibits. Free parking and a picnic area are available. For more information, call (412) 228-9256. ☎️

Company intended to pressure the management of Citizens' Traction; the routes of the Fort Pitt line were to run parallel to the Citizens' routes. John G. Holmes, president of Citizens' Traction, realized that the new street railway would probably use electric streetcars capable of attaining faster speeds than the cable cars. Holmes capitulated on 1 November, and allowed Fort Pitt Traction to lease the Citizens' lines. Several weeks later it was announced that Pittsburgh Traction, Central Traction, Duquesne Traction, and Fort Pitt Traction would officially pass into the control of Consolidated on 2 April 1896. Allegheny Traction announced that it would join the combine as well in January.лов

When Magee and other Consolidated officials attempted to figure out how to manage their new company the following April, it did not take them long to realize they had acquired a mess. Consolidated Traction would be responsible for 130 miles of track. This was complicated by both cable and electric motive power, five powerhouses (along with several different types of engines and generating equipment), five major carbarns and numerous maintenance facilities, cars of all sizes and weights, and at least three different types of track.

After much deliberation, it was decided to build a new storage and maintenance facility in the East End on Frankstown Avenue capable of handling all of the company's streetcars. Realizing this facility would eliminate the enormous carbarn on Craig Street (which he built only five years earlier), Magee converted the structure into a large public hall. Renamed Duquesne Gardens, the former carbarn hosted a variety of events, notably ice hockey. It remained a Pittsburgh landmark for many years.

A new powerhouse capable of powering all of the Consolidated lines would be located along the Allegheny River at Twentieth Street. All other powerhouses would be closed, thus sealing the cable car's fate. Due to recent improvements in electrical motors and control equipment, all electric streetcars in service prior to 2 April 1896 would be replaced with larger and more powerful electric cars. Magee ultimately had to acquire 1,400 of these new electric cars to replace existing car fleets.

With a bigger and heavier car fleet on the way, all of Consolidated's trackage had to be ripped up and replaced with heavier rails. For the former cable car lines, Magee planned to remove the cable conduits at the same time. In order to simplify routes, some trackage was removed altogether, while new connectors were built for others. The most drastic example of this was the total abandonment of Central Traction's Wylie Avenue line, which was replaced with a route running exclusively along Centre Avenue (the latter was more direct and had safer grades).

On 2 April 1896, the Consolidated Traction Co. took control of the East End's street railways. No time was wasted in putting Magee's grand reorganization plan to work. The first cable line to go was Pittsburgh Traction, which ended service on 23 August 1896. All Fifth Avenue service was suspended for two months as a crew of 1,400 men used cranes to rip out the old tracks and conduit; electric service began on 17 October 1896. Central Traction was next; discontinued only one week after the Fifth Avenue line, service was replaced immediately by the Centre Avenue route.

The Citizens' cable lines remained in service a little while longer; the East Liberty branch was retired on 9 November 1896. However, cable cars continued to run between downtown and Butler Street until 14 June 1897.

Despite the many advantages of electric traction, Pittsburgh's cable car lines were operating profitably when they closed in 1896.
97. In the end, their limitations were exposed only when Pitts-
burgh street railway owners realized they could make even
greater profits by reorganizing the East End streetcar lines into a
comprehensive network. They also realized electric railway
technology could adapt more easily to the new demands imposed
by such a network — something cable technology just could not
do.

Notes
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