

# Resuscitating an Old Trolley System

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As was the case in most principal American cities, public transportation services in Philadelphia began in earnest in 1858 just before the Civil War. A plethora of independent horsecar lines, concentrated mainly in a dense network within 2 mi of City Hall, had developed by 1883. In that year, a brief 12-year experience with cable car operation on a few routes began. Steam dummies hauled cars on a handful of other lines. The advent of electric traction in 1892 allowed the system to expand its comprehensive service territory to include about a 6-mi radius from City Hall. By 1897 the street railway system had been completely electrified, and, with the exception of four small companies serving the fringes of the city, was consolidated under one management, Union Traction Company.

At the turn of the century success with subway and elevated lines in Boston, Chicago, and New York City led to a flurry of proposals and new companies with franchises to construct such lines in Philadelphia. In 1902 trends elsewhere and pressures from the city government, which was awarding franchises for many rapid transit lines, prompted reorganization of Union Traction Company as the Philadelphia Rapid Transit Company (PRT) for the purpose of constructing a 7-mi subway-elevated line. This line included a 1-mi section of four-track subway, two tracks of which were used by trolley cars.

However, the private company found it could not raise sufficient capital and had to turn to the city for public funds (1). Comparatively little expansion of the trolley system occurred after 1911, the year PRT came under the control of the efficiency-minded Thomas E. Mitten. Under Mitten's management, which lasted until 1931, PRT provided first-rate trolley service; however, the city was disenchanted with PRT's inaction on constructing badly needed subway-elevated extensions. Accordingly, the city built two new rapid transit lines in the 1920s, but PRT resisted operating the lines. Mitten thought his trolley cars could handle virtually all the transit riders in the nation's third largest city.

The low-capital bus and trackless trolley technology that evolved in the early 1920s appealed to Mitten, however, and by 1929 about 20 such routes complemented almost 70 trolley routes. Under Mitten's tenure in 1926 PRT trolley service reached its peak--2,700 cars carried 811 million passengers over 660 mi of track.

During the 1930s six weak trolley routes were converted to bus operation. In 1940 PRT emerged from a 5-year period of bankruptcy, reorganized as the Philadelphia Transportation Company (PTC). Freed at last from staggering rental payments to PRT underliers, PTC was able to pursue a major modernization program that had actually had its small beginnings in 1938. A major facet of this program was the purchase of 260 new PCC trolleys between 1938 and 1942. World War II intervened, and these PCC cars, instead of permitting the retirement of older cars, were required just to keep up with wartime riding. In 1946 the trolley system used 1,900 cars on 58 routes to carry more than 720 million passengers, or 65 percent of the transit system total. Buses then accounted for only 11 percent of system patronage (2).

After the war another 210 PCC cars were purchased, three trolley routes were converted to trackless trolley operation, and another nine were either abandoned as duplicative or converted to bus operation. In 1954 PTC was a conservative, almost "family run" organization. Although ridership was still at immediate prewar levels--strong in relation to trends elsewhere--the trolley fleet was in dire shape. Only one-third of the 1,500-car fleet consisted of PCC cars. The balance were 30 to 40 years old and, although reasonably well maintained, could not continue to attract riders and afford satisfactory service.

## NATIONAL CITY LINES (1955-1962)

The progressive new city administration that took office in 1952 encouraged PTC to modernize its fleet. However, the effects of inflation prevented PTC from acquiring any new rolling stock between 1950 and 1955. In 1955, out of sheer exasperation rather than any sense of confidence, the city acquiesced in the board of director's decision to enlist National City Lines (NCL) to manage the transit system. Although NCL had the initiative to undertake organizational efficiencies and service adjustments, which the old management had eschewed, their principal remedy for an ailing PTC was to eliminate the trolley system as soon as possible.

Clearly, some retrenchment from the 1954 level of PTC trolley operation was warranted because some routes were duplicative or simply no longer justified trolley service because of low patronage. However,

NCL's view of the situation, perhaps biased to some degree by their known predisposition toward motor bus service, entailed contraction of the trolley system by two-thirds. Between 1955 and 1957 the number of trolley routes shrank from 46 to 14. Those 14 were sufficient to use the fleet of 557 PCC cars, which as a group were only about one-third depreciated.

Five of the remaining 14 trolley routes used the surface car subway for downtown access. The original 1-mi trolley subway, opened in 1905 by the old PRT, was extended 1 1/2 mi by the city in the early 1950s. The extension opened in 1955 just after NCL took control of PTC. Although concepts for using the trolley subway for rapid transit trains or trackless trolleys had been advanced, ultimately no serious consideration was given to these ideas. The other nine trolley lines retained by NCL were chosen mainly to consolidate routes at the newest carhouses and to provide interconnecting trackage. The residual life of the track, ridership levels, and operating conditions all played lesser roles in determining which routes remained trolley operated. The nine routes were to be retained only until their PCC fleets were depreciated.

Within 3 months of takeover by NCL, PTC had received 300 new large diesel buses and had plans for another 700 (3). Proceeds from the sale of several depot and shop facilities and a large amusement park, plus salvage of plant and equipment, helped pay for the buses. PTC employment plummeted by 30 percent within 3 years. Although some of the city government's concerns about PTC were resolved by NCL, the attendant indiscriminate reduction in trolley service did not occur unnoticed. Correspondence from the period indicates that the city wanted PTC to justify each trolley route conversion, a request never acknowledged by PTC.

In 1956 the city hired a new engineering staff to pursue its interests before the State Public Utilities Commission. PTC argued that traffic congestion along trolley routes necessitated conversion to buses. A protracted controversy arose when the busy Chestnut and Walnut Street trolley routes were changed over to buses in 1956. The city's stance in opposition to this change was vindicated when ridership fell and service slowed after bus conversion. It is believed that this is the result of most conversions and that it occurs partly because buses cannot accelerate as rapidly as can trolleys and partly because more automobiles are attracted to routes served by buses.

Despite the city's concerns about PTC's operations and policies during the late 1950s, Mayor James H.J. Tate (who took office in 1962) was not disposed to seek a municipal takeover of the transit system. When NCL relinquished control of PTC in 1962 the effects of their policies on the trolley system were apparent.

An adequate overhaul shop had been lacking since 1957, and the PCC car fleet was deteriorating. Programmed track renewals had ceased; rail renewal occurred only when absolutely necessary. Even so, during 1962 the 487 PCC cars on PTC's 14 trolley routes carried 20 percent of PTC's passengers, or 92 million riders. During that same year, subway-elevated trains carried 25 percent of riders; trackless trolleys 5 percent; and motor buses 50 percent.

#### CREATION OF SEPTA (1963-1977)

The decision to create a transit authority covering the five Pennsylvania counties in the Philadelphia Standard Metropolitan Statistical Area (SMSA) took a long time. It began before 1950 and came to a head in 1963 when the Pennsylvania Transportation Company

had a 19-day strike followed almost immediately by an even longer strike at the Philadelphia Suburban Transportation Company. The latter served Delaware County, the principal opponent of joint city-county action just a decade earlier.

Mayor Tate, noted earlier as an opponent of a strong public transit agency, opened the dialogue with the counties, sent a staff team to several large cities in North America with regional transit agencies, and persuaded the five counties to establish a drafting committee for transit authority legislation. The mayor accepted the suburban demands that the counties be equally represented on the board. Each county has two voting representatives; the state has one member on the board because all regional politicians anticipated that the state would be a major source of funds. Members representing one-third of the region's population in the latest census could veto any action, but this only led to postponement and required an extraordinary vote to pass at the next regular meeting.

The legislature agreed to the draft and enacted the bill after making a few minor changes, one of which concerned condemnation of railroad property and another of which made the effective date in mid-January 1964 (Act 450 of Aug. 14, 1963, Pub. L. No. 984). Thus, when the counties and city named two board members each in January or February, the Southeastern Pennsylvania Transportation Authority (SEPTA) came into being as an instrumentality of the Commonwealth of Pennsylvania. It should be noted that it was an instrumentality without a dedicated source of funds, a requirement of the state administration before it would lend its support.

Thus the region had its regional transportation agency; but the city, then with half the population but a far higher share of the region's transit users, had only two appointees on an 11-member board. As one would expect, the road since has been stormy. Many observers feel that the city has not received the quality and amount of transit service its citizens need (4,p.25A), but it has been possible to use that heavy suburban majority to help persuade the state to provide substantial grants for transit agencies throughout the state. Thus SEPTA has had to be a beggar at the county seats, the state house, and Washington.

Some observers have said the main objective of any suburban SEPTA board appointee is to attempt to minimize the funds needed from the counties, even at the expense of the quality of transit service. During the tenure of Mayor Frank Rizzo, from 1972 to 1980, SEPTA was nearly paralyzed and its grants for both operating and capital purposes were insignificant in comparison with the magnitude of needs as seen by outside observers.

Despite these handicaps, SEPTA, with the aid of city guarantees of the debt incurred to buy out the stockholders, was able to acquire the property of the PTC in Philadelphia well as the segments constructed by the city.

Thus the North Philadelphia trolley system was acquired by SEPTA in 1968 when the system consisted of

- \* 14 routes,
- \* 188 mi of single track,
- \* 465 PCC cars the average age of which was then approximately 24 years,
- \* An old and poorly maintained traction power system, and
- \* 80 million annual riders.

About one-third of the track-miles, cars, and ridership was attributed to the five subway-surface routes and the balance to the surface routes under discussion.

As would be expected, the attitude of a suburban board toward a trolley system that served a large section of poor Philadelphia, and which was operated by many of the same managers who had been employed to dispose of the electric-powered system 13 years earlier, did not lead to improved service. This attitude prevailed even though the pro-trolley views of Toronto and most Western European cities were well known and the city had a transit operations engineer who was convinced that the trolley system was more efficient than diesel-powered buses. Between 1968 and 1977 SEPTA made only one permanent conversion of a trolley route to bus operation, and this only with a prolonged 3-year controversy (1968 to 1971). A short shuttle trolley route was combined with a longer trunk route in 1971.

Accordingly, since 1971 there have been 12 urban trolley routes operated by SEPTA; five routes use the surface car subway and seven use the so-called "North Philadelphia" trolley routes, which operate entirely on-street and which are the focus of this paper. See Figure 1.

The several dichotomies that were present (city versus suburbs; Democrats versus Republicans; transit versus automobiles and highways; transit versus suburban railroad lines; and, finally, SEPTA's Chairman, James C. McConnon, versus Mayor Frank Rizzo) were sufficient to completely immobilize the staff. The transit system continued to consume its own assets with inadequate maintenance, slow use of capital grants when they were received, and fares that were too low to support the system.

#### SEPTA DEVELOPMENTS 1978-1983

By 1978 the newest of the PCC cars were fully depreciated. Thus the trolley fleet, despite half-hearted cosmetic repairs in the mid-1970s, was nearing collapse. More than 20 years of inadequate track renewals and inattention to the traction power system contributed to the malaise. SEPTA finally recognized what even NCL had admitted reluctantly more than 20 years earlier--that the five trolley routes that used the surface car subway were permanent. Accordingly in 1979 SEPTA awarded a contract to Nissho-Iwai for 112 new light rail vehicles (LRVs) for these routes; these cars were delivered in 1981 and 1982.

In the meantime the city was pursuing several activities that aided somewhat the seven surface trolley routes. The condition of some track streets had grown so terrible that many of the city's street reconstruction projects were on trolley routes. Because, in these instances, the city paid for excavation and paving in the track area, SEPTA cooperated and renewed the rail. Second, in compliance with Environmental Protection Agency (EPA) mandates, the city provided exclusive trolley lanes along portions of three trolley routes on comparatively wide streets; the lanes were demarcated in a low-cost "paint and signs" format. The EPA issued these mandates in the November 28, 1973, Federal Register and specified certain corridors for transit preferential strategies. In view of these factors, and of ecological and energy considerations, the new SEPTA management advanced a project for a thorough overhaul of 148 (later reduced to 112) PCC cars for the seven surface trolley routes. Officially, however, the PCC overhaul program was a stopgap measure to buy about 8 years of extended service while a permanent modal choice was deliberated for these routes. Production of the rebuilt cars commenced in 1980 at the slow rate of two per month. At the end of 1984, 80 cars had been completed.

The overall situation deteriorated until 1977

when Mayor Rizzo concluded that it was time to replace his SEPTA board appointees and put Hillel Levinson, the city's Managing Director, on the board. Levinson was an attorney who had demonstrated a problem-solving ability and a competence for management of complex organizations. About the same time, the disenchantment of the suburbs with SEPTA Board Chairman McConnon's performance led to his replacement by John MacMurray, a Bell Telephone financial executive, who determined the true state of the property by establishing a crude reporting system and analyzing available data at his kitchen table. MacMurray had the votes to discharge the general manager, but he was not able to employ a manager selected by his own committee. Nevertheless, he had begun a turn-around and the true and appalling condition of the plant was becoming known outside SEPTA. MacMurray's replacement was David F. Girard Di Carlo, a labor attorney appointed by the governor, who had become familiar with the authority while serving as its labor counsel. Girard Di Carlo persuaded the board to hire an effective manager from outside the city, David Gunn.

Gunn speeded up the rebuilding of the bus, subway, and elevated systems and began to work on a better management structure for the commuter railroads under the deadlines established by Congress to take Conrail out of this role. The North Philadelphia trolley system continued to languish, in part because of inadequate funds and limited staff capabilities.

In the meantime, the new SEPTA management became entangled in several disagreements with the city over such projects as the Center City Commuter Railroad Connection (linking two disparate rail systems) and the new Airport High-Speed Rail Line, both under construction by the city in 1980. SEPTA also took issue with the city's plan for reconstruction of the 6-mi Frankford Elevated structure. Unfortunately, by 1982, yet another period of strained relations with the city ensued. SEPTA also attempted to blame many of its problems on so-called "dual-ownership," or the fact that the city designed, built, and owned much of the rapid transit infrastructure. In essence SEPTA resisted city involvement in the public transportation function, save for its subsidy contribution. It is in this climate that discussion of the trolley system from 1982 to the present must be viewed.

For a while it appeared that SEPTA might perceive the value of such a large in-place, albeit deteriorated, trolley system the likes of which many cities of the western United States are having to pay enormous costs to obtain (San Diego, Sacramento, San Jose, Portland, Long Beach). However, by the early part of 1982, SEPTA's internal staff committee put forth the results of its deliberations in a draft report that one critic described as a perfect committee report, meaning that it had parts written by supporters of the trolley system and other sections prepared by members who thought the diesel bus offered the cheapest and best possible service. Because of strong criticism, the report ostensibly went back to the drafting table for considerable rework only to appear 8 months later in November 1982 with only superficial changes (5).

It appeared obvious that top SEPTA management had decided to scrap the trolley lines. The city staff was somewhat ambivalent about some routes and agreed with a few of SEPTA's recommendations; on the whole, however, there was a strong sentiment that the system was too valuable to be scrapped. The year 1983 was the last year of Mayor William J. Green's term. The city administration was arguing with SEPTA about the proper level of fares for the commuter rail lines and was being criticized by the city council for turning over the Frankford Elevated reconstruc-



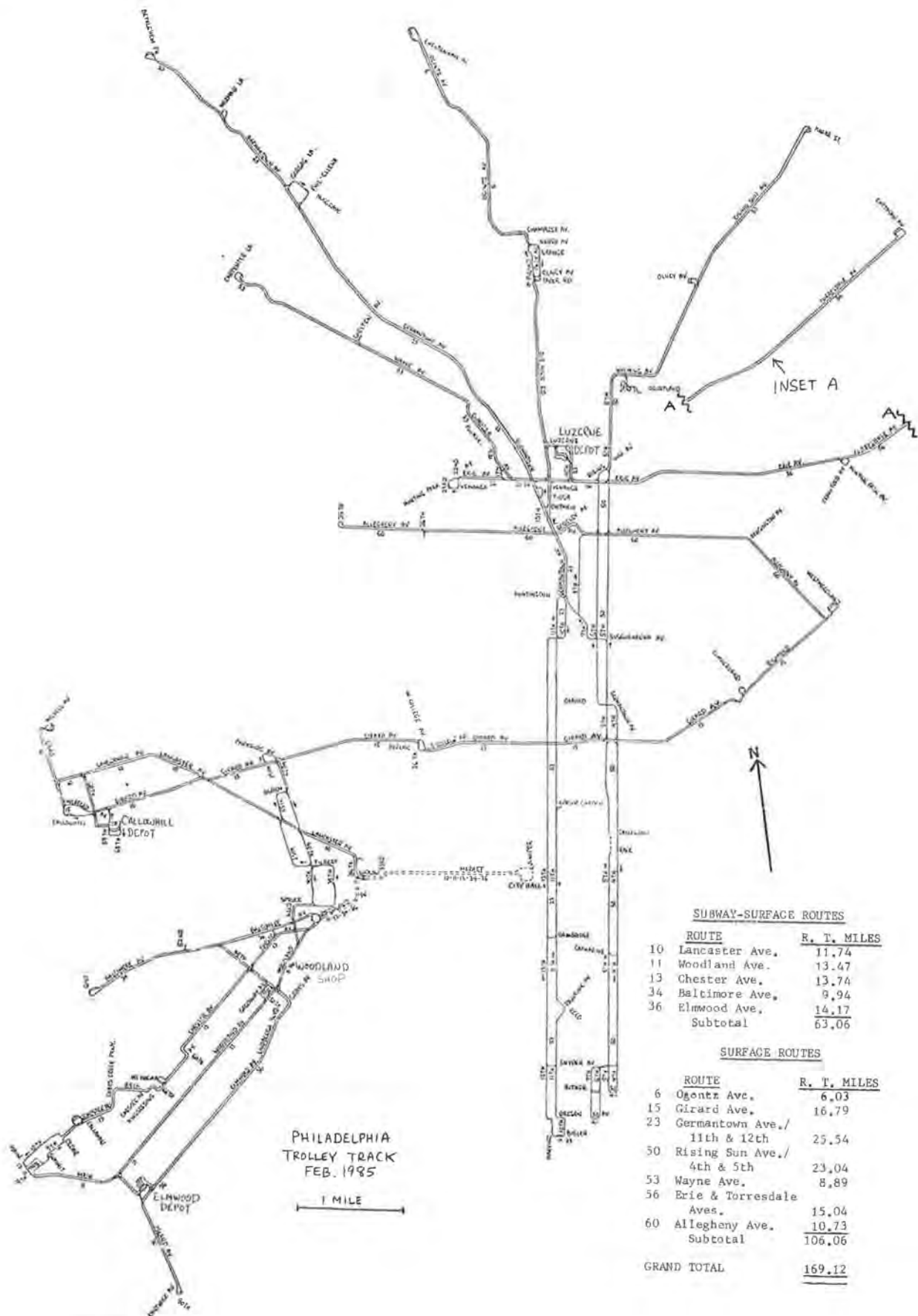


FIGURE 1 Route map.

tion project to SEPTA. Consequently, there was not much effort focused on the trolley system. But an emboldened SEPTA, feeling its strength, decided to force the issue and announced that it would go to public hearings to abandon trolley service on three routes immediately and would plan to abandon the other four routes when either the rebuilt PCC cars wore out or when some major problem developed with the track or power system (communication from SEPTA to Mayor W.J. Green, May 12, 1982). Consequently, in July 1983, Mayor Green wrote to Lewis F. Gould, Chairman of SEPTA, that the city acquiesced in SEPTA's decision to hold immediate hearings on the possible abandonment of trolley service on three routes, noting that the whole issue of the evaluation of the mode to be used would require "ongoing cooperation between the city and SEPTA," and convening a task force to "review the possible testimony on these three route conversions and to ensure cooperation on all outstanding issues with respect to these three routes and the other surface streetcar routes in the city" (Mayor W.J. Green to Lewis F. Gould, July 11, 1983). As a result of this letter, a task force of eight members, chaired by John Bailey, a consultant to the city, was established. The member agencies of the task force were the SEPTA Operations Planning Department; the city's Departments of Public Property, Streets, Police, and Water; the City Planning Commission; and the Philadelphia Parking Authority.

Realizing the short time remaining in the Green administration and being aware of the pressure of the SEPTA staff to proceed with their trolley abandonment hearings, the task force was organized and held its first meeting on August 31, 1983. The task force clearly understood that it had a difficult assignment, that no funds were appropriated for retention of consultant assistance, and that the obvious deadline of a report to an outgoing administration in only 4 months would be extremely difficult to meet.

The task force held meetings during those 4 months, assigned work elements to subcommittees, and approached the end of the year without agreement on a course of action. Nonetheless, the chairman (one of the authors of this paper) felt that a consensus could be developed around a middle-of-the-road set of decisions based on several pieces of information developed during the 4 months and identified briefly herein.

First, it appeared that SEPTA had used an extremely high cost for procurement of new trolleys--\$1 million each when recent procurements suggested that \$650,000 would be more appropriate for nonarticulated cars. Second, excluding some broadly based capital projects that cut across several modes, it appeared that SEPTA had invested less than half as many capital dollars per rider in the trolley network as in the low-capital bus system (\$117 versus \$262) and had already committed more than \$1,500 per rider to the commuter rail system. In 1984, the seven surface trolley routes carried 97,000 riders per day compared to 80,000 on the entire commuter rail network. Obviously, the surface rail system had been starved for funds. A third factor evaluated was that SEPTA's analysis had not given adequate consideration to the 33 percent larger carrying capacity of a trolley compared to a single bus even though these routes carried large numbers of riders. Nor had SEPTA given adequate consideration to the reduced pollutant levels of the electric trolley in residential neighborhoods.

Additional difficulty arose in programming street and track reconstruction projects because many of the North Philadelphia trolley routes are on state highways. It had been thought that putting an additional member on the task force to represent the

state would only have complicated the process and extended it by many months; thus a major voice was absent, but the overall views of the Pennsylvania Department of Transportation (PennDOT) on the issue were known.

The chairman drafted a report based on his assessment of those task force factors and his professional evaluation of the SEPTA planning report. He hoped to develop a consensus around his "middle-of-the-road assessment" of the committee's views (6). This draft was distributed to the committee and elicited strong opposition on the part of several members of the committee who still desired to explore several aspects in much more depth. That exploration would have taken both time and funds that were not available. Although the chairman concluded that further deliberation probably would not change his position, it might also be noted that the strongest trolley advocate on the task force considered ill-advised even the 2-mi of trackage that the report recommended for elimination.

The basic conclusion of the report was that trolley service should be retained or reinstituted on five routes and that part of the sixth route be eliminated. The report concluded that SEPTA's capital budget could provide the funds for new cars, timely replacement of tracks and traction power systems, and necessary improvements to carhouse facilities. A brand new heavy overhaul shop for LRVs, with capacity for cars on seven North Philadelphia lines, opened in June 1984. The report observed that there was no identifiable source of capital funds in the Department of Street's budget to cover paving costs but that, to date, no track or street reconstruction project had failed to be completed because of these limitations. The report further suggested that the city would have to face and resolve the problem of inadequate street funds whether or not the trolley system were retained, especially because buses cause substantial wear and tear on streets.

The seventh line, which the report left in limbo, was Route 60 on Allegheny Avenue from Richmond Street on the east to 35th Street on the west. This route was converted temporarily to bus operation in September 1977, primarily because of a shortage of operable PCC cars. However, when the car shortage eased in 1982, this route was passed over for restoration of trolley service because the track was in such disrepair--most of it dates from the early 1920s. Route 60 connects with Route 15 trolley line at Richmond Street, passes under the Frankford Elevated at Kensington Avenue, over the Broad Street subway, and within one block of the Allegheny station on the commuter rail system. Thus it is a major connector for several substantial employment and residential communities. However, it appeared that the SEPTA budget could not cover immediate replacement of the 10 mi of track that would be essential to return this line to service. It was suggested that some method of funding, other than the normal channels, had to be secured for Allegheny Avenue or trolley service on Allegheny Avenue would be abandoned permanently. Actually, a SEPTA planner had suggested a demonstration of LRT quality of service on a North Philadelphia trolley line rebuilt to LRT standards within a relatively short period of time. This was the general tenor of the draft task force report.

#### CURRENT CITY ADMINISTRATION--1984

Immediately after Mayor W. Wilson Goode took office on January 2, 1984, his attention was diverted to several issues more pressing than the trolley system. However, during April 1984, several meetings were

held, some involving Mayor Goode's cabinet members, to evolve a formal city policy on the trolley system. City Managing Director Leo A. Brooks, Mayor Goode's cabinet member who is specifically charged with transportation policy matters, agreed with the task force report but took its recommendations one step further by concluding that the entire trolley system, even the few miles that the task force had acceded to abandoning, should be revitalized. He and the city's two SEPTA board representatives took such a recommendation to Mayor Goode; he concurred and formally committed this policy to writing in a letter (addressed to Judith Harris and Mary Harris) to the SEPTA board on May 11, 1984.

It should be noted that the public hearings conducted by SEPTA during August 1983 on conversion of three trolley routes to diesel bus operation elicited verbal and written testimony that was 85 percent in favor of keeping and upgrading the trolley system. Nevertheless, the SEPTA staff attempted to secure board approval of trolley service abandonment on these three routes in December 1983 and again in March 1984 but failed on both occasions. In view of Mayor Goode's policy statement in favor of trolley retention, no further board action on abandonment has been sought by the SEPTA staff.

The Mayor's policy decision was based on the following considerations:

1. No on-site pollution would occur in the populated neighborhoods served by the trolleys.

2. Higher transit ridership and revenue potential, and lower operating expenses, would result from upgraded trolley service compared to diesel buses over the long term.

3. The five routes currently served by trolleys should continue to have trolley service while the car fleet and infrastructures are renewed. A sixth route, currently served by buses, should resume trolley service as soon as possible. All six of these routes have a schedule requirement of 91 cars, which should make efficient use of the fleet of 112 rehabilitated PCC cars until new cars can be provided.

4. The seventh route, Allegheny Avenue, should continue to have temporary bus service while the city seeks a federal demonstration grant for rebuilding the route to LRT standards.

5. Improved trolley operation affords a higher level of service than do diesel buses and, in general, accents the character of the neighborhood through which they operate. The 97,000 daily riders on these seven routes (more than the entire commuter rail system) warrant the long-deferred capital investment in better trolley service.

6. The condition of many track streets is so bad that total street and utility construction would likely be required within the next 10 to 15 years even if the trolleys were abandoned. It would be more cost-effective to rebuild these streets sooner, say within 6 years, with new trolley tracks and reap the long-term service, economic, and environmental dividends from upgraded trolley service.

7. It is estimated that the capital resources required over the next 6 years for six of the seven trolley routes would comprise only 13.7 percent of anticipated funding levels (1984). This compares to only 1.6 percent of capital funding that was allocated to these routes during the period 1972-1984. These routes carry about 6 percent of SEPTA's ridership. On a typical weekday these six trolley routes carry 80,000 riders, as many as the 12 SEPTA commuter railroad branches. In simple terms, the capital requirements for the trolley routes are not inordinate.

8. Most trolley routes operate on state-main-

tained streets. Because the Commonwealth of Pennsylvania has not been able to provide top-quality maintenance to the highway system in Philadelphia, it would be cost-effective to include some track area paving reconstruction in SEPTA's UMTA-funded grants. Relatively speaking, recent UMTA capital funds have been more plentiful than federal or state highway funds. The mountable curbs contemplated in the Allegheny Avenue concept would make the track area somewhat less useful to motorists and truckers.

In spite of the mayor's policy decision, the SEPTA board's refusal to sanction trolley abandonment, and SEPTA staff's own documentation of capital needs on the trolley system, little progress has been noted since May 1984. Engineering projects for new cars and a new carhouse have been included in SEPTA's FY 1985 capital budget; however, nothing substantive has transpired in regard to the critical track and traction power needs. At this writing (February 5, 1985), the city administration finds itself in a quandary somewhat parallel to that faced by a minority stockholder in a large private corporation: "How does one get an obdurate majority to change its policies to give a fair break to the minority's clients?" Unfortunately, the city cannot "sell out," so to speak, because it could not stand the political heat of turning city residents' transit needs over completely to the suburban-dominated SEPTA board.

Thus it would appear that the city administration may have to acquiesce to SEPTA's uncooperative and insensitive actions or decide to develop a tight, highly professional set of analysts incorporated in the mayor's office. The intent would be to influence every SEPTA-related decision so the city's economic power would be used to the fullest. This potential battle may not be successful, but it appears preferable to the first and only other alternative--passivity and the resulting continued decline in the quality of service on the entire SEPTA City Transit Division.

#### ALLEGHENY AVENUE LIGHT RAIL PROJECT--1984

As stated before, trolley service on Allegheny Avenue was temporarily withdrawn in September 1977; the immediate cause was a shortage of PCC cars. However, for many years before that, the track, most of which dates from the 1920s, had been in poor condition with considerable attendant wear-and-tear to the rolling stock. Accordingly, when the PCC equipment shortage subsequently eased, this route was passed over for restoration of trolley service. Because virtually all of the track structure was deteriorated, piecemeal renewals were viewed as ineffectual.

In 1982 informal discussion ensued on a demonstration grant to fund rebuilding the entire route to LRT standards in a short time frame. Mayor Green's trolley task force draft report documented the concept in December 1983, and Mayor Goode specifically endorsed it in May 1984.

The proposed project qualifies for special demonstration funding for several reasons. It is novel in a broad sense because it is the first known domestic attempt to install an LRT line in a densely populated old industrial city with only a few wide streets available for improved surface transit. The upgraded transit and reconstructed highway and utility facilities would be evaluated to determine whether they slowed the process of disinvestment or sped up reinvestment in the neighborhoods along the route, or both. As alluded to earlier, the trolley infrastructure is totally depleted so timely reconstruction of the route under normal UMTA Section 3



or 9 grants would tend to displace other pressing capital needs, particularly on the commuter rail system.

The project would cost about \$60 million including 24 new LRVs, new trolley tracks within a raised yet paved segregated right-of-way where possible, passenger boarding platforms, new highway and parking lanes, new curbing and utilities where required, an overhead traction power system with underground feeder cable ducts, a transit preferential signal system and other trafficking engineering hardware, plus selected tree plantings.

The cost at first blush seems high, but considering the many years of deferred maintenance and the project's useful life of 30+ years, it is not inordinate.

The transit route itself is important, as the following information indicates. Route 60

- \* Serves 18,000 daily riders and has the potential for a 50 percent increase with new equipment, if experience with the subway-surface trolley lines and their new LRVs is any indication and

- \* Feeds two subway-elevated lines plus a possible direct connection with the commuter rail system.

The car requirement of 24 vehicles assumes a 50 percent increase in riders, 85-passenger LRVs compared to 64-passenger buses, a 10 percent decrease in running time, and an 80 percent availability factor for the LRVs. Use of two planned short-turn loops would permit more efficient use of equipment should ridership growth exceed 50 percent.

Allegheny Avenue is a diverse corridor, 5 mi long with varied residential, commercial, institutional, and industrial land uses. Several joint public-private ventures are under way on or near Allegheny Avenue, involving medical centers, an industrial development strip on American Street, and the Allegheny West Foundation/Hunting Park West commercial revitalization project. SEPTA is constructing a brand new bus garage, and the city plans improved schools and recreation facilities. The proposed LRT line will tie together all of these efforts by improving circulation within the Allegheny corridor and access to and from the entire Philadelphia region.

A preliminary plan for the LRT line, with the following basic parameters, has been prepared by the City Department of Streets:

1. Ten feet is adopted as a minimum width for all through-traffic lanes.

2. A minimum of two full-width through-traffic lanes in each direction is provided.

3. To the greatest possible extent the design keeps the highway lanes tangent and, if necessary, swerves the tracks around fixed objects such as loading platforms and islands.

4. To the greatest possible extent where some widening of the cartway is necessary, it has been designed to leave one of the two curbs intact thus minimizing the cost of construction and the impact on the adjacent properties.

5. The design does not anticipate legalizing any left turns from Allegheny Avenue that are not currently legal but does make provisions for continuing left turns from Allegheny Avenue at signalized intersections where they are presently legal.

6. Low demand left turns could be prohibited even though they are presently legal.

7. The design has a provision for the "building block" concept wherein each intersection and footway can be modified as necessary to meet specific needs or desires.

8. One or two 8-ft-wide parking lanes can be provided where required.

As depicted in Figure 2, Allegheny Avenue has a dedicated right-of-way of 120 ft, although the actual cartway is 60 ft over about half of the street length and only 50 ft over the balance. To accommodate the LRT and traffic and parking lanes, 81 ft of cartway are needed so curb setbacks of 10 to 15 ft on each side of the street are required. Where the nature and sensitivity of various encroachments into the right-of-way (such as staircases, terraces, lawns, and retaining walls) are serious, the design may have to compromise in one of three ways:

- \* Delete one or both parking lanes; politically, this often would be difficult to achieve, especially in residential areas.

- \* Incorporate only one instead of two traffic lanes, in either or both directions, with the understanding that when vehicular obstruction occurs encroachment onto the LRT right-of-way would be condoned. Traffic volume counts would determine whether one traffic lane would suffice.

- \* Delete LRT exclusivity in one or both directions.

As can be imagined, the community liaison aspect of the project design phase will be extensive if such detailed issues are to be resolved successfully.

At the end of 1984 an informational brochure had been printed and distributed, and two public hearings had been held, with 75 percent favorable testimony (7). The concerns expressed at the public hearings did not entail opposition to trolleys or support for buses, per se, but rather three largely extraneous issues.

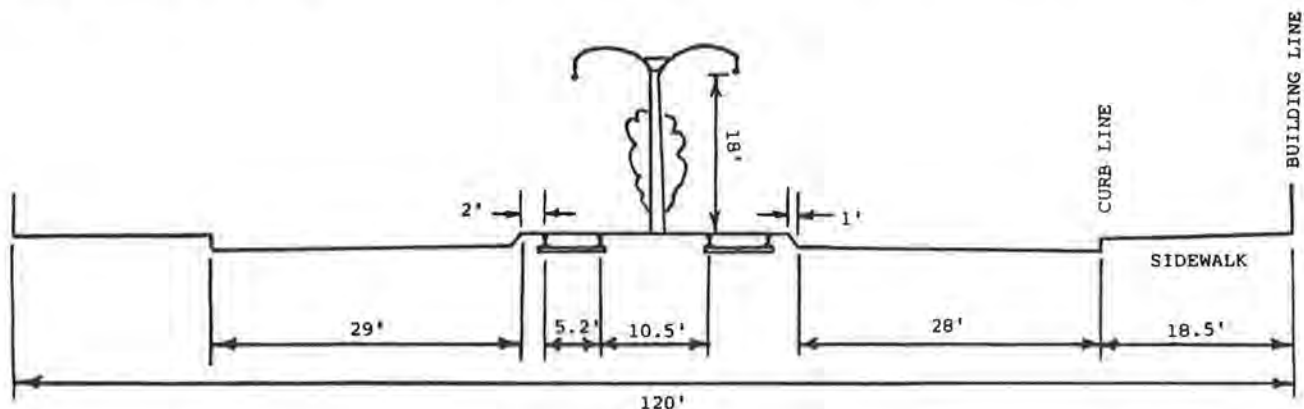


FIGURE 2 Cross section of Allegheny Avenue light rail project.

TABLE 1 Route 60 Demonstration Project, Estimates for Capital Budgets (\$ millions)

	Preproject (pre-FY 1986)	FY 1986	FY 1987	Total Project
Vehicles				
Pilot order, 2 cars	2.5 <sup>a</sup>			
22 cars		14.3		14.3
Other engineering		3.8		3.8
Track and power			12.6	12.6
Utility costs directly related to transit			2.7	2.7
Utility costs indirectly related to transit			4.1	4.1
Paving and curbing, 50% federal demonstration			10.1	10.1
Motor vehicle lanes, PennDOT			10.2 <sup>b</sup>	10.2 <sup>b</sup>
Total	2.5	18.1	39.7	57.8
Spread				
Existing UMTA grant	2.5			
Federal demonstration		13.6	22.1	35.7
Utilities (city)		1.0	1.0	2.0
Pennsylvania demonstration		2.5	5.4	7.9
SEPTA		1.0	1.0	2.0
PennDOT (Hwy)			10.2 <sup>b</sup>	10.2 <sup>b</sup>
Total	2.5	18.1	39.7	57.8

<sup>a</sup>Includes cat engineering.<sup>b</sup>Not amenable to demonstration.

First, there was the pervasive concern about disruption of small business during the construction phase. These concerns will be manageable, one way or another.

Second, there was concern about loss of on-street parking, to which the response was made that no such parking would be eliminated where demand exists.

Third, there was apprehension about senior citizens' ability to cross a widened Allegheny Avenue safely, as well as to board and alight LRVs operating between lanes of vehicular traffic. It was pointed out that the LRV loading platforms also would function as midstream refuges for older people unable to complete a crossing of Allegheny Avenue within a given signal phase and thus aid rather than hinder pedestrian safety. And the loading platforms and LRV step configuration would be designed to facilitate access and egress by elderly riders. Conversely, and with regard to sensitivity to parking, it was noted that for buses to serve passengers properly at curbside, six to eight parking spaces per block would have to be expropriated for bus zones. Even then, illegal parking and bus driver laxity would result in many buses' making passenger stops away from the curbs.

Funding for the project has been programmed by the regional planning organization. A tentative budget by object and funding sources is given in Table 1. The budget depicts 30 percent of the cost as not directly transit oriented: \$17 million will be required for highway lanes and utility renewals. Even with the highway paving and utility costs, the Allegheny Avenue project's estimated cost per mile is only 60 percent of that for the Los Angeles-Long Beach LRT line. Although this is admittedly an "apples and oranges" comparison to some degree, it is believed that the unit cost for an LRT line built to Allegheny Avenue specifications is far more cost-effective than other projects funded by the federal government.

Assuming funding is approved for the project in the federal FY 1986 budget, engineering and design would be undertaken in 1986-1987, and construction could start during the summer of 1987 with commencement of service late in 1988.

The lead time for procurement of new LRVs is such that a new fleet of vehicles for Allegheny Avenue could not be available much before 1988.

It is believed that the Allegheny Avenue Light Rail Project can be a trailblazer for many similar projects, especially in older midwestern cities with wide avenues and where exclusive LRT right-of-ways are not readily available. The rebuilding of Route 60 should also speed reconstruction of other LRT routes, and it could lead to greater adaptability and flexibility in response to operating problems by serving as a crosstie between other trolley routes.

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