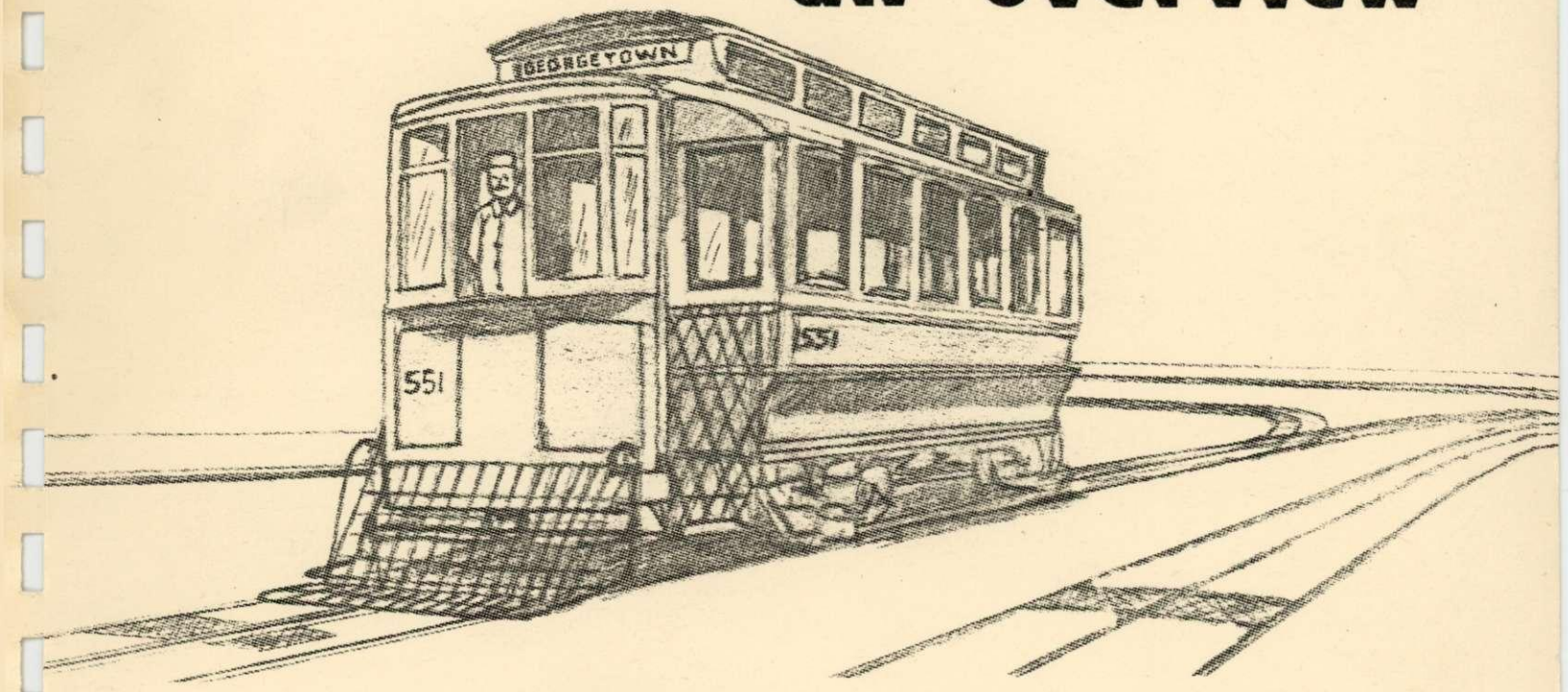
GEORGETOWN AREA ACCESS ALTERNATIVES STUDY

TECHNICAL MEMORANDUM NO. 2

The Reinstitution of Georgetown Trolley Service: an overview



PREPARED FOR

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

PREPARED BY

JHK AND ASSOCIATES

MARCH 1979

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THE REINSTITUTION OF GEORGETOWN TROLLEY SERVICE: AN OVERVIEW

Prepared for

District Of Columbia Department of Transportation

Prepared by

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March 1979

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1. INTRODUCTION

In January 1962, the last trolley in Washington, D.C. was replaced by a bus and an era spanning two centuries came to an end. The privately operated trolley service was the victim of a combination of post-World War II factors including decreased ridership, spiraling operating costs and the public's desire to remove on-street trolley service to improve automobile operations.

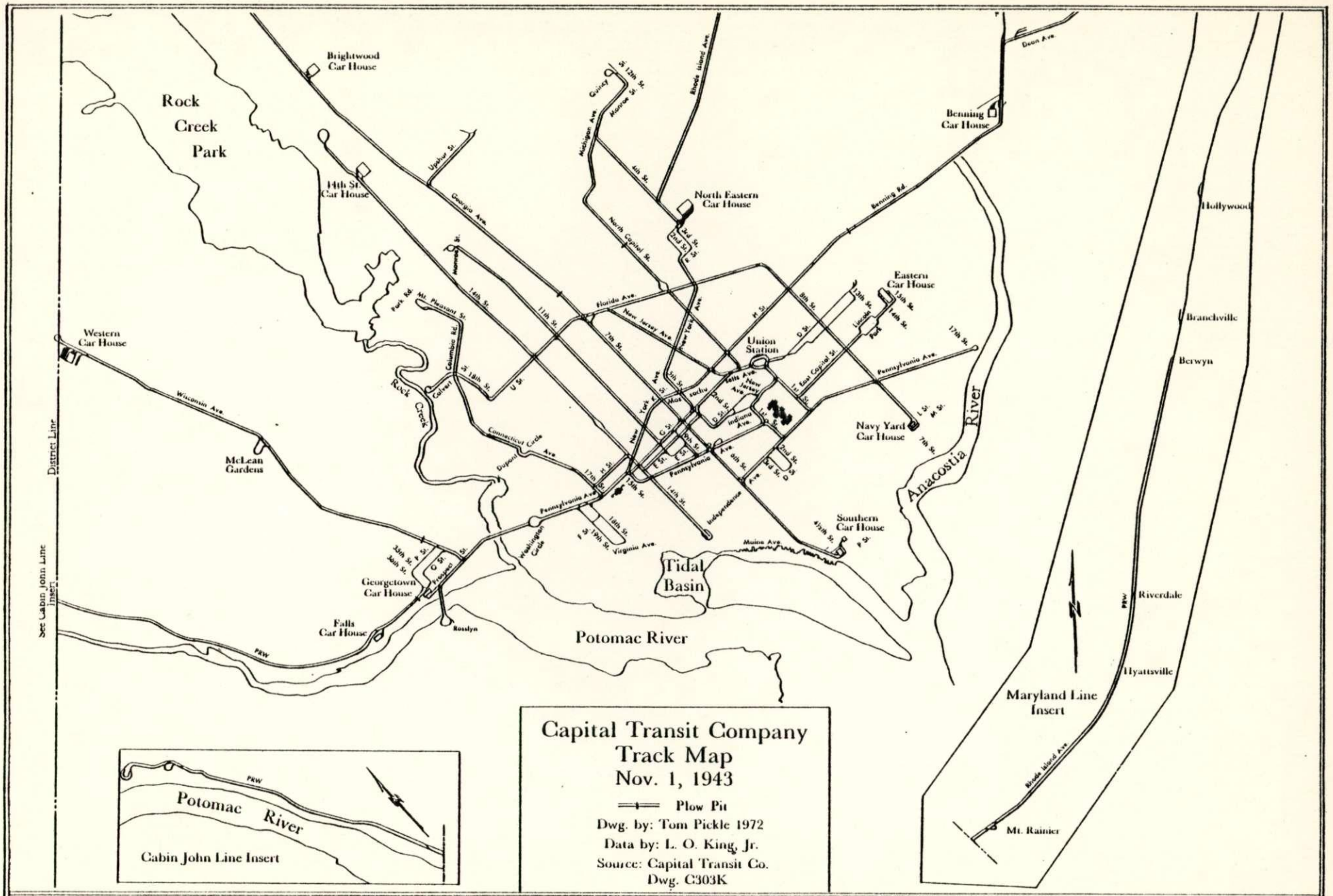
Georgetown was one of the areas well served by the trolley system. A map of the Capital Transit Company showing its operations in 1943 (Figure 1) depicts trolley lines through Georgetown on Pennsylvania Avenue, M Street, Wisconsin Avenue, O and P Streets and across Key Bridge to Rosslyn. The service in Georgetown tied into an extensive network in the remainder of the District of Columbia.

Washington, D.C. was not unique in abandoning trolley service. By the early 1960's most other similar-sized U.S. cities had also replaced their streetcar operation with bus fleets.

By the time the last trolley pulled into the barn, transportation planners were already well along in their work aimed at developing a rapid rail system that would be able to operate on exclusive rights of way at speeds and service levels substantially higher than either the trolley or bus service could provide.

Those planning the rapid rail system in the 1960's had difficult decisions to make concerning route alignment and station locations. Many alternatives were reviewed and the final system that emerged represented a compromise which considered many factors including costs, neighborhood impacts and environmental and social factors.

The 1960's also saw a dramatic change in how the United States viewed public transportation. For more than



Capital Transit Company Track Map Nov. 1, 1943

Plow Pit

Dwg. by: Tom Pickle 1972

Data by: L. O. King, Jr.

Source: Capital Transit Co. Dwg. C303K

1943 D.C. STREETCAR NETWORK

jhk & associates

FIGURE NO. 1

six decades public transportation had largely been a bastion of private enterprise. Large sums of money were invested and made by entrepeneurs in the public transit industry. However, the growing domination of the automobile and the post-World War II economy established a set of conditions that no longer allowed a profit on public transportation operations. Private operators sold out to newly-created public agencies and public transportation began to emerge and be viewed as a public service, in the same light as the provision of educational, police and fire services. With public funding came a more understanding assessment of the role of public transportation in filling the mobility needs of our community.

The opening of the first Metrorail line in the District of Columbia and the extension of the system across the Potomac River has rekindled the interest of people in rail transportation. Those areas that are not well served by Metrorail have been studying means of improving accessibility to the system. Montgomery County, anticipating the desirability of access to the Silver Spring Station developed a localized bus access service called "Ride-On", which now carries one in five of all persons who use the Silver Spring station.

The District of Columbia is presently investigating alternative means to improve transit access to Metrorail stations in a number of areas throughout the City including Georgetown. The Georgetown Area Access Alternatives Study, for which this memorandum is being prepared, is investigating a number of options for improving access to Georgetown's three nearby Metrorail stations.

Georgetown maintains a unique posture in the Washington area with its concentration of specialty shops, entertainment centers, office buildings, residential communities, Georgetown University, and the Potomac Waterfront, all set within a historical environment. This wide variety of activities generates significant mobility requirements at all times of the day, and every day of the week, including weekends.

Meeting these mobility requirements has not been easy and Georgetown is plagued by a number of transportation problems including traffic congestion, inadequate parking supply, and a large percentage of through traffic. As Georgetown has emerged to a place of prominence in the last decade so have ideas to improve transportation in the area. One of these suggestions has focused on the restoration of trolley service in the area as a means of linking Georgetown to the Metrorail system. In addition to improving transportation service, there is a strong movement in Georgetown and the region for preservation. This has resulted in the Georgetown Historic District being added to the National Register of Historic Places. As part of this emphasis several of the streets in Georgetown have retained their original cobblestones and streetcar tracks.

The proposal to reinstitute trolley service in Georgetown has come largely from the private sector. The proposal, has not previously received formal analysis by public agencies, largely because of the focus on the Metrorail system. However, with the initiation of the Georgetown Area Access Alternatives Study has come the opportunity to review the trolley proposal as one means of improving the area's transportation service.

Additional encouragement for this review of reinstituting trolley service has come from the Urban Mass Transportation Administration (UMTA). In a letter from Charles H. Graves, Director of Planning Assistance at UMTA to Mr. Albert A. Grant of the Metropolitan Washington Council of Governments (see Appendix), Mr. Graves indicated that UMTA would be willing to provide 100 percent funding of a study to investigate trolley service in Georgetown. Mr. Graves indicated that the study could have national significance since "it would demonstrate how to plan an at-grade light rail facility which connects urban activity centers and which may operate without a deficit." His letter also indicated that the study should not commence until

the Georgetown Access Study had reached a point where the alternatives have been narrowed and "at-grade light rail remains a promising option."

The purpose of this memorandum is to provide an overview analysis to determine if the reinstitution of trolley service in Georgetown is a viable alternative which should be pursued in more detail through the conduct of the Georgetown Trolley Study. It should be recognized that the analysis performed for this memorandum does not represent a full feasibility study, but instead simply represents a determination of whether it is worthwhile to pursue the investigation of trolley service as a possible alternative for improving transportation in Georgetown. Trolley service is only one of several alternatives being seriously considered for improving access within Georgetown. The ultimate determination regarding trolley service must be made within an evaluation framework which considers the full range of possible alternatives for improving transportation in Georgetown. However, in order for the trolley option to be adequately assessed it will be necessary for a more detailed study to occur so that accurate assessments of cost, impacts, and institutional issues can be used in the final evaluation. Thus the findings of this report represent only one step in the process which will ultimately lead to a decision regarding whether or not trolley service will be brought back to Georgetown.

2. PRIOR STUDIES

Although the reinstitution of trolley service in Georgetown has been discussed for a number of years, it was the issuance of two independent reports by citizens' groups that triggered serious consideration of such an option by transportation officials in the region. These reports represent attempts by concerned citizens of the Washington area to shed light on a transportation option which they felt was not receiving a proper critical analysis. The findings of these reports formed a base for the analyses performed in this study. This report represents an attempt to supplement the information provided in these prior reports.

The first citizen's report is entitled "A Demonstration of Light Rail Transportation in the Nation's Capital: A Citizens' Proposal.(2)" It was issued in March 1975 and was produced in the hope of "(a) stimulating further in-depth analysis and follow-up action by the appropriate responsible officials at the federal, local and regional levels and (b) generating public interest in the concepts examined."

The study investigated three regional light rail alternatives, two of which included routes through Georgetown. The alternatives were designed to provide an intermediate level transit service in several corridors in which Metrorail service is not planned. The systems were designed to serve as an auxiliary distributor and collection service to Metrorail and to reduce vehicular traffic in several residential communities in the District of Columbia, including Georgetown.

The findings of the study indicated that medium scale light rail systems could afford operational cost savings over comparable bus operations, they could offer significant door-to-door travel time savings relative to travel by bus, and they could likely have

significant positive impacts on important economic, environmental and social values such as enhanced personal mobility for inner-city residents and increased commercial activity. Capital cost estimates in 1975 dollars were made which approximated $3 million per mile (including construction and rolling stock). The study team concluded that it believed that "its initial findings warrant further serious consideration by District, regional and federal officials." They believed their study strongly suggested that "major transportation and related benefits would be achieved by the integration of a light rail program into the region's transportation plans."

A second independent report was produced in September 1976 by the Citizens Association of Georgetown entitled "Report on the Restoration of Streetcars and Cobblestones" (3). This report was produced in response to plans by the District of Columbia to pave over the trolley tracks and cobblestones on M Street through Georgetown. The District of Columbia was under order by the U. S. District Court to either remove the trolley tracks or cover them with pavement. This report concluded that much of the track and conduit through Georgetown was in good condition and could be used for trolley service with only minor repair work. It estimated that trolley service could be restored at a total cost of between $1.0 million and $1.8 million.

The report considered three alternative alginments all of which would originate at the Foggy Bottom Metro Station and run up 24th Street to Pennsylvania Avenue, west on Pennsylvania Avenue to M Street, and from there to Wisconsin Avenue along M Street. The first alignment would terminate just west of Wisconsin Avenue on M Street at the old D. C. Transit repair shop. The second would continue along M Street to Key Bridge, and the third would turn up Wisconsin Avenue to P Street, go west on P Street to 36th Street, south to Prospect Street, looping around to 35th and O Streets and returning to Wisconsin Avenue via O Street.

The report concluded that old streetcars similar to those presently used in Detroit should be sought for use in Georgetown. Operating costs were estimated at $2.50 per vehicle mile. It was estimated that with an average one-way passenger load of 10 and a fare of 25 cents, farebox revenues could cover operating costs for the base one-mile system. Because of Georgetown's midday, evening, and weekend attractiveness, it was felt that such an average load could be reasonably expected.

3. THE FUNCTION OF A GEORGETOWN TROLLEY

Trolley service in Georgetown could provide a number of functions. Such service would obviously be attractive to the many thousands of persons who live, work, and shop in Georgetown for movement within the area. Likewise, tourists from out-of-town or visitors to Georgetown could be expected to use it as a form of recreation much as visitors and tourists use the Metro system. Finally, for many persons trolley service could be a primary transportation service carrying them from their residence to their job site or to another transportation mode that serves their job site.

To a great extent, the manner in which the service would be structured would determine its primary function. A system using older vehicles, limited trackage, low frequency and limited hours of operation would provide mostly tourist, visitor and historical service functions. On the other hand, a service with newer vehicles, extended routes, high frequencies and operating over the full daytime and evening hours would offer a higher level of transportation service. This range of functions and the characteristics that define them are described in the remainder of this report and are summarized in Table 5 in Chapter 11.

Georgetown was served by streetcars of one type or another for nearly one hundred years between 1862 and 1960. The Georgetown that we know today largely grew up around the streetcar. The streetcar was a critical element in its history. As movement continues to preserve Georgetown's historical landmarks, attention has focussed upon the possibility of restoring trolley service as a means of preserving one of Georgetown's most significant transportation artifacts. The preservation of trolleys within Georgetown is seen by some as being somewhat akin to preserving Georgetown's other famous transportation landmark, the C & O Canal.

Streetcar museums have sprung up across the country and have proven to be extremely popular, the nearest such one being the Wheaton Trolley Museum in nearby suburban Maryland. Reinstitution

of trolley service in Georgetown could serve some of the same functions as these popular trolley museums. Such a service could prove to be a tourist attraction drawing a large number of Washington tourists. Such an attraction could prove to be a boon to many of the specialty shops and restaurants in Georgetown which rely on tourist business and would add to the overall attractiveness of Georgetown as an entertainment center.

However, trolley service in Georgetown could serve much more than just as a museum or recreational ride. Perhaps the service in the United States which most closely resembles the type of service which many people envision for Georgetown is the cable cars in San Francisco. The justification for retaining cable cars in San Francisco is largely historic. However, they serve an important transportation function as well. Many persons use San Francisco's cable cars to commute to and from work or to access other elements of San Francisco's public transportation network.

Trolleys in Georgetown could also serve an important transportation function as well as a historical function. Georgetown is presently linked to Metrorail only by Metrobus routes which pass over the major arterial streets. These buses must travel in congested commuter traffic. Riders boarding in Georgetown often must stand on overcrowded buses, fares are high, and the overall perceived level of service is low. If a trolley service could be instituted in Georgetown which would directly link Georgetown to the Foggy Bottom Metrorail station and would be given preferential treatment over autos in its use of the streets, it could provide an important transportation function within Georgetown.

Thus in evaluating whether the reinstitution of trolley service in Georgetown is worthwhile, it is important that the bi-functional nature of this service by recognized. In fact if trolley service is to be reinstituted, the nature of this service

will depend to a great extent upon the degree to which it is to serve as a historical landmark and the degree to which it is to provide a transportation service. The evaluation of the feasibility of reinstituting trolley service will be somewhat dependent upon the degree to which it is designed to meet each of these functions.

If the trolley is to be designed to serve primarily a historical function the criteria used to evaluate alternative plans and designs and the weights given to each of the criteria will be quite different from the criteria and weights that would be assigned if the purpose is primarily to provide improved transportation access. Hopefully, if the decision is made to seriously pursue the reinstitution of trolley service as an option, a system could be designed which could both operate as a historical landmark and provide improved transportation service.

4. REVIEW OF SELECTED NORTH AMERICAN LIGHT RAIL OPERATIONS

Light rail systems exist or are in the planning stages in a number of cities throughout North America. Operations in these cities provide useful information that should be used in the determination of whether trolley service in Georgetown would be feasible. Some of these operations have been in place continuously since the nineteenth century. Others have recently begun or are planning to begin light rail service. A brief description of some of these systems follows. Operating characteristics of several of the systems are summarized in Table 1. The information provided in this chapter was derived from information provided in References 4, 5, and 6.

Buffalo, New York

In June 1976 the City of Buffalo, N.Y. through the Niagara Frontier Transportation Authority received approval to construct a $350 million light-rail-rapid-transit (LRRT) system. This project was the culmination of a 10-year planning process which included an extensive alternatives analysis to justify the system. The LRRT system will become the central transportation feature of Buffalo's transit shopping mall on Main Street. This surface operation will be an important part of the service. It was designed to minimize CBD disruption while at the same time maximizing access to the system.

Edmonton, Alberta

The City of Edmonton, Alberta opened a new 4.5-mile LRT system in April, 1978. The estimated capital cost of the system was $65 million dollars. In contrast to the Buffalo system, the CBD portion of the system is in subway with two underground stations. The remainder of the system is at surface and shares the right of way with the Canadian Northern Railway System and the Grand Trunk Pacific Railway.

Table 1. Operating Characteristics of Selected North American LRT Systems

City	Buffalo, New York	Edmonton, Alberta	Detroit, Michigan	New Orleans, Louisiana	Fort Worth, Texas
Length (Mi.)	6.4	4.5	0.9	6.6	1.2
Vehicle Type	-	DuWag U2	Brill Trolley	1920's Street-cars	Restored PCC
No. of Vehicles	47	14	6	35	6
Seated Capacity	-	64	24	52	30
Total Capacity	-	164	40	78	45
Track					
Double	6.4	4.5	0.1	5.6	1.2
Single 1-way	-	-	0.8	-	-
2-way	-	-	-	1.0	0
Average Operating Speed (mph)	22.8	18.8	3.8	9.4	16.1
Distance Between Stops (Mi.)	-	-	Unlimited	0.13	0.4
Headways	-	5 min. peak 10 min. base	15 min.	3-4 min. peak 5 min. base	-
Right-of-Way					
Separated	5.2	4.5	-	-	1.2
Reserved Lane	-	-	0.8	5.8	-
Mixed Traffic	1.2	-	0.1	0.8	-

Source: References 4, 5, 6

Toronto, Ontario

The LRT system in Toronto operates largely within street rights of way in mixed traffic. It interlinks CBD employment areas and close-in residential neighborhoods, much as the proposed Georgetown system would. One of the keys to the success of Toronto's system has been well-designed transfer facilities at rapid transit stations, with minimal distance between the subway and LRT lines.

Mexico City, Mexico

LRT vehicles in Mexico City operate in medians of arterial streets. However, these streets are very wide compared to Georgetown's, so adequate room is available for safe passenger handling.

Pittsburgh, Pennsylvania

The Pittsburgh transit authority has recently rehabilitated their aging streetcars. They have made this rehabilitation an effective marketing tool to encourage ridership. Pittsburgh's streetcars operate in mixed traffic in the CBD. However, judicious use of priority treatment permits streetcars to maintain relatively high speeds. Park and ride lots along several lines provide an effective alternative to central city driving and parking.

Shaker Heights, Ohio

The high income community of Shaker Heights, Ohio is linked by an LRT system to downtown Cleveland. It is significant that the Transit Bureau of Shaker Heights has found maintenance, reliability, and cleanliness to be of greater importance to patrons than the age of the vehicle.

New Orleans, Louisiana

The St. Charles line in New Orleans is the only double track streetcar line in the United States still operating with pre-PCC cars. The cars on this line were built in the 1920's. The line is six and one-half miles long, with 88 percent of it being located in reserved median lanes. The distance between stops is short (.12 miles), so average system speed is low (9.4 mph).

Detroit, Michigan

Detroit is the most recent U.S. city to have reinstituted trolley service when it opened a 0.9-mile segment of single track service on September 20, 1976 in the center of its CBD. The service operates with Brill cars which were manufactured in the 1890's and bought from the Lisbon Traction Company in Lisbon, Portugal. The tracks are located on protected right of way in the median of a wide boulevard. The 0.9-mile system cost $1.8 million to construct and was built with no UMTA funding.

Fort Worth, Texas

The Tandy Corporation in Fort Worth operates a trolley as a shuttle between a peripheral parking lot and their downtown department store, 1.2 miles away. The system uses old D.C. Transit PCC cars which have been completely renovated. The new body design is modernistic and does not resemble old PCC vehicles. The Fort Worth system is an example of a situation where a private corporation recognized the potential of a trolley system in providing improved access to a commercial center and attracting additional customers.

San Francisco, California (Cable Cars)

As was mentioned in Chapter 3, the City of San Francisco has retained cable car operations on three routes within the City. The operation costs of the system are high, but the service is retained because it is a historical landmark and is recognized for its importance in contributing to the image of the City. The cable cars also provide an important transportation service and are used by many commuters for access to work locations and other public transit modes, as well as by sightseers.

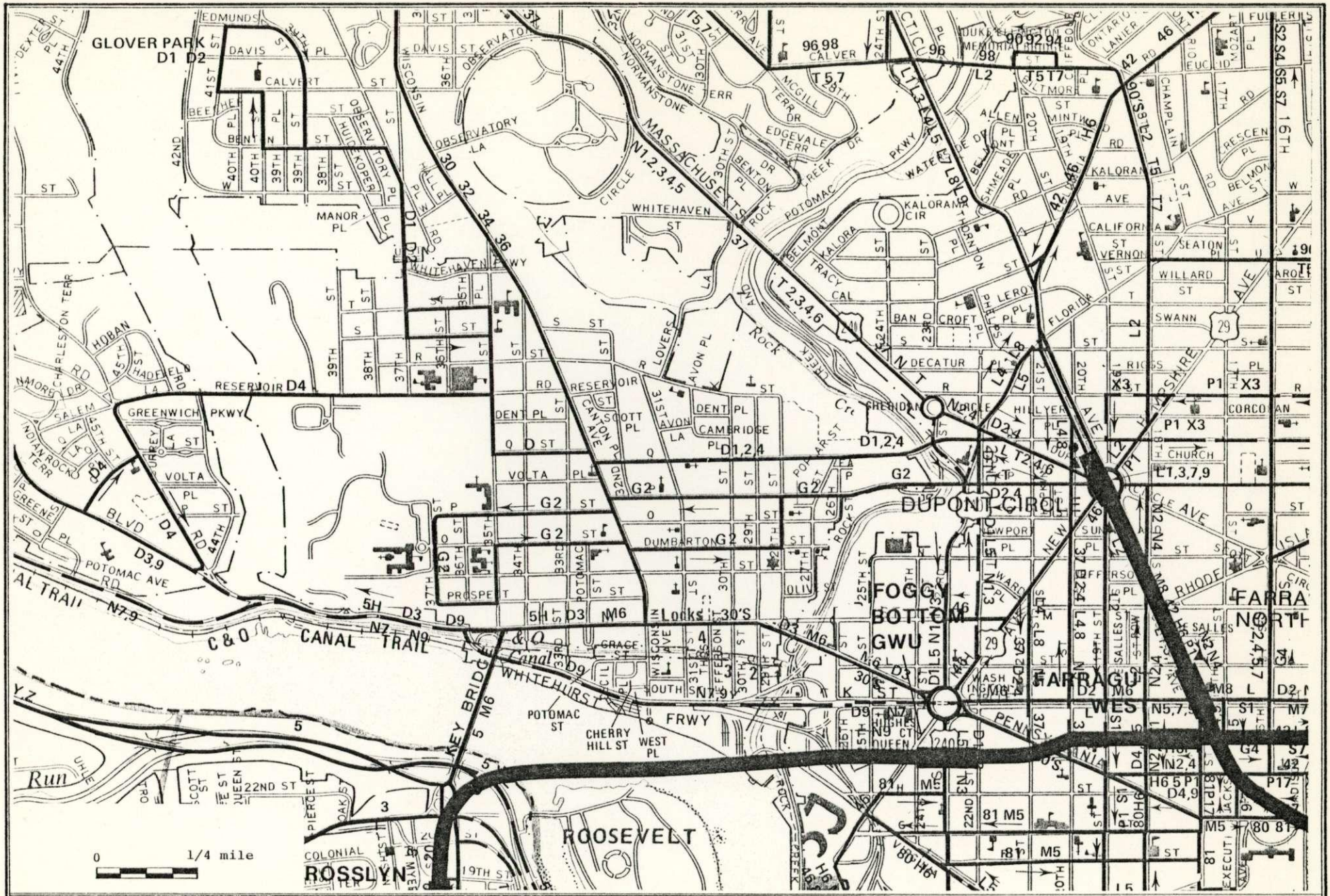
The LRT systems described above represent a wide range of systems and services. A Georgetown trolley system would likely fall within this range and can benefit by the operational experience gained in these other systems.

5. EXISTING TRANSIT CONDITIONS IN GEORGETOWN

A complete review of existing transit conditions in Georgetown is provided in Technical Memoranda 3 and 4 of this study. Existing Metrorail and Metrobus service is reviewed in Technical Memorandum 3 and Georgetown University's GUTS system is reviewed in Technical Memorandum 4. A brief review of these conditions and their implications for trolley service is presented in this chapter.

The Metrobus and Metrorail routes which presently serve Georgetown are shown in Figure 2. Three Metrorail stations are located approximately one mile from the center of Georgetown. These stations are linked to Georgetown by a number of Metrobus routes. The backbone of Georgetown's Metrobus system is the 30's buses (Routes 30, 32, 34, and 36) which run on Wisconsin Avenue, M Street, and Pennsylvania Avenue through Georgetown. These routes connect Georgetown to the Foggy Bottom Metrorail station and downtown Washington. Further service along M Street is provided by the M6 route which crosses Key Bridge and connects Georgetown to the Rosslyn Metrorail station. East-west service across the middle of Georgetown is provided by the D buses and the G2. These routes connect Georgetown to the Dupont Circle station and the Metrorail Red Line. Route information for the above-mentioned Metrobus routes and other less frequent routes which serve Georgetown is presented in Table 2.

Georgetown University, which is the single highest generator of trips in the Georgetown area, is further served by its GUTS small bus system. A route map of the GUTS system within Georgetown is provided in Figure 3. GUTS provides a direct connection between the University and the Rosslyn and Dupont Circle stations, although the routes to both stations traverse slow residential streets. The University does not presently have a direct connection to the Foggy Bottom station.



GEORGETOWN METROBUS AND METRORAIL ROUTES

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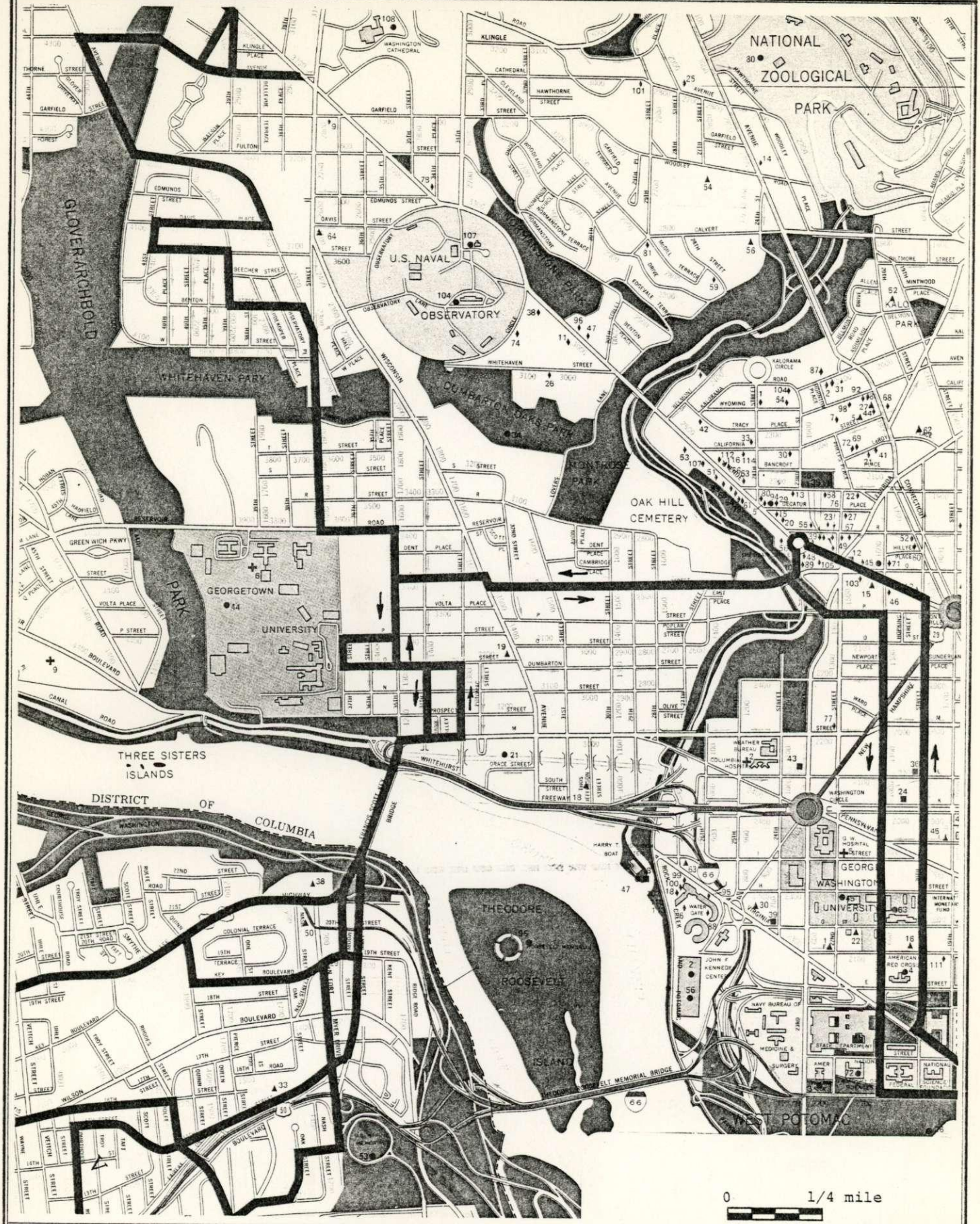
FIGURE NO. 2

Table 2. Georgetown Metrobus Service

Route	Origin	Destination	Via	Average Headways (in minutes) AM Rush	Midday	PM Rush	Evening	Sat.	Sun.
D1	Glover Park	Federal Triangle	Q St.	15/-	-	-/15	-	-	-
D2	Glover Park	Federal Triangle	Q St.	10/10	20	10/10	40	20	40
D3	Glover Park	Federal Triangle	M St.	20/-	-	-/20	-	-	-
D4	Sibley Hospital	Farragut Square	Q St.	10/10	20	10/10	30	20	40
G2	Howard U.	Georgetown U.	P St.	7/9	12	7/9	30	20	20
M6	Rosslyn	Union Station	M St.	5/10	15	5/10	20	15	-
30	Friendshp. Hts.	Potomac Ave. Sta.	Wisc. Ave/M St	6/-	30	-/7	-	30	60
32	Friendshp. Hts.	Shipley Terrace	Wisc. Ave/M St	20/10	30	10/15	60	30	45
34	Friendshp. Hts.	Naylor Gardens	Wisc. Ave/M St	20/8	30	15/20	60	30	45
36	Friendshp. Hts.	Hillcrest	Wisc. Ave/M St	20/10	30	10/20	60	30	45
5H	McLean	Farragut Square	M St.	(a)/-	-	-	-	-	-
5K	George Mason U.	Farragut Square	M St.	36/60	60	60/30	60	-	-
5N	C.I.A.	Farragut Square	M St.	-/30	-	30/-	-	-	-
5S	Herndon	Farragut Square	M St.	30/60	60	60/30	60	(b)	-
5W	Oakton	Farragut Square	M St.	30/-	-	-/50	(a)	-	-
Routes which pass through but do not serve Georgetown									
D9	Sibley Hospital	Farragut Square	Whitehurst Fwy	20/-	-	-/30	-	-	-
N7	Rockville	Federal Triangle	Whitehurst Fwy	20/-	-	-/20	-	-	-
N9	Bethesda	Federal Triangle	Whitehurst Fwy	10/-	-	-/10	-	-	-

(a) infrequent service (b) does not serve Georgetown on Saturdays.



GUTS ROUTE MAP
(IN THE GEORGETOWN AREA)

jhk & associates

FIGURE NO. 3

The information presented above appears to indicate that Georgetown is served by a high level of bus transit service and has convenient transit connections both to Metrorail and downtown Washington. However, there are some problems which lower Georgetowners' perception of their level of transit service. The most serious is the crowded conditions on buses serving Georgetown during the peak periods. This is caused by a combination of two factors. Because Georgetown is the last community the 30's and M6 buses traverse before entering downtown Washington, Georgetown residents are the last persons to board and usually have to stand, often on very crowded buses in uncomfortable conditions. Compounding this problem is the fact that the Wisconsin Avenue buses suffer from a serious platooning problem. Although 20 peak direction buses are scheduled on Wisconsin Avenue during the peak hour, it is not uncommon for periods of 10 to 12 minutes to pass without a bus coming by. Then three or four buses will pass by within one or two minutes. The first two or three are often so full that passengers cannot board or if they do, they experience uncomfortable, crowded conditions. The net result is that Georgetown residents perceive their service as being one with 10 to 12 minute headways instead of the three minute headways the schedule shows.

Once passengers do board the buses, the buses are caught in the traffic congestion on Georgetown's arterial streets. This combined with frequent stops to board and discharge passengers, results in slow travel times. Fares for short trips to Metrorail stations or nearby employment centers are quite high, either 50 or 75 cents during peak periods.

What would appear to be needed for Georgetown is some type of localized transit service which would run on regular headways, would not result in Georgetowners always being the passengers who must stand, would have lower fares to reflect Georgetowners' shorter trips, would provide a direct transit connection to the Foggy Bottom station, and would run on its own right of way so as not to suffer

from congested traffic conditions in Georgetown. The reinstitution of trolley service is one possibility of a means to provide this service.

However, the characteristics of existing transit trips through Georgetown indicate that unless the trolley service is to extend beyond Georgetown, it should be designed to supplement existing bus service, not replace it. The majority of riders on both the 30's buses and the M6 buses during peak periods are trips which are passing through Georgetown. Most of the boardings and alightings in Georgetown are by persons whose trip either originates or ends outside of Georgetown. Forcing these passengers to make one or two additional transfers would result in significant deterioration of their level of service and would likely drive some of them from utilizing transit.

6. CONDITION OF EXISTING TROLLEY TRACKS AND CONDUIT

Since trolley service was abandoned in Georgetown most of the trolley tracks have been paved over to improve operating conditions for autos and buses and to improve overall safety conditions both for motorized vehicles and bicycles. The most recent tracks to have been paved over are those along M Street and Pennsylvania Avenue in Georgetown. These tracks were paved over in 1977 following a U. S. District Court order that such action be taken. The only remaining exposed tracks in Georgetown are on O and P Streets west of Wisconsin Avenue, where both the trolley tracks and cobblestones in the street have been saved for historical preservation reasons.

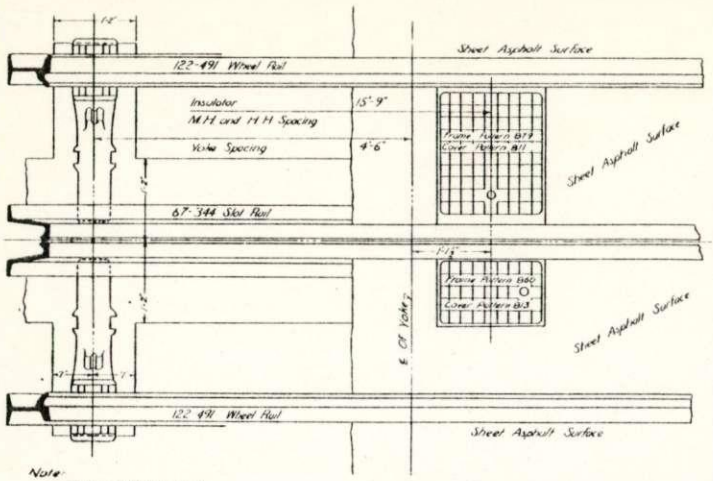
On July 22, 1976, prior to the repaving of M Street and Pennsylvania Avenue, two members of the Citizens Association of Georgetown Subcommittee on M Street, together with personnel from the D. C. Department of Transportation, inspected the trackage on these two streets to determine its existing condition (3). Major portions of the track along Pennsylvania Avenue and M Street were found to be in relatively good condition at the time of inspection, although it appeared that some regauging of the tracks would be necessary. Probably more importantly from the cost perspective was that the conduit was also found to be in good condition along long stretches of these two streets. The center slot was pinched at a number of locations (an easily correctable problem) and the conduit was full of debris. However, cleaning the conduit would be a relatively easy task. The power rail was found to be slightly pitted, but the Subcommittee members felt it was serviceable. Since the Subcommittee made their inspection, construction has begun on the replacement of the Pennsylvania Avenue Bridge over Rock Creek Park. In replacing this bridge, the old tracks and conduit have been removed.

Trackage west of Wisconsin Avenue on M Street and on O and P Street was found to be in poor condition and in some places

had been removed. However, the conduit tunnel appeared to be serviceable in many places, if it were properly cleaned and the power rails were replaced. Segments on Wisconsin Avenue, 36th Street, and Prospect Street were covered with asphalt, making inspection impossible.

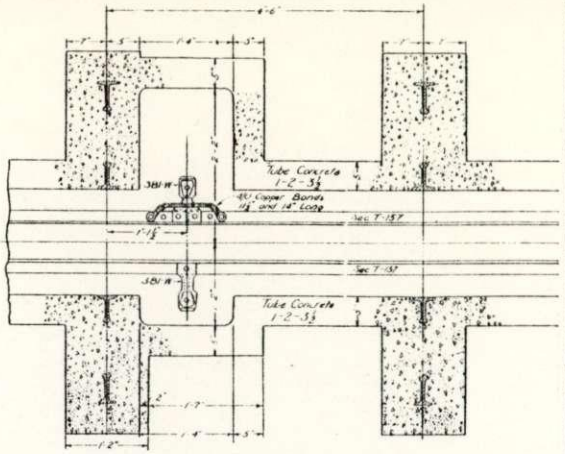
If trolley service were to be reinstituted in Georgetown and center-of-the-street operations were planned, it is likely that new track would have to be laid. Usage of the old track could at best be only a temporary measure, and would likely forbode significant maintenance problems. Detroit was faced with a similar situation and decided that with the reinstitution of a long-term service new continuously-welded track would be necessary. Such track would provide a much smoother ride, would enable higher speeds, reduce wear and tear on the trolley vehicles, and result in significantly lower noise levels. The element of the old system which would more likely be reusable is the old conduit tunnel. To the degree that conduit tunnel could be reused capital costs would be lowered. Installing new conduit tunnel would be a major undertaking, as would removal of the old tunnel. A typical cross section of M Street prior to repaving showing both tracks and conduit is portrayed in Figure 4. As can be seen in this cross section depiction, the conduit tunnel is encased in concrete. It is largely because it was designed to such high standards that it remains in such good condition today.

Since the Subcommittee inspected the condition of the trackage and conduit in Pennsylvania Avenue and M Street, it has been covered by blacktop. It is beyond the scope of this study to uncover trackage or conduit to inspect its present condition. If the decision is made to further pursue the reinstitution of trolley service and the detailed planning and design contract is awarded, one of the first tasks of the study should be a thorough inventory of trackage and conduit condition.



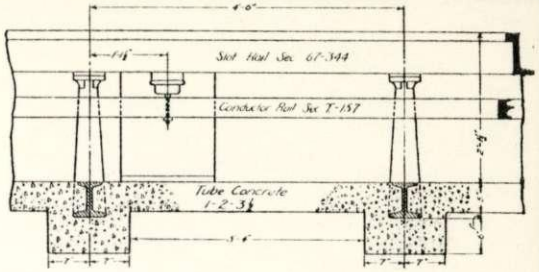
PLAN SHOWING PAVING AND M.H. AND H.H. CASTINGS

Scale 1"-1'-0"



SECTION AT A-A

Scale 1"-1'-0"

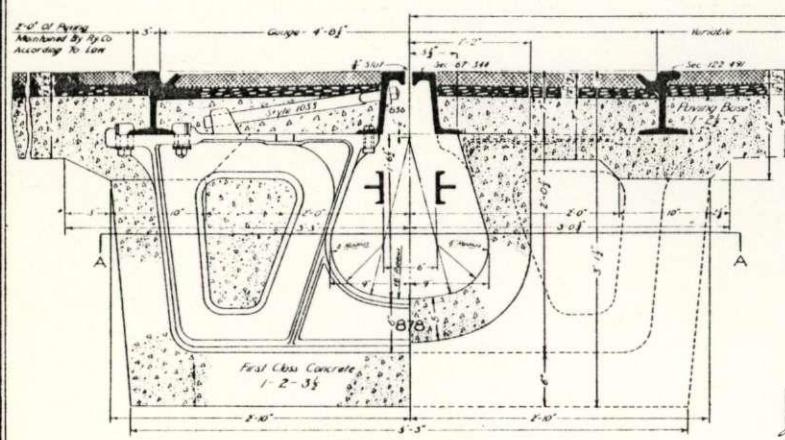


LONGITUDINAL SECTION - ℄ SLOT - STRAIGHT TRACK CONSTRUCTION

Scale 1"-1'-0"

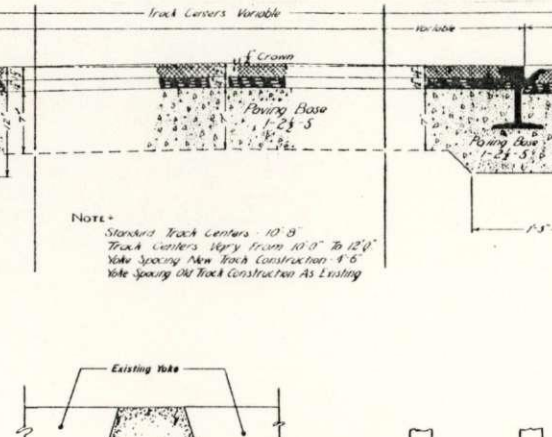
NOTES FOR CURVE TRACK CONSTRUCTION

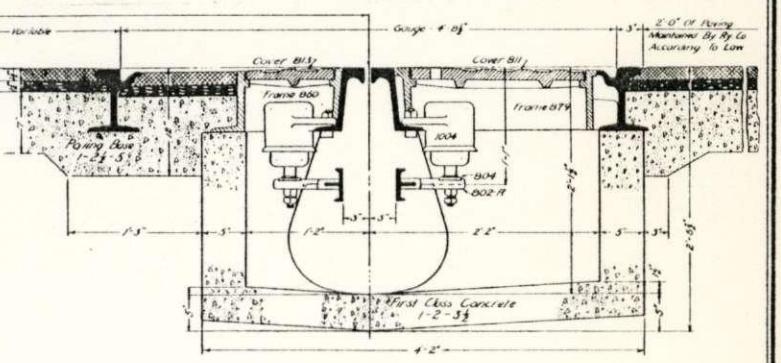
Outer Rail - Trolley Section 122-49#
Inner Rail - Guard Section 130-46#
Standard Thermite Welded Joints
Manhole Frame 879 With 4 Planed Off Wheel Rail Size
Manhole Frame 811
Yoke Spacing 4'-6"
Insulator Spacing 11'-3"
All Other Material Same As For Straight Track



CROSS SECTIONS

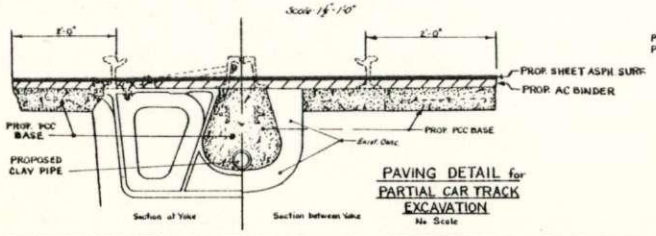
SECTION AT YOKES SECTION BETWEEN YOKES





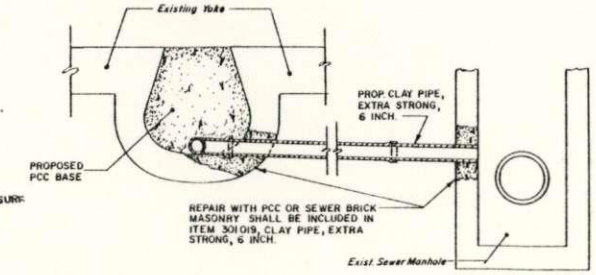
SECTION AT MANHOLE AND HANDHOLE

Scale ½"-1'-0"



PAVING DETAIL for PARTIAL CAR TRACK EXCAVATION

No Scale



DETAIL - CLAY PIPE DRAIN

NOTE: THIS DRAWING HAS BEEN REDUCED 50 PER CENT OF THE ORIGINAL SIZE.

SOURCE: DEPARTMENT OF TRANSPORTATION, WASHINGTON, D.C.

CARTRACK DETAILS

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FIGURE NO. 4

7. ALTERNATIVE ALIGNMENTS

The choice of a final alignment for a trolley system would depend upon a number of factors. Among these would be whether the primary function of the system is to be historic, to provide transportation service, or to provide a hybrid function; whether the system is to provide local service within Georgetown only or is to extend beyond Georgetown and provide a line-haul function; to what degree the trolley will be allowed to reduce automobile capacity and parking on Georgetown's streets; to what degree residents will allow trolleys to penetrate their neighborhoods; capital and operating costs of alternative alignments; demand which could be generated on alternative alignments; and environmental impacts of various alignments.

The extent of the system will depend to a great degree upon its primary function. This discussion of alternative alignments will consider two distinct types of systems, one of which would be strictly a local service within Georgetown which would also act as a feeder service to Metrorail for Georgetown residents. The other would be a system which would extend beyond Georgetown and serve both Georgetown trips and longer trips from Northwest Washington, Maryland, and Virginia.

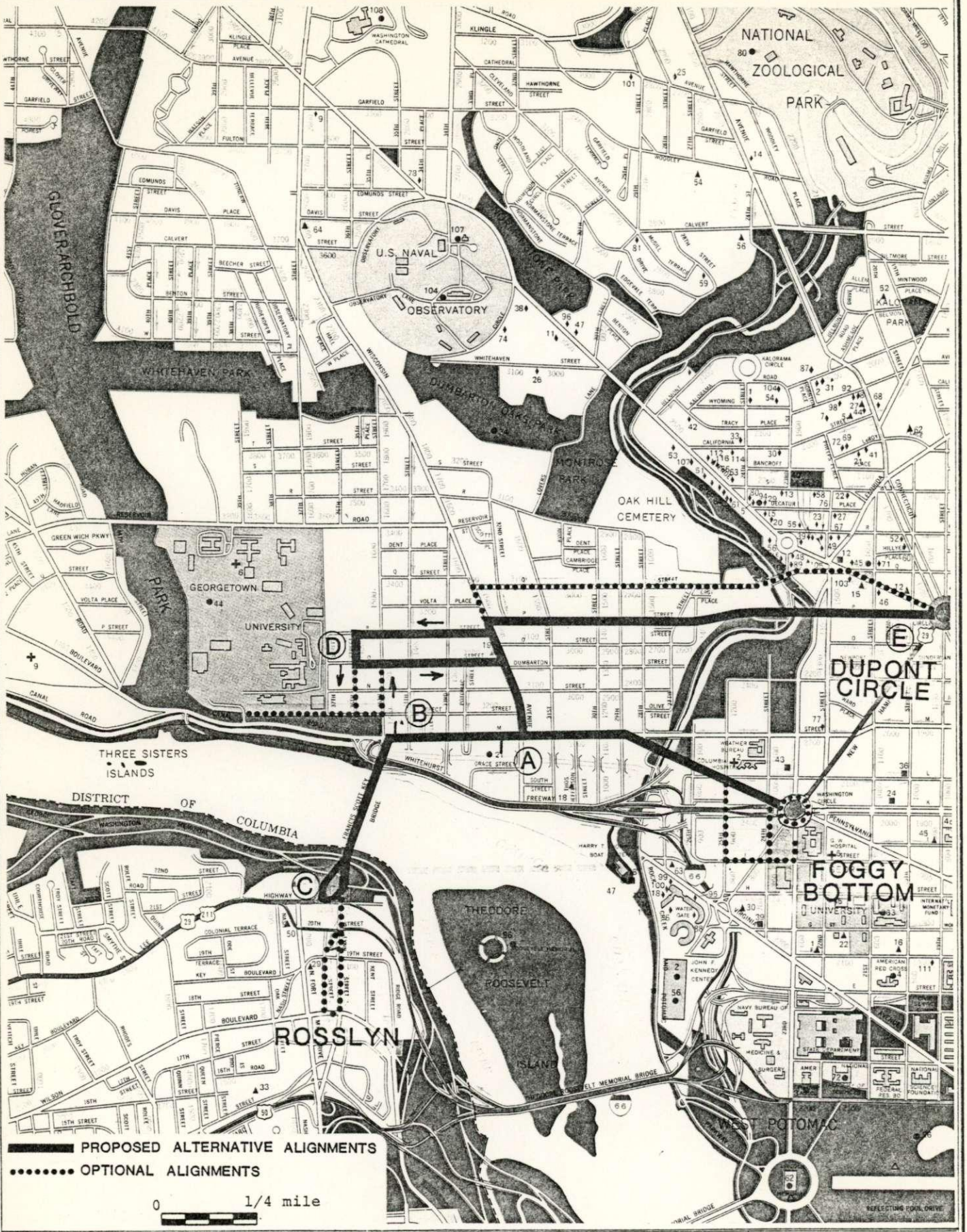
LOCAL SYSTEM

All of the alternatives considered for the local system would originate at the Foggy Bottom Metrorail Station and proceed via Pennsylvania Avenue and M Street to the intersection of Wisconsin Avenue and M Street. There are several alternatives for routing the trolley between Pennsylvania Avenue and the entrance to the Foggy Bottom Station which is located between 23rd and 24th Streets on I Street. One would be to operate on 24th Street between Pennsylvania Avenue and I Street. It is not known if the bridge on 24th Street over K Street is capable

of supporting trolley loads, but it is assumed that some reconstruction of that bridge would be required. Another option would be to operate on 25th Street between Pennsylvania Avenue and I Street and then turn down I Street to the Foggy Bottom Station. Through auto traffic is not presently allowed to make this movement but a signal on K Street exists for pedestrian use. If the elevation of K Street were maintained at its level under Washington Circle and 24th Street a trolley bridge could be built over it at 25th Street, thus minimizing auto/trolley interference. Twenty-fifth Street is presently a quiet dead-end street in this vicinity, so using it for trolley service could be expected to produce neighborhood impacts.

A potential problem with both the 24th and 25th Street alignments is that land would have to be taken to allow enough room for the trolley turnaround. Another is that both streets are relatively narrow, and double track trolley operations might be hindered by interference from parking vehicles and by tight turns. An alternative option might be to operate a one-way loop operation using both 24th and 25th Streets. A less preferable option would be to loop around Washington Circle. Under this option passengers would have to get off at least one block from the Foggy Bottom Station. If passengers were to board and discharge at Washington Circle, there would be a considerable amount of trolley/auto interference.

A discussion of trolley operations on Pennsylvania Avenue and M Street is provided in Chapter 8. It should be noted that the Pennsylvania Avenue Bridge over Rock Creek Park is presently being reconstructed so that it can support trolley loadings. A discussion of alternative alignments west and north of the intersection of Wisconsin Avenue and M Street follows. The location of these alignments is shown in Figure 5.



ALTERNATIVE ALIGNMENTS FOR LOCAL GEORGETOWN TROLLEY SERVICE

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FIGURE NO. 5

Alignment A

This alternative would end at the former D.C. Transit maintenance building located on the south side of M Street approximately 1/16 mile west of Wisconsin Avenue. This system would represent a minimal system and would serve as a shuttle between the center of Georgetown and the Foggy Bottom station. It would provide minimal service for trips to and from the residential areas of Georgetown and Georgetown University. However, if the trolley service is to be justified primarily for historical and entertainment reasons rather than for transportation service it is perhaps the most feasible system to be implemented.

Alignment B

This alternative would continue along M Street to its intersection with the Key Bridge. From here it would turn into the Car Barn Building located at the end of Key Bridge where facilities once existed for turnaround, storage, and maintenance of the vehicles. This alternative would bring service within reasonable walking distance of Georgetown University and would serve the entire length of the M Street commercial district of Georgetown. Trolleys operating in the street at the end of Key Bridge would likely cause significant traffic impacts.

Alignment C

This alignment would be similar to Alternative B but would extend across Key Bridge to Rosslyn Circle where it would loop around for its return trip across the river. A variation of this alternative would be for the trolley to pass through Rosslyn

Circle and extend to the Rosslyn Metrorail Station. Another option might be to integrate the trolley into the design of the proposed park-like plaza to be constructed over Interstate 66. Running trolleys across Key Bridge and through Rosslyn Circle would result in significant impacts on auto traffic.

Alignment D

From the intersection of M Street and Wisconsin Avenue this alternative would turn up Wisconsin Avenue, turn westward on P Street, south on 36th Street, and eastward again on O Street to Wisconsin Avenue. Trolleys on P, 36th, and O Streets would have to run one-way because of the narrowness of the streets. One variation of this alternative might bring the trolleys south on 36th Street to Prospect Street, east on Prospect Street to 35th Street, north on 35th Street to O Street, and east again on O Street. This is the route trolleys in the Georgetown area have historically taken. Another variation might be to bring the trolley onto Georgetown University's campus and thus provide service directly to Georgetown's largest trip generator.

Alignment E

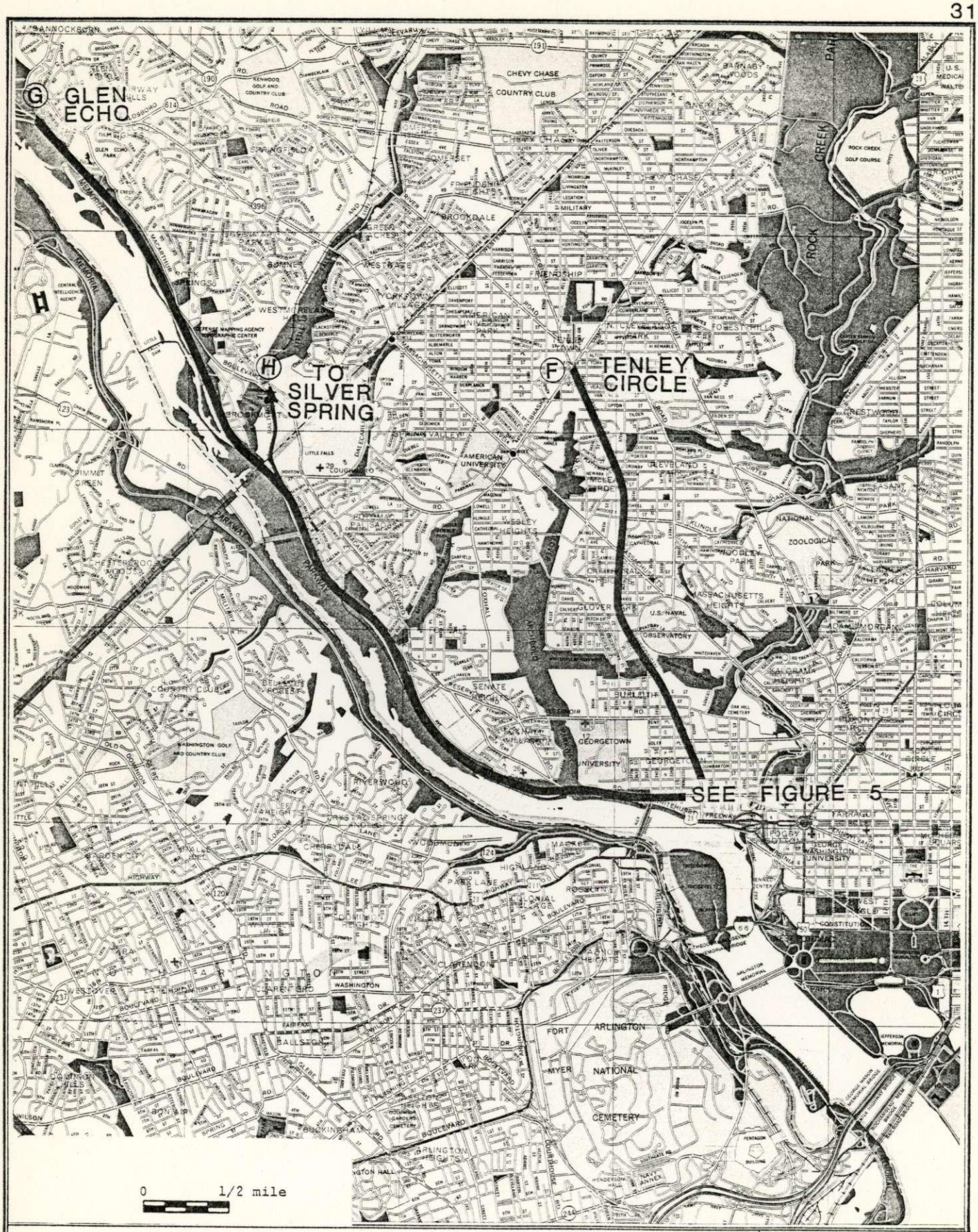
A fifth local alternative would also turn up Wisconsin Avenue from M Street, but would turn east on P Street and proceed to Dupont Circle where passengers could again link up with Metrorail. This alternative is not recommended for further review for two primary reasons. This route was not part of the Capital Transit Company's streetcar network (see Figure 1), so it does not have existing track or conduit that might be usable. In addition it is unlikely that the P Street Bridge over Rock Creek Park is designed for trolley loadings. Perhaps even more critical though is the fact that Georgetown University would not be directly served by such a system.

EXTENDED SYSTEM

A system which extends beyond Georgetown would primarily serve a line-haul transit function for trips accessing Metrorail and entering downtown Washington from Upper Northwest Washington, Maryland, and Virginia. Such a system would likely operate with different vehicles than a local system within Georgetown. It would be desirable if compatible gauges were used for the two types of systems so the different types of cars could be intermixed within Georgetown itself. An extended system would be designed to replace line-haul bus service which presently serves the corridor through which it would be located. Interfaces with local bus service would be critical to the successful operation of such a service, as would the operation of park and ride lots designed to intercept auto drivers to downtown Washington. Three extended system alternatives were considered in this analysis. These are shown in Figure 6.

Alignment F

This alignment would extend out Wisconsin Avenue from Georgetown. It could run approximately 3.1 miles up Wisconsin Avenue where it would again meet Metrorail at the future Tenley Circle Metrorail Station. Another option would be to terminate at an intermediate point such as the intersection of Wisconsin and Massachusetts Avenues. Such an alignment would provide service to a high demand corridor and would be well utilized. It would replace the existing 30's buses north of Washington Circle and could provide a high level of service in this corridor. Unless two lanes of traffic were removed from Wisconsin Avenue and dedicated to light rail vehicles, however, it is unlikely significant time savings could be afforded over existing bus service and significant modal shifts would not occur.



ALTERNATIVE ALIGNMENTS FOR EXTENDED GEORGETOWN TROLLEY SERVICE

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FIGURE NO. 6

Alignment G

This alignment would utilize D.C. Transit's Cabin John right of way between Georgetown and Glen Echo Amusement Park in Glen Echo, Maryland. The right of way for this alignment is almost entirely held by one owner, so right of way acquisition would be made much easier than if it were under multiple ownership. Because the alignment is entirely separated from existing street systems a high level of service could be realized in a corridor which is not presently well served by transit. Population densities in the corridor are quite low. However, considerable potential for significant park-ride usage exists at the Glen Echo Amusement Park where a large parking lot presently exists. The D.C. Department of Environmental Services (DES) is presently considering using the Cabin John right of way to locate a future water main. If DES decides to do so, the right of way could be shared by the water pipe and trolley system.

Alignment H

This alignment would utilize the B&O railroad tracks, between Georgetown and the Maryland state line. From this point it could extend across Montgomery County to Silver Spring where it would again meet Metrorail. The chief advantage of this alignment is that the trackage is already in place and construction costs could be minimized. However, the tracks would have to be shared with the B&O Railroad which recently signed a forty-year agreement with the General Services Administration to continue supplying coal to GSA's Foggy Bottom power plant. Although it would be possible to connect to Montogmery County population centers along this alignment

it would not serve large enough population densities within the District of Columbia or western Montgomery County to attract great enough demand to be justified. It also would enter Georgetown south of K Street and provide little service to the main activity centers of Georgetown itself.

A trolley system which extends beyond Georgetown is an option which should be kept open for future consideration. However, due to its cost and the significant construction which would be involved it must be viewed as a long term major capital investment option and would therefore have to undergo detailed alternatives analysis review before it could be considered for UMTA funding. The major concentration in terms of implementing a trolley system in the short term should focus upon a system which would provide service within Georgetown only. However, if such a service is to be implemented it should be designed so it could some day be extended beyond Georgetown.

8. OPERATIONAL CONSIDERATIONS

In this chapter a number of considerations regarding trolley operations will be addressed. They will enter into the decision regarding whether trolley service is to be reinstituted and if so, what type of service would be provided.

LOCATION OF TRACK

In the past trolleys in Georgetown operated in the center of the street with boarding and discharging of passengers generally occuring at intersections. The primary disadvantage of such a system is passenger safety. To provide passenger safety islands or platforms would likely require the taking of at least one extra traffic lane. If passengers wait on sidewalks, the trolley is delayed while passengers wait until they can safely cross traffic lanes to board or alight. An alternative location for trolley tracks is in the curb lane. With this type of operation, passengers can board and alight from the sidewalk much as bus passengers do and interference with traffic is minimized. However, curb lane operations interfere with truck loading and unloading, which presents a serious problem in the commercial areas along M Street and Wisconsin Avenue.

NUMBER OF TRACKS

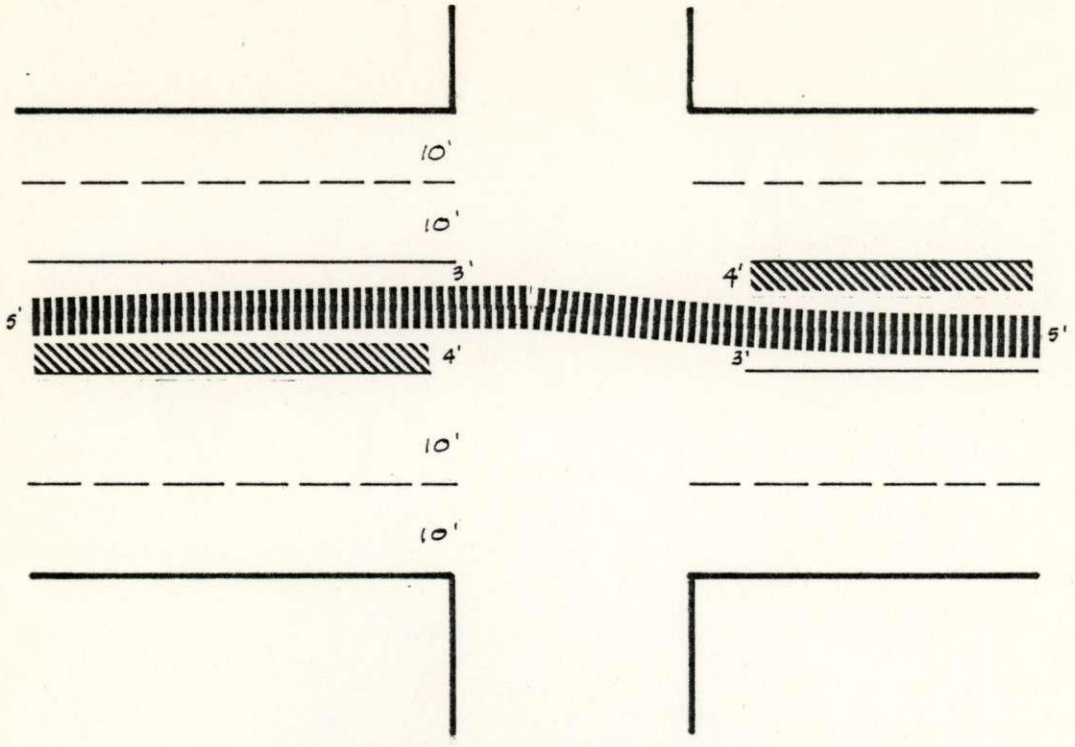
The number of tracks in the Georgetown system will depend largely upon system extent, system headways, reliability requirements, travel time requirements and track location. Detroit's 0.9-mile trolley operates with a single track for most of its length. Double trackage is provided for a short segment near the center to allow trolley cars travelling in opposite directions to pass each other. If a short historic system similar to Detroit's

were established in Georgetown, single track operation would be feasible and perhaps preferable because platforms or pedestrian safety islands could be established in the street. Diagrams showing a station with a single track in the center of the street and bypass tracks for single track operations are shown in Figure 7. Single track operations are also possible when the tracks are located in the curb lane. Truck loading and unloading can then occur on the opposite side of the street.

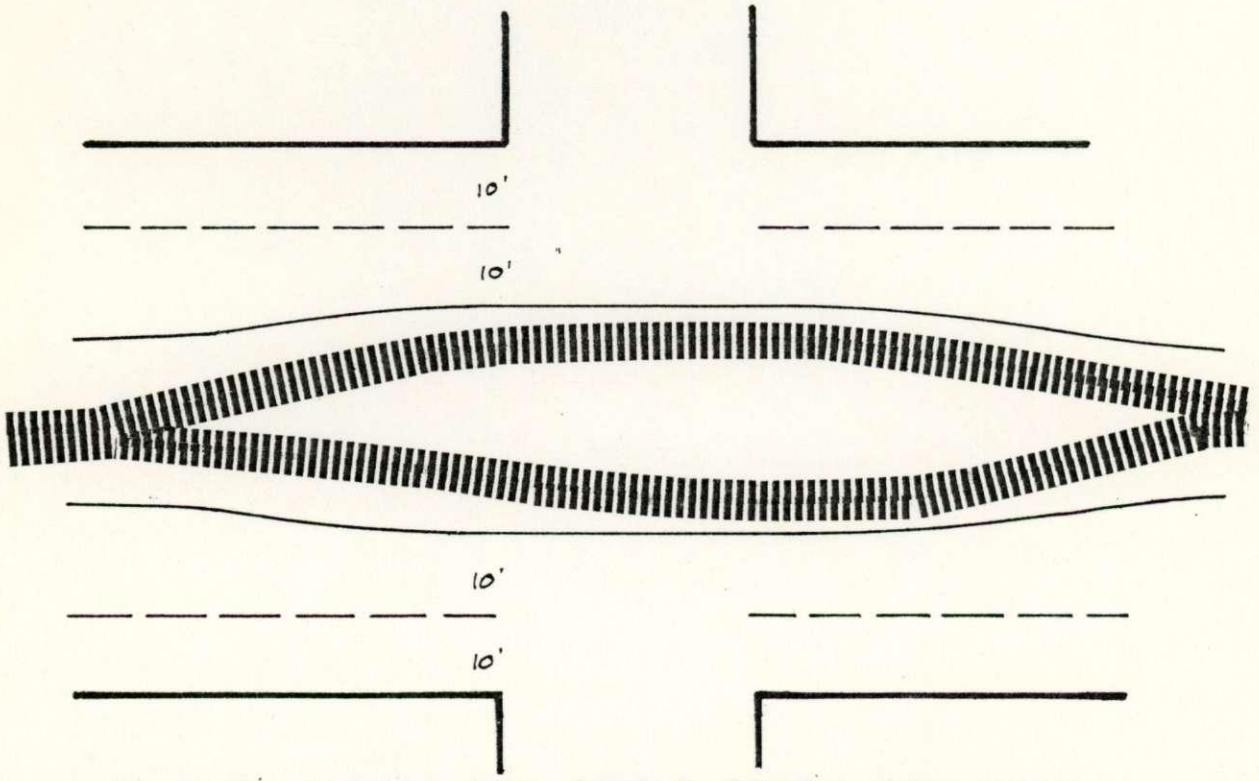
Single track operations are only feasible with a limited system which does not require high service standards or in locations where loop operations are possible, such as on O and P Streets west of Wisconsin Avenue. A two-way system with frequent headways, which is longer than about one mile in length, or which is designed to operate at competitive speeds with buses and autos must operate with two tracks.

RESERVED RIGHT OF WAY VERSUS OPERATING IN MIXED TRAFFIC

Light rail can operate in one of three modes: on exclusive grade-separated right of way, in reserved on-street right of way or in mixed traffic on-street. The highest level of service can be achieved when light rail vehicles operate with no interference from other traffic. Such operations could be achieved on a light rail line extending out the Cabin John right of way. However, within Georgetown, the trolleys will have to operate on-street and will experience interference from other users of the street. A means of minimizing this interference is to reserve street space for the exclusive use of trolleys. The most effective way to do this is to place a raised curb between general traffic lanes and the trolley lanes. Traffic interference will still be experienced at intersections where autos, trucks,and buses have to cross the trolley tracks. However, if a priority signal system is installed trolleys can preempt other traffic and pass through intersections with minimal delay. It is also possible to reserve right of way



NEAR SIDE ISLAND STATION
#1



BY-PASS TRACKS FOR SINGLE TRACK OPERATION
#2

DETAILS OF SINGLE TRACK OPERATION

jhk & associates

FIGURE NO 7

without separating it from other traffic lanes by raised curbs. In this way turning vehicles can maneuver more easily. The tracks will discourage traffic from using the trolley lanes, but in cases of severe traffic congestion violators will enter the lanes much as they do on arterial bus lanes. Trolleys still operate in mixed traffic in several North American cities. However, these trolleys do not experience any travel time savings relative to autos and buses and they often get delayed significantly when other vehicles block the tracks.

TYPE OF VEHICLE

The type of vehicle chosen for the system will be dependent upon the primary function of the system. If the system is to serve a historical function, trolley cars from the late nineteenth or early twentieth century should be sought. However, if a high speed, rapid light rail service with full accessibility for the elderly and handicapped is to be the goal of the system, these old cars will not suffice. If the system is to be extended beyond Georgetown perhaps a mix of vehicle types should be sought. The characteristics of several types of light rail vehicles are listed in Table 3.

A number of historic Brill and St. Louis trolley cars might be available from a source in Portugal. These cars predate the PCC cars and would serve a historic function. The Detroit system obtained their cars from this source and was able to successfully refurbish them. The cars that are available have been converted to non-transit uses, however, and considerable effort is required to renovate them. Other vehicles are available from Melbourne, Australia. These are open air vehicles and would have to be enclosed so they could operate in Washington's temperate climate.

An extended system would likely require cars which could provide a higher level of service than the historic cars. The

Table 3. Light Rail Vehicle Characteristics

	LOCAL SYSTEM	BOTH	EXPANDED SYSTEM		
Vehicle	J.G. Brill & St. Louis Car	U.S. PCC Car	DuWag U2	Boeing LRV	Canadian LRV
approximate design year	late 1890's	1933	1965	1973	1975
Systems using (planned for)	renovated for Detroit and Yakima, Wash.	approximately 5000 built	Frankfurt (Edmonton)	(Boston) (San Fran) (Dayton)	(Toronto)
Axles/aritculation	2/0	4/0	6/1	6/1	4/0
Length, ft.,mtrs.	25'6"/ 7.8	43.5 to 50.5/ 13.2 to 15.4	75.5/23.0	71.5/21.8	50.67/15.44
Width, feet/mtrs.	7'8"/ 2.3	8.33 to 9.0/ 2.54 to 2.74	8.70/2.65	8.85/2.70	8.50/2.59
Floor height feet/meters	-	2.75/0.84	3.18/0.97	2.82/0.86	3.02/0.92
Roof height, feet/meters	11'10¼"/3.6	10.1/3.08	10.8/3.28	11.5/3.51	11.0/3.37
Seats,number/ layout	24/2	49 to 69/ 2+1 or 2+2	64/2+2	68/2+2	42 or 47 Varies
Doors per side					
Number	2	2 or 3 double	4 double	3 double	2 double
Type	Folding	Folding	Folding	Plug	Folding
Steps	Low	Low	High	High/Low	Low
Maximun speed mph/kph	-	50/80	50/80	50/80	50/80
Acceleration loaded, feet/sec.^{2}	-	4.6	3.3	4.1	4.6
Deceleration, loaded, feet/sec.^{2}	-	4.6	3.9	5.1	5.1
Emergency Deceleration,load/ft/sec.	-	9.5	10	8.8	10
Empty weight, 1000 lbs.	-	33 to 42	66	68	52
Maximum design grade (percent)	-	10+	4.4	9.0	10+
Minimum curve radius (feet)	-	Varies	82	Varies 32 or 42	38

Source: References 4, 5, & 6

Fort Worth experience proves that PCC cars can be successfully refurbished. A number of other systems are presently purchasing modern light rail vehicles which are designed to operate at a high level of service and are fully accessible to the elderly and handicapped. However, at the present time these vehicles cost on the order of $500,000 to $800,000 apiece.

ELECTRIFICATION SYSTEM

Most North American trolley systems have traditionally operated with electrical power supplied from overhead wires. Much of Washington's system was operated without overhead wires because Congressional action prohibited overhead wires in the Old City of Washington. Electric power was provided through a third rail which was located in an underground conduit placed between the trolley tracks (see Figure 4). Although Georgetown is not located within the confines of the Old City of Washington, overhead wires would probably be politically infeasible and would visually detract from the image which Georgetown is attempting to create. Fortunately it has been found that much of the conduit below the street is salvageable, although full of debris. However, it would probably be best to begin the operation of a new system with new power rails. Segments of the conduit system have been removed and would have to be replaced. The estimated cost of doing so exceeds $200 per foot. The high cost of installing new conduit is a strong argument for retaining trolley operations in the center of the street where conduit presently exists, rather than in the curb lane where new conduit would have to be installed. A third electrification option might be some form of new technology system. One option involves the placement of electrically charged buttons along the length of the track. A forseeable problem with such a system, other than the fact that it is a new technology system which has not been fully tested, is that there is no way to guarantee that a charge will only be released when a trolley passes over the button.

Another new technology system might be the use of electric storage batteries to provide power.

PLATFORM DESIGN

Two types of platforms are commonly used to access LRT vehicles, low level platforms and high level platforms. Trolley cars of the PCC era and earlier can be accessed only from low level platforms. Platforms could be installed in the center of M Street and Pennsylvania Avenue if single track operations are maintained. The sidewalk would act as a platform if curb lane operations were maintained. With double track center lane operations platforms would probably not be possible and passengers would have to board from the street level. The use of low level platforms and historic trolley cars requires passengers to climb several steps to enter the car. Such operations would not meet Federal accessibility requirements for the elderly and handicapped. Newer vehicles can be accessed by handicapped persons from low level platforms. High level platforms can only be used with the newer vehicles. Their chief advantage is in high volume locations. It is unlikely that high level platforms would be used within Georgetown, but could be used on an extended system which utilized new LRT vehicles.

STATION SPACING

The spacing between stops will depend upon whether the system is to be designed to be conveniently accessible or to operate at maximum possible speeds. A system which is to serve primarily a historic or entertainment function should be easily accessible and should have stops almost every block. A system which is designed to provide higher speeds than buses must sacrifice convenience of accessibility

and space stops further apart so acceleration, deceleration, and dwell times can be minimized. If a system is built which is eventually extended beyond Georgetown, station spacing outside Georgetown is likely to be greater than within Georgetown where activity is more concentrated.

HOURS OF OPERATION

The hours a trolley would operate in Georgetown would depend upon the function the trolley is to serve, ridership demand, the amount of deficit which will be allowed, and the degree to which auto/trolley interference will be tolerated. A trolley which is designed to serve as a historic landmark could have limited hours of operation, perhaps during midday and certain evenings or on weekends. Service might also be discontinued during the winter. In this way the trolley could provide service during periods when many tourists and visitors to entertainment spots in Georgetown are present while at the same time having minimal impacts on peak hour traffic. However, if the trolley is to provide an effective transportation service function it is likely it will have to operate throughout the day, as well as on weekends. Whether it would operate during all hours of Metrorail operations (6 AM - 12 PM) will depend upon demand, particularly during evening hours and on weekends; the level of deficit which is allowed; and the degree to which bus operations are allowed to replace trolley operations during light demand periods. During periods of snow and ice it is unlikely that the trolley would operate. If salt and other abrasives can be kept from entering the electrical system its expected life would be significantly lengthened.

HEADWAYS

The headways at which the trolley service would operate will depend upon the function of the service, demand, the capacity of individual trolley vehicles, minimum allowable service levels, the number of cars available to the system, allowable deficit levels, and whether the system is designed for single track or double track operations. A trolley system similar to Detroit's can operate with headways as high as 15 or 20 minutes because users are not as concerned with the amount of time spent waiting for a vehicle to arrive as they are if they use the system primarily for transportation service. However, if the system is to provide a transportation service function and is to act as an effective feeder service to Metrorail, frequent headways will be necessary, particularly during peak periods. In this case headways should certainly be no more than 10 minutes, and would preferably be 5 minutes or less during peak periods.

NUMBER OF VEHICLES

The number of vehicles required on a trolley system is dependent upon the time required for a vehicle to make one complete cycle of the system, i.e., return to its point of origin; headways during the peak period of operation, and spare vehicle requirements. The formula for vehicle requirements is:

$$\text{Number of Vehicles} = \frac{\text{Round Trip Running Time}}{\text{Peak Headway}} + \text{Spare Vehicles}$$

If a minimal system is built between the Foggy Bottom Station and the intersection of Wisconsin Avenue and M Street, the total distance traveled in one cycle would be 2.0 miles (1.0 mile each way). If the average speed during the entire cycle (including

stops and layover time) is 6.0 mph and the headway is 10 minutes, two vehicles would have to be in operation at all times. This is similar to the existing Detroit operation. In that system, two vehicles are in operation, two are kept in reserve, and two more are used for spare parts. If a system were built which extended either to Georgetown University or Rosslyn Circle, four vehicles would be in operation at any given time if 10 minute headways are maintained. If headways dropped to five minutes, the number of vehicles in operation would double to eight. Increased average speeds could reduce this number somewhat. Extension of the system beyond Georgetown would increase vehicle requirements substantially.

FARES

One of the often expressed criticisms of existing transit service in Georgetown is that many trips which are less than two miles in length cost 50 to 75 cents during peak periods. The high fares discourage transit ridership within Georgetown and to the three nearby Metrorail stations. Since a trolley system within Georgetown would be designed to attract primarily short intra-Georgetown and Metrorail access trips, its fares would have to be kept low. Montgomery County's Ride-On system is an example of a system which with its 25-cent fare attracts many short trips which would not be made on WMATA buses where a 50-cent fare is charged. Because trips on a local trolley system within Georgetown would be short, the cost of providing the service per passenger trip should be less than the cost of providing service for a longer trip, so the fare should accordingly be lower. If the trolley is used by persons who transfer to or from a Metrobus, appropriate transfer procedures should be adopted, perhaps similar to those used on Ride-On buses.

Fare collection procedures on most trolley lines are similar to those used on most buses, i.e., passengers board through the front door and deposit exact change in a fare box next to the driver. However, boarding exclusively through the front door in small vehicles could prove to be difficult. In San Francisco, passengers are allowed to board either in the front or back of the vehicle and pay on an honor system. Such a fare collection system should receive serious consideration if small vehicles or articulated vehicles are used.

MAINTENANCE AND STORAGE FACILITY

A critical element in the operation of a trolley system in Georgetown would be maintenance and storage of vehicles. Several options exist for the location of a building which could be used for these purposes. A former D. C. Transit repair shop still stands just west of Wisconsin Avenue on the south side of M Street. D. C. Transit's Car Barn Building is located on the north side of M Street, opposite the Key Bridge. This building has been offered for sale for $5,000,000. However, it would require substantial rennovation to be brought up to existing building code standards. If either of the above facilities were to be used for maintenance and storage of a limited number of trolley vehicles, the buildings could probably be converted to multiple use. A third option would be the construction of a new maintenance and storage facility. Detroit built an attractive, glass-walled maintenance building for approximately $200,000 which serves its four-car system. The major obstacle to building a new maintenance and storage facility, other than cost, is finding a location on which to construct it. Land values in Georgetown are high and virtually all land along any of the local routes proposed for trolley service is developed or has plans for development. Zoning ordinances and potential neighborhood impacts also limit the number of locations which could be considered for such a building.

OPERATING AUTHORITY

Who would assume authority for operation of a trolley system would largely depend upon what type of system is instituted. If a limited system is built operating primarily as a historical landmark, the operating authority would likely be different than if an extended system which forms an integral link in the regional transit network is built. Several operating authority options exist if a limited or even moderate system is built which does not extend beyond Georgetown. One operating authority could be a branch of the District of Columbia Government, most probably the D.C. Department of Transportation. Another option might be a private, non-profit corporation or a quasi-public agency. Either of these types of authority would be publicly accountable and could be subsidized. A private non-profit corporation named the Old Georgetown and Foggy Bottom Corporation has been established for the purpose of monitoring the conduct of the detailed planning and design study for a Georgetown trolley system. This corporation or a similar corporation could also assume responsibility for overseeing construction and operation of the system. Another possible option would be for the National Park Service to operate the system, in the interest of preserving a historical landmark in the nation's capital. Such an operation would be analogous to NPS's present operation of sightseeing barges on the C&O Canal. The National Park Service frequently becomes involved in the preservation of existing historical artifacts, but usually does not make it a practice to bring back historical operations which are presently defunct. It is likely the National Park Service would become the operating agency only if they were given a mandate to do so by the U. S. Congress.

If a system is implemented which provides a high level of transit service and is an integral part of the regional transit system, it is probable that WMATA would be the system operating

authority. However, it is unlikely that WMATA would be an appropriate operating authority for a limited system whose primary function is historic. A limited system could be operated within an informal management structure with a small number of employees. A larger service-oriented system, particularly one operated by WMATA, would have to fall within a formal management and employee structure.

9. SYSTEM IMPACTS

There are a number of additional impacts other than those related to operational considerations which a trolley system would have. Some of these impacts are discussed in this chapter. Cost and funding considerations are discussed in Chapter 10.

HISTORIC PRESERVATION

A trolley system which is operated with historic cars through the center of Georgetown could offer a pleasant reminder of turn-of-the-century Georgetown and could aid significantly in the attempts presently being made to preserve Georgetown in its historic state. As was stated in Chapter 3, much of Georgetown as we know it today grew up around streetcars and trolleys and the reinstitution of this service would add to Georgetown's attractiveness and charm. Because Georgetown is a historic district every effort should be made in the design of a trolley system to make it as historically correct as appropriate while still maintaining high levels of accessibility.

IMPACTS ON BUSINESS

The potential impacts a trolley could have on businesses in Georgetown are mostly positive. The trolley would serve to increase transit accessibility to Georgetown and thereby encourage persons to travel to Georgetown for shopping and entertainment. The trolley will add to Georgetown's image as a worthwhile attraction for tourists and thereby increase commercial trade within Georgetown. It is likely that if the trolley is operated on reserved right of way or is operated in the curb lane that parking along M Street and Wisconsin Avenue would have to be curtailed. This could meet with resistance from shop owners who presently have parking spaces located in front of their stores, although any loss of business caused by the removal of these spaces would

likely be more than offset by increased patronage resulting from the increased number of persons attracted to Georgetown because of the trolley. A more serious problem for businesses would be the potential loss of loading zones for delivery trucks. The design of the system must be such that loading and unloading of trucks is still possible along M Street and Wisconsin Avenue. To the degree that the trolley would increase traffic congestion in Georgetown, accessibility by auto would be hurt and potential customers could be lost. However, the loss of customers who would not travel to Georgetown because of the increased congestion should be more than offset by the increased number of customers attracted because trolley service exists in Georgetown.

ACCESSIBILITY

As was mentioned in Chapter 5, the perceived level of transit service in Georgetown is lower than might appear when scheduling and routing information is analyzed. Buses are overcrowded and tend to form platoons. Fares are high for relatively short trips, walking distances to buses which are destined to travellers' ultimate destinations are sometimes high, and buses get caught in Georgetown's congestion and suffer significant delays. A localized trolley service within Georgetown has the potential to overcome a number of these problems, and thereby significantly improve transit accessibility within Georgetown. Such a service would serve Georgetown trips only, so passengers would not be riding on transit vehicles which are already filled with passengers who boarded before the vehicle entered Georgetown. Because the vehicles would have a relatively short route the platooning problem should be minimized. The trolley could provide a direct transit connection from Georgetown University and the residential areas surrounding the University to the Foggy Bottom Metrorail Station. Such a connection does not presently exist. The trolley

could be operated with lower fares than WMATA presently charges for relatively short trips made by Georgetowners. A trolley operating on reserved right of way could avoid congestion on Georgetown's streets and thereby gain a travel time advantage over mixed traffic. However, as will be discussed in the next section these gains in transit accessibility would likely cause an overall degradation in auto accessibility to and through Georgetown.

TRAFFIC IMPACTS

Traffic impacts are likely to be among the most critical impacts resulting from a trolley operation. It was partially because of trolleys' interference with traffic that pressure was exerted to remove them from Washington's streets. If trolleys are operated in mixed traffic they block traffic when they stop to serve passengers. Trolleys often are delayed while waiting for stopped vehicles to move from their tracks. Due to their size, they further compound traffic congestion during these periods of delay. Trolley tracks in a traffic lane significantly reduce the lane's capacity because driving amidst the tracks is more difficult than driving in a regular traffic lane.

If two lanes of six are removed and dedicated to exclusive use by trolleys, capacity is reduced by at least a third. In Georgetown where most streets presently operate at Level of Service D or E, this reduction in capacity could cause severe congestion problems. Reserving two lanes for trolleys, whether they be center or curb lanes would probably necessitate the removal of parking, particularly along major arterial streets such as M Street and Wisconsin Avenue. This would further reduce Georgetown's already tight parking supply. The degree to which trolley operations would impact traffic will depend to a certain extent upon what other access improvements are implemented in Georgetown which might reduce traffic volumes or those streets which the trolley traverses.

SAFETY

Reintroducing trolley service has the potential to cause severe safety problems and greatly increase the number of transportation accidents in Georgetown, particularly if center lane two track operations are utilized. Perhaps the most severe problem is the safety of boarding and alighting passengers. These passengers must cross traffic lanes to access the trolley in the center of the street, thereby greatly increasing the potential for pedestrian/vehicle accidents. Accidents between trolleys and other vehicles could also be a serious problem. Turning vehicles often attempt to pass in front of trolleys when they are stopped to serve passengers, but do not successfully complete their maneuver before the trolley starts up again. Sideswipe accidents are also a frequent problem when trolleys operate in mixed traffic. Autos operating in lanes which have trolley tracks tend to swerve and cause accidents with other autos. Many of these accidents not involving boarding and alighting passengers can be greatly reduced if trolleys operate on reserved right of way which is inaccessible to other vehicles. Accidents involving boarding and alighting passengers can be minimized with curb lane operations. However, as has been previously discussed there are significant disadvantages with curb lane operations.

NOISE

Perhaps the most significant environmental impact of operating a trolley system is the noise it generates. However, test data show that trolley systems are capable of operating at lower noise levels than diesel buses and at noise levels comparable to or slightly louder than autos operating on city streets. Noise levels for PCC cars operating at surface on a straight track range between 70 and 80 dBA at 50 feet (6). However, trolleys on an aerial or elevated structure, or trolleys negotiating a very tight radius curve could be expected to produce much greater noise levels.

AIR QUALITY

Trolleys produce virtually no direct air pollution and as a result could reduce local air pollution levels to the degree that they replace buses. However, benefits could easily be more than offset by the increased traffic congestion created as a result of trolley operations. Furthermore, air pollution would be created at the plant generating the electricity used by the trolley if the plant is a fossil fuel plant.

NEIGHBORHOOD IMPACTS

If trolley operations penetrate residential neighborhoods, certain negative impacts would result. Noise levels would be higher on streets which presently do not have large auto or bus volumes. Speeds could be decreased for vehicles caught behind trolleys on narrow residential streets. Some parking might have to be removed to permit trolley operations. In spite of these potential impacts, however, support among Georgetown residents appears to be generally in favor of renewed trolley operations. A survey of Georgetown residents in 1975 showed that among those who returned the survey, over 65 percent favored restoration of trolley operations in Georgetown, with a large number of the remaining respondents expressing no opinion (3).

CONSTRUCTION IMPACTS

Construction of trolley tracks and conduit in Georgetown's streets would likely force the closing of the traffic lanes in which they are being placed while construction occurs. In addition intersections could be closed to certain crossing movements for periods of several weeks at a time. Noise levels would also be high during the construction period.

ELDERLY AND HANDICAPPED ACCESS

Present UMTA regulations require that all new rail systems built with UMTA capital asssitance funds be fully accessible to the elderly and handicapped. At this time it is unclear whether an exception could be made if a historic trolley operation were reinstituted in Georgetown. It is possible that a special provision could be made for such a system, particularly if UMTA Demonstration Project funds are used rather than capital assistance funds. The use of historical vehicles would make full accessibility for passengers in wheelchairs nearly impossible. Proposed UMTA regulations would further require that all rail systems receiving UMTA operating funds be fully accessible. If these regulations are put in effect, it is unlikey a historic Georgetown trolley operation would be eligible for such assistance.

10. ESTIMATED COSTS AND FUNDING SOURCES

The construction and installation of a Georgetown trolley as described in this report will involve a significant capital cost and a continuing annual operation and maintenance cost. In this chapter, assumptions regarding these costs are outlined and a cost estimate range is provided. Following this, an assessment is made regarding funding sources for both capital and operating costs.

CAPITAL COSTS

There is very little data available on which to prepare a detailed cost estimate. For the purposes of this report, JHK has reviewed cost estimates for other LRT/trolley systems which have recently been constructed, compared those systems with that envisioned in Georgetown, and used engineering judgment to translate those costs to a likely Georgetown situation.

Detroit's trolley system probably offers the best direct comparison. That system (single-track, 0.9 miles in length) was constructed for a cost of $1.26 million, exclusive of rolling stock. The Detroit system was constructed in an existing highway median and therefore no right of way acquisition was required. The estimated cost included an overhead power distribution system and a new maintenance facility.

As an additional example, the Edmonton LRT system also provides recent capital cost data. This system's construction cost, excluding rolling stock, was approximately $56.2 million. The surface portion of the system (double-track, 3.5 miles in length) cost approximately $10.5 million, or $3.0 million per mile.

The cost to implement a system in Georgetown would likely fall between these two. With all new track and conduit construction it is estimated that extending a system between Foggy

Bottom and the intersection of Wisconsin Avenue and M Street would involve an initial construction cost of approximately $2.2 million in 1979 dollars. Adding to this, the cost of vehicles (assuming 4 trolleys restored at a cost of $50,000 each) and a maintenance facility (estimated cost of $200,000), the total capital cost of a minimum system would be approximately $2.6 million in 1979 dollars. This cost figure would be reduced to the degree that existing conduit and tracks could be used.

Table 4 provides an estimate of the range of costs for several of the alternatives which have been considered in this report. Estimates for a more extensive regional system have not been developed given the scope of this project, but a likely range of costs could be anywhere from $3 to $15 million per mile depending upon construction methods, availability of right of way, and the type of rolling stock used.

A major cost issue in Georgetown is the type of vehicle to be used. Restoring either a turn-of-the-century Brill or St. Louis car or restoring a PCC car to operating condition is estimated to cost approximately $50,000. A new LRV vehicle of the type being used in San Francisco and Boston would likely cost between $500,000 and $800,000 per vehicle. The restored vehicles are the most satisfactory alternative for the system being considered in Georgetown. If a regional system were being investigated, the newer cars would likely be required.

An underlying factor in any of these cost estimates is the rate of inflation. Given the likelihood that implementation of the trolley system is at least four, and probably eight years in the future, the estimated 1979 costs could conceivably double during that period.

Table 4. Georgetown Trolley Estimated Costs

Alternative Alignment	Estimated Capital Costs(a)		Estimated Annual Operating Costs (a,b)
I. Foggy Bottom Metro Station to Wisconsin Ave. & M Street	Const.	- $1,600-3,100	$200 - 280
	Vehicles	- 120- 240	
	Maint. Fac.	- 100- 250	$120(c)
	Total	$1,820-3,590	
II. Extend Alternative "I" up Wisconsin Ave. and loop routes on P & O Streets	Const.	- $3,700-6,200	$400 - 550
	Vehicles	- 320- 600	
	Maint. Fac.	- 150- 300	
	Total	$4,170-7,100	
III. Extend Alternative "I" on M Street and across Key Bridge to Rosslyn	Const.	- $4,100-6,600	$400 - 550
	Vehicles	- 320- 600	
	Maint. Fac.	- 150- 300	
	Total	$4,570-7,500	

(a) All costs in thousands of dollars.

(b) All operating costs assume 10 minute headways.

(c) Estimated annual operating cost for a historical trolley operating eight hours per day.

OPERATING COSTS

The operating costs for a Georgetown trolley would include maintenance, power supply and wages paid to operating and administrative personnel. The range of costs for other operating systems ranges between $1.50 and $3.50 per vehicle mile. The key variables include the type of equipment to be used, the number of days and hours of operation, vehicle headways, labor contracts, etc. Given the level of detail of this study, a precise estimate is difficult to document. However, it is expected that with relatively low operating speeds, Georgetown's operating costs would be at the high end of this scale, i.e., on the order of $3.50 per vehicle mile.

Given the general assumptions described in previous chapters, the annual operating cost may be assumed to be approximately $200,000 to $280,000 per year for the base system operating between Wisconsin Avenue and M Street. This is based on a system with two vehicles operating at 10 minute headways at an average speed of six miles per hour. It is also assumed that the system will operate 18 hours a day, seven days a week. A range of costs for several of the systems, including a limited historic operation, are presented in Table 4.

System revenue is also difficult to predict but it is unlikely that any system would do better than meet its operating costs, and deficits can be expected with increased service levels. For the base system described above to break even, average one-way loads with a 25-cent fare would have to be 10-14 passengers. The systems to Georgetown University or Rosslyn would have to average twice as many passengers in order to break even.

FUNDING SOURCES

Funding for a Georgetown trolley system could come from a number of private, quasi-public and public sources. It is likely that a combination of sources could be found to provide both capital and operating funds. Some of the more likely sources are briefly discussed below.

The Urban Mass Transportation Administration might fund the trolley service as a demonstration project. This would use UMTA's Section 6 funds. These moneys could cover both capital and operating costs of a local system for a limited period of time.

Any UMTA funding beyond that for demonstration purposes would be treated in the manner of a normal grant application for either Section 3 or Section 5 funds. Such applications would have to compete with other applications for such funds and would be subject to all the conditions that are attached to such funds including employee protection (Section 13c) and the requirements for accessibility by the elderly and handicapped.

If operated as a historical facility, funding from the Department of Interior might be available. Other Federal and local agencies interested in historical preservation might also contribute limited funding.

The District of Columbia Government may be a local source of funds. The D.C. Department of Transportation operates the street and highway system within which the trolley service would operate. It might be possible that D.C. DOT could provide maintenance services once the system is operational.

The Georgetown Merchants Association could provide support of the system in a manner similar to merchant support of parking validation programs. This would of course depend upon the value the merchants place on the trolley service improving their business. In Fort Worth, a single merchant currently operates a trolley system.

Management support could be provided by the Old Georgetown and Foggy Bottom Corporation which has strongly supported the reinstitution of trolley service in Georgetown. This group, in a manner similar to the Reston Community Bus Association could provide the direction and technical expertise involved in the day-to-day operation of the system.

If the system provides a high level of service or extended service and is operated by WMATA, then the normal WMATA funding program would be utilized. This includes funds from local, state and federal sources as well as user contributions.

A substantial amount of money required to cover operating costs should be generated by the fare box. However, as level of service vehicle requirements and operating costs increase, the gap between income from the fare box and operating costs will widen.

11. SUMMARY AND RECOMMENDATIONS

This report has outlined a number of alignment and operational alternatives for implementing a trolley system in Georgetown. The alternatives have been evaluated within a framework which considered the primary functions the system is designed to serve. For purposes of summarizing the key findings of this evaluation a matrix has been prepared which displays the key operating characteristics and impacts of four different functional levels of service. This matrix is presented in Table 5. It is designed to assist in visually comparing the different types of service. The entries in the matrix have been discussed in previous chapters.

The options which are presented in the matrix show a wide range of types of trolley service which could be implemented in Georgetown. These types range from a very limited service which is primarily historically or tourist oriented to a service which extends well beyond Georgetown and acts as an integral part of the regional transit network. In between lie alternatives which could both serve a historical preservation function and provide a needed transportation service within Georgetown.

A trolley service within Georgetown could aid in Georgetown's attempts to preserve its heritage while at the same time assisting to improve the level of transit service for trips within Georgetown and trips accessing Metrorail from Georgetown. Such a service would be similar to San Francisco's cable cars or New Orlean's streetcars, both of which serve important historical and transportation functions in residential and commercial areas bordering and in the main Central Business District. Although such a system would have both positive and negative impacts, JHK & Associates feels that with a properly planned and designed system the positive impacts could outweigh the negative impacts. These arguments, combined with the general support for trolley service within the Georgetown community, leads JHK & Associates to conclude that the trolley option should be included as one of the

Table 5. Characteristics of Potential Georgetown Trolley Service

Service Type and Function	Hours of Operation	Headways (minutes)	Vehicle Type	Impact on Street Oper.	Capital Costs	Operating Costs	Operating Agency	Potential Funding
Historic/ Tourist	9:30 AM 4:30 PM	15	Old	Minor	Low	Low (Break Even or modest subsidy)	Private Non-Profit, Quasi-Public	Federal Demonstration Funding
Local Service (Moderate LOS)	7:00 AM 7:00 PM	10-15	Old	Modest	Low	Modest (Break Even or modest subsidy)	Private Non-Profit, Quasi-Public or Local Agency	Federal/ Local Demonstration Funding
Local Service (High LOS)	6:00 AM 12:00 PM*	5 PK 15 Off-Peak	PCC Type and Old	Substantial	Moderate	High (Subsidy Required)	Local Agency, Regional Agency	Require Federal Capital/Operating Funds
Local and Extended Service (High LOS)	6:00 AM 12:00 PM*	5 PK 15 Off-Peak	PCC Type and LRV	Substantial	High	High (Subsidy Required)	Regional Agency	Require Federal Capital/Operating Funds

*Consistent with Metrorail Operation.

alternatives to be further analyzed in the Georgetown Area Access Alternatives Study.

By including the trolley option as one of the major alternatives to be tested in the Georgetown Area Access Alternatives Study, this option will be evaluated against a number of other alternative transportation access improvements for the area. Examples of alternative improvements include a local area small bus system, expanded Metrobus service, and exclusive high occupancy vehicle lanes.

If the trolley option is chosen as one of the major alternatives to be tested in the current access study, it will be important that it be compared with the other candidate alternatives not only with respect to traditional transportation evaluation criteria, but also with respect to its impact upon historical preservation within the Georgetown area.

During the course of this report a number of issues have been identified which should be addressed in more detail before a final decision regarding the reinstitution of trolley service is made. Among these issues are the following:

Function

- Is the primary function of the system to be historic preservation, transportation service, or a combination of the two?

System Location

- Is the system to be a local Georgetown system, or is it to extend beyond Georgetown and provide a major line-haul function?
- What is to be the alignment of the system?

Physical System

- To what degree can existing electrical conduit and track be used for trolley operations?
- Should the track be located in the center lane(s) or curb lanes(s)?
- Should the system have single or double track operations?

- Should the sytem be located in reserved right of way or will it operate in mixed traffic?
- What type of vehicle should be used?
- What type of power source should be used?
- What should be the station spacing?
- Where will the maintenance facility be located?

System Operations

- What would be the hours of operation?
- What would be the system headways?
- How many vehicles would be required?
- What fares would be charged?
- What would be the roles for other transit systems in the Georgetown area?

System Impacts

- How would the trolley affect businesses in Georgetown?
- How would the trolley affect accessibility to and within Georgetown?
- How would the trolley affect traffic operations and parking? How would it affect traffic volumes on Georgetown streets?
- What safety problems does a trolley system introduce? To what degree are these solvable?
- What are the neighborhood impacts? What would the community acceptance of these impacts be?
- How much noise would the system create?
- How would the trolley affect air quality?
- What are the construction impacts?
- Is the system to be accessible to the elderly and handicapped? If so, how does this affect design and operations?

Institutional

- Who would operate the system?
- Who would fund the system? Where are moneys available? How would funding for a trolley affect funding for other transit in the region?

Patronage and Revenue

- What ridership would be attracted to the system? How would this demand be distributed over time of day, day of week and season of the year?
- How does demand affect system requirements?
- What portions of the demand would be former transit riders, former auto users, or induced trips?
- How much revenue would be collected from the system?

Costs

- How much would alternative systems cost to build?
- What would it cost to operate these systems at various levels of service?
- What would system deficits (or operating surpluses) be? If there were a deficit, who would pay the subsidy?

Based upon the information available at this time, JHK & Associates does not feel that any of these issues should foreclose trolley service as a possible transportation option in Georgetown. Rather it appears that many options remain for further consideration of reinstituting trolley service in Georgetown. This flexibility of available options, combined with the strength of the arguments for continuing the consideration of a trolley option as an access improvement alternative within Georgetown, leads JHK & Associates to further recommend that the in-depth Georgetown Trolley Study be performed, and that the study be structured to address the issues identified in this report.

It is important that a decision regarding the reinstitution of trolley service in Georgetown be made on an informed basis. In order that this may be done, it is necessary that the issues identified above be studied in detail. The proposed Georgetown Trolley Study could do this.

Of the issues identified above, several are likely to be more critical than the rest. These are the issues which may have the greatest bearing on whether trolley service is actually reinstituted in Georgetown. Among these issues are the following:

- Traffic impacts
- Source of financial support
- Location of vehicle storage and maintenance facility
- Power supply system
- Usability of existing track and conduit
- Accessibility requirements for the elderly and handicapped

It is recommended that efforts during the initial phase of the Georgetown Trolley Study focus upon these issues and that a decision to continue beyond this phase be based upon whether these issues can be successfully resolved. It is further recommended that subsequent work also be structured in phases with an evaluation of whether the study should continue occurring at the end of each phase. In this way if insoluble problems are encountered during the course of the study or if it is judged during the course of the study that the trolley option should no longer be pursued, continued funds would not be expended on the examination of an option which will never be implemented. A committee of local officials and citizens representatives should act as a steering committee for the study. Many of the members of this committee may be the same persons who are presently members of the Georgetown Area Access Alternatives Study Steering Committee.

Although the focus of the Georgetown Trolley Study should be upon the analysis of alternative trolley operations, it is recommended that options other than a traditional trolley operation be considered. It is noted that other transit options are still under consideration in the access study. The trolley analysis should incorporate the results of the Georgetown Area Access Study. Findings during the analysis and evaluation stages of the access study could lead to changes in the direction of the trolley study. Conversely, additional information which is gained during the trolley study should be used to reevaluate whether the trolley option's ranking relative to other access improvements in Georgetown as determined during the access study should be changed.

It is likely that if a trolley system is to be implemented in Georgetown it will be because it is justified for a combination of historical and transportation reasons. For this reason, it is recommended that if the proposed Georgetown Trolley Study is conducted that it concentrate upon a system which would serve both historic and transportation service functions. It is further recommended that although light rail systems which extend beyond Georgetown be considered within the study as long-range options the study should concentrate upon the planning and design of a localized system which would serve trips within Georgetown and trips between Georgetown and Metrorail.

REFERENCES

(1) LeRoy O. King, Jr. 100 Years of Capital Traction : The Story of Streetcars in the Nation's Capital. Dallas, Texas: LeRoy O. King, Jr., 1972.

(2) Joseph A. Bosco, et. al. "A Demonstration of Light Rail Transportation in the Nation's Capital: A Citizens' Proposal", March 15, 1975.

(3) The Citizens Association of Georgetown Subcommittee on M Street. "Report on the Restoration of Streetcars and Cobblestones." September 9, 1976.

(4) Light Rail Transit. TRB Special Report 161, Transportation Research Board, Washington, D. C., 1975.

(5) Light Rail Transit: Planning and Technology. TRB Special Report 182, Transportation Research Board, Washington, D. C., 1978.

(6) E. S. Diamant, et. al. Light Rail Transit: A State of the Art Review. Prepared for Urban Mass Transportation Administration, 1976.

APPENDIX

LETTER FROM

CHARLES H. GRAVES

TO

ALBERT A. GRANT

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

JUN 8 1978

Mr. Albert A. Grant, P.E.
Director Department of
Transportation Planning
Washington Council of Governments
Suite 201
1225 Connecticut Avenue, N.W.
Washington, D. C. 20036

Dear Al:

I have your May 24th letter asking certain questions about the proposed Georgetown Trolley study.

First, you ask if the grant ratio could be 100 percent. The answer is yes because the study could have national significance. It could demonstrate how to plan an at-grade light rail facility which connects urban activity centers and which may operate without a deficit. The grant would be in addition to our regular annual apportionment of technical studies funds to the Washington metropolitan area.

Second, work should not begin on the Trolley Study until the related Georgetown Access Study has produced appropriate early results: for example, until the range of alternatives has been narrowed and at-grade light-rail remains a promising option. It may also be appropriate to examine in detail some other option emerging from the Access study. If you wish, we would be willing to participate in the review of any approach to integrating these two efforts.

Third, you asked if the steering committee of the Georgetown Access Study should also be used for the Trolley Study. I would rather not express an opinion on this point, though we would be willing to participate as observers.

The Trolley Study proposal is unlikely to require a "major transportation investment" and therefore would not be subject to our formal alternative analysis requirements for new starts and extensions.

Finally, you asked several questions about procurement of third party contracts. You should follow your normal procedures and ours as described in UMTA's External Operating Manual.

This letter merely invites you to apply and establishes the ground rules for processing an application but does not, of course, imply that we will approve a grant. The proposal looks very interesting and I would encourage the Washington Metropolitan Council of Governments to transmit an application to our Philadelphia office.

Sincerely,

Charles H. Graves
Director of Planning Assistance