



3

DEVELOPMENT OF ALTERNATIVES

Streetcar and Premium Bus have been identified as the two transit modes for the Union Station to Georgetown Premium Transit AA Study.

Chapter 3 → Development of Alternatives

A. INTRODUCTION

1. Overview of Process

Streetcar and Premium Bus have been identified as the two transit modes for the Union Station to Georgetown Premium Transit AA Study. The development of premium transit alternatives has been based upon previous transportation planning efforts in the corridor, most specifically the *Environmental Assessment/Finding of No Significant Impact for K Street, 24th Street NW to 7th Street NW* and the *DC's Transit Future System Plan*, each performed for DDOT. The primary goal in developing the premium transit alternatives is to meet the project purpose and need for improved transit in the east-west corridor between Union Station and Georgetown. As such, the development of alternatives does not focus on more regional transit needs and higher capacity modes, such as expanding Metro in the corridor, or introducing more regional alternatives such as light rail.

The development of alternatives was also defined by the study area boundary. All alternatives were developed to be within the study area boundary. The boundary is graphically depicted in **Appendix A: Figure 1**. As part of the AA Study process, it was also determined that the potential to evaluate transit to Georgetown University area should be considered in a separate study.

The premium transit alternatives have been developed to be in accord with the project's purpose and need. The project team further developed Guiding Principles for the alignments and station locations based on the purpose and need. The project purpose and need has been presented in **Chapter 2** of this AA report. The Guiding Principles for Alignments and Stations are described in the next section of this chapter.

A “building block” process was used to develop a range of Streetcar and Premium Bus Alternatives. This process is described in more detail later in this chapter. In summary, the following major steps were undertaken in the development of premium transit alternatives:

1. All alignment links in the corridor were analyzed for the potential to accommodate streetcars or premium buses generally within existing roadways.
2. Those links were narrowed down by eliminating the links that were least likely to accommodate streetcar or premium bus.
3. Links were combined together to form preliminary end-to-end alternatives. Six streetcar and five premium bus preliminary end-to-end alternatives were developed.
4. The eleven preliminary alternatives were evaluated and narrowed down to two streetcar and one premium bus alternative that are presented in detail in this report.

2. Guiding Principles for Alignments

Based on Purpose and Need, twelve guiding principles were established to help direct the development and evaluation of the alignments for premium transit alternatives. The principles were applied to develop the 11 preliminary alternatives and to narrow these 11 down to the final three alternatives. The guiding principles for development of the alignments are:

- > Develop efficient east-west connection between Union Station and Georgetown and major activity centers
- > Consider directness of alignments, which will lead to efficient operations and optimize travel times
- > Minimize need for curves and turns for alternatives
- > Maximize use of public right-of-way
- > Consider directness of potential connections to Metro stations and major bus stops
- > Minimize impacts on roadway capacity
- > Minimize need to eliminate on-street parking
- > Avoid impacting National Park Service land
- > Consider feasibility of implementation relative to anticipated impacts, disruption, and cost
- > Capability to place stations along the alignments
- > Capitalize on K Street Transitway (previously studied between Washington Circle and Mount Vernon Square)
- > Support existing and future land uses

3. Guiding Principles for Stations

Seven guiding principles were established to help direct the development and evaluation of the stations for the premium transit alternatives. Since all of the alternatives were generally parallel within a relatively narrow corridor, the stations in each alternative were fairly consistent within the corridor, with each alternative having eight or nine stations at approximately the same locations linearly (north to south) within the corridor. The locations varied somewhat in the north-south direction based upon the specific roadway alignment. The seven guiding principles for identifying stations for the premium transit alternatives were:

- > Typical station spacing is 3 to 4 blocks
- > Proximity to Metro Station entrances
- > Proximity to major bus stops
- > Pedestrian friendly environments and high pedestrian areas
- > Proximity to major activity centers
- > Support existing and future use and revitalization projects
- > Feasibility of implementation – minimizes impacts of adjacent property, traffic flow, and parking

B. ALIGNMENT LINKS

1. Description of Links

For the purposes of organizing and comparing links, the study area was divided into five basic segments:

- > West End - Georgetown to Washington Circle
- > Washington Circle
- > Central – Washington Circle to Mount Vernon Square
- > Mount Vernon Square
- > East End – Mount Vernon Square to Union Station

A total of 60 links were identified for potential streetcar or premium bus alignments: 15 in the West End, three at Washington Circle, 13 in the Central Area, four at Mount Vernon Square, and 25 in the East End. These links were developed by the study team with input from the public at meetings or through public comments. A listing of the links for each five segments is provided below in **Tables 3-1** through **3-5** and shown on **Figure 3-1**.

Table 3-1: West End – Georgetown to Washington Circle (NW) Alignment Links

Alignment Link	From	To
1. Extend to Georgetown University		
2. Extend to Rosslyn		
3. Wisconsin Avenue	K Street	M Street
4. M Street	Wisconsin Street	Whitehurst Freeway
5. Canal Road	Whitehurst Freeway	Georgetown University
6. Whitehurst Freeway	33rd Street	Rock Creek and Potomac Parkway
7. Water Street	33rd Street	29th Street
8. K Street	Rock Creek and Potomac Parkway	Washington Circle
9. M Street	Wisconsin Avenue	29th Street
10. M Street	29th Street	21st Street
11. Pennsylvania Avenue	M Street	Washington Circle
12. Thomas Jefferson Street	Water Street	M Street
13. L Street	Pennsylvania Avenue	21st Street
14. Pennsylvania Avenue	22nd Street	21st Street
15. 24th Street	M Street	Pennsylvania Avenue

Table 3-2: Washington Circle (NW) Alignment Links

Alignment Link	From	To
1. K Street (Around Circle)	24th Street	22nd Street
2. K Street (Under Circle)	24th Street	22nd Street
3. K Street (Through Circle on Surface)	24th Street	22nd Street

Table 3-3: Central – Washington Circle to Mount Vernon Square (NW) Alignment Links

Alignment Link	From	To
1. K Street	22nd Street	9th Street
2. 21st Street	M Street	K Street
3. L Street	21st Street	Massachusetts Avenue
4. I Street	21st Street	New York Avenue
5. 12th Street	I Street	H Street
6. 11th Street	New York Avenue	H Street
7. 11th Street	K Street	H Street
8. H Street	12th Street	Massachusetts Avenue
9. I Street	11th Street	Massachusetts Avenue
10. 11th Street	L Street	L Street
11. Massachusetts Avenue	L Street	9th Street
12. New York Avenue	11th Street	9th Street
13. H Street	Pennsylvania Avenue	New York Avenue

Table 3-4: Mount Vernon Square (NW) Alignment Links

Alignment Link	From	To
1. 9th Street	Mount Vernon Place	K Street
2. Mt. Vernon Place	9th Street	7th Street
3. K Street	9th Street	7th Street
4. 7th Street	Mount Vernon Place	K Street

Table 3-5: East End - Mount Vernon Square to Union Station (NW and NE) Alignment Links

Alignment Link	From	To
1. K Street	7th Street	4th Street NW
2. K Street	4th Street NW	New Jersey Avenue
3. K Street	New Jersey Avenue	North Capitol Street
4. K Street	North Capitol Street	3rd Street NE
5. New York Avenue	7th Street	New Jersey Avenue
6. Massachusetts Avenue	7th Street	H Street
7. Massachusetts Avenue	H Street	North Capitol Street
8. Massachusetts Avenue	North Capitol Street	1st Street
9. 5th Street	L Street	L Street
10. L Street	5th Street	4th Street
11. 4th Street	L Street	Massachusetts Avenue
12. L Street	11th Street	5th Street
13. New Jersey Avenue	New York Avenue	K Street
14. New Jersey Avenue	K Street	H Street
15. H Street	Massachusetts Avenue	New Jersey Avenue
16. H Street	New Jersey Avenue	North Capitol Street
17. H Street	North Capitol Street	3rd Street NE
18. North Capitol Street	K Street	H Street
19. North Capitol Street	Massachusetts Avenue	H Street
20. 2nd Street	K Street	H Street
21. 3rd Street NE	K Street	H Street
22. 6th Street	H Street	E Street
23. E Street	6th Street	2nd Street
24. 2nd Street	E Street	Massachusetts Avenue
25. 1st Street	Massachusetts Avenue	H Street

2. Initial Screening of Alignment Links

An initial screening was conducted of all links within each of the five segments. Links were dropped from further consideration as described below. In total, 15 links were dropped at this phase. For each table, **those links that were dropped are highlighted in green**, with a brief description of the reasons for dropping immediately below the table. **Figure 3-1**, the Alignment Links map, depicts all of the links considered, with those dropped in the initial screening in red and those retained in yellow. (A larger version of this map is included in **Appendix A: Figure 2**.)

Figure 3-1: Alignment Links

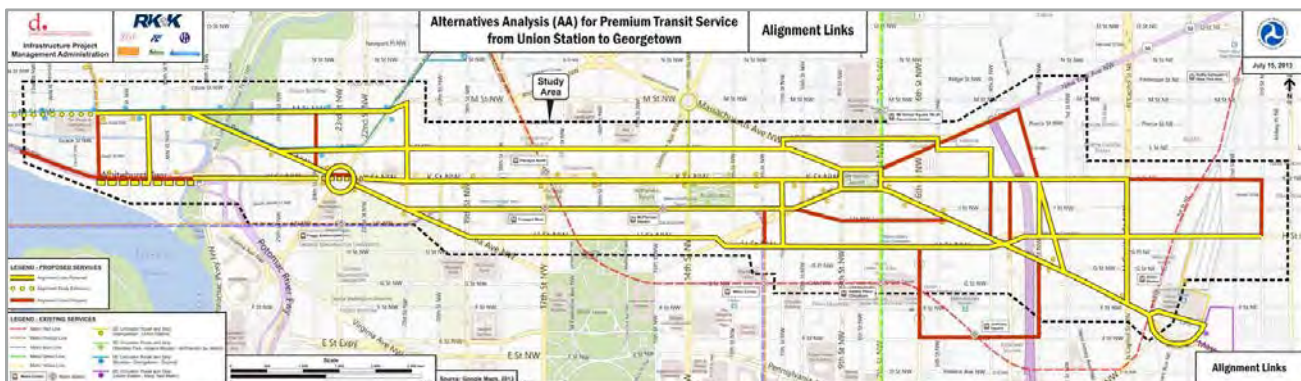


Table 3-6: Initial Screening of West End – Georgetown to Washington Circle (NW) Alignment Links

Alignment Link	From	To
1. Extend to Georgetown University		
2. Extend to Rosslyn		
3. Wisconsin Avenue	K Street	M Street
4. M Street	Wisconsin Street	Whitehurst Freeway
5. Canal Road	Whitehurst Freeway	Georgetown University
6. Whitehurst Freeway	33rd Street	Rock Creek and Potomac Parkway
7. Water Street	33rd Street	29th Street
8. K Street	Rock Creek and Potomac Parkway	Washington Circle
9. M Street	Wisconsin Avenue	29th Street
10. M Street	29th Street	21st Street
11. Pennsylvania Avenue	M Street	Washington Circle
12. Thomas Jefferson Street	Water Street	M Street
13. L Street	Pennsylvania Avenue	21st Street
14. Pennsylvania Avenue	22nd Street	19th Street
15. 24th Street	M Street	Pennsylvania Avenue

Four links were dropped in this segment. The reasons for dropping these links included: beyond the limits of the study area; vertical grades too steep to accommodate Streetcar; and less direct than other links retained. The Whitehurst Freeway link was dropped for the Streetcar alternative because more detailed engineering would be required to understand the capability of the structure to support Streetcar infrastructure.

Table 3-7: Initial Screening of Washington Circle (NW) Alignment Links

Alignment Link	From	To
1. K Street (Around Circle)	24th Street	22nd Street
2. K Street (Under Circle)	24th Street	22nd Street
3. K Street (Through Circle on Surface)	24th Street	22nd Street

A link on the surface through Washington Circle was dropped due to Section 4(f) impacts to the park in Washington Circle. There are less impactful alternatives both under and around Washington Circle.

Table 3-8: Initial Screening of Central – Washington Circle to Mount Vernon Square (NW) Alignment Links

Alignment Link	From	To
1. K Street	22nd Street	9th Street
2. 21st Street	M Street	K Street
3. L Street	21st Street	Massachusetts Avenue
4. I Street	21st Street	New York Avenue
5. 12th Street	I Street	H Street
6. 11th Street	New York Avenue	H Street
7. 11th Street	K Street	H Street
8. H Street	New York Avenue	Massachusetts Avenue
9. I Street	11th Street	Massachusetts Avenue
10. 11th Street	L Street	L Street
11. Massachusetts Avenue	L Street	9th Street
12. New York Avenue	11th Street	9th Street
13. H Street	Pennsylvania Avenue	New York Avenue

Two links were dropped in this segment because the link not needed as a result of H Street being dropped east of 12th Street and K Street and New York Avenue/Massachusetts Avenue are preferred routes.

Table 3-9: Initial Screening of Mount Vernon Square (NW) Alignment Links

Alignment Link	From	To
1. 9th Street	Mount Vernon Place	K Street
2. Mt. Vernon Place	9th Street	7th Street
3. K Street	9th Street	7th Street
4. 7th Street	Mount Vernon Place	K Street

Table 3-10: East End - Initial Screening of Mount Vernon Square to Union Station (NW and NE) Alignment Links

Alignment Link	From	To
1. K Street	7th Street	4th Street NW
2. K Street	4th Street NW	New Jersey Avenue
3. K Street	New Jersey Avenue	North Capitol Street
4. K Street	North Capitol Street	3rd Street NE
5. New York Avenue	7th Street	New Jersey Avenue
6. Massachusetts Avenue	7th Street	H Street
7. Massachusetts Avenue	H Street	North Capitol Street
8. Massachusetts Avenue	North Capitol Street	1st Street
9. 5th Street	L Street	L Street
10. L Street	5th Street	4th Street
11. 4th Street	K Street	Massachusetts Avenue
12. L Street	11th Street	5th Street
13. New Jersey Avenue	New York Avenue	K Street
14. New Jersey Avenue	K Street	H Street
15. H Street	Massachusetts Avenue	New Jersey Avenue
16. H Street	New Jersey Avenue	North Capitol Street
17. H Street	North Capitol Street	3rd Street NE
18. North Capitol Street	K Street	H Street
19. North Capitol Street	Massachusetts Avenue	H Street
20. 2nd Street	K Street	H Street
21. 3rd Street NE	K Street	H Street
22. 6th Street NE	H Street	E Street
23. E Street NE	6th Street	2nd Street
24. 2nd Street NE	E Street	Massachusetts Avenue
25. 1st Street	Massachusetts Avenue	H Street

In this segment, eight links were dropped. The reasons included: less direct route than links retained; link outside study area; an indirect route which increased travel times; and other links provided more direct connections.

C. DEVELOPMENT OF END-TO-END ALTERNATIVES

1. Combination of Links Into Alternatives

Utilizing the project purpose and need and guiding principles for alignments and stations, a series of eleven Preliminary Alternatives were developed. These alternatives were developed by connecting combinations of the 45 links that remained after the initial screening of links. The alignments became the driving force behind the development of the alternatives as it was determined that eight to nine stations could likely be provided under any end-to-end premium transit alternative. The Preliminary Alternatives were also developed to provide a range of alternatives to be considered

for the final set of alternatives, upon which more detailed analysis would be performed. The six Streetcar Alternatives are shown in **Appendix A: Figure 3** and the five Premium Bus Alternatives are shown in **Appendix A: Figure 4**. Each of these alternatives is described below.

2. Preliminary Streetcar Alternatives

a. Streetcar Alternative 1

From the western end of the alignment at Wisconsin Avenue NW, near the Georgetown Waterfront Park, the Streetcar Alternative 1 would operate along K Street NW in both the eastbound and westbound directions to Washington Circle. There are two options under consideration for operating around Washington Circle. Under the first option, the Streetcar Alternative 1 would continue at-grade along K Street NW around Washington Circle. Under the second option the Streetcar Alternative 1 would operate underneath Washington Circle along the existing roadway emerging back onto K Street NW to same eastbound or westbound alignment to and around Mount Vernon Square. From Mount Vernon Square the Streetcar Alternative 1 would continue two-way travel along K Street NW to New Jersey Avenue NW. Both directions of the Streetcar Alternative 1 would operate on New Jersey Avenue NW between K Street NW and H Street NE. Both directions of the Yellow Alternative would operate along H Street NE connecting to the H Street Streetcar at the eastern end of the alternative.

b. Streetcar Alternative 2

From the western end of the alignment at Wisconsin Avenue NW, the Streetcar Alternative 2 would operate on M Street NW in both the eastbound and westbound directions to Pennsylvania Avenue NW. At Pennsylvania Avenue NW, the alignment continues two-way travel to and around Washington Circle. Between Washington Circle and Mount Vernon Square the eastbound and westbound alignments follow different routes. The eastbound direction follows K Street NW. The westbound direction follows New York Avenue NW to I Street NW and then to northwest on Pennsylvania Avenue NW. East of Mount Vernon Square the Streetcar Alternative 2, operates two-way travel on Massachusetts Avenue NW to two-way travel on North Capitol Street to H Street NE. Continuing along H Street NE in both the eastbound and westbound directions to the eastern terminus at 3rd Street NE.

An extension could be considered for the Streetcar Alternative 2 on the western end of the alignment that would extend two-way service on M Street NW to Georgetown University on Canal Road.

c. Streetcar Alternative 3

From the western end of the alignment at Thomas Jefferson Street NW near Washington Harbour, the Streetcar Alternative 3 operates eastbound along K Street to/from and around Washington Circle and then begins two-way travel in both the eastbound and westbound directions along K Street NW to/from North Capitol Street. On K Street NW at North Capitol Street, the Streetcar Alternative 3 turns northbound and southbound to/from H Street NE. On H Street NE the alignment operates two-way travel towards 3rd Street NE on H Street connecting to the H Street Streetcar.

d. Streetcar Alternative 4

From the western end of the alignment at Wisconsin Avenue NW, the Streetcar Alternative 4 operates along M Street NW and continues in both the eastbound and westbound directions along M Street to Pennsylvania Avenue. The alignment continues in both directions on Pennsylvania Avenue NW to L Street NW where the eastbound direction continues around Washington Circle. From Washington Circle the Streetcar Alternative 4 operates in the eastbound direction only along K Street NW to 4th Street NW. In the westbound direction the route operates from 4th Street NW at L Street NW and continues along L Street NW in the westbound direction only to Pennsylvania Avenue NW. East of 4th Street NW, the Streetcar Alternative 4 returns to two-way travel along K Street NW to two-way travel on North Capitol Street to H Street NE. Continuing two-way travel on H Street NE across Hopscotch Bridge to the eastern terminus at 3rd Street NE.

An extension could be considered for the Streetcar Alternative 4 on the western end of the alignment that would extend two-way service on M Street NW to Georgetown University on Canal Road or extend service north of M Street NW on Wisconsin Avenue NW.

e. Streetcar Alternative 5

From the western end of the alignment at Wisconsin Avenue NW near Georgetown Waterfront Park, the Streetcar Alternative 5 operates along Water Street underneath the Whitehurst Freeway NW to K Street NW. The Streetcar Alternative 5 continues along K Street NW in both the eastbound and westbound directions, around Washington Circle to Pennsylvania Avenue NW. The alignment continues two-way travel to H Street NW. From H Street NW the Streetcar Alternative 5 continues eastbound and westbound crossing Massachusetts Avenue NW to H Street NE and continuing across Hopscotch Bridge to the eastern terminus at 3rd Street NE at the H Street Streetcar connections.

f. Streetcar Alternative 6

From the western end of the alignment at Wisconsin Avenue NW, the Streetcar Alternative 6 operates along M Street NW and continues in both the eastbound and westbound directions along M Street to 21st Street NW. At 21st Street NW, the alignment travels both southbound and northbound on 21st Street NW to K Street NW where the alignment continues in both directions to and around Mount Vernon Square. East of Mount Vernon Square the Streetcar Alternative 6 travels in both directions on Massachusetts Avenue NW to H Street NE. At H Street NE eastbound travel only continues on Massachusetts Avenue NW to and around Columbus Circle before following North Capitol Street to H Street NE. Westbound travel between North Capitol Street and Massachusetts Avenue NW operates along H Street NE. East of North Capitol Street both directions of the Streetcar Alternative 6 operate along H Street NE to the eastern terminus at 3rd Street NE.

An extension could be considered for the Streetcar Alternative 6 on the western end of the alignment that would extend two-way service on M Street NW to Georgetown University on Canal Road or extend service north of M Street NW on Wisconsin Avenue NW.

3. Preliminary Premium Bus Alternatives

a. Premium Bus Alternative 1

From the western end of the alignment at Wisconsin Avenue NW near Georgetown Waterfront Park, the Premium Bus Alternative 1 operates two-way travel along Water Street NW under Whitehurst Freeway NW to K Street NW at 29th Street NW continuing along K Street NW to travel underneath Washington Circle, continuing two-way travel along K Street to North Capitol Street. The Premium Bus Alternative 1 then travels northbound and southbound on North Capitol to and around the loop at Columbus Circle adjacent to Union Station.

An extension could be considered for the Premium Bus Alternative 1 on the western end of the alignment that would extend two-way service on K Street NW to Georgetown University on Canal Road. An alternate eastern end branch would continue along North Capitol Street from Union Station to H Street NE. On H Street NE the alternate branch would operate in both the eastbound and westbound directions to the terminus at 3rd Street NW connecting with the H Street Streetcar.

b. Premium Bus Alternative 2

From the western end of the alignment at Wisconsin Avenue NW, the Premium Bus Alternative 2 operates on M Street NW in both the eastbound and westbound directions to Pennsylvania Avenue NW. At Pennsylvania Avenue NW, the alignment continues two-way travel to and around Washington Circle and continuing two-way travel along Pennsylvania Avenue NW to H Street NW. On H Street NW, the Premium Bus Alternative 2 continues two-way travel along H Street NW to Massachusetts Avenue NW. From Massachusetts Avenue NW continuing to/from Columbus Circle NE and operate around Columbus Circle at Union Station.

An extension could be considered for the Premium Bus Alternative 2 on the western end of the alignment that would extend two-way service on M Street NW to Georgetown University on Canal Road or extend service north of M Street NW on Wisconsin Avenue NW. An alternate eastern end branch would operate along North Capitol Street from Union Station to to/from H Street NE. On H Street NE the alternate branch would operate in the eastbound and westbound direction to the terminus at 3rd Street NW connecting with the H Street Streetcar.

C. Premium Bus Alternative 3

Beginning on the western end of the alignment the Premium Bus Alternative 3 travels in both directions along K Street NW at Wisconsin Avenue NW and continuing two-way travel on K Street NW to and around Washington Circle to/from Pennsylvania Avenue NW. On Pennsylvania Avenue NW, the Premium Bus Alternative 3 would continue two-way travel to/from H Street NW continuing in the eastbound and westbound direction to North Capitol Street. The Premium Bus Alternative 3 would then operate in the northbound and southbound direction along North Capitol Street to Massachusetts Avenue NE and loop around Columbus Circle at Union Station. An alternate eastern end branch would operate along North Capitol Street from Union Station to/from H Street NE. On H Street NE, the alternate branch would operate in the eastbound and westbound direction to the terminus at 3rd Street NW connecting with the H Street Streetcar.

An extension could be considered for the Premium Bus Alternative 3 on the western end of the alignment that would extend two-way service on K Street NW to Georgetown University on Canal Road. An alternate eastern end branch would continue along North Capitol Street from Union Station to H Street NE. On H Street NE, the alternate branch would operate in both the eastbound and westbound directions to the terminus at 3rd Street NW connecting with the H Street Streetcar.

d. Premium Bus Alternative 4

From the western end of the alignment at Wisconsin Avenue NW, the Premium Bus Alternative 4 operates along M Street NW and continues in both the eastbound and westbound directions along M Street to 21st Street NW. At 21st Street NW, the alignment travels both southbound and northbound on 21st Street NW to K Street NW where the alignment continues in both directions along K Street NW to and around Mount Vernon Square. East of Mount Vernon Square, the Premium Bus Alternative 4 operates as two-way travel along Massachusetts Avenue NW to H Street NW. From Massachusetts Avenue NW at H Street NW, the alternative would operate in the southeast direction only along Massachusetts Avenue NW to and around Columbus Circle at Union Station. From Union Station, the route would turn north on North Capitol Street and turn and continue eastbound on H Street NE to 3rd Street NW connecting with the H Street Streetcar. From 3rd Street and H Street the route would continue westbound along H Street to Massachusetts Avenue and then continue west on Massachusetts Avenue.

An extension could be considered for the Premium Bus Alternative 4 on the western end of the alignment that would extend two-way service north of M Street NW on Wisconsin Avenue NW.

e. Premium Bus Alternative 5

From the western end of the alignment at Wisconsin Avenue NW, the Premium Bus Alternative 5 would operate on M Street NW and continue in both the eastbound and westbound directions to/from 21st Street NW. On 21st Street NW, the Premium Bus Alternative 5 would operate as two-way travel between M Street NW and L Street NW only. The eastbound Premium Bus Alternative 5 would continue on L Street NW to Massachusetts Avenue, around Mount Vernon Square and continue along Massachusetts Avenue NW. In the westbound direction, between Mount Vernon Square and 21st Street NW the Premium Bus Alternative 5 would operate on New York Avenue NW to I Street NW to north on 21st Street NW. East of Mount Vernon Square the Premium Bus Alternative 5 operates along Massachusetts Avenue NW to and around Columbus Circle at Union Station.

An alternate eastern end branch would operate along North Capitol Street from Union Station to/from H Street NE. On H Street NE the alternate branch would operate in the eastbound and westbound direction to the terminus at 3rd Street NW connecting with the H Street Streetcar.

4. Selection of Final Alternatives

Each of the six Streetcar and five Premium Bus Alternatives were compared using the purpose and need, and guiding principles for alignments and stations. The comparisons were qualitative as opposed to quantitative.

a. Streetcar Alternatives

Streetcar Alternative 1 - This alternative is carried forward as a final alternative for more detailed study [Alternative 1 Streetcar]. The advantages and disadvantages of this alternative include:

Advantages:

- > Most direct route of the six streetcar alternatives.
- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for both directions of streetcar travel.
- > Minimizes turns.
- > Provides convenient connections with Metro station entrances and bus lines.
- > Optimizes transit travel times when compared with other alternatives.
- > Minimizes impacts to roadway capacity and on-street parking.
- > Is centrally located in the study corridor and provides reasonable access to major activity centers and land use within the corridor.

Disadvantages:

- > Several blocks separated from the intersection of M Street and Wisconsin Avenue.
- > Streetcar operations at congested K Street and 27th Street intersection.
- > Vehicular/ pedestrian/ Streetcar interfaces at Mount Vernon Square.

Streetcar Alternative 2 - This alternative is carried forward as a final alternative for more detailed study [Alternative 2 Streetcar]. The advantages and disadvantages of this alternative include:

Advantages:

- > Direct route when compared with other streetcar alternatives.
- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for one direction of streetcar travel.
- > Provides convenient connections with Metro station entrances and bus lines.
- > K Street and I Street are centrally located in the study corridor and provide reasonable access to major activity centers and land use within the corridor.
- > Provides more central access to Georgetown area on M Street.
- > Closer access to the entrances to Union Station and access from the Hopscotch Bridge.

Disadvantages:

- > Provides split service on two different streets, which can be confusing to transit riders.
- > Split service requires additional station costs for eastbound and westbound stations.
- > Two streets impacted during construction.
- > Substantial removal of on-street parking.

Streetcar Alternative 3 - This alternative is not carried forward as a final alternative for more detailed study. This alternative has fairly similar characteristics as the Streetcar Alternative 1 with many of the same advantages, but has disadvantages when compared with the Streetcar Alternative 1. The advantages and disadvantages of this alternative include:

Advantages:

- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for both directions of streetcar travel.
- > Provides convenient connections with Metro station entrances and bus lines.
- > Is centrally located in the study corridor and provides reasonable access to major activity centers and land use within the corridor.

Disadvantages:

- > A one-way loop on the west end of the project is not as desirable as two-way operation on one alignment. A loop requires additional station costs and can be more confusing to transit riders.
- > The loop system requires that streetcars go around Washington Circle, as opposed to utilizing the existing underpass under Washington Circle.
- > On the west end, North Capitol Street is not the best option due to the greater volume of traffic on North Capitol Street.

Streetcar Alternative 4 - This alternative is not carried forward as a final alternative for more detailed study. This alternative is similar to the Streetcar Alternative 2 in that it is comprised of a pair of parallel streets with K Street as one of the streets, but using L rather than I as the second street. The advantages and disadvantages of this alternative include:

Advantages:

- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for both directions of streetcar travel.
- > Provides convenient connections with Metro station entrances and bus lines.
- > Is centrally located in the study corridor and provides reasonable access to major activity centers and land use within the corridor.

Disadvantages:

- > L Street is a street with a bicycle lane and would not be as compatible with the width needed for streetcar as I Street.
- > This alternative requires using Convention Center property between 7th and 9th Streets.
- > This alternative requires a large number of turns along L Street between 11th Street and 4th Street.
- > Provides split service on two different streets, which can be confusing to transit riders.
- > Split service requires additional station costs for eastbound and westbound stations.
- > Two streets impacted during construction.

Streetcar Alternative 5 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Provides convenient connections with Metro station entrances and bus lines.

Disadvantages:

- > H Street is located at the southern edge of the study corridor and is not as centrally located to major activity centers and land use as the other streetcar alternatives.
- > H Street carries heavy volumes of buses, therefore a dedicated lane for streetcar could not be provided.
- > Does not use the K Street Transitway.

Streetcar Alternative 6 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for both directions of streetcar travel.

Disadvantages:

- > Route is not as direct as other alternatives, with a high number of turns.
- > A one-way loop on the east end of the project is not as desirable as two-way operation on one alignment. A loop requires additional station costs and can be more confusing to transit riders.
- > This alternative would have greater transit travel times than other alternatives.

b. Premium Bus Alternatives

Premium Bus Alternative 1 - This alternative is carried forward as a final alternative for more detailed study [Alternative 3 Premium Bus]. The advantages and disadvantages of this alternative include:

Advantages:

- > Most direct route of the five bus alternatives
- > Utilizes K Street Transitway previously approved between Washington Circle and Mount Vernon Square for both directions of bus travel
- > Minimizes turns
- > Provides convenient connections with Metro station entrances and bus lines.
- > Optimizes transit travel times when compared with other bus alternatives
- > Minimizes impacts to roadway capacity and on-street parking
- > Is centrally located in the study corridor and provides reasonable access to major activity centers and land use within the corridor
- > Allows for service extension into Georgetown University area
- > Allows for the flexibility of connecting to both Union Station and the Streetcar on H Street at the Hopscotch Bridge

Disadvantages:

- > Several blocks separated from the intersection of M Street and Wisconsin Avenue.
- > Vehicular/ pedestrian/ Premium Bus interfaces at Mount Vernon Square.

Premium Bus Alternative 2 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Provides convenient connections with Metro station entrances and bus lines.

Disadvantages:

- > H Street is located at the southern edge of the study corridor and is not as centrally located to major activity centers and land use as the other streetcar alternatives.
- > H Street carries heavy volumes of buses, therefore a dedicated lane for streetcar could not be provided.
- > Does not use the K Street Transitway.

Premium Bus Alternative 3 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Provides convenient connections with Metro station entrances and bus lines.

Disadvantages:

- > H Street is located at the southern edge of the study corridor and is not as centrally located to major activity centers and land use as the other streetcar alternatives.
- > H Street carries heavy volumes of buses, therefore a dedicated lane for streetcar could not be provided.
- > Does not use the K Street Transitway.

Premium Bus Alternative 4 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Utilizes K Street Transitway previously studied between Washington Circle and Mount Vernon Square for both directions of streetcar travel.
- > Provides convenient connections with Metro station entrances and bus lines.
- > Is centrally located in the study corridor and provides reasonable access to major activity centers and land use within the corridor.

Disadvantages:

- > Route is not as direct as other alternatives, with a high number of turns.
- > A one-way loop on the east end of the project is not as desirable as two-way operation on one alignment. A loop requires additional station costs and can be more confusing to transit riders.
- > This alternative would have greater transit travel times than other alternatives.

Premium Bus Alternative 5 - This alternative is not carried forward as a final alternative for more detailed study. The advantages and disadvantages of this alternative include:

Advantages:

- > Provides convenient connections with Metro station entrances and bus lines.

Disadvantages:

- > A one-way pair two blocks apart on L Street and I Street was seen as a significant disadvantage in terms of providing quality transit service in the corridor.
- > L Street is a street with a bicycle lane and would not be as compatible with the width needed for streetcar as I Street.
- > Does not use the K Street Transitway.