
Traffic Impact Study

Community College of DC

Washington, D.C.

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TABLE OF CONTENTS

List of Figures	ii
List of Tables	ii
Executive Summary	iii
Introduction	1
Study Methodology	2
Existing Conditions.....	4
Transit Service.....	4
Site Access and Existing Road Network	4
Existing Conditions Capacity Analysis	8
Future Background Conditions without Development	11
Traffic Volumes	11
Total Future Traffic with Community College of the District of Columbia	14
Description of Proposed Development	14
Changes to Parcel 12	14
CCDC	14
Site Trip Generation.....	14
Site Trip Distribution.....	16
Total Future Conditions Capacity Analysis.....	16
Conclusions	22

LIST OF FIGURES

Figure 1: Site Location & Study Area Intersections.....	3
Figure 2: Current and Planned Configuration of Nannie Helen Burroughs/Kenilworth Avenue Intersection.....	6
Figure 3: Existing Lane Configurations and Traffic Controls	7
Figure 4: Existing Peak Hour Traffic Volumes	9
Figure 5: Future Background Peak Hour Traffic Volumes	12
Figure 6: Southbound PM Peak Period Left Turn Restriction along Nannie Helen Burroughs Avenue	17
Figure 7: Site Generated Peak Hour Traffic Volumes	18
Figure 8: Total Future Traffic Peak Hour Traffic Volumes.....	19

LIST OF TABLES

Table 1: Existing Conditions Capacity Analysis Results	10
Table 2: Background Developments	11
Table 3: Future Background Conditions Capacity Analysis Results.....	13
Table 4: Parkside Parcel 12 Trip Generation.....	15
Table 5: Site Trip Distribution for Office, Retail and Community College Trips	16
Table 6: Site Trip Distribution for Residential Trips	16
Table 7: Future Conditions (with and without CCDC) Capacity Analysis Results	20
Table 8: Comparison of Future Analysis Results with and without Improvements.....	21

EXECUTIVE SUMMARY

The following report presents the findings of a traffic impact study in support of the Community College of the District of Columbia (CCDC), located within the Parkside Mixed-Use Development in northeast, Washington DC. Parkside is located in Ward 7, east of the Anacostia River, in Northeast Washington DC, and is bounded by Anacostia Avenue, Kenilworth Avenue, NE, Hayes Street, NE, and Foote Street, NE. The property is being developed under a Master Plan and is presently subdivided into twelve parcels (numbered 1 through 12) of various sizes and configurations. This traffic impact study supports a Stage 1 PUD modification and Stage 2 PUD application necessary to allow development of a Community College of the District of Columbia (CCDC) facility within Parkside on Parcel 12.

A health care center is also being proposed for development on Parcel 12. A traffic study reviewing the impacts of that site was completed and submitted as part of a Stage 2 PUD application in May, 2010. This traffic study assumes approval of the Health Care Center. This study also assumed the approval of the proposed Educare of DC day care school which is a non-profit organization recently approved by the BZA.

Stage 1 PUD Modification of Parcel 12

In order to allow development of the CCDC within Parkside, a Stage 1 PUD modification is necessary. These modifications are limited to Parcel 12, and do not change the overall amount of square feet being developed or parking spaces constructed. They will remain at 1,709,800 square feet and 1,400 spaces, respectively, for the entirety of Parcel 12. The land-uses on Parcel 12 will be changing as part of Stage 1 PUD modification. The original Stage 1 PUD included a mix of office, retail and residential uses. Current plans include a Health Care Center (with a separate Stage 2 application) at the eastern end of the site. Adjacent to the Health Center is the proposed CCDC facility. Neither of these uses is included in the Stage 1 approval; residential uses were approved where these uses are now being proposed. The remainder of Parcel 12 will remain a mixture of office, retail and residential uses.

Stage 2 PUD Application for CCDC

The Community College will be located in a 259,500 square foot facility. It will have 50 administrative staff, 25 faculty and 50 to 75 adjunct faculty. A total of 500 classroom seats will be provided. Parking and access will be shared with other Parcel 12 buildings; the zoning requirement for parking spaces is 87 vehicular and 5 bicycle spaces. The Community College will be 1,000 feet (less than a quarter of a mile) from the Minnesota Avenue Metrorail station.

The mixed use nature of Parkside and its proximity to Metrorail, which is supported with an existing and a planned pedestrian bridge connection between the development and the Minnesota Avenue Metrorail Station, makes Parkside a Transit Oriented Development (TOD) that would encourage multimodal traffic and reduce auto dependence in the community.

The net trips generated by CCDC after adjustment for non-auto mode reductions and synergy between land-uses would be 99 AM peak hour trips (81 in and 18 out), 129 PM peak hour trips (83 in and 46 out). The net trips generated by Parcel 12 excluding the health care center would be 853 AM peak hour trips (678 in and 175 out), 944 PM peak hour trips (286 in and 658 out).

The capacity analyses presented in this report had the following findings:

- Existing Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.

- Six unsignalized intersections close to the development operate at acceptable Levels of Service.
- The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue now operate as two intersections under one traffic signal. These intersections operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being fully implemented as planned. The existing restricted movements and alternations of traffic flow generated by the barriers and bollards placed in the roadway area significantly restrict traffic flow.
- All other study area intersections operate at acceptable levels of service in both morning and afternoon peak hours.
- Future Background Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.
 - Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service;
 - The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continue to operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being fully implemented as planned.
 - The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences unacceptable delays on the southbound approach in the morning peak hour.
 - The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue in both morning and evening peak hours.
- Total Future Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.
 - Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service.
 - The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continue to operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being fully implemented as planned.
 - The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences unacceptable delays on the southbound approach in the morning peak hour.
 - The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue during both morning and evening peak hours and southbound approach of Nannie Helen Burroughs Avenue during the evening peak hour.

All of the unacceptable levels of service projected in the total future conditions can be mitigated through the following:

- Slight changes to signal timing at Nannie Helen Burroughs Avenue's intersections with Minnesota Avenue and the Kenilworth Avenue Service Road (NB);
- Enforcing the no left turn restriction from southbound Nannie Helen Burroughs Avenue onto Minnesota Avenue in the evening peak hour; and
- Constructing the ultimate build-out of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue intersections as proposed in the Kenilworth Avenue Corridor Study.

All the study area intersections that operate unacceptably under total future conditions can be mitigated to operate acceptably with above listed improvements. Thus, the development of the proposed Community College of the District of Columbia is not projected to generate any negative impacts to the surrounding transportation network.

INTRODUCTION

The following report presents the findings of a traffic impact study in support of the Community College of the District of Columbia (CCDC), located within the Parkside Mixed-Use Development in northeast, Washington DC. Parkside is located in Ward 7, east of the Anacostia River, in Northeast Washington DC, and is bounded by Anacostia Avenue, Kenilworth Avenue, NE, Hayes Street, NE, and Foote Street, NE as shown in Figure 1. The property is being developed under a Master Plan and is presently subdivided into twelve parcels (numbered 1 through 12) of various sizes and configurations. This traffic impact study supports a Stage 1 PUD modification and Stage 2 PUD application necessary to allow development of a Community College of the District of Columbia (CCDC) facility within Parkside.

The mixed use nature of Parkside and its proximity to Metrorail, which is supported with an existing and a planned pedestrian bridge connection between the development and the Minnesota Avenue Metrorail Station, makes Parkside a Transit Oriented Development (TOD) that would encourage multimodal traffic and reduce auto dependence in the community.

The Stage 1 PUD traffic impact study (covering all parcels) was submitted in August 2005 and reviewed by DDOT. The approved traffic study formed part of the PUD submission to the Zoning Commission (Z.C. Case No. 05-28), which was granted approval conditioned upon a requirement that a revised and updated traffic impact analysis be submitted prior to second-stage approval of each proposed development of the PUD (Z.C. order 05-28, Condition No.10). This traffic study serves to comply with that Zoning Commission Order in support of the second stage PUD application for the development of the CCDC on Parcel 12. In addition, the addition of the CCDC facility to Parcel 12 necessitates a modification to the Stage 1 PUD.

A health care center is also being proposed for development on Parcel 12. A traffic study reviewing the impacts of that site was completed and submitted as part of a Stage 2 PUD application in May, 2010. This traffic study assumes approval the health center site, and includes it as part of future conditions. The Educare of DC day care school, a non-profit organization that recently received approval from the BZA, is also included in the future conditions of this study.

Gorove/Slade Associates undertook the following steps while preparing this study:

- Observed traffic conditions during the morning and afternoon peak periods on a typical weekday;
- Conducted peak hour turning movement counts at study intersections;
- Analyzed the existing transportation network;
- Described and quantified the impacts of other development changes on the future transportation network;
- Calculated the trip generation for the proposed development based on the Institute of Transportation Engineers' (ITE) Trip Generation, 8th Edition;
- Detailed the transportation elements of the proposed CCDC;
- Forecasted future traffic volumes with and without the CCDC;
- Estimated the difference in peak hour traffic with and without the proposed CCDC;
- Calculated future levels of service at the study intersections with and without the proposed CCDC; and
- Recommended mitigation measures, if necessary, based on the future transportation analysis.

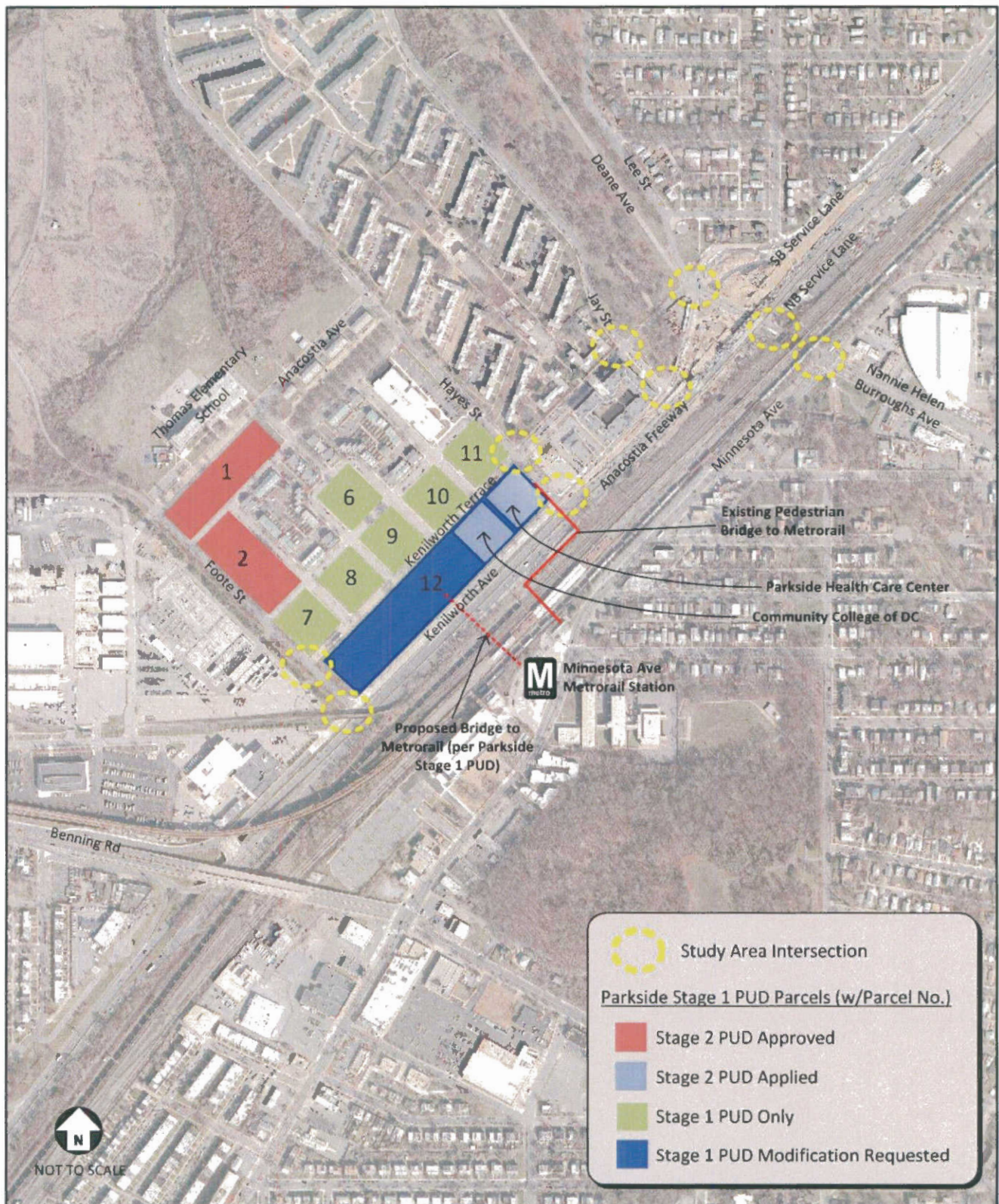
Sources of data for this study include traffic counts conducted by Gorove/Slade, ITE's *Trip Generation*, 8th Edition, general site plans from the Community College of DC, the District Department of Transportation (DDOT), the Kenilworth Avenue Corridor Study Draft Plan, the "Development-Related Ridership Survey II" prepared by WMATA, and the files/library of Gorove/Slade.

Study Methodology

The scope for this study was based on those performed for the adjacent Parkside Mixed-Use development, and includes the same set of intersections studied for prior Parkside Stage 1 and 2 PUD applications.

The following study intersections are included in this study (shown in Figure 1):

- Kenilworth Avenue/Jay Street
- Kenilworth Avenue/Hayes Street
- Kenilworth Avenue/Foote Street
- Kenilworth Terrace/Jay Street
- Kenilworth Terrace/Hayes Street
- Kenilworth Terrace/Foote Street
- Nannie Helen Burroughs Avenue/Minnesota Avenue
- Nannie Helen Burroughs Avenue/Kenilworth Avenue (northbound)
- Nannie Helen Burroughs Avenue/ Kenilworth Avenue (southbound)



EXISTING CONDITIONS

The following section reviews the existing transit and roadway conditions in the study area.

Transit Service

Metrorail access is provided by the Minnesota Avenue Station, directly across Kenilworth Avenue; via an overhead pedestrian bridge. The approximate walking distance between the station entrance and the boundary of the subject property along the bridge is 2,500 feet, or one half mile. The Minnesota Avenue Station is on the Orange Line which runs between New Carrollton and Vienna/Fairfax – George Mason University. A new pedestrian bridge, proposed as part of the Parkside Master Plan and included in the Stage 1 approvals, is proposed to help improve the connection between the new development and Metrorail.

The Minnesota Avenue Metrorail Station is served by eleven bus routes: A31, U2, U4, U5, U6, U8, V7, V8, X1, X2, and X3. The U5 and U6 bus lines, which connect the Benning Road Metrorail station to the Minnesota Avenue Station, also serve the Parkside community. The route follows the Kenilworth Terrace and Hayes St/Jay Street loop on route to the Minnesota Avenue Station.

Site Access and Existing Road Network

Interstate 295 (I-295)/Kenilworth Avenue/Anacostia Freeway and Benning Road provide regional access to Parkside. Local access is made via the Hayes Street, Nannie Helen Burroughs Avenue, the Kenilworth Avenue service roads, and Kenilworth Terrace. A network of residential streets, including Cassell Place, Burnham Place, Grant Place, Roosevelt Place, Foote Street, and Barnes Street provide direct access to the development.

The following is a description of some of the roads near the site:

- *Kenilworth Avenue/Anacostia Freeway (DC-295)*
Kenilworth Avenue (also known as the Anacostia Freeway) is a major highway providing a link between I-395, I-295, and the Baltimore-Washington Parkway. It is a major commuter link between Maryland and Washington, DC. The average daily traffic volume (ADT) on Kenilworth Avenue near the site is approximately 120,000 to 140,000 vehicles (source - <http://www.kacstudy.com/kacstudy/pdf/Daily%20Traffic%20Volumes.pdf>)
- *Nannie Helen Burroughs Avenue*
Nannie Helen Burroughs Avenue, NE, is a 1.5 mile long minor arterial and multi-modal corridor that accommodates regional commuters, transit riders, local auto travel, pedestrians, and bicyclists. Nannie Helen Burroughs runs roughly parallel to Watts Branch, the largest tributary to the Anacostia River within the District with a drainage area of 3.75 Square miles. Daily traffic volumes range from 10,000 to 12,000 vehicles per day. The highest commercial and vehicular activity occurs at the western end of the corridor as it approaches Minnesota Avenue.
- *Kenilworth Avenue service road*
The Kenilworth Avenue service road is one-way southbound and functions as the link between the residential street network and the busy Kenilworth Avenue. The service road is generally un-striped and wide enough to operate as a two-lane roadway.

- *Kenilworth Terrace*

Kenilworth Terrace is a two-lane, bi-directional roadway running parallel to the Kenilworth Avenue service road. It services several residential streets that form a network through the Parkside Development.

- *Hayes Street & Jay Street*

Hayes Street is one-way northbound and Jay Street is one-way southbound north of Kenilworth Terrace, NE. They are bi-directional between Kenilworth Terrace and Kenilworth Avenue. These roads are residential roads and provide access to Metrobus.

Figure 3 presents the local roadway network of the study area and existing lane use and configurations. The complex five legged intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue (Southbound) was recently reconfigured as a part of Kenilworth Avenue Corridor Study (KACS), May 2007). The configuration depicted in the study was not fully implemented, as and there are barriers and bollards restricting traffic flow. Figure 2 below depicts the current condition of the intersection including temporary restrictions compared to a sketch of the final planned intersection. The existing configuration of this intersection was assumed to be in place for all scenarios of this study, in order to maintain a consistent point of reference for the capacity analyses.

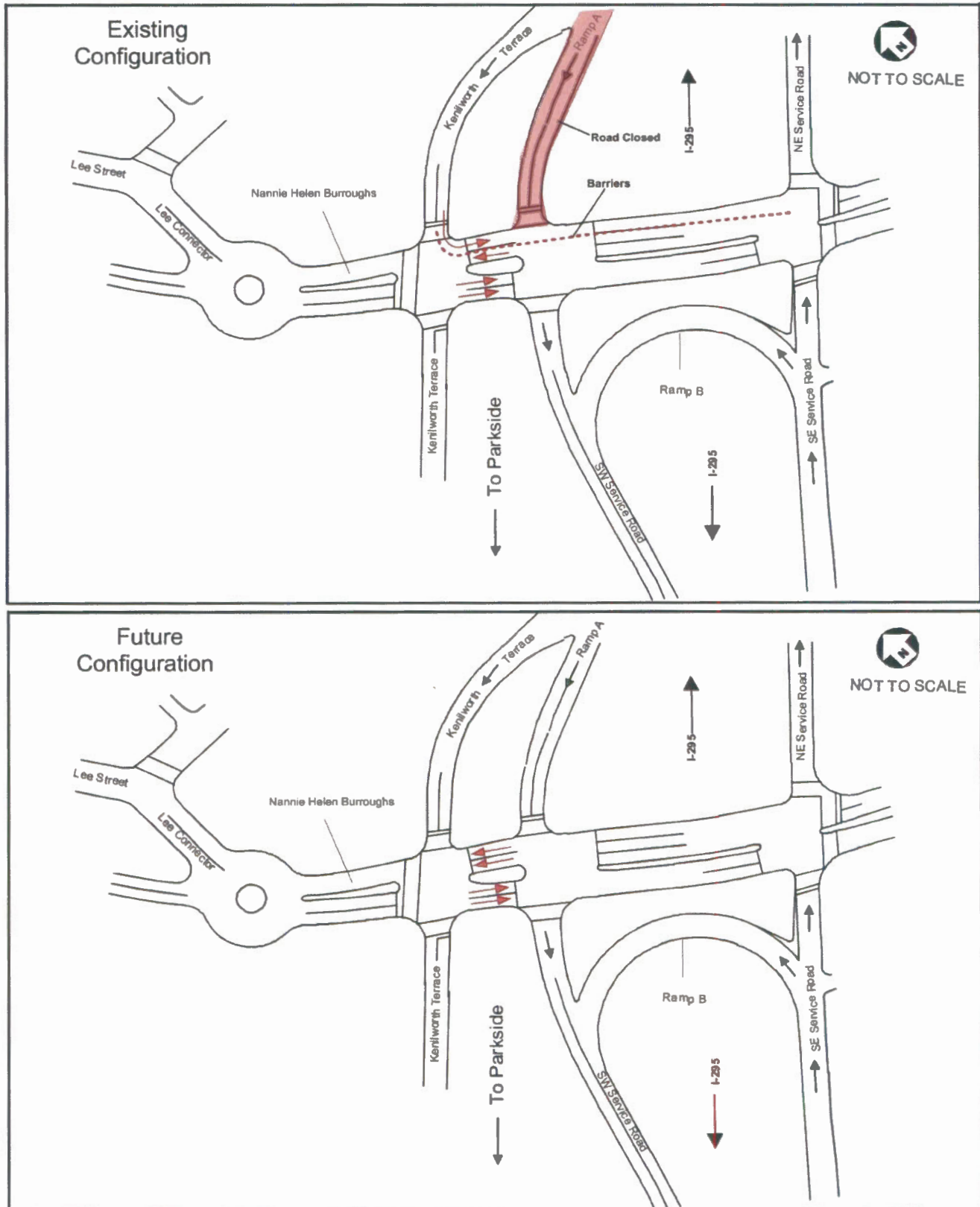


Figure 2: Current and Planned Configuration of Nannie Helen Burroughs/Kenilworth Avenue Intersection

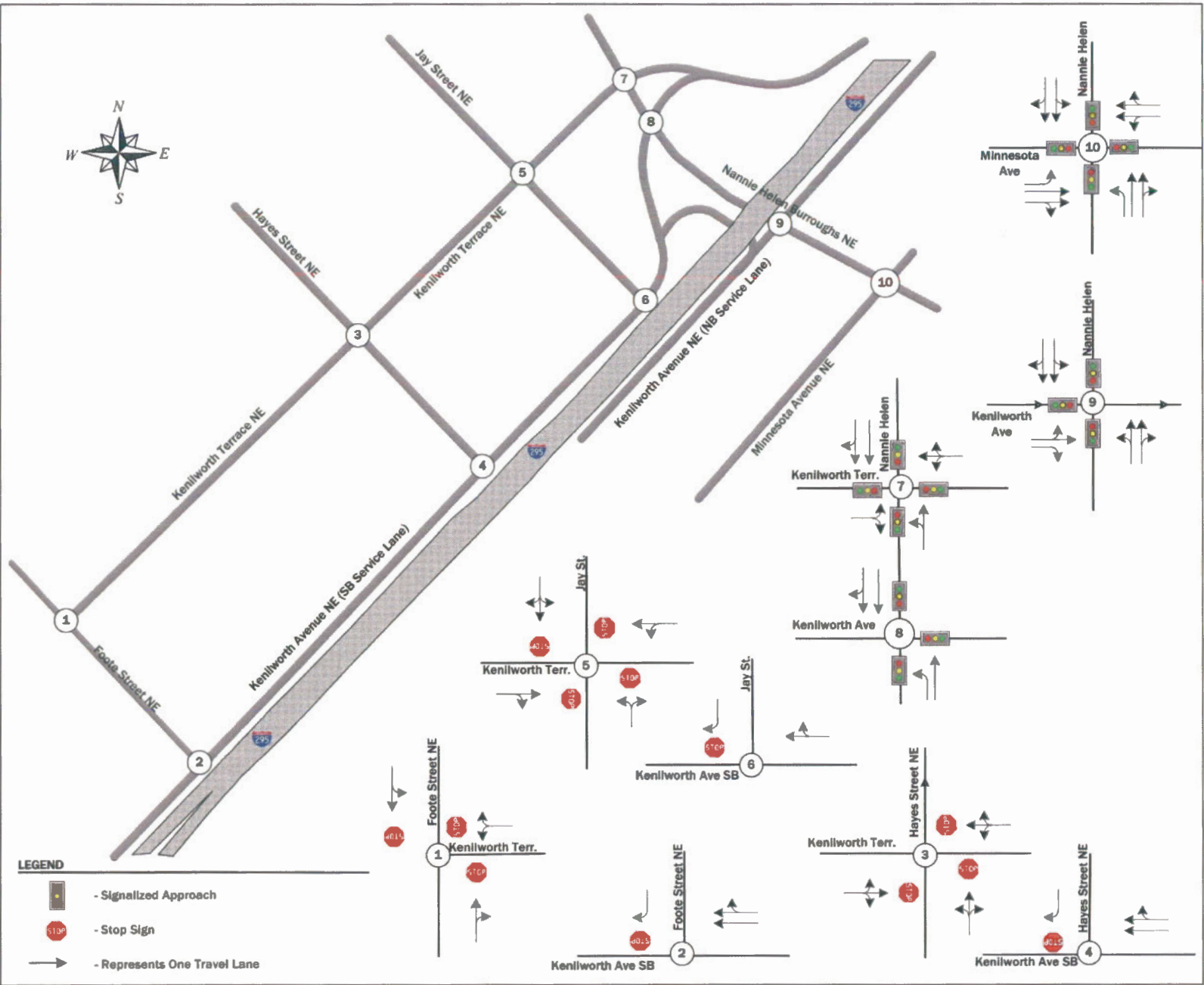


Figure 3: Existing Lane Configurations and Traffic Controls

Existing Conditions Capacity Analysis

The peak hour turning movement traffic volumes were determined by performing traffic counts on Tuesday, September 21, 2010 from 6:00 to 9:00 AM and from 4:00 to 7:00 PM. The existing traffic volumes for the intersections contained within the study area are shown on Figure 4. Analysis of the existing traffic data determined that morning peak hour is from 7:15 to 8:15 AM, and the afternoon peak hour is from 5:00 to 6:00 PM. The existing turning movement counts are included in the Appendix.

The existing capacity analysis is based on the roadway network as shown in Figure 3 and the traffic volumes described above and shown previously on Figure 4.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of "E" or better on each approach. Table 1 shows the Capacity (Level of Service) Analysis results for Existing Conditions. The results for Existing Conditions analysis are summarized below:

- The local streets near and within the Parkside neighborhood operate with low delays.
- Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service.
- The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue now operate as two intersections under one traffic signal. These intersections operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being implemented as planned. The existing restricted movements and alternations of traffic flow generated by the barriers and bollards placed in the roadway area significantly restrict traffic flow.
- All other study area intersections operate at acceptable levels of service in both morning and afternoon peak hours.

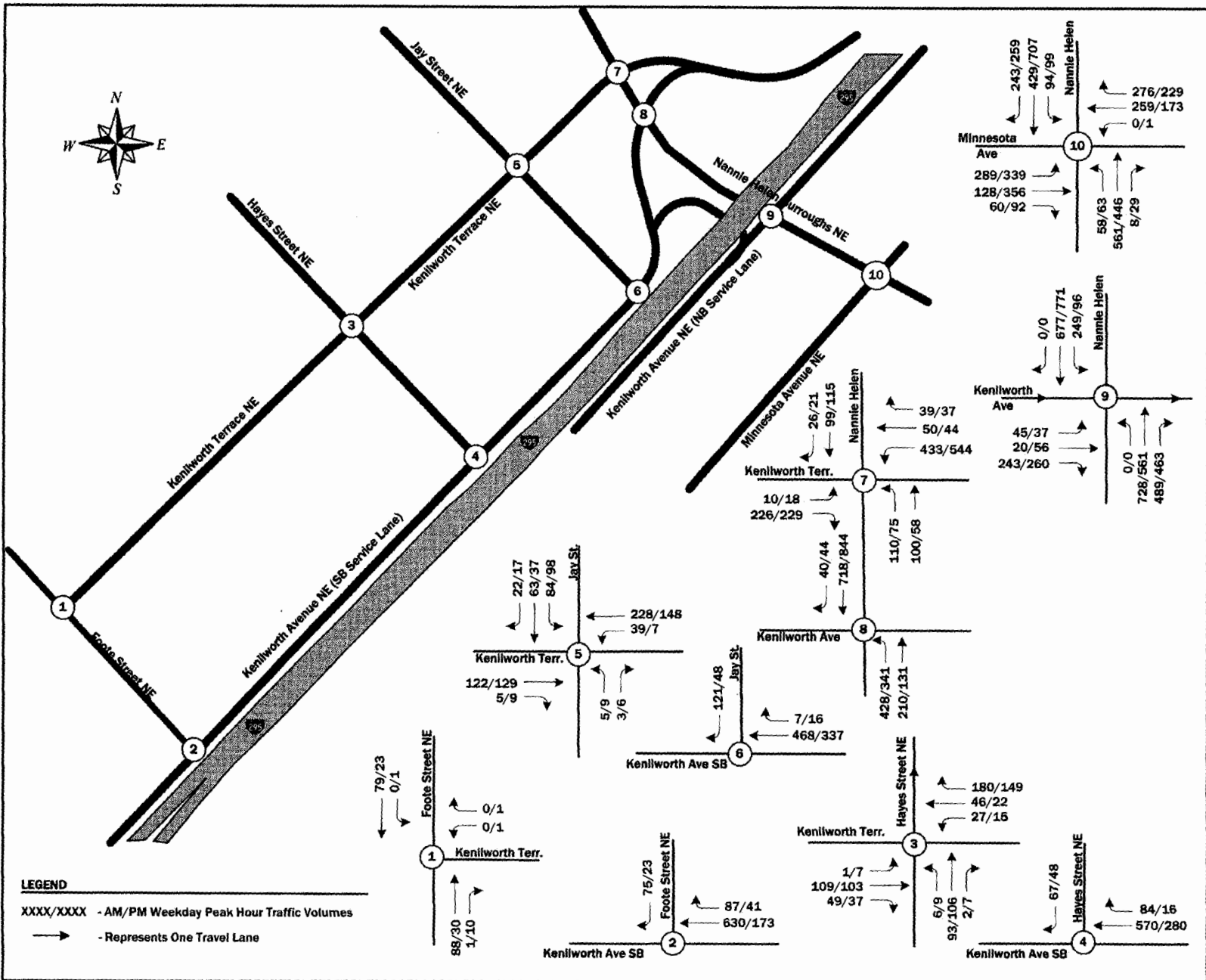


Figure 4: Existing Peak Hour Traffic Volumes

Table 1: Existing Conditions Capacity Analysis Results

Study Area Intersections		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1 Foote St. & Kenilworth Ter.					
Overall		7.4	A	7.0	A
Northbound		7.8	A	7.2	A
Southbound		6.9	A	6.5	A
Westbound		0.0	A	7.2	A
2 Foote St. & Kenilworth Ave.					
Southbound (Right)		11.8	B	9.1	A
3 Hayes St. & Kenilworth Ter.					
Overall		8.6	A	8.3	A
Northbound		8.7	A	8.7	A
Eastbound		8.4	A	8.4	A
Westbound		8.8	A	8.1	A
4 Hayes St. & Kenilworth Ave.					
Southbound (Right)		14.3	B	10.3	B
5 Jay St. & Kenilworth Ter.					
Overall		9.9	A	8.8	A
Northbound		7.7	A	7.9	A
Southbound		9.9	A	9.1	A
Eastbound		8.8	A	8.6	A
Westbound		10.4	B	8.8	A
6 Jay St. & Kenilworth Ave.					
Southbound (Right)		13.3	B	10.7	B
7 Kenilworth Ter & N.H.B Ave					
Overall		47.0	D	102.6	F
Northbound		56.6	E	31.0	C
Southbound		29.6	C	28.8	C
Eastbound		12.2	B	12.7	B
Westbound		61.0	E	191.7	F
8 Kenilworth Ave (SB) & N.H.B Ave					
Overall		9.1	A	6.5	A
Northbound		21.6	C	20.0	B
Southbound		1.1	A	1.0	A
9 Kenilworth Ave (NB) & N.H.B Ave					
Overall		33.9	C	12.5	B
Northbound		13.8	B	7.9	A
Southbound		61.7	E	10.1	B
Eastbound		29.9	C	31.4	C
10 Minnesota Ave & N.H.B Ave					
Overall		33.7	C	39.2	D
Northbound		17.2	B	14.8	B
Southbound		24.3	C	26.0	C
Eastbound		53.0	D	71.1	E
Westbound		49.2	D	44.2	D

FUTURE BACKGROUND CONDITIONS WITHOUT DEVELOPMENT

Future background conditions represent the projected future traffic levels without the proposed development. These conditions are a basis for comparison with the total future conditions, which include the proposed development.

Traffic Volumes

The construction of the proposed development is anticipated to be complete in 2017. The traffic generated by nearby proposed developments and inherent growth on the roadways within the study area were accounted for in the traffic projections. These traffic increases were accounted for with a one (1) percent growth rate compounded annually over the two-year period for the traffic movements used by commuting regional traffic. This growth rate represents commuting traffic traversing the study area and nearby developments.

Several background developments are planned for the immediate area around the site. These developments are listed in and their projected peak hour trip productions are shown in Table 2. These trips were distributed on the study area network based on existing travel patterns.

The traffic volumes generated by the growth rate and the background developments were added to the existing (2010) traffic volumes in order to establish the future background traffic volumes. The traffic volumes for the future conditions without development are shown on Figure 5.

Table 2: Background Developments

Development	Location	Trip Generation					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
East River Park Development	Minnesota Ave & Benning Road	86	75	161	102	112	214
Minnesota Avenue Gov. Center	Adj. to Minnesota Ave Metro Station	233	39	272	53	206	259
Parkside Health Center	Hayes St & Kenilworth Terrace	40	11	51	19	52	71
Educare of DC	Anacostia Avenue & Foote Street	59	54	113	49	55	104
Total Trips		418	179	597	223	425	648

Source: The Nannie Helen at 4800 TIA, Gorove/Slade Associates, 2010; The Parkside Health Center TIA, Gorove/Slade Associates, 2010; Educare of DC Traffic Impact Study, Gorove/Slade Associates, 2010

Table 3 shows the Capacity (Level of Service) Analysis results for Future Background Conditions. The results for Future Background Conditions analysis are summarized below:

- The local streets near and within the Parkside neighborhood operate with low delays.
- Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service.
- The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continue to operate at unacceptable delays during both morning and evening peak hours.
- The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences unacceptable delays on the southbound approach in the morning peak hour.
- The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue in both morning and evening peak hours.



Table 3: Future Background Conditions Capacity Analysis Results

Study Area Intersection	Future Background			
	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1 Foote St. & Kenilworth Ter.				
Overall	7.7	A	7.2	A
Northbound	8.1	A	7.5	A
Southbound	7.5	A	7.1	A
Westbound	7.4	A	7.3	A
2 Foote St. & Kenilworth Ave.				
Southbound (Right)	12.5	B	9.3	A
3 Hayes St. & Kenilworth Ter.				
Overall	9.7	A	9.2	A
Northbound	9.4	A	9.3	A
Eastbound	9.2	A	9.3	A
Westbound	10.1	B	8.9	A
4 Hayes St. & Kenilworth Ave.				
Southbound (Right)	15.6	C	10.9	B
5 Jay St. & Kenilworth Ter.				
Overall	10.8	B	9.4	A
Northbound	8.5	A	8.3	A
Southbound	10.5	B	9.5	A
Eastbound	9.6	A	9.4	A
Westbound	11.8	B	9.4	A
6 Jay St. & Kenilworth Ave.				
Southbound (Right)	14.5	B	11.2	B
7 Kenilworth Ter & N.H.B Ave *				
Overall	88.4	F	152.8	F
Northbound	82.4	F	31.2	C
Southbound	30.2	C	30.6	C
Eastbound	13.9	B	14.1	B
Westbound	153.0	F	312.5	F
8 Kenilworth Ave (SB) & N.H.B Ave				
Overall	22.9	C	14.5	B
Northbound	55.4	E	48.1	D
Southbound	1.5	A	1.7	A
9 Kenilworth Ave (NB) & N.H.B Ave				
Overall	50.5	D	15.8	B
Northbound	23.7	C	10.7	B
Southbound	93.8	F	14.8	B
Eastbound	31.1	C	33.1	C
10 Minnesota Ave & N.H.B Ave				
Overall	56.0	E	57.9	E
Northbound	18.7	B	19.8	B
Southbound	26.0	C	54.3	D
Eastbound	131.1	F	95.5	F
Westbound	54.6	D	46.6	D

TOTAL FUTURE TRAFFIC WITH COMMUNITY COLLEGE OF THE DISTRICT OF COLUMBIA

This section of the study describes the CCDC site and overall changes to Parcel 12 including site access, and provides a capacity analysis of future conditions with development of the proposed modifications and CCDC.

Description of Proposed Development

Changes to Parcel 12

In order to allow development of the CCDC within Parkside, a Stage 1 PUD modification is necessary. These modifications are limited to Parcel 12, and do not change the overall amount of square feet being developed or parking spaces constructed. They will remain at 1,709,800 square feet and 1,400 spaces on Parcel 12, respectively. The land-uses on Parcel 12 will be changing as part of Stage 1 PUD modification. The original Stage 1 PUD included a mix of office, retail and residential uses. Current plans include a Health Care Center (with a separate Stage 2 application) at the eastern end of the site. Adjacent to the Health Center is the proposed CCDC facility. Residential use was proposed at these sites; neither the CCDC or health center uses were included in the Stage 1 approval. The remainder of Parcel 12 will remain a mixture of office, retail and residential uses.

CCDC

The Community College will be located in a 259,500 square foot facility. It will have 50 administrative staff, 25 faculty and 50 to 75 adjunct faculty. A total of 500 classroom seats will be provided. Parking access will be shared with the health center; the zoning requirement for parking spaces is 87 vehicular and 5 bicycle spaces. The CCDC will provide 135 parking spaces and 20 bicycle parking spaces. The Community College will be 1,000 feet (less than a quarter of a mile) from the Minnesota Avenue Metrorail station.

Site Trip Generation

This report generates and distributes traffic for all of Parcel 12 as part of the total future conditions with the Community College. This is because the changes to the remainder of Parcel 12 are necessary to support the development of the Community College, so the impacts of the entire development of the Parcel are taken into account. The number of anticipated vehicle trips generated by the proposed CCDC as well as the remainder of Parcel 12 mixed-use development were estimated based on data provided in the Institute of Transportation Engineers (ITE)'s *Trip Generation*, 8th Edition, WMATA's *Development-Related Ridership Survey II*, and from the library of Gorove/Slade.

By definition, ITE's trip generation rates were derived from data collected from single-use developments where virtually all access to the development would be by private automobile (Source- *Trip Generation Handbook*, 2nd Edition, Appendix B). *Trip Generation* does not account for the potential effects of Transit Demand Management (TDM) programs, transit availability, and interaction between various on-site uses (synergy), particularly when these uses are in walking distance of each other. Hence additional reduction was assumed for alternate mode use and synergy between uses.

Alternate Mode Reduction. According to the WMATA *Development-Related Ridership Survey 2005*, the mode choice for trips is significantly influenced by the location of the site within Metropolitan Washington and the proximity to the Metrorail station. This study was prepared to model the travel patterns of persons traveling to and from office buildings, residential developments and commercial entities close to Metrorail stations, "and to establish relationships among travel characteristics, distance, and the nature of development at each site."

According to WMATA Ridership Survey about 62% non-auto mode (42% Metrorail, 6% Metrobus and 14% Walk/Bike) trips are generated by a residential facility in a suburban setting inside the Beltway (I-495). Similarly about 36% of non-auto mode (21% Metrorail, 9% Metrobus and 6% Walk/Bike) trips are generated by an office facility located in a suburban setting inside the Beltway (I-495). Gorove/Slade trip generation analysis assumes a 50% non-auto mode reduction for Community College, Office and Residential land uses within Parcel 12. While the assumed reduction for non-auto trips to and from office and community college land-uses is slightly higher than the non-auto mode share provided in the WMATA survey, the limited parking available on-site for these land-uses is expected to increase the non-auto mode choice of daily commuters.

A 25% non-auto mode reduction derived from the WMATA survey was used for Retail land-use within Parcel 12. In addition to non-auto mode reduction about 55% of trips to the retail land-use were assumed to be pass-by trips that are already part of the transportation network and will not be generated directly by the retail use. This pass-by reduction assumed is in accordance with pass-by trips observed at similar retail facilities listed in ITE Trip Generation Handbook, 2nd Edition. To account for the synergy among the land-uses within Parcel 12 an additional reduction in trips was assumed based on the methodology described in the ITE Trips Generation Handbook, 2nd Edition.

The net trips generated by CCDC after adjustment for reductions would be 99 AM peak hour trips (81 in and 18 out), 129 PM peak hour trips (83 in and 46 out), as shown in Table 4. The net trips generated by Parcel 12 excluding Health Care Center would be 853 AM (678 in and 175 out) and 944 PM peak hour trips (286 in and 658 out) also shown in Table 4.

Table 4: Parkside Parcel 12 Trip Generation

	ITE Land Use Code	Size	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Building G1 (Residential) ¹	220	375 Units	187	37	150	224	146	78
Office Synergy ²			-6	0	-6	-6	-6	0
Retail Synergy ²			0	0	0	-42	-24	-18
Residential Trips with Synergy			181	37	144	176	116	60
Alternate Mode Reduction ³	50%		-91	-19	-72	-88	-58	-30
Net Residential Trips			90	18	72	88	58	30
Building G2 + H (Office) ¹	710	1,118,200 SF	1294	1139	155	1331	226	1105
Residential Synergy ²			-6	-6	0	-6	0	-6
Retail Synergy ²			0	0	0	-10	-6	-4
Office Trips with Synergy			1288	1133	155	1315	220	1095
Alternate Mode Reduction ^{3,4}	50%		-644	-566	-78	-658	-110	-548
Net Office Trips			644	567	77	657	110	547
Ground Level Retail ¹	820	50,000 SF	102	62	40	400	196	204
Residential Synergy ²			0	0	0	-42	-18	-24
Office Synergy ²			0	0	0	-10	-4	-6
Retail Trips with Synergy			102	62	40	348	174	174
Alt. Mode Reduction + Pass-by ^{3,2}	80%		-82	-50	-32	-278	-139	-139
Net Retail Trips			20	12	8	70	35	35
Community College (CCDC) ¹	540	500 Students	198	162	36	258	165	93
Alternate Mode Reduction ^{3,4}	50%		-99	-81	-18	-129	-82	-47
Net Community College Trips			99	81	18	129	83	46
Net Trips of Parcel 12 (excluding Health Care Center)			853	678	175	944	286	658

Source: 1. Institute of Transportation Engineers, Trip Generation Manual, 8th Edition, Year 2008

2. ITE Trip Generation Handbook, 2nd Edition
3. WMATA Development Related Ridership Survey, 2005
4. Parking Garage Capacity of Office and Community College land-uses

Site Trip Distribution

Two different site trip distribution patterns were used in the analysis. The site trips generated by Office, Community College and Retail land-uses were expected to have the same trip distribution pattern as shown in Table 5 below. The site trips generated by residential land-use would follow the distribution pattern shown in Table 6.

Table 5: Site Trip Distribution for Office, Retail and Community College Trips

Direction of Approach	Percentage of Site Trips
Local from North	20%
Local from South	25%
I-295 South	25%
I-295 North	20%
Benning Road	10%

Table 6: Site Trip Distribution for Residential Trips

Direction of Approach	Percentage of Site Trips
Local from North	5%
Local from South	20%
I-295 South	25%
I-295 North	40%
Benning Road	10%

Total Future Conditions Capacity Analysis

The total future traffic scenario with the Parkside CCDC was derived by combining the Future Background Volumes (Figure 5) and the traffic generated by the proposed facility (Figure 7). The total future AM and PM peak hour volumes are shown in Figure 8.

The capacity analysis of these total future peak hour volumes was performed in Synchro 7.0 using the same Highway Capacity Manual methodology as the previous analyses. The capacity analysis results are shown in Table 7, and are summarized as follows:

- The local streets near and within the Parkside neighborhood operate with low delays;
- Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service;
- The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continue to operate at unacceptable delays during both morning and evening peak hours.
 - When the planned configuration of these intersections is completely constructed, these delays will reduce significantly.
- The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences LOS F on the southbound approach in the morning peak hour.

- These delays can be mitigated through slight changes in signal timings.
- The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue during both morning and evening peak hours and southbound approach of Nannie Helen Burroughs Avenue during the evening peak hour.
 - These delays can be mitigated through slight changes in signal timings. In addition the illegal left turns on the southbound approach of this intersection during the evening peak period should be enforced.

Table 8 displays with results of the Total Future conditions capacity analysis including the recommended improvements, and the planned configuration of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue intersections. These analysis results show all study intersections operating under acceptable conditions, with the following improvements:

- Slight changes to signal timing at Nannie Helen Burroughs Avenue's intersections with Minnesota Avenue and the Kenilworth Avenue Service Road (NB);
- Enforcing the no left turn restriction from southbound Nannie Helen Burroughs Avenue onto Minnesota Avenue; (Shown in Figure 6 below)
- Constructing the ultimate build-out of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue intersections as proposed in the Kenilworth Avenue Corridor Study.

No study area intersections operate at unacceptable levels of service that do not already do so under the existing or future background conditions. Thus, the proposed CCDC is projected to have minimal traffic impacts within the study area.



Figure 6: Southbound PM Peak Period Left Turn Restriction along Nannie Helen Burroughs Avenue

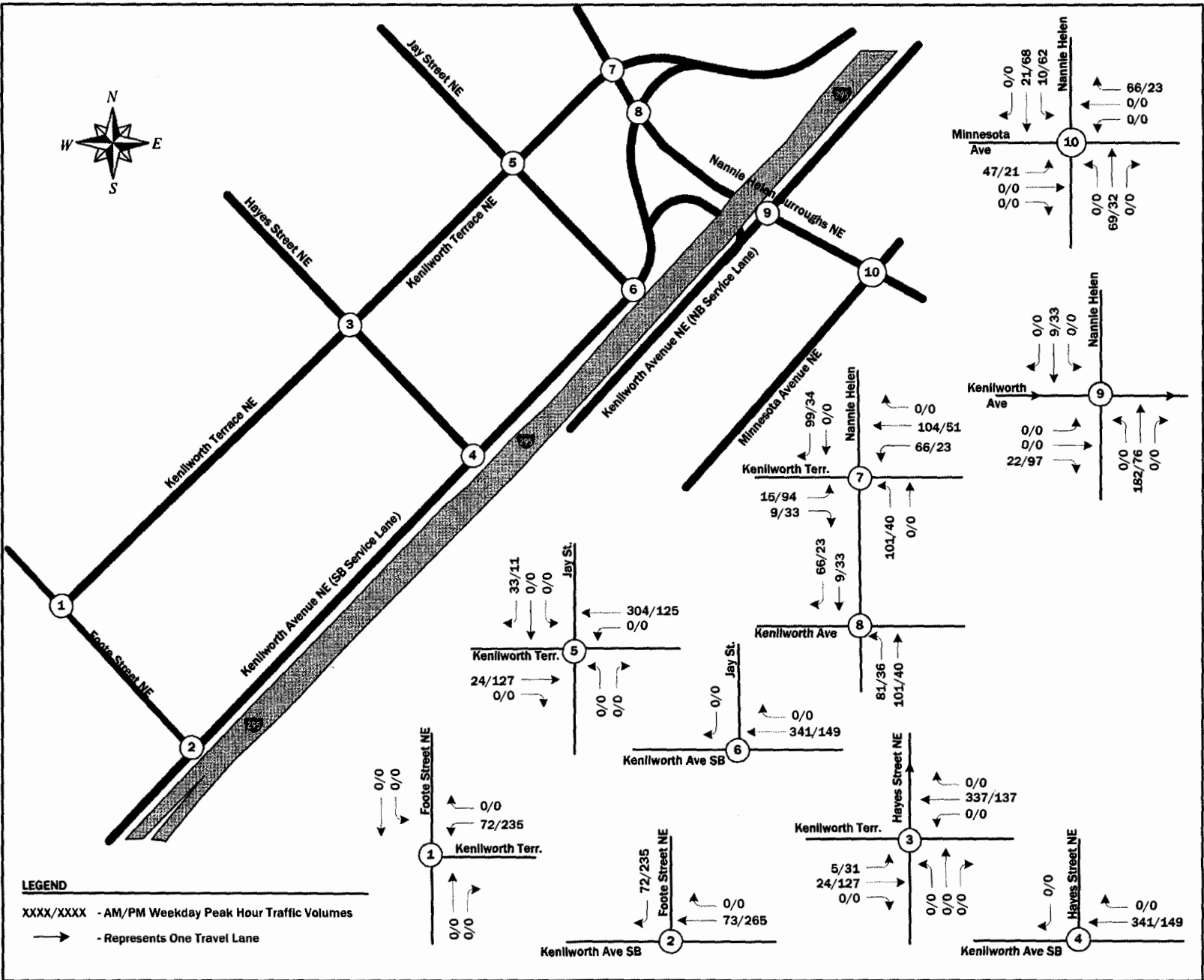


Figure 7: Site Generated Peak Hour Traffic Volumes

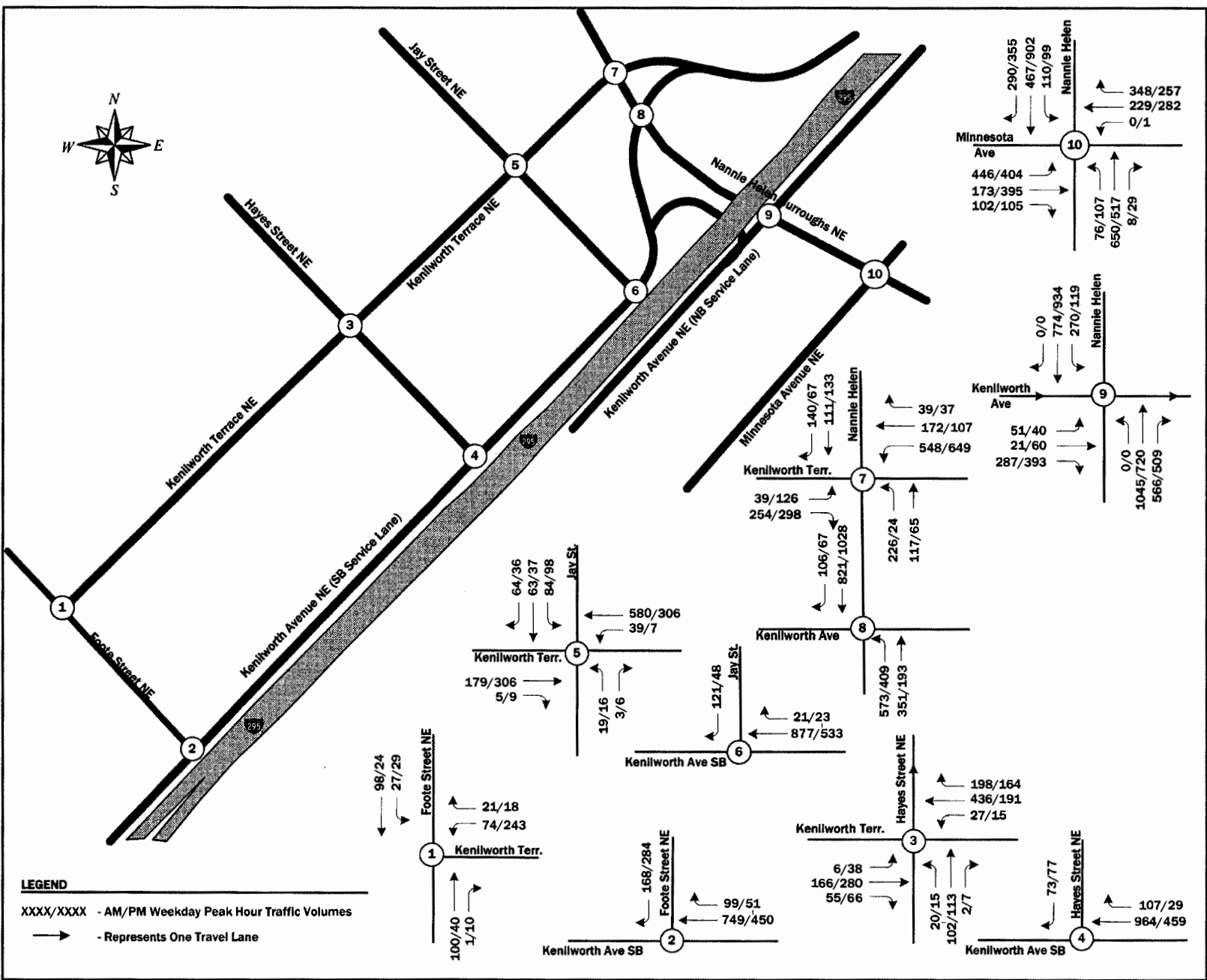


Figure 8: Total Future Traffic Peak Hour Traffic Volumes

Table 7: Future Conditions (with and without CCDC) Capacity Analysis Results

Study Area Intersection	AM Peak Hour				PM Peak Hour			
	Without CCDC		With CCDC		Without CCDC		With CCDC	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1 Foote St. & Kenilworth Ter.								
Overall	7.7	A	8.0	A	7.2	A	9.0	A
Northbound	8.1	A	8.4	A	7.5	A	8.1	A
Southbound	7.4	A	7.5	A	7.1	A	7.4	A
Westbound	7.5	A	8.2	A	7.3	A	9.6	A
2 Foote St. & Kenilworth Ave.								
Southbound (Right)	12.5	B	14.8	B	9.3	A	13.6	B
3 Hayes St. & Kenilworth Ter.								
Overall	9.7	A	26.1	D	9.2	A	12.7	B
Northbound	9.4	A	11.0	B	9.3	A	10.6	B
Eastbound	9.2	A	10.8	B	9.3	A	13.6	B
Westbound	10.1	B	34.1	D	8.9	A	12.6	B
4 Hayes St. & Kenilworth Ave.								
Southbound (Right)	15.6	C	25.3	D	10.9	B	12.6	B
5 Jay St. & Kenilworth Ter.								
Overall	10.8	B	32.4	D	9.4	A	12.1	B
Northbound	8.5	A	9.9	A	8.3	A	9.3	A
Southbound	10.5	B	13.4	B	9.5	A	11.0	B
Eastbound	9.6	A	11.4	B	9.4	A	12.5	B
Westbound	11.8	B	45.9	E	9.4	A	12.5	B
6 Jay St. & Kenilworth Ave.								
Southbound (Right)	14.5	B	24.5	C	11.2	B	12.8	B
7 Kenilworth Ter & N.H.B Ave								
Overall	88.4	F	202.0	F	152.8	F	205.1	F
Northbound	82.4	F	287.2	F	31.2	C	39.5	D
Southbound	30.2	C	33.6	C	30.6	C	31.0	C
Eastbound	13.9	B	14.4	B	14.1	B	26.7	C
Westbound	153.0	F	287.7	F	312.5	F	459.5	F
8 Kenilworth Ave (SB) & N.H.B Ave								
Overall	22.9	C	53.2	D	14.5	B	23.5	C
Northbound	55.4	E	122.0	F	48.1	D	77.1	E
Southbound	1.5	A	1.6	A	1.7	A	1.3	A
9 Kenilworth Ave (NB) & N.H.B Ave								
Overall	50.5	D	70.4	E	15.8	B	18.4	B
Northbound	23.7	C	63.7	E	10.7	B	13.2	B
Southbound	93.8	F	94.2	F	14.8	B	16.0	B
Eastbound	31.1	C	31.6	C	33.1	C	36.5	D
10 Minnesota Ave & N.H.B Ave								
Overall	56.0	E	69.3	E	57.9	E	74.4	E
Northbound	18.7	B	19.3	B	19.8	B	21.1	C
Southbound	26.0	C	27.7	C	54.3	D	86.0	F
Eastbound	131.1	F	177.3	F	95.5	F	110.4	F
Westbound	54.6	D	61.4	E	46.6	D	46.4	D

Table 8: Comparison of Future Analysis Results with and without Improvements

Study Area Intersection	AM Peak Hour				PM Peak Hour			
	Total Future		Total Future with Improvements		Total Future		Total Future with Improvements	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
7 Kenilworth Ter & N.H.B Ave								
Overall	202.0	F	34.0	C	205.1	F	44.8	D
Northbound	287.2	F	16.6	B	39.5	D	20.6	C
Southbound	33.6	C	42.7	D	31.0	C	40.9	D
Eastbound	14.4	B	34.7	C	26.7	C	75.0	E
Westbound	287.7	F	56.5	E	459.5	F	29.5	C
8 Kenilworth Ave (SB) & N.H.B Ave								
Overall	53.2	D	37.9	D	23.5	C	29.0	C
Northbound	122.0	F	56.5	E	77.1	E	31.1	C
Southbound	1.6	A	12.3	B	1.3	A	5.0	A
Westbound	N/A		43.0	D	N/A		71.1	E
Kenilworth Ave (NB) & N.H.B Ave								
9 Ave								
Overall	70.4	E	60.2	E	18.4	B	23.1	C
Northbound	63.7	E	64.1	E	13.2	B	24.8	C
Southbound	94.2	F	63.5	E	16.0	B	14.7	B
Eastbound	31.6	C	33.3	C	36.5	D	36.5	D
10 Minnesota Ave & N.H.B Ave								
Overall	69.3	E	51.2	D	74.4	E	47.2	D
Northbound	19.3	B	22.1	C	21.1	C	21.3	C
Southbound	27.7	C	34.3	C	86.0	F	41.2	D
Eastbound	177.3	F	77.2	E	110.4	F	72.9	E
Westbound	61.4	E	78.8	E	46.4	D	50.8	D

CONCLUSIONS

The capacity analyses contained in this report yielded the following results:

- Existing Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.
 - Six unsignalized intersections close to the development operate at acceptable Levels of Service.
 - The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue now operate as two intersections under one traffic signal. These intersections operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being implemented as planned. The existing restricted movements and alternations of traffic flow generated by the barriers and bollards placed in the roadway area significantly restrict traffic flow.
 - All other study area intersections operate at acceptable levels of service in both morning and afternoon peak hours.
- Future Background Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.
 - Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service.
 - The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continue to operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being fully implemented as planned.
 - The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences unacceptable delays on the southbound approach in the morning peak hour.
 - The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue in both morning and evening peak hours.
- Total Future Conditions
 - The local streets near and within the Parkside neighborhood operate with low delays.
 - Six unsignalized intersections close to the development are projected to operate at acceptable Levels of Service.
 - The intersections of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue continues to operate at unacceptable delays during both morning and evening peak hours. The delays at these intersections are extremely high due to the reconfiguration of the intersections not being fully implemented as planned.
 - The intersection of Nannie Helen Burroughs Avenue and Kenilworth Avenue Service Road (NB) experiences unacceptable delays on the southbound approach in the morning peak hour.

- The Nannie Helen Burroughs Avenue/Minnesota Avenue intersection operates at overall acceptable levels of service with the exception of the eastbound approach of Minnesota Avenue during both morning and evening peak hours and southbound approach of Nannie Helen Burroughs Avenue during the evening peak hour.

All of the unacceptable levels of service projected in the total future conditions can be mitigated through the following:

- Slight changes to signal timing at Nannie Helen Burroughs Avenue's intersections with Minnesota Avenue and the Kenilworth Avenue Service Road (NB);
- Enforcing the no left turn restriction from southbound Nannie Helen Burroughs Avenue onto Minnesota Avenue in the evening peak hour; and
- Constructing the ultimate build-out of the Kenilworth Avenue Service Road (SB) and Kenilworth Terrace with Nannie Helen Burroughs Avenue intersections as proposed in the Kenilworth Avenue Corridor Study.

All the study area intersections that operate unacceptably under total future conditions can be mitigated to operate acceptably with above listed improvements. Thus, the development of the proposed Community College of the District of Columbia is not projected to generate any negative impacts to the surrounding transportation network.