



Figure 4: Overview of Expansion Plans



TRIP GENERATION

This section outlines the transportation demand of the proposed Ingleside project. Observations and data collected at the existing facility are used to predict future vehicular demand generated by the expansion.

EXISTING TRIP GENERATION

Vehicular trip generation for this project was calculated based on the existing number of trips generated by Ingleside. Traditionally, weekday peak hour trip generation for a proposed development is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition. National and DDOT standards through recommend using existing counts for an expansion project such as that proposed by Ingleside.

Thus, the first step in projecting future trips was to collect traffic volumes at the two site driveways, one on each Military Road NW and Broad Branch Road NW. This data was collected

on Wednesday, May 28, 2014 during the morning and afternoon peak periods (6:30 – 9:30 AM and 4:00 – 7:00 PM).

The number of vehicles entering and exiting the site were summed up for each fifteen-minute period of the data collection, and the morning and afternoon peak hours were determined by summing up the four fifteen-minute consecutive time periods that experience the highest cumulative traffic volumes.

Figure 5 shows the results of the existing data collection, highlighting the morning and afternoon peak hours. The charts of Ingleside generated traffic show traffic increasing later in the morning as the peak hour ends, and decreasing in the afternoon as the PM peak hour begins. This demonstrates how traffic generated by the facility does not overlap the peak hours of commuting traffic, as the residents that so drive avoid those hours and many employees work irregular shifts.

A summary of the existing peak hour trip generation is shown in Table 3.

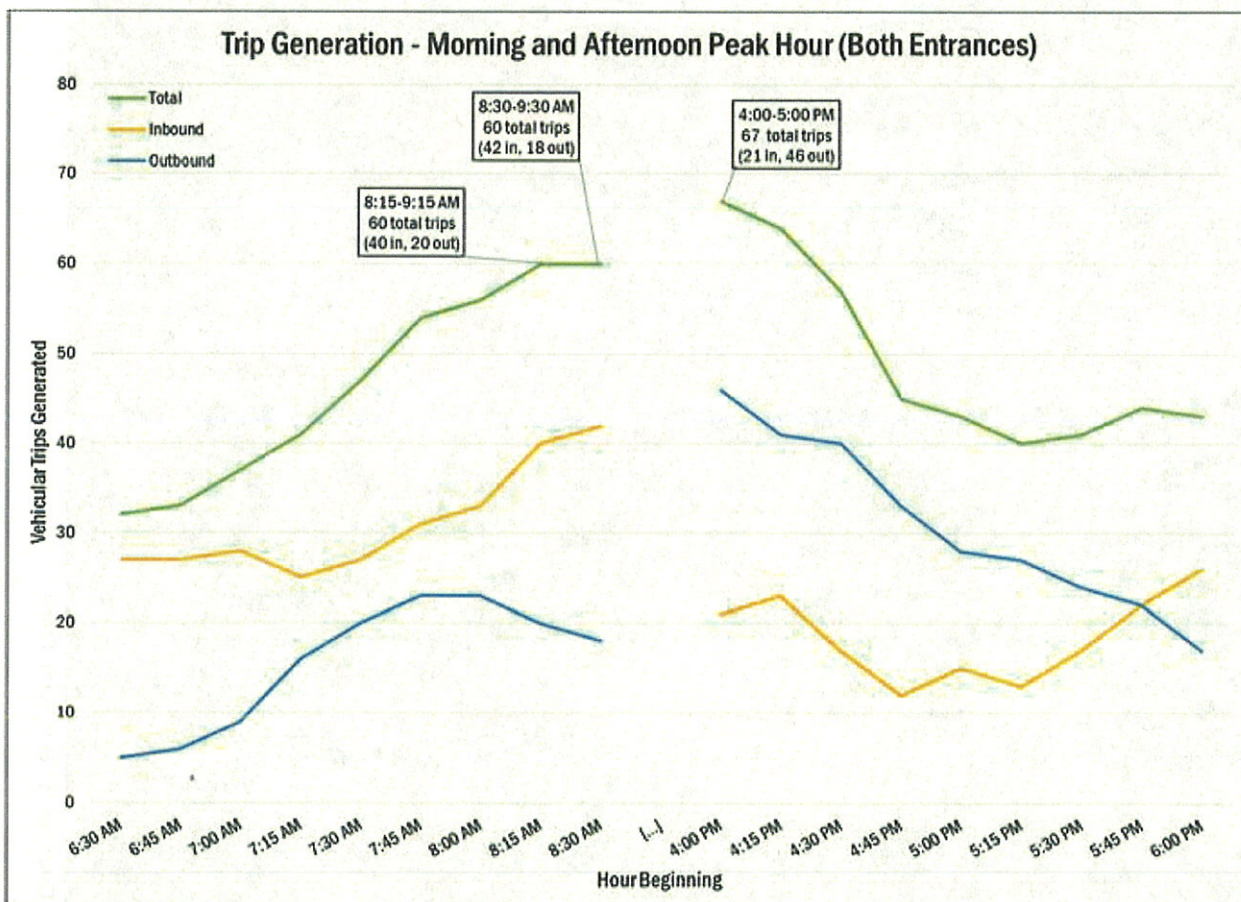


Figure 5: Existing Trip Generation (Both Entrances)

**Table 3: Existing Peak Hour Trip Generation**

Access Point	Peak Hour Trip Generation					
	AM Peak Hour (8:15 - 9:15 AM)			PM Peak Hour (4:00 - 5:00 PM)		
	In	Out	Total	In	Out	Total
Military Rd	32	12	44	15	36	51
Broad Branch Rd	8	8	16	6	10	16
Total	40	20	60	21	46	67

The total number of existing vehicular trips entering and exiting the Ingleside site were a total of 40 inbound and 20 outbound (60 total) during the morning peak hour, at both the Military Road and Broad Branch Road entrances. During the afternoon peak hour, there were 21 inbound and 46 outbound (67 total) trips. Thus, during the times when adjacent roads carry the highest amount of volume, about one vehicle per minute enters or exits the Ingleside facility from either the Military Road or Broad Branch Road.

FUTURE TRIP GENERATION

The following steps were taken to calculate future trip generation:

1. The existing data collection was used as a base for the trip generation calculation, as outlined previously.
2. The peak hour trips were converted into trip generation rates, based on the existing number of units at Ingleside (228 units).
3. The net new trips generated by the proposed 104 future units were calculated using the rates derived from existing trips

Table 4 shows a summary of the future trip generation calculation.

Table 4: Future Trip Generation

Step	Peak Hour Trip Generation					
	AM Peak Hour (8:15 - 9:15 AM)			PM Peak Hour (4:00 - 5:00 PM)		
	In	Out	Total	In	Out	Total
1 Existing Trips	40	20	60	21	46	67
2 Rate per Unit (228 units)	67%	33%	0.26	31%	69%	0.29
3 Future Trips (104 new units)	18	9	27	10	21	31

The trip generation calculations show that the 104 new units will generate 18 inbound and 9 outbound (27 total) trips during the morning peak hour and 10 inbound and 21 outbound (31 total) trips during the afternoon peak hour. This equates to a new vehicle every two minutes.

COMPARISON WITH ITE TRIP GENERATION

As noted previously, the ITE *Trip Generation Manual* is traditionally used to project trip generation for a proposed development. For reference, Table 5 shows the projected future trip generation based on the rates provided by ITE. The net new trips were calculated based on ITE Land Use 255 for Continuing Care Retirement Community (CCRC). ITE defines CCRCs as:

*"land uses that provide multiple elements of senior adult living. [They] combine aspects of independent living with increased care, as lifestyle needs change with time. Housing options include various combinations of senior adult [housing], congregate care, assisted living and skilled nursing care – aimed at allowing the residents to live in one community as their medical needs change. The communities may also contain special services such as medical, dining, recreation and some limited, supporting retail facilities."*¹

As shown in, Table 5, the ITE trip generation rates project a similar but slightly higher amount of trips.

Table 5: Future Trip Generation per ITE Rates

Land Use	Peak Hour Trip Generation					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Congregate Care Facility (LUC 253) 104 dwelling units	15	8	23	9	14	23

¹ ITE "Trip Generation Manual", 9th Edition, p. 544



TRAFFIC OPERATIONS

This section provides a summary of the existing roadway facilities, as well as an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the Ingleside project and recommendations for improvements and mitigation measures.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the Ingleside project on the study area roadways;
- Discuss potential improvements and mitigation measures to accommodate the additional vehicular trips; and
- Evaluate the proposed roadway network to determine if adequate capacity is provided in the future.

This analysis was accomplished by determining the traffic volumes and roadway capacity for the following scenarios:

- 2014 Existing Conditions
- 2017 Background Conditions (without the Ingleside project)
- 2017 Total Future Conditions (with the Ingleside project)

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

The following conclusions are reached within this chapter:

- The existing study area roadways generally operate under acceptable conditions during the morning and afternoon peak hour.
- Existing areas of concern include: the intersection of Military Road NW with Nebraska Avenue NW and Broad Branch Road NW, the intersection of Military Road NW with 30th Place NW, and the intersection of Military Road NW with Nevada Avenue NW.
- The addition of the trips generated by inherent growth on the study area roadways, as well as by the Ingleside project have a negligible impact to the study area.
- The Ingleside project will have no detrimental impacts to the study area. No study intersections operate under

unacceptable conditions with the construction of the project that wouldn't otherwise.

ROADWAYS

As outlined previously, the site is served by many arterial roadways, including Military Road NW, Nebraska Avenue NW, and Connecticut Avenue NW. Major collector roadways include Nevada Avenue NW, Linnean Avenue NW, Broad Branch Road NW, and 27th Street NW. Figure 6 shows the roadway network hierarchy near the Ingleside site.

The existing study area roadway network is anchored by Military Road NW, which borders the northern edge of the site. Military Road NW is a primarily arterial, which carries a mix of regional and local traffic. In the study area, Military Road NW has a four-lane cross-section with on-street parking on both the east- and westbound sides of the roadway west of Nebraska Avenue NW and on the eastbound side of the roadway east of Nebraska Avenue. Afternoon peak-period parking restrictions allow for an additional eastbound travel lane adjacent to the site.

Near the Ingleside site, Military Road NW carries approximately 24,000 vehicles on a typical weekday and is a heavily-traveled commuter route. Heavy eastbound through volumes at the intersection with Nebraska Avenue NW and Broad Branch Road NW lead to congestion along the approach during the afternoon peak period.

Due to the existing four-lane cross-section of the roadway, the traffic signal progression, and the excess available capacity, drivers frequently speed along Military Road NW adjacent to the Ingleside site. An existing speed camera is installed along Military Road NW east of 27th Street NW to decrease driver violations. More details on speed cameras and the DDOT *Speed Limit & Safety Nexus Study* performed in January 2014 are provided in the "Safety" section later in this report.



Figure 6: Existing Roadway Network Hierarchy



Military Road NW also serves as a designated truck route. As it is the only designated truck route in the District that travels through Rock Creek Park, it serves as the primary connection between the eastern and western portions of the district. Consequently, Military Road NW also experiences significant truck volumes.

The second most-heavily trafficked roadway within the study area is Nebraska Avenue NW, which travels diagonally through the study area and carries a mix of regional and local traffic. South of Military Road NW, Nebraska Avenue NW is classified a primary arterial and has a four-lane cross-section with no peak-hour on-street parking. North of Military Road NW, Nebraska Avenue NW is classified as a collector roadway and has a four-lane cross-section including unrestricted on-street parking on the north- and southbound sides of the roadway.

South of Military Road NW, Nebraska Avenue NW carries approximately 17,000 vehicles on a typical weekday and is a heavily-trafficked commuter route. The majority of the commuters connect to Military Road NW to travel east towards Rock Creek Park. North of Military Road NW, Nebraska Avenue NW carries approximately 5,000 vehicles on a typical weekday. The majority of this local traffic connects to roadways in the neighborhoods north of Military Road NW.

Besides Military Road NW and Nebraska Avenue NW, the remaining roadways primarily function as collector roadways that funnel vehicles to the arterials or as local roadways that connect to the neighborhoods in study area. The majority of these roadways function with little to no congestion. Additionally, all of the traffic signals in the study area are located along Military Road NW.

Many of the local roadways in the study area are designated as one-way to discourage cut-through traffic, and truck traffic is prohibited on several of the roadways. However, as outlined in the "Transit" section later in this report, two existing WMATA bus lines (the M4 line and the E2/3/4 line) travel along 30th Place NW north of Military Road NW. The presence of the existing bus stop on the southbound approach of 30th Place NW leads to a small amount of congestion at the existing stop sign.

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions.

The scope of the analysis contained within this report was discussed with and agreed to with the District Department of Transportation (DDOT). The general methodology of the analysis follows national and DDOT guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular analyses are performed to determine if the proposed development of the Ingleside project will lead to adverse impacts on traffic operations. (A review of impacts to each of the other modes is outlined later in this report.) This is accomplished by comparing two future scenarios: (1) without the proposed application being approved (referred to as the Background conditions) and (2) with the application approved and constructed (referred to as the Future conditions).

Specifically, the roadway capacity analysis examined the following scenarios:

- 2014 Existing Conditions
- 2017 Background Conditions (without the Ingleside project)
- 2017 Total Future Conditions (with the Ingleside project)

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios listed above. The set of intersections decided upon during the study scoping process with DDOT are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. Although it is possible that impacts will occur outside of the study area, those impacts are not significant enough to be considered a detrimental impact, nor worthy of mitigation measures.

Based on the projected future trip generation and the location of the site access points, the following intersections were chosen for analysis:

1. Military Road NW, Nebraska Avenue NW, & Broad Branch Road NW
2. Military Road NW & 32nd Street NW



3. Military Road NW, 31st Street NW, & Ingleside Driveway
4. Military Road NW & 30th Place NW
5. Military Road NW & 30th Street NW
6. Military Road NW & 27th Street NW
7. Broad Branch Road NW, Linnean Avenue NW, & Nevada Avenue NW
8. Broad Branch Road NW & 32nd Street NW
9. Broad Branch Road NW & Ingleside Driveway
10. Military Road NW & Nevada Avenue NW

Figure 7 shows a map of the study area intersections.

Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

Existing Traffic Volumes

Traffic counts were conducted at the study area intersections on Wednesday, May 28, 2014 from 6:30 AM to 9:30 AM and from 4:00 PM to 7:00 PM. In addition to the traffic counts collected by Gorove/Slade, data for the intersection of Military Road NW & Nevada Avenue NW was obtained from DDOT. The traffic counts at this intersection were conducted on Wednesday, February 22, 2012 from 7:00 AM to 9:00 AM and from 4:30 PM to 6:30 PM.

The results of the traffic counts, including the peak hour traffic volumes, are shown in the Technical Attachments. Figure 7 shows a summary of the existing data collection.

Background Volumes (without Ingleside project)

The traffic projections for the Background conditions consist of the existing volumes with two additions:

- Traffic generated by developments expected to be completed prior to the project (known as background developments); and
- Inherent growth on the roadway (representing regional traffic growth).

Following national and DDOT methodologies, a background development must meet the following criteria to be incorporated into the analysis:

- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, no background developments are included in the Background conditions (for example, the 5333 Connecticut Avenue development is not located within the study area; it is accounted for in the regional growth rates). There are no background developments located within the study area that are approved and expected to be complete prior to the completion of the Ingleside project.

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using percentage growth rates. In order to determine the study area growth rate for the Ingleside project, annual average daily traffic volumes of the study area roadways were investigated.

As shown in Table 6, the roadways within the study area have shown a decrease in traffic over the past several years. However, to maintain a conservative analysis, a background growth rate of 0.5% per year (compounded annually over the study period) was assumed. This background growth rate was applied to all thru movements at the study area intersections, as summarized on Figure 8. The peak hour traffic volumes for the Background conditions are shown in the Technical Attachments.

Future Volumes (with Ingleside project)

The Future volumes consist of the Background volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips). Thus, the Future traffic

Table 6: Growth Rate Calculation

Roadway	AADT Volumes					Average Annual Growth Rate
	2008	2009	2010	2011	2012	
Military Road NW	25,900	26,100	23,700	23,900	23,600	-2.40%
Broad Branch Road NW	4,500	4,500	4,400	4,400	4,300	-1.10%
Nebraska Avenue NW	17,000	17,100	16,800	16,900	16,700	-0.50%