



volumes include traffic generated by: the existing volumes, the inherent growth on the study area roadways, and the proposed Ingleside project.

Existing traffic volumes and travel patterns in the study area were analyzed in order to determine the trip distribution for the site-generated trips. Based on this review and the existing site access locations, the site-generated trips were distributed through the study area intersections. Figure 9 shows a summary of the trip distribution and site-generated trips. The site-generated traffic volumes and the peak hour traffic volumes for the Future conditions are shown in the Technical Attachments.

Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove/Slade made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance. The lane configurations and traffic controls for the Existing conditions are shown in the Technical Attachments.

Background Geometry and Operations Assumptions

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

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

Based on this criteria, no changes to traffic operations or geometry were incorporated into the future background scenario. The lane configurations and traffic controls for the Background conditions are shown in the Technical Attachments.

Future Geometry and Operations Assumptions

The lane configurations for the Future conditions are based on the lane configurations for the Background conditions. No

changes to traffic operations or geometry were assumed. The lane configurations and traffic controls for the Future conditions are shown in the Technical Attachments.

Analysis Methodology

Following DDOT guidelines, the capacity analyses were performed using *Highway Capacity Manual* (HCM) methodologies. For signalized and unsignalized intersections, the HCM calculates the delay experienced by drivers traveling through an intersection. This delay is associated with vehicles slowing in advance of an intersection, the time spent stopped at an intersection, the time spent as vehicles move up in the queue, and the time needed to vehicles to accelerate to the speed limit. Traffic delay also results from the interaction of vehicles, primarily in a state where the traffic volumes exceed the available capacity.

The results of these delay calculations is a computed average delay (seconds per vehicle) for each approach and a Level of Service (LOS) grade. At signalized intersections, all approaches controlled by the traffic signal have a calculated average delay and associated LOS, and an overall average delay and LOS for the entire intersection are determined. At unsignalized intersections, the approaches controlled by a stop-sign have a calculated average delay and associated LOS. For all-way stop intersections, an overall average delay and LOS are also determined. For one- or two-way stop intersections, an average delay and LOS are also calculated for vehicles turning across a free-flowing approach, as the driver must yield to oncoming traffic. The major through movements and right-turns on free-flowing approaches at one- or two-way stop controlled intersections are assumed to operate with no delay.

For this report, the analysis was performed using the *Synchro, Version 7* software package, which is based on the HCM methodologies. As stated previously, the weekday morning and afternoon peak hours were analyzed in the Existing, Background, and total future conditions. The *Synchro* models were compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade.

Capacity Analysis Results

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A summary of the LOS results is shown on Figure 10 for the morning peak hour and on Figure 11 for the afternoon peak hour. The detailed capacity analysis tables and worksheets are contained in the Technical Attachments.

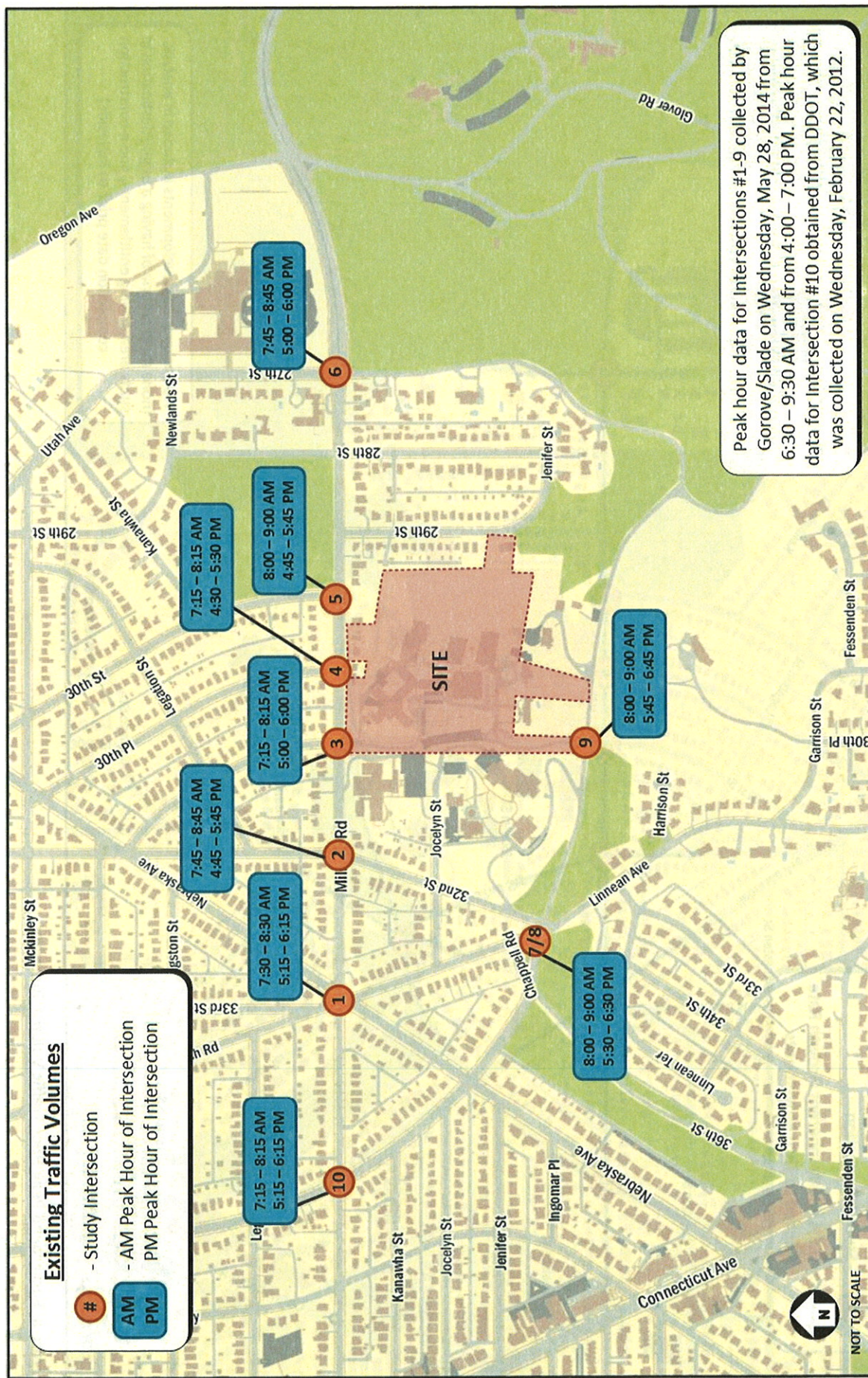


Figure 7: Study Area Intersections

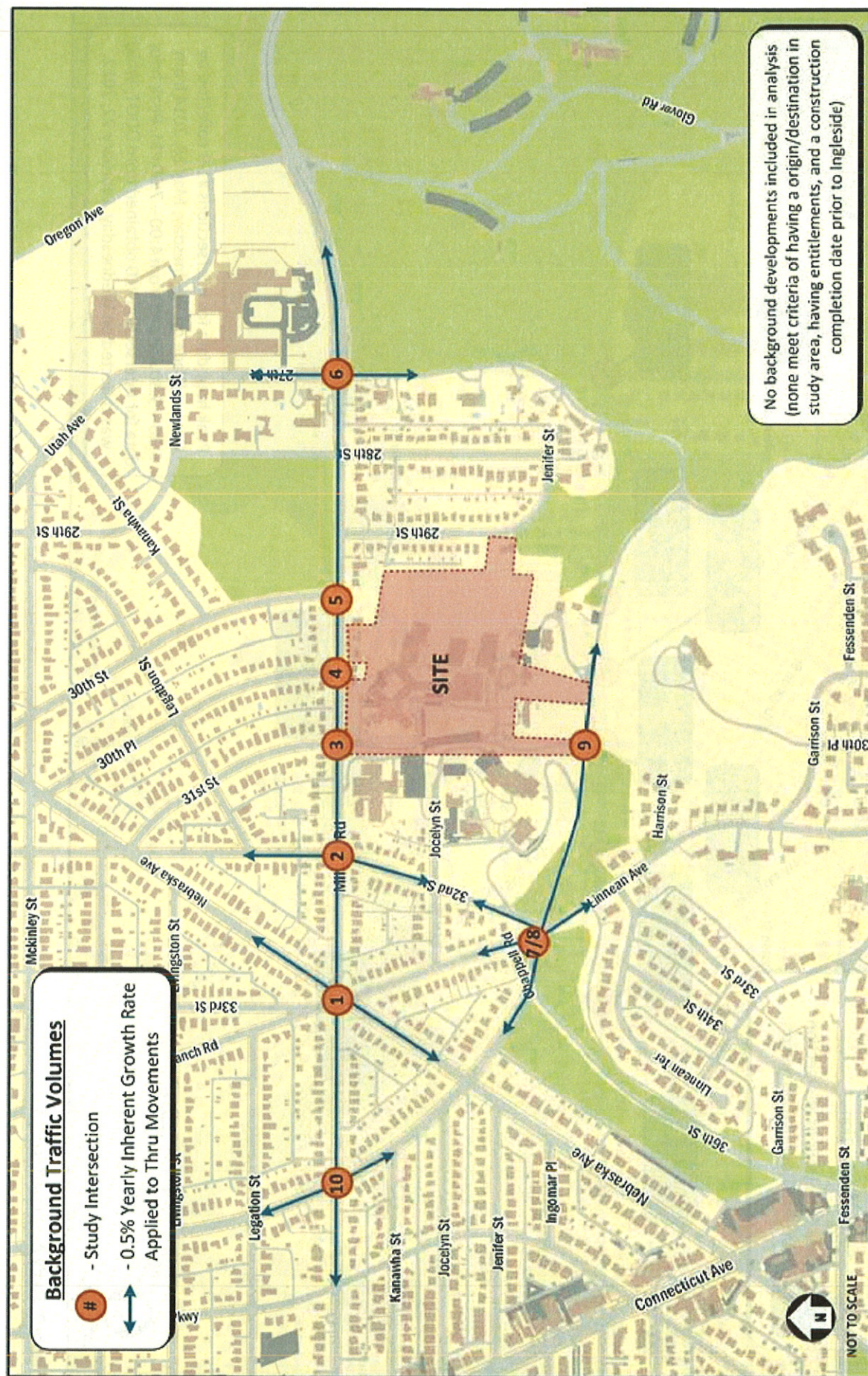
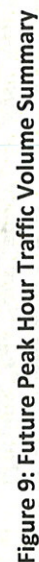


Figure 8: Background Peak Hour Traffic Volume Summary



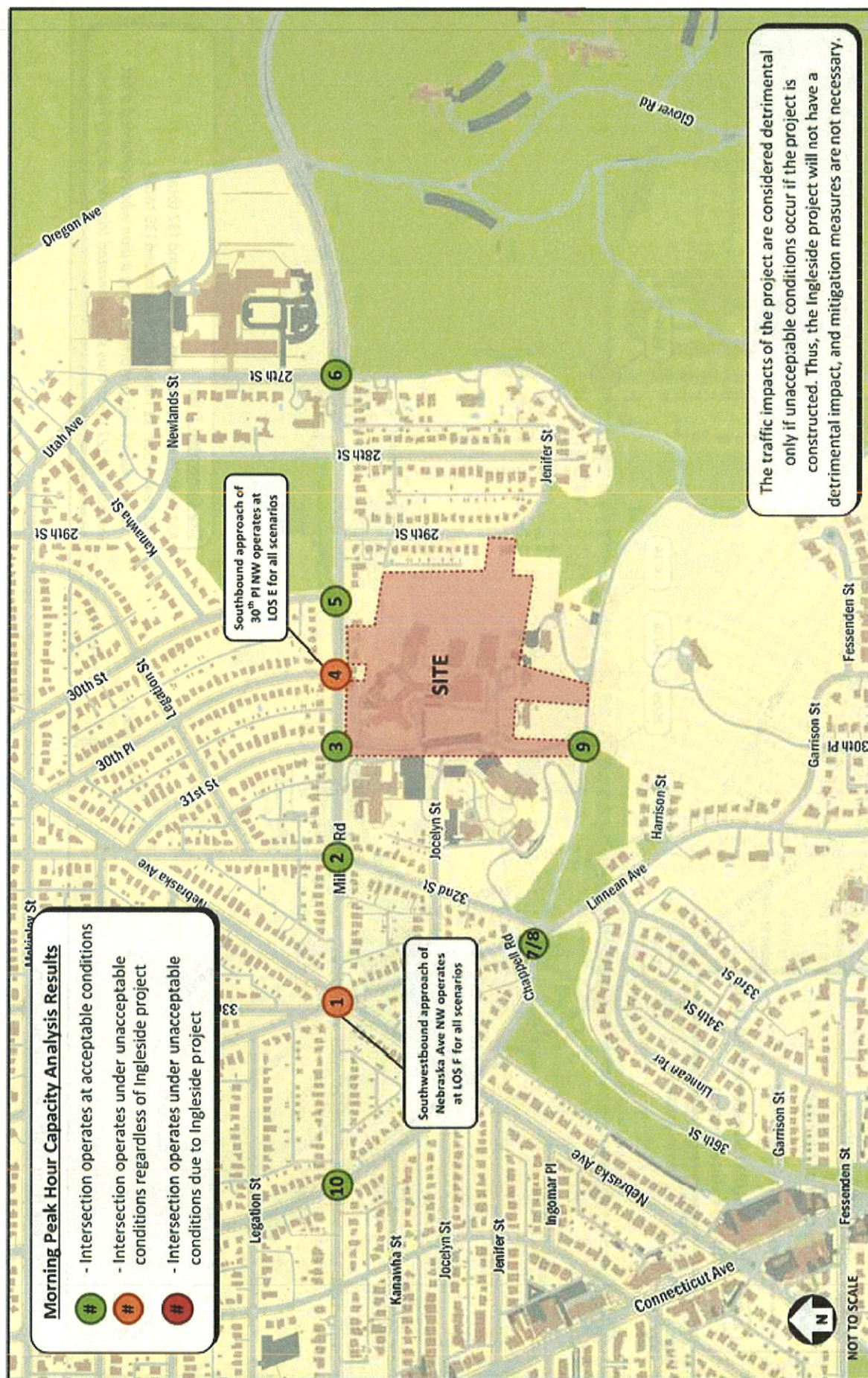
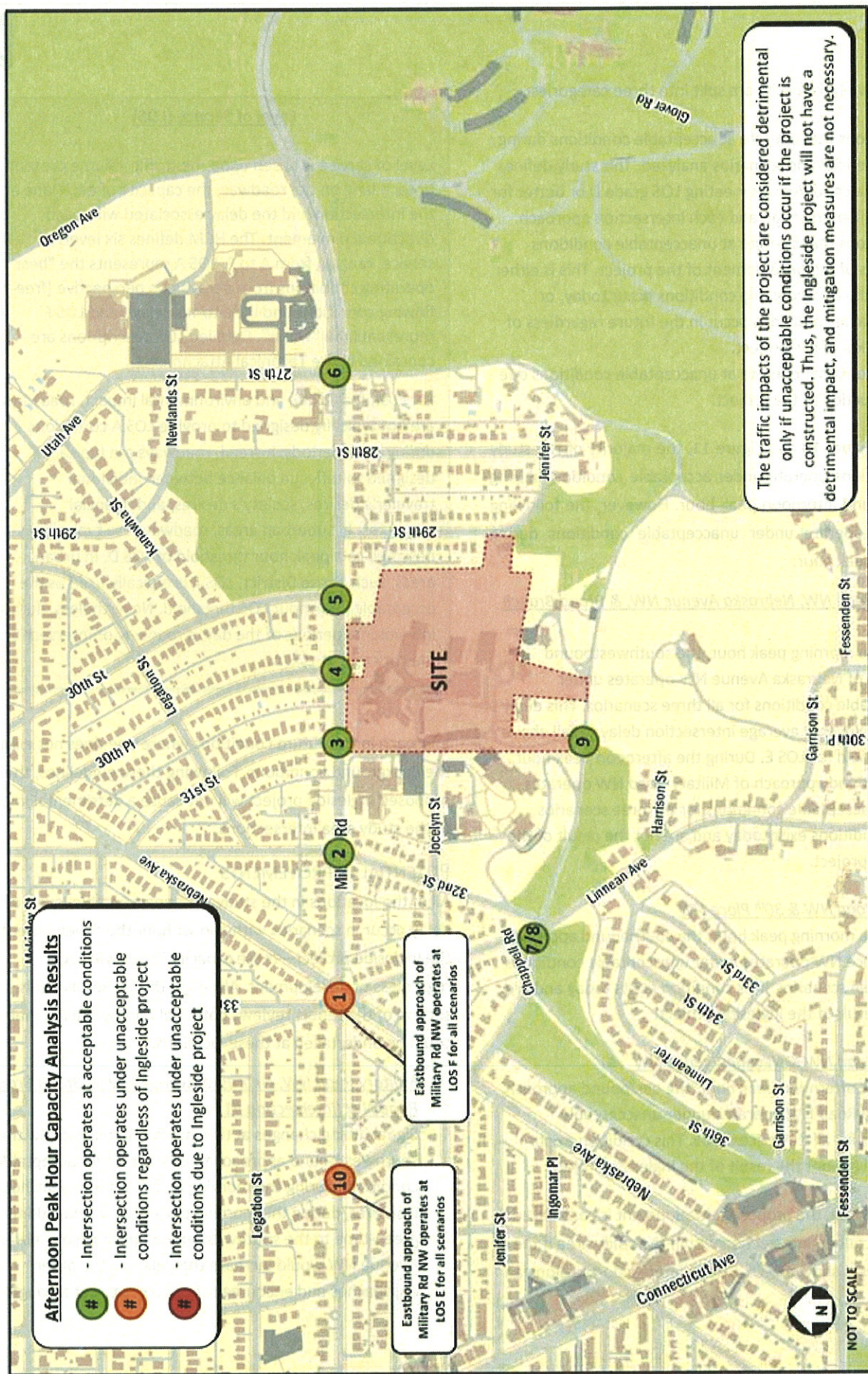


Figure 10: AM Peak Hour Capacity Analysis Summary





The capacity analysis results are split into three categories:

1. Intersections that operate at acceptable conditions during all time periods and scenarios analyzed. This study defines acceptable conditions as meeting LOS grade D or better for the overall intersection and each intersection approach.
2. Intersections that operate at unacceptable conditions regardless of the development of the project. This is either because the unacceptable conditions occur today, or unacceptable conditions occur in the future regardless of construction of the project.
3. Intersections that operate at unacceptable conditions due to construction of the project.

As shown in Figure 10 and Figure 11, the majority of the study area intersections operate under acceptable conditions during the morning and afternoon peak hour. However, the following intersections operate under unacceptable conditions during one or more peak hour:

- *Military Road NW, Nebraska Avenue NW, & Broad Branch Road NW*

During the morning peak hour, the southwestbound approach of Nebraska Avenue NW operates under unacceptable conditions for all three scenarios. This delay causes the overall average intersection delay to fall above the threshold for LOS E. During the afternoon peak hour, the eastbound approach of Military Road NW operates under unacceptable conditions for all three scenarios. These conditions exist today and are not the result of the Ingleside project.

- *Military Road NW & 30th Place NW*

During the morning peak hour, the southbound approach of 30th Place NW operates under unacceptable conditions for all three scenarios. This condition exists today and are not the result of the Ingleside project.

- *Military Road NW & Nevada Avenue NW*

During the afternoon peak hour, the eastbound approach of Military Road NW operates under unacceptable conditions for all three scenarios. This condition exists today and are not the result of the Ingleside project.

Generally speaking, the proposed development is considered to have an impact at an intersection within the study area if the capacity analyses show an LOS E at an intersection or along an

Level of Service (LOS)

Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The HCM defines six levels of service, ranging from A to F. LOS A represents the “best” operating conditions from a traveler’s perspective (free-flowing conditions and little-to-no delay), and LOS F represents the “worst”. Detailed LOS descriptions are contained in the Technical Attachments.

For cost, feasibility, and environmental impact, roadways are not typically designed to provide LOS A conditions during peak periods. Instead, roadways are typically designed to reflect a balance between individual traveler’s desires, society’s desires, and financial resources. In suburban areas, roadways are typically designed to a peak hour threshold of LOS D. In urban areas, such as the District, LOS E is typically used as the acceptable peak hour LOS threshold. Nevertheless, during low-volume periods of the day, a roadway or intersection may operate at LOS A.

approach in the Future conditions where one does not exist in the Background conditions. Following these guidelines, the proposed Ingleside project will not cause a detrimental impact to the study area intersections.

POTENTIAL IMPROVEMENTS

All of the locations in the study with unacceptable levels of delay occur in scenarios with and without the development of the Ingleside project—these capacity issues will occur regardless of development. Although this is the case, this section of the report reviews potential improvements that could be undertaken at these locations.

- *Military Road NW, Nebraska Avenue NW, & Broad Branch Road NW (Intersection #1)*

Signal timing changes at this intersection may allow the southwestbound approach to operate under acceptable conditions during the morning and afternoon peak hours. However, during the morning peak hour, giving additional green-time to the southwestbound approach of Nebraska Avenue NW would increase the delay on the other approaches and encourage commuters to cut through