GOROVE SLADE
Transportation Planners and Engineers

TECHNICAL MEMORANDUM

To: Dennis Sellin — Arlington County DES

From: Sasha Redmon
Daniel Solomon, AICP
Daniel VanPelt, P.E., PTOE

Date: August 16, 2022

Subject: 701 N. Glebe Road – Ballston Macy's Site
Supplemental Analysis & Response to Comments

Executive Summary

This memorandum follows nearly two years of discussion between County staff, Gorove Slade, and the project team regarding a proposed left turn lane along N. Glebe Road in relation to the redevelopment of the Ballston Macy's. Of the myriad of transportation issues raised with the Ballston Macy's redevelopment, the configuration of the proposed N. Glebe Road left turn storage lane has resulted in the most dialogue with DES staff. We believe this remains the predominant outstanding DES issue meriting resolution in order for the project to move forward through the zoning process. Accordingly, while this memorandum seeks to address some of the other DES comments/recommendations that inform the physical design of left turn lane, the main focus of this document relates to the configuration of this left turn storage lane and the studies that have been undertaken to analyze its design.

Discussions with DES staff regarding the proposed project began in October 2020. During these initial conversations, an emphasis was placed upon discerning how vehicles would access the site and the contemplated ground floor commercial uses. It was acknowledged by all parties that, on one hand, the site offers an attractive location for a major retail anchor (in this case, an urban grocer) given the surrounding residential and office development and proximity to public transit. On the other hand, it was noted that the site is handicapped by limited vehicular access resulting from the "superblock" that is created by the adjacent Ballston Quarter shopping mall.

Given that a left turn along westbound Wilson Boulevard for traffic arriving from the east was not possible due to the existing Wilson Boulevard median, it was recognized that a new left turn into the site from N. Glebe Road would be imperative to attract a ground floor anchor (especially a grocer) and deliver a viable project. Without a left turn into the site, it would not be possible to attract the project's major ground floor tenant or realize the anticipated redevelopment envisioned by the County's planning documents (including not only the physical redevelopment of the building, but the associated pedestrian, streetscape, and public realm improvements which necessarily accompany such redevelopment).

Our team understood that the ultimate design of the left turn lane and operations along N. Glebe Road would need to be refined in coordination with the County and VDOT. After an exhaustive series of studies, in which the County asked us to progressively analyze more and more conservative assumptions (which were a departure from the more usual methods deployed for urban conditions and the initial MMTA scope approved by the County), we have revised our design which, we believe, now offers a viable and balanced solution to address the numerous concerns DES staff has raised during our conversations and in written comments.

Our revised plan responds to the most recently updated MMTA analysis in the following manner:

- The revised plan contemplates storage space for the new southbound left turn lane of 69 feet. Our analyses show that this design will be sufficient during commuter peak times and may only occasionally underperform during peak times on Saturdays for the worst-case scenario with maximum queue lengths. On average, queues will be significantly shorter than the 69 feet of storage during peak times.

  The revised plan presents the most balanced outcome given the various multimodal elements in the area. It also accords with the purposes of providing sufficient queuing space for the southbound left turn lane. In the most conservative scenario, we would need to add one to six feet of storage by taking it from the northbound left turn lane at Wilson Boulevard.

  - AM and PM Peak: The supplemental SimTraffic analysis staff requested shows that future queues for the new southbound left turn lane will be a maximum of 70 feet in both the AM and PM peak hours. While the queue may occasionally extend to 70 feet, the average queue is no more than 20 feet in the AM and PM peak hours, which indicates that queues will be significantly shorter than the 69 feet of available storage during the commuter peak hours. We would need to take one foot from the northbound left turn lane storage at Wilson Boulevard to meet the worst-case future queue projections during commuter peak hours.
  - Saturday Peak: The supplemental SimTraffic analysis staff requested shows that future queues for the new southbound left turn lane will be a maximum of 75 feet in the Saturday peak hour, but will not exceed 70 feet during the commuter peak times. While the proposed left turn queue may occasionally extend to 75 feet on Saturdays, the average queue is no more than 22 feet, which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the Saturday peak hour.

    Due to several County requests that have constrained operations at this intersection, and since the northbound thru and the new southbound left turn are competing for capacity at this signal, we are unable to further reduce this queue without exacerbating queues for other movements. To achieve the 75 feet of storage space that would be necessary to fully accommodate the worst-case future queue during Saturday peak times, we would need to take an additional 6 feet from the northbound left turn lane storage at Wilson Boulevard, which existing data shows is currently stressed and exceeding capacity.

- While the pedestrian refuge width on the northern approach of the N. Glebe Road intersection will be reduced in some areas as part of the new left turn lane, it would continue to meet the minimum width recommendations and requirements VDOT and NACTO. The width of the current median is larger because at the time it was installed, no left turn lane was needed. In response to the proposed reduction of the median to 6 feet. Our plan offsets the reduction in pedestrian refuge width by shortening the pedestrian crossing distance through narrowed travel lanes, including a no-right-turn-on-red (NRTOR) restriction from the alley proposed by staff, installing leading pedestrian intervals (LPIs), and instituting protected-only left turn phasing.
- To reduce the demand on the new southbound left turn lane into the alley, proposed site circulation has been revised such that the garage entrance on the west side of the alley will be operated as right-in only access in the future, which is similar to existing conditions. Office and residential trips will not be able to use the new southbound left into the alley and must access the site from Wilson Boulevard as they do today. The southbound left turn lane will be used by retail trips only. This circulation pattern, shown in Figure 2, and traffic within the alley will managed (e.g., signage to indicate that a left turn into the west garage entrance is prohibited).
- The alley will function as an enhanced alley with dedicated space for pedestrians to navigate through it, and conflicts between loading, garage traffic, and pedestrians will be managed. Closely spaced garage and loading entrances/exits are typical for alleys in urbanized areas and throughout the County and will be effectively managed through a Loading Dock Management Plan (LDMP).

The below Figure 1 summarizes the updated design to the N. Glebe Road intersection as part of our continuing coordination with the County.

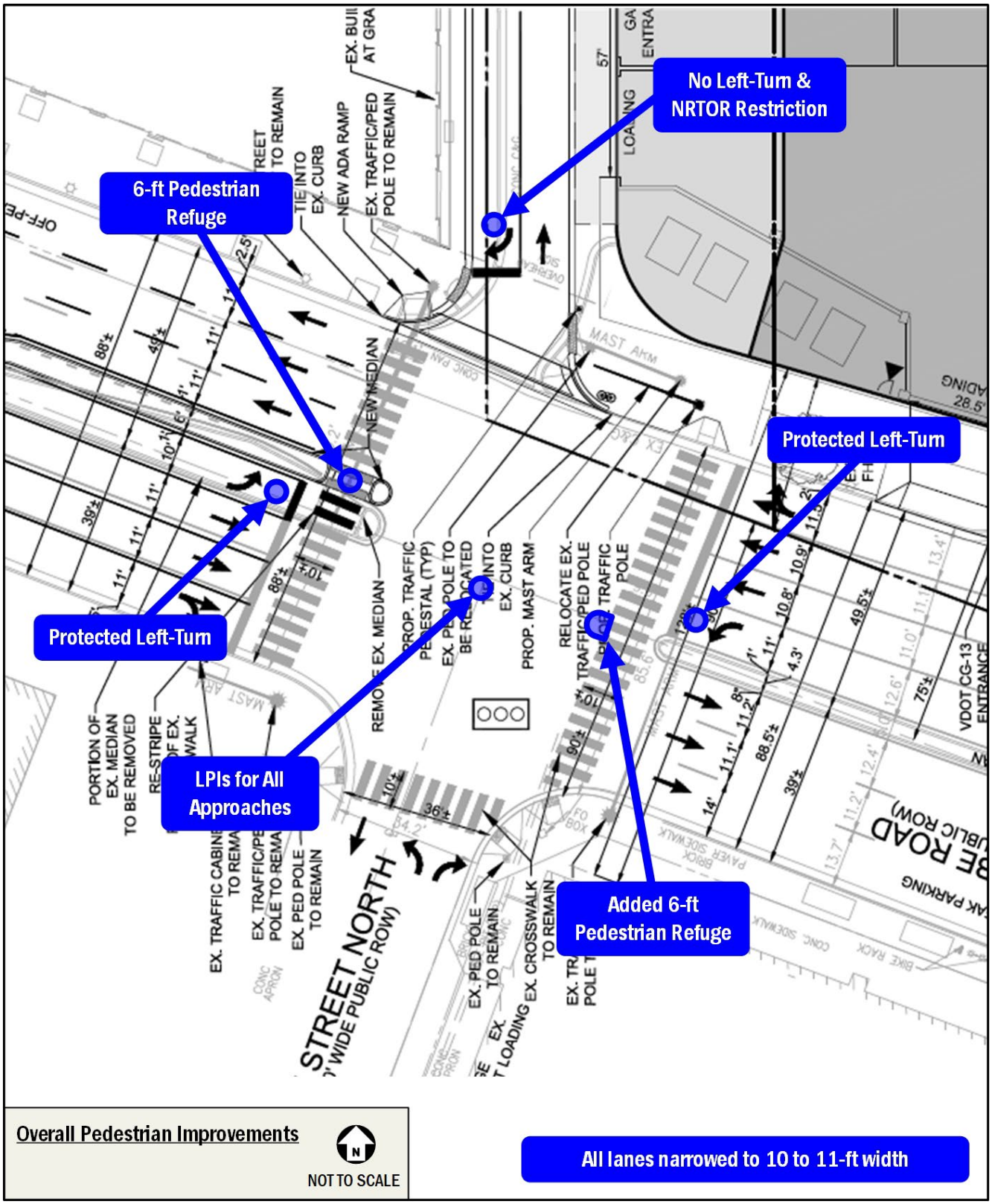


Figure 1: Overall Pedestrian Improvements

Evolution of Study and Design

The following section captures the sequence of discussions with DES Staff regarding the left turn lane over the last 22 months as it relates to the Ballston Macy's project:

October 1, 2020 – Initial Meeting with DES

Gorove Slade and the Applicant met with DES representatives to discuss access needs for the proposed grocer and residential uses planned for the redevelopment of the site. The teams recognized that a new left turn into the site from N. Glebe Road was required for the contemplated uses given the superblock configuration. The specifics of how this left turn would be physically accommodated, and the operations/queuing were to be further studied, but it was understood that without the left turn into the site there is no project.

December 1, 2020 – Follow-up Meeting with DES to Discuss Access Alternatives

Gorove Slade and the Applicant held a second meeting with DES to discuss access alternatives and study of the left turn lane into the site from N. Glebe Road. After additional study, it was concluded that a westbound left turn from Wilson Boulevard into the site was not feasible and a westbound U-turn at N. Taylor Street did not offer a viable movement. Civil engineering plans from VIKA were presented to show how a new left turn lane could be accommodated. Staff requested capacity and queuing analysis. Staff recommended that Gorove Slade provide initial trip generation and distribution studies.

December 16, 2020 – Meeting with DES to Review Preliminary Analysis

Gorove Slade and the Applicant had a meeting with DES to review preliminary trip generation, trip distribution and resulting queuing needs from the Synchro model. Based on the preliminary analysis, a 50-foot left turn lane from N. Glebe Road into the site was shown to adequately accommodate the necessary queuing. However, staff asked the Applicant study whether they could expand the left turn lane to 75 feet for buffer. The Applicant team said they would study staff's request for further discussion.

January 26, 2021 – Email with N. Glebe Road Left turn Schemes

The Applicant team studied how to create more southbound left turn lane stacking space on N. Glebe Road at the alley. Four schemes were presented to staff via email.

February 2, 2021 – Meeting with DES to Review Left turn Schemes

Gorove Slade reviewed the four schemes with DES staff. The civil engineer and Gorove Slade concluded that achieving 75 feet of storage for the southbound N. Glebe Road left turn lane would only be possible if the adjacent northbound N. Glebe Road left turn lane stacking at Wilson Boulevard were to be shortened. The Applicant's team analysis continued to suggest that the left turn demand did not require a full 75-foot left turn storage from N. Glebe Road. The teams agreed that the next steps would include scoping the MMTA to develop detailed analyses beyond the preliminary analysis presented to date.

June 28, 2021 – Draft MMTA Scoping Form Submitted

June 30, 2021 – MMTA Scoping Meeting with County Staff

Gorove Slade and Applicant met with DES staff to discuss draft scoping form that was previously transmitted to staff. Staff agreed with study area, background developments, distributions, and growth rate. Staff also agreed with being consistent with 600 N. Glebe TIS, but encouraged more support for the auto mode split. Staff asked for a Saturday analysis and the inclusion of a safety analysis in MMTA.

August 24, 2021 – Coordination with DES on Existing Volumes

Data collection was not possible under the existing conditions as traffic volumes were not representative of typical traffic conditions due to the COVID-19 pandemic. Therefore, available data from different sources, including historical turning movement counts from 2015-2019 and StreetLight data were utilized to establish baseline conditions. Gorove Slade coordinated with DES via email and phone regarding volume balancing given the atypical traffic conditions due to the COVID-19 pandemic.

September 9, 2021 – Revised MMTA Scoping Form Submitted with Balanced Existing Volumes

September 16, 2021 – Revised MMTA Scoping Form Approved

September 17, 2021 – MMTA Submitted

November 12, 2021 – DES Provided Comments on MMTA

November 16, 2021 – Meeting with DES to Discuss MMTA Comments

Gorove Slade and the Applicant met with DES staff to discuss the comments provided on the MMTA, preliminary responses, and next steps. As part of this discussion, the staff requested that the MMTA be revised to respond to include:

- As part of the County's future planned signal optimization along N. Glebe Road, all left turns will be protected only to minimize conflicts with pedestrians. Staff asked that the left turn into the site be converted to protected only to be consistent with the rest of the protected left turns along the corridor. Staff acknowledged that this would result in higher delays but considered pedestrian safety the greater priority. This was not part of the original scope of study.
- Pedestrian Recall for all approaches, including minor approaches, that have a pedestrian phase.
- Consider how to accommodate a "No Right Turn on Red" restriction for traffic exiting the alley onto N. Glebe Road including shifting the grocery garage entrance away from the signal on N. Glebe Road. Synchro studies showed that an NRTOR could create queuing conditions in the alley that would impact vehicles moving through the alley from Wilson Boulevard.
- Ballston Station and 11th and Vermont projects be included as pipeline developments. These were not identified during the original scoping process.
- Minor updates based on VDOT simulation standards that staff wanted applied to the models.
- Staff was concerned that the queuing results did not adequately reflect the true potential queues given that Synchro reports them as being metered by an upstream signal. Staff requested that a SimTraffic analysis be layered in in order to understand the maximum queue length for any queues where Synchro is reporting "m" (metered). This represented a significant departure from the original scope and represents a very conservative approach to studying the potential queuing.

December 8, 2021 – SimTraffic Scope Submitted

December 28, 2021 – SimTraffic Scope Approved

February 10, 2022 – Revised MMTA Submitted (Including SimTraffic Results)

March 3, 2022 – DES Provided Comments on Revised MMTA

DES staff provided additional comments in response to the revised MMTA submitted on February 10, 2022. Specifically, staff requested:

- Grocery parking garage entrance be aligned with the existing office parking entrance on the west side of the alley to help extend space between the intersection and garage for queuing. If the garage entrance could not be shifted, then the signals group would not recommend the left turn from N. Glebe Road into the site.
- Staff upped the requested length for the left turn storage lane from 75 to 100 feet for additional buffer even though analyses did not reflect any peak queues greater than 75 feet. Staff acknowledged that to accomplish this the storage lane at the northbound left turn at Wilson Boulevard would need to be shortened by between 25 to 30 feet, which our studies indicate is not a preferred or balanced solution.

Staff also requested the addition of leading pedestrian intervals (LPIs) for the signal at N. Glebe Road and the alley to create safer pedestrian environment.

May 4, 2022 – Meeting with Staff to Discuss Site Design Alternatives

Gorove Slade and the Applicant team had a meeting to discuss seven different alternative designs for loading and garage access off of N. Glebe Road and the private alley. A preferred alternative was identified for further study which moved large truck loading access further away from the N. Glebe Road/alley intersection.

May 24, 2022 – DES Provided Comments on the Preferred Alternative Design

DES staff distilled its outstanding concerns in response to the preferred alternative designs presented at the May 4th meeting:

- Reiterated the desire to see a longer queuing distance from the grocery parking garage entrance to the traffic signal on N. Glebe Road. The Applicant highlighted that, in addition to the queuing in the alley, there existed significant queuing availability up the ramp to the grocery parking garage.
- Looked for expanded length of the southbound left turn lane from N. Glebe Road into the site.
- Look at the opportunity for separation between the loading exit on the alley and the parking garage entrance on the alley

June 2, 2022 – Meeting DES to Discuss Comments on Preferred Alternative Design

Gorove Slade met with DES staff to discuss their comments and offered the following responses to the three outstanding identified concerns.

- The garage ramp was been shifted north to align with the opposing garage plan in the preferred plan to increase queuing space in the alley and that there would be ongoing monitoring of the queuing in light of the requested NRTOR at N. Glebe Road;
- A finding that increasing the length of the southbound left turn lane storage would impact the length of the northbound left turn lane at Wilson Boulevard, which today spills back, and that the proposed 69-foot storage is sufficient in light of the many analyses that have been performed; and
- A determination that design parameters do not allow for separation of the loading exit and the grocery parking garage entrance on the alley, however a robust a robust Loading Dock Management Plan (LDMP) that monitored and managed this space would be implemented by the Applicant.

Staff requested time to discuss internally and would follow-up with a response.

June 15, 2022 – TE&O Provided a Response Memo as Follow-up to June 2nd Meeting

June 23, 2022 – Meeting with DES to Response Memo and Next Steps

Gorove Slade met with DES staff to discuss the response memo provided on June 15, 2022, prior to submitting a formal response to the memo. Of the three main issues raised in the memo (pedestrian safety, alley operations, and the new southbound left turn lane), the primary issue continued to be the southbound left turn lane. Staff expressed some optimism

that the other alley concerns could be resolved. Staff also agreed that any additional improvements over the current proposal that can be recommended would be viewed favorably, and would make staff more comfortable regarding the three main issues. As it related to the left turn design, staff requested that the Applicant's analysis be revised to include Leading Pedestrian Intervals (LPIs) at the signal with the alley and test whether coding a hypothetical longer left turn storage length in Synchro would change the reported queue results.

July 18, 2022 – Meeting with DES to Discuss Updated Analysis and Responses

The analysis was updated in response to additional requests from the June 23, 2022 meeting with staff, and included the signalized intersection at N. Fairfax Drive and N. Glebe Road as part of the network to help meter traffic along the corridor and better model traffic at the Wilson Boulevard intersection. Staff requested an additional iteration of the analysis, this time including the signalized pedestrian crossing at N. Vermont Street instead of up to N Fairfax Drive. The latest revised analysis, based on this discussion, is detailed in the sections that follow.

Revised Analysis Results

Since the revised MMTA was submitted in February 2022, the Synchro/SimTraffic analysis has been further revised based upon the June 23rd and July 18th discussions with DES staff, as outlined in the previous section. The revised analysis includes the following changes to analysis assumptions:

- Leading pedestrian intervals (LPIs) incorporated at the intersection of N. Glebe Road with the alley.
- To reduce queues exiting the alley onto N. Glebe Road and to provide some additional capacity to N. Glebe Road, right-turn overlap phases for the alley and 7th Street N. were added. This significantly reduces queues within the alley as a result of the NRTOR restriction.
- Based on the 4.1 site plan, there is 85 feet of storage space provided for the left turn that is at least eight feet wide; however, this impacts the existing 252 feet of storage space for the northbound left at Wilson Boulevard by approximately 16 feet. To avoid impacting the northbound left, the storage space for the southbound left would instead be 69 feet, affording 16 feet to be returned/incorporated in to the northbound left (as it exists today). An exhibit showing this shift in storage space is provided in the Technical Attachments.
- The model has been modified to extend the coded southbound left turn lane storage length to 110 feet to ensure the full maximum queue is reflected in the results.
- To reduce the demand on the new southbound left turn lane into the alley, site trips were revised to assume that the garage entrance on the west side of the alley will be right-in only access in the future. Office and residential trips will not be able to use the southbound left, and must access the site from Wilson Boulevard, which is the existing pattern for the office trips. The southbound left turn lane will only be used by retail trips. This circulation pattern, shown in Figure 2, as well as traffic within the alley, will managed (e.g., signage to indicate that a left turn into the west garage entrance is restricted). To be conservative, the analysis assumes right-in/right-out circulation for the west garage entrance. The re-routed volumes are provided in the Technical Attachments.

Currently, the northernmost study intersection in the model is the signal at Wilson Boulevard and N. Glebe Road. Since the model does not include a signalized intersection further to the north that would meter traffic entering the network, traffic is arriving at the Wilson Boulevard signal at random rates when in reality arrivals would be controlled by an upstream signal. To analyze the impacts of the project more accurately at the Wilson Boulevard intersection and recommend mitigations with a greater degree of confidence, the model was revised to include an additional signalized intersection to the north. As discussed with DES Staff, two different models were included for comparison: (1) one with the signalized pedestrian crossing at N. Vermont Street and (2) one with the Fairfax Drive and N. Glebe Road intersection.

A comparison of the detailed Synchro and SimTraffic results for the Background, Future, and Future with Mitigations analysis scenarios are provided in the Technical Attachments; however, the primary focus of this analysis is the SimTraffic queue length for the new southbound left turn into the site under the Future with Mitigations scenario.

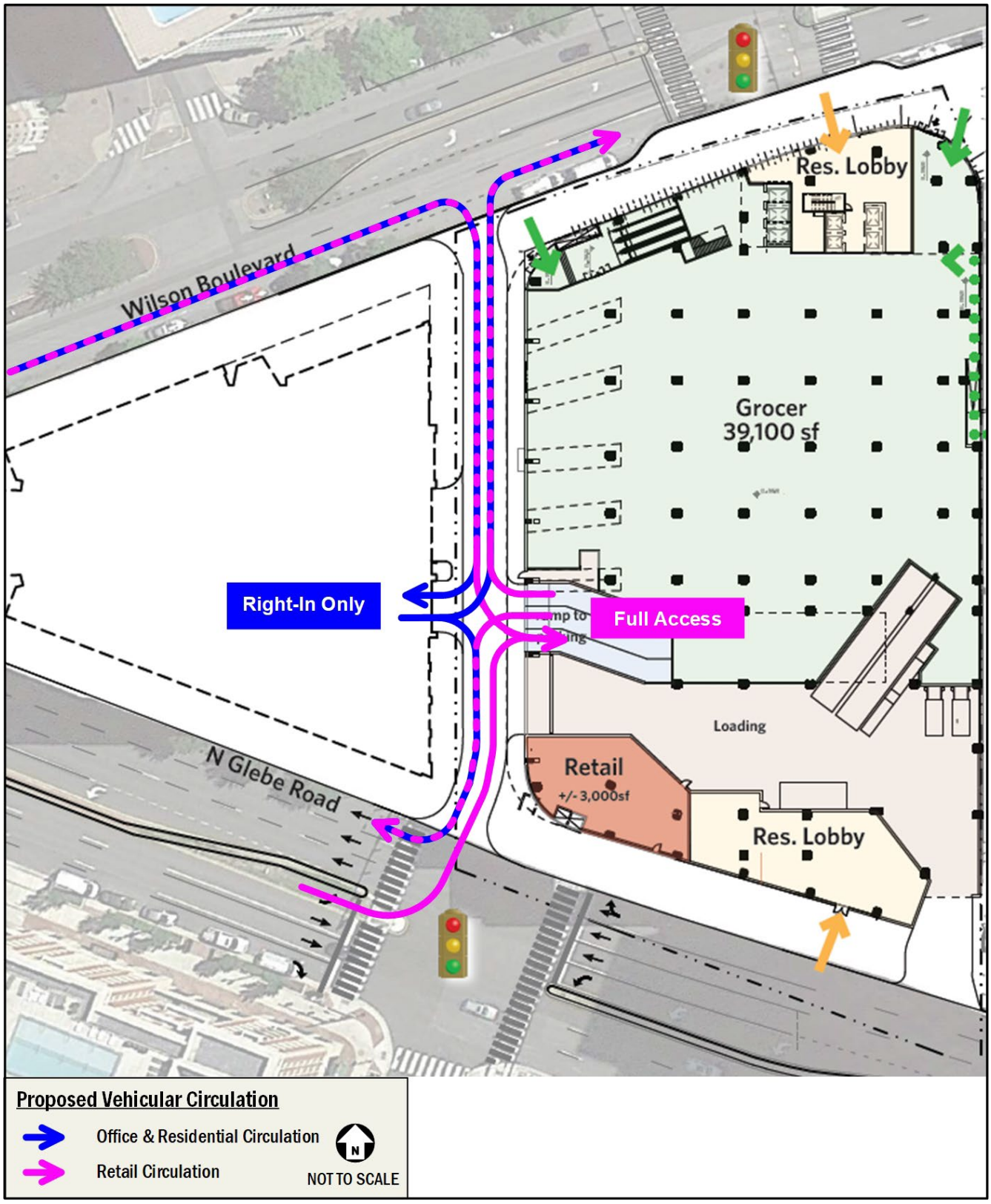


Figure 2: Proposed Vehicular Circulation

With N Vermont Street Pedestrian Crossing

An updated Intersection capacity analysis was performed for the Background (2026), Future (2026), and Future with Mitigations (2026) at the study intersections during the morning, afternoon, and Saturday peak hours. This is consistent with the Macy's Ballston Revised MMTA submitted on February 10, 2022 and is in accordance with the agreed-upon scoping document with DES staff.

For the purposes of this model, volumes were balanced along N. Glebe Road between Wilson Boulevard and N. Vermont Street. The N. Vermont Street pedestrian crossing is not a study intersection and no historic count data was available.

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using *Synchro* software. Typically, the 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections and only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) for unsignalized intersections based on the HCM 2000 calculations.

At the request of the DES Staff, SimTraffic maximum queue length results are reported for Background (2026), Future (2026), and Future with Mitigations (2026) scenarios at movements where Synchro HCM 2000 results indicate that queues are metered by an upstream signal (denoted with an "m"). SimTraffic analysis calibration parameters, including PHF/AntiPHF adjustments, seeding time, number of recording intervals were determined based on TOSAM Version 2 and as agreed upon with DES Staff. The average results for 10 simulation runs were reported. The maximum queue length results supersede these metered values and were used as the basis for mitigation at these locations.

SimTraffic determines maximum queue length by recording the maximum queue by two-minute interval within the simulation run, in this case one hour, and reports the absolute maximum out of those two-minute intervals. SimTraffic also reports the average queue length, which is a simple average of every two-minute interval and speaks to the frequency at which long queues occurred during the simulation run. If the average queue is significantly lower than the maximum queue, it can be concluded that long queues will occur infrequently. Table 1 shows the maximum and average queues reported for each peak hour as well as the average value for all 10 runs (i.e., the average of maximum queues and the average of average queues).

AM Peak Hour

All increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only. With the recommended mitigations in place, the maximum queue for the southbound left turn is 69 feet, based on 10 simulation runs, as shown in Table 1.

While the queue may occasionally extend to 69 feet as the maximum queue results show, the average queue for the entire peak hour is 13 feet which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the AM peak hour.

PM Peak Hour

All increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only. With the recommended mitigations in place, the average maximum queue for the southbound left turn is 70 feet, based on 10 simulation runs, as shown in Table 1.

While the queue may occasionally extend to 70 feet as the maximum queue results show, the average queue for the entire peak hour is 21 feet which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the PM peak hour.

Saturday Peak Hour

Most increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only; however, there was one impact attributable to the project that were not able to mitigate. The queue for the northbound thru movement on N. Glebe Road at 7th Street extends beyond the available storage by 63 feet. Since the northbound thru and the new southbound left turn are competing for capacity at this signal, this queue could not be mitigated without exacerbating the maximum queue for the southbound left turn. The spillback is primarily due to the reduced thru capacity along N. Glebe Road during the Saturday peak, compared to the AM or PM peak, as street parking is only restricted for weekday peak periods. This is typical in urban areas like this with closely spaced signals, and the queue will ultimately be managed/metered by the signal at Carlin Springs Road (as opposed to cars stopping in the middle of the intersection and blocking Carlin Springs Road). Based on visual observations of the SimTraffic simulations, the queue is able to clear while the signal is red at Carlin Springs Road and cars are able to proceed along N. Glebe Road in the next cycle.

In order to improve progression along N. Glebe Road between the signals at Wilson Boulevard and 7th Street N., the left turn phasing for the N. Glebe Road approaches at Wilson Boulevard was also modified. Under existing conditions, these left turns operate under lead-lag phasing rather than running concurrently. The updated analysis includes modified phasing to include concurrent, leading left turn phasing. There is precedent for this modification as this is how they operate during the AM peak. With the recommended mitigations in place, the maximum queue for the southbound left turn is 75 feet, as shown in Table 1.

While the queue may occasionally extend to 75 feet as the maximum queue results show, the average queue is 22 feet which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the Saturday peak hour.

Table 1: Southbound Left turn SimTraffic Queuing Results by Run (With N Vermont Street Pedestrian Crossing)

Peak Hour	Maximum Queue (ft)	Average Queue (ft)
AM	**69**	**13**
PM	**70**	**21**
Saturday	**75**	**22**

With Fairfax Drive and N. Glebe Road Intersection

An updated Intersection capacity analysis was performed for the Background (2026), Future (2026), and Future with Mitigations (2026) at the study intersections during the morning, afternoon, and Saturday peak hours. This is consistent with the Macy's Ballston Revised MMTA submitted on February 10, 2022, and in accordance with the agreed upon scoping document with DES staff.

For the purposes of this model, Gorove Slade conducted 15-minute intersection spot counts at the N Fairfax Drive and N. Glebe Road intersection during the morning and afternoon peak periods on Tuesday, July 5, 2022. The 15-minute counts were multiplied by four to reflect one hour of traffic and volumes were balanced along N. Glebe Road accordingly. The afternoon counts were used for the Saturday peak hour, to be conservative. This is not a study intersection and no historic count data was available. The count data is provided in the Technical Attachments.

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using *Synchro* software. Typically, the 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections and only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) for unsignalized intersections based on the HCM 2000 calculations.

At the request of the DES Staff, SimTraffic maximum queue length results are reported for Background (2026), Future (2026), and Future with Mitigations (2026) scenarios at movements where Synchro HCM 2000 results indicate that queues are metered by an upstream signal (denoted with an "m"). SimTraffic analysis calibration parameters, including PHF/AntiPHF adjustments, seeding time, number of recording intervals were determined based on TOSAM Version 2 and as agreed upon with DES Staff. The average results for 10 simulation runs were reported. The maximum queue length results supersede these metered values and were used as the basis for mitigation at these locations.

SimTraffic determines maximum queue length by recording the maximum queue by 2-minute interval within the simulation run, in this case one hour, and reports the absolute maximum out of those two-minute intervals. SimTraffic also reports the average queue length, which is a simple average of every two-minute interval and speaks to the frequency at which long queues occurred during the simulation run. If the average queue is significantly lower than the maximum queue, it can be concluded that long queues will occur infrequently. Table 2 shows the maximum and average queues reported for each peak hour as well as the average value for all 10 runs (i.e., the average of maximum queues and the average of average queues).

AM Peak Hour

All increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only. With the recommended mitigations in place, the maximum queue for the southbound left turn is 67 feet, based on 10 simulation runs, as shown in Table 2.

While the queue may occasionally extend to 67 feet as the maximum queue results show, the average queue for the entire peak hour is 16 feet which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the AM peak hour.

PM Peak Hour

All increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only. With the recommended mitigations in place, the maximum queue for the southbound left turn is 69 feet, based on 10 simulation runs, as shown in Table 2.

While the queue may occasionally extend to 69 feet as the maximum queue results show, the average queue for the entire peak hour is 20 feet which indicates that queues will be significantly shorter than the 69 feet of available storage during the majority of the PM peak hour.

Saturday Peak Hour

Most increases in delay and/or queues attributable to the project were mitigated through signal timing adjustments only; however, there was one impact attributable to the project that were not able to mitigate. The queue for the northbound thru movement on N. Glebe Road at 7th Street N. extends beyond the available storage by 74 feet. Since the northbound thru and the new southbound left turn are competing for capacity at this signal, we are unable to mitigate this queue without exacerbating the maximum queue for the southbound left turn. The spillback is primarily due to the reduced thru capacity along N. Glebe Road during the Saturday peak, compared to the AM or PM peak, as street parking is only restricted for weekday peak periods. This is typical in urban areas like this with closely spaced signals, and the queue will ultimately be managed/metered by the signal at Carlin Springs Road (as opposed to cars stopping in the middle of the intersection and blocking Carlin Springs Road). Based on observations of the SimTraffic simulation, the queue is able to clear while the signal is red at Carlin Springs Road and cars are able to proceed along Glebe Road in the next cycle.

In order to improve progression along N. Glebe Road between the signals at Wilson Boulevard and 7th Street, the left turn phasing for the N. Glebe Road approaches at Wilson Boulevard was also modified. Under existing conditions, these left turns operate under lead-lag phasing rather than running concurrently. The updated analysis includes modified phasing to include concurrent, leading left turn phasing. There is precedent for this modification as this is how they operate during the AM peak today. With the recommended mitigations in place, the maximum queue for the southbound left turn is 66 feet, as shown in Table 2.

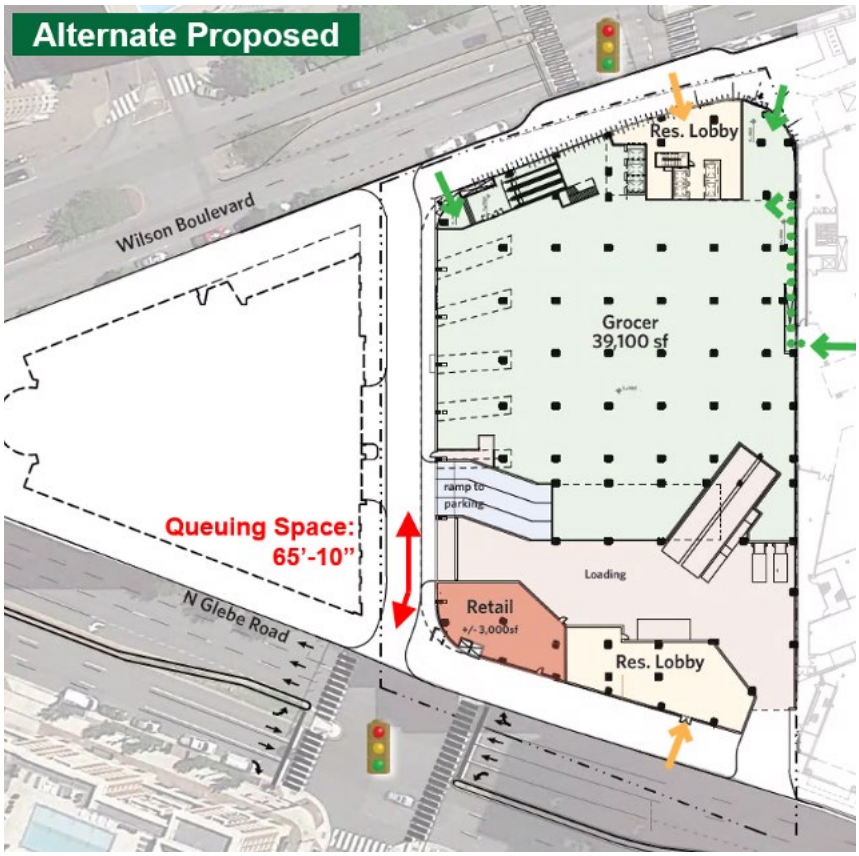
While the queue may occasionally extend to 66 feet as the maximum queue results show, the average queue is 20 feet which indicates that queues will be significantly shorter than the 20 feet of available storage during the majority of the Saturday peak hour.

Table 2: Southbound Left turn SimTraffic Queuing Results by Run (With Fairfax Drive & N. Glebe Road Intersection)

Peak Hour	Maximum Queue (ft)	Average Queue (ft)
AM	67	16
PM	69	20
Saturday	66	20

Responses to DES Memorandum

The memorandum provided by DES TE&O staff, dated June 15, 2022, was to serve as guidance to the developer team for the preferred site alternative, shown below. This included a list of items that would be required for review if this alternative is to be further developed throughout the site plan process. Gorove Slade responses to each item are provided in this section.



Safety

- Identify the safety implications and proposed mitigations of introducing a left turn pocket at SB N. Glebe Road/7th Street North. Below are areas of concern:
    - Existing pedestrian refuge of ne feet to be affected

      GS Response: The nine-foot wide pedestrian refuge that exists today is possible because there is no southbound left turn lane, and that width is needed for alignment with the left turn lane on the opposite approach. While the pedestrian refuge width will be reduced to six feet as part of the proposed plan, it meets the minimum width recommended by VDOT and NACTO guidelines. Additional improvements are proposed to offset the reduction in pedestrian refuge width, including:

        - *Narrowing the width of the lanes on the northern approach of N. Glebe Road which, in turn, shortens the pedestrian crossing north of the median;*
        - *Implementing a NRTOR restriction out of the alley onto N. Glebe Road to limit vehicle-pedestrian conflicts;*
        - *Adding LPIs to reinforce pedestrian priority and enhance pedestrian visibility in the intersection;*

- *Providing protected-only left turn phasing to minimize conflicts with pedestrians crossing N. Glebe Road at the alley;*
- *Potential additional safety elements like bell bollards, in coordination with the County and VDOT; and*
- *Potential addition of a pedestrian refuge on the southern leg of the intersection, in coordination with the County and VDOT.*

- Proposed southbound left turn lane is sufficient to accommodate three to four vehicles (75' storage pocket modeled per 2.11.22 MMTA Revision) and Future queueing results show the pocket queue to be 74' in both AM and PM peaks.

  GS Response: Based on the proposed 4.1 site plan, there is 85 feet of storage space for the left turn that is at least eight feet wide; however, this impacts the existing 252 feet of storage space for the northbound left at Wilson Boulevard by approximately 16 feet. To avoid impacting the northbound left, the storage space for the southbound left would instead be 69 feet, giving those 16 feet back to the northbound left as it exists today. The storage for the southbound left turn lane cannot be increased from 69 feet without impacting the storage for the northbound left turn lane at Wilson Boulevard which already spills back today.

  The revised SimTraffic analysis shows that future queues will be a maximum of 70 feet in both the AM and PM peaks. SimTraffic determines maximum queue length by recording the maximum queue by two-minute interval within the simulation run, in this case one hour, and reports the absolute maximum out of those two-minute intervals, even if it only occurs once during in the peak hour. SimTraffic also reports the average queue length, which is a simple average of every two-minute interval and speaks to the frequency at which long queues occurred during the simulation run. If the average queue and maximum queue are similar, it can be concluded that long queues will occur frequently.

  The SimTraffic analysis also shows that the average queue for the southbound left turn lane will be no more than 20 feet in the AM and PM peaks. This shows that while queues may occasionally extend to the maximum queue length, they are significantly shorter during the majority of the peak hours.

  We believe that this is a conservative analysis. Recent data collected along similar roadways in the County shows that the underlying traffic volumes are lower than what was used in the analysis, with data showing an approximately 15 percent decrease in traffic during peak hours compared to pre-COVID data. There is a decent likelihood that an analysis using current data would indicate lower queues than the conservative analysis submitted as part of the MMTA which was based on pre-pandemic data

- Identify the safety implications and proposed mitigations of introducing an intense loading facility use adjacent to retail/residential parking garage in a constrained alley:

  - There is no separation between the loading facilities and retail/residential garage entrance/exit

    GS Response: The alley will function as an enhanced alley with dedicated space for pedestrians to navigate through it and conflicts between loading, garage traffic, and pedestrians will be managed. Closely spaced garage and loading entrances/exits are typical for alleys in urbanized areas and throughout the County and can be effectively managed through a Loading Dock Management Plan (LDMP). Elements of the LDMP could include:

    - *Designate a Loading Dock Manager (LDM) to supervise and direct all loading dock operations*
    - *Disseminate and post suggested truck routing maps and entrance/exit restrictions to drivers from delivery services that frequently use the loading dock*
      - *The LDM will monitor and coordinate inbound and outbound truck maneuvers to both minimize conflicting movements between trucks and other traffic and manage parking ramp traffic at the alley intersection.*

As outlined in the MTP, the primary purpose of an alley is to provide for loading and parking access. Alleys most commonly do not provide separate areas for pedestrian travel, but they may serve as pedestrian routes and could include walkways, provided such facilities do not diminish the usability of the alley for other purposes, which the proposed design meets.

- Private alley known to have pedestrian traffic and is proposed to have four (4) driveways per recommended alternative as opposed to today's conditions of only two (2) driveways.

  GS Response: After extensive exploration of seven alternatives, and given the constraints of the site and the needs of the grocer, we believe this is the most balanced plan in terms of safety and operations. Loading access has been designed to include the curb cut on N. Glebe Road to minimize conflicts between backing trucks and pedestrians/garage traffic within the alley. The alley will function as an enhanced alley with dedicated space for pedestrians to navigate through it and potential conflicts between loading, garage traffic, and pedestrians will be managed. This is above and beyond what is expected of a typical alley.

Operations

- Identify the operational impacts and proposed mitigations of introducing a left turn pocket at N. Glebe Road/7th Street North. Below are areas of concern:

  - The proposed left turn pocket is seen to be at capacity per 2.11.22 MMTA Revision for both AM/PM peaks.

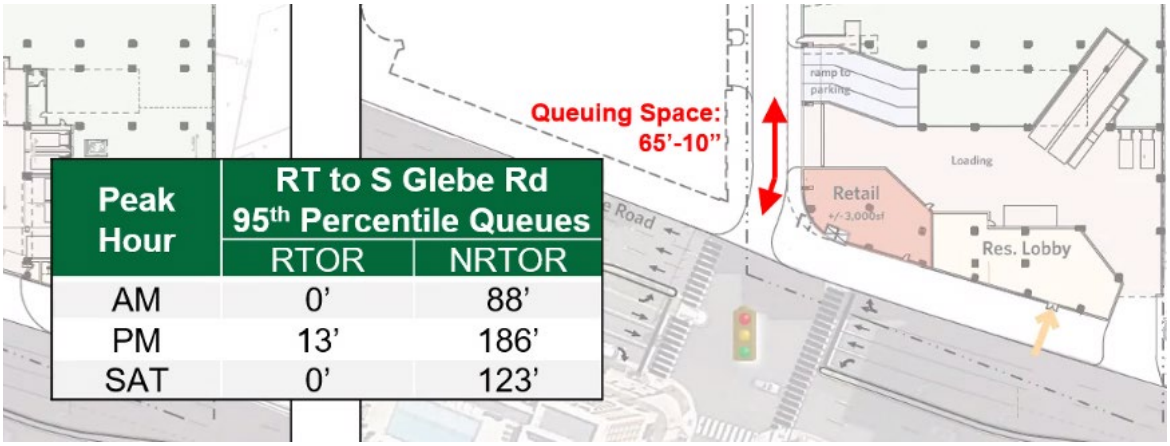
    GS Response: Based on the proposed 4.1 site plan, there is 85 feet of storage space for the left turn that is at least 8 feet wide; however, this impacts the existing 252 feet of storage space for the northbound left at Wilson Boulevard by approximately 16 feet. To avoid impacting the northbound left, the storage space for the southbound left would instead need to be 69 feet, giving those 16 feet back to the northbound left as it exists today. The storage for the southbound left turn lane cannot be increased from 69 feet without impacting the storage for the northbound left turn lane at Wilson Boulevard which already spills back today.

    The revised SimTraffic analysis shows that future queues will be a maximum of 70 feet in both the AM and PM peaks. SimTraffic determines maximum queue length by recording the maximum queue by two-minute interval within the simulation run, in this case one hour, and reports the absolute maximum out of those two-minute intervals, even if it only occurs once during in the peak hour. SimTraffic also reports the average queue length, which is a simple average of every two-minute interval and speaks to the frequency at which long queues occurred during the simulation run. If the average queue and maximum queue are similar, it can be concluded that long queues will occur frequently.

    The SimTraffic analysis also shows that the average queue for the southbound left turn lane will be no more than 20 feet in the AM and PM peaks. This shows that while queues may occasionally extend to the maximum queue length, they are significantly shorter during the majority of the peak hours.

    We believe that this is a conservative analysis. Recent data collected along similar roadways in the County shows that the underlying traffic volumes are lower than what was used in the analysis, with data showing an approximately 15 percent decrease in traffic during peak hours compared to pre-COVID data. There is a decent likelihood that an analysis using current data would indicate lower queues than the conservative analysis submitted as part of the MMTA which was based on pre-pandemic data.

- Identify the operational impacts of signalizing the alley at N. Glebe Road and introducing access points for both retail/residential uses and loading uses. Queueing space was shown to be insufficient based on developer's analysis; see below:



Peak Hour	RT to S Glebe Rd 95th Percentile Queues	
	RTOR	NRTOR
AM	0'	88'
PM	13'	186'
SAT	0'	123'

GS Response: As expected, allowing RTOR results in significantly lower queues. The NRTOR restriction was a request by staff in response to the MMTA and was not originally contemplated. This results in a reduction of capacity and an increase in expected queues. Consistent with previous comments from staff, the garage ramp was shifted further north in the proposed alternate plan to be across from the existing driveway on the opposite side, providing additional queuing space. There are site/easement related considerations that limit the ability to shift the driveway further north.

Similar to the NRTOR restriction, additional improvements at this signal were requested by staff to prioritize pedestrian movements over vehicular movements at this intersection, which will lead to higher vehicular delay/queues at this intersection, including protected-only phasing for new southbound left turn and leading pedestrian intervals (LPIs). To reduce queues exiting the alley and to provide some additional capacity to N. Glebe Road, right-turn overlap phases for the alley and 7th Street N. were added. This significantly reduces queues within the alley as a result of the NRTOR restriction.

The analysis shows there is available capacity at Wilson Boulevard, and it is expected that traffic will naturally redirect to where there is capacity when queues are present. The alley will function as an enhanced alley with dedicated space for pedestrians to navigate through it and potential conflicts between loading, garage traffic, and pedestrians will be managed.

Recommendations

- Developer to list safety implications and proposed mitigations for areas of concern noted above

  GS Response: While the pedestrian refuge width will be reduced as part of the proposed plan, it will continue to meet the minimum width recommended by VDOT and NACTO. Additional improvements are proposed to offset the reduction in pedestrian refuge width, including shortened pedestrian crossing distance, a NRTOR restriction from the alley, LPIs, protected-only left turn phasing, and other potential safety elements in coordination with the County and VDOT. Figure 1 shows the pedestrian improvements at the intersection of the alley with N. Glebe Road.

  Based on the proposed 4.1 site plan, there is 85 feet of storage space for the left turn that is at least eight feet wide; however, this impacts the existing 252 feet of storage space for the northbound left at Wilson Boulevard by approximately 16 feet. To avoid impacting the northbound left, the storage space for the southbound left would instead need to be 69 feet, which affords those 16 feet to be returned/incorporated back into the northbound left (as it exists today). The storage for the southbound left turn lane cannot be increased from 69 feet without impacting the storage for the northbound left turn lane at Wilson Boulevard which already spills back today.

- Continue to explore other alternatives that do not degrade the safety or operations of roadways/intersections nearby

  GS Response: After extensive exploration of seven alternatives, and given the constraints of the site and the requests of the grocer, we believe this is the most balanced plan in terms of safety and operations.

- Do not modify volumes to show post pandemic trends – per scoping agreement.

  GS Response: This should be considered a conservative analysis. Recent data collected along similar roadways in the County shows that the underlying traffic volumes are lower than what was used in the analysis, with data showing an approximately 15 percent decrease in traffic during peak hours compared to pre-COVID data. There is a decent likelihood that an analysis using current data would indicate lower queues than the conservative analysis submitted as part of the MMTA which was based on pre-pandemic data. However, no modifications to volumes were included in the revised analysis.

Conclusions

Discussions with County DES staff regarding the Ballston Macy's redevelopment project began in October 2020. During initial discussions regarding the project, both the Applicant team and staff recognized the importance of providing a left turn from N. Glebe Road into the site given the superblock configuration. This superblock configuration does not allow for direct access to the property for any traffic that is moving west along Wilson Boulevard or south along N. Glebe Road.

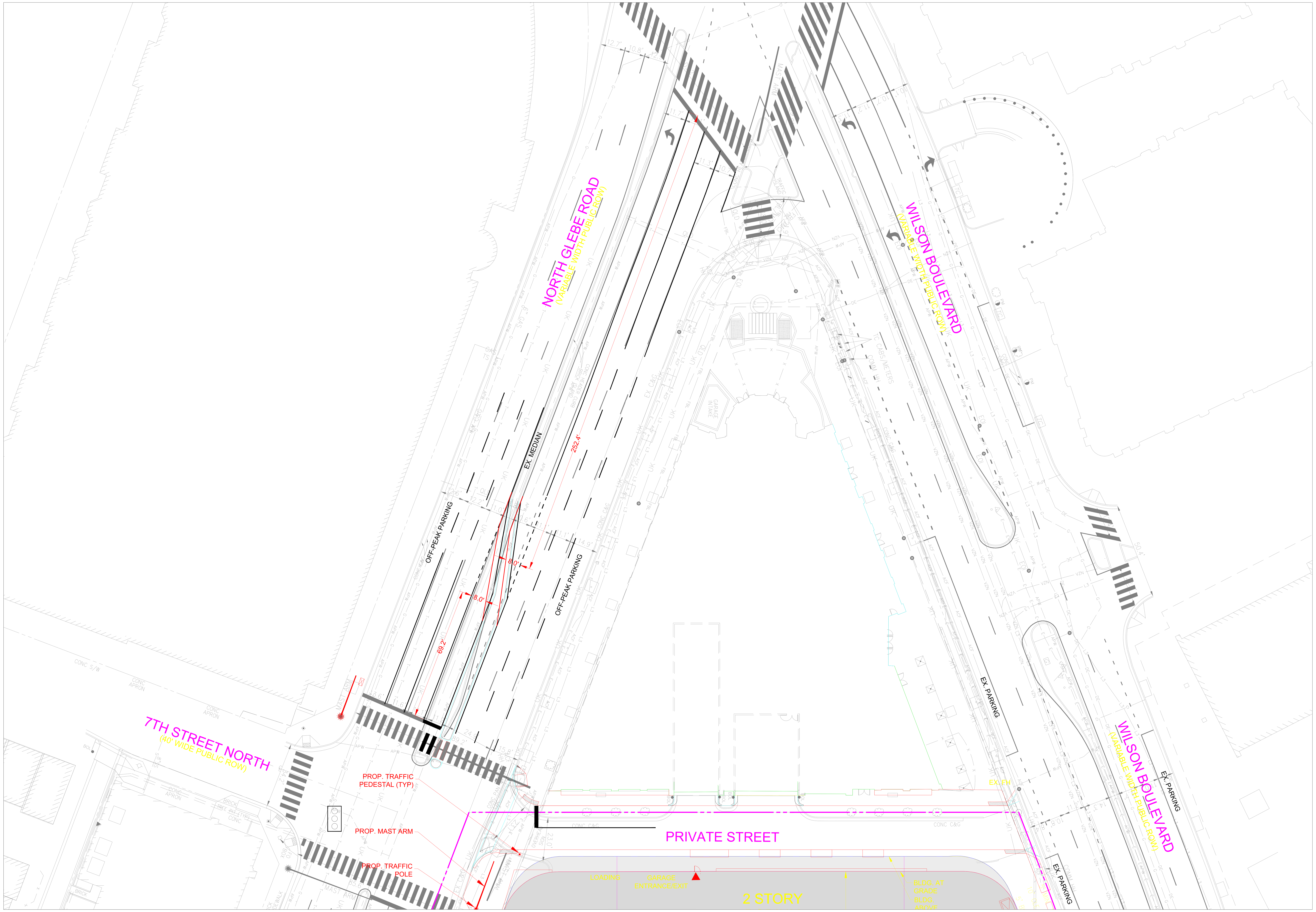
Since October 2020, Gorove Slade and the Applicant team have engaged in a series of ongoing collaborations with staff, and have provided additional information and analyses, as requested. At each stage, the Applicant has been asked to consider/study increasingly expansive criteria that, is has been demonstrated, result in additional stress on the queuing scenarios as it relates to the southbound left turn lane storage, even in light of the project's urban context. We believe that a balanced response to the information and analyses includes the 69-foot storage lane we are currently proposing; alternatively, in the most conservative scenario, it is possible to add between one and six feet of storage by reallocating it from the northbound left turn lane at Wilson Boulevard. We will continue to work with staff to refine the operational strategies as it relates to the private alley.

We look forward to working with the County to implement the operational and geometrical improvements discussed in the memorandum that follows and as summarized in Figure 1, as well as continuing coordination with the County as we move through the SPRC process.

APPENDIX:

(Note: Click on heading to navigate directly to each section of the Appendix)

A. Southbound Left-Turn Lane Exhibit



LEGEND

- PROPOSED BUILDING PODIUM
- PROPOSED BUILDING TOWER
- PROPOSED BUILDING OVERHANG
- PROPOSED LIMITS OF GARAGE
- PROPOSED PEDESTRIAN ENTRANCE
- EXISTING SIGNALIZED INTERSECTION

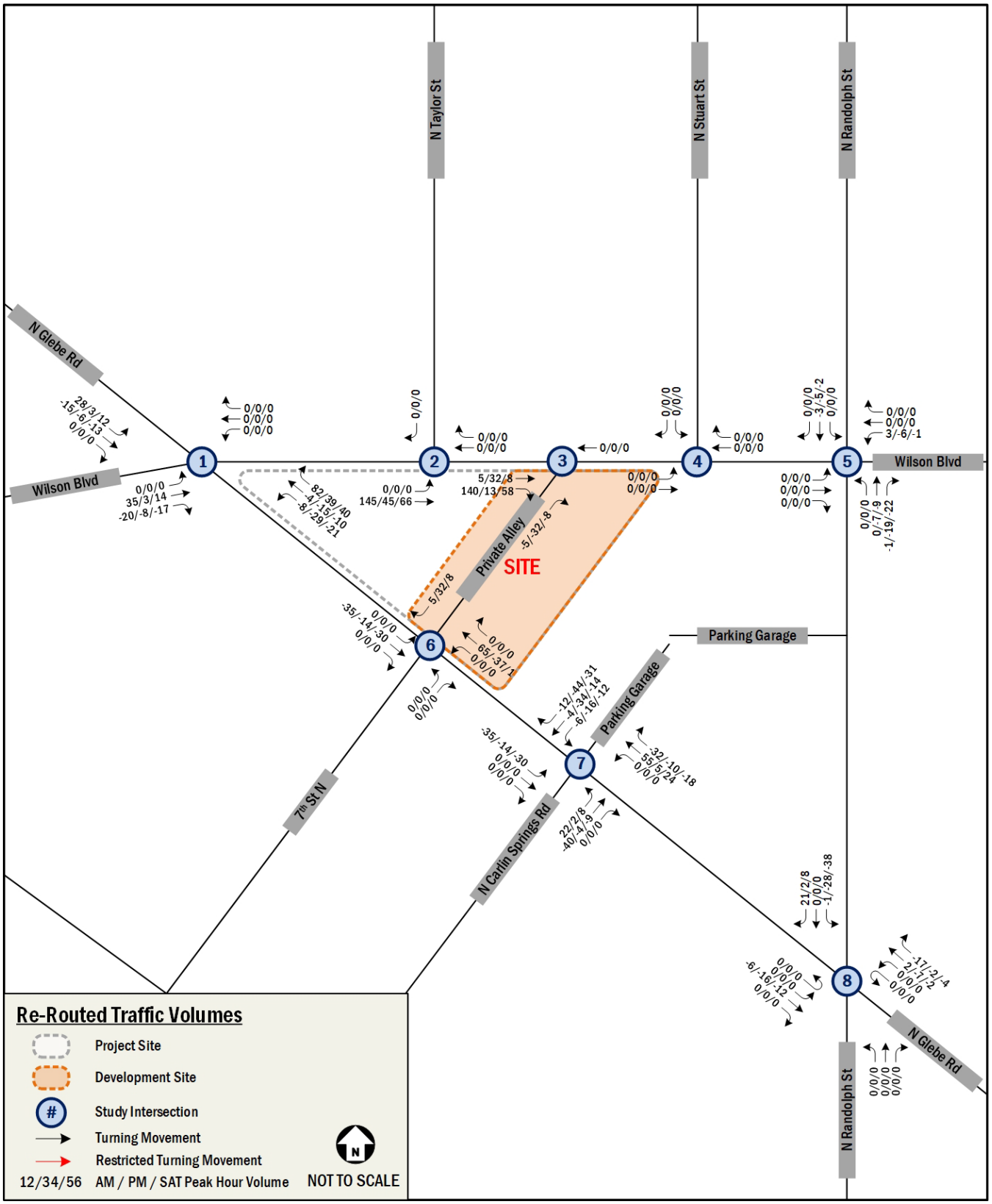
GRAPHIC SCALE

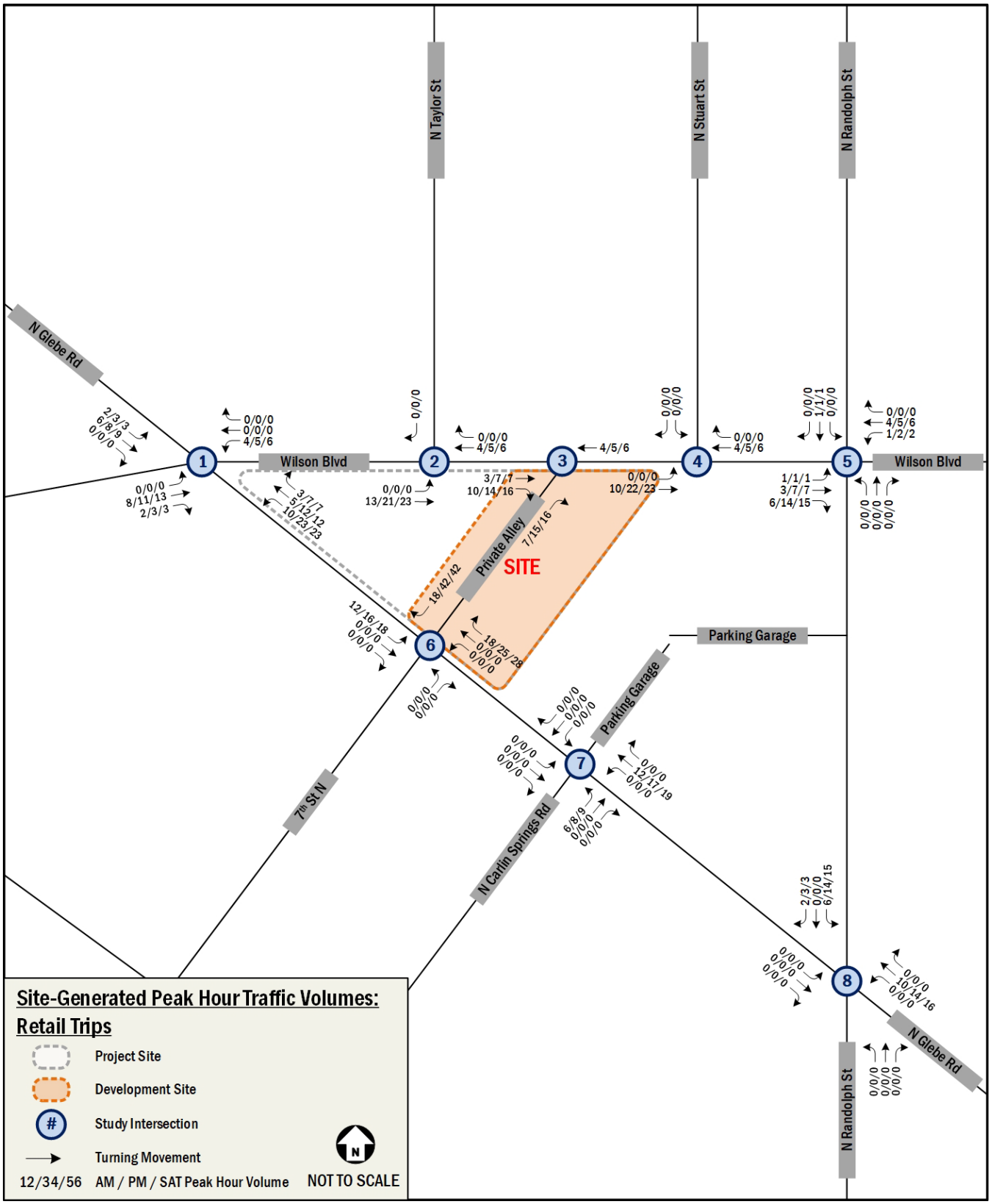
(IN FEET)
1 inch = 25 ft.

STRIPING AND MARKING PLAN

1"=25'

B. Re-Routed, Site-Generated, and 2026 Future Peak Hour Traffic Volumes


N Taylor St
N Stuart St
N Randolph St
N Glebe Rd
Wilson Blvd
Private Alley
SITE
Parking Garage
Parking Garage
7th St N
N Carlin Springs Rd
Wilson Blvd
N Randolph St
N Glebe Rd
1
2
3
4
5
6
7
8
Re-Routed Traffic Volumes
Project Site
Development Site
Study Intersection
Turning Movement
Restricted Turning Movement
12/34/56 AM / PM / SAT Peak Hour Volume
NOT TO SCALE


N Taylor St
N Stuart St
N Randolph St
N Glebe Rd
Wilson Blvd
Wilson Blvd
Private Alley
SITE
Parking Garage
Parking Garage
7th St N
N Carlin Springs Rd
N Randolph St
N Glebe Rd
1
2
3
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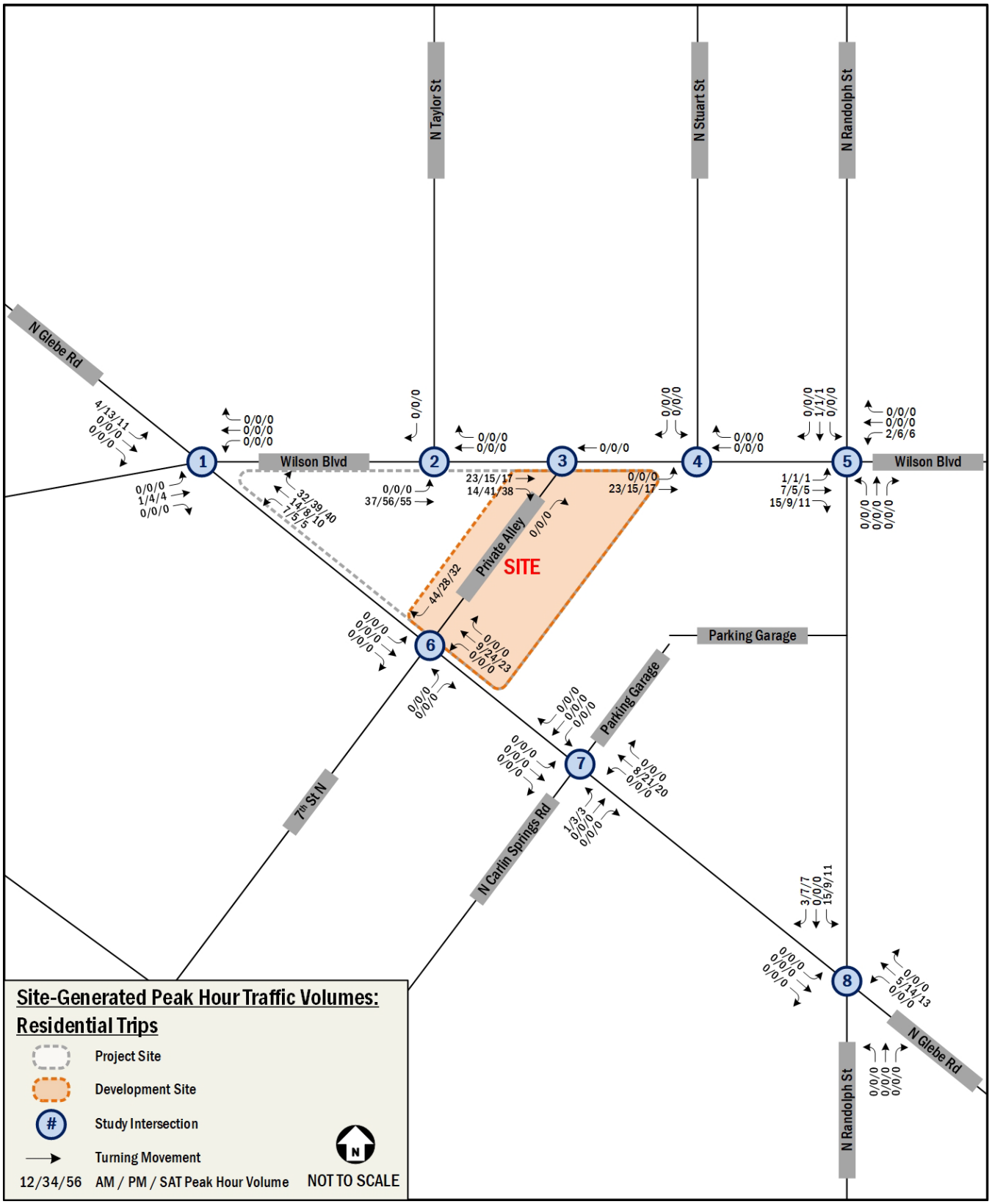
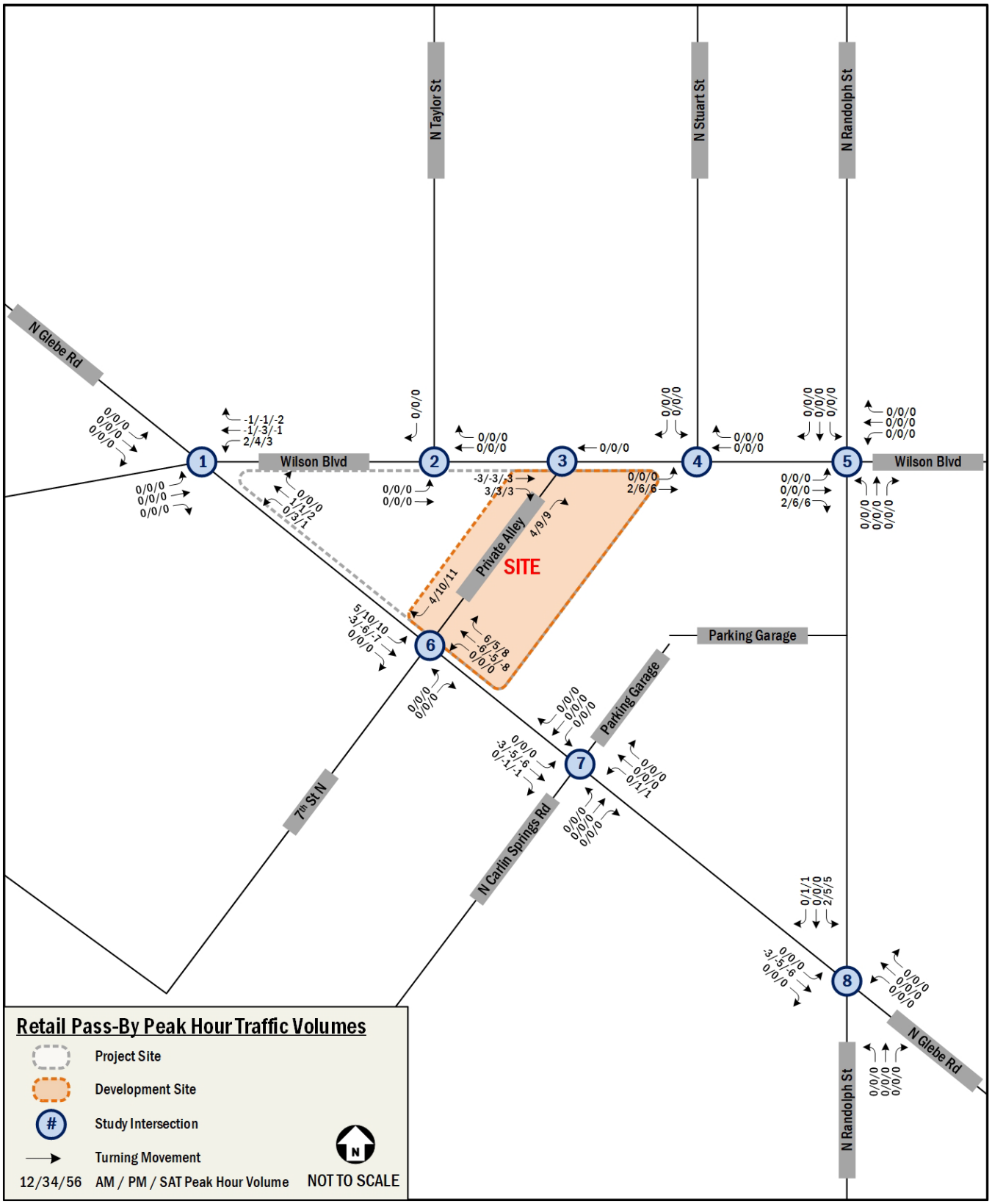
8
Site-Generated Peak Hour Traffic Volumes:
Retail Trips
Project Site
Development Site
Study Intersection
Turning Movement
12/34/56 AM / PM / SAT Peak Hour Volume
NOT TO SCALE


N Taylor St
N Stuart St
N Randolph St
N Glebe Rd
Wilson Blvd
Wilson Blvd
Private Alley
SITE
Parking Garage
Parking Garage
7th St N
N Carlin Springs Rd
N Randolph St
N Glebe Rd
1
2
3
4
5
6
7
8
Site-Generated Peak Hour Traffic Volumes:
Residential Trips
Project Site
Development Site
Study Intersection
Turning Movement
12/34/56 AM / PM / SAT Peak Hour Volume
NOT TO SCALE


N Taylor St
N Stuart St
N Randolph St
N Glebe Rd
Wilson Blvd
Wilson Blvd
Private Alley
SITE
Parking Garage
Parking Garage
7th St N
N Carlin Springs Rd
N Randolph St
N Glebe Rd
1
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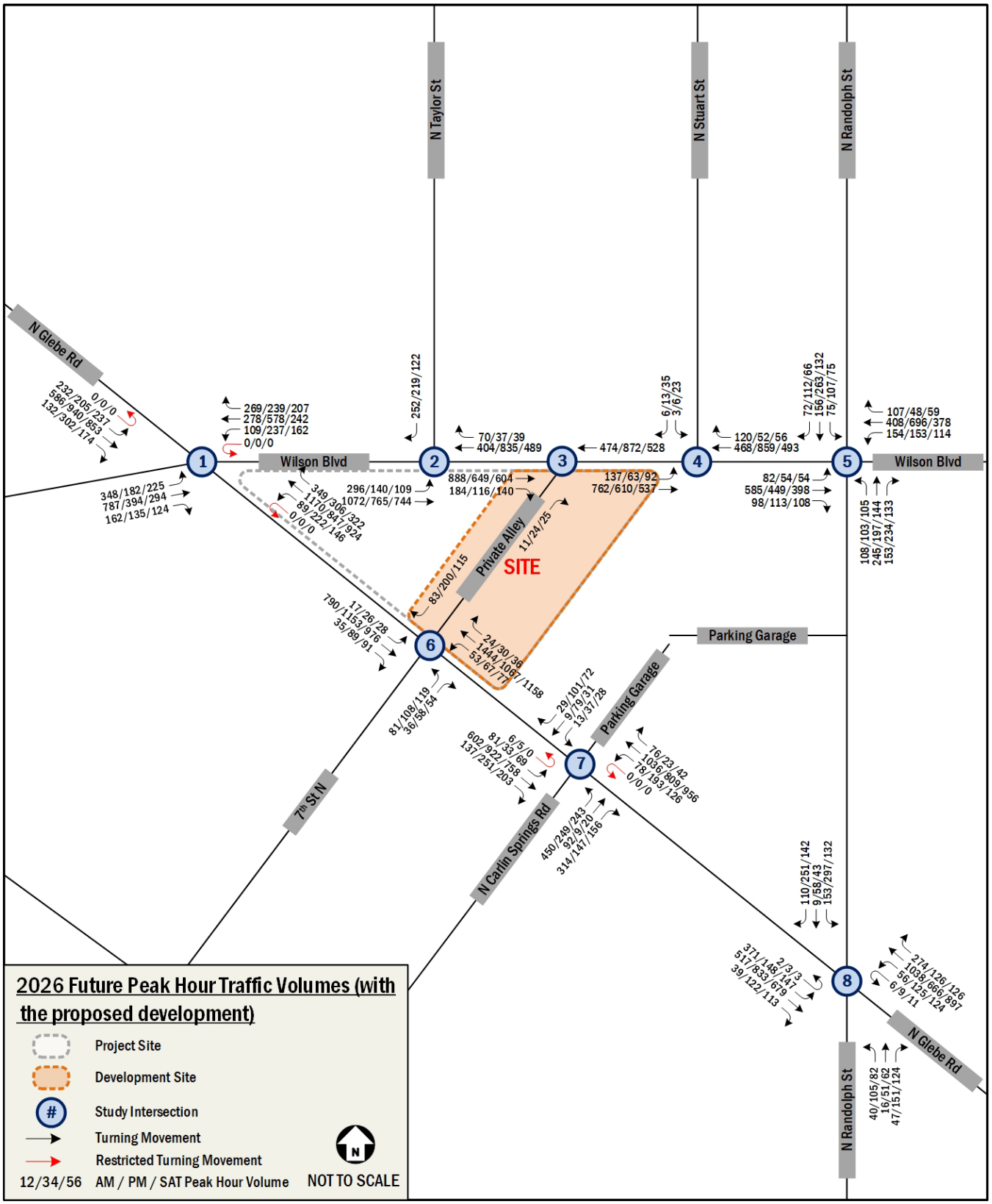
8
Retail Pass-By Peak Hour Traffic Volumes
Project Site
Development Site
Study Intersection
Turning Movement
12/34/56 AM / PM / SAT Peak Hour Volume
NOT TO SCALE


N Taylor St
N Stuart St
N Randolph St
N Glebe Rd
Wilson Blvd
Private Alley
SITE
Parking Garage
Parking Garage
7th St N
N Carlin Springs Rd
N Randolph St
N Glebe Rd
Wilson Blvd
1
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3
4
5
6
7
8
232/205/237
586/940/853
132/302/174
0/0/0
269/239/207
278/578/242
109/237/162
0/0/0
252/219/122
70/37/39
404/835/489
474/872/528
6/13/35
3/6/23
120/52/56
468/859/493
72/112/66
156/263/132
75/107/75
107/48/59
408/696/378
154/153/114
348/182/225
787/394/294
162/135/124
349/306/322
1170/847/924
89/222/146
0/0/0
296/140/109
1072/765/744
888/649/604
184/116/140
137/63/92
762/610/537
82/54/54
585/449/398
98/113/108
108/103/105
245/197/144
153/234/133
83/200/115
11/24/25
790/1153/976
35/89/91
17/26/28
24/30/38
144/1067/1158
53/67/71
81/108/119
36/58/54
29/101/72
9/19/31
13/37/28
6/5/0
81/33/69
602/922/758
137/251/203
76/23/42
1036/809/956
78/193/126
0/0/0
450/249/243
82/9/20
314/147/156
110/251/142
9/58/43
153/297/132
371/148/141
517/833/679
39/122/113
2/3/3
274/128/126
1038/686/897
56/125/124
6/9/11
40/105/82
16/51/62
47/151/124
2026 Future Peak Hour Traffic Volumes (with the proposed development)
Project Site
Development Site
Study Intersection
Turning Movement
Restricted Turning Movement
12/34/56 AM / PM / SAT Peak Hour Volume
N
NOT TO SCALE

C. LOS and Queue Summary Tables: With N Vermont Street Pedestrian Crossing

Intersection and Lane Group	Storage Length (ft)	Background (2026)						Future (2026)						Future (2026) with Mitigations					
		AM Peak		PM Peak		Saturday Peak		AM Peak		PM Peak		Saturday Peak		AM Peak		PM Peak		Saturday Peak	
		50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)
1. Wilson Boulevard & N Glebe Road																			
Eastbound Left	290	261	#464	107	#171	144	214	261	#464	107	#169	144	214	264	#484	108	#185	148	220
Eastbound Thru	485	360	442	143	192	101	141	388	473	151	201	114	156	388	473	151	201	114	156
Eastbound Right	180	58	110	4	40	5	46	50	97	2	38	0	35	51	99	2	37	25	65
Westbound Left	225	65	109	138	206	94	148	69	#136	145	214	100	155	70	#148	147	#224	103	160
Westbound Thru	250	121	166	244	310	97	138	120	166	242	308	97	137	120	166	242	308	93	131
Westbound Right	170	186	270	96	143	88	134	185	270	95	143	88	133	178	260	95	143	114	172
Northbound Left	270	67	116	~211	#384	111	#241 (180)	86	135	~218	#388	114	m#211 (174)	89	125	171	#351	141	m#224 (175)
Northbound TR	350	492	#579	147	234	--	--	~511	#689	#689	#445	--	--	~594	#676	#676	#196	--	--
Northbound Thru	350	--	--	--	--	446	#574	--	--	--	--	292	#566	--	--	--	--	334	#554
Northbound Right	100	--	--	--	--	38	30	--	--	--	--	21	#199	--	--	--	--	19	67
Southbound Left	260	~182	#362	171	#294	205	#337	~277	#439	191	#336	232	#397	~249	#432	132	#301	215	#373
Southbound TR	320	184	238	405	469	--	--	183	235	406	469	--	--	174	224	281	337	--	--
Southbound Thru	815	--	--	--	--	395	482	--	--	--	--	402	491	--	--	--	--	367	448
Southbound Right	100	--	--	--	--	0	0	--	--	--	--	0	0	--	--	--	--	0	0
2. Wilson Boulevard & N Taylor Street																			
Eastbound LT	250	--	37	--	21	--	11	--	37	--	21	--	11	--	--	--	--	--	--
Westbound TR	190	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
Southbound Right	640	--	43	--	34	--	16	--	43	--	34	--	16	--	--	--	--	--	--
3. Wilson Boulevard & Internal Roadway																			
Eastbound TR	70	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
Northbound Right	125	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
4. Wilson Boulevard & N Stuart Street																			
Eastbound Left	120	38	68	16	36	24	48	38	68	16	36	24	48	--	--	--	--	--	--
Eastbound Thru	190	125	166	91	124	76	106	133	175	99	134	85	116	--	--	--	--	--	--
Westbound TR	275	76	98	91	110	64	83	76	99	91	110	64	83	--	--	--	--	--	--
Southbound Left	245	1	8	3	13	10	29	1	8	3	13	10	29	--	--	--	--	--	--
Southbound Right	50	0	10	0	14	0	22	0	10	0	14	0	22	--	--	--	--	--	--
5. Wilson Boulevard & N Randolph Street																			
Eastbound Left	180	18	34	15	31	15	31	18	34	15	32	15	32	--	--	--	--	--	--
Eastbound TR	315	73	93	71	92	56	84	76	95	75	97	62	89	--	--	--	--	--	--
Westbound Left	150	52	91	50	89	37	70	54	94	51	90	40	74	--	--	--	--	--	--
Westbound TR	315	121	172	190	261	103	150	122	174	192	262	105	153	--	--	--	--	--	--
Northbound Left	115	45	92	46	108	43	87	45	92	46	#113	43	87	--	--	--	--	--	--
Northbound TR	250	178	291	193	#359	112	195	178	290	176	297	98	173	--	--	--	--	--	--
Southbound Left	160	32	75	52	#138	30	67	32	75	51	#129	30	66	--	--	--	--	--	--
Southbound TR	300	83	146	173	278	68	123	83	146	172	276	68	123	--	--	--	--	--	--
6. N Glebe Road & 7th Street N / Internal Roadway																			
Eastbound Left	200	65	114	79	135	93	153	67	118	82	139	96	158	67	118	82	139	96	158
Eastbound Right	90	28	61	42	82	41	81	25	51	36	66	35	68	25	51	36	66	35	68
Westbound Right	220	0	0	6	51	0	0	23	62	41	97	0	33	23	62	36	85	0	33
Northbound Left	140	44	m72 (115)	44	m103 (135)	71	114 (139)	51	m79 (130)	62	m113 (140)	74	m#121 (140)	51	m77 (139)	63	m109 (139)	76	m125 (140)
Northbound Thru	375	113	m75 (295)	62	91	84	56	--	--	--	--	547	638	--	--	--	--	237	438
Northbound TR	375	--	--	--	--	--	--	148	m215 (359)	265	327	--	--	148	m256 (367)	282	315	--	--
Northbound Right	175	--	--	--	--	--	--	--	--	--	--	0	m0 (80)	--	--	--	--	0	m1 (80)
Southbound Left	69	--	--	--	--	--	--	16	m30 (110)	24	m32 (110)	13	m24 (108)	16	m36 (69)	16	m20 (70)	22	m36 (75)
Southbound TR	380	113	135	86	123	--	--	227	268	346	411	--	--	227	268	119	142	--	--
Southbound Thru	380	--	--	--	--	122	228	--	--	--	--	107	179	--	--	--	--	82	115
Southbound Right	50	--	--	--	--	1	m10 (55)	--	--	--	--	0	m0 (52)	--	--	--	--	1	m0 (51)
7. N Glebe Road & N Carlin Springs Road / Ballston Parking																			
Eastbound Left	175	413	#645	192	273	196	276	~485	#706	204	287	218	296	~454	#688	204	301	218	#366
Eastbound Thru	190	90	145	9	24	21	44	61	106	6	18	14	33	60	103	6	19	14	37
Eastbound Right	155	201	282	74	104	96	122	201	282	74	104	95	117	195	273	74	106	95	148
Westbound Left	50	12	32	36	67	29	56	8	25	25	50	20	42	8	24	25	53	20	47
Westbound Thru	50	8	24	78	121	32	60	6	19	54	89	22	45	6	18	54	93	22	51
Westbound Right	50	27	56	105	156	79	123	19	43	71	112	53	88	18	42	71	118	53	99
Northbound Left	245	81	m106 (240)	171	#279	127	197	82	m107 (240)	172	#280	128	196	82	m102 (240)	180	263	127	197
Northbound TR	450	342	397	205	271	104	134	356	419	212	280	116	148	345	443	93	122	84	110
Southbound Left	220	64	101	24	48 (192)	50	84 (200)	29	57	18	m34 (200)	34	m61 (200)	28	47	18	m0 (85)	36	m63 (112)
Southbound TR	375	179	208	221	246	381	#583	241	283	404	455	395	#595	159	176	99	242	91	90
8. N Glebe Road & N Randolph Street																			
Eastbound Left	190	31	65	64	106	62	109	31	64	64	106	62	109	31	64	--	--	62	109
Eastbound TR	190	49	92	130	193	151	227	49	91	130	193	151	227	49	91	--	--	151	227
Westbound Left	170	114	190	245	#409	119	199	135	218	245	#409	112	190	135	218	--	--	112	190
Westbound Thru	520	7	22	33	62	31	63	7	22	33	62	32	64	7	22	--	--	32	64
Westbound Right	70	0	10	39	104	7	58	0	35	48	117	22	80	0	35	--	--	0	53
Northbound Left	185	61	#119	116	185	125	198	62	#119	116	185	125	198	62	112	--	--	125	198
Northbound TR	430	408	470	196	252	228	288	409	475	203	260	235	296	429	#555	--	--	236	316
Southbound Left	175	~237	#568	125	196	144	m204 (169)	m204 (169)	m204 (169)	m204 (169)	m204 (169)	144	m201 (169)	248	#334	--	--	143	m210 (165)
Southbound TR	450	47	65	332	383	--	--	46	75	325	376	--	--	56	73	--	--	--	--
Southbound Thru	450	--	--	--	--	77	182	--	--	--	--	110	179	--	--	--	--	145	208
Southbound Right	100	--	--	--	--	6	m33 (100)	--	--	--	--	5	m33 (100)	--	--	--	--	13	m43 (100)

95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal.
~ Volume exceeds capacity, queue is theoretically infinite.

Intersection and Movement	Background (2026)						Future (2026)						Future (2026) with Mitigations					
	AM Peak		*PM Peak*		*Saturday Peak*		*AM Peak*		*PM Peak*		*Saturday Peak*		*AM Peak*		*PM Peak*		*Saturday Peak*	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Wilson Boulevard & N Glebe Road																		
Overall	**48.0**	**D**	**44.4**	**D**	**40.5**	**D**	**65.9**	**E**	**53.0**	**D**	**41.0**	**D**	**61.5**	**E**	**48.7**	**D**	**36.3**	**D**
Eastbound Left	68.1	E	35.4	D	31.5	C	67.6	E	35.1	D	31.5	C	76.4	E	38.7	D	38.9	D
Eastbound Thru	51.0	D	36.1	D	37.2	D	54.2	D	36.4	D	37.5	D	54.2	D	36.4	D	37.5	D
Eastbound Right	31.1	C	22.0	C	26.9	C	30.3	C	21.9	C	25.9	C	30.4	C	21.3	C	26.5	C
Westbound Left	41.1	D	37.1	D	34.2	C	47.7	D	40.0	D	34.4	C	54.9	D	43.0	D	33.9	C
Westbound Thru	43.5	D	41.4	D	40.1	D	43.5	D	41.3	D	40.1	D	43.5	D	41.3	D	36.9	D
Westbound Right	33.4	C	26.0	C	28.5	C	33.4	C	26.0	C	28.4	C	31.1	C	25.3	C	25.0	C
Northbound Left	47.1	D	146.5	F	95.4	F	52.9	D	126.1	F	92.7	F	71.0	E	113.3	F	104.9	F
Northbound TR	51.6	D	31.9	C	--	--	91.3	F	67.8	E	--	--	76.5	E	38.7	D	--	--
Northbound Thru	--	--	--	--	53.3	D	--	--	--	--	48.4	D	--	--	--	--	38.9	D
Northbound Right	--	--	--	--	19.5	B	--	--	--	--	25.6	C	--	--	--	--	16.9	B
Southbound Left	115.8	F	62.8	E	67.7	E	172.4	F	75.1	E	86.6	F	115.6	F	79.8	E	75.8	E
Southbound TR	22.6	C	47.4	D	--	--	22.8	C	47.3	D	--	--	38.1	D	59.4	E	--	--
Southbound Thru	--	--	--	--	35.4	D	--	--	--	--	36.6	D	--	--	--	--	28.7	C
Southbound Right	--	--	--	--	0.1	A	--	--	--	--	0.1	A	--	--	--	--	0.1	A
2. Wilson Boulevard & N Taylor Street																		
Eastbound LT	7.6	A	6.4	A	4.1	A	7.4	A	6.2	A	3.8	A	--	--	--	--	--	--
Westbound TR	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--	--	--
Southbound Right	12.7	B	11.9	B	10.7	B	12.7	B	11.9	B	10.7	B	--	--	--	--	--	--
3. Wilson Boulevard & Internal Roadway																		
Eastbound TR	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--	--	--
Northbound Right	10.7	B	10.2	B	10.1	B	11.7	B	10.6	B	10.9	B	--	--	--	--	--	--
4. Wilson Boulevard & N Stuart Street																		
Overall	**7.4**	**A**	**6.6**	**A**	**8.2**	**A**	**7.4**	**A**	**6.6**	**A**	**8.1**	**A**	**--**	**--**	**--**	**--**	**--**	**--**
Eastbound Left	5.7	A	6.6	A	5.6	A	5.7	A	6.7	A	5.6	A	--	--	--	--	--	--
Eastbound Thru	6.2	A	5.7	A	5.9	A	6.3	A	5.8	A	6.0	A	--	--	--	--	--	--
Westbound TR	8.9	A	6.6	A	8.3	A	8.9	A	6.6	A	8.3	A	--	--	--	--	--	--
Southbound Left	30.4	C	30.5	C	30.0	C	30.4	C	30.5	C	30.0	C	--	--	--	--	--	--
Southbound Right	30.3	C	30.3	C	29.6	C	30.3	C	30.3	C	29.6	C	--	--	--	--	--	--
5. Wilson Boulevard & N Randolph Street																		
Overall	**22.0**	**C**	**27.6**	**C**	**19.9**	**B**	**22.5**	**C**	**26.6**	**C**	**19.5**	**B**	**--**	**--**	**--**	**--**	**--**	**--**
Eastbound Left	12.3	B	14.3	B	12.0	B	13.2	B	13.7	B	12.3	B	--	--	--	--	--	--
Eastbound TR	16.6	B	17.4	B	14.3	B	18.8	B	17.0	B	15.0	B	--	--	--	--	--	--
Westbound Left	14.1	B	14.2	B	12.6	B	15.5	B	13.8	B	12.0	B	--	--	--	--	--	--
Westbound TR	19.7	B	22.9	C	17.7	B	20.3	C	22.2	C	17.4	B	--	--	--	--	--	--
Northbound Left	23.6	C	31.6	C	25.2	C	23.7	C	35.4	D	25.8	C	--	--	--	--	--	--
Northbound TR	36.5	D	43.9	D	29.5	C	34.7	C	40.8	D	28.2	C	--	--	--	--	--	--
Southbound Left	25.1	C	44.7	D	24.3	C	24.2	C	39.4	D	24.5	C	--	--	--	--	--	--
Southbound TR	24.2	C	32.0	C	24.5	C	23.6	C	34.0	C	25.0	C	--	--	--	--	--	--
6. N Glebe Road & 7th Street N / Internal Roadway																		
Overall	**12.3**	**B**	**13.3**	**B**	**13.6**	**B**	**18.5**	**B**	**26.1**	**C**	**21.6**	**C**	**19.4**	**B**	**24.2**	**C**	**20.6**	**C**
Eastbound Left	43.3	D	39.1	D	42.0	D	45.8	D	41.6	D	44.6	D	45.8	D	41.6	D	44.6	D
Eastbound Right	42.1	D	38.0	D	40.3	D	38.8	D	34.2	C	35.9	D	38.8	D	34.2	C	35.9	D
Westbound Right	40.2	D	36.3	D	37.9	D	41.6	D	34.2	C	31.6	C	41.6	D	30.7	C	32.0	C
Northbound Left	84.2	F	78.8	E	83.2	F	72.1	E	59.8	E	92.4	F	70.9	E	74.0	E	89.9	F
Northbound Thru	6.9	A	9.2	A	4.4	A	--	--	--	--	22.2	C	--	--	--	--	21.8	C
Northbound TR	--	--	--	--	--	--	10.0	B	27.5	C	--	--	13.4	B	31.2	C	--	--
Northbound Right	--	--	--	--	--	--	--	--	--	--	18.2	B	--	--	--	--	17.9	B
Southbound Left	--	--	--	--	--	--	62.2	E	56.9	E	33.7	C	70.8	E	34.2	C	40.8	D
Southbound TR	11.9	B	8.3	A	--	--	23.0	C	19.3	B	--	--	19.8	B	12.2	B	--	--
Southbound Thru	--	--	--	--	13.4	B	--	--	--	--	11.1	B	--	--	--	--	9.1	A
Southbound Right	--	--	--	--	11.1	B	--	--	--	--	4.9	A	--	--	--	--	3.1	A
7. N Glebe Road & N Carlin Springs Road / Ballston Parking																		
Overall	**51.0**	**D**	**34.7**	**C**	**33.0**	**C**	**51.1**	**D**	**42.8**	**D**	**33.8**	**C**	**47.0**	**D**	**26.5**	**C**	**22.8**	**C**
Eastbound Left	82.8	F	48.9	D	51.4	D	100.5	F	49.6	D	52.9	D	87.6	F	51.3	D	62.0	E
Eastbound Thru	31.1	C	33.0	C	35.7	D	30.2	C	32.7	C	34.6	C	28.9	C	33.3	C	36.8	D
Eastbound Right	31.3	C	24.3	C	28.9	C	31.3	C	24.1	C	28.1	C	29.5	C	24.2	C	30.9	C
Westbound Left	28.9	C	34.6	C	36.3	D	28.7	C	33.9	C	35.1	D	27.4	C	34.5	C	37.3	D
Westbound Thru	28.5	C	35.2	D	35.9	D	28.5	C	34.2	C	34.8	C	27.2	C	34.8	C	37.0	D
Westbound Right	29.3	C	37.1	D	38.5	D	29.0	C	35.5	D	36.4	D	27.7	C	36.1	D	38.8	D
Northbound Left	57.4	E	60.0	E	88.4	F	57.3	E	60.9	E	89.1	F	59.5	E	79.4	E	96.0	F
Northbound TR	59.9	E	23.0	C	11.7	B	58.6	E	22.8	C	12.0	B	57.2	E	13.1	B	8.9	A
Southbound Left	52.4	D	54.0	D	43.7	D	72.4	E	33.3	C	42.9	D	54.1	D	72.0	E	74.4	E
Southbound TR	33.3	C	35.9	D	41.9	D	19.2	B	57.0	E	44.6	D	15.8	B	19.1	B	10.7	B
8. N Glebe Road & N Randolph Street																		
Overall	**43.6**	**D**	**40.2**	**D**	**32.0**	**C**	**43.4**	**D**	**41.3**	**D**	**32.9**	**C**	**43.6**	**D**	**--**	**--**	**34.1**	**C**
Eastbound Left	40.9	D	29.3	C	39.9	D	40.8	D	29.3	C	39.9	D	40.8	D	--	--	39.9	D
Eastbound TR	41.5	D	31.3	C	43.3	D	41.5	D	31.3	C	43.3	D	41.5	D	--	--	43.3	D
Westbound Left	48.1	D	69.3	E	53.0	D	51.6	D	69.3	E	51.0	D	51.6	D	--	--	51.0	D
Westbound Thru	39.7	D	27.5	C	37.8	D	39.6	D	27.5	C	37.9	D	39.6	D	--	--	37.9	D
Westbound Right	40.1	D	29.8	C	38.0	D	40.3	D	30.2	C	38.8	D	40.3	D	--	--	38.0	D
Northbound Left	88.3	F	66.8	E	74.9	E	105.6	F	66.8	E	74.9	E	90.2	F	--	--	74.9	E
Northbound TR	43.2	D	33.3	C	25.4	C	43.3	D	33.5	C	25.6	C	46.9	D	--	--	26.4	C
Southbound Left	86.1	F	54.0	D	82.2	F	79.7	E	48.2	D	81.5	F	69.5	E	--	--	69.0	E
Southbound TR	11.3	B	37.3	D	--	--	11.0	B	41.6	D	--	--	12.0	B	--	--	--	--
Southbound Thru	--	--	--	--	15.0	B	--	--	--	--	18.2	B	--	--	--	--	23.1	C
Southbound Right	--	--	--	--	16.0	B	--	--	--	--	18.9	B	--	--	--	--	28.3	C

D. LOS and Queue Summary Tables: With N Fairfax Drive and N Glebe Road Intersection

Intersection and Lane Group	Storage Length (ft)	Background (2026)						Future (2026)						Future (2026) with Mitigations					
		AM Peak		PM Peak		Saturday Peak		AM Peak		PM Peak		Saturday Peak		AM Peak		PM Peak		Saturday Peak	
		50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)	50th	95th (Max)
1. Wilson Boulevard & N Glebe Road																			
Eastbound Left	290	257	#444	107	#171	144	214	257	#444	107	#169	144	214	264	#484	108	#185	148	220
Eastbound Thru	485	364	446	143	192	101	141	392	#486	151	201	114	156	388	473	151	201	114	156
Eastbound Right	180	49	101	4	40	5	46	41	89	2	38	0	35	51	99	2	38	0	36
Westbound Left	225	64	108	138	206	94	148	68	120	145	214	100	155	70	#148	147	#224	103	160
Westbound Thru	250	121	166	244	310	97	138	120	166	242	308	97	137	120	166	242	308	93	131
Westbound Right	170	175	252	96	143	88	134	173	252	95	143	88	133	178	260	95	143	110	167
Northbound Left	270	67	116	~204	#377	111	#241 (179)	86	135	~213	#382	114	m#211 (170)	83	127	~209	#376	141	m#234 (173)
Northbound TR	350	~547	#653	136	225	--	--	~616	#761	#761	#446	--	--	~573	#676	#676	#196	--	--
Northbound Thru	350	--	--	--	--	446	#574	--	--	--	--	292	#566	--	--	--	--	373	#578
Northbound Right	100	--	--	--	--	38	30	--	--	--	--	21	#199	--	--	--	--	40	84
Southbound Left	260	204	#326	167	m#257 (279)	198	#333	241	#408	185	m#299 (280)	224	#393	~231	#420	187	m#288 (280)	219	#351
Southbound TR	320	90	112	391	448	--	--	86	107	392	449	--	--	239	289	393	428	--	--
Southbound Thru	815	--	--	--	--	288	261	--	--	--	--	352	313	--	--	--	--	329	447
Southbound Right	100	--	--	--	--	0	0	--	--	--	--	0	0	--	--	--	--	0	0
2. Wilson Boulevard & N Taylor Street																			
Eastbound LT	250	--	37	--	21	--	11	--	37	--	21	--	11	--	--	--	--	--	--
Westbound TR	190	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
Southbound Right	640	--	43	--	34	--	16	--	43	--	34	--	16	--	--	--	--	--	--
3. Wilson Boulevard & Internal Roadway																			
Eastbound TR	70	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
Northbound Right	125	--	0	--	0	--	0	--	0	--	0	--	0	--	--	--	--	--	--
4. Wilson Boulevard & N Stuart Street																			
Eastbound Left	120	38	68	16	36	24	48	38	68	16	36	24	48	--	--	--	--	--	--
Eastbound Thru	190	125	166	91	124	76	106	133	175	99	134	85	116	--	--	--	--	--	--
Westbound TR	275	76	98	91	110	64	83	76	99	91	110	64	83	--	--	--	--	--	--
Southbound Left	245	1	8	3	13	10	29	1	8	3	13	10	29	--	--	--	--	--	--
Southbound Right	50	0	10	0	14	0	22	0	10	0	14	0	22	--	--	--	--	--	--
5. Wilson Boulevard & N Randolph Street																			
Eastbound Left	180	18	34	15	31	15	31	18	34	15	32	15	32	--	--	--	--	--	--
Eastbound TR	315	73	93	71	92	56	84	76	95	75	97	62	89	--	--	--	--	--	--
Westbound Left	150	52	91	50	89	37	70	54	94	51	90	40	74	--	--	--	--	--	--
Westbound TR	315	121	172	190	261	103	150	122	174	192	262	105	153	--	--	--	--	--	--
Northbound Left	115	45	92	46	108	43	87	45	92	46	#113	43	87	--	--	--	--	--	--
Northbound TR	250	178	291	193	#359	112	195	178	290	176	297	98	173	--	--	--	--	--	--
Southbound Left	160	32	75	52	#138	30	67	32	75	51	#129	30	66	--	--	--	--	--	--
Southbound TR	300	83	146	173	278	68	123	83	146	172	276	68	123	--	--	--	--	--	--
6. N Glebe Road & 7th Street N / Internal Roadway																			
Eastbound Left	200	65	114	79	135	93	153	67	118	82	139	96	158	67	118	82	139	96	158
Eastbound Right	90	28	61	42	82	41	81	25	51	36	66	35	68	25	51	36	66	35	68
Westbound Right	220	0	0	6	51	0	0	23	62	41	97	0	33	23	62	36	85	0	33
Northbound Left	140	44	m72 (140)	44	m103 (139)	71	114 (139)	51	m79 (140)	62	m113 (140)	74	m#121 (140)	51	m77 (140)	63	m109 (139)	76	m125 (140)
Northbound Thru	375	113	m75 (421)	62	91	84	56	--	--	--	--	547	638	--	--	--	--	250	449
Northbound TR	375	--	--	--	--	--	--	148	m215 (412)	266	330	--	--	148	m256 (416)	282	315	--	--
Northbound Right	175	--	--	--	--	--	--	--	--	--	--	0	m0 (80)	--	--	--	--	0	m1 (80)
Southbound Left	75	--	--	--	--	--	--	15	m33 (110)	24	m32 (109)	13	m24 (106)	15	m37 (67)	15	m20 (69)	21	m36 (66)
Southbound TR	380	99	148	93	123	--	--	234	269	337	415	--	--	234	269	119	145	--	--
Southbound Thru	380	--	--	--	--	131	228	--	--	--	--	122	180	--	--	--	--	111	280
Southbound Right	50	--	--	--	--	1	m10 (58)	--	--	--	--	0	m0 (53)	--	--	--	--	0	m1 (52)
7. N Glebe Road & N Carlin Springs Road / Ballston Parking																			
Eastbound Left	175	413	#645	192	273	196	276	~485	#706	204	287	218	296	~454	#688	204	301	218	#366
Eastbound Thru	190	90	145	9	24	21	44	61	106	6	18	14	33	60	103	6	19	14	37
Eastbound Right	155	201	282	74	104	96	122	201	282	74	104	95	117	195	273	74	106	95	146
Westbound Left	50	12	32	36	67	29	56	8	25	25	50	20	42	8	24	25	53	20	47
Westbound Thru	50	8	24	78	121	32	60	6	19	54	89	22	45	6	18	54	93	22	51
Westbound Right	50	27	56	105	156	79	123	19	43	71	112	53	88	18	42	71	118	53	99
Northbound Left	245	81	m106 (240)	171	#279	127	197	82	m107 (240)	172	#280	128	196	82	m102 (240)	180	263	127	196
Northbound TR	450	342	397	205	271	104	134	356	419	212	280	116	148	345	443	93	122	74	100
Southbound Left	220	64	101	24	48 (159)	50	84	29	57	18	m34 (200)	35	m60 (200)	39	57	18	m0 (113)	36	m63 (116)
Southbound TR	375	190	200	225	250	374	#583	244	285	404	455	383	#594	103	123	92	266	92	93
8. N Glebe Road & N Randolph Street																			
Eastbound Left	190	31	65	64	106	62	109	31	64	64	106	62	109	31	64	--	--	62	109
Eastbound TR	190	49	92	130	193	151	227	49	91	130	193	151	227	49	91	--	--	151	227
Westbound Left	170	114	190	245	#409	119	199	135	218	245	#409	112	190	135	218	--	--	112	190
Westbound Thru	520	7	22	33	62	31	63	7	22	33	62	32	64	7	22	--	--	32	64
Westbound Right	70	0	10	39	104	7	58	0	35	48	117	22	80	0	35	--	--	0	53
Northbound Left	185	61	#119	116	185	125	198	62	#119	116	185	125	198	62	112	--	--	125	198
Northbound TR	430	408	470	196	252	228	288	409	475	203	260	235	296	429	#555	--	--	236	316
Southbound Left	175	~227	#568	128	196	144	m204 (167)	~200	#565	145	#221	144	m201 (200)	282	#489	--	--	144	m211 (168)
Southbound TR	450	47	65	332	383	--	--	46	75	325	376	--	--	56	73	--	--	--	--
Southbound Thru	450	--	--	--	--	77	182	--	--	--	--	116	178	--	--	--	--	136	206
Southbound Right	100	--	--	--	--	6	m33 (100)	--	--	--	--	8	m33 (100)	--	--	--	--	8	m40 (100)

95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal.
~ Volume exceeds capacity, queue is theoretically infinite.

Intersection and Movement	Background (2026)						Future (2026)						Future (2026) with Mitigations					
	AM Peak		*PM Peak*		*Saturday Peak*		*AM Peak*		*PM Peak*		*Saturday Peak*		*AM Peak*		*PM Peak*		*Saturday Peak*	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Wilson Boulevard & N Glebe Road																		
Overall	**52.5**	**D**	**46.3**	**D**	**38.7**	**D**	**81.0**	**F**	**55.6**	**E**	**39.4**	**D**	**63.1**	**E**	**48.6**	**D**	**42.1**	**D**
Eastbound Left	61.5	E	35.4	D	31.5	C	61.5	E	35.1	D	31.5	C	76.4	E	38.7	D	38.9	D
Eastbound Thru	52.9	D	36.1	D	37.2	D	56.8	E	36.4	D	37.5	D	54.2	D	36.4	D	37.5	D
Eastbound Right	31.5	C	22.0	C	26.9	C	30.8	C	21.9	C	25.9	C	30.4	C	22.5	C	26.2	C
Westbound Left	37.7	D	37.1	D	34.2	C	41.2	D	40.0	D	34.4	C	54.9	D	43.0	D	33.9	C
Westbound Thru	43.5	D	41.4	D	40.1	D	43.5	D	41.3	D	40.1	D	43.5	D	41.3	D	36.9	D
Westbound Right	31.6	C	26.0	C	28.5	C	30.1	C	26.0	C	28.4	C	31.1	C	25.3	C	24.6	C
Northbound Left	47.1	D	143.7	F	95.4	F	52.9	D	124.3	F	92.7	F	77.2	E	149.0	F	104.8	F
Northbound TR	68.4	E	30.3	C	--	--	146.2	F	69.6	E	--	--	78.6	E	34.1	C	--	--
Northbound Thru	--	--	--	--	53.3	D	--	--	--	--	48.4	D	--	--	--	--	46.2	D
Northbound Right	--	--	--	--	19.5	B	--	--	--	--	25.6	C	--	--	--	--	23.8	C
Southbound Left	113.4	F	70.9	E	60.6	E	123.7	F	82.0	F	80.3	F	105.8	F	79.7	E	79.6	E
Southbound TR	19.7	B	54.9	D	--	--	19.4	B	54.7	D	--	--	46.6	D	56.7	E	--	--
Southbound Thru	--	--	--	--	29.1	C	--	--	--	--	30.8	C	--	--	--	--	44.3	D
Southbound Right	--	--	--	--	0.1	A	--	--	--	--	0.1	A	--	--	--	--	0.1	A
2. Wilson Boulevard & N Taylor Street																		
Eastbound LT	7.6	A	6.4	A	4.1	A	7.4	A	6.2	A	3.8	A	--	--	--	--	--	--
Westbound TR	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--	--	--
Southbound Right	12.7	B	11.9	B	10.7	B	12.7	B	11.9	B	10.7	B	--	--	--	--	--	--
3. Wilson Boulevard & Internal Roadway																		
Eastbound TR	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--	--	--
Northbound Right	10.7	B	10.2	B	10.1	B	11.7	B	10.6	B	10.9	B	--	--	--	--	--	--
4. Wilson Boulevard & N Stuart Street																		
Overall	**7.4**	**A**	**6.6**	**A**	**8.2**	**A**	**7.4**	**A**	**6.6**	**A**	**8.1**	**A**	**--**	**--**	**--**	**--**	**--**	**--**
Eastbound Left	5.7	A	6.6	A	5.6	A	5.7	A	6.7	A	5.6	A	--	--	--	--	--	--
Eastbound Thru	6.2	A	5.7	A	5.9	A	6.3	A	5.8	A	6.0	A	--	--	--	--	--	--
Westbound TR	8.9	A	6.6	A	8.3	A	8.9	A	6.6	A	8.3	A	--	--	--	--	--	--
Southbound Left	30.4	C	30.5	C	30.0	C	30.4	C	30.5	C	30.0	C	--	--	--	--	--	--
Southbound Right	30.3	C	30.3	C	29.6	C	30.3	C	30.3	C	29.6	C	--	--	--	--	--	--
5. Wilson Boulevard & N Randolph Street																		
Overall	**22.0**	**C**	**27.6**	**C**	**19.9**	**B**	**22.5**	**C**	**26.6**	**C**	**19.5**	**B**	**--**	**--**	**--**	**--**	**--**	**--**
Eastbound Left	12.3	B	14.3	B	12.0	B	13.2	B	13.7	B	12.3	B	--	--	--	--	--	--
Eastbound TR	16.6	B	17.4	B	14.3	B	18.8	B	17.0	B	15.0	B	--	--	--	--	--	--
Westbound Left	14.1	B	14.2	B	12.6	B	15.5	B	13.8	B	12.0	B	--	--	--	--	--	--
Westbound TR	19.7	B	22.9	C	17.7	B	20.3	C	22.2	C	17.4	B	--	--	--	--	--	--
Northbound Left	23.6	C	31.6	C	25.2	C	23.7	C	35.4	D	25.8	C	--	--	--	--	--	--
Northbound TR	36.5	D	43.9	D	29.5	C	34.7	C	40.8	D	28.2	C	--	--	--	--	--	--
Southbound Left	25.1	C	44.7	D	24.3	C	24.2	C	39.4	D	24.5	C	--	--	--	--	--	--
Southbound TR	24.2	C	32.0	C	24.5	C	23.6	C	34.0	C	25.0	C	--	--	--	--	--	--
6. N Glebe Road & 7th Street N / Internal Roadway																		
Overall	**12.3**	**B**	**13.7**	**B**	**13.8**	**B**	**18.4**	**B**	**25.5**	**C**	**22.0**	**C**	**16.1**	**B**	**24.0**	**C**	**21.2**	**C**
Eastbound Left	43.3	D	39.1	D	42.0	D	45.8	D	41.6	D	44.6	D	45.8	D	41.6	D	44.6	D
Eastbound Right	42.1	D	38.0	D	40.3	D	38.8	D	34.2	C	35.9	D	38.8	D	34.2	C	35.9	D
Westbound Right	40.2	D	36.3	D	37.9	D	41.6	D	34.2	C	31.6	C	41.6	D	30.7	C	31.6	C
Northbound Left	84.2	F	78.8	E	83.2	F	72.1	E	59.0	E	92.4	F	70.9	E	74.0	E	88.1	F
Northbound Thru	6.9	A	9.2	A	4.4	A	--	--	--	--	22.2	C	--	--	--	--	22.4	C
Northbound TR	--	--	--	--	--	--	10.0	B	27.6	C	--	--	13.4	B	31.2	C	--	--
Northbound Right	--	--	--	--	--	--	--	--	--	--	18.2	B	--	--	--	--	18.2	B
Southbound Left	--	--	--	--	--	--	72.3	E	55.9	E	34.6	C	79.4	E	33.0	C	42.0	D
Southbound TR	11.8	B	9.1	A	--	--	22.4	C	18.1	B	--	--	9.8	A	11.6	B	--	--
Southbound Thru	--	--	--	--	13.8	B	--	--	--	--	12.4	B	--	--	--	--	10.2	B
Southbound Right	--	--	--	--	10.8	B	--	--	--	--	4.8	A	--	--	--	--	0.7	A
7. N Glebe Road & N Carlin Springs Road / Ballston Parking																		
Overall	**50.8**	**D**	**34.9**	**C**	**32.9**	**C**	**51.2**	**D**	**42.9**	**D**	**33.5**	**C**	**46.3**	**D**	**25.8**	**C**	**22.9**	**C**
Eastbound Left	82.8	F	48.9	D	51.4	D	100.5	F	49.6	D	52.9	D	87.6	F	51.3	D	62.0	E
Eastbound Thru	31.1	C	33.0	C	35.7	D	30.2	C	32.7	C	34.6	C	28.9	C	33.3	C	36.8	D
Eastbound Right	31.3	C	24.3	C	28.9	C	31.3	C	24.1	C	28.1	C	29.5	C	24.2	C	30.7	C
Westbound Left	28.9	C	34.6	C	36.3	D	28.7	C	33.9	C	35.1	D	27.4	C	34.5	C	37.3	D
Westbound Thru	28.5	C	35.2	D	35.9	D	28.5	C	34.2	C	34.8	C	27.2	C	34.8	C	37.0	D
Westbound Right	29.3	C	37.1	D	38.5	D	29.0	C	35.5	D	36.4	D	27.7	C	36.1	D	38.8	D
Northbound Left	57.4	E	60.0	E	88.4	F	57.3	E	60.9	E	89.1	F	59.5	E	79.4	E	96.8	F
Northbound TR	59.9	E	23.0	C	11.7	B	58.6	E	22.8	C	12.0	B	57.2	E	13.1	B	8.0	A
Southbound Left	50.6	D	53.9	D	44.0	D	72.5	E	34.1	C	43.6	D	70.3	E	70.9	E	76.7	E
Southbound TR	32.8	C	36.2	D	41.5	D	19.4	B	57.2	E	43.7	D	11.0	B	17.6	B	11.5	B
8. N Glebe Road & N Randolph Street																		
Overall	**43.4**	**D**	**40.3**	**D**	**32.0**	**C**	**43.3**	**D**	**41.3**	**D**	**33.2**	**C**	**45.0**	**D**	**--**	**--**	**33.9**	**C**
Eastbound Left	40.9	D	29.3	C	39.9	D	40.8	D	29.3	C	39.9	D	40.8	D	--	--	39.9	D
Eastbound TR	41.5	D	31.3	C	43.3	D	41.5	D	31.3	C	43.3	D	41.5	D	--	--	43.3	D
Westbound Left	48.1	D	69.3	E	53.0	D	51.6	D	69.3	E	51.0	D	51.6	D	--	--	51.0	D
Westbound Thru	39.7	D	27.5	C	37.8	D	39.6	D	27.5	C	37.9	D	39.6	D	--	--	37.9	D
Westbound Right	40.1	D	29.8	C	38.0	D	40.3	D	30.2	C	38.8	D	40.3	D	--	--	38.0	D
Northbound Left	88.3	F	66.8	E	74.9	E	105.6	F	66.8	E	74.9	E	90.2	F	--	--	74.9	E
Northbound TR	43.2	D	33.3	C	25.4	C	43.3	D	33.5	C	25.6	C	46.9	D	--	--	26.4	C
Southbound Left	84.5	F	53.7	D	82.1	F	79.6	E	48.5	D	81.3	F	79.9	E	--	--	68.3	E
Southbound TR	11.3	B	37.6	D	--	--	11.0	B	41.5	D	--	--	12.0	B	--	--	--	--
Southbound Thru	--	--	--	--	15.0	B	--	--	--	--	19.0	B	--	--	--	--	22.8	C
Southbound Right	--	--	--	--	16.0	B	--	--	--	--	20.0	C	--	--	--	--	25.4	C

E. Future (2026) with Mitigations SimTraffic Analysis Worksheets: With N Vermont Street Pedestrian Crossing

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	290	1163	1148	180	162	208	276	148	149	188	181	196
Average Queue (ft)	265	652	629	111	57	59	87	86	46	162	163	167
95th Queue (ft)	347	1356	1323	251	137	150	224	168	115	186	180	189
Link Distance (ft)		1918	1918			244	244		88	88	88	88
Upstream Blk Time (%)		3	3			0	3		6	44	47	49
Queuing Penalty (veh)		0	0			0	9		24	177	191	198
Storage Bay Dist (ft)	290			180	220			150				
Storage Blk Time (%)	14	36	40	1		0	1	3				
Queuing Penalty (veh)	56	128	66	4		0	4	4				

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	TR
Maximum Queue (ft)	280	347	328	298
Average Queue (ft)	254	282	209	178
95th Queue (ft)	324	392	340	301
Link Distance (ft)		291	291	291
Upstream Blk Time (%)	3	35	5	1
Queuing Penalty (veh)	0	112	15	5
Storage Bay Dist (ft)	280			
Storage Blk Time (%)	20	36		
Queuing Penalty (veh)	40	83		

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	R
Maximum Queue (ft)	269	264	40	67	107
Average Queue (ft)	120	54	2	7	9
95th Queue (ft)	233	191	18	39	63
Link Distance (ft)	244	244	71	71	464
Upstream Blk Time (%)	1	1	0	0	
Queuing Penalty (veh)	5	4	0	1	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	TR	T	R
Maximum Queue (ft)	18	61	140	8	25
Average Queue (ft)	1	4	56	0	7
95th Queue (ft)	10	29	145	6	23
Link Distance (ft)		71	71	80	86
Upstream Blk Time (%)		0	6		
Queuing Penalty (veh)		1	32		
Storage Bay Dist (ft)	15				
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	1			

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	152	157	176	203	292	45	62
Average Queue (ft)	70	83	132	73	132	3	9
95th Queue (ft)	127	142	194	154	235	20	40
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	6	6	19				
Queuing Penalty (veh)	19	18	57				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						0	1
Queuing Penalty (veh)						0	0

Intersection: 5: N Randolph St & Wilson Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	138	225	232	139	236	223	120	312	149	217
Average Queue (ft)	47	98	113	85	114	121	95	232	49	103
95th Queue (ft)	99	178	196	143	200	199	153	343	110	185
Link Distance (ft)		630	630		662	662		267		550
Upstream Blk Time (%)								17		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)	0	2		1	3		4	36	0	2
Queuing Penalty (veh)	0	1		2	4		16	39	0	1

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	170	90	75	139	349	367	361	69	156	125	134
Average Queue (ft)	69	34	44	56	181	207	220	13	79	62	63
95th Queue (ft)	135	83	78	131	362	383	381	42	135	109	117
Link Distance (ft)	407		59		390	390	390		198	198	198
Upstream Blk Time (%)			8		1	1	2				
Queuing Penalty (veh)			6		4	7	8				
Storage Bay Dist (ft)		90		140				110			
Storage Blk Time (%)	7	1		1	15			0	5		
Queuing Penalty (veh)	3	1		3	8			0	1		

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	TR	UL	L
Maximum Queue (ft)	230	223	207	47	29	79	240	365	364	384	85	119
Average Queue (ft)	203	157	111	9	5	23	116	228	240	254	27	47
95th Queue (ft)	219	275	228	31	22	65	242	344	356	378	68	91
Link Distance (ft)	186	186	186	229	229	229		454	454	454		
Upstream Blk Time (%)	72	30	6							0		
Queuing Penalty (veh)	0	0	0							0		
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							1	13				0
Queuing Penalty (veh)							3	10				0

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	190	180	206
Average Queue (ft)	94	81	104
95th Queue (ft)	166	151	172
Link Distance (ft)	390	390	390
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	109	141	159	343	68	180	410	420	423	170	436	258
Average Queue (ft)	35	58	106	76	38	106	270	257	261	160	201	38
95th Queue (ft)	85	117	181	270	68	213	387	377	389	193	445	153
Link Distance (ft)	133	133		352			1458	1458	1458		454	454
Upstream Blk Time (%)	0	1		1							1	0
Queuing Penalty (veh)	0	0		0							2	0
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			5	0	1	1	22			31	12	
Queuing Penalty (veh)			7	1	2	3	13			54	43	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	TR
Maximum Queue (ft)	176
Average Queue (ft)	53
95th Queue (ft)	129
Link Distance (ft)	454
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 1495

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	192	201	173	123	220	289	313	150	173	165	164	197
Average Queue (ft)	86	95	83	12	158	184	203	84	145	89	133	158
95th Queue (ft)	159	164	152	59	261	309	350	195	200	158	199	203
Link Distance (ft)		1927	1927			244	244		88	88	88	88
Upstream Blk Time (%)						14	22		68	16	38	49
Queuing Penalty (veh)						75	115		234	55	131	170
Storage Bay Dist (ft)	290			180	220			150				
Storage Blk Time (%)	0	0	0	0	15	12	10	1				
Queuing Penalty (veh)	0	0	0	0	43	29	24	2				

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	TR
Maximum Queue (ft)	274	334	333	337
Average Queue (ft)	180	234	246	269
95th Queue (ft)	298	331	337	343
Link Distance (ft)		292	292	292
Upstream Blk Time (%)	1	7	8	17
Queuing Penalty (veh)	0	36	41	82
Storage Bay Dist (ft)	280			
Storage Blk Time (%)	3	9		
Queuing Penalty (veh)	9	18		

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	R
Maximum Queue (ft)	238	238	162	145	192
Average Queue (ft)	86	32	39	26	32
95th Queue (ft)	184	151	140	105	141
Link Distance (ft)	244	244	71	71	464
Upstream Blk Time (%)	0	1	15	3	
Queuing Penalty (veh)	1	4	64	15	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	EB	WB	WB	NB
Directions Served	T	T	TR	T	T	R
Maximum Queue (ft)	5	27	117	130	111	31
Average Queue (ft)	0	1	27	20	14	11
95th Queue (ft)	4	15	94	98	73	30
Link Distance (ft)		71	71	80	80	86
Upstream Blk Time (%)		0	2	5	1	
Queuing Penalty (veh)		0	6	23	5	
Storage Bay Dist (ft)	15					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	136	150	161	248	286	57	62
Average Queue (ft)	54	81	120	91	117	7	15
95th Queue (ft)	111	132	178	194	228	33	50
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	4	5	15				
Queuing Penalty (veh)	8	12	35				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						2	1
Queuing Penalty (veh)						0	0

Intersection: 5: N Randolph St & Wilson Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	83	170	184	140	328	294	120	322	160	416
Average Queue (ft)	34	88	106	107	188	159	101	263	91	198
95th Queue (ft)	70	148	164	172	292	253	152	357	178	357
Link Distance (ft)		630	630		662	662		267		550
Upstream Blk Time (%)								43		0
Queuing Penalty (veh)								0		0
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)		1		2	15		8	52	0	16
Queuing Penalty (veh)		1		6	22		33	54	1	18

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	264	103	82	139	312	323	328	70	137	162	181
Average Queue (ft)	101	38	61	63	130	141	159	21	67	77	93
95th Queue (ft)	225	83	88	130	265	277	289	55	114	136	156
Link Distance (ft)	407	407	60		390	390	390		198	198	198
Upstream Blk Time (%)	1		20			0	0			0	0
Queuing Penalty (veh)	0		40			0	0			0	0
Storage Bay Dist (ft)				140				110			
Storage Blk Time (%)				0	9			0	1		
Queuing Penalty (veh)				1	6			0	0		

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	TR	UL	L
Maximum Queue (ft)	218	203	179	92	118	167	232	243	180	141	52	85
Average Queue (ft)	189	81	60	29	50	75	141	85	63	74	10	27
95th Queue (ft)	239	232	142	71	100	141	220	185	126	131	36	65
Link Distance (ft)	186	186	186	229	229	229		454	454	454		
Upstream Blk Time (%)	53	15	0									
Queuing Penalty (veh)	0	0	0									
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							1	0				
Queuing Penalty (veh)							1	0				

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	233	296	297
Average Queue (ft)	88	126	159
95th Queue (ft)	171	232	254
Link Distance (ft)	390	390	390
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	142	158	160	384	70	180	342	306	251	167	211	198
Average Queue (ft)	70	111	141	190	56	127	189	153	118	103	75	92
95th Queue (ft)	130	169	185	419	81	207	292	257	221	170	167	162
Link Distance (ft)	133	133		352			1458	1458	1458		454	454
Upstream Blk Time (%)	1	11		5								
Queuing Penalty (veh)	0	0		0								
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			14	4	6	2	8			4	1	
Queuing Penalty (veh)			43	20	23	4	11			10	1	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	TR
Maximum Queue (ft)	211
Average Queue (ft)	113
95th Queue (ft)	182
Link Distance (ft)	454
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 1534

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	233	247	210	108	155	171	198	139	175	206	197	103
Average Queue (ft)	123	99	75	19	66	31	42	45	94	179	180	69
95th Queue (ft)	221	207	168	69	131	100	126	118	168	192	191	147
Link Distance (ft)		1834	1834			267	267		104	104	104	
Upstream Blk Time (%)						0	0		18	62	60	1
Queuing Penalty (veh)						0	1		82	286	280	0
Storage Bay Dist (ft)	290			180	220			150				150
Storage Blk Time (%)	1	0	0	0		0	0	1			60	1
Queuing Penalty (veh)	1	1	0	0		0	0	1			194	5

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	280	356	352	97
Average Queue (ft)	233	295	292	45
95th Queue (ft)	338	372	365	107
Link Distance (ft)		305	305	
Upstream Blk Time (%)		8	8	
Queuing Penalty (veh)		52	49	
Storage Bay Dist (ft)	280			100
Storage Blk Time (%)	2	11	24	0
Queuing Penalty (veh)	10	25	42	1

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	R
Maximum Queue (ft)	142	90	2	24	30
Average Queue (ft)	44	4	0	1	1
95th Queue (ft)	106	49	2	13	18
Link Distance (ft)	267	267	71	71	464
Upstream Blk Time (%)		0		0	
Queuing Penalty (veh)		0		0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	EB	NB
Directions Served	T	T	TR	R
Maximum Queue (ft)	3	8	77	48
Average Queue (ft)	0	0	7	14
95th Queue (ft)	3	6	40	35
Link Distance (ft)		71	71	86
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)	15			
Storage Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	111	134	160	140	181	69	53
Average Queue (ft)	47	61	83	57	76	22	26
95th Queue (ft)	91	114	152	116	143	59	59
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	2	3	9				
Queuing Penalty (veh)	4	7	18				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						3	1
Queuing Penalty (veh)						1	0

Intersection: 5: Wilson Blvd & N Randolph St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	69	139	161	139	208	184	120	307	133	197
Average Queue (ft)	26	66	84	69	98	80	76	123	46	83
95th Queue (ft)	57	120	139	131	171	149	135	247	96	156
Link Distance (ft)		630	630		662	662		415		550
Upstream Blk Time (%)								0		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)		0		1	2		2	8	0	1
Queuing Penalty (veh)		0		1	2		6	8	0	1

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	422	90	77	140	426	418	80	75	195	207	51
Average Queue (ft)	210	38	63	92	344	353	23	22	67	79	25
95th Queue (ft)	432	101	92	170	500	497	79	58	137	154	58
Link Distance (ft)	410		73		392	392			201	201	
Upstream Blk Time (%)	14		34		14	18			0	0	
Queuing Penalty (veh)	0		39		88	113			1	1	
Storage Bay Dist (ft)		90		140			80	110			50
Storage Blk Time (%)	52	1		3	48	62	0	0	3	18	1
Queuing Penalty (veh)	28	1		18	37	22	1	0	1	16	3

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	L
Maximum Queue (ft)	222	215	206	79	88	193	240	461	447	383	80	112
Average Queue (ft)	204	131	57	26	24	85	153	221	228	123	21	48
95th Queue (ft)	247	283	171	65	70	178	267	507	507	416	58	90
Link Distance (ft)	198	198	198	241	241	241		454	454	454		
Upstream Blk Time (%)	80	34	0			2		5	6	2		
Queuing Penalty (veh)	0	0	0			0		18	22	9		
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							1	19				
Queuing Penalty (veh)							6	24				

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	235	228
Average Queue (ft)	102	127
95th Queue (ft)	196	210
Link Distance (ft)	392	392
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	139	160	158	363	70	180	494	463	369	165	203	202
Average Queue (ft)	62	114	91	62	47	139	247	217	169	99	95	104
95th Queue (ft)	129	171	164	223	79	216	458	419	361	163	171	176
Link Distance (ft)	132	132		398			1458	1458	1458		454	454
Upstream Blk Time (%)	2	18		1								
Queuing Penalty (veh)	0	0		0								
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			3	2	4	3	19			1	1	13
Queuing Penalty (veh)			6	5	7	8	26			4	1	14

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	R
Maximum Queue (ft)	100
Average Queue (ft)	29
95th Queue (ft)	99
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Zone Summary

Zone wide Queuing Penalty: 1604

F. Future (2026) with Mitigations SimTraffic Analysis Worksheets: With N Fairfax Drive and N Glebe Road Intersection

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	290	1914	1898	180	169	196	279	150	132	182	183	193
Average Queue (ft)	285	1151	1118	95	55	63	88	87	47	164	149	164
95th Queue (ft)	312	2092	2067	238	133	151	214	171	112	175	199	193
Link Distance (ft)		1919	1919			244	244		88	88	88	88
Upstream Blk Time (%)		18	16			0	2		6	66	29	40
Queuing Penalty (veh)		0	0			1	6		23	264	115	162
Storage Bay Dist (ft)	290			180	220			150				
Storage Blk Time (%)	36	57	37	1	0	0	2	3				
Queuing Penalty (veh)	142	200	60	3	1	0	5	4				

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	TR
Maximum Queue (ft)	280	830	821	730
Average Queue (ft)	257	533	446	348
95th Queue (ft)	325	956	890	718
Link Distance (ft)		842	842	842
Upstream Blk Time (%)		8	1	0
Queuing Penalty (veh)		25	3	1
Storage Bay Dist (ft)	280			
Storage Blk Time (%)	30	42		
Queuing Penalty (veh)	58	98		

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	R
Maximum Queue (ft)	260	252	34	84	105
Average Queue (ft)	114	49	1	9	6
95th Queue (ft)	226	179	16	45	52
Link Distance (ft)	244	244	71	71	464
Upstream Blk Time (%)	0	1	0	0	
Queuing Penalty (veh)	3	4	0	1	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	TR	T	R
Maximum Queue (ft)	27	62	132	4	28
Average Queue (ft)	1	4	48	0	8
95th Queue (ft)	12	34	134	4	25
Link Distance (ft)		71	71	80	86
Upstream Blk Time (%)		0	5		
Queuing Penalty (veh)		1	24		
Storage Bay Dist (ft)	15				
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	1			

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	150	159	171	228	296	24	52
Average Queue (ft)	68	78	125	70	127	1	8
95th Queue (ft)	125	137	192	161	237	10	37
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	7	6	18				
Queuing Penalty (veh)	20	17	53				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						0	0
Queuing Penalty (veh)						0	0

Intersection: 5: N Randolph St & Wilson Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	104	176	192	140	251	244	120	318	152	259
Average Queue (ft)	38	84	105	85	117	119	92	225	52	101
95th Queue (ft)	82	150	166	145	207	200	153	353	114	192
Link Distance (ft)		630	630		662	662		267		550
Upstream Blk Time (%)								21		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)	0	1		1	3		3	34	0	3
Queuing Penalty (veh)	0	1		3	5		12	36	0	2

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	179	90	73	140	416	420	388	67	114	85	105
Average Queue (ft)	71	30	44	68	295	213	183	16	46	26	35
95th Queue (ft)	140	80	78	159	505	428	354	47	91	63	80
Link Distance (ft)	407		59		390	390	390		198	198	198
Upstream Blk Time (%)			8		13	1	0				
Queuing Penalty (veh)			7		69	6	2				
Storage Bay Dist (ft)		90		140				110			
Storage Blk Time (%)	8	1		1	50				1		
Queuing Penalty (veh)	3	1		5	27				0		

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	TR	UL	L
Maximum Queue (ft)	230	215	211	46	33	71	240	447	425	407	87	108
Average Queue (ft)	202	159	94	8	6	24	131	298	255	241	30	52
95th Queue (ft)	219	271	220	31	24	60	271	450	409	374	71	95
Link Distance (ft)	186	186	186	229	229	229		454	454	454		
Upstream Blk Time (%)	78	35	4					4	0	0		
Queuing Penalty (veh)	0	0	0					15	1	0		
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							0	34				
Queuing Penalty (veh)							1	27				

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	152	138	163
Average Queue (ft)	68	52	78
95th Queue (ft)	131	113	140
Link Distance (ft)	390	390	390
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	98	135	159	334	70	180	480	442	438	170	430	237
Average Queue (ft)	35	58	111	62	39	114	304	271	251	157	206	27
95th Queue (ft)	80	115	185	237	71	218	438	406	395	197	436	117
Link Distance (ft)	133	133		352			1085	1085	1085		454	454
Upstream Blk Time (%)	0	1		0							0	0
Queuing Penalty (veh)	0	0		0							1	0
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			5	0	3	1	29			32	11	
Queuing Penalty (veh)			6	0	4	2	18			55	41	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	TR
Maximum Queue (ft)	137
Average Queue (ft)	41
95th Queue (ft)	106
Link Distance (ft)	454
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 1645

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	196	208	209	128	215	267	312	150	186	163	174	183
Average Queue (ft)	97	102	91	18	144	162	182	84	150	89	117	148
95th Queue (ft)	178	176	167	78	245	288	330	192	203	158	192	205
Link Distance (ft)		1931	1931			244	244		88	88	88	88
Upstream Blk Time (%)						9	18		75	19	28	44
Queuing Penalty (veh)						48	93		257	65	97	152
Storage Bay Dist (ft)	290			180	220			150				
Storage Blk Time (%)	0	0	0	0	8	9	9	1				
Queuing Penalty (veh)	0	0	0	0	24	21	22	2				

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	TR
Maximum Queue (ft)	280	503	529	555
Average Queue (ft)	214	294	338	386
95th Queue (ft)	319	463	500	535
Link Distance (ft)		837	837	837
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	280			
Storage Blk Time (%)	5	11		
Queuing Penalty (veh)	16	23		

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	R
Maximum Queue (ft)	216	214	107	118	215
Average Queue (ft)	82	30	25	23	40
95th Queue (ft)	176	138	110	101	195
Link Distance (ft)	244	244	71	71	464
Upstream Blk Time (%)	0	0	7	3	
Queuing Penalty (veh)	2	2	33	14	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	EB	WB	WB	NB
Directions Served	T	T	TR	T	T	R
Maximum Queue (ft)	12	27	126	67	65	47
Average Queue (ft)	1	2	20	12	10	14
95th Queue (ft)	8	15	82	75	67	36
Link Distance (ft)		71	71	80	80	86
Upstream Blk Time (%)		0	2	3	1	
Queuing Penalty (veh)		0	6	12	5	
Storage Bay Dist (ft)	15					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	132	147	167	213	258	48	58
Average Queue (ft)	54	79	118	83	116	6	15
95th Queue (ft)	109	132	179	160	213	29	49
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	4	5	15				
Queuing Penalty (veh)	9	12	34				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						1	1
Queuing Penalty (veh)						0	0

Intersection: 5: N Randolph St & Wilson Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	92	179	206	140	332	294	120	322	160	411
Average Queue (ft)	31	91	111	106	192	164	98	268	89	193
95th Queue (ft)	69	157	175	171	300	262	156	362	180	349
Link Distance (ft)		630	630		662	662		267		550
Upstream Blk Time (%)								51		0
Queuing Penalty (veh)								0		0
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)		1		2	15		7	56	0	15
Queuing Penalty (veh)		1		5	23		32	58	1	17

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	305	138	84	139	350	320	307	69	153	166	184
Average Queue (ft)	159	44	62	71	174	136	155	20	69	78	97
95th Queue (ft)	358	128	86	150	320	270	279	54	124	137	162
Link Distance (ft)	407	407	60		390	390	390		198	198	198
Upstream Blk Time (%)	10	0	34		1	0	0		0	0	0
Queuing Penalty (veh)	0	0	68		3	0	0		0	0	1
Storage Bay Dist (ft)				140				110			
Storage Blk Time (%)				0	17			0	1		
Queuing Penalty (veh)				2	11			1	0		

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	TR	UL	L
Maximum Queue (ft)	229	208	190	80	122	167	227	277	174	143	58	113
Average Queue (ft)	194	85	65	28	54	75	144	97	63	67	10	26
95th Queue (ft)	234	242	152	63	105	138	217	206	126	125	36	68
Link Distance (ft)	186	186	186	229	229	229		454	454	454		
Upstream Blk Time (%)	52	18	1			0						
Queuing Penalty (veh)	0	0	0			0						
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							1	0				
Queuing Penalty (veh)							3	1				

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	245	304	310
Average Queue (ft)	90	138	168
95th Queue (ft)	192	256	272
Link Distance (ft)	390	390	390
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	151	158	160	386	70	180	397	358	240	166	183	195
Average Queue (ft)	74	115	145	203	56	137	214	160	109	103	66	92
95th Queue (ft)	135	168	182	433	80	215	338	281	207	165	136	158
Link Distance (ft)	133	133		352			1085	1085	1085		454	454
Upstream Blk Time (%)	2	10		7								
Queuing Penalty (veh)	0	0		0								
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			16	3	6	3	11			2	0	
Queuing Penalty (veh)			49	15	22	6	15			6	1	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	TR
Maximum Queue (ft)	222
Average Queue (ft)	117
95th Queue (ft)	192
Link Distance (ft)	454
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 1292

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	272	412	362	112	156	121	172	143	173	198	202	103
Average Queue (ft)	161	149	114	21	64	29	41	54	98	179	180	72
95th Queue (ft)	280	385	329	69	130	84	108	128	178	191	192	147
Link Distance (ft)		1836	1836			267	267		104	104	104	
Upstream Blk Time (%)							0		21	64	62	1
Queuing Penalty (veh)							0		98	296	287	0
Storage Bay Dist (ft)	290			180	220			150				150
Storage Blk Time (%)	7	5	0	0	0	0	0	1			62	1
Queuing Penalty (veh)	10	11	0	0	0	0	0	1			199	6

Intersection: 1: N. Glebe Rd & Wilson Blvd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	280	554	556	99
Average Queue (ft)	232	346	359	50
95th Queue (ft)	330	512	511	116
Link Distance (ft)		840	840	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	280			100
Storage Blk Time (%)	4	20	53	0
Queuing Penalty (veh)	17	48	92	2

Intersection: 2: Wilson Blvd & N Taylor St.

Movement	EB	EB	WB	WB
Directions Served	LT	T	T	TR
Maximum Queue (ft)	155	50	10	24
Average Queue (ft)	46	2	0	1
95th Queue (ft)	111	30	6	12
Link Distance (ft)	267	267	71	71
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Internal Rd & Wilson Blvd

Movement	EB	EB	NB
Directions Served	T	TR	R
Maximum Queue (ft)	2	77	48
Average Queue (ft)	0	9	13
95th Queue (ft)	2	44	36
Link Distance (ft)	71	71	86
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Wilson Blvd & N Stuart St

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	103	143	160	120	185	68	53
Average Queue (ft)	45	65	91	50	75	20	27
95th Queue (ft)	86	123	162	95	145	55	58
Link Distance (ft)	80	80	80	630	630	486	
Upstream Blk Time (%)	2	3	8				
Queuing Penalty (veh)	3	6	18				
Storage Bay Dist (ft)							50
Storage Blk Time (%)						2	1
Queuing Penalty (veh)						1	0

Intersection: 5: Wilson Blvd & N Randolph St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	68	141	158	139	221	184	120	255	140	223
Average Queue (ft)	26	66	85	71	100	83	72	121	46	89
95th Queue (ft)	58	120	137	132	178	150	132	222	98	168
Link Distance (ft)		630	630		662	662		415		550
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	160			140			120		160	
Storage Blk Time (%)		0		1	2		2	7	0	1
Queuing Penalty (veh)		0		1	2		5	8	0	1

Intersection: 6: N. Glebe Rd & 7th St N/Internal Rd

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	425	90	77	140	420	420	80	66	172	190	52
Average Queue (ft)	273	38	65	91	344	355	25	20	67	74	27
95th Queue (ft)	508	103	93	170	485	478	82	52	135	149	57
Link Distance (ft)	410		73		392	392			201	201	
Upstream Blk Time (%)	34		40		12	17			0	0	
Queuing Penalty (veh)	0		46		75	107			1	1	
Storage Bay Dist (ft)		90		140			80	110			50
Storage Blk Time (%)	66	1		1	49	64	0		2	15	1
Queuing Penalty (veh)	36	1		9	38	23	2		0	14	3

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	L
Maximum Queue (ft)	234	222	193	103	126	209	240	472	457	375	78	116
Average Queue (ft)	209	126	41	24	34	93	145	190	197	77	21	47
95th Queue (ft)	230	285	137	71	115	208	254	454	452	310	60	91
Link Distance (ft)	198	198	198	241	241	241		454	454	454		
Upstream Blk Time (%)	85	39	0	0	3	8		3	3	1		
Queuing Penalty (veh)	0	0	0	0	0	0		10	11	4		
Storage Bay Dist (ft)							240				200	200
Storage Blk Time (%)							0	11				0
Queuing Penalty (veh)							1	14				0

Intersection: 7: N. Glebe Rd & N Carlin Springs Rd/Ballston Parking

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	207	225
Average Queue (ft)	71	100
95th Queue (ft)	158	181
Link Distance (ft)	392	392
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	TR	UL	T	T
Maximum Queue (ft)	146	162	156	249	70	180	580	532	388	168	225	219
Average Queue (ft)	66	117	86	42	46	147	270	224	147	97	95	103
95th Queue (ft)	136	178	154	150	77	216	486	431	298	166	185	190
Link Distance (ft)	132	132		398			1085	1085	1085		454	454
Upstream Blk Time (%)	3	21		0								
Queuing Penalty (veh)	0	0		0								
Storage Bay Dist (ft)			160		70	180				170		
Storage Blk Time (%)			1	1	3	5	20			2	1	14
Queuing Penalty (veh)			2	4	6	15	27			7	1	16

Intersection: 8: N. Glebe Rd & N Randolph St

Movement	SB
Directions Served	R
Maximum Queue (ft)	100
Average Queue (ft)	33
95th Queue (ft)	105
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

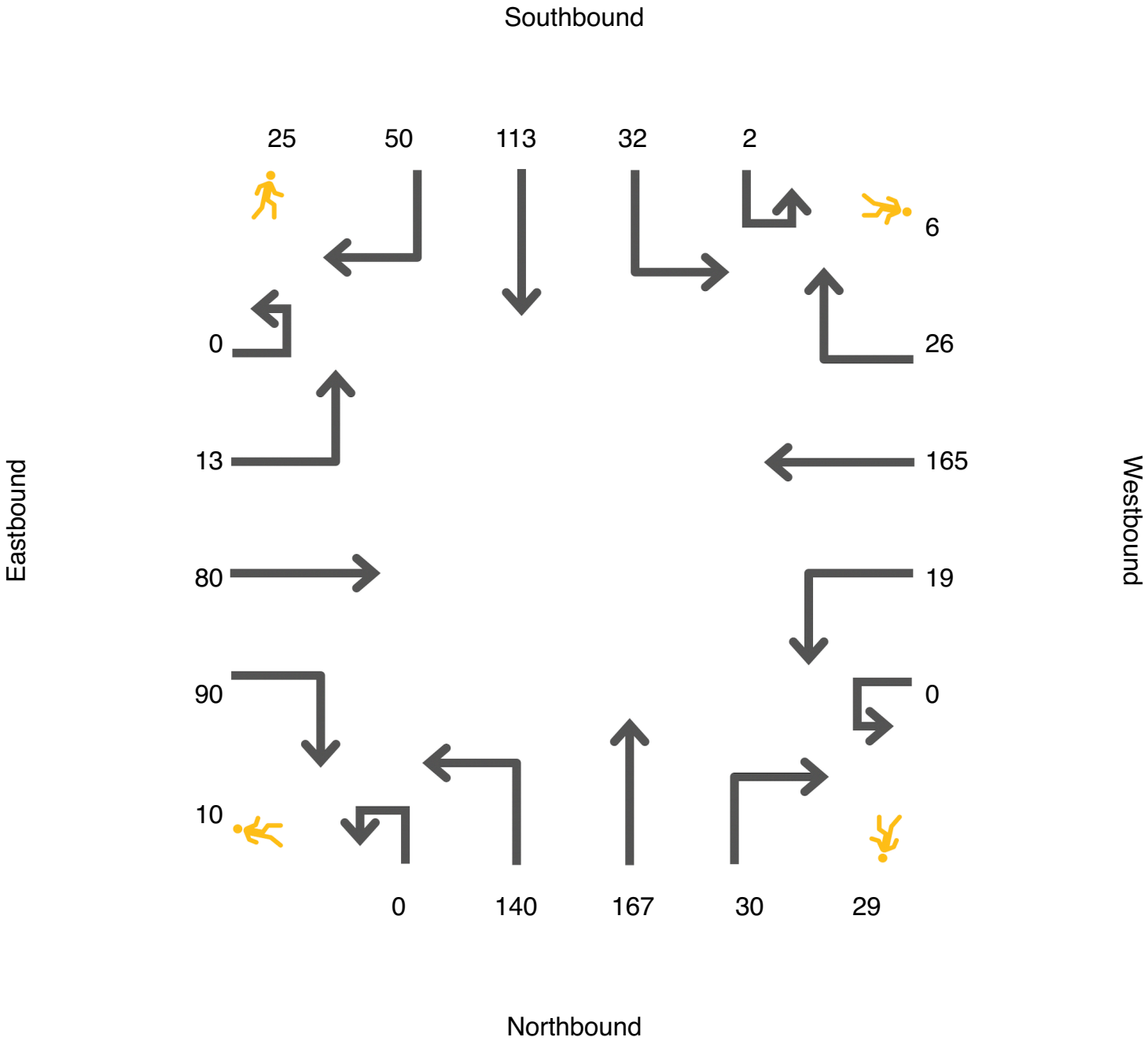
Zone Summary

Zone wide Queuing Penalty: 1587

G. 15-Minute Spot Count Data

Turning Movement Count

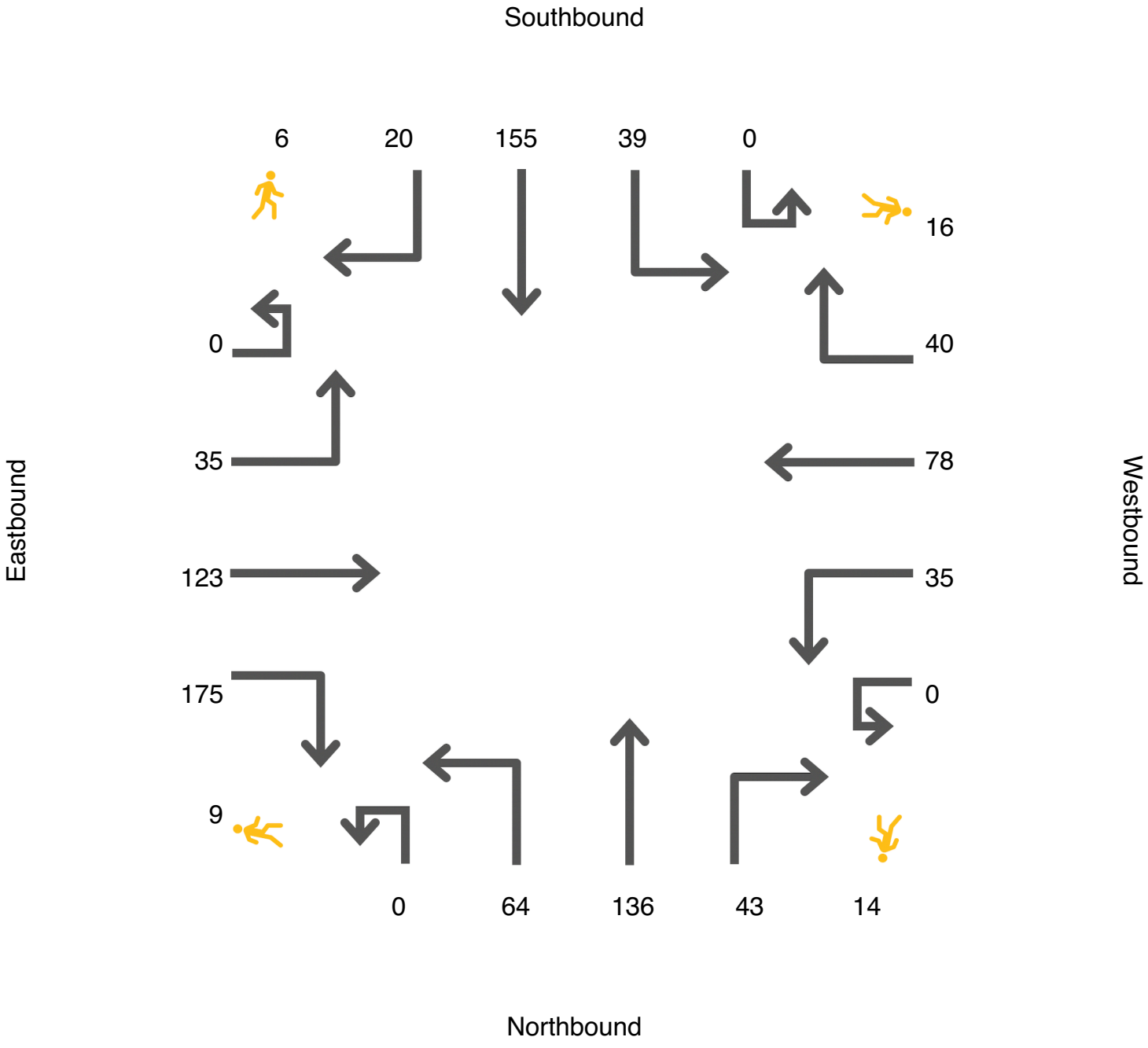
Study Name: Fairfax Dr
Date: Tuesday, Jul 5 2022
Location: Arlington
Observer: Mike
Weather: Clear
Comments: ""



Created with Traffic Count for iOS

Turning Movement Count

Study Name: Fairfax Dr
Date: Tuesday, Jul 5 2022
Location: Arlington
Observer: Mike
Weather: Clear
Comments: ""



Created with Traffic Count for iOS