

TECHNICAL MEMORANDUM

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From: Maribel Wong
Daniel Solomon, AICP
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Date: October 18, 2019
Subject: George Washington University Thurston Hall Renovation Comprehensive Transportation Review

DDOT – PSD
George Washington University
Goulston & Storrs

INTRODUCTION

This memorandum presents the findings of a Comprehensive Transportation Review (CTR) for the proposed renovation to the residential/dormitory development at George Washington University (GWU) known as Thurston Hall. Thurston Hall is located at 1900 F Street in the Foggy Bottom neighborhood in Northwest Washington, DC. Figure 1 identifies the regional site location within the District and Figure 2 identifies the location of the site in relation to the neighborhood and campus. The site is currently occupied by an existing 190,430 square foot building that houses 1,080 beds for first-year GWU students. The site is bounded by F Street to the north, 19th Street to the east, a private alley to the south, and a GWU property to the west.

The renovated building will have a reduced GFA of approximately 186,789 square feet with 458 dwelling units and a reduced number of beds to approximately-850 beds. The renovation also includes the addition of a student-only 250 seat dining facility to the building. The renovation is consistent with the Campus Plan/PUD approved in ZC Case 06-11/06-12 in 2007. The Temporary Housing Plan includes the use of One Washington Circle Hotel and The Aston, properties that are not designated for undergraduate use under the Campus Plan and the University seeks Zoning Commission approval of this plan.

The purpose of this CTR is to:

- Provide a review of the existing site conditions, details on the proposed redevelopment plans, and projected future site trip generation;
- Review the transportation elements of the project to determine whether the project will have a detrimental impact on the surrounding transportation network;
- Review the University's proposed Temporary Housing Plan to determine whether its implementation will impact the local transportation network and provide mitigation recommendations as necessary.

The findings of this study conclude that:

- The proposed project will not have a detrimental impact on the local transportation network and does not result in any significant increase in vehicular travel;
- The proposed loading area and access do not differ from existing conditions and therefore will not adversely change future conditions;

- Implementation of the proposed Loading Management Plan minimizes loading-truck related disruptions to traffic flow on adjacent roadways;
- The proposed Temporary Housing Plan will not adversely impact the local transportation network;
- The Transportation Management Demand measures that will be implemented, as part of the University's Transportation Management Program, at Thurston Hall and facilities associated with the Temporary Housing Plan adequately promote non-auto modes of travel for students.

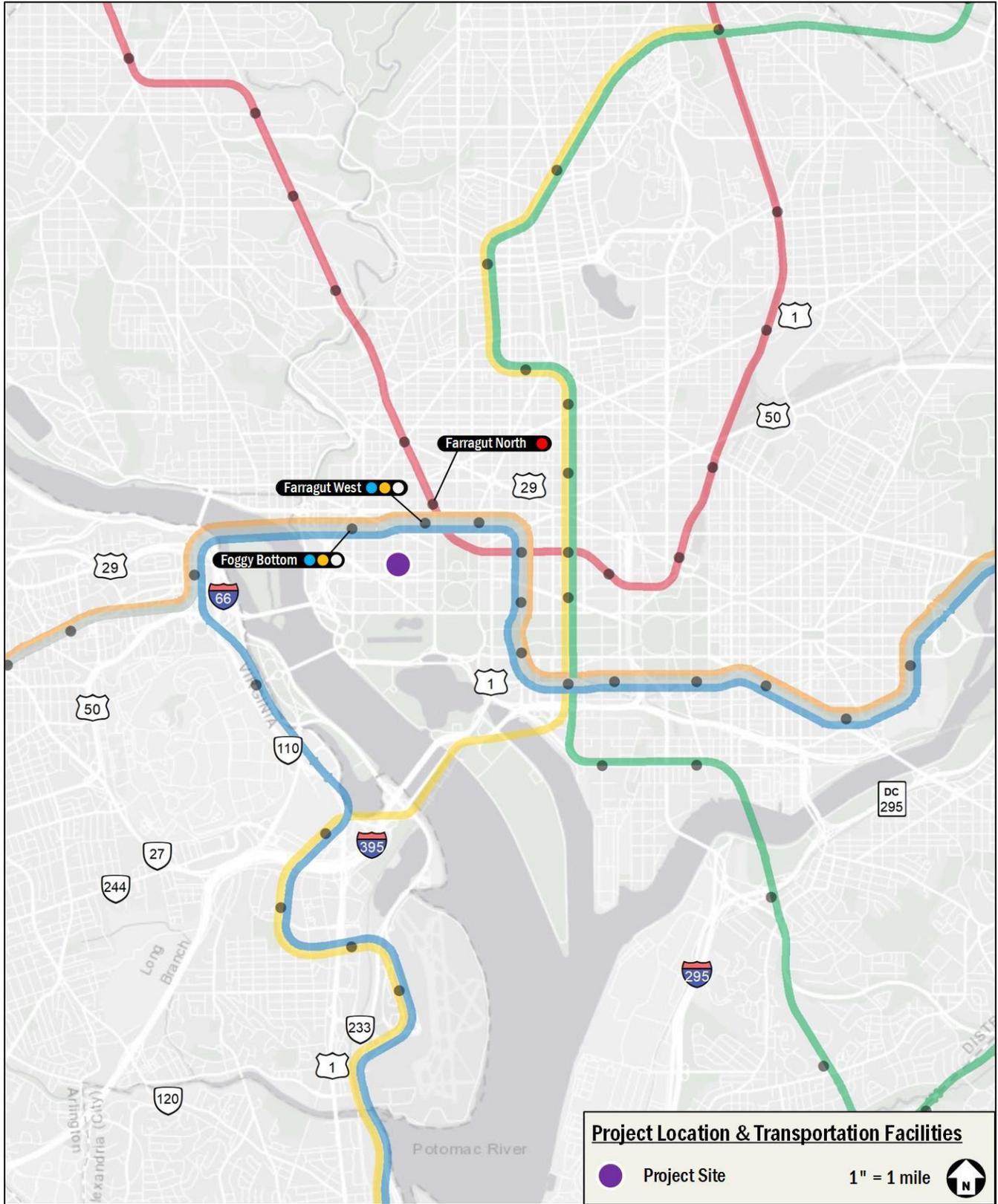


Figure 1: Regional Location

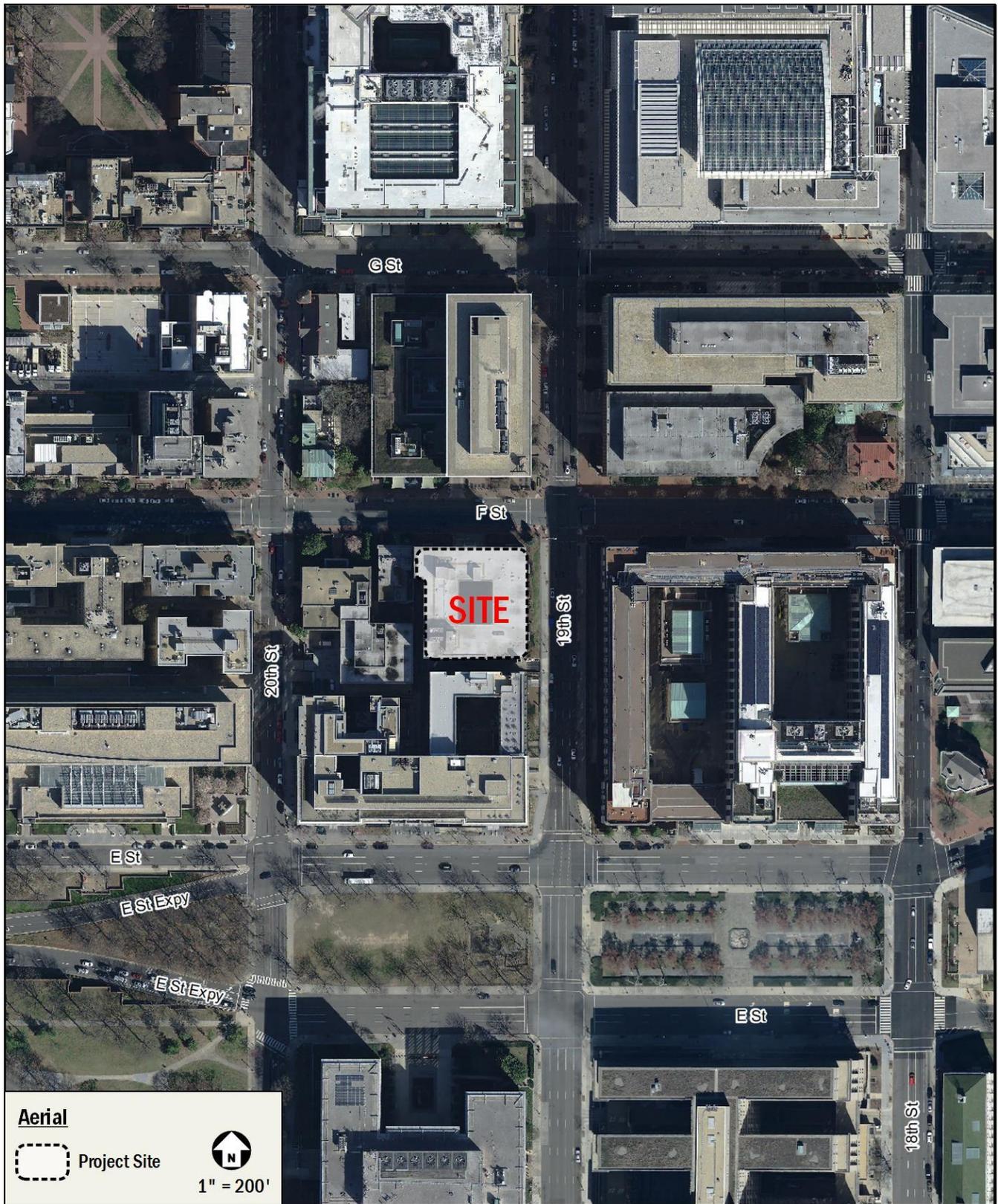


Figure 2: Site Location

EXISTING TRANSPORTATION CONDITIONS

This section reviews the existing vehicular, transit, and pedestrian facilities in the vicinity of the site. The GW campus is served by several Metrobus routes and two (2) university shuttle routes. The site is within an approximately 10-minute walk of both the Foggy Bottom-GWU and Farragut West Metrorail stations served by the Blue, Orange, and Silver lines. The site is also surrounded by a robust pedestrian and bicycle network that consists of well-connected sidewalks, crosswalks, and cycle tracks along the roadways around the site.

Vehicular

Access to the site is available from several principal arterials such as Pennsylvania Avenue, H Street, and Eye Street to the north, 23rd Street to the west, and E Street to the south. E Street provides direct access to I-66 and the Rock Creek Parkway, allowing for convenient access to Virginia and points north and east.

The site is located on F Street, a minor arterial, and is served by a local vehicular network that includes other minor arterials such as 19th Street and 20th Street. These minor arterials are supplemented by a network of connector and local roadways.

Transit

The site is serviced by several local and commuter bus routes along 18th Street and 19th Street with multiple bus stops located within walking distance of the site. These bus lines connect the site to many areas of Washington, DC, and other Metrorail stations where transfers can be made to reach areas in the District, Virginia, and Maryland. As shown in Figure 3, the transit study area for this project is currently served by 12 Metrobus routes. The 80, 3Y, 7Y, 11Y, 16Y, N4, and S1 routes have designated bus stops adjacent to the site on 19th Street at F Street. The 80 line provides crosstown service between Fort Totten and the Kennedy Center. The 3Y, 7Y, 11Y, and 16Y lines complement Metrorail service and provide direct service to neighborhoods in Arlington County. The N4 line provides direct service to Friendship Heights and the S1 line provides direct service to the Brightwood area of Northwest, DC. In addition to the local Metrobus lines servicing the site, commuter bus lines that include the Fairfax County Connector and Loudoun County Transit have designated bus stops adjacent to the site. Table 1 shows a summary of the bus route information for the routes that serve the site, including service hours, headway, and distance to the nearest bus stop.

In addition to public bus lines, there are two (2) University-operated campus shuttles that provide service between the Foggy Bottom campus and the Mount Vernon campus, in the Foxhall neighborhood of Washington, DC, and the Virginia campus. Both shuttles (Vern Express and VSTC Express) serve the Foggy Bottom campus at G Street between 22nd and 23rd Streets. The Vern Express serves a stop on E Street between 20th Street and 21st Street, approximately one (1) block southwest of the site.

The closest Metrorail station to the site is the Farragut West station, which is served by the Blue, Orange, and Silver Lines and located approximately 0.4 miles (an 8-minute walk) east of the site. The Foggy Bottom-GWU station is also within walking distance, located 0.6 miles (an 11-minute walk) west of the site. The Blue Line provides service from Franconia-Springfield to Largo Town Center, the Orange Line provides service from Vienna to Minnesota Avenue, and the Silver Line provides service from Wiehle-Reston East to Largo Town Center. Each line runs every eight (8) minutes during the morning and afternoon rush hour periods, every 12 minutes during the midday and evening periods, and every 12 to 20 minutes on weekends. Connections to the Red Line may be made at the Metro Center station and connections to the Green and Yellow lines can be made at the L'Enfant Plaza station.

The proximity to nearby bus stops and Metrorail stations allows much of the DC metropolitan area to be accessible from the site. Existing transit facilities surrounding the site are shown on Figure 3.

Table 1: Bus Route Information

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
31	Wisconsin Avenue Line	Weekdays: 6:26 AM-11:30 PM Weekends: 6:10 AM-12:40 AM	10-87 min	0.2 miles, 3 minutes
32, 36	Pennsylvania Avenue Line	Weekdays: 5:10 AM-11:29 PM Weekends: 5:34 AM-12:34 AM	1-38 min	0.2 miles, 3 minutes
33	Wisconsin Avenue Line	Weekdays: 5:31 AM-9:24 PM Weekends: 5:31 AM-9:24 PM	10-46 min	0.3 miles, 6 minutes
39	Pennsylvania Avenue Limited Line	Eastbound: 3:43 PM-6:58 PM	16-20 min	0.3 miles, 6 minutes
80	North Capitol Street Line	Weekdays: 5:07 AM-1:36 AM Weekends: 5:16 AM-1:40 AM	12-36 min	<0.1 miles, 1 minute
N4	Massachusetts Avenue Line	Eastbound: 8:20 AM-9:19 AM Westbound: 4:35 PM-5:45 PM	24-40 min	<0.1 miles, 1 minute
S1	16th Street-Potomac Park Line	Southbound: 6:29 AM-10:05 AM Northbound: 3:54 PM-7:00 PM	5-20 min	<0.1 miles, 1 minute
3Y	Lee Highway-Farragut Square Line	Eastbound: 7:00 AM-9:17 AM Westbound: 4:24 PM-7:23 PM	15-30 min	<0.1 miles, 1 minute
7Y	Lincolnia-North Fairlington Line	Northbound: 5:31 AM-9:35 AM Southbound: 3:33 PM-6:30 PM	4-32 min	<0.1 miles, 1 minute
11Y	Mt. Vernon Express Line	Northbound: 7:12 AM-9:03 AM Southbound: 4:10 PM-6:15 PM	5-30 min	<0.1 miles, 1 minute
16Y	Columbia Pike-Farragut Square Line	Eastbound: 6:22 AM-9:37 AM Westbound: 3:38 PM-7:28 PM	6-20 min	<0.1 miles, 1 minute
LCT	Loudoun County Transit	Eastbound: 5:58 AM-9:24 AM Westbound: 3:16 PM-6:57 PM	1-34 min	<0.1 miles, 1 minute
699	Fairfax County Connector Government Center-Downtown D.C.	Eastbound: 6:23 AM-9:08 AM Westbound: 3:34 PM-6:43 PM	15-25 min	<0.1 miles, 1 minute
GWU	Vern Express Shuttle	Weekdays: 7:00 AM-3:00 AM Weekends: 7:00 PM-3:00 AM	5-30 min	0.2 miles, 3 minutes
GWU	VSTC Shuttle	Weekdays: 7:15 AM-7:30 PM	130-170 min	0.4 miles, 7 minutes

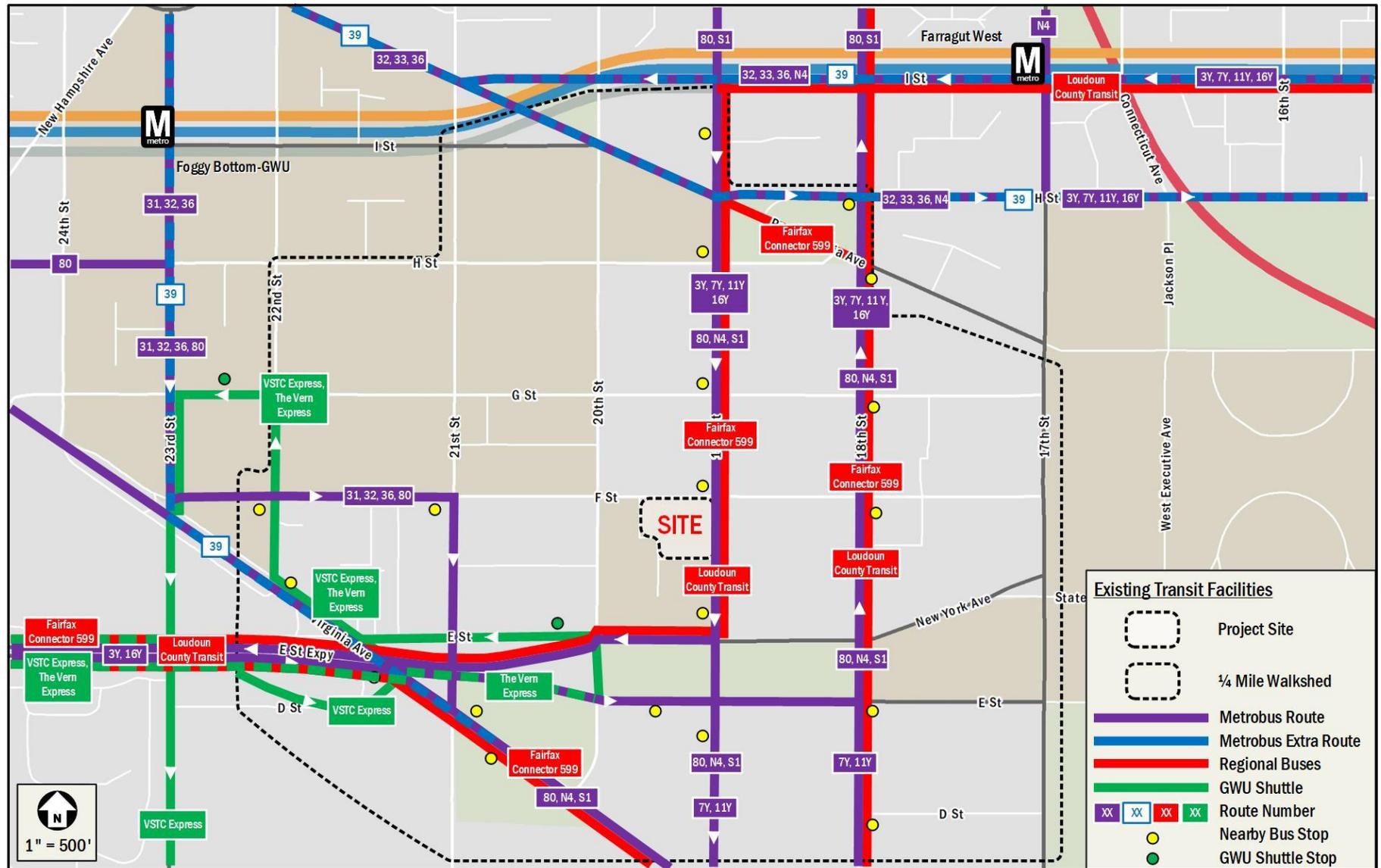


Figure 3: Existing Transit Facilities

Bicycle Facilities

The project site is located in an area with access to on-street bicycle facilities. Existing on-street facilities consist of cycle tracks north of the site along L Street (eastbound) and M Street (westbound). These facilities lead to the Rock Creek Trail to the west and the 15th Street cycle track to the east. The Rock Creek Trail provides cyclists with a continuous path between the Tidal Basin and Montgomery County, Maryland. Additional trail connections are available along the Georgetown Waterfront, connecting to the Capital Crescent Trail. Figure 4 illustrates the existing bicycle facilities in the area.

Further additions to the bicycle infrastructure are proposed in the vicinity of the site. DDOT is currently evaluating a protected north-south cycle track connecting Dupont Circle to the National Mall. The recommended alternative is to have a protected two-way cycle track run along 20th Street from Connecticut Avenue and F Street, a protected two-way cycle track run along 21st Street between G Street and Constitution Avenue, and one-way protected bike lanes running along G Street and F Street. This proposed facility will run adjacent to the site and will provide students and employees of the proposed development with more immediate access to protected bicycle facilities. Final design and construction for the cycle tracks is scheduled for completion in 2021.

Capital Bikeshare

The Capital Bikeshare program provides additional cycle options for students and employees of the proposed development. The program has placed over 500 bikeshare stations across the Washington, DC metropolitan area with over 4,300 bicycles in the fleet. Two (2) Capital Bikeshare Stations are within a two-minute walk: a 23-dock station located at the northeast corner of 19th and G Streets (one-block north) and a 15-dock station located at the northwest corner of E Street and 20th Street.

E-Scooters and Dockless E-Bicycles

Seven (7) electric-assist scooter (e-scooter) and electric-assist bicycle (e-bike) companies provide Shared Mobility Device (SMD) service in the District: Bird, Bolt, JUMP, Lime, Lyft, Skip, and Spin. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through each company-specific mobile phone application. Many SMDs do not have designated stations where pick-up/drop-off activities occur like with Capital Bikeshare; instead, many SMDs are parked in public space, most commonly in the “furniture zone” (the portion of sidewalk between where people walk and the curb, often where you’ll find other street signs, street furniture, trees, parking meters, etc.). At this time, SMD pilot/demonstration programs are underway in Arlington County, the District, Fairfax County, the City of Alexandria, and Montgomery County.

In addition to the existing and planned bicycle facilities, the project is proposing to provide additional accommodations to bicyclists with the addition of short-term bicycle parking racks along the frontage of the site making bicycle travel a viable option for those traveling to and from the site.

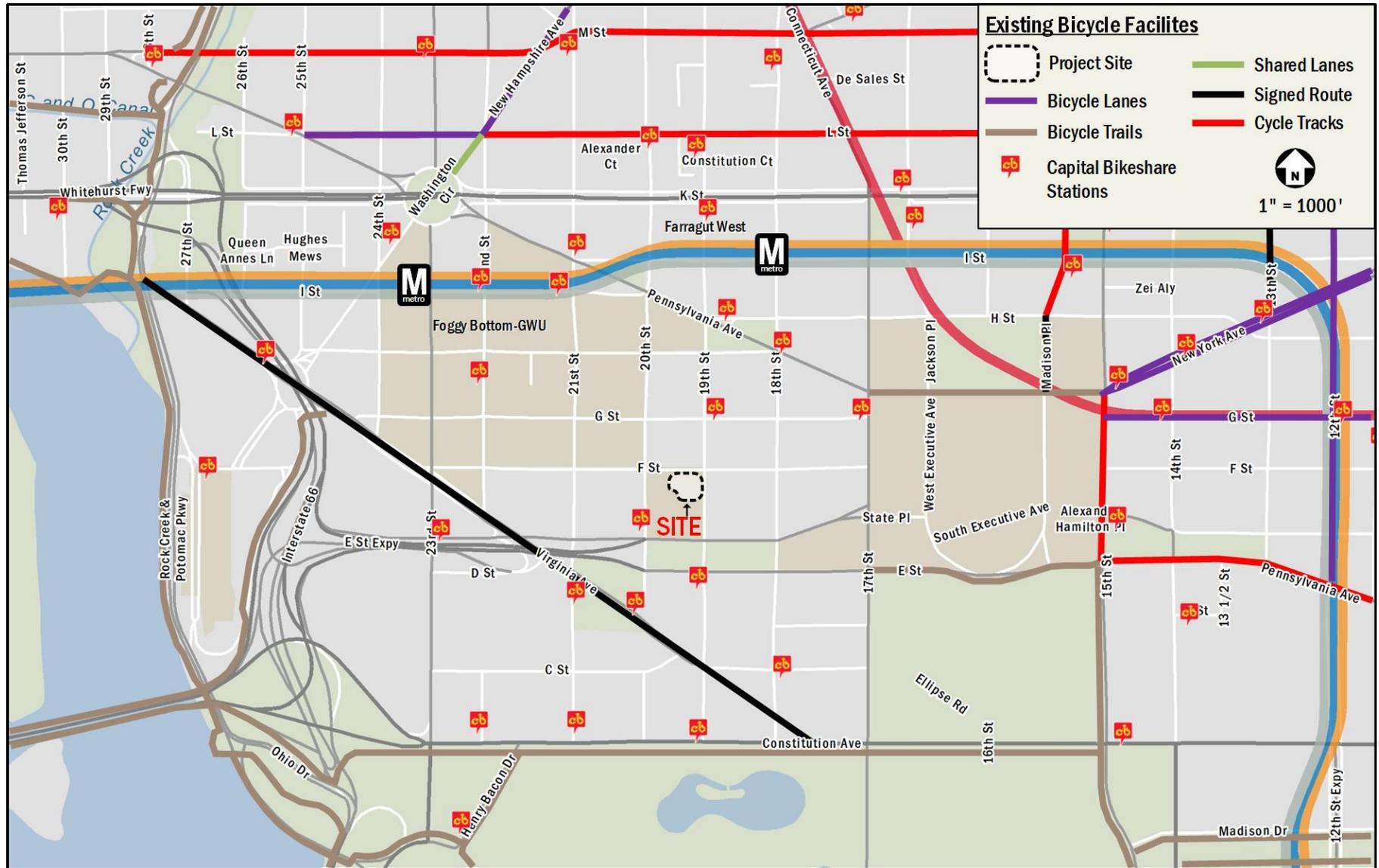


Figure 4: Existing Bicycle Facilities

Pedestrian Facilities

Overall, the pedestrian facilities within the study area provide excellent connectivity to major local destinations. A summary of the pedestrian facilities within a 0.25-mile area is shown on Figure 5, with a summary of sidewalk width and buffer requirements provided in Table 2.

There are minor areas of concern within the study area that may impact the quality and attractiveness of walking, such as the site's proximity to major commuting routes including the crossing of E Street near the portals of the E Street Expressway. Within the study area shown, all roadways are considered part of the Central Business District. The sidewalks that do not meet DDOT standards are typically along commercial streets that do not maintain the minimum sidewalk width of 16 feet but do provide a minimum unobstructed width of 10 feet.

ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two (2) crosswalks are not desired. As shown in Figure 5, under existing conditions, there are some crosswalks and curb ramps near the site that do not meet DDOT and/or ADA standards. Along major pedestrian routes within the GWU campus (F Street, G Street, 21st Street), most sidewalks, crosswalks, and curb ramps meet DDOT and/or ADA standards, providing students and employees of the proposed development with a quality walking environment.

Table 2: Sidewalk Requirements

Street Type	Minimum Buffer Width	Minimum Sidewalk Unobstructed Width	Total Minimum Sidewalk Width
Residential (Low to Moderate Density)	4-6 feet	6 feet	10 feet
Residential (High Density)	4-8 feet	8 feet	13 feet
Central DC and Commercial Areas	4-10 feet	10 feet	16 feet

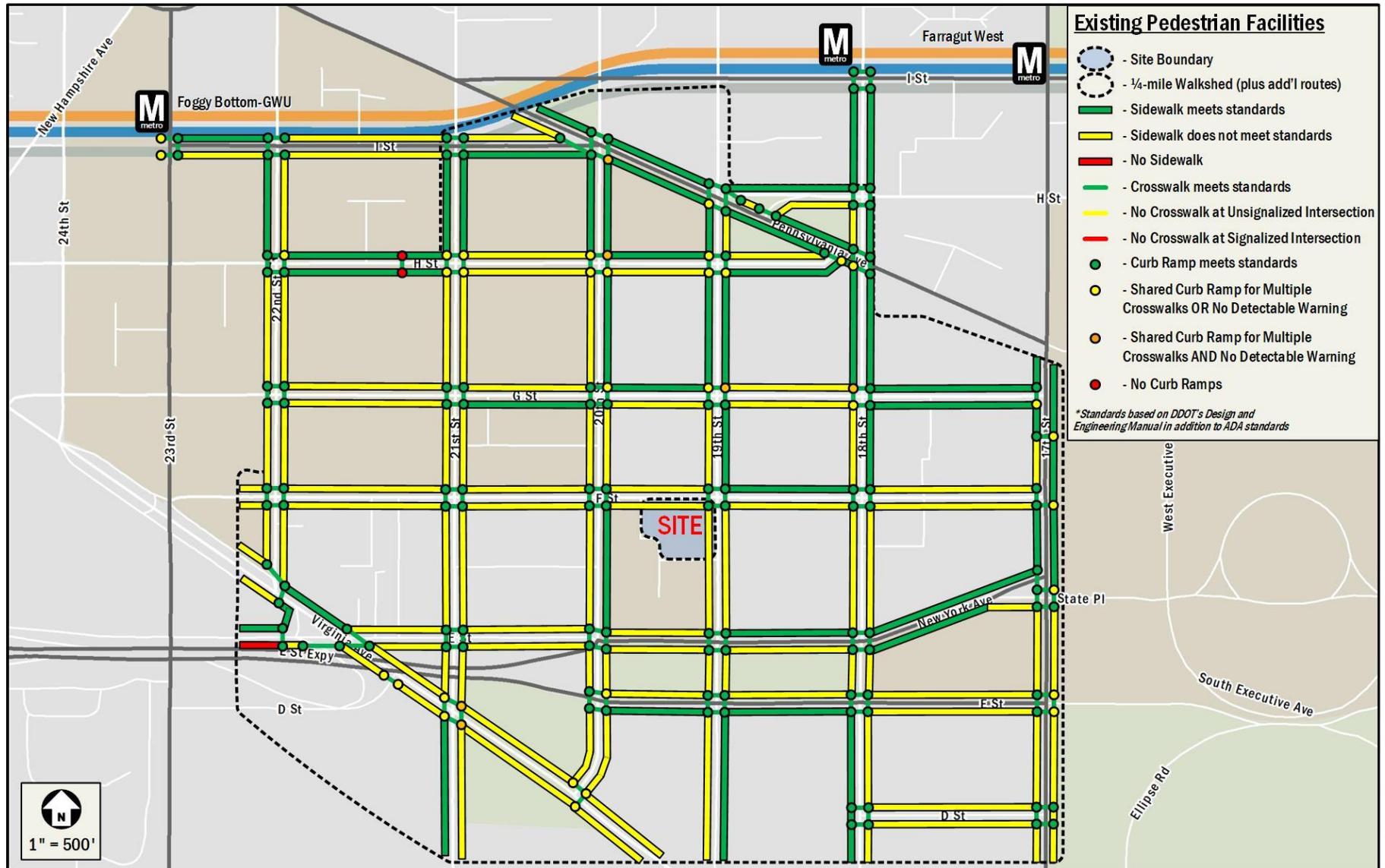


Figure 5: Existing Pedestrian Facilities

TRIP GENERATION

Vehicle trips were calculated to quantify the vehicular impact of the project and to determine the scope of review for vehicular analysis. Traditionally weekday peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition*. This methodology was supplemented to account for the urban nature of the site (the *Trip Generation Manual* provides data for non-urban, low transit use site) and to generate trips for multiple modes. Trip generation was calculated based on ITE Land Use 225, Off-Campus Student Housing (*Adjacent to Campus*) for the existing and proposed number of beds (1,080 and 850 beds, respectively). Staff trip generation was calculated with the assumption that all six (6) employees will arrive and depart during the peak hours.

This analysis was supplemented with data from GWU's 2007 Campus Plan and previously submitted transportation studies for University projects. These previous studies indicate that on-campus student housing generates minimal peak hour vehicle trips as students primarily travel by foot around campus. Additionally, Thurston Hall is designated to house first-year undergraduate students, who are not allowed to bring vehicles on campus per University policy. However; a conservative auto mode split of 7% was assumed for student residents of Thurston Hall to account for trips made by Transportation Network Companies (TNCs) such as Uber and Lyft, as well as trips made by delivery vehicles. The mode split assumptions applied to the analysis are presented in Table 3.

A summary of the multimodal trip generation for Thurston Hall is shown in Table 4 for the weekday morning and afternoon peak hours. Detailed trip generation calculations are included in the Technical Attachments. As can be seen, the renovation of Thurston Hall is expected to generate one (1) additional trip (0 inbound, 1 outbound) during the morning peak hour and two (2) fewer trips (1 fewer inbound, 1 fewer outbound) in the afternoon peak hour as compared to existing conditions. Please note that per DDOT guidelines, and as vetted and approved by DDOT, the number of net new trips does not exceed

Table 3: Mode Split

User Group	Mode			
	Drive	Transit	Bike	Walk
Students	7%	15%	5%	73%
Staff	13%	85%	0%	2%

Table 4: Multimodal Trip Generation Summary

Mode	Scenario	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto	Existing	4 veh/hr	4 veh/hr	8 veh/hr	10 veh/hr	10 veh/hr	20 veh/hr
	Proposed	4 veh/hr	5 veh/hr	9 veh/hr	9 veh/hr	9 veh/hr	18 veh/hr
	Net Total	0 veh/hr	1 veh/hr	1 veh/hr	-1 veh/hr	-1 veh/hr	-2 veh/hr
Transit	Existing	13 ppl/hr	17 ppl/hr	30 ppl/hr	36 ppl/hr	35 ppl/hr	71 ppl/hr
	Proposed	16 ppl/hr	21 ppl/hr	37 ppl/hr	35 ppl/hr	35 ppl/hr	70 ppl/hr
	Net Total	3 ppl/hr	4 ppl/hr	7 ppl/hr	-1 ppl/hr	0 ppl/hr	-1 ppl/hr
Bike	Existing	4 ppl/hr	6 ppl/hr	10 ppl/hr	12 ppl/hr	12 ppl/hr	24 ppl/hr
	Proposed	3 ppl/hr	5 ppl/hr	8 ppl/hr	10 ppl/hr	9 ppl/hr	19 ppl/hr
	Net Total	-1 ppl/hr	-1 ppl/hr	-2 ppl/hr	-2 ppl/hr	-3 ppl/hr	-5 ppl/hr
Walk	Existing	61 ppl/hr	86 ppl/hr	147 ppl/hr	174 ppl/hr	173 ppl/hr	347 ppl/hr
	Proposed	50 ppl/hr	73 ppl/hr	123 ppl/hr	140 ppl/hr	140 ppl/hr	280 ppl/hr
	Net Total	-11 ppl/hr	-13 ppl/hr	-24 ppl/hr	-34 ppl/hr	-33 ppl/hr	-67 ppl/hr

the number of trips that would require a vehicular capacity analysis (25 trips in the peak direction). The minimal number of new trips generated by the Thurston Hall renovation will have a manageable impact on the surrounding transportation and roadway network.

DESIGN REVIEW

This section provides an overview of the on-site transportation features of the development, including an overview of site access. The renovated building will have a reduced GFA of approximately 186,789 square feet with 458 dwelling units and a reduced number of beds to approximately 850 beds. The renovation also includes the addition of a student-only 250 seat dining facility to the building. A ground level floor plan is provided in Figure 6 and first level floor plan is provided on Figure 7.

Site Access

Under existing conditions, pedestrian access to Thurston Hall is located along F Street. The location of the main pedestrian access point will remain unchanged following renovations. The pedestrian entrance is located across the street from the bus stop at 19th Street and F Street, allowing for convenient access to regional bus lines for student residents and employees of Thurston Hall.

Bicycle access to the site will be available from F Street (one-way eastbound). Short-term and long-term bicycle facilities are proposed for the renovated Thurston Hall. Short-term spaces are proposed in the form of 18 inverted U-racks providing 36 spaces, which will be placed at 45 degrees curbside along the F Street and 19th Street frontages. Secure long-term bicycle storage rooms will be located one floor below street level and accessed from the main entrance along F Street. A minimum of 36 long-term spaces are proposed in the bicycle storage rooms consistent with existing conditions. Given the reduction in number of beds and student residents that will be housed in the renovated Thurston Hall, the proposed ratio of long-term bicycle parking spaces per student resident is higher as a result of the renovations.

No on-site vehicular parking is provided under existing conditions, and none is proposed as part of the Thurston Hall renovation. Pick-up and drop-off operations will continue to predominately take place curbside on F Street (which is one-way eastbound), adjacent to the primary entrance to Thurston Hall. Access to the loading facilities will continue to take place via an existing curb cut on 19th Street, which connects to a private alley abutting Thurston Hall to the south. Loading truck access will continue to utilize the existing back-in, head-out maneuvers. Site circulation and access for all modes is presented on Figure 8. Inbound and outbound turning maneuvers into the loading area are presented in Figure 9 and Figure 10, respectively.

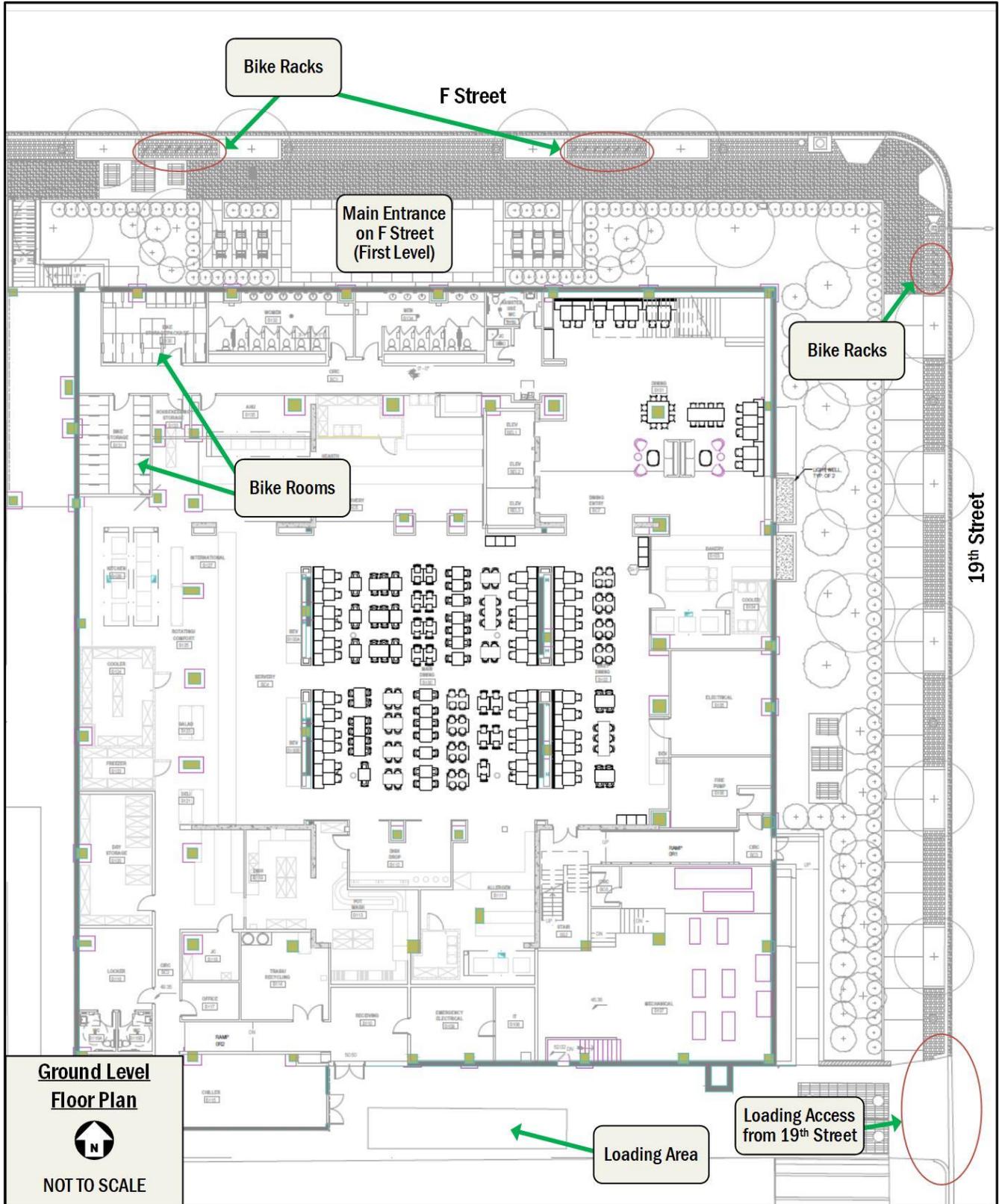


Figure 6: Ground Level Floor Plan

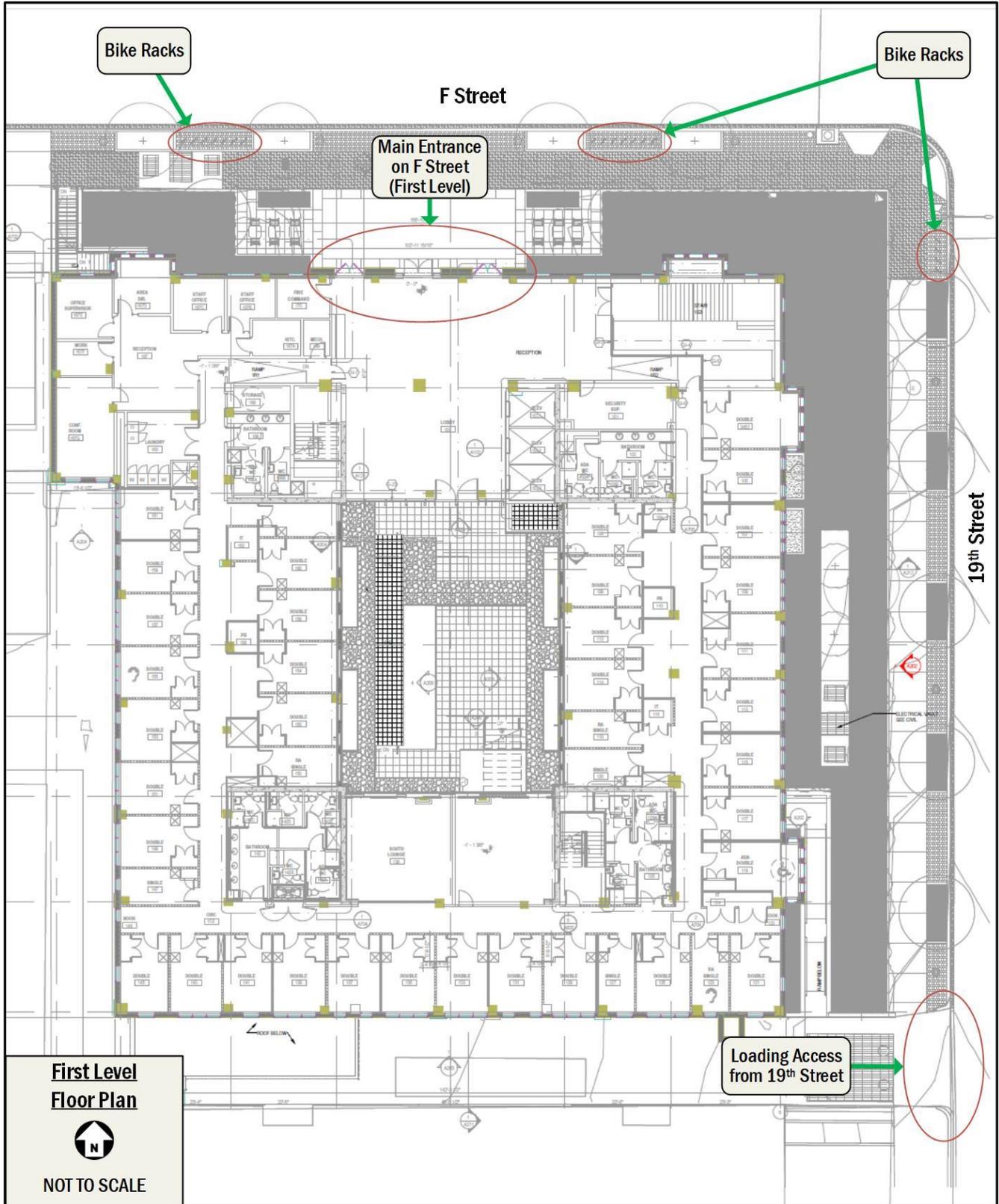


Figure 7: First Level Floor Plan

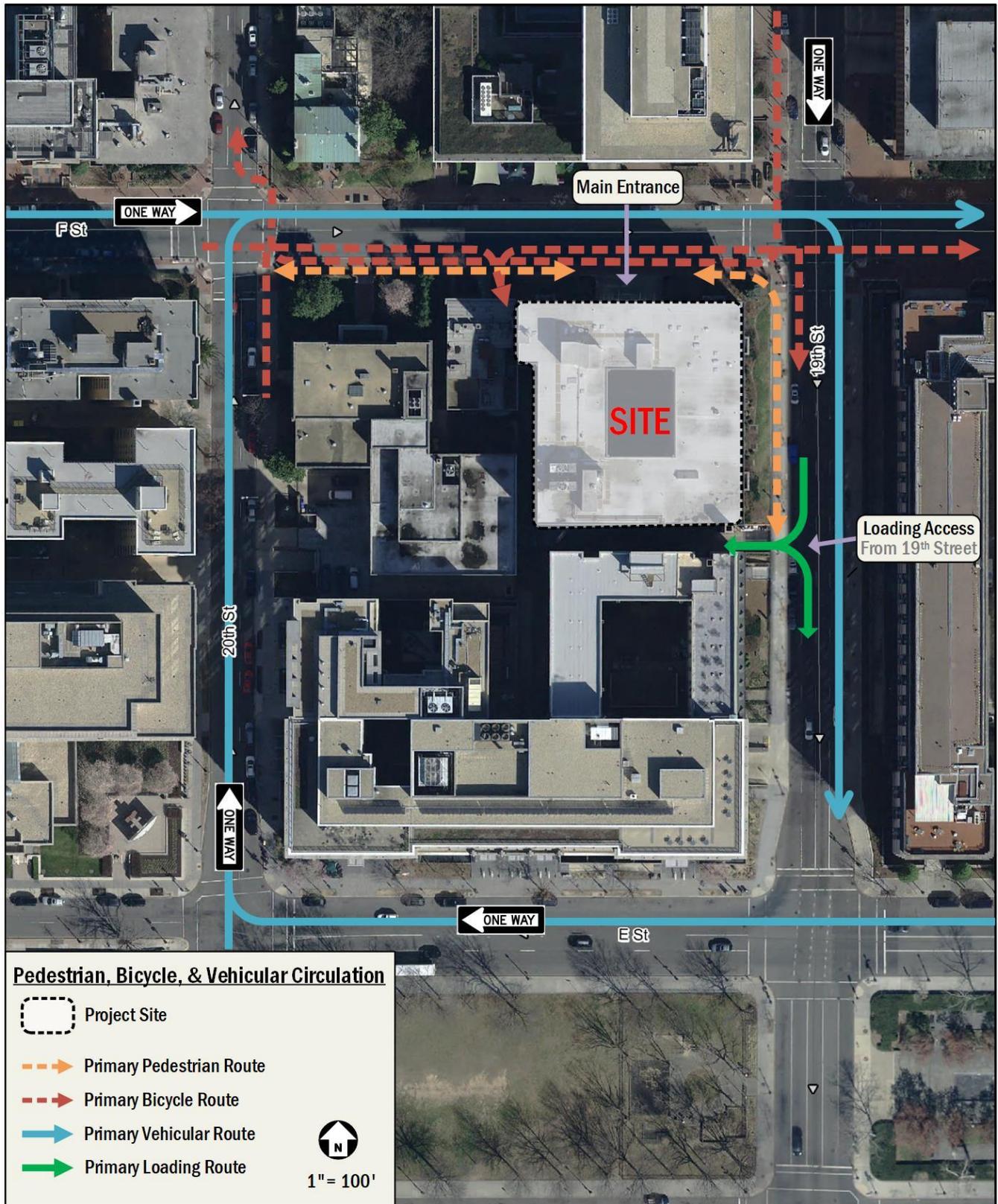


Figure 8: Circulation Plan

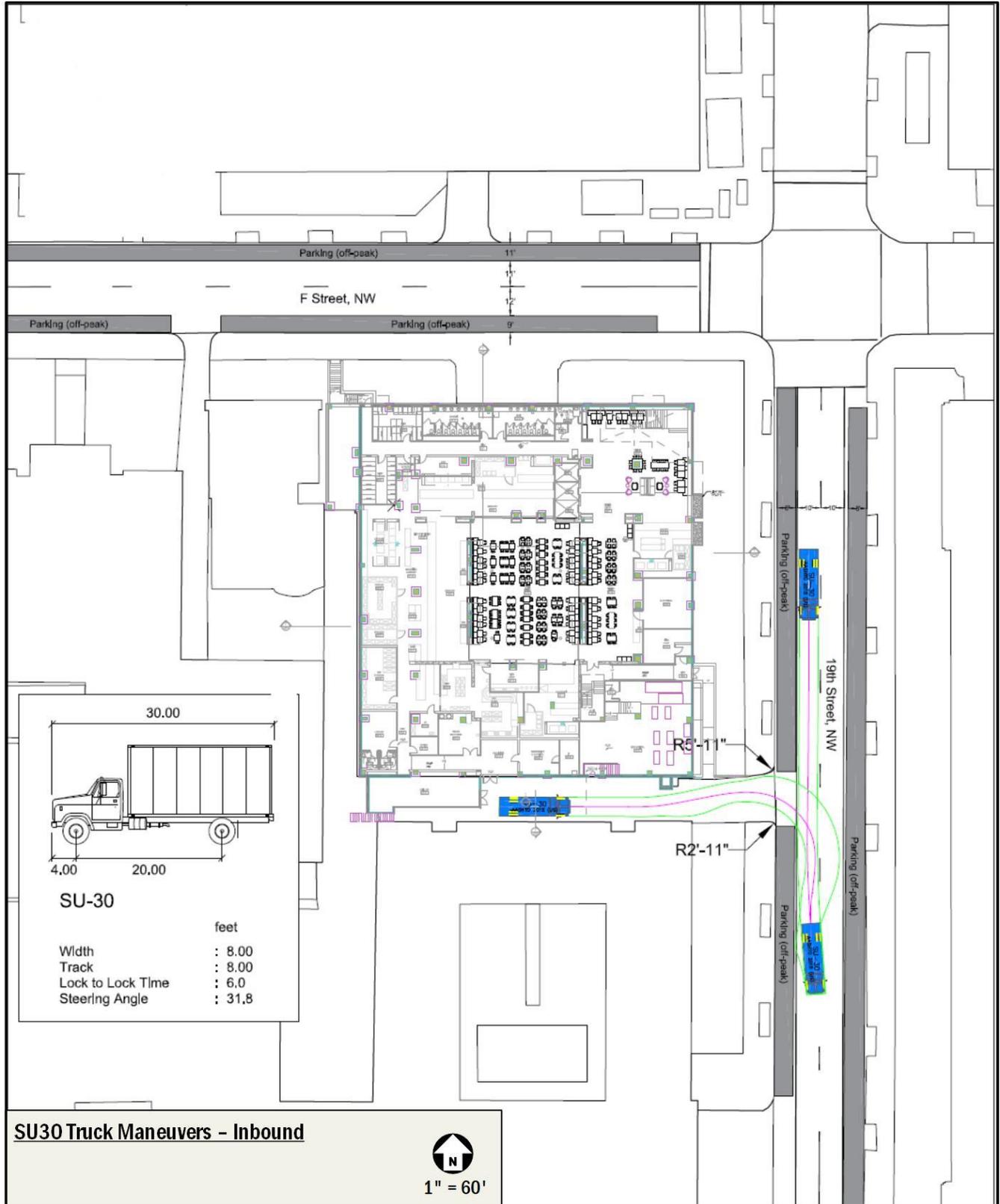


Figure 9: Inbound Turning Maneuver into Loading Area

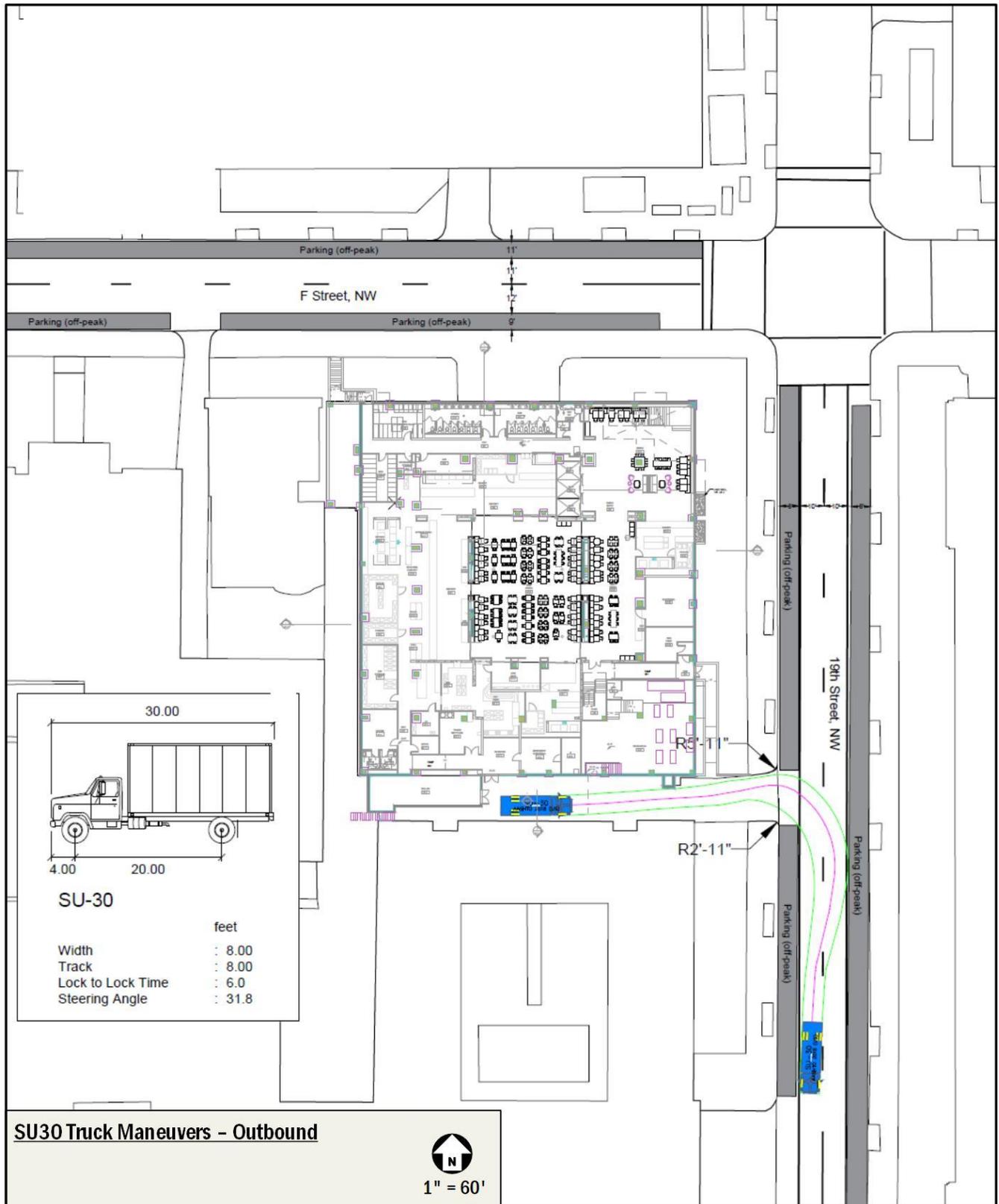


Figure 10: Outbound Turning Maneuver from Loading Area

Loading Management Plan

The proposed loading area and access for the building are consistent with existing conditions. With the introduction of the dining facility, a loading management plan

is proposed with the goal of minimizing impact to the surrounding roadways, neighboring developments, and students. The components of the plan are intended to facilitate smooth operation of the loading facilities through a combination of management and scheduling of loading operations.

The components of the loading management plan are as follows:

- A loading dock manager will be designated by the University. The dock manager will coordinate with the office of GW Housing and the dining hall operator to schedule deliveries;
- All loading, delivery, and trash collection activity will be required to take place in the alleyway remaining on private property at all times;
- The dock manager will schedule deliveries and ensuring loading area capacity is not exceeded. In the case of unscheduled deliveries arriving while the loading area is full, the driver will be directed to return at a different time so as to not impede traffic flow on any adjacent streets;
- Trucks using the loading area will not be allowed to idle and must follow all District guidelines for heavy vehicle operation including but not limited to DCMR 20 – Chapter 9, Section 900 (Engine Idling), the regulations set forth in DDOT’s Freight Management and Commercial Vehicle Operations document, and the primary access routes listed in the DDOT Truck and Bus Route System;
- The dock manager will be responsible for disseminating DDOT’s Freight Management and Commercial Vehicle Operations document to drivers as needed to encourage compliance with District laws and DDOT’s truck routes. The dock manager will also post these documents in a prominent location within the service area;
- The dock manager and/or a representative of the University will be on call during scheduled deliveries to address compliance issues;

Temporary Housing Plan Review

The 2007 Campus Plan was approved with conditions specifying a minimum number of beds provided through on-campus housing and restricting the student groups that can be housed at specific properties. In order to continue supplying the required number of beds to undergraduate students while the Thurston Hall renovations take place, the University developed a proposed Temporary Housing Plan to address the temporary loss of Thurston’s 1,080 on-campus beds. The Temporary Housing Plan consists of three primary elements: (1) a temporary decrease in enrolment; (2) utilizing existing capacity in existing student housing with available capacity; and (3) relocating different student groups across existing GWU properties. These elements will address student housing supply while minimizing impacts to the surrounding community. The head count of 1,080 students would be matched by the following accommodations, relocations, and enrolment reductions:

- Temporary Reduction in Enrollment

The Temporary Housing Plan includes a temporary reduction in enrollment of 332 students. This includes an enrollment reduction of 200 students, as well as a reduction in an additional 132 students by increasing student participation in study abroad programs or additional enrollment reductions.

- Utilization of Existing Capacity

The Temporary Housing Plan includes housing 198 students in existing surplus on-campus beds.

- Temporary Relocation of Students across GWU Properties

The Temporary Housing Plan identifies 11 facilities, shown on Figure 11 and listed on Table 5, to accommodate relocated student beds as a result of the deficit of first-year student beds while the Thurston Hall renovations take place. Out of the proposed facilities, only three (3) are proposed to change in use or are proposed to accommodate student sub-groups currently restricted:

- The 1959 E Street Residence Hall – currently limited to third- and fourth-year students, is proposed to accommodate 189 second-year students.
- The Aston – located at 1129 New Hampshire Avenue and currently limited to graduate and law school students, is proposed to accommodate 220 third- and fourth-year students.
- One Washington Circle – currently a 151-room hotel, is proposed to be temporarily converted to a residence hall accommodating 330 third- and fourth-year students.

No transportation impacts are expected from the relocation of students to the proposed facilities that already house first- and second-year students as no to minimal differences in travel patterns are expected. Similarly, the temporary housing the relocation of second-year students to 1959 E Street or the relocation of third- and fourth-year students to The Aston would result in no to minimal transportation impacts.

The One Washington Circle Hotel is the only property identified in the Temporary Housing Plan with a proposed change in use. This property is proposed to change in use from a hotel with 151 rooms to student housing accommodating up to 330 student beds. Table 6 shows a comparison of the multimodal trip generation for the temporary relocation of students to One Washington Circle and the existing hotel. As can be seen, temporary relocation of students to One Washington Circle would result in a decrease in vehicular trips during the weekday morning and afternoon peak hours as compared to the existing hotel. Detailed trip generation calculations are included in the Technical attachments.

The Temporary Housing Plan also includes the following measures for each property to mitigate potential impacts associated with the temporary relocation and introduction of new student sub-groups to facilities currently house no students or house third-, fourth-, or graduate students only:

- The University will provide residential engagement support to service the student population at all three properties, including resident advisors, faculty in-residence, and in-residence professional staff living at each property. The Residential Conduct Guidelines that govern student behavior in and around university residential facilities shall apply to each property, as well as the Student Code of Conduct.
- At One Washington Circle, the building will be staffed by professional management staff 24 hours per day, seven (7) days per week to maintain and operate the property, and also serve as additional oversight regarding the buildings' operations and any concerns raised by neighbors.

- The University will continue to provide a mechanism for reporting issues concerning student behavior to the GW University Police Department, and violations of DC law may be reported to the Metropolitan Police Department.

Once the Thurston Hall renovations are complete, the University will discontinue the Temporary Housing Plan and will revert back to the existing housing plan and the current Campus Plan/PUD and 1959 E Street PUD conditions. The renovated Thurston Hall is anticipated to provide approximately 250 net fewer beds but this reduction is offset by the current bed surplus and the decreased Foggy Bottom full-time undergraduate population.

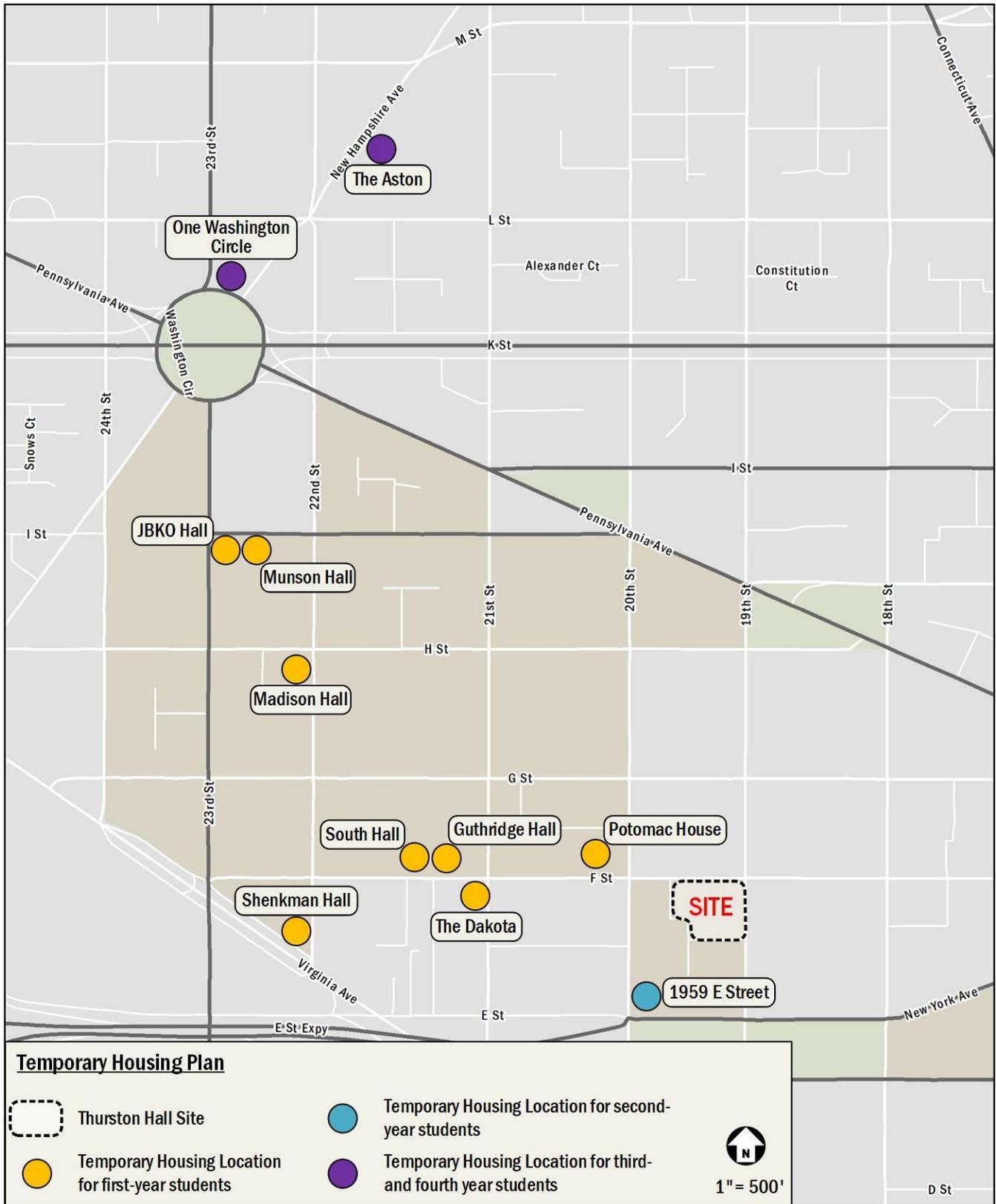


Figure 11: Location of Temporary Housing Properties

Table 5: List of Temporary Housing Properties

Property	Current Use	Temporary Change	Transportation Impact
Madison Hall	Residential Hall; reserved for first-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
Potomac House	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
The Dakota	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
Guthridge Hall	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
Shenkman Hall	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
Munson Hall	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
JBKO Hall	Residential Hall; reserved for second- and third-year students	No change in use or size; housing for first-year students	None; same use, user group, and size
1959 E Street	Residential Hall; reserved for third- and fourth-year students	No change in use or size; housing for second-year students in addition to groups already housed at this location	None; same use, user group, and size
The Aston	Residential Hall; graduate housing only	No change in use or size; 220 student beds reserved for upper class undergraduate (third- and fourth-year) students in addition to groups already housed at this location	None; same use, user group, and size
One Washington Circle	Hotel (151 rooms)	Resident Hall with 330 student beds reserved for upper class undergraduate (third- and fourth-year) students	Net decrease in vehicle trips, increase in pedestrian trips

Table 6: One Washington Circle Trip Generation Comparison

Mode	Scenario	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto	Existing	12 veh/hr	9 veh/hr	21 veh/hr	10 veh/hr	11 veh/hr	21 veh/hr
	Proposed	7 veh/hr	5 veh/hr	12 veh/hr	7 veh/hr	7 veh/hr	14 veh/hr
	Net Total	-5 veh/hr	-4 veh/hr	-9 veh/hr	-3 veh/hr	-4 veh/hr	-7 veh/hr
Transit	Existing	23 ppl/hr	17 ppl/hr	40 ppl/hr	19 ppl/hr	21 ppl/hr	40 ppl/hr
	Proposed	26 ppl/hr	18 ppl/hr	44 ppl/hr	25 ppl/hr	25 ppl/hr	50 ppl/hr
	Net Total	3 ppl/hr	1 ppl/hr	4 ppl/hr	6 ppl/hr	4 ppl/hr	10 ppl/hr
Bike	Existing	3 ppl/hr	2 ppl/hr	5 ppl/hr	2 ppl/hr	3 ppl/hr	5 ppl/hr
	Proposed	9 ppl/hr	6 ppl/hr	15 ppl/hr	8 ppl/hr	9 ppl/hr	17 ppl/hr
	Net Total	6 ppl/hr	4 ppl/hr	10 ppl/hr	6 ppl/hr	6 ppl/hr	12 ppl/hr
Walk	Existing	12 ppl/hr	8 ppl/hr	20 ppl/hr	10 ppl/hr	10 ppl/hr	20 ppl/hr
	Proposed	126 ppl/hr	87 ppl/hr	213 ppl/hr	123 ppl/hr	119 ppl/hr	242 ppl/hr
	Net Total	114 ppl/hr	79 ppl/hr	193 ppl/hr	113 ppl/hr	109 ppl/hr	222 ppl/hr

TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM is the application of policies and strategies used to reduce travel demand or redistribute demand to other times or spaces. TDM focuses on reducing the demand of single-occupancy, private vehicles during peak period travel times or on shifting single-occupancy vehicular demand to off-peak periods.

The 2007 Campus Plan includes a Traffic Management Program (TMP) with TDM elements that apply to all University properties, including the renovated Thurston Hall and properties identified in the Temporary Housing Plan.

The renovated Thurston Hall and temporary housing locations will apply the following TDM measures:

- Students are provided information on transportation options upon move-in that includes details on public transit options, bike facilities locations, and other available programs;
- Alternative transportation modes, carpooling programs, car-sharing, and carpooling programs are promoted through flyers and information provided to students at the subject locations;
- A transportation factsheet link is posted online to provide information and campus transportation options;

The Office of Transportation & Parking Services maintains and provides up to date information to students regarding transportation options and options to purchase transit fare media, including SmarTrip fare cards and bus passes, online.

SUMMARY AND CONCLUSIONS

The findings of this study conclude the following:

- The proposed project will not have a detrimental impact on the surrounding transportation network and does not result in any significant increase in vehicular travel;
- The proposed Temporary Housing Plan will not adversely impact the local transportation network;
- The TDM measures that will be implemented at Thurston Hall and the locations associated with the Temporary Housing Plan adequately promote non-auto modes of travel for students.

The project has several positive elements contained within its design that minimize potential transportation impacts, including:

- The project's proximity to transit;
- The provision of secure long-term bicycle parking consistent with existing conditions (including an improvement in the long-term bicycle parking ratio due to a reduction in beds), and the installation of new short-term bicycle parking spaces along the frontage of the site;
- The implementation of TDM measures consistent with the University's TMP that reduce the demand of single-occupancy, private vehicles.

TECHNICAL ATTACHMENTS

Trip Generation - Student Housing (Existing)

1080 Residential Beds

Step 1: Base trip generation using ITEs' *Trip Generation* 10th Edition

Land Use	Land Use Code	Quantity (x)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour*		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	225	1,080 Residents	50 veh/hr	71 veh/hr	121 veh/hr	143 veh/hr	142 veh/hr	285 veh/hr	3071 veh	100 veh/hr	127 veh	227 veh
<i>Calculation Details:</i>			41%	59%	$\ln(T)=0.76\ln(X)-0.51$	50%	50%	$=0.24X+25.88$	$\ln(T)=0.66\ln(X)+3.42$	53%	47%	$=.21(x)$

Note: Setting used for trip generation above is Adjacent to Campus

* ITE LUC 221 used for Saturday Student trip generation

Step 2: Convert to people per hour, before applying mode splits

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	1.67 ppl/veh	84 ppl/hr	118 ppl/hr	202 ppl/hr	239 ppl/hr	237 ppl/hr	476 ppl/hr	5129 ppl	167 ppl	212 ppl	379 ppl

Step 3: Split between modes, per assumed Mode Splits

Land Use	Mode	Split	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	Auto	7%	6 ppl/hr	8 ppl/hr	14 ppl/hr	17 ppl/hr	16 ppl/hr	33 ppl/hr	359 ppl	12 ppl/hr	15 ppl/hr	27 ppl/hr
Student Housing	Transit	15%	13 ppl/hr	17 ppl/hr	30 ppl/hr	36 ppl/hr	35 ppl/hr	71 ppl/hr	769 ppl	25 ppl/hr	32 ppl/hr	57 ppl/hr
Student Housing	Bike	5%	4 ppl/hr	6 ppl/hr	10 ppl/hr	12 ppl/hr	12 ppl/hr	24 ppl/hr	256 ppl	8 ppl/hr	11 ppl/hr	19 ppl/hr
Student Housing	Walk	73%	61 ppl/hr	86 ppl/hr	147 ppl/hr	174 ppl/hr	173 ppl/hr	347 ppl/hr	3744 ppl	122 ppl/hr	155 ppl/hr	277 ppl/hr

Step 4: Convert auto trips back to vehicles/hour

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	1.67 ppl/veh	4 veh/hr	4 veh/hr	8 veh/hr	10 veh/hr	10 veh/hr	20 veh/hr	215 veh	7 veh/hr	9 veh/hr	16 veh/hr

Trip Gen Summary for Existing Student Housing

Mode	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
	In	Out	Total	In	Out	Total	Total	In	Out	Total
Auto	4 veh/hr	4 veh/hr	8 veh/hr	10 veh/hr	10 veh/hr	20 veh/hr	215 veh	7 veh/hr	9 veh/hr	16 veh/hr
Transit	13 ppl/hr	17 ppl/hr	30 ppl/hr	36 ppl/hr	35 ppl/hr	71 ppl/hr	769 ppl	25 ppl/hr	32 ppl/hr	57 ppl/hr
Bike	4 ppl/hr	6 ppl/hr	10 ppl/hr	12 ppl/hr	12 ppl/hr	24 ppl/hr	256 ppl	8 ppl/hr	11 ppl/hr	19 ppl/hr
Walk	61 ppl/hr	86 ppl/hr	147 ppl/hr	174 ppl/hr	173 ppl/hr	347 ppl/hr	3744 ppl	122 ppl/hr	155 ppl/hr	277 ppl/hr

Trip Generation - Student Housing (Proposed)

850 Residential Beds

Step 1: Base trip generation using ITEs' *Trip Generation* 10th Edition

Land Use	Land Use Code	Quantity (x)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour*		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	225	850 Residents	41 veh/hr	60 veh/hr	101 veh/hr	115 veh/hr	115 veh/hr	230 veh/hr	2622 veh	79 veh/hr	100 veh	179 veh
<i>Calculation Details:</i>			41%	59%	$\ln(T)=0.76\ln(X)-0.51$	50%	50%	$=0.24X+25.88$	$\ln(T)=0.66\ln(X)+3.42$	53%	47%	$=.21(x)$

Note: Setting used for trip generation above is *Adjacent to Campus*

* ITE LUC 221 used for Saturday Student trip generation

Dining Hall Staff	N/A	6 Staff	6 veh/hr	6 veh/hr	12 veh/hr	6 veh/hr	6 veh/hr	12 veh/hr	36 veh	6 veh/hr	6 veh	12 veh
<i>Calculation Details:</i>			50%	50%	$=2(x)$	50%	50%	$=2(x)$	$=3.65(x)$	50%	50%	$=2(x)$

Note: Trip generation above calculated assuming all 6 are swapping shifts during the peak hours.

Step 2: Convert to people per hour, before applying mode splits

User Group	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	1.67 ppl/veh	68 ppl/hr	101 ppl/hr	169 ppl/hr	192 ppl/hr	192 ppl/hr	384 ppl/hr	4379 ppl	132 ppl	167 ppl/hr	299 ppl
Staff	1.18 ppl/veh	7 ppl/hr	7 ppl/hr	14 ppl/hr	7 ppl/hr	7 ppl/hr	14 ppl/hr	42 ppl	7 ppl	7 ppl/hr	14 ppl

Step 3: Split between modes, per assumed Mode Splits

User Group	Mode	Split	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	Auto	7%	5 ppl/hr	7 ppl/hr	12 ppl/hr	13 ppl/hr	14 ppl/hr	27 ppl/hr	307 ppl	9 ppl/hr	12 ppl/hr	21 ppl/hr
Students	Transit	15%	10 ppl/hr	15 ppl/hr	25 ppl/hr	29 ppl/hr	29 ppl/hr	58 ppl/hr	657 ppl	20 ppl/hr	25 ppl/hr	45 ppl/hr
Students	Bike	5%	3 ppl/hr	5 ppl/hr	8 ppl/hr	10 ppl/hr	9 ppl/hr	19 ppl/hr	219 ppl	7 ppl/hr	8 ppl/hr	15 ppl/hr
Students	Walk	73%	50 ppl/hr	73 ppl/hr	123 ppl/hr	140 ppl/hr	140 ppl/hr	280 ppl/hr	3197 ppl	96 ppl/hr	122 ppl/hr	218 ppl/hr
Staff	Auto	13%	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	5 ppl	1 ppl/hr	1 ppl/hr	2 ppl/hr
Staff	Transit	85%	6 ppl/hr	6 ppl/hr	12 ppl/hr	6 ppl/hr	6 ppl/hr	12 ppl/hr	36 ppl	6 ppl/hr	6 ppl/hr	12 ppl/hr
Staff	Bike	0%	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl	0 ppl/hr	0 ppl/hr	0 ppl/hr
Staff	Walk	2%	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	1 ppl	0 ppl/hr	0 ppl/hr	0 ppl/hr

Step 4: Convert auto trips back to vehicles/hour

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	1.67 ppl/veh	3 veh/hr	4 veh/hr	7 veh/hr	8 veh/hr	8 veh/hr	16 veh/hr	184 veh	5 veh/hr	8 veh/hr	13 veh/hr
Staff	1.18 ppl/veh	1 veh/hr	1 veh/hr	2 veh/hr	1 veh/hr	1 veh/hr	2 veh/hr	4 veh	1 veh/hr	1 veh/hr	2 veh/hr

Trip Gen Summary for Proposed Student Housing

Mode	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
	In	Out	Total	In	Out	Total	Total	In	Out	Total
Auto	4 veh/hr	5 veh/hr	9 veh/hr	9 veh/hr	9 veh/hr	18 veh/hr	188 veh	6 veh/hr	9 veh/hr	15 veh/hr
Transit	16 ppl/hr	21 ppl/hr	37 ppl/hr	35 ppl/hr	35 ppl/hr	70 ppl/hr	693 ppl	26 ppl/hr	31 ppl/hr	57 ppl/hr
Bike	3 ppl/hr	5 ppl/hr	8 ppl/hr	10 ppl/hr	9 ppl/hr	19 ppl/hr	219 ppl	7 ppl/hr	8 ppl/hr	15 ppl/hr
Walk	50 ppl/hr	73 ppl/hr	123 ppl/hr	140 ppl/hr	140 ppl/hr	280 ppl/hr	3198 ppl	96 ppl/hr	122 ppl/hr	218 ppl/hr

Trip Generation - Hotel (Existing at One Washington Circle)

151 hotel rooms

Step 1: Base trip generation using ITEs' *Trip Generation* 10th Edition

Land Use	Land Use Code	Quantity (x)	AM Peak Hour			PM Peak Hour			Weekday Total	Saturday Peak Hour		
			In	Out	Total	In	Out	Total		In	Out	Total
Hotel	310	151 Rooms	35 veh/hr	24 veh/hr	59 veh/hr	29 veh/hr	31 veh/hr	60 veh/hr	829 veh	48 veh/hr	37 veh	85 veh
<i>Calculation Details:</i>			59%	41%	=0.39X	48%	52%	=0.4X	=5.49X	56%	44%	=.56 (x)

Note: Setting used for trip generation above is Dense Multi-Use Urban for AM Peak Hour, Center City Core for the PM Peak Hour, Weekday, and Saturday

Step 2: Convert to people per hour, before applying mode splits

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday Total	Saturday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Hotel	1.67 ppl/veh	58 ppl/hr	41 ppl/hr	99 ppl/hr	48 ppl/hr	52 ppl/hr	100 ppl/hr	1384 ppl	80 ppl	62 ppl/hr	142 ppl

Step 3: Split between modes, per assumed Mode Splits

User Group	Mode	Split	AM Peak Hour			PM Peak Hour			Weekday Total	Saturday Peak Hour		
			In	Out	Total	In	Out	Total		In	Out	Total
Hotel	Auto	35%	20 ppl/hr	15 ppl/hr	35 ppl/hr	17 ppl/hr	18 ppl/hr	35 ppl/hr	484 ppl	28 ppl/hr	22 ppl/hr	50 ppl/hr
Hotel	Transit	40%	23 ppl/hr	17 ppl/hr	40 ppl/hr	19 ppl/hr	21 ppl/hr	40 ppl/hr	554 ppl	32 ppl/hr	25 ppl/hr	57 ppl/hr
Hotel	Bike	5%	3 ppl/hr	2 ppl/hr	5 ppl/hr	2 ppl/hr	3 ppl/hr	5 ppl/hr	69 ppl	4 ppl/hr	3 ppl/hr	7 ppl/hr
Hotel	Walk	20%	12 ppl/hr	8 ppl/hr	20 ppl/hr	10 ppl/hr	10 ppl/hr	20 ppl/hr	277 ppl	16 ppl/hr	12 ppl/hr	28 ppl/hr

Note: Mode Split for Hotel land use based on 2005 WMATA Ridership Study

Step 4: Convert auto trips back to vehicles/hour

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday Total	Saturday Peak Hour		
		In	Out	Total	In	Out	Total		In	Out	Total
Hotel	1.67 ppl/veh	12 veh/hr	9 veh/hr	21 veh/hr	10 veh/hr	11 veh/hr	21 veh/hr	290 veh	17 veh/hr	13 veh/hr	30 veh/hr

Trip Gen Summary for Existing Hotel

Mode	AM Peak Hour			PM Peak Hour			Weekday Total	Saturday Peak Hour		
	In	Out	Total	In	Out	Total		In	Out	Total
Auto	12 veh/hr	9 veh/hr	21 veh/hr	10 veh/hr	11 veh/hr	21 veh/hr	290 veh	17 veh/hr	13 veh/hr	30 veh/hr
Transit	23 ppl/hr	17 ppl/hr	40 ppl/hr	19 ppl/hr	21 ppl/hr	40 ppl/hr	554 ppl	32 ppl/hr	25 ppl/hr	57 ppl/hr
Bike	3 ppl/hr	2 ppl/hr	5 ppl/hr	2 ppl/hr	3 ppl/hr	5 ppl/hr	69 ppl	4 ppl/hr	3 ppl/hr	7 ppl/hr
Walk	12 ppl/hr	8 ppl/hr	20 ppl/hr	10 ppl/hr	10 ppl/hr	20 ppl/hr	277 ppl	16 ppl/hr	12 ppl/hr	28 ppl/hr

Trip Generation - Student Housing (Proposed at One Washington Circle)

330 Residential Beds

Step 1: Base trip generation using ITEs' *Trip Generation* 10th Edition

Land Use	Land Use Code	Quantity (x)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour*		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Student Housing	225	330 Residents	103 veh/hr	72 veh/hr	175 veh/hr	101 veh/hr	97 veh/hr	198 veh/hr	2580 veh	0 veh/hr	69 veh	69 veh
<i>Calculation Details:</i>			59%	41%	=0.53X	51%	49%	=0.6X	=8.95X/1000-373.16	0%	100%	=.21 (x)

Note: Setting used for trip generation above is Adjacent to Campus

* ITE LUC 221 used for Saturday Student trip generation

Step 2: Convert to people per hour, before applying mode splits

User Group	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	1.67 ppl/veh	172 ppl/hr	120 ppl/hr	292 ppl/hr	169 ppl/hr	162 ppl/hr	331 ppl/hr	4309 ppl	0 ppl	115 ppl/hr	115 ppl

Step 3: Split between modes, per assumed Mode Splits

User Group	Mode	Split	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
			In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	Auto	7%	12 ppl/hr	8 ppl/hr	20 ppl/hr	12 ppl/hr	11 ppl/hr	23 ppl/hr	302 ppl	0 ppl/hr	8 ppl/hr	8 ppl/hr
Students	Transit	15%	26 ppl/hr	18 ppl/hr	44 ppl/hr	25 ppl/hr	25 ppl/hr	50 ppl/hr	646 ppl	0 ppl/hr	17 ppl/hr	17 ppl/hr
Students	Bike	5%	9 ppl/hr	6 ppl/hr	15 ppl/hr	8 ppl/hr	9 ppl/hr	17 ppl/hr	215 ppl	0 ppl/hr	6 ppl/hr	6 ppl/hr
Students	Walk	73%	126 ppl/hr	87 ppl/hr	213 ppl/hr	123 ppl/hr	119 ppl/hr	242 ppl/hr	3146 ppl	0 ppl/hr	84 ppl/hr	84 ppl/hr

Step 4: Convert auto trips back to vehicles/hour

Land Use	People/Car (from 2017 NHTS, Table 16)	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
		In	Out	Total	In	Out	Total	Total	In	Out	Total
Students	1.67 ppl/veh	7 veh/hr	5 veh/hr	12 veh/hr	7 veh/hr	7 veh/hr	14 veh/hr	181 veh	0 veh/hr	5 veh/hr	5 veh/hr

Trip Gen Summary for Proposed Student Housing

Mode	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour		
	In	Out	Total	In	Out	Total	Total	In	Out	Total
Auto	7 veh/hr	5 veh/hr	12 veh/hr	7 veh/hr	7 veh/hr	14 veh/hr	181 veh	0 veh/hr	5 veh/hr	5 veh/hr
Transit	26 ppl/hr	18 ppl/hr	44 ppl/hr	25 ppl/hr	25 ppl/hr	50 ppl/hr	646 ppl	0 ppl/hr	17 ppl/hr	17 ppl/hr
Bike	9 ppl/hr	6 ppl/hr	15 ppl/hr	8 ppl/hr	9 ppl/hr	17 ppl/hr	215 ppl	0 ppl/hr	6 ppl/hr	6 ppl/hr
Walk	126 ppl/hr	87 ppl/hr	213 ppl/hr	123 ppl/hr	119 ppl/hr	242 ppl/hr	3146 ppl	0 ppl/hr	84 ppl/hr	84 ppl/hr