



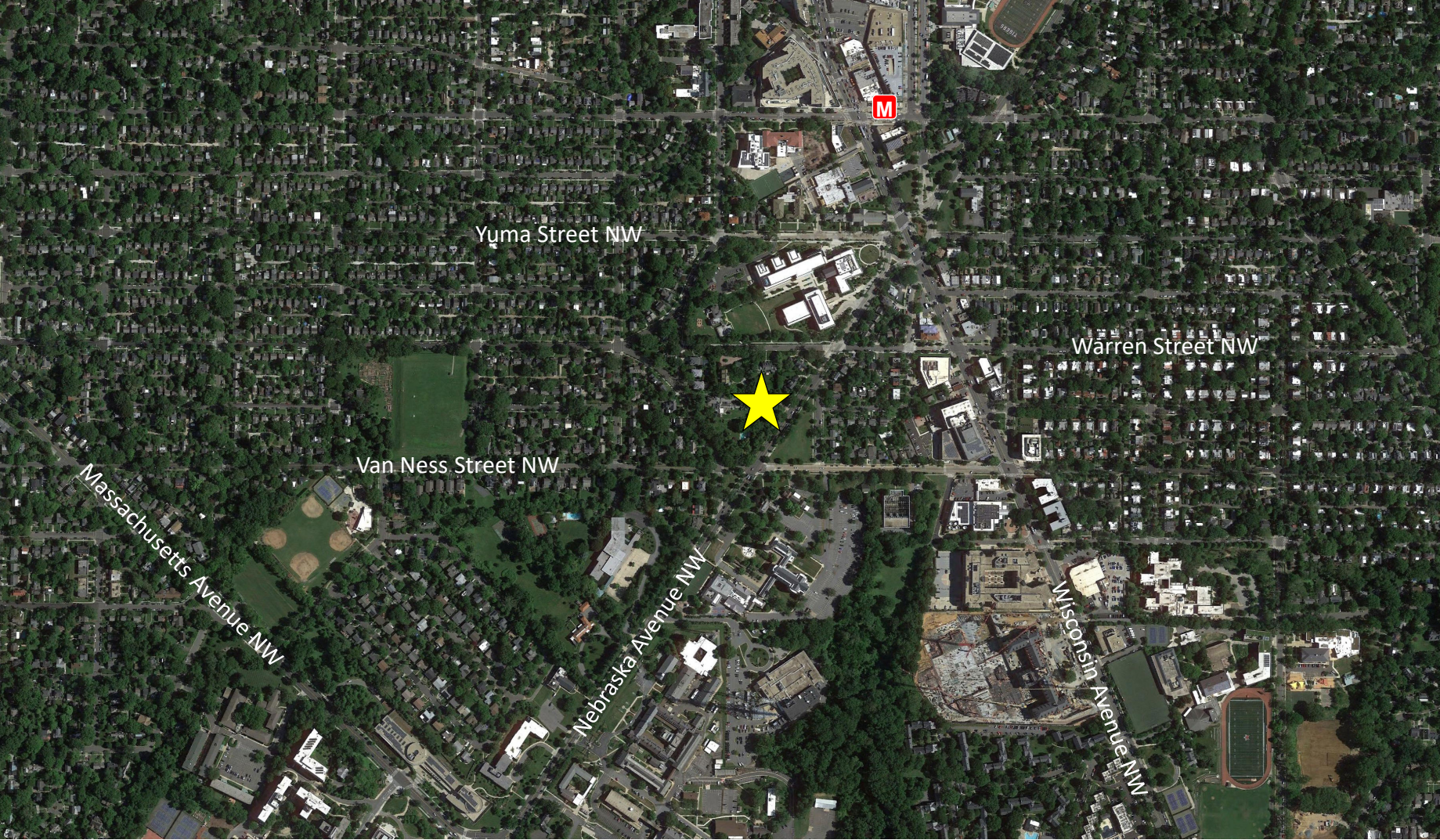
WELLS + ASSOCIATES

THE RIVER SCHOOL

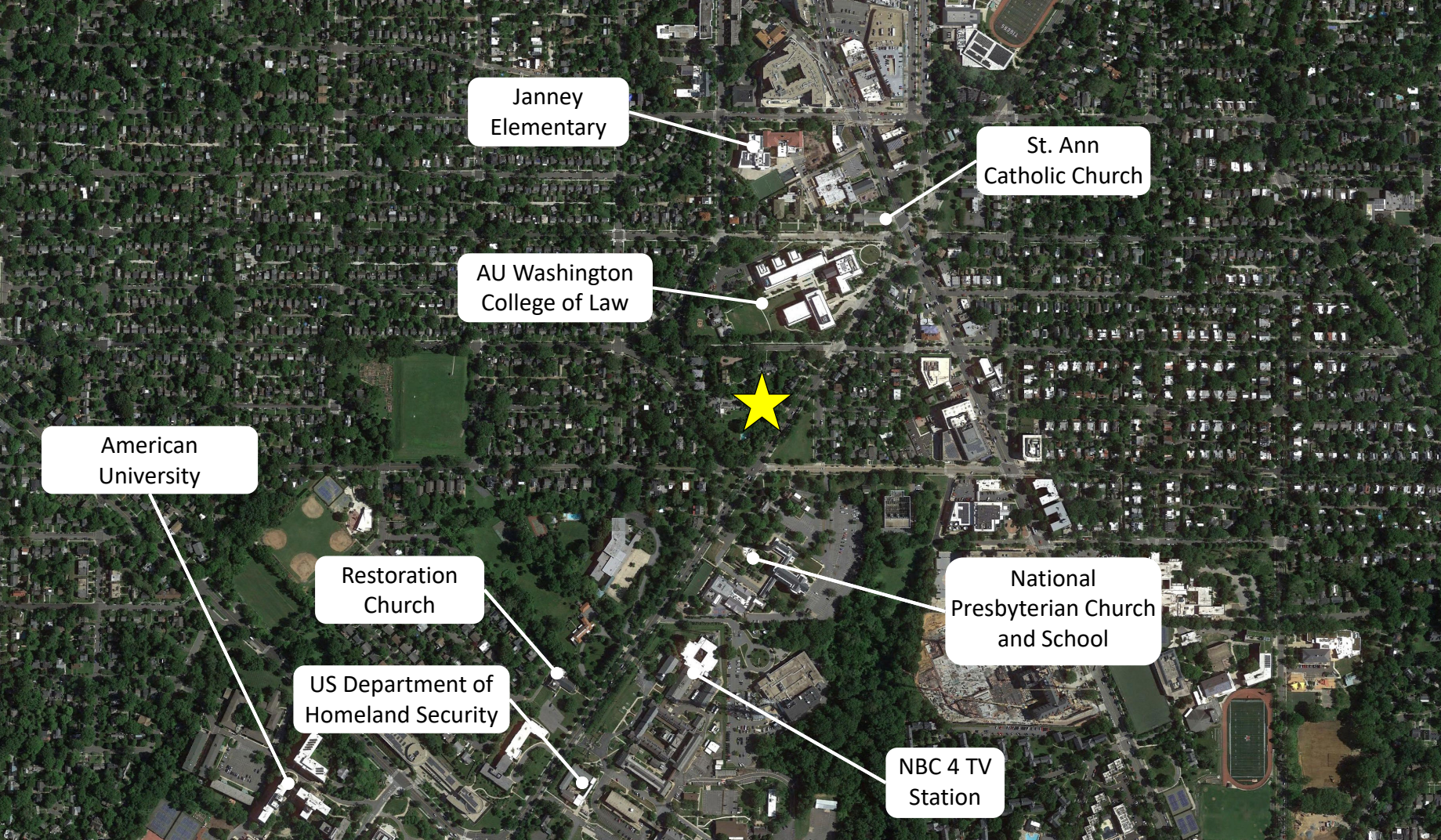
Board of Zoning Adjustment
October 27, 2021

Project Overview

Site Location



Site Context

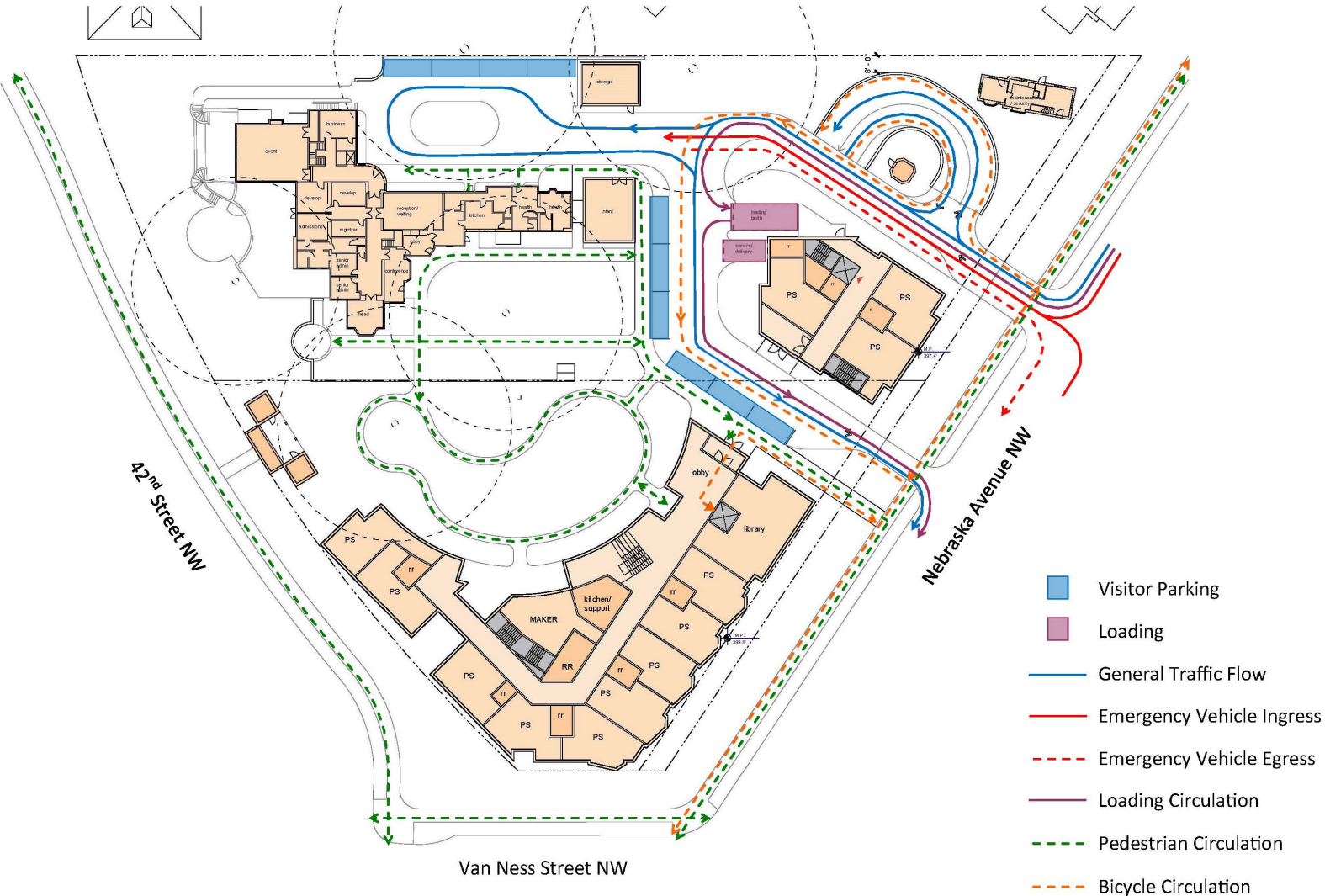


Summary of Project Characteristics

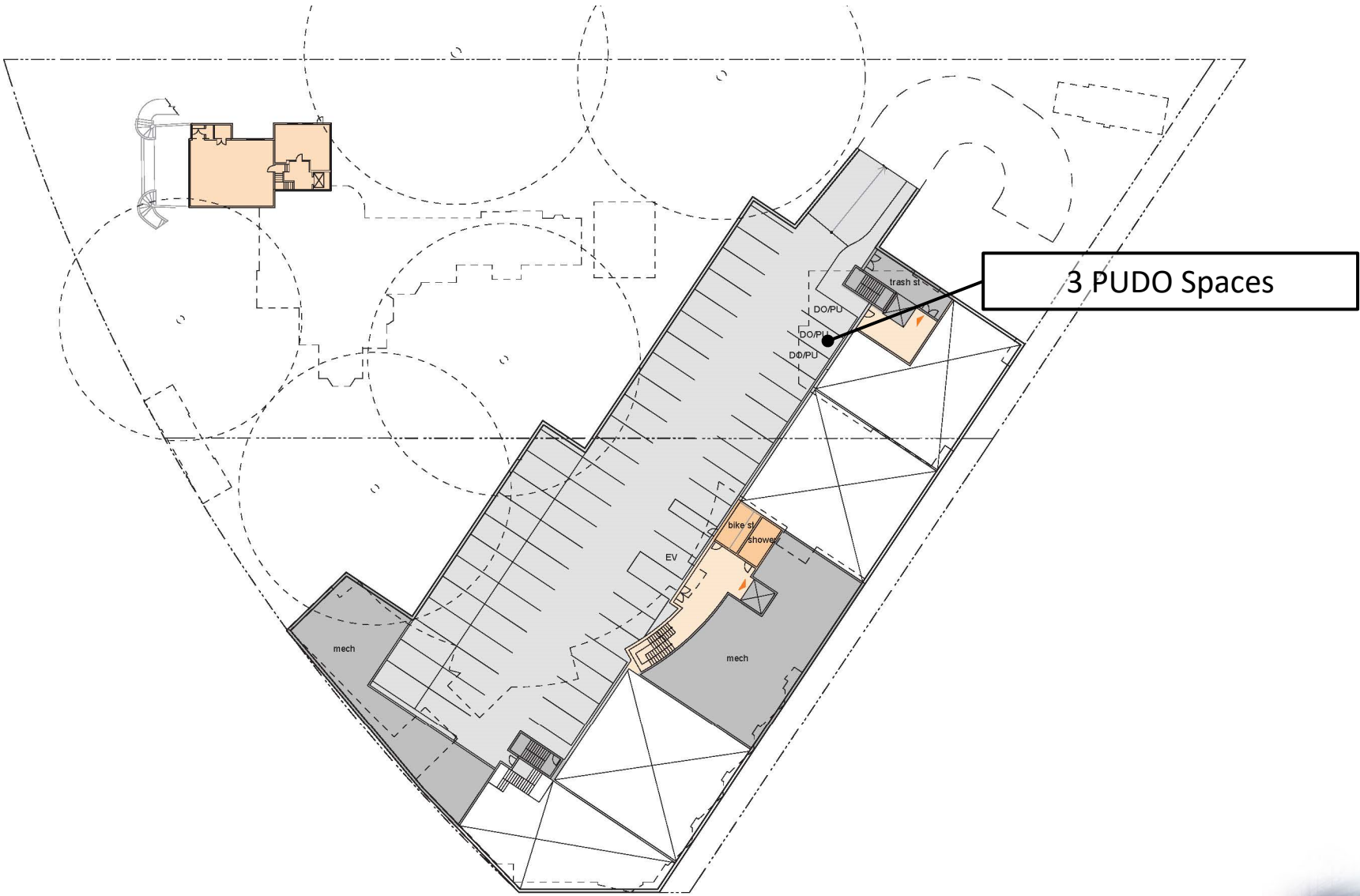
- Elementary School and Child Development Center – Infants through 6th grade
- Ancillary Clinic Use – 60% of patients will be students enrolled at the school
- Maximum Student Enrollment – 350
- Number of part-time students (2 or 3 days/week) – 24 to 48
- Faculty/staff – 90
- Vehicle Parking – 55 garage spaces, including 12 tandem spaces; 10 surface spaces (52 spaces required)
- Bicycle Parking – 9 long-term spaces; 34 short-term spaces
- Loading – 1 30-foot berth; 1 service/delivery space

Site Circulation

Ground Level Circulation



Site Circulation – Below Grade



Trip Generation

Vehicle Trip Generation – No TDM Plan

Component	AM Peak Hour (8:00-9:00 AM)		PM School Peak Hour (2:45 – 3:45 PM)		PM Cmmtr Peak Hour (5:00-6:00 PM)	
	In	Out	In	Out	In	Out
Students	204	204	87	87	33	33
Faculty/Staff	0	0	0	0	0	39
Clinic	0	0	0	0	2	2
Total	204	204	87	87	35	74



Vehicle Trip Generation – Original TDM Plan

Component	AM Peak Hour (8:00-9:00 AM)		PM School Peak Hour (2:45 – 3:45 PM)		PM Cmmtr Peak Hour (5:00-6:00 PM)	
	In	Out	In	Out	In	Out
Students	173	173	74	74	28	28
Faculty/Staff	0	0	0	0	0	32
Clinic	0	0	0	0	2	2
Total	173	173	74	74	30	62

Represents a 15% reduction during all three peak hours

Vehicle Trip Generation – Current TDM Plan

Component	AM Peak Hour (8:00-9:00 AM)		PM School Peak Hour (2:45 – 3:45 PM)		PM Cmmtr Peak Hour (5:00-6:00 PM)	
	In	Out	In	Out	In	Out
Students	112	112	74	74	28	28
Faculty/Staff	0	0	0	0	0	32
Clinic	0	0	0	0	2	2
Total	112	112	74	74	30	62



Represents a **45% Reduction** in AM Peak Hour Vehicle Trips compared to No TDM Plan

Queue Analysis

Differences between MacArthur Boulevard PUDO and Proposed PUDO

- MacArthur campus has no on-site circulation; entire PUDO operation is on MacArthur Blvd.
- 6-8 vehicles can load simultaneously compared to 14 under proposed plan
- Dismissal currently is not staggered
- Carpooling is currently not in place due to pandemic, unless same family
- Transportation Management Plan is not in place

Queuing Model – Two Methods

- M/M/1 Queue Model
 - $Q_{99} = [\ln (1-0.99)/\ln (\rho)] - 1$
 - Statistical model based on exponential arrivals
 - All arrivals occur randomly and independent of each other
 - First-In/First-Out service
 - Calibrated based on data collected at existing school
- Extrapolation Method
 - Uses minute-by-minute queues at existing school
 - Extrapolates projected queues based on projected trip generation for the new school

M/M/1 Queuing Model

Existing Model Calibration – AM Peak

$$\lambda = 88 \text{ vph}$$

$$\lambda_{\text{adj}} = 135 \text{ vph (accounts for uneven distribution of traffic over peak hour)}$$

$$\mu = 240 \text{ vph (assumes 4 vehs unload at once; 60 sec unloading time)}$$

$$\rho = 0.564$$

$$Q_{99} = 8 \text{ vehs}$$

$$Q_{\text{obs}} = 9 \text{ vehs}$$

Existing Model Calibration – PM Peak

$$\lambda = 95 \text{ vph}$$

$$\lambda_{\text{adj}} = 158 \text{ vph (accounts for uneven distribution of traffic over peak hour)}$$

$$\mu = 179 \text{ vph (assumes 6 vehs load at once; 121 sec loading time)}$$

$$\rho = 0.887$$

$$Q_{99} = 38 \text{ vehs}$$

$$Q_{\text{obs}} = 38 \text{ vehs}$$

River School Student Unloading Times

	All Drop-offs	2+ children
Min	6	16
Max	62	62
Average	27	37
95 th Percentile	50	62
Sample Size = 86; data was collected on 9/30/21		

W+A's Queuing Model Input for drop-off times = 60 seconds

	All Pick-ups	2+ children
Min	8	12
Max	80	65
Average	38	45
95 th Percentile	65	63
Sample Size = 59; data was collected on 9/30/21		

W+A's Queuing Model Input for drop-off times = 121 seconds

M/M/1 Queuing Model

Projected Queues – AM Peak

$$\lambda = 108 \text{ vph}$$

$$\lambda_{\text{adj}} = 166 \text{ vph (accounts for uneven distribution of traffic over peak hour)}$$

$$\mu = 240 \text{ vph (assumes 4 vehs unload at once; 60 sec unloading time)}$$

$$\rho = 0.692$$

$$Q_{99} = 12 \text{ vehs}$$

Projected Queues – PM Peak

$$\lambda = 74 \text{ vph}$$

$$\lambda_{\text{adj}} = 123 \text{ vph (accounts for uneven distribution of traffic over peak hour)}$$

$$\mu = 179 \text{ vph (assumes 6 vehs load at once; 121 sec loading time)}$$

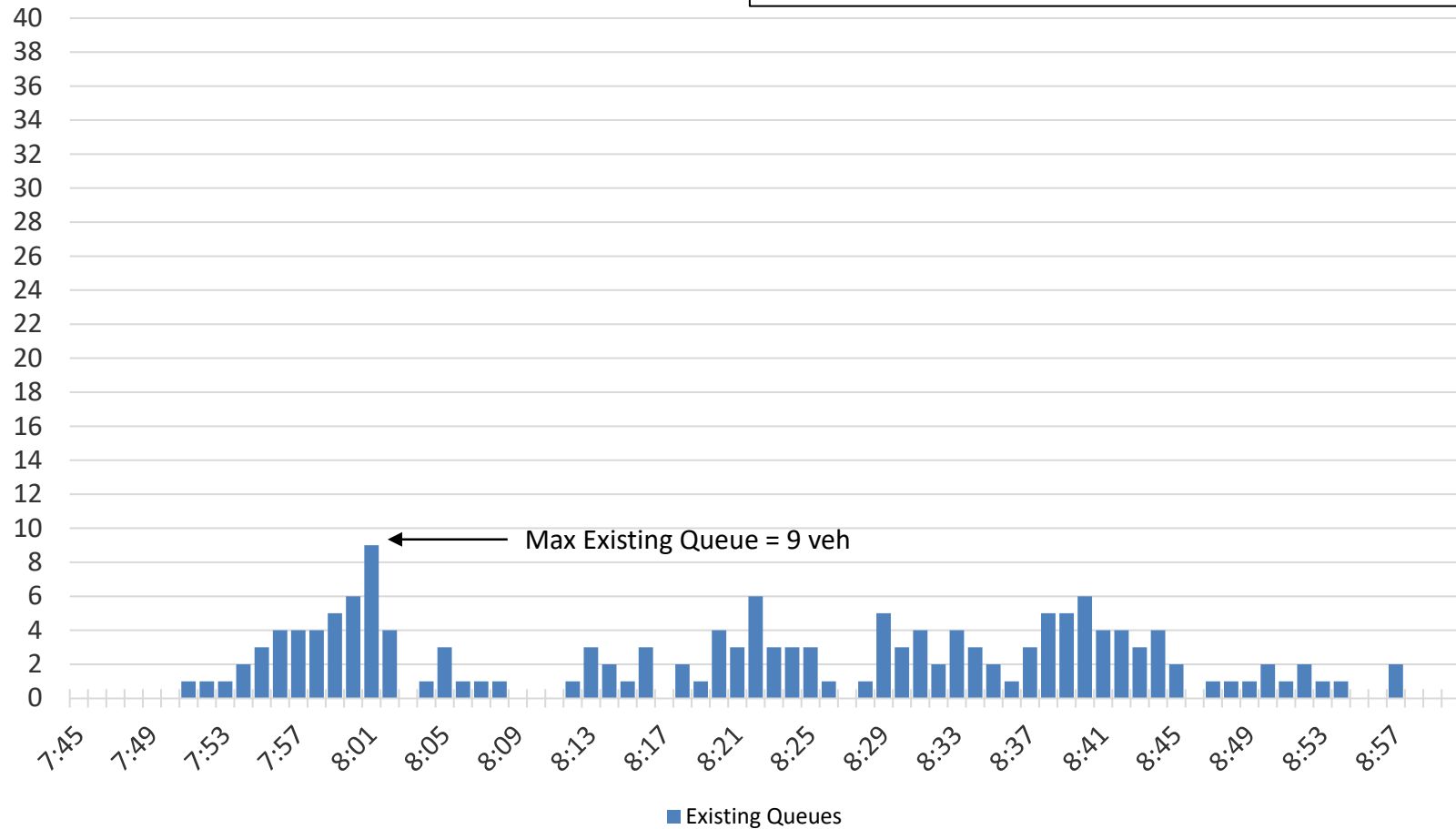
$$\rho = 0.691$$

$$Q_{99} = 17 \text{ vehs}$$

Extrapolated Queues

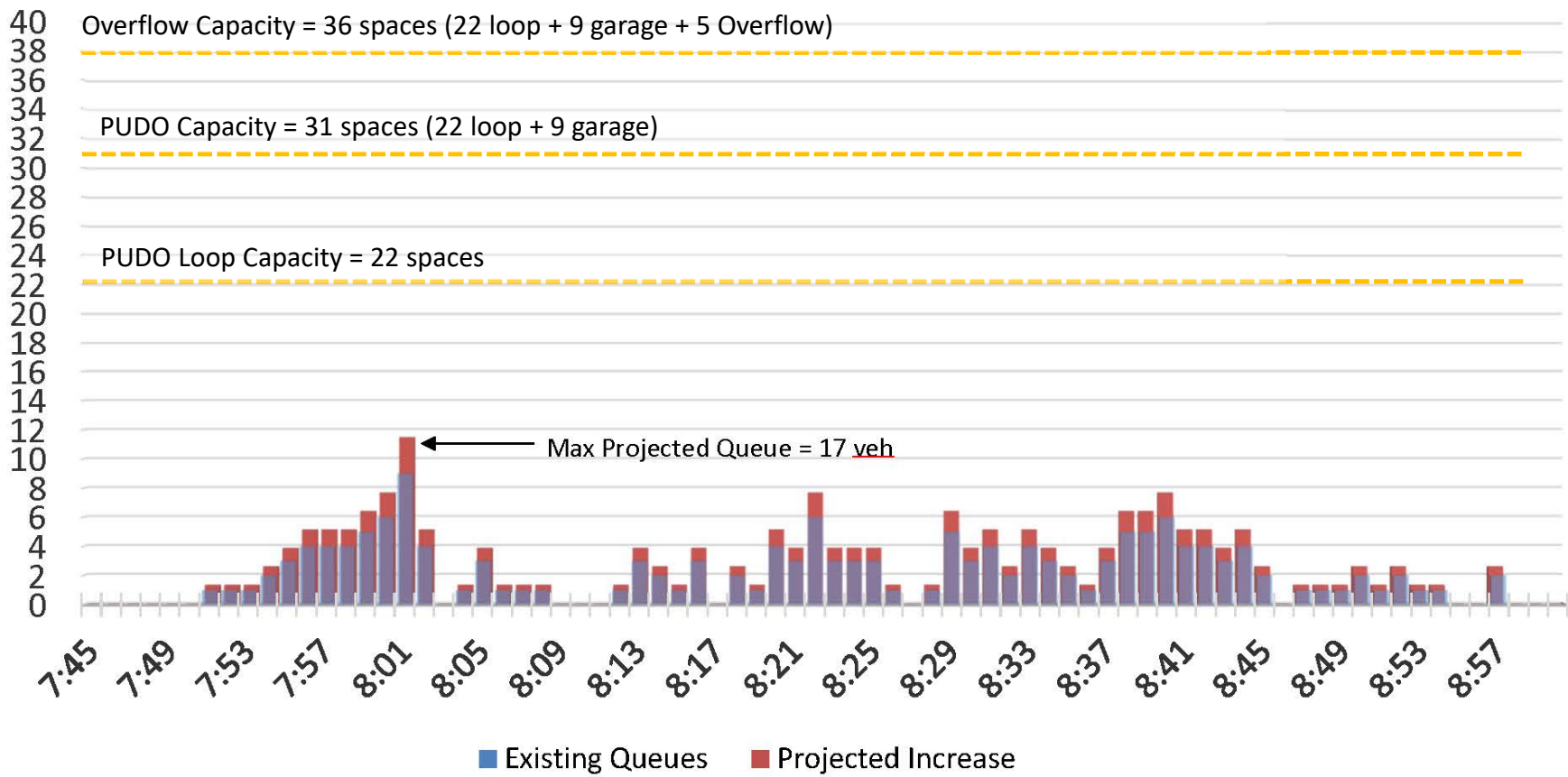
Existing AM Peak Hour – March 2021

Total number of vehicles dropping off = 88



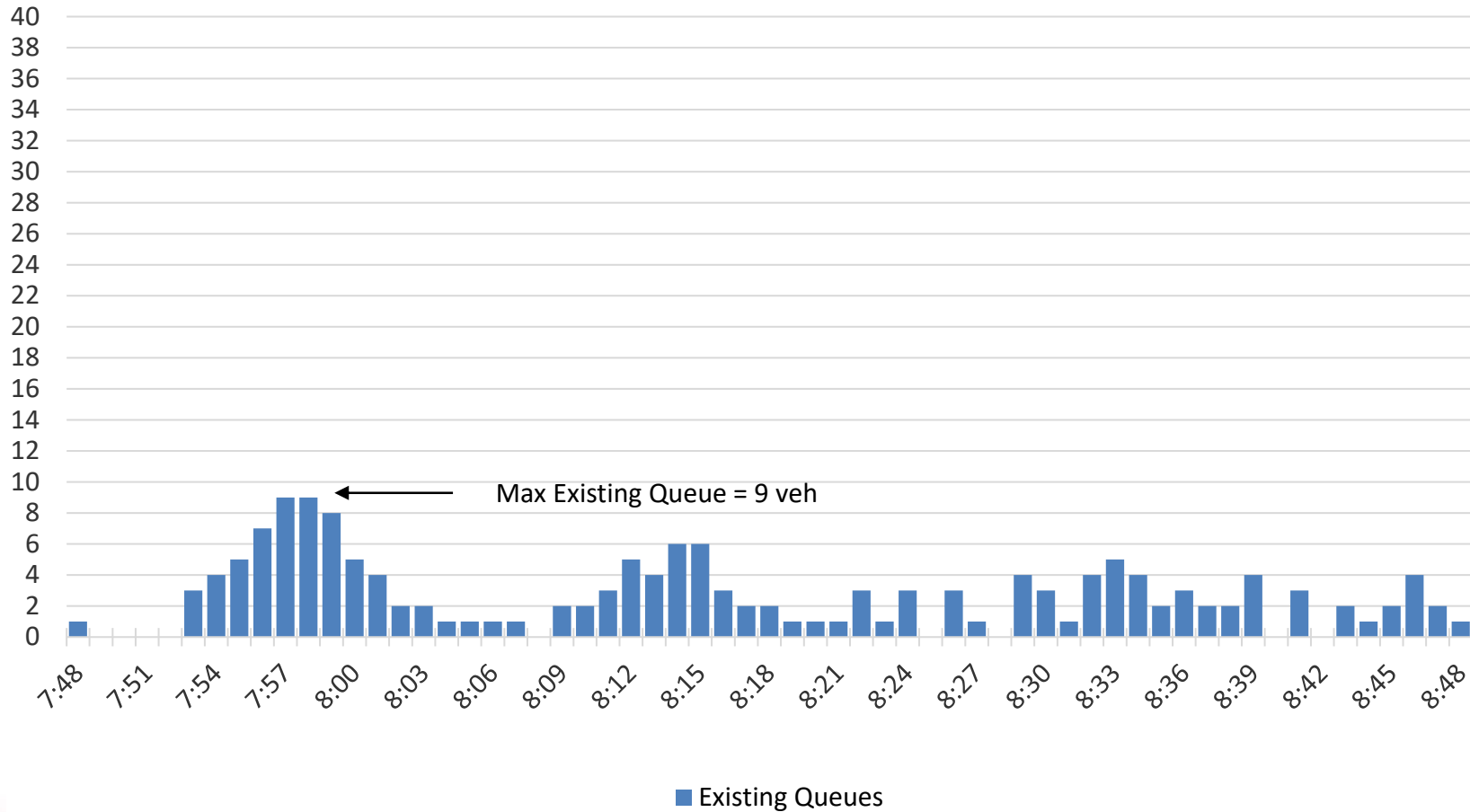
Projected AM Peak Hour

Total number of vehicles dropping off = 112



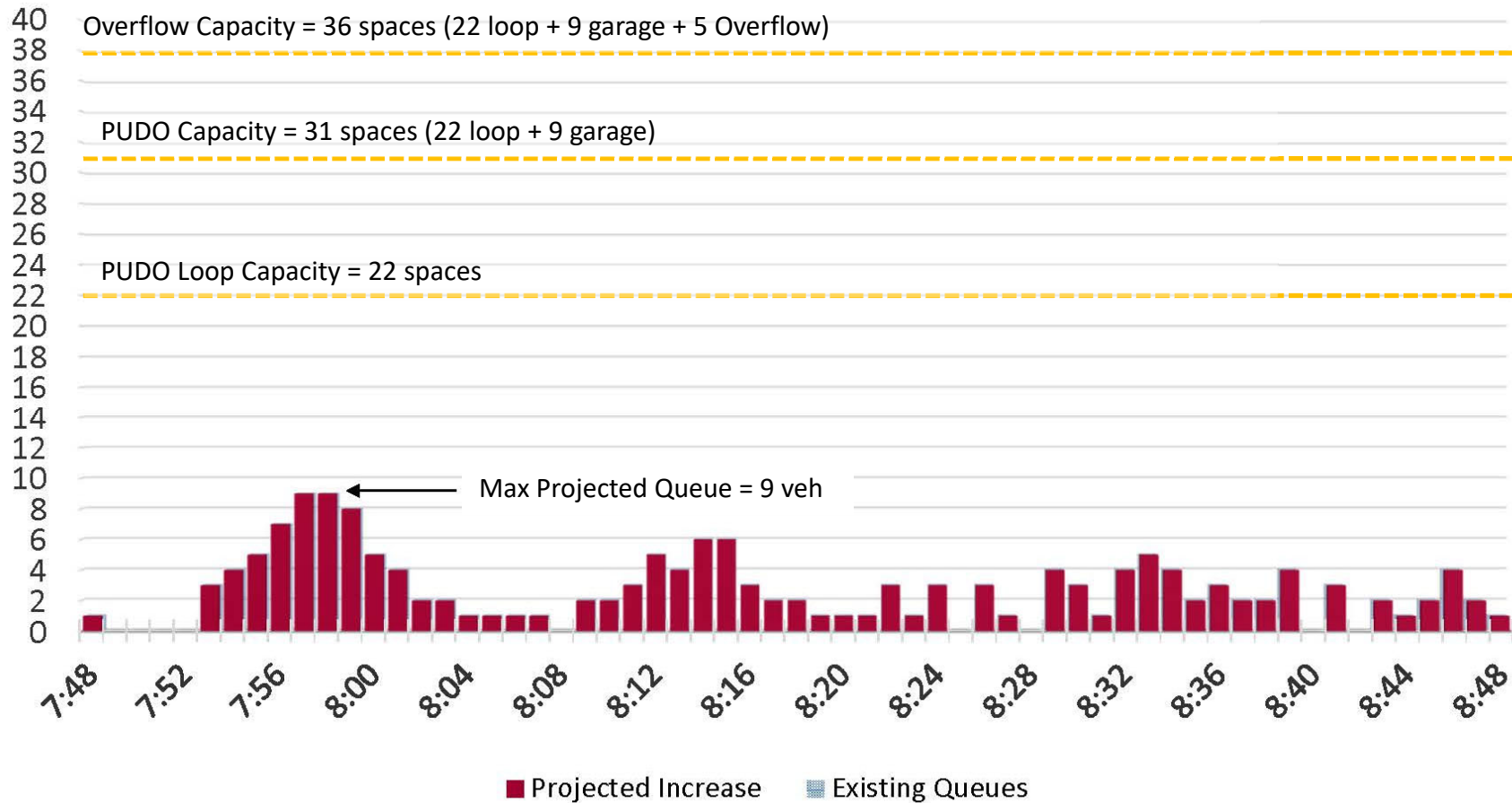
Existing AM Peak Hour – September 2021

Total number of vehicles dropping off = 117



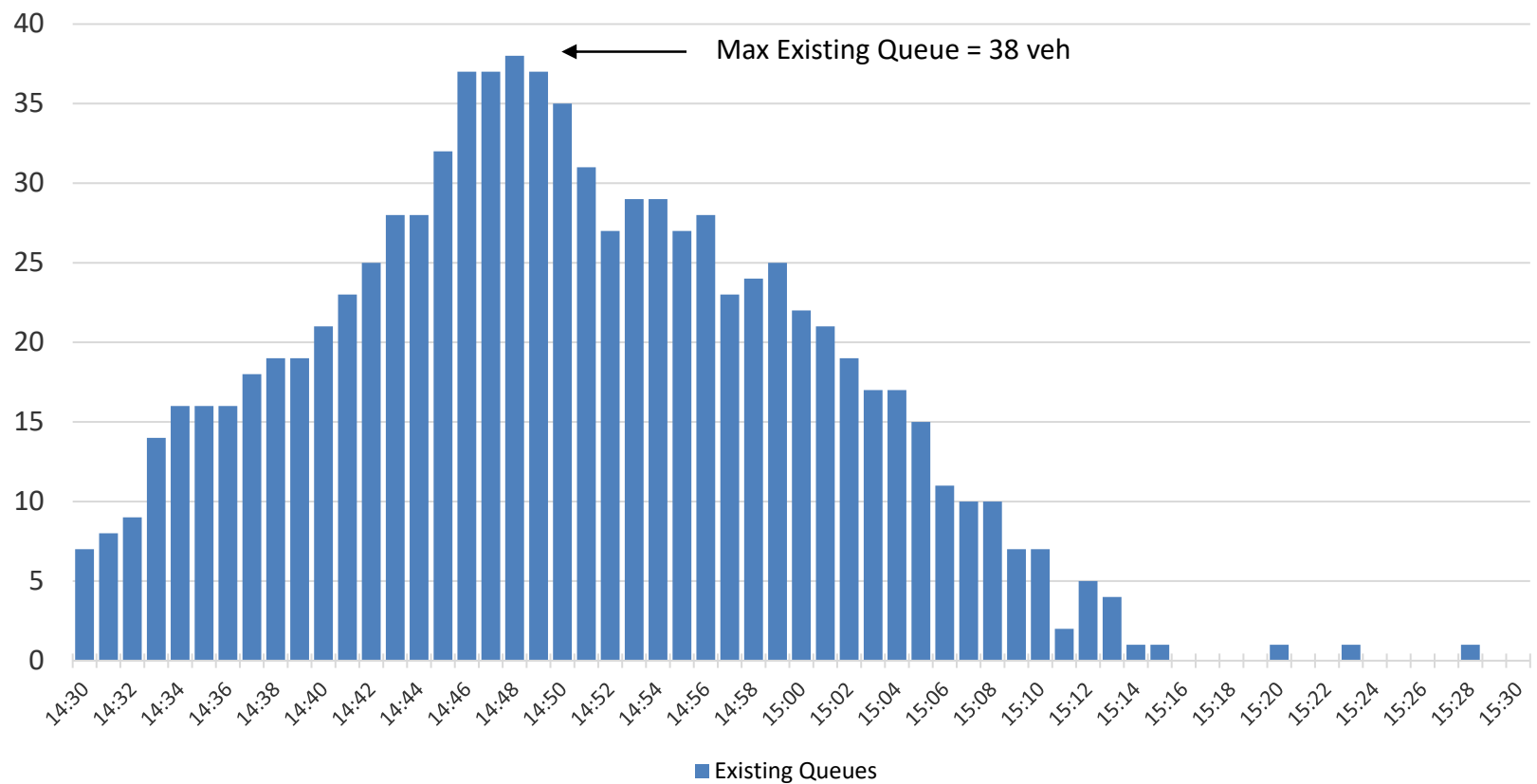
Projected AM Peak Hour

Total number of vehicles dropping off = 112



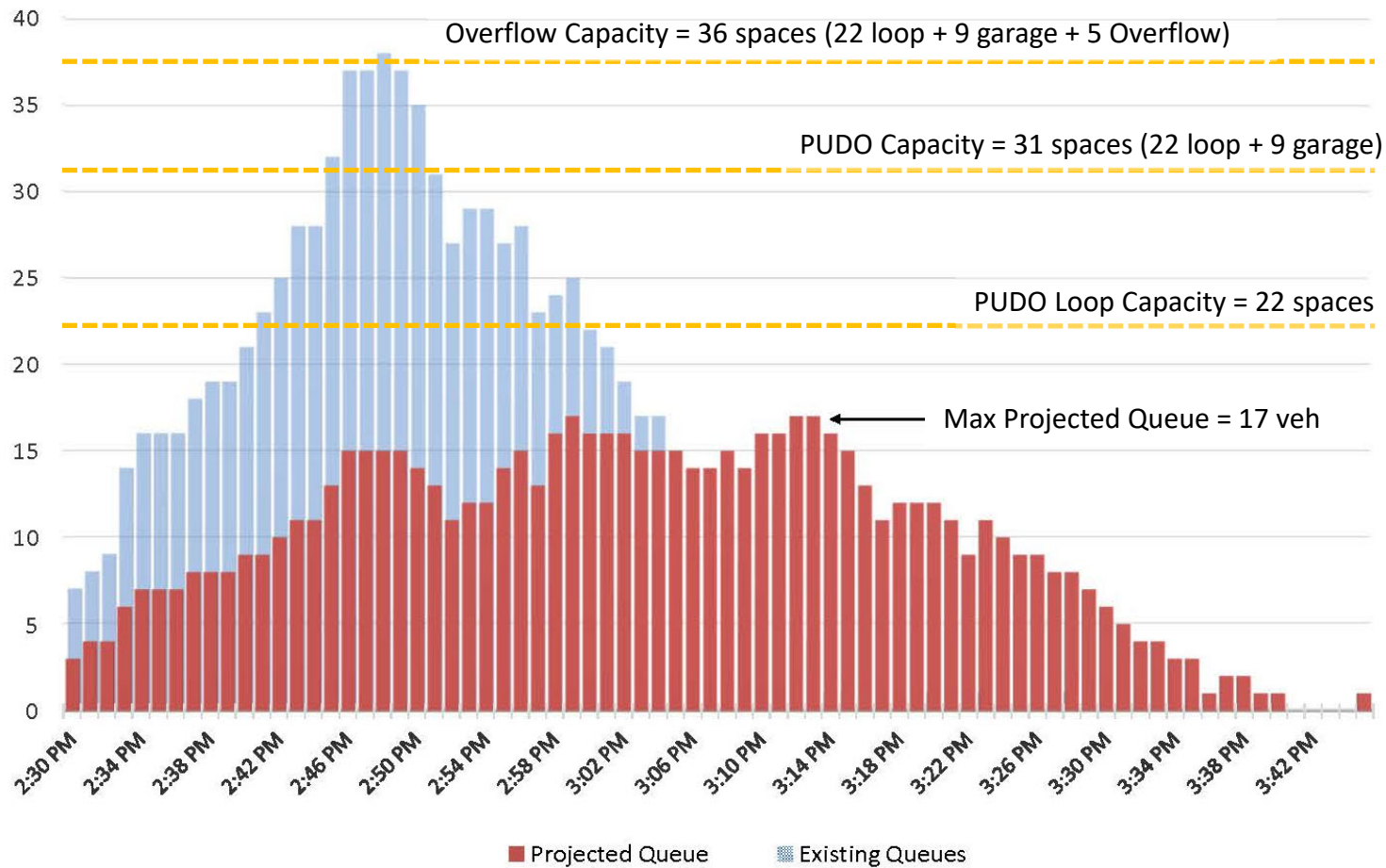
Existing PM Peak Hour – March 2021

Total number of vehicles picking up = 95



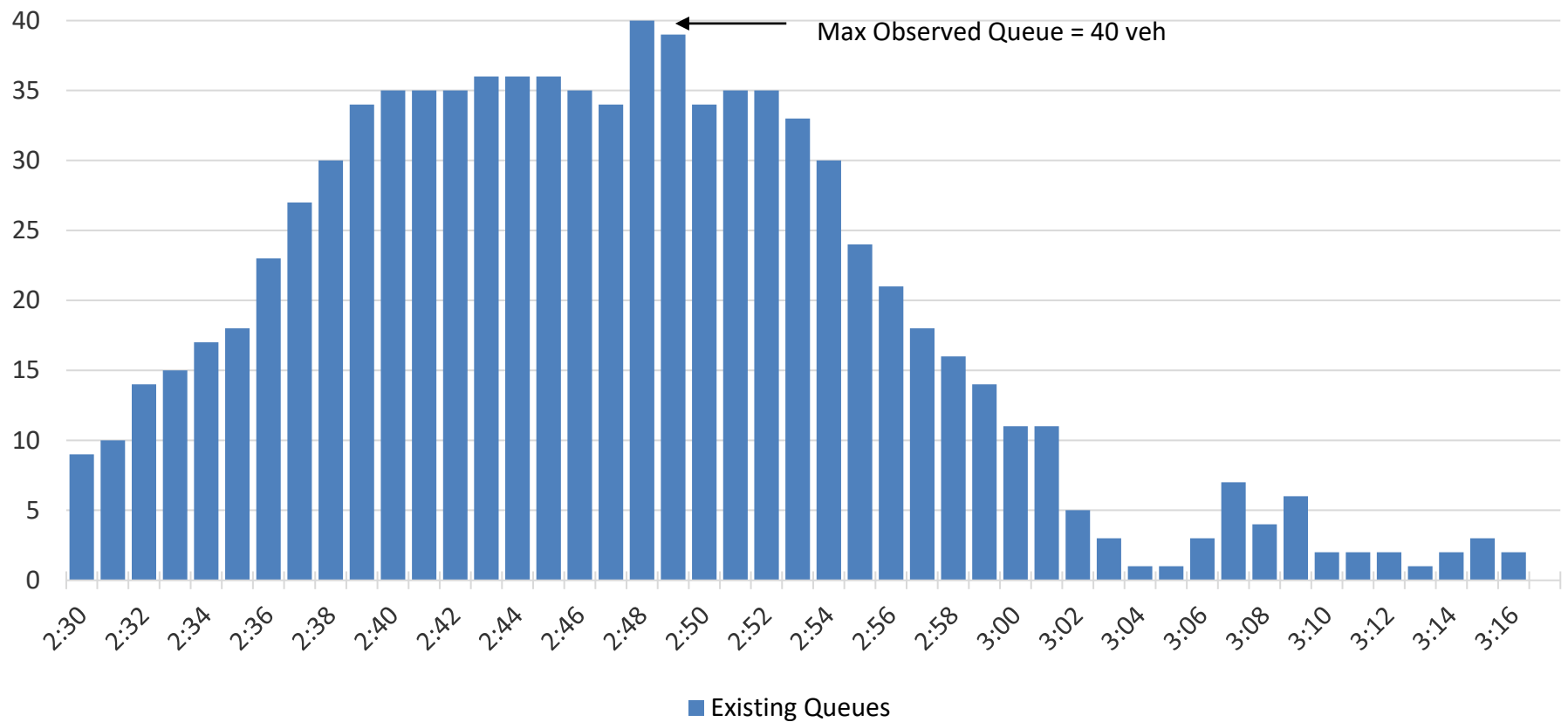
Projected PM Peak Hour

Total number of vehicles picking up = 74



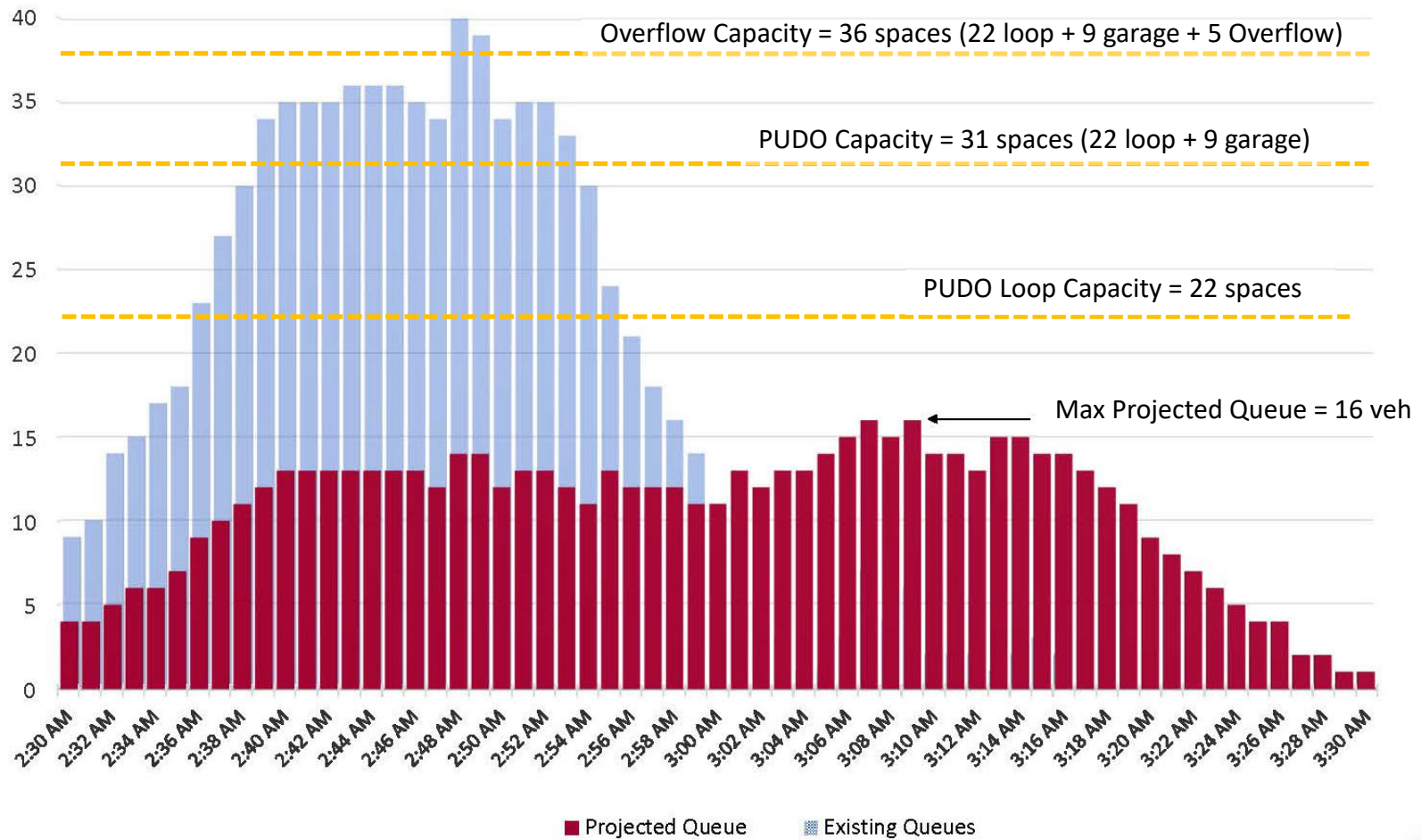
Existing PM Peak Hour – September 2021

Total number of vehicles picking up = 106



Projected PM Peak Hour

Total number of vehicles picking up = 74



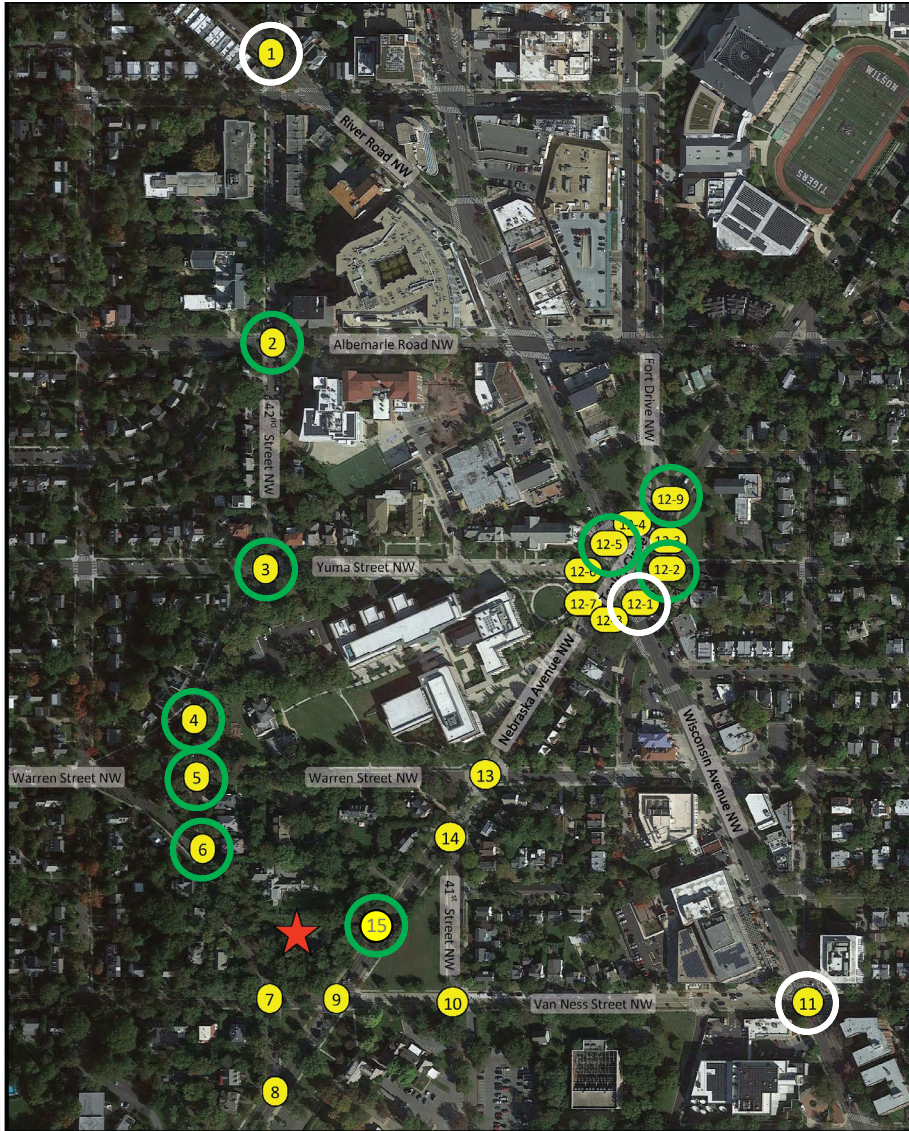
Summary

	M/M/1 Model	Extrapolation	Capacity*
AM Peak Hour	12	9–11	31
PM Peak Hour	11	16–17	31

* Capacity includes loop capacity plus three spaces in garage. It does not include overflow capacity of 5 vehs

Transportation Mitigation Plan

Study Area



19 Intersections Analyzed

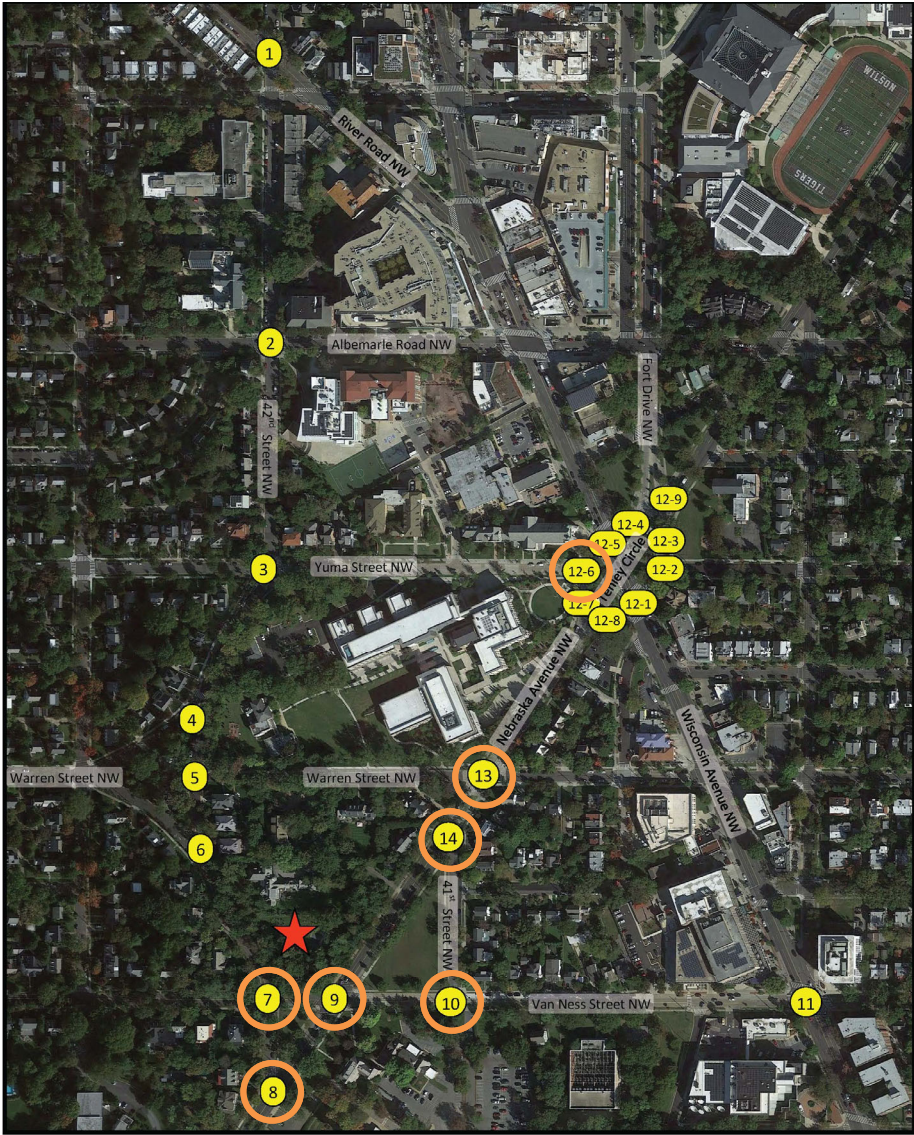
No Adverse Impact:

- 42nd Street/Albemarle Street
- 42nd Street/Yuma Street
- 42nd Street/Warren Street (North)
- 42nd Street/Warren Street (Middle)
- 42nd Street/Warren Street (South)
- Tenley Circle/Yuma Street (East)
- Wisconsin Avenue/Tenley Circle (North)
- Nebraska Avenue/Fort Drive/Tenley Circle
- Nebraska Avenue/Site Driveway

Minor Impacts Mitigated with Routine Signal Timing Optimization:

- 42nd Street/River Road
- Wisconsin Avenue/Van Ness Street
- Wisconsin Avenue/Tenley Circle (South)

Study Area



Intersections with Impacts to be Mitigated:

- 42nd Street/Van Ness Street (PM School)
- Nebraska Avenue/42nd Street (PM School)
- Nebraska Avenue/Van Ness Street (AM/PM School)
- Van Ness Street/41st Street/NPS Drive (PM School)
- Nebraska Avenue/Warren Street (All 3 peaks)
- Nebraska Avenue/41st Street (PM School)
- Tenley Circle/Yuma Street West (PM School)



Transportation Mitigation

Two General Approaches to Mitigate Traffic Impacts

1. Increase Capacity

- Add Lanes
- Add Signal Phases
- Optimize Signal Timings

2. Decrease Demand

- Implement Transportation Demand Management Plans
- Add/Improve Non-Auto Infrastructure

The River School's Approach

Proposed Improvement	Increase Capacity	Reduce Demand	Improve Safety
Remove parking on Nebraska Avenue north and south of Van Ness Street	X		
Remove parking on Van Ness Street east of Nebraska Avenue	X		
Modify traffic signal at Nebraska Avenue/Van Ness Street to include a westbound left turn phase	X		
Install HAWK signal at Nebraska Avenue/Warren Street		X	X
Install 400' of missing sidewalk along 42 nd Street		X	X
Install CaBi Station		X	
Replace Yield Sign at 41 st Street/Nebraska Avenue with Stop Sign			X
Implementation of a Comprehensive Transportation Management Plan		X	

Transportation Management Plan

- Demand Management Plan
 - Strategies and incentive to reduce the number of vehicles coming to the site
- Operations Management Plan
 - Establishes a set of protocols to ensure traffic is appropriately managed on campus without spilling into adjacent streets and neighborhoods
- Monitoring Plan
 - Ensures accountability and provides mechanism for remedial strategies if commitments aren't met
- Physical Improvements
 - Included commitments to roadway, pedestrian, and bicycle infrastructure to mitigate the impact of the school

Demand Management Plan

- Bicycle amenities and incentives
 - Provide covered/secure bicycle parking
 - Provide bicycle repair station on campus
 - Provide bicycle subsidies for faculty/staff who primarily commute to work by bicycle or provide annual CaBi membership
 - Incorporate bicycle education into the phys ed curriculum
 - Host bike and walk to school events
 - Participate in Safe Routes to School Program
- Transit Incentives
 - Provide monthly transit subsidy for faculty/staff who take transit
 - Enroll in Guaranteed Ride Home
- Carpooling Initiatives
 - Provide carpool matching assistance for students and faculty/staff
 - Register with Commuter Connections School Pool Program
 - Implement mandatory carpooling program
 - Pre-K and younger students exempt
 - On a case-by-case basis, students who demonstrate a hardship based on special transportation needs are not required to carpool with prior approval

Demand Management Plan (cont'd)

- Implement one of the following or some combination of the following:
 - Shuttle students in grades K – 6 from off site location in AM
 - Increase mandatory carpooling for Kindergarten or older from 2 students per car to 3 students per car
 - Provide tuition discounts or subsidies for families who use Metro, walk, or bike to school

Operations Management Plan

- Establishes a clear Pick-up/Drop-off Protocol
 - Includes Advanced Passenger Identification System
 - Staggered arrivals and dismissals
- Provides two Traffic Control Officers at driveways
- Provides staffing to manage PUDO operations
- Prohibits pick-up/drop-off on neighborhood streets
- Prohibit trash pick-up and most deliveries during PUDO times
- Restrict size of delivery vehicles to box trucks and vans
- TMP will be incorporated into the student contract with penalties of increasing severity with each infraction up to and including dismissal from the school

Monitoring Plan

- Requires Trip Caps to be met and PUDO queues to be accommodated on-site
- Conduct studies, at least annually, to ensure transportation commitments are being met
- If commitments are met over time, studies gradually phase out
- If study reveals deficiencies, School will meet with ANC and DDOT to develop and implement remedial strategies to correct issues
- Meet with ANC quarterly to discuss any transportation related concerns of the community

Monitoring Plan - Enhancements

- More aggressive timeline for monitoring
 - Year 1: two times each semester, 1st monitoring study must be completed by October 15th
 - Beginning Year 2: monitoring study must be completed by October 15th
 - If requirements are not met:
 - Five days after submission of study to request meeting with ANC 3E and DDOT
 - 30 days to hold meeting (subject to availability of ANC 3E reps and DDOT)
 - River School shall make diligent efforts to implement remedial strategies (Enhanced Strategies) within 30 days of meeting
 - 2nd monitoring study must be completed in Spring Semester to ensure Enhanced Strategies are working

Monitoring Plan - Enhancements

- Identification of specific Enhanced Strategies to be implemented if requirements are not met
 - Enhanced Strategy #1
 - Reduce the number of PUDO passes issued to parents
 - Lease off-site parking within 1/3-mile at the school's expense for use as short-term parking/PUDO spaces for parents
 - Enhanced Strategy #2
 - Convert all spaces in the garage except for tandem spaces and the ADA spaces to short-term parking for PUDO operation
 - Lease off-site parking within 1/3-mile at the school's expense for River School faculty and staff
 - Modify the PUDO lane to use a single stacking lane with a bypass lane to allow garage PUDO traffic to bypass the queue lane
 - Enhanced Strategy #3
 - Increase mandatory carpooling requirement from two students per vehicle to three students per vehicle for families still dropping off or picking up students on campus

Coordination with DDOT

The River School has agreed to all of the conditions DDOT recommended in its report.

- In lieu of improvements at the Nebraska Avenue/Van Ness Street intersection, the River School agrees to enhance monitoring plan to included additional evaluation of 7 off-site intersections plus the site driveways once the school reaches 80% enrollment.

Coordination with DDOT

- Contribute \$75k + Design and Permitting Fees for necessary improvements (including signing, pavement markings, and tactical safety measures) identified through additional monitoring and evaluation
- If no improvements are deemed necessary (by DDOT), the school will contribute the \$75k to DDOT's Transportation Mitigation Fund

Conclusions

- The River School has proposed a significant and comprehensive transportation mitigation package
 - Implementation of a Transportation Demand Management Plan with trip caps
 - Implementation of an Operations Management Plan
 - Implementation of a Monitoring Plan
 - Installation of a pedestrian hybrid signal (or similar signal) at the Nebraska Avenue/Warren Street intersection
 - Construction of 400' of missing sidewalk along 42nd Street
 - Installation and 1st year's operating cost for a new Capital Bikeshare station
 - Replacement of Yield Sign with a Stop sign and crosswalk improvements on 41st Street at its intersection with Nebraska Avenue
 - Fund up to \$75,000 of improvements (exclusive of design and permitting fees) at up to 7 off-site intersections (unused money contributed to DDOT's Transportation Mitigation Fund).