



Traffic Analysis and Bus Management Recommendations

PFRC Meeting for
Stratford and H-B Woodlawn
Wilson Site, 18th Street
May 11, 2016



TRAFFIC ANALYSIS

Presentation Overview



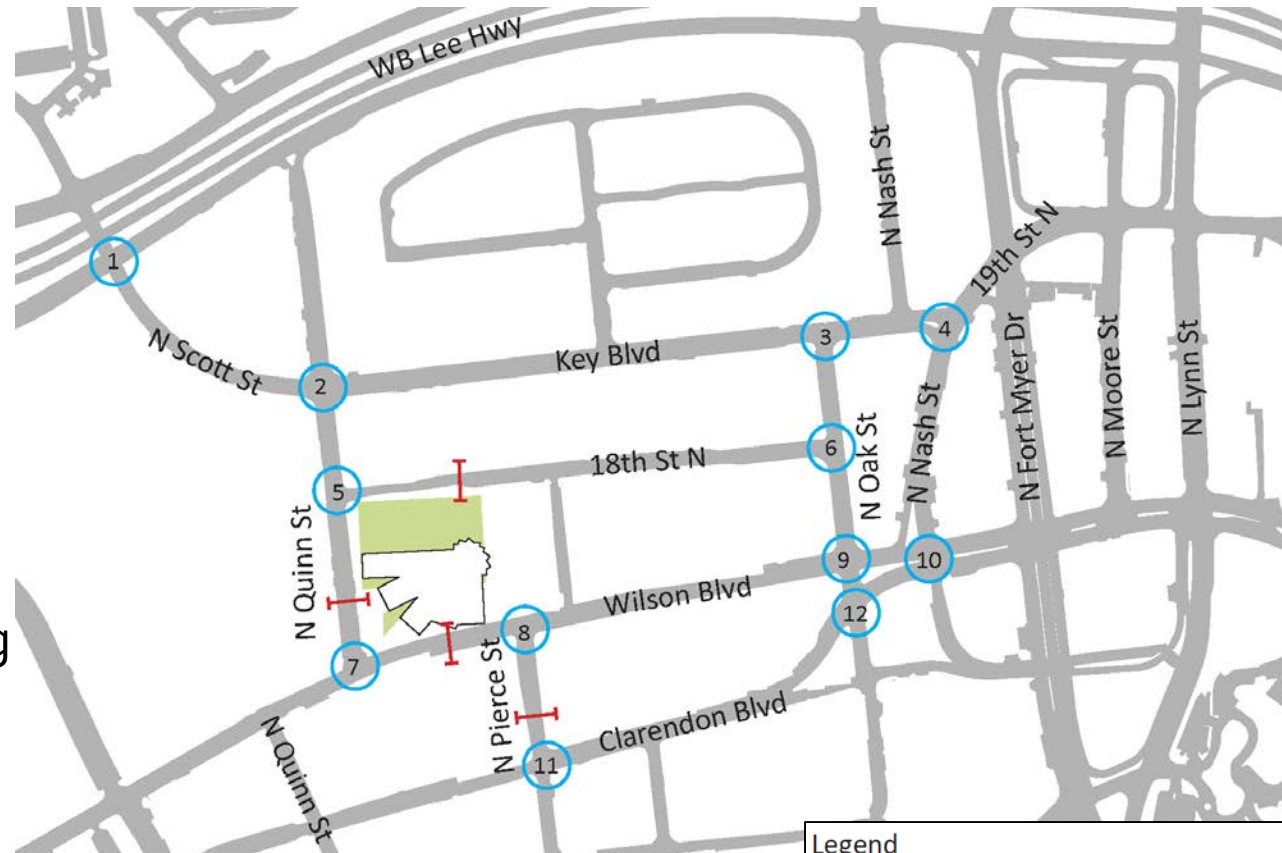
- Review traffic impact analysis of school traffic
 - Includes pipeline developments
 - Includes assumptions about staff and student travel
 - Analyzes peak hour for arrival and dismissal
- Share issues and opportunities for
 - Alternate parent drop-off
 - Vehicular transportation network

Study Area and Analysis Approach



What we analyzed...

- Arrival peak hour (8:20-9:20AM)
- Dismissal peak hour (3:15-4:15PM)
- 12 study intersections (see right)
- Vehicular delay, Level of Service and queuing
- Impact of pipeline developments



Legend

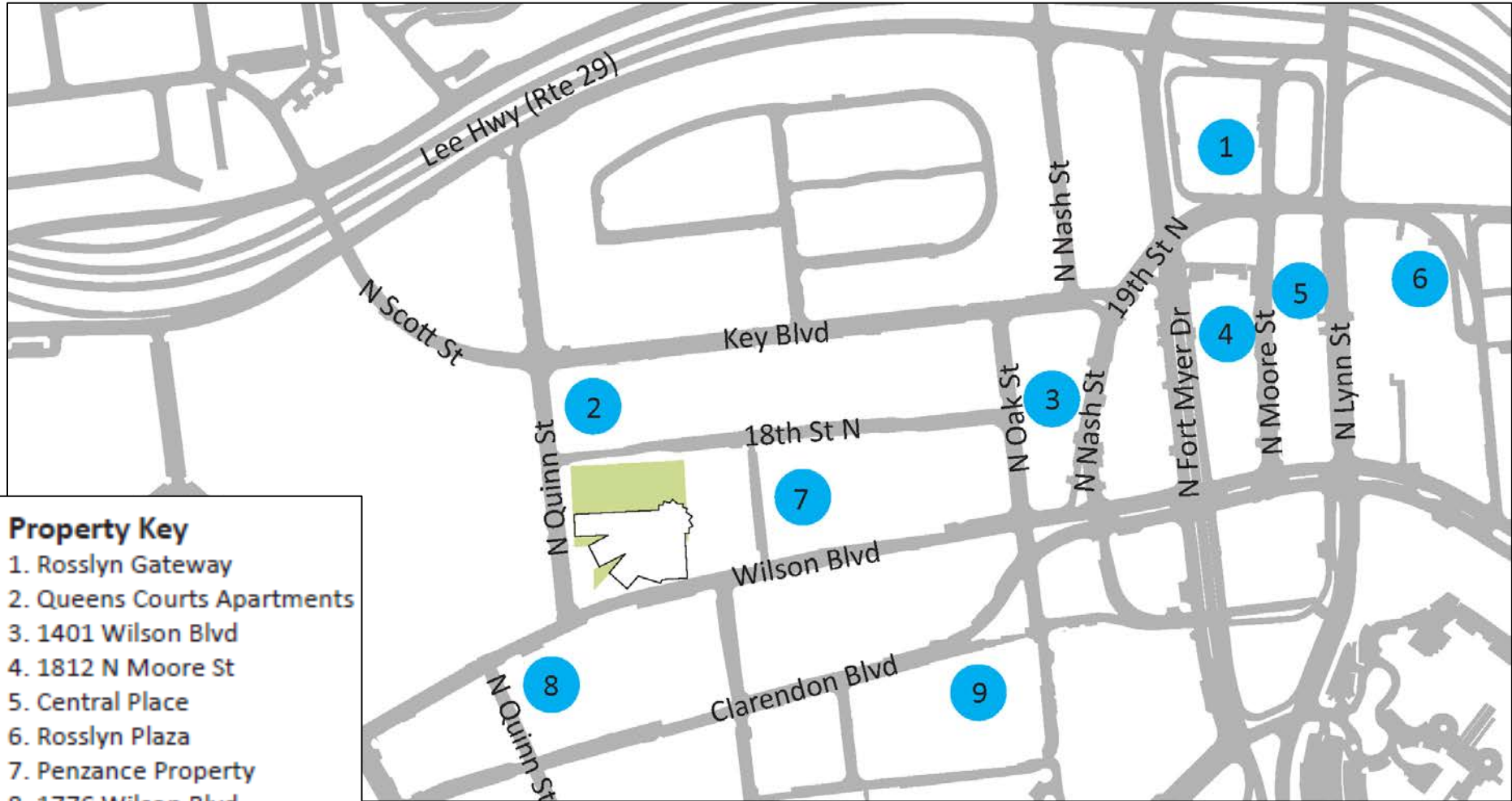


Automatic Traffic Recorder (ATR)/
"Tube" Count Location



Turning Movement Count (TMC) &
Capacity Analysis Location

Pipeline Developments



Property Key

1. Rosslyn Gateway
2. Queens Courts Apartments
3. 1401 Wilson Blvd
4. 1812 N Moore St
5. Central Place
6. Rosslyn Plaza
7. Penzance Property
8. 1776 Wilson Blvd
9. Sedona/Slate Apartments

Calculating Trip Generation



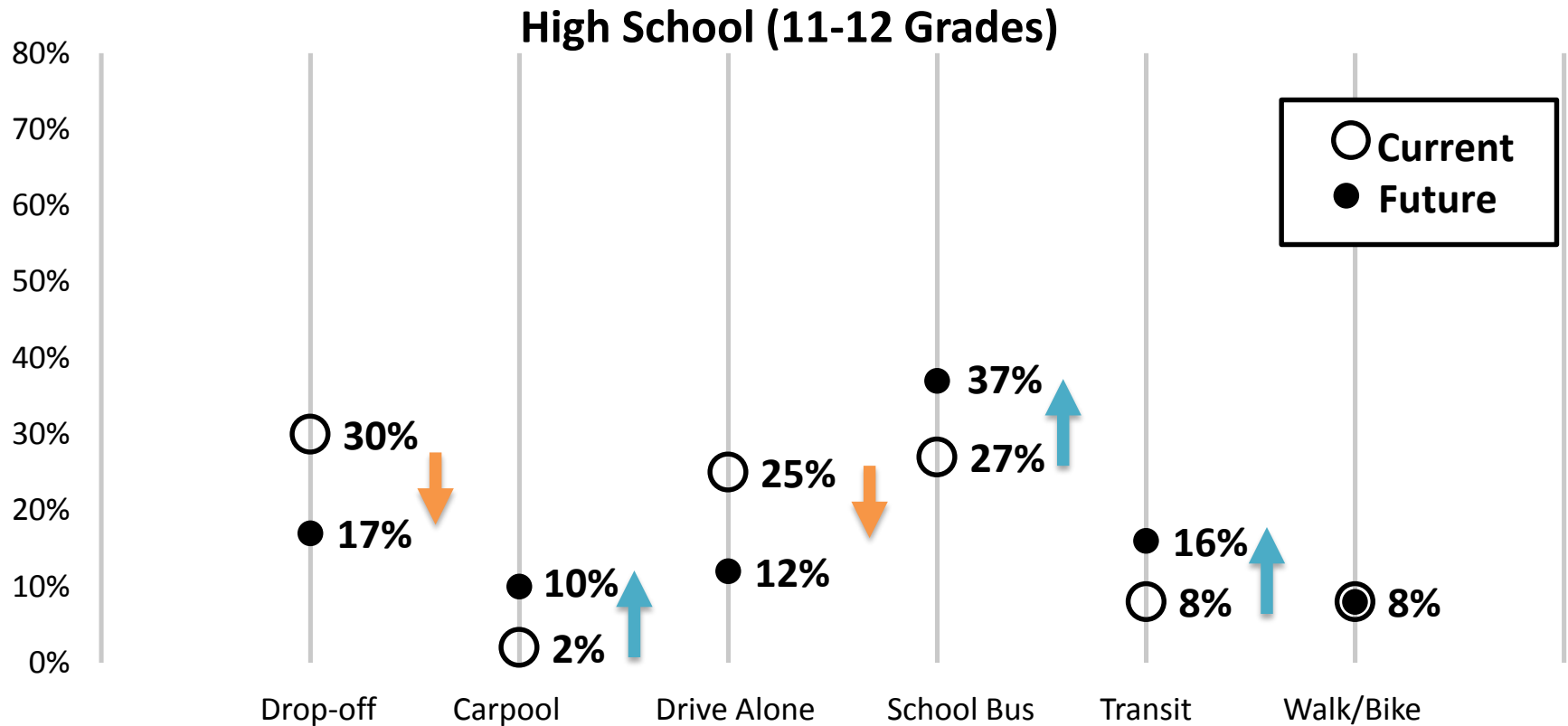
- Trip generation, an estimate of the number of vehicle trips that can be expected, is an essential part of the traffic analysis
- Includes: Students, Buses, Staff, Visitors
- Students, both being dropped off and driving themselves, represent the largest number of trips arriving and leaving the school site

Student Mode Splits



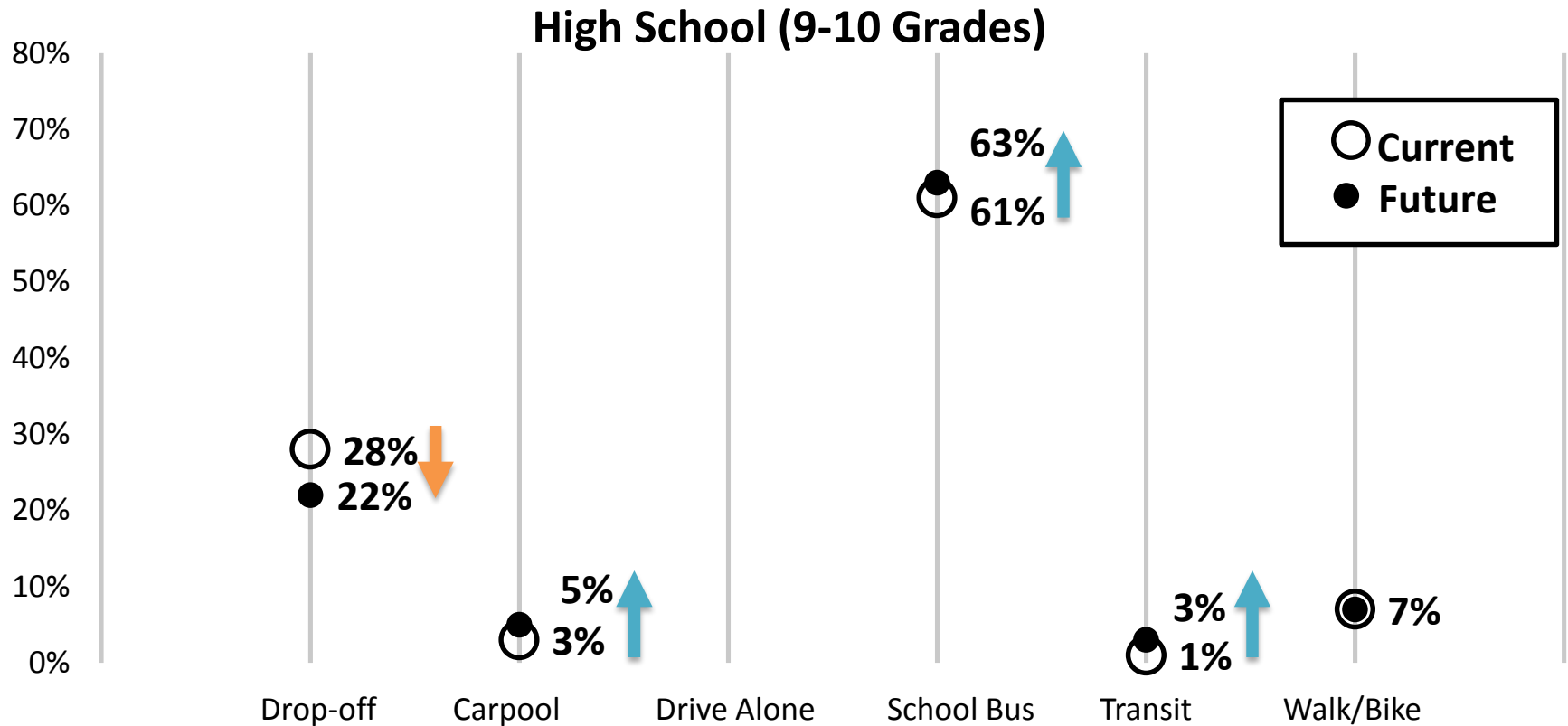
- Looked at three group of students separately
 - Grades 6-8, Grades 9-10, and Grades 11-12
 - Travel choices vary between groups
- Likelihood of mode change from current based on
 - Geographic location of school
 - Improved access to transit
 - Cost of parking for students
 - Student surveys

Mode Splits - Current & Future High School (11th & 12th Grade)



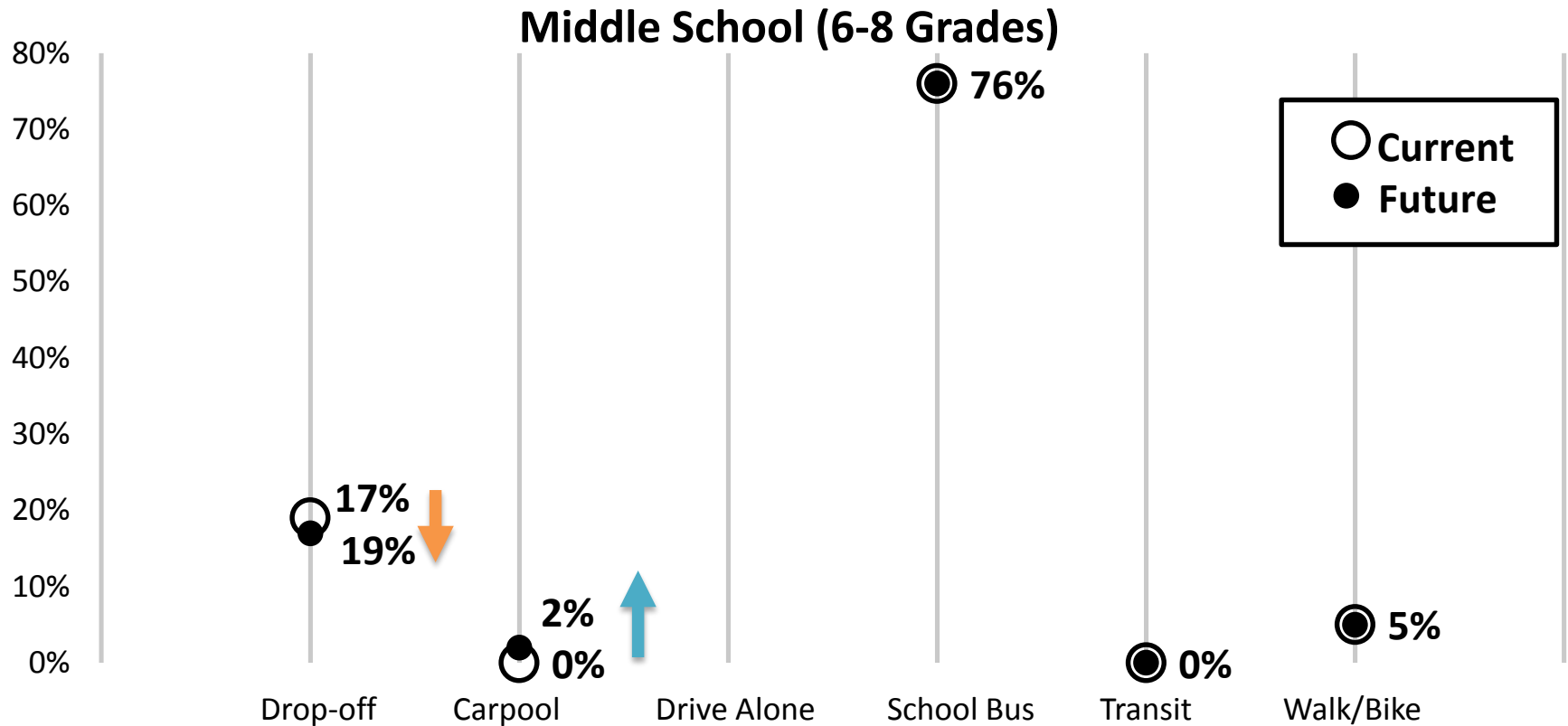
231 students (11th & 12th grades)

Mode Splits - Current & Future High School (9th & 10th Grades)



231 students (9th & 10th grades)

Mode Splits - Current & Future Middle School (6th - 8th Grades)



253 students (6th-8th grades)

Vehicle Trip Summary

Arrival Peak Hour



HB Woodlawn and Stratford Program at Wilson Site

246
student trips

	Arrival Peak Hour		
	IN	OUT	TOTAL
Students Drop Offs/Carpool	112	112	224
Students Drive Alone/Carpool	22	0	22
Staff ¹	68	0	68
Visitors	4	4	8
Buses ²	21	21	42
TOTAL	227	137	364³

1 – Assumes a 94% drive rate.

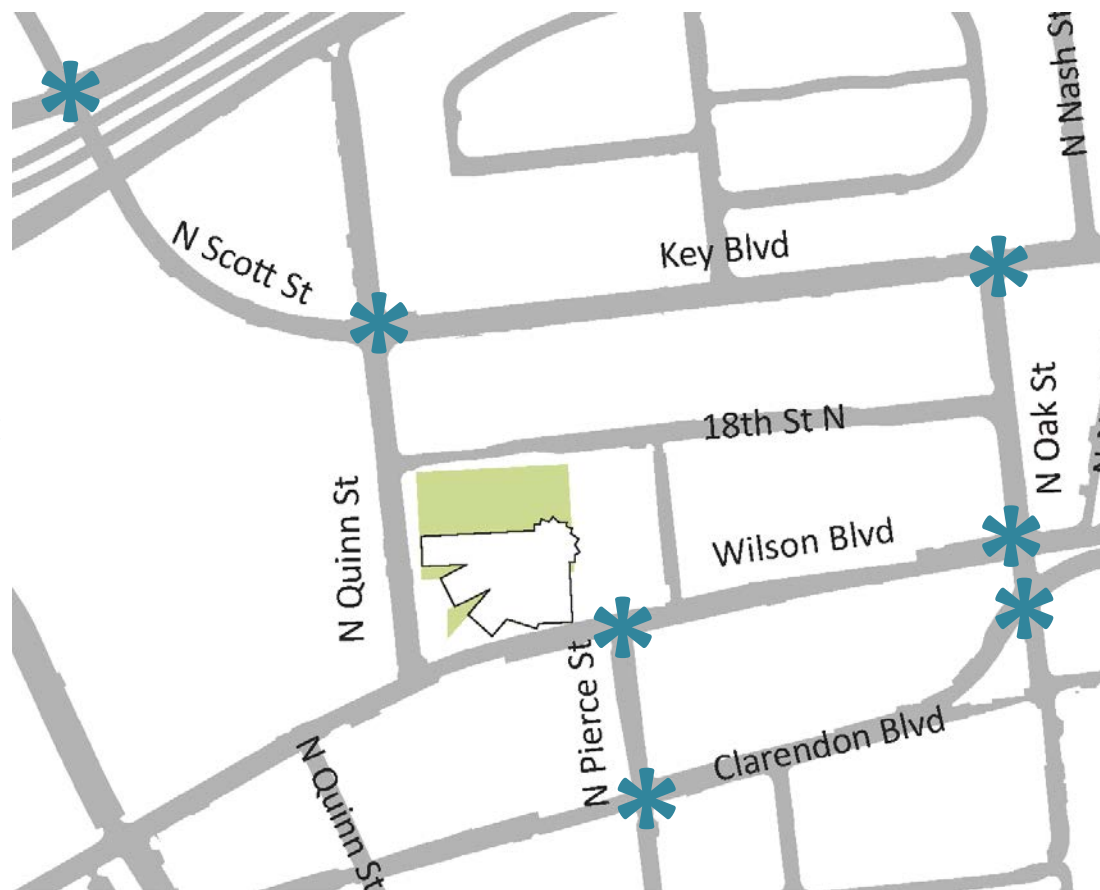
2 – Assumes 8 Stratford buses and 13 H-B Woodlawn buses.

3 - Compared to 295 trips at dismissal peak hour. Also, this is approximately 5% fewer trips at the Wilson site than the current arrival peak hour at the current school location.

Issues and opportunities



- Vehicular transportation network
 - Some intersections may require signal timing changes or additional turn lanes *
 - One-way streets and offset intersections limit access somewhat
- Remote drop-off



Alternate Parent drop-off






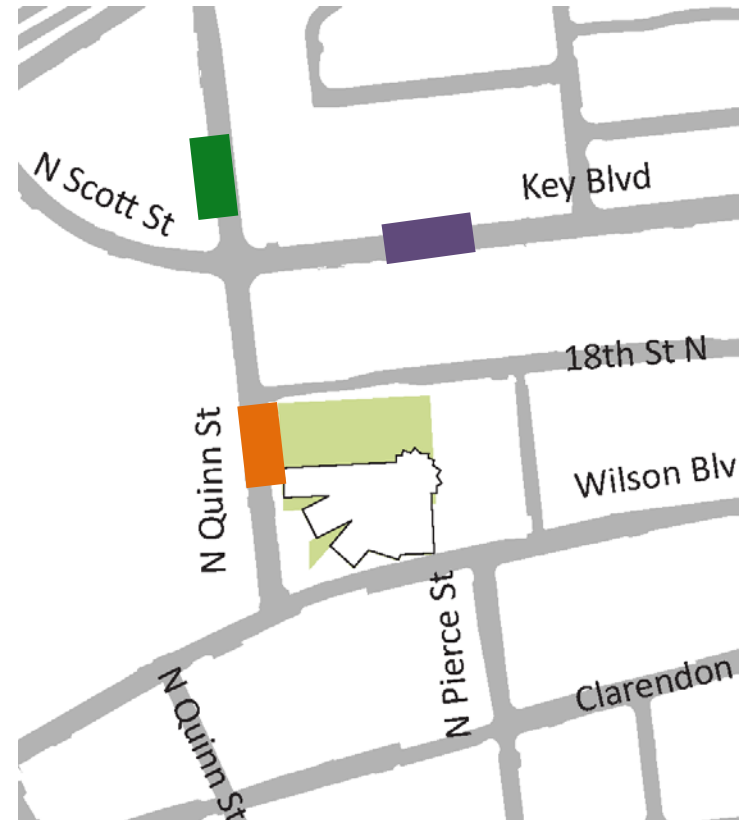
Considerations include:

- Balance of convenience and proximity
- Avoid potential congestion along Quinn Street
- Avoid circuitous routes
- Observe and assess after several months' experience

Alternate Parent Drop-off



- Parent drop-off analysis includes both:
 - How do students being dropped off ARRIVE?
 - How do parents dropping students off LEAVE?
- Several options being considered:
 -  All drop-off on east side of Quinn Street
 -  Additional, remote drop-off on Key Blvd, east of Quinn Street
 -  Additional, remote drop-off on Quinn Street, north of Key Blvd

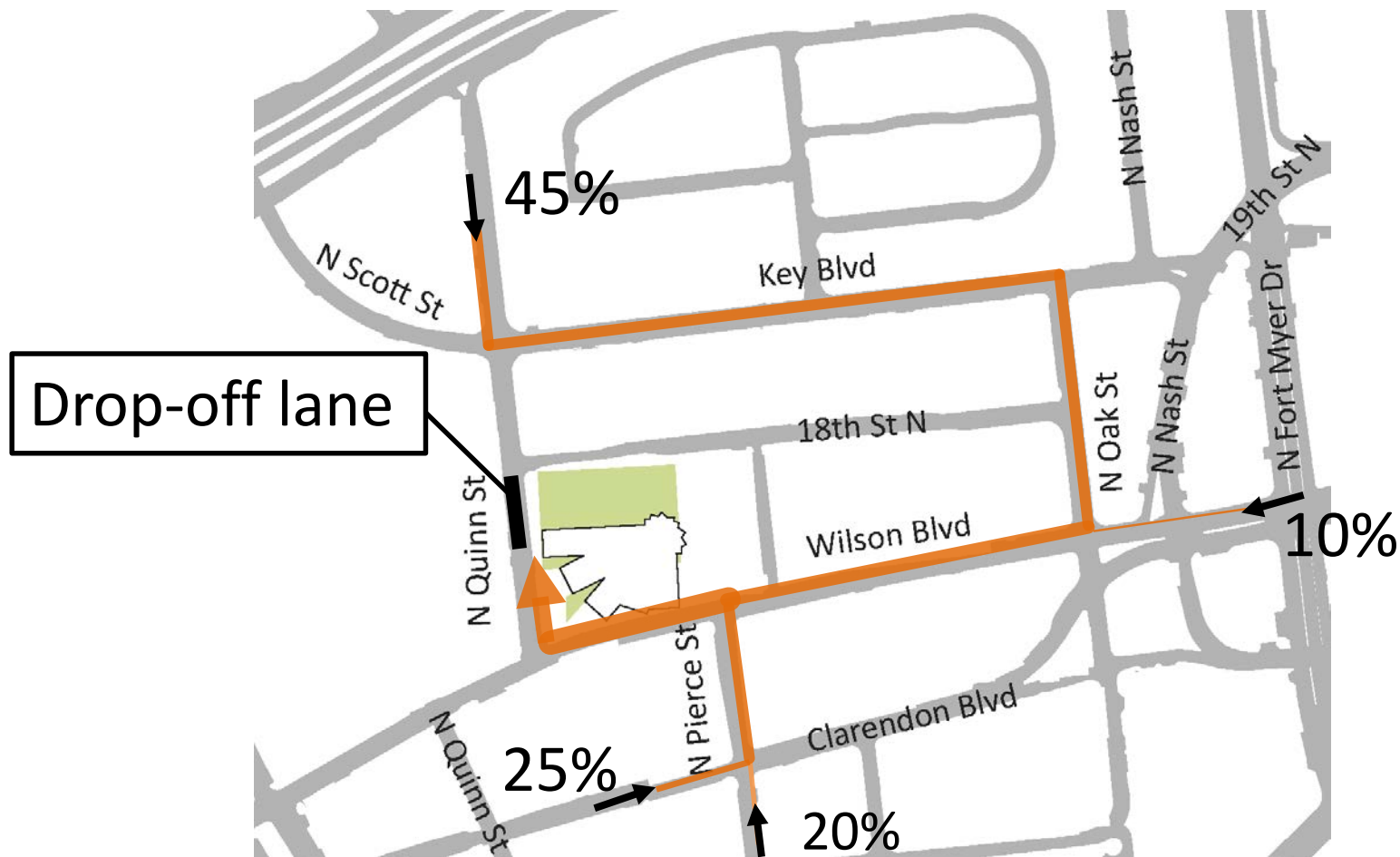


Drop-off on Quinn Street ONLY

How do students being dropped off ARRIVE at the site?



112
inbound
drop-off trips

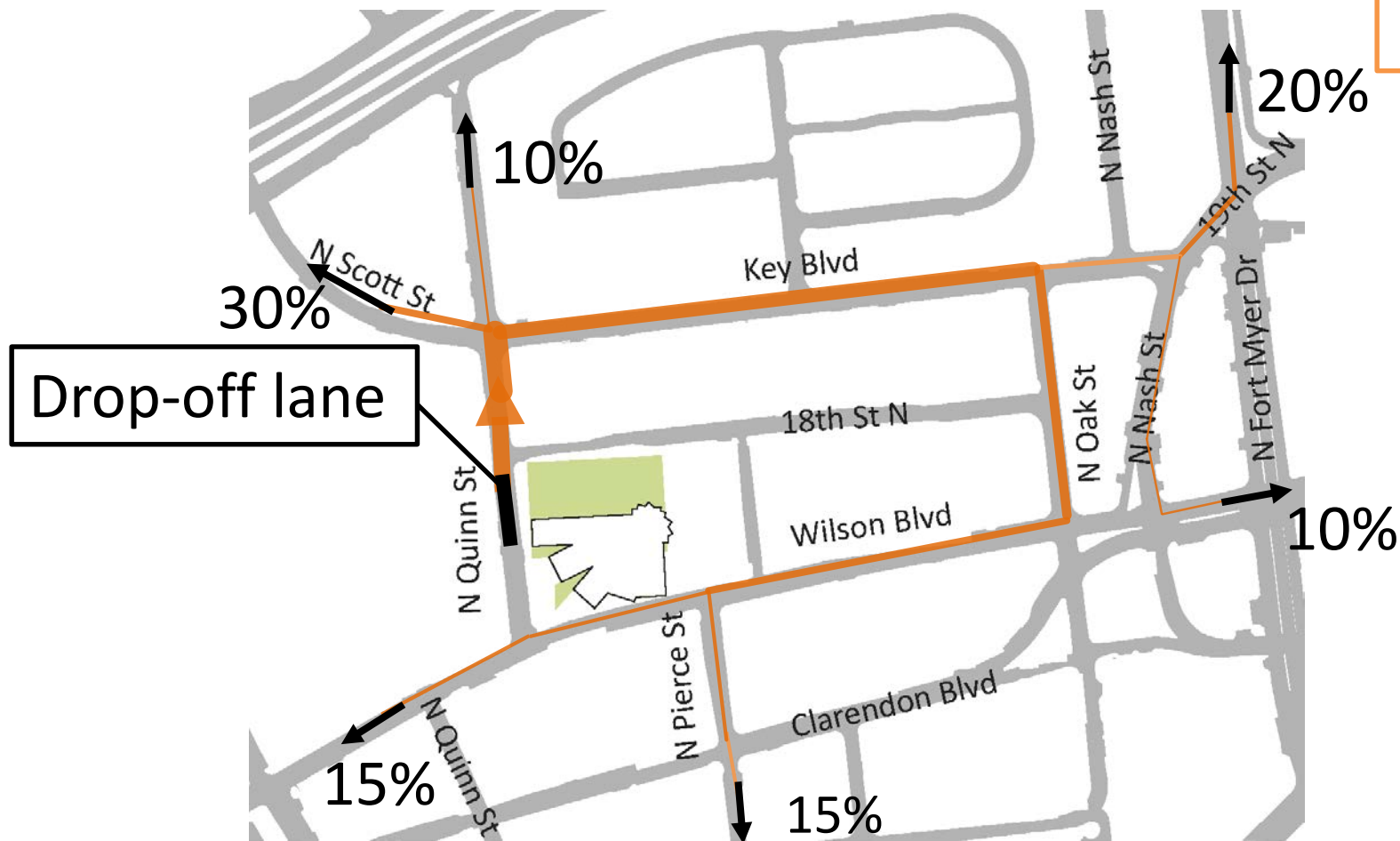


Drop-off on Quinn Street ONLY

How do parents dropping off students LEAVE the site?



112
outbound
drop-off trips

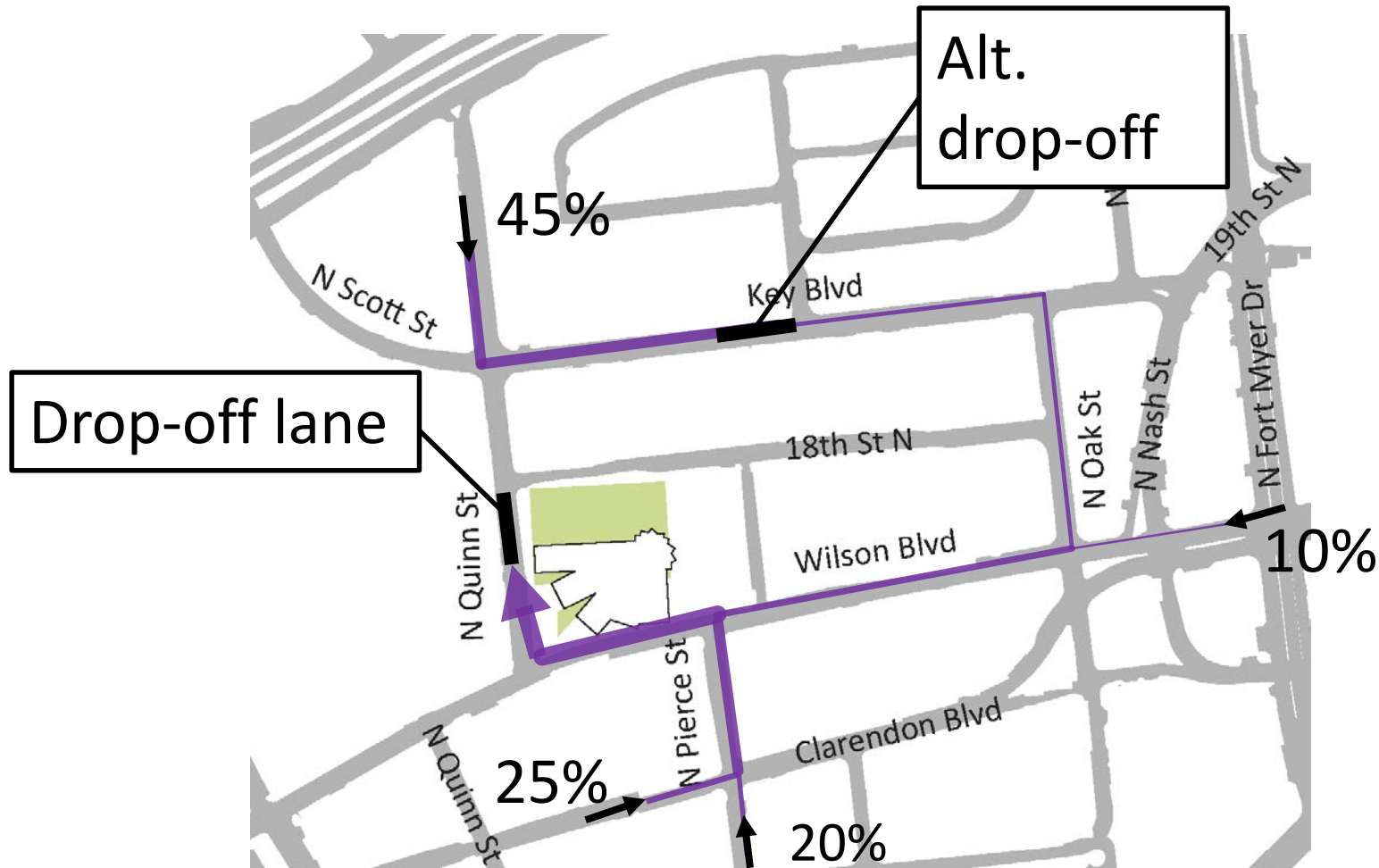


Option: Drop-off on Key Blvd

How do students being dropped off ARRIVE at the site?



112
inbound
drop-off trips

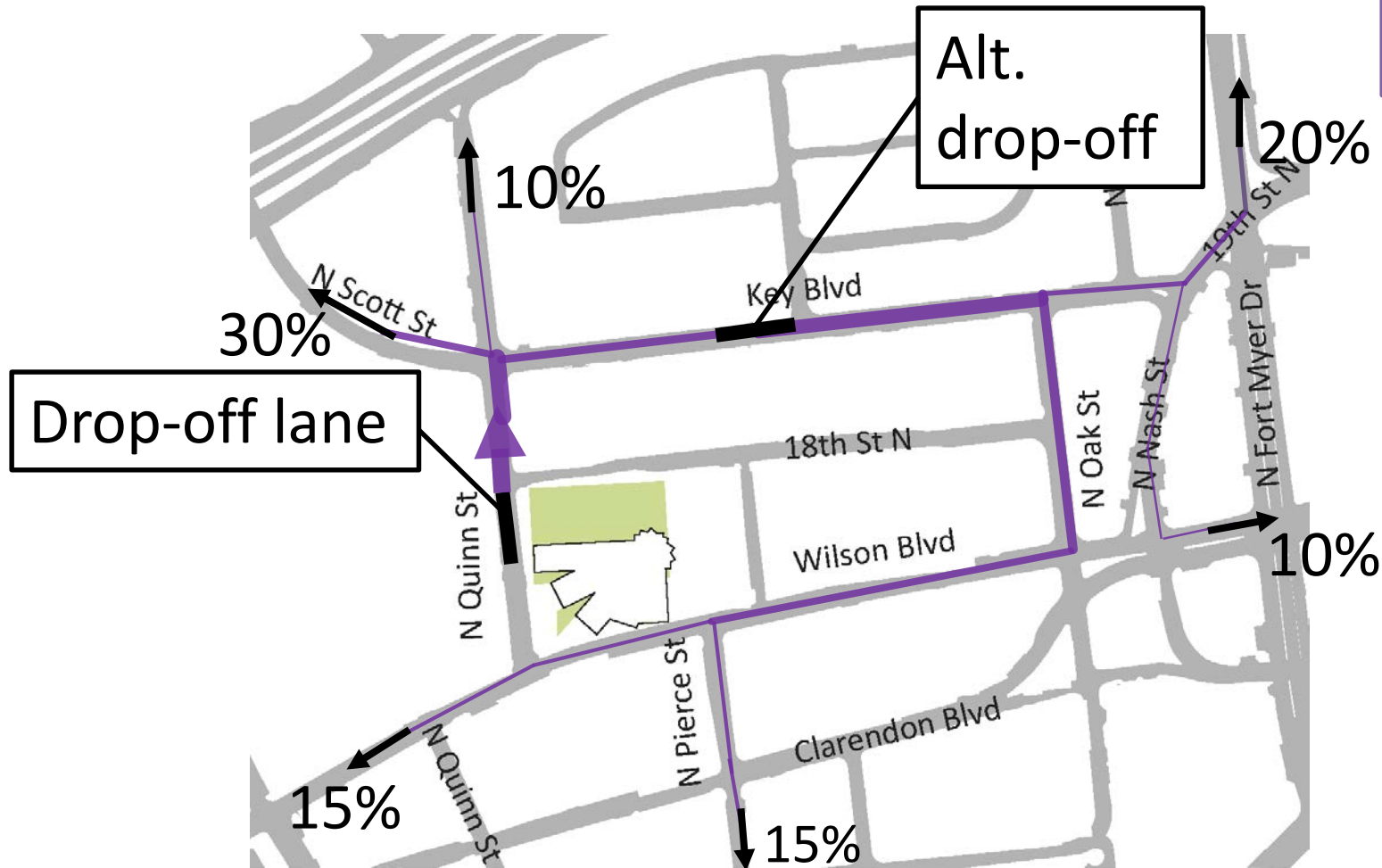


Option: Drop-off on Key Blvd

How do parents dropping off students LEAVE the site?



112
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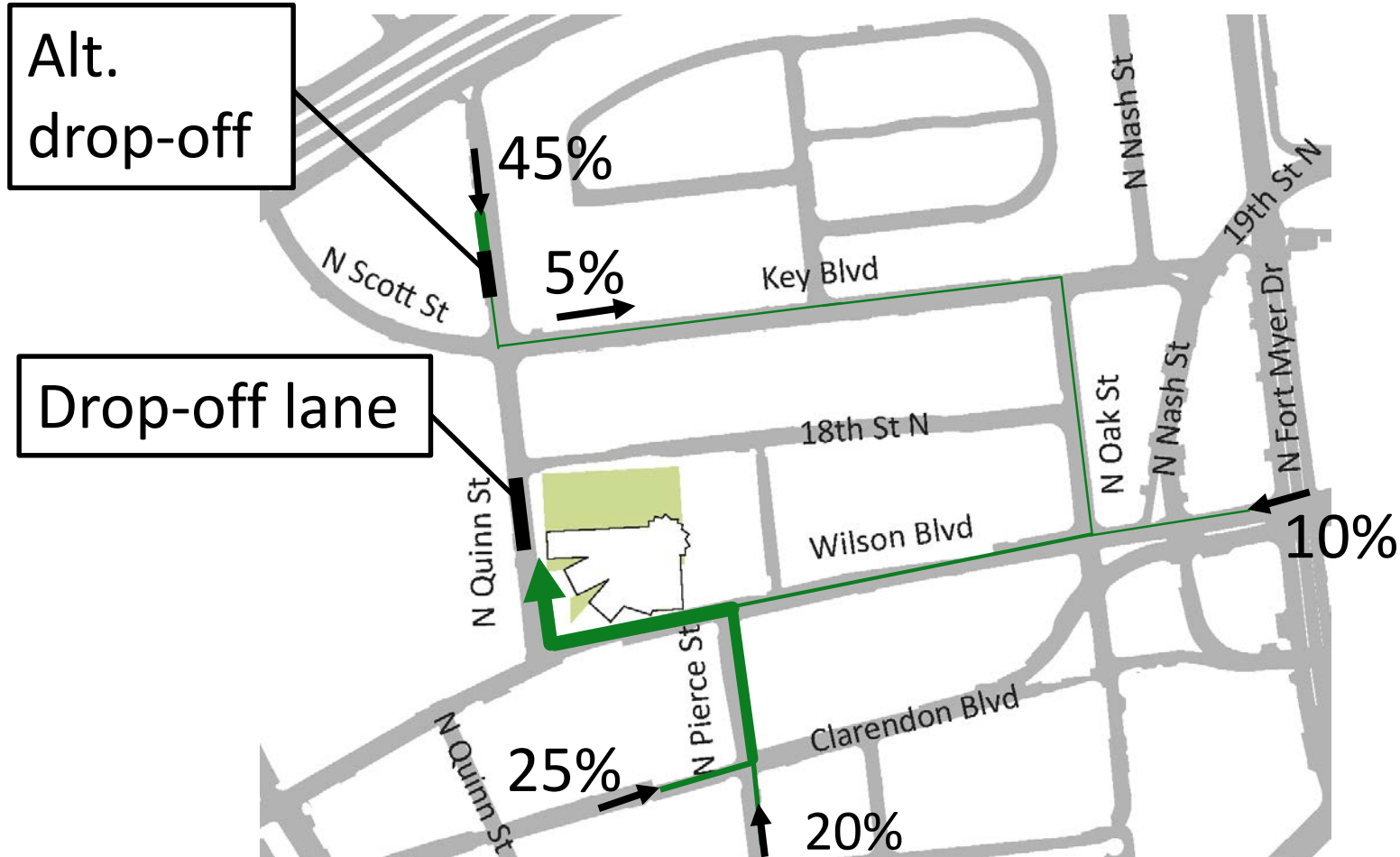


Option: Drop-off on Quinn Street

How do students being dropped off ARRIVE at the site?



112
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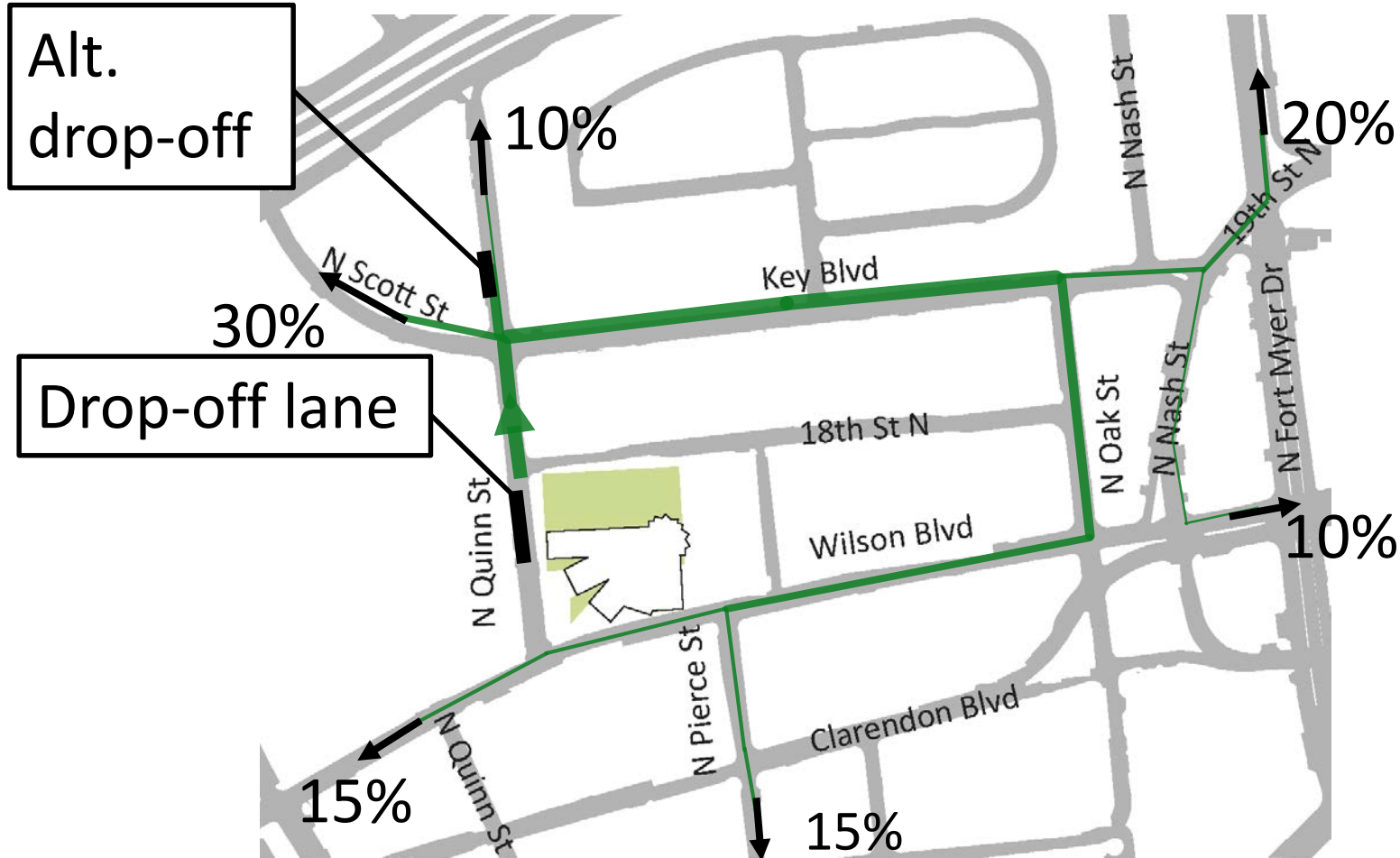


Option: Drop-off on Quinn Street

How do parents dropping off students LEAVE the site?



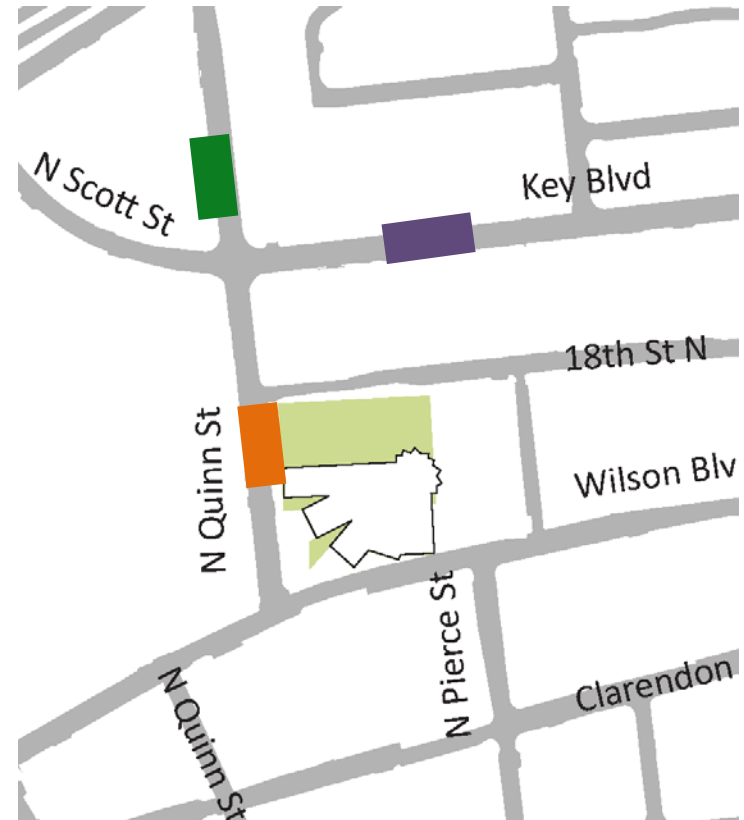
112
outbound
drop-off trips



Parent Drop-off Summary



- Location needs to be both convenient for parents and provide a direct and safe connection for students.
- It will be important to observe and assess after school opens





BUS MANAGEMENT OPTIONS AND RECOMMENDATIONS

Summary of recommendations



- During arrival:
 - Restrict access to 18th Street for Stratford only
 - Restrict parking for both schools
- During dismissal
 - Restrict access to 18th Street for both schools
 - Restrict parking for both schools



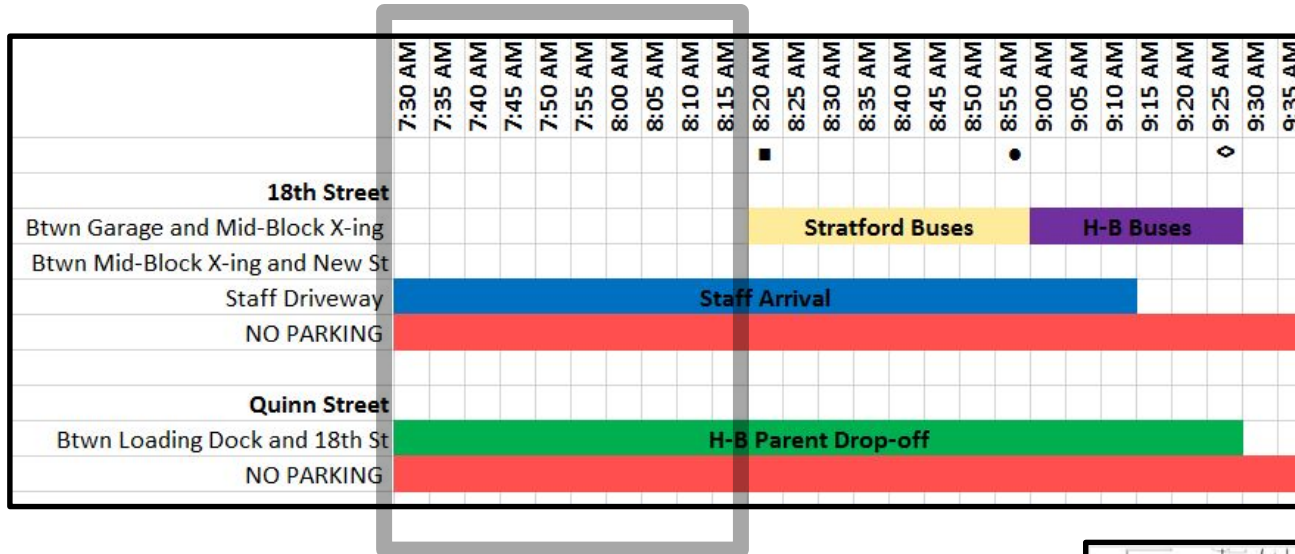
BEGAN WITH SORTING OUT THE ARRIVAL AND DISMISSAL SEQUENCING

Current Planning Context for Bus Management



- Planning for 8 buses for Stratford and 13 buses for H-B Woodlawn
- BLPC/PFRC process identified 18th Street as location for drop-off and pick-up
- Stratford starts 30 minutes earlier than H-B Woodlawn
- Per state law: The driver of a vehicle also need not stop when approaching a school bus which is loading or discharging passengers from or onto property immediately adjacent to a school if the driver is directed by a law-enforcement officer or other duly authorized uniformed school crossing guard to pass the school bus. <http://law.lis.virginia.gov/vacode/46.2-859/>
 - May conclude from this that unless a police officer or uniformed school crossing guard is present, all drivers must stop while buses are unloading or loading on 18th Street.
- Mid-block crossing on 18th Street at Rosslyn Highlands Park will be maintained

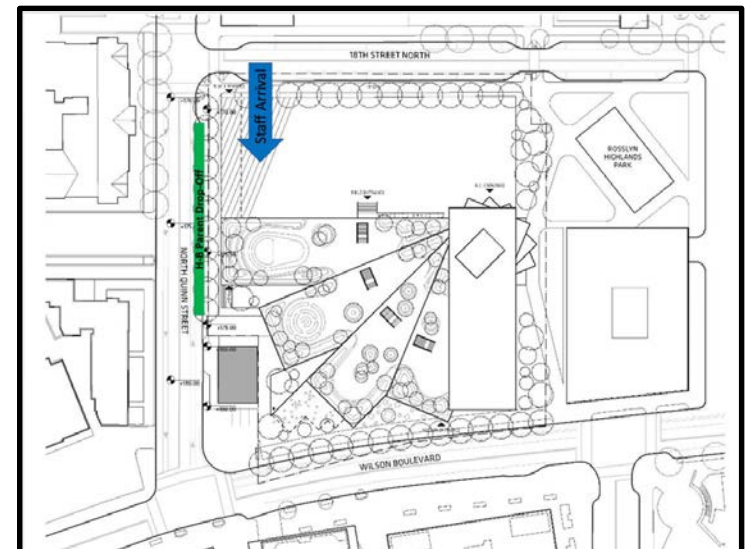
Arrival Timing



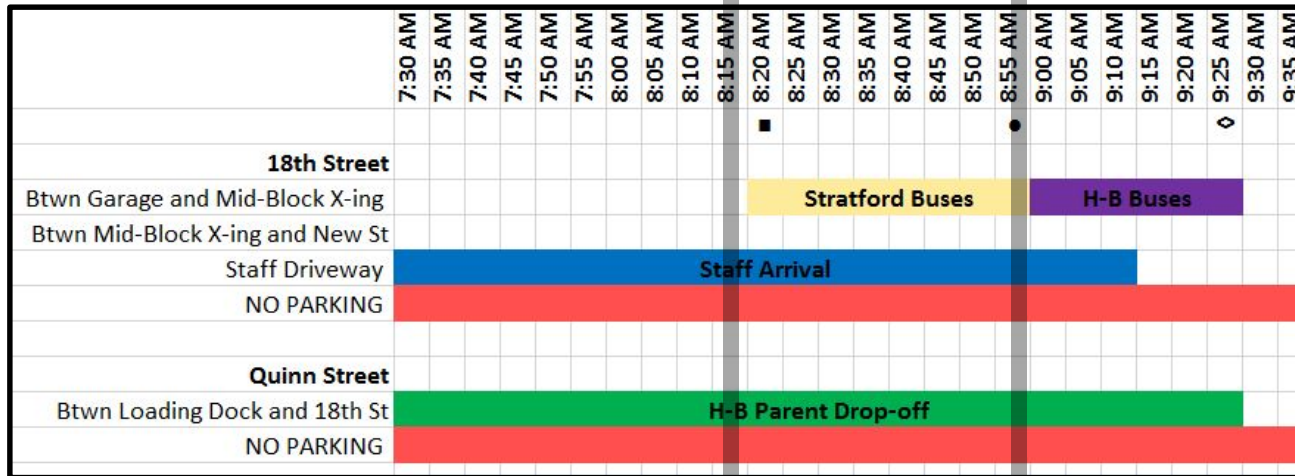
7:30 – 8:20 AM

■ 8:20 AM H-B Zero Period Bell

- H-B Parent Drop-Off on Quinn St
- Staff Arrival via Parking Driveway
- Parking restrictions on N Quinn St and 18th St N
- Note: Special Ed bus can park in front of field after 9:30AM



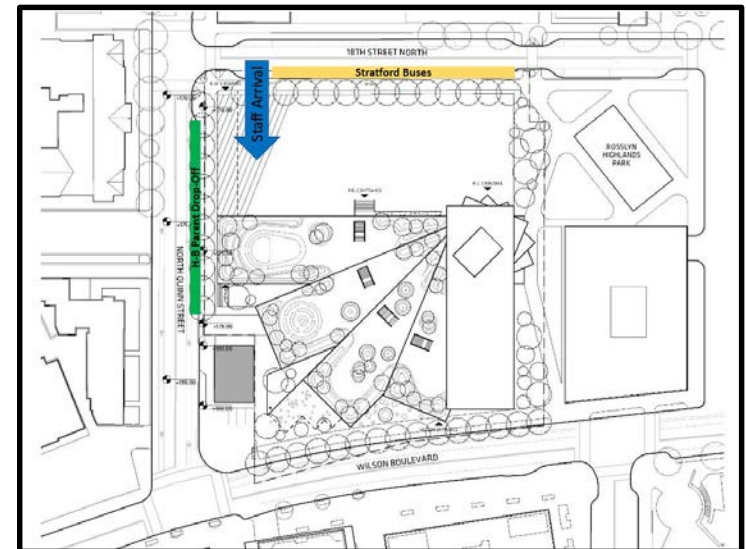
Arrival Timing



8:20 – 9:00 AM

- 8:20 AM H-B Zero Period Bell
- 8:54 AM Stratford Bell

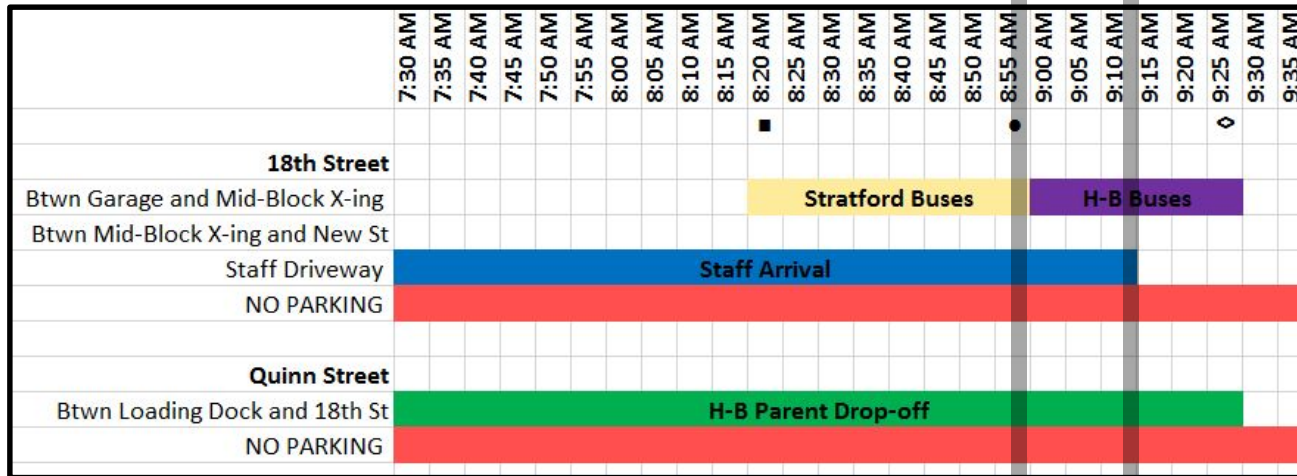
- Stratford Buses Arrive on 18th St N
- H-B Parent Drop-Off on Quinn St
- Staff Arrival via Parking Driveway
- Parking restrictions on N Quinn St and 18th St N



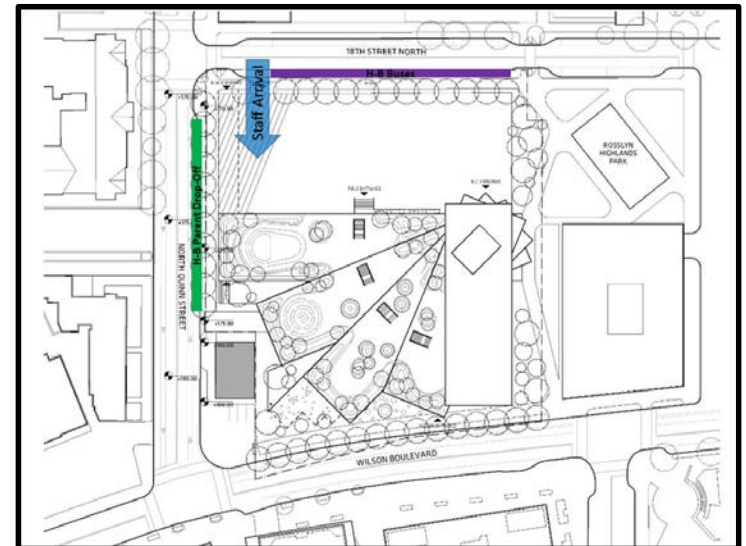
Arrival Timing



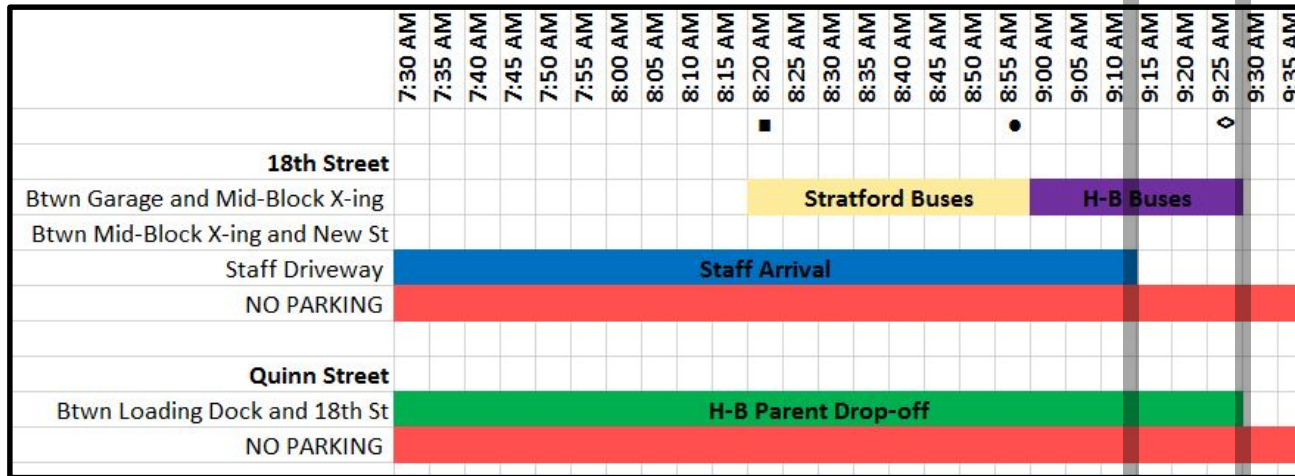
9:00 – 9:15 AM



- H-B Buses Arrive on 18th St N
- H-B Parent Drop-Off on Quinn St
- Staff Arrival via Parking Driveway
- Parking restrictions on N Quinn St and 18th St N

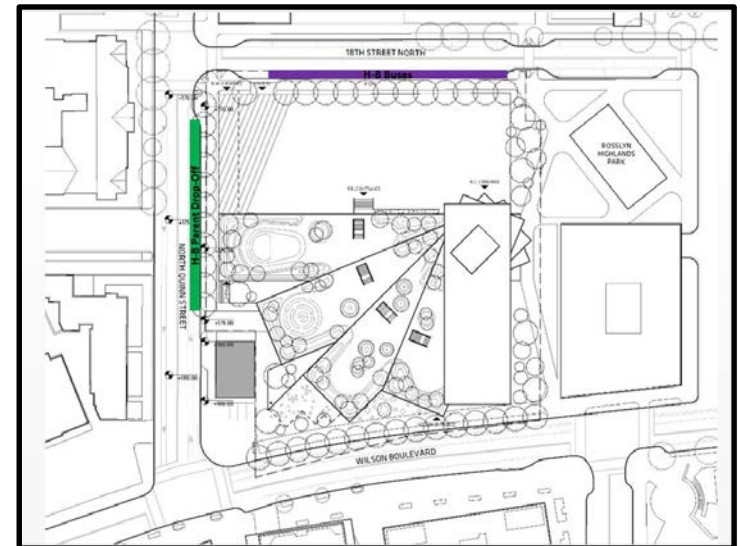


Arrival Timing

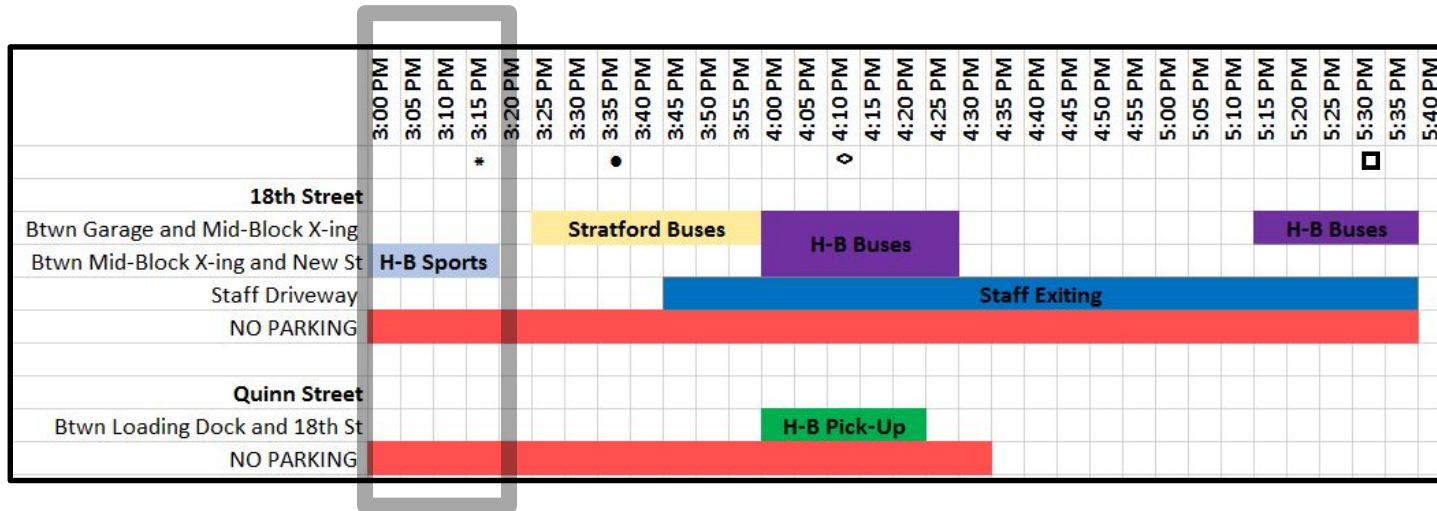


9:15 – 9:30AM
 ◇ 9:24 AM H-B First Period Bell

- H-B Buses Arrive on 18th St N
- H-B Parent Drop-Off on Quinn St
- Parking restrictions on N Quinn St and 18th St N

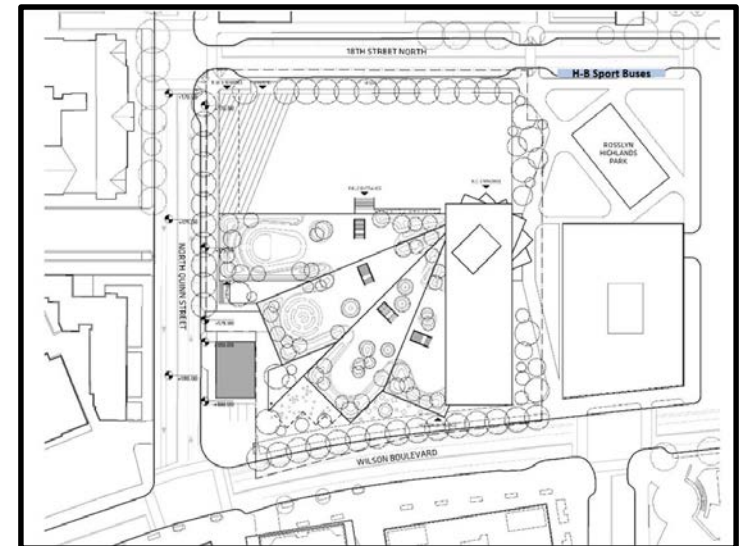


Dismissal Timing

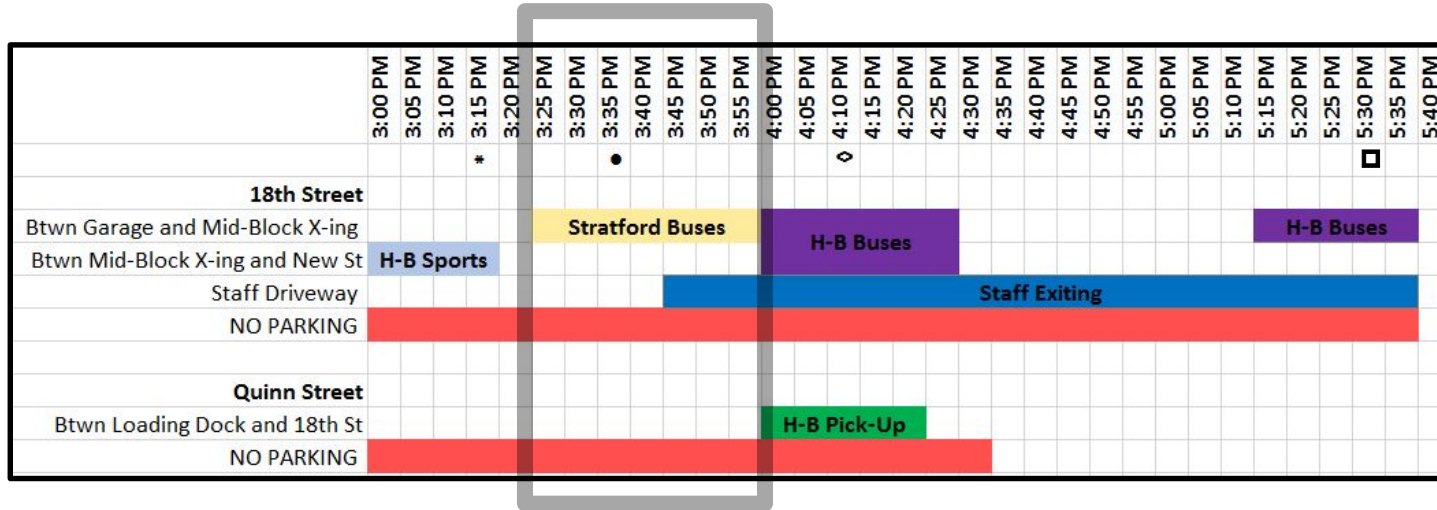


**3:00 -
3:20 PM**
*3:15 PM H-B
Sports Buses
Leave

- H-B Sports Buses Arrive on 18th St N;
Depart at 3:15 PM
- Parking restrictions on N Quinn St and
18th St N



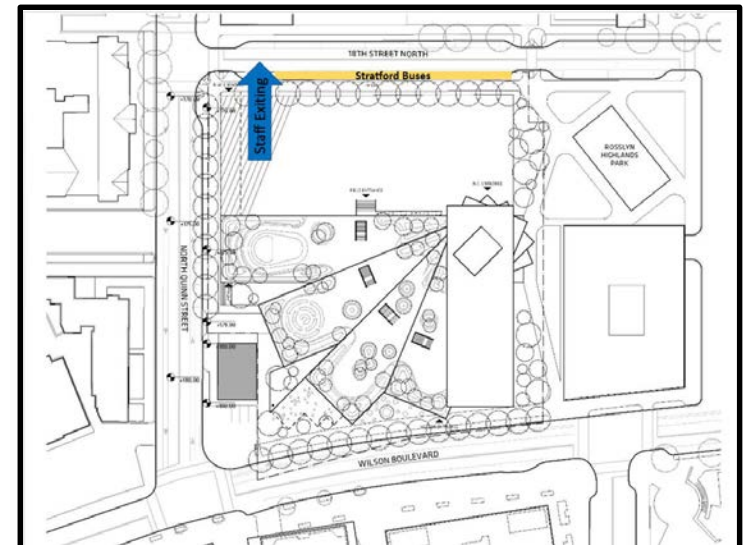
Dismissal Timing



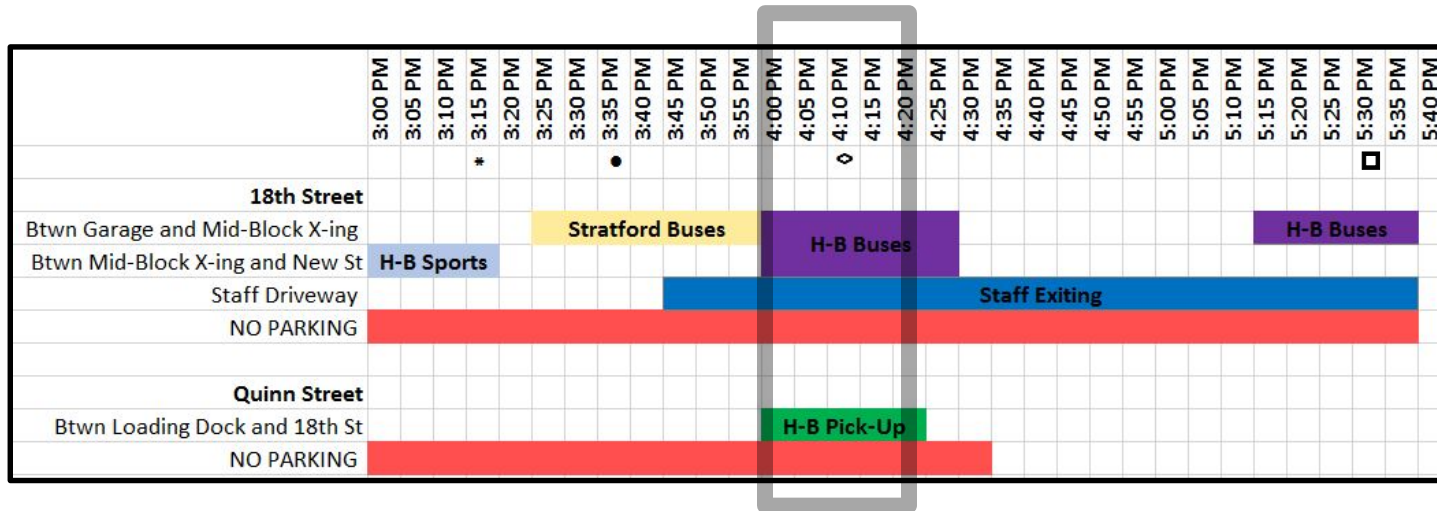
**3:25 -
4:00 PM**

- 3:36 PM
Stratford Bell

- Stratford Buses Arrive on 18th St N
- Staff Begin Exiting Parking Lot on 18th St N
- Parking restrictions on N Quinn St and 18th St N

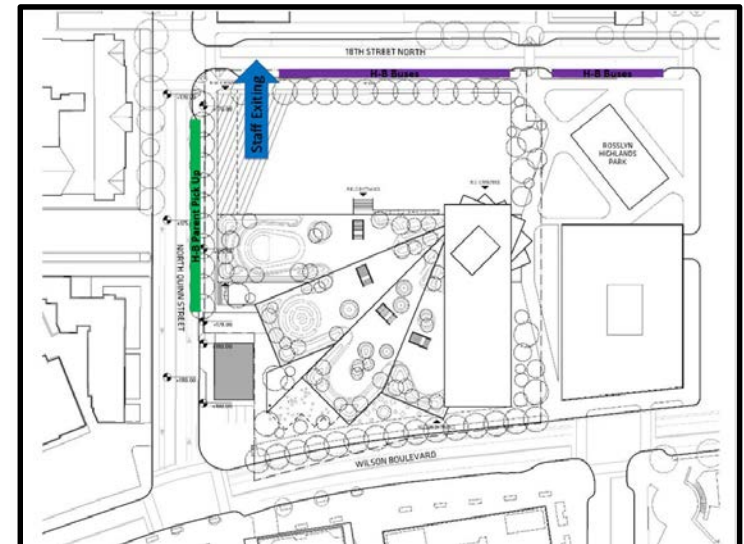


Dismissal Timing

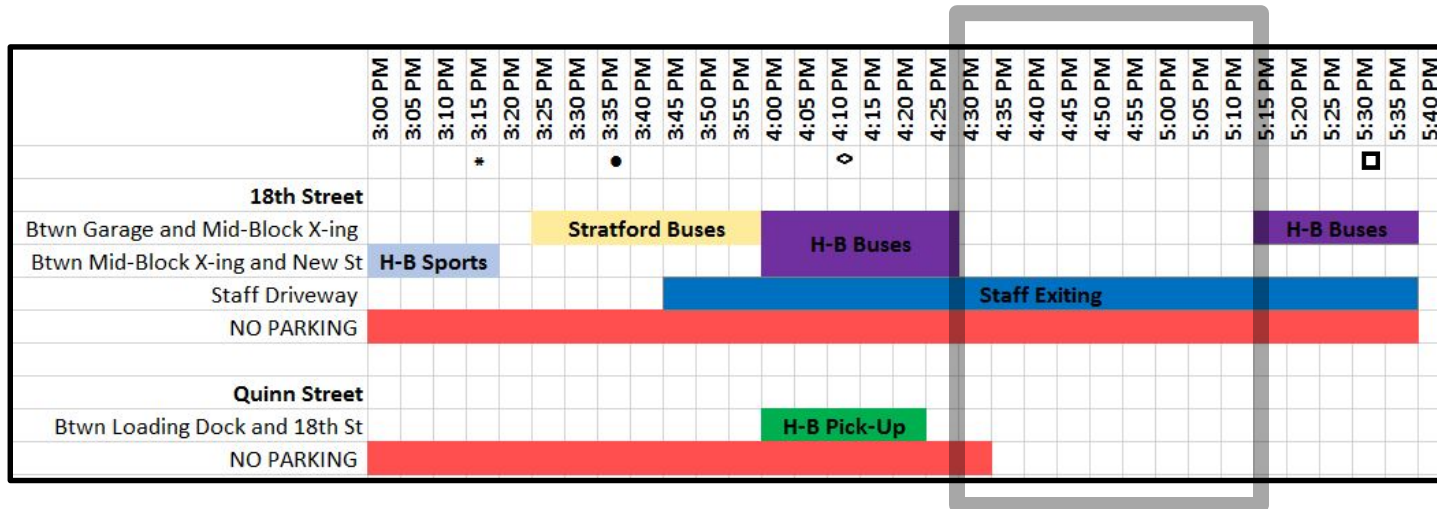


**4:00 –
4:20 PM**
◊ 4:06 PM H-B Bell

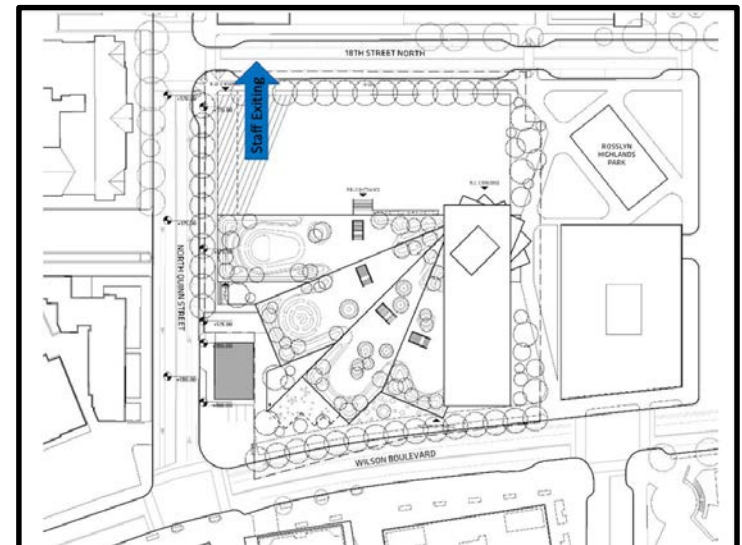
- H-B Buses Arrive on 18th St N
- Staff Exit Parking Lot on 18th St N
- H-B Parent Pick-Up Begins on Quinn St
- Parking restrictions on N Quinn St and 18th St N



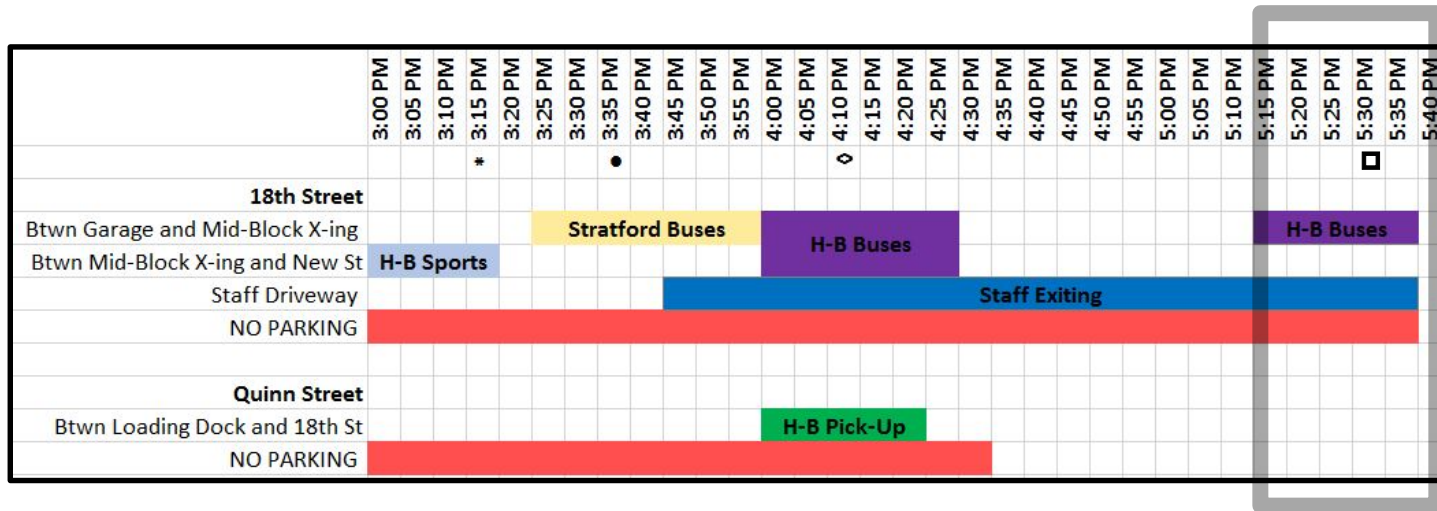
Dismissal Timing



- Staff Exit Parking Lot on 18th St N
- Parking restrictions on N Quinn St and 18th St N

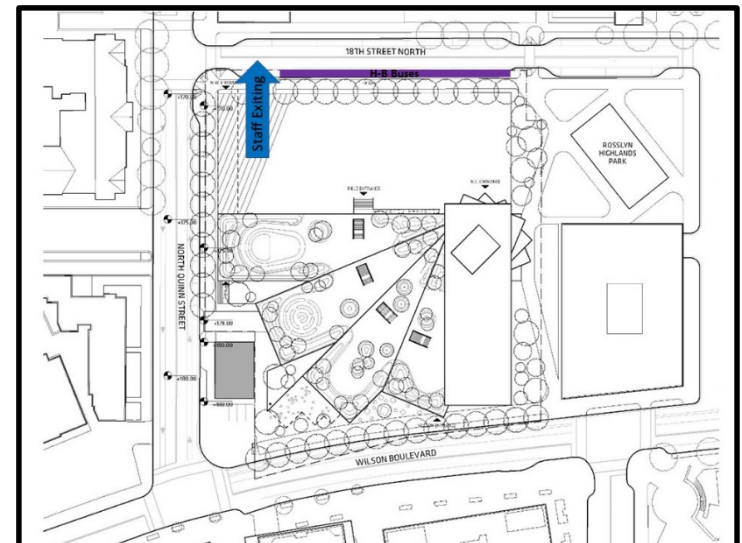


Dismissal Timing



5:15 –
5:40 PM
 □ 5:30 PM H-B
 Late Buses Leave

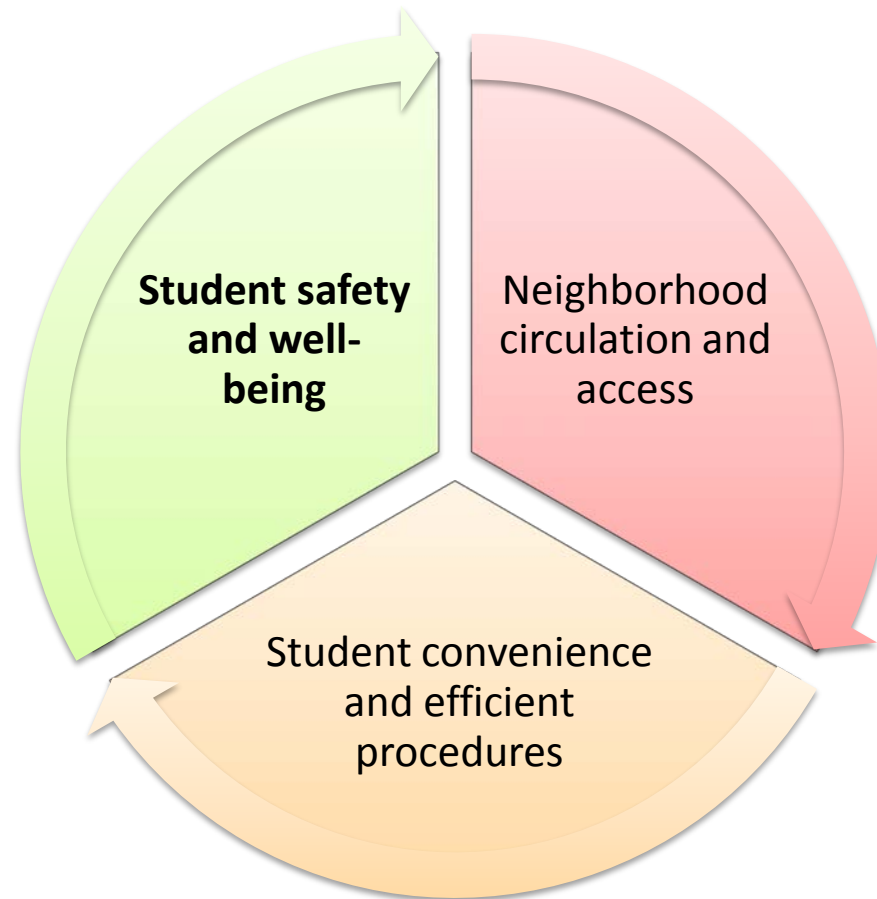
- H-B Late Buses Arrive on 18th St N
- Staff Exit Parking Lot on 18th St N
- No Parking on 18th St N





KEY CONSIDERATIONS

Key considerations





**RECOMMEND LIMITING ACCESS TO
18TH STREET DURING ARRIVAL AND
DISMISSAL**

Limiting access to 18th Street during arrival and dismissal



Three options for managing 18th Street

1. Signage and periodic enforcement
2. Signage with police officer directing traffic
3. Open with police officer directing traffic

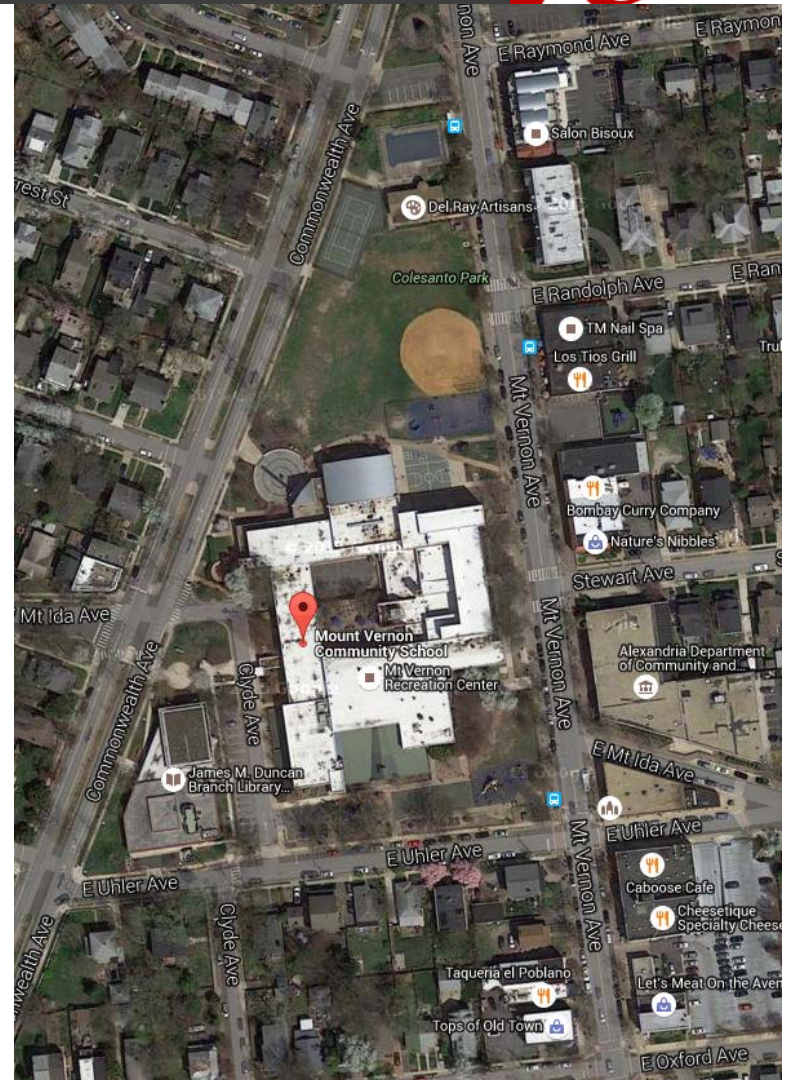
Limiting access is essential for Stratford arrival and dismissal

Not essential for H-B Woodlawn, but may be practical

How other school systems handle on-street school bus drop-off and pick-up



- Mt. Vernon Community school, Alexandria
 - Drop-off on curb with crossing guard
 - Afternoon pick-up on school grounds
 - Only 1 or 2 special ed buses; arrive at different times
- Various schools in Richmond
 - Drop-off on curb with no crossing guard
 - Motorists do no stop; no enforcement
 - Have been child pedestrian crashes
 - One 1 or 2 special ed buses; arrive at different times



How other school systems handle on-street school bus drop-off and pick-up



Boston – Carter Development School



Carter School, Boston



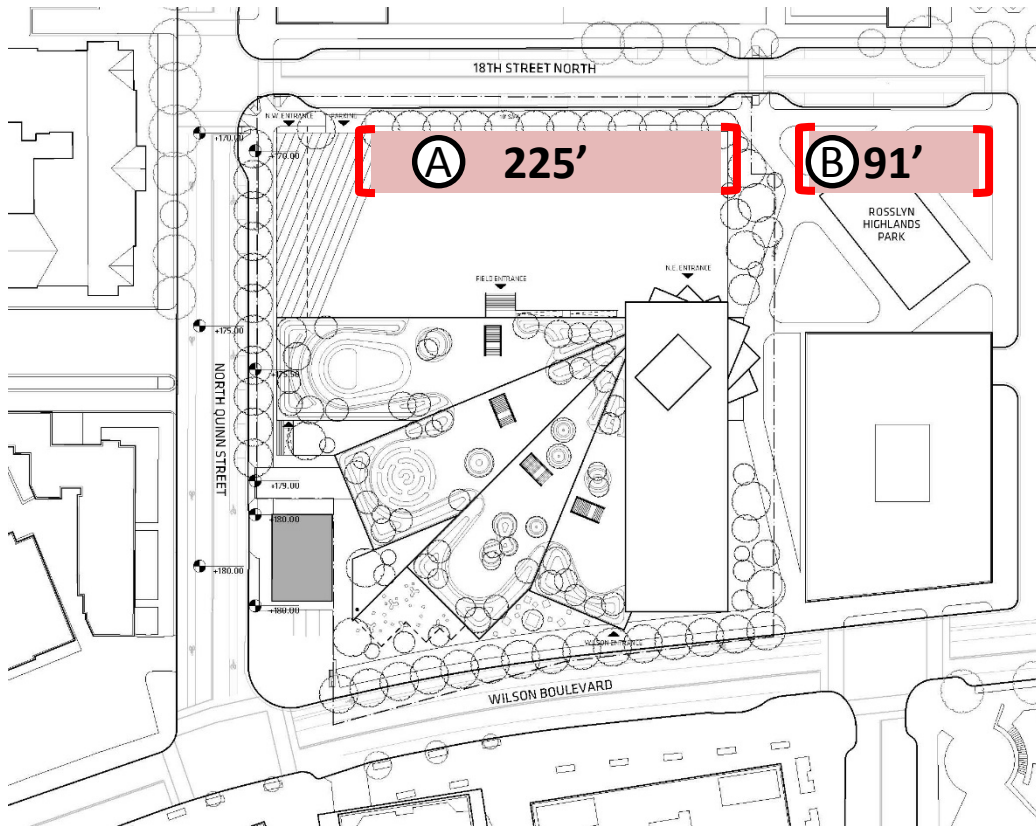
- About 30 students and 8 buses
- Space on-site: School dead ends between two streets that connect with street in front of building
- All buses arrive about the same time with all staff greeting students and escorting them into building
- Buses pull away as students depart
- Majority of students are in wheel chairs; few self-propel





AVAILABLE SPACE FOR BUSES ON 18TH STREET

Curb space along 18th Street



Current site plan allows for up to 342 feet of curb space

- Stratford principal does not want to use this space for its students
- H-B Woodlawn principal is comfortable using this space



SOME NEEDS OF THE TWO SCHOOL DIFFER



STRATFORD

Stratford Arrival and Dismissal Curbside Needs



- Need to create a special environment for these students
- Limiting motor vehicle access to 18th Street is key for this
- Restricting parking will increase available space



Stratford Arrival and Dismissal

Buses now line up around driveway circle at school entrance



Stratford Arrival and Dismissal

The arrival ritual: All staff meets students and buses



Stratford Arrival and Dismissal

The Arrival Ritual: part of the overall care for students



Stratford Arrival and Dismissal

Dismissal on April 8, 2016

Stratford Arrival and Dismissal Curbside Needs



- Space for all buses to dwell to unload and load students at the same time for both arrival and dismissal
- Maneuvering space needed for staff to unload and load students, including for wheel chair lifts
- Minimal travel distance between bus and school door
- Linear space of up to 320' for 8 buses

Number	Bus length	Maneuvering length	Total length	Total length of all buses
8	25' or 30'	10'	35' min 40' max	280' min 320' max

Recommendations for Stratford Arrival and Dismissal

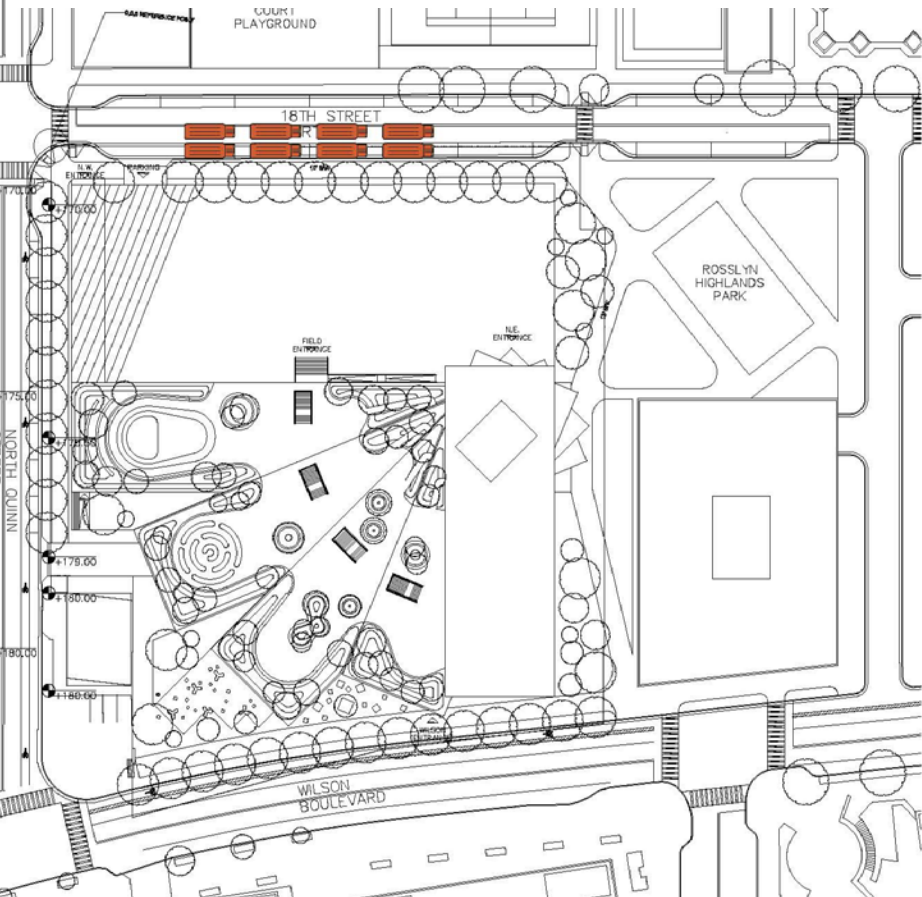


- Recreate the current environment for Stratford students at Wilson site
 - Limited access to 18th Street and parking restrictions
 - All buses staged at one time on 18th Street
 - Build a flush curb
- Options not considered feasible:
 - Use space east of mid-block crossing: Too far for students to travel
 - Buses arrive in two waves: Due to contract times, staff may not be available

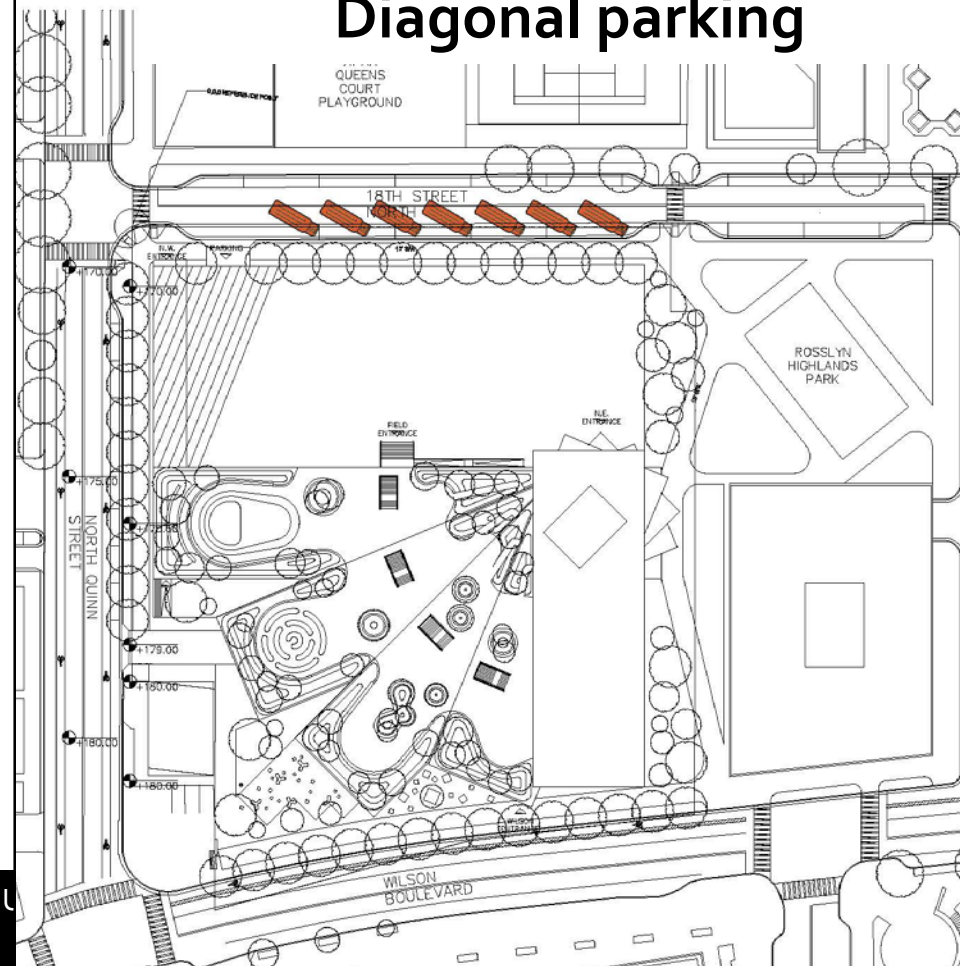
Potential bus staging configurations



Double-stacked



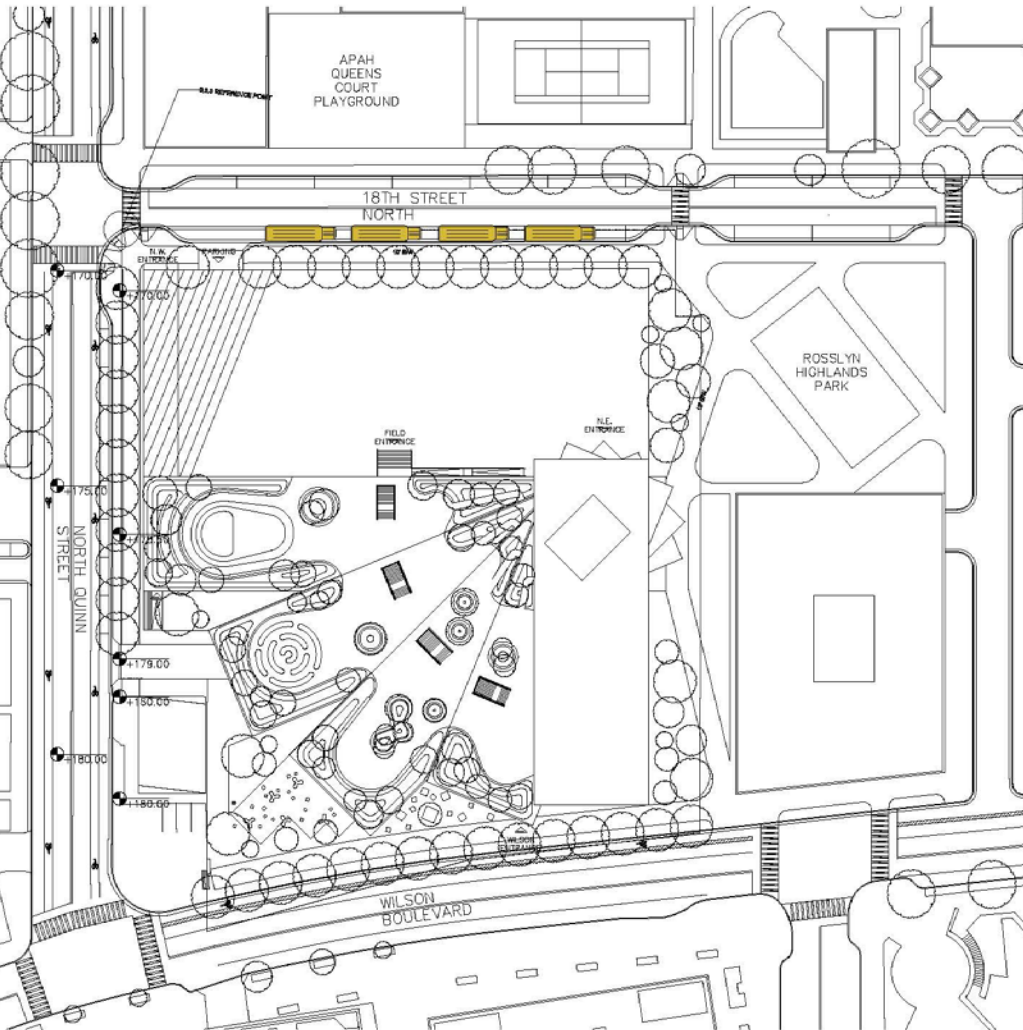
Diagonal parking





H-B WOODLAWN ARRIVAL/DISMISSAL

H-B Woodlawn Arrival



- A total of 13 buses arrive at different times, unload and depart
- Multiple buses may arrive and unload at the same time, but bus dwell time is short
- Close the street or police officer directs traffic

H-B Woodlawn Dismissal Needs



- Space for multiple buses to wait for dismissal and students to board
- Adequate space needed for students waiting for bus
- Space in front of Rosslyn-Highlands park is closer to H-B Woodlawn entrance
- Linear space need is 650' for 13 buses

Number	Bus length	Maneuvering length	Total length	Total length of all buses
13	40'	10'	50'	650' (13 buses)

Recommendation for H-B Woodlawn Dismissal



Continue limited access to the street after Stratford dismissal

- Requires two waves of buses
- Several potential configurations
- Parking restrictions

Option offering limited benefit:

- No access restrictions to the street
- Requires 3 waves of buses
- Minimal time difference for 3 waves of buses

Recommendation for H-B Woodlawn Dismissal

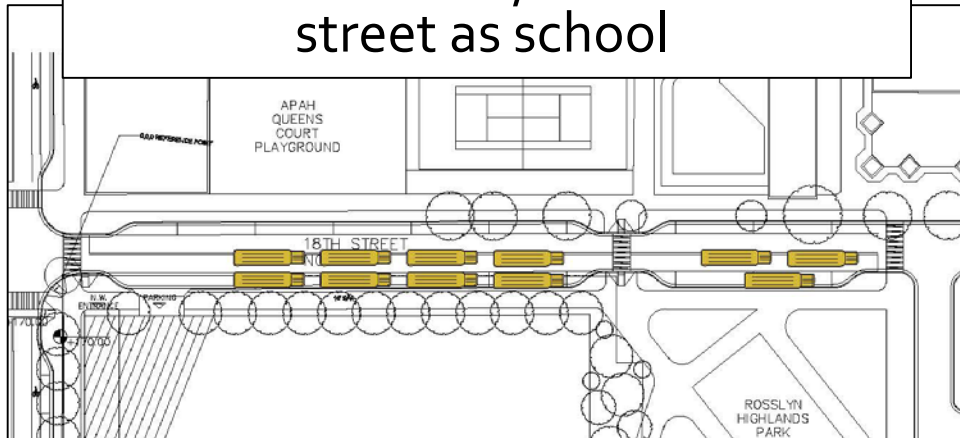


- All buses wait for dismissal on 18th Street:
 - All headed eastbound
 - Half in parking lane
 - Half in travel lane
- Limited access to 18th Street
- Parking restrictions
- Three potential staging configurations

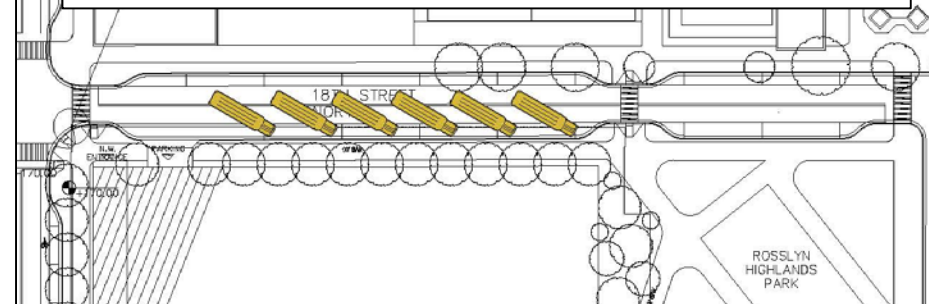
H-B Dismissal: Potential staging configurations



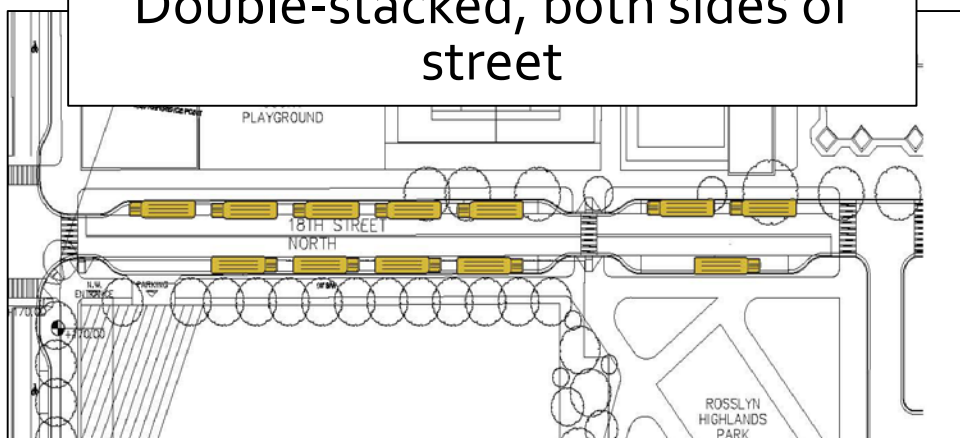
Double-stacked, same side of street as school



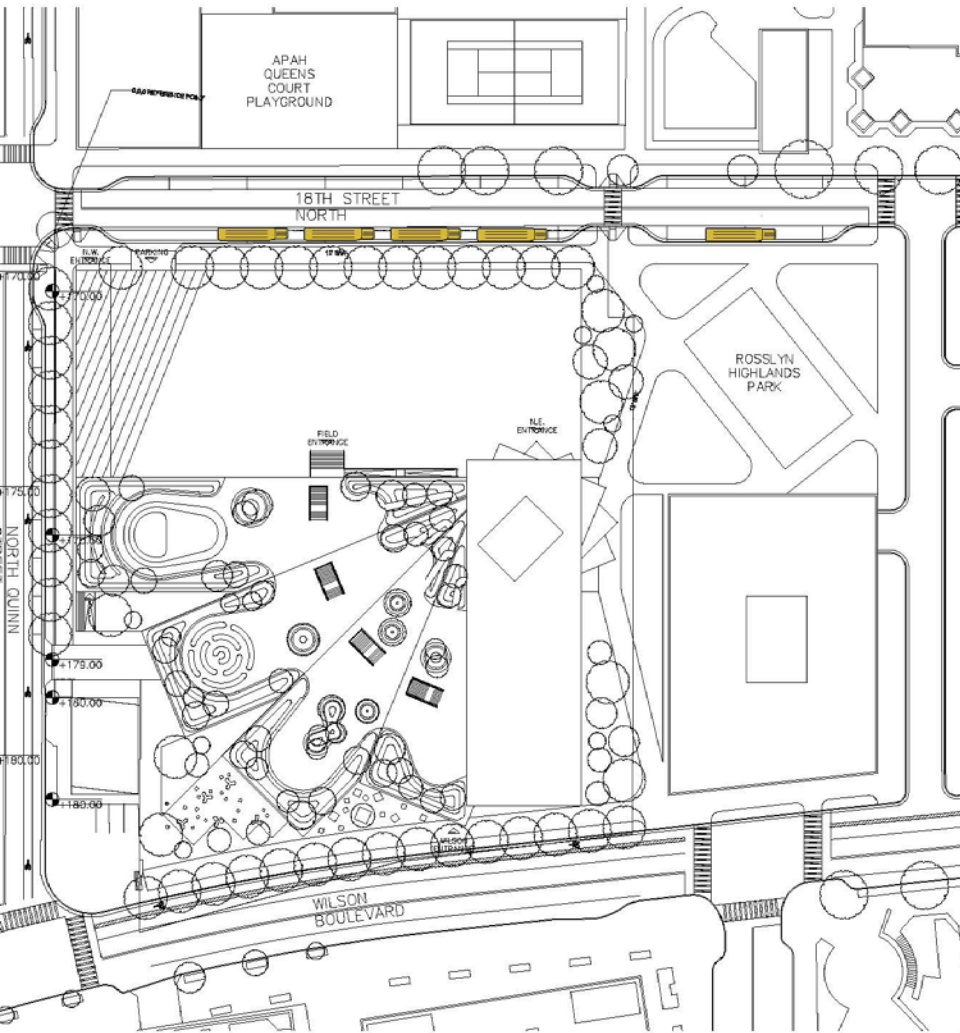
Diagonal parking, same side of street as school



Double-stacked, both sides of street



Not recommended: Open access to 18th Street



- Use existing curb space for up 5 or 6 buses at one time
- Dismiss students in three groups, depending on waiting buses
- Stage buses off-site
- Police officer directs traffic
- Parking restrictions

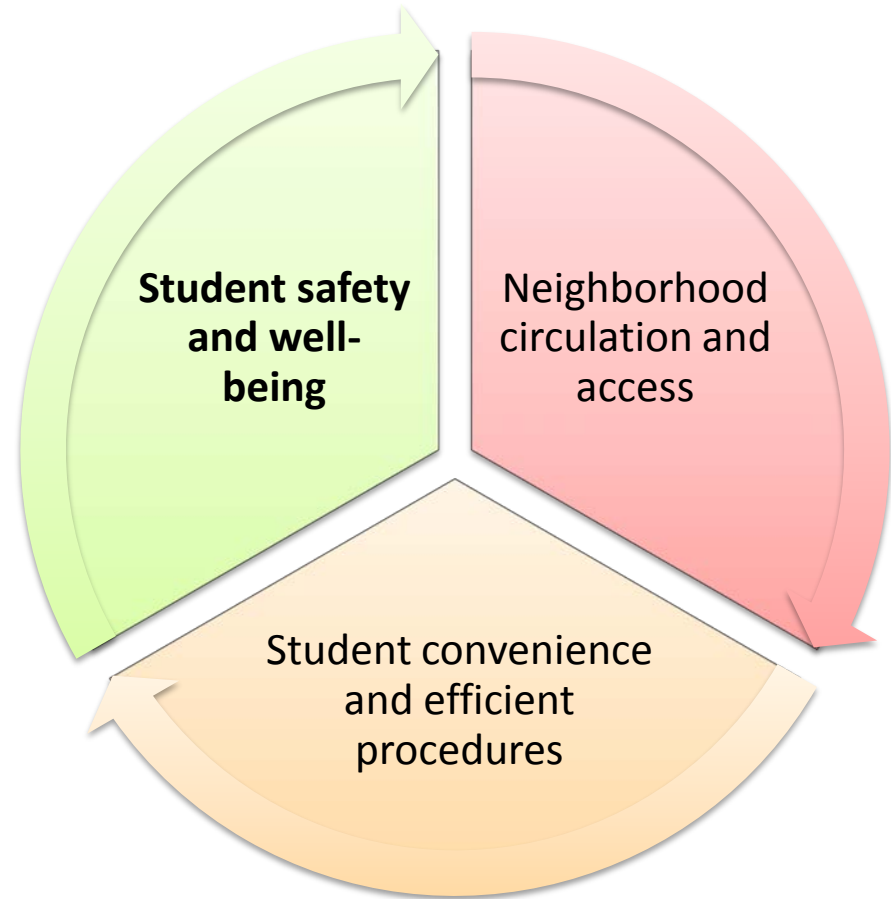


RECOMMENDATIONS BASED ON STRATFORD NEEDS AND STUDENT SAFETY

Key considerations



★ Importance of replicating special environment for Stratford students



Summary of recommendations



- During arrival:
 - Restrict access to 18th Street for Stratford only
 - Restrict parking for both schools
- During dismissal
 - Restrict access to 18th Street for both schools
 - Restrict parking for both schools



Recommendations are based on current information and site plan; plan needs to be re-evaluated and refined after school opens