



Arlington Public Schools  
**Thomas Jefferson Site Evaluation**  
***Transportation Networks***

Thomas Jefferson Working Group Meeting #6  
*November 10, 2014*

# Not alone; not unique





# INTRODUCTION

# Introduction



- Goal of our work:
  - Identify and assess multi-modal transportation network to serve school and community use of site
  - Work with VMDO to evaluate on-site circulation for schemes
- Recommend transportation network improvement options
- Establish foundation for potential future TDM recommendations

# Thomas Jefferson Working Group Charge



Transportation-related goals and *County staff-identified challenges*:

## **#5 Ensure adequate consideration is given to neighborhood impacts and parking**

- *Limiting undue delays for users of local streets that may be generated by school arrival and dismissal traffic*

## **#6 Enhance the safety of existing pedestrian walkways and bikeways**

- *Reducing concerns about travel safety and speeding around the site, to the extent feasible*
- *Separating pedestrian zones and motor vehicle zones, to the extent possible. Where motor vehicles must cross major pedestrian paths, facility design should prioritize the safety of pedestrian*

# Community Survey Results



*In your opinion, which are the THREE most critical elements related to circulation in considering the viability of locating a new elementary school on the TJ site? (89 total responses)*

- Provide safe pedestrian and bike routes to school building and community center entrances (75 responses)
- Provide adequate room for configuration of drop-off and pick-up on site (42 responses)
- Separate pedestrian and vehicle traffic on site to reduce potential conflicts (41 responses)



# ARRIVAL AND DISMISSAL

# Arrival Circulation: Walkers

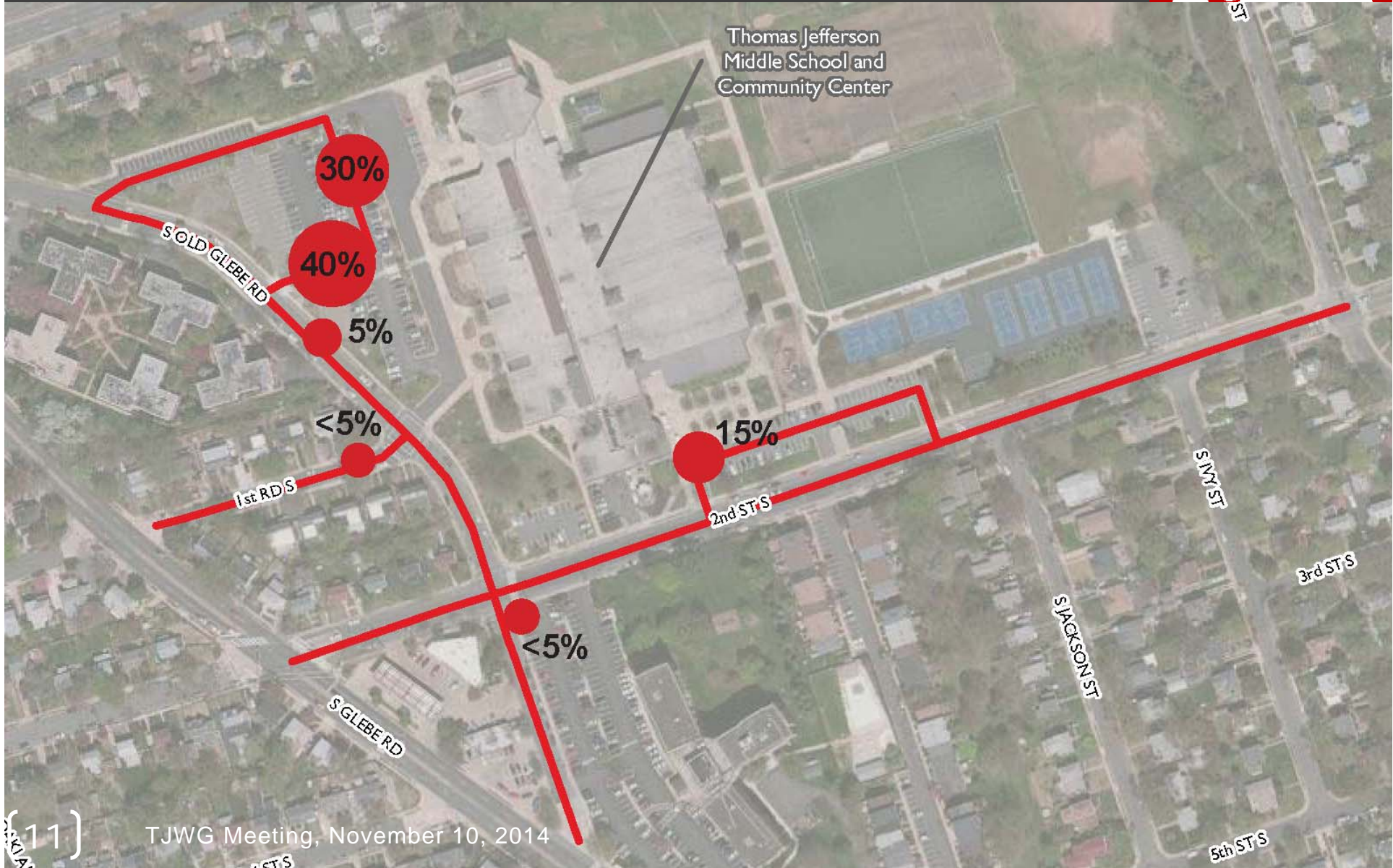




# Arrival Circulation: Bicyclists



# Arrival Circulation: Student Drop-Offs



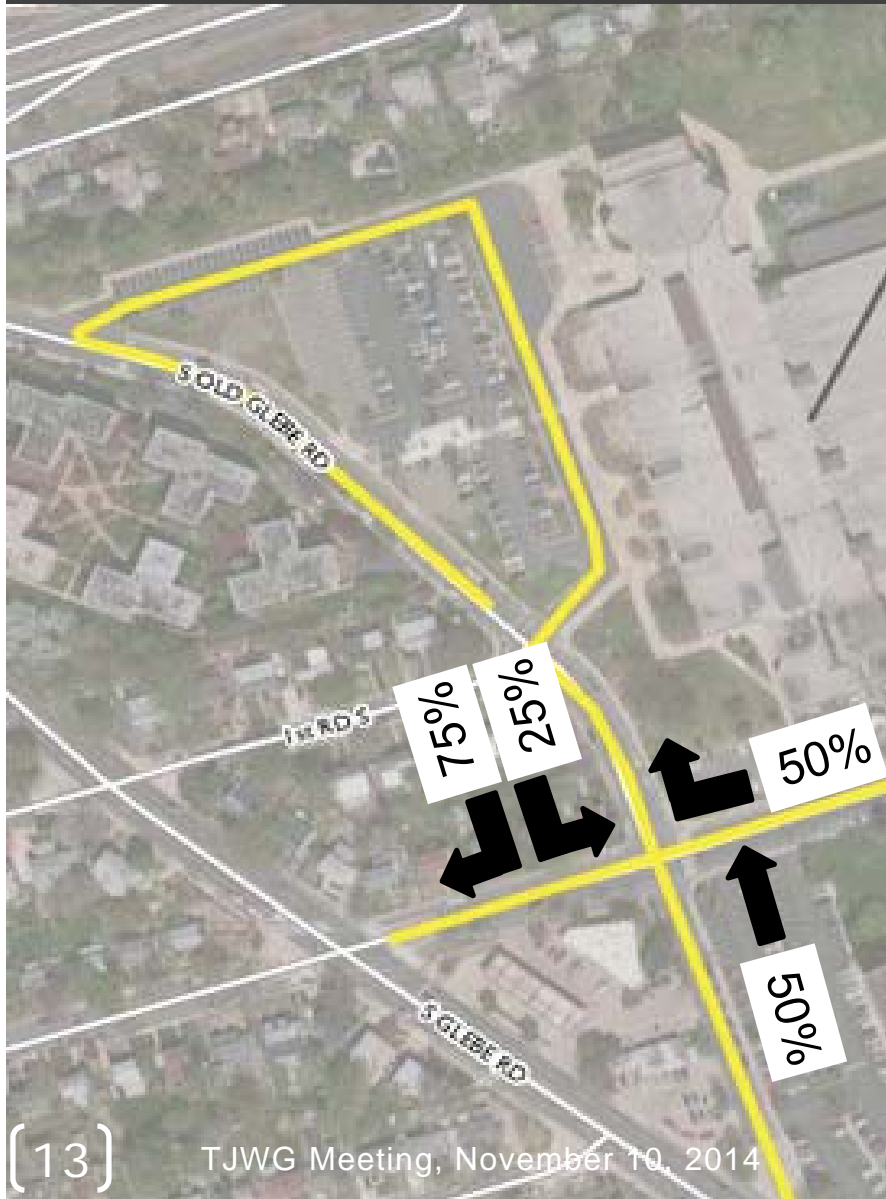


- Play video of drop-off video

# Bus Circulation



- 11 total regular buses at arrival and dismissal
- 4 late and sport buses after dismissal
- During arrival:
  - Buses arrive and depart between continuously 7:15 and 7:35
  - See graphic for approach/departure routes
- During dismissal:
  - Buses arrive before bell and all leave around 2:35



# Buses along S. Old Glebe Rd



Photo credit: Ritch Viola, Arlington DE



- Play video of buses on S.Old Glebe Rd.

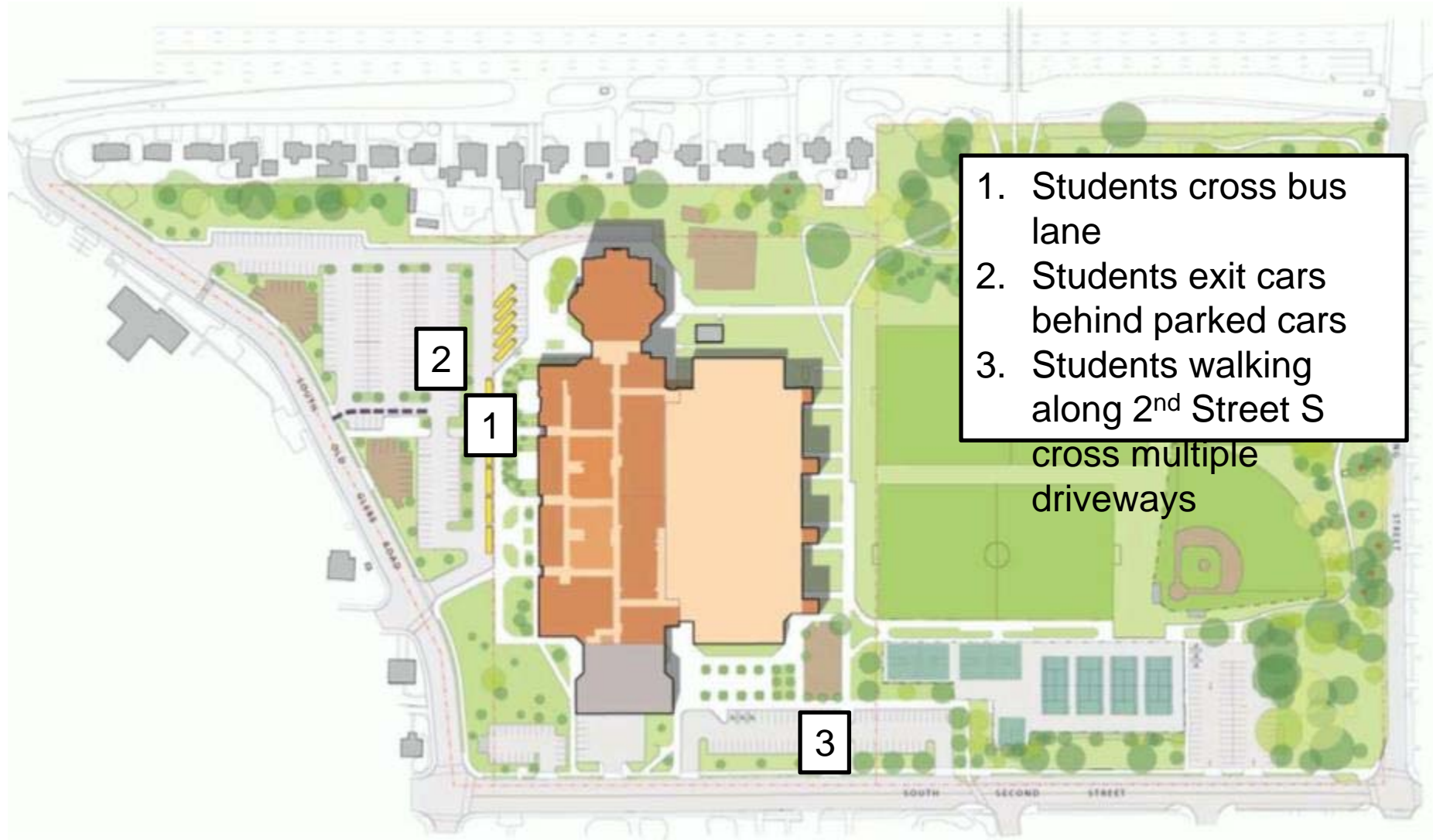
# Pedestrian safety and buses







# Potential multi-modal conflicts on-site (existing)



# Crossing guard at 2<sup>nd</sup> & Old Glebe



- At the intersection:  
7:20AM to 7:55AM  
and 2:20PM to  
2:50PM
- Stops all directions  
of vehicle traffic  
when students  
cross
- Students pay  
attention to crossing  
guards instructions



# Cars back-up on 2<sup>nd</sup> St S and S. Old Glebe Rd



Photo credit: VMDO Architect

- Back-up begins at around 7:40AM, peaks between 7:45AM and 7:55AM, and ends by 8:00AM
- Queue is over 20 vehicles



# OTHER CAMPUS USES

# Other TJ Campus Destinations



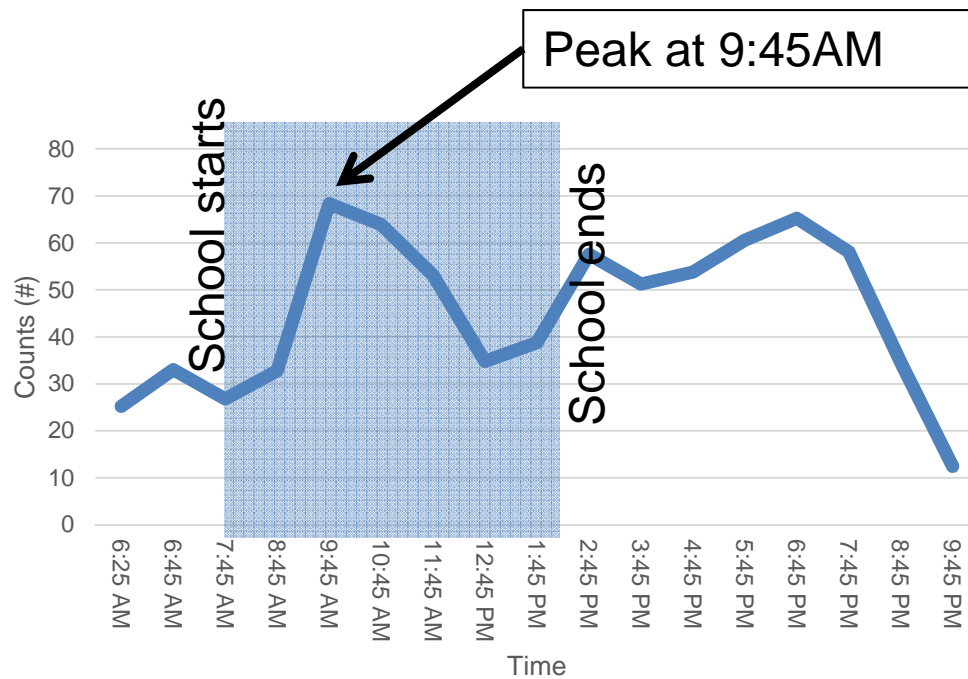
- Community center
- Fields and courts
- Theatre



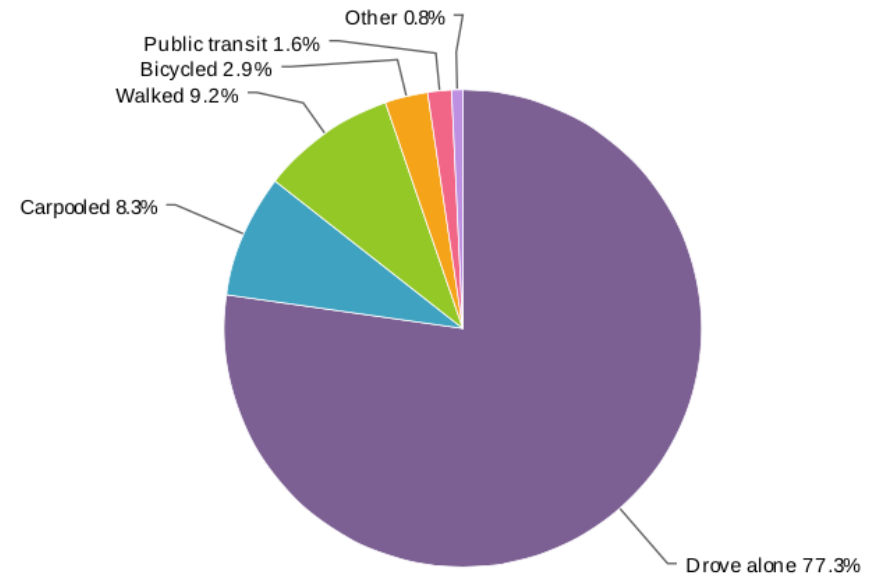
# Community Center



## Weekday Community Center Activity



## How did you get to the Community Center?



# Fields/Courts



	Fall	Winter	Spring	Summer
Synthetic Field	<u>Youth soccer</u> Mon-Thu (5-8 p.m.) Fri (5-6:30 p.m.)  <u>Adult drop in</u> Mon-Fri (8-10 p.m.)	<u>Adult drop in</u> Mon-Fri Sat afternoon Sun	<u>Youth soccer</u> Mon-Thu (5-8 p.m.) Fri (5-6:30 p.m.)  <u>Adult drop in</u> Mon-Fri (8-10 p.m.)	<u>Adult drop in</u> Mon-Fri Sat afternoon Sun
Upper Bermuda Grass Field	<u>Youth soccer</u> Mon-Fri (5-9:30 p.m.) Sat-Sun (reserved for games)	Closed	<u>Youth soccer</u> Mon-Fri (5-9:30 p.m.) Sat-Sun (reserved for games)	Closed
Diamond Field	<u>Youth baseball</u> Mon-Fri (5:30 to 7:30) Sat (9:00 a.m. to 8 p.m.) Sun (12--8 p.m.)	Closed	<u>Youth baseball</u> Mon-Fri (5:30 to 7:30) Sat (9:00 a.m. to 8 p.m.) Sun (12--8 p.m.)	<u>Youth baseball</u> Mon-Fri (5:30– 8:30 p.m.)
Tennis Courts	<u>Tennis classes</u> Tue, Thu (5:30-10 p.m.) Sun (12-8 p.m.)		<u>Tennis classes</u> Tue, Thu (5:30-10 p.m.) Sun (12-8 p.m.)	<u>Tennis classes</u> Mon, Wed (5:30-10 p.m.) Sun (afternoons)

# Theatre



Activity	Days and Times	Attendance*
<b>Theater Performances</b>	Friday evenings, Saturday and Sunday	110 to 618 (avg.=314)
<b>Theater Rehearsals</b>	Monday-Friday, 4:30- 10:30 p.m.	20 to 50
<b>Church Services</b>	Sunday, 7:30 a.m. - 12:30 p.m.	700

**\*Based on 2013 data. Theater has 720 seats total.**





# HOW MIGHT THE TRANSPORTATION SYSTEM OPERATE IF A NEW ELEMENTARY SCHOOL IS BUILT?

# Many questions...



- How do we make the transportation system work effectively for all travel modes?
- How many vehicles can we expect?
- Do we know how many students are likely to walk or bike?
- How do we design the campus to satisfy traffic and circulation needs?



# TRIP GENERATION AND MODE SPLIT

# How many vehicles can we expect and when?

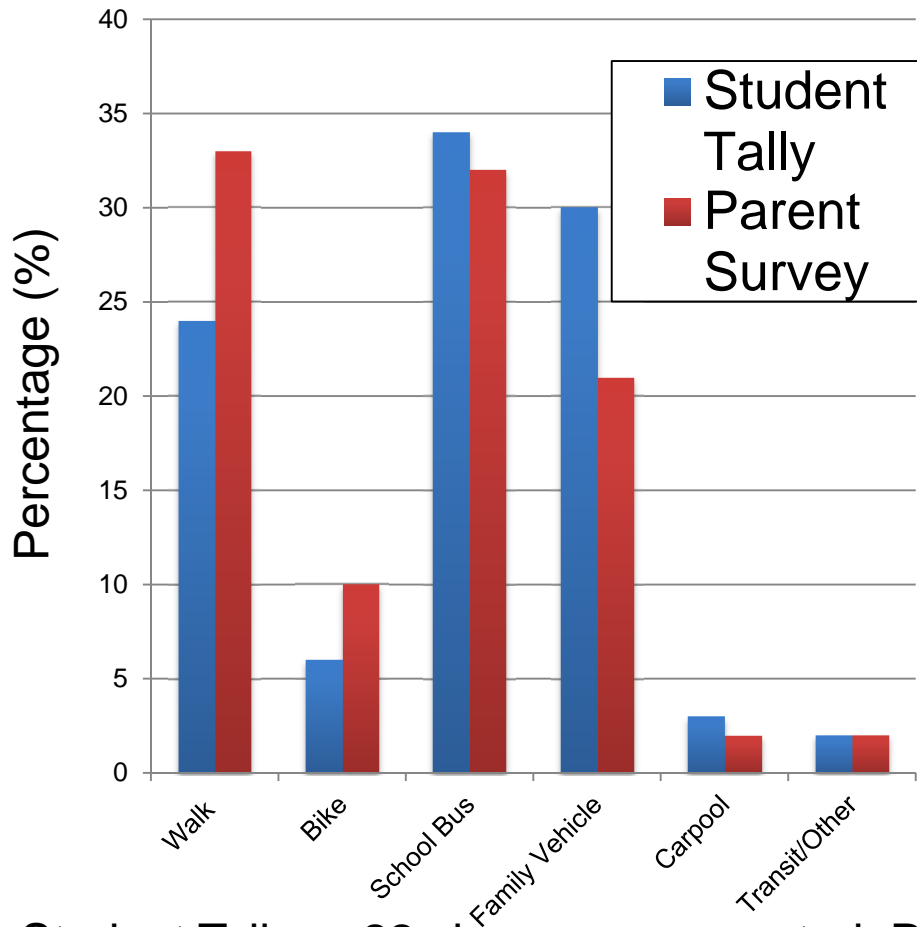


- Type of school likely to affect school-related vehicular demand
- School hours affect when vehicular traffic is present
- Current work used to predict future vehicular traffic
- Location of school and drop-off/pick-up loop will impact location of vehicular traffic

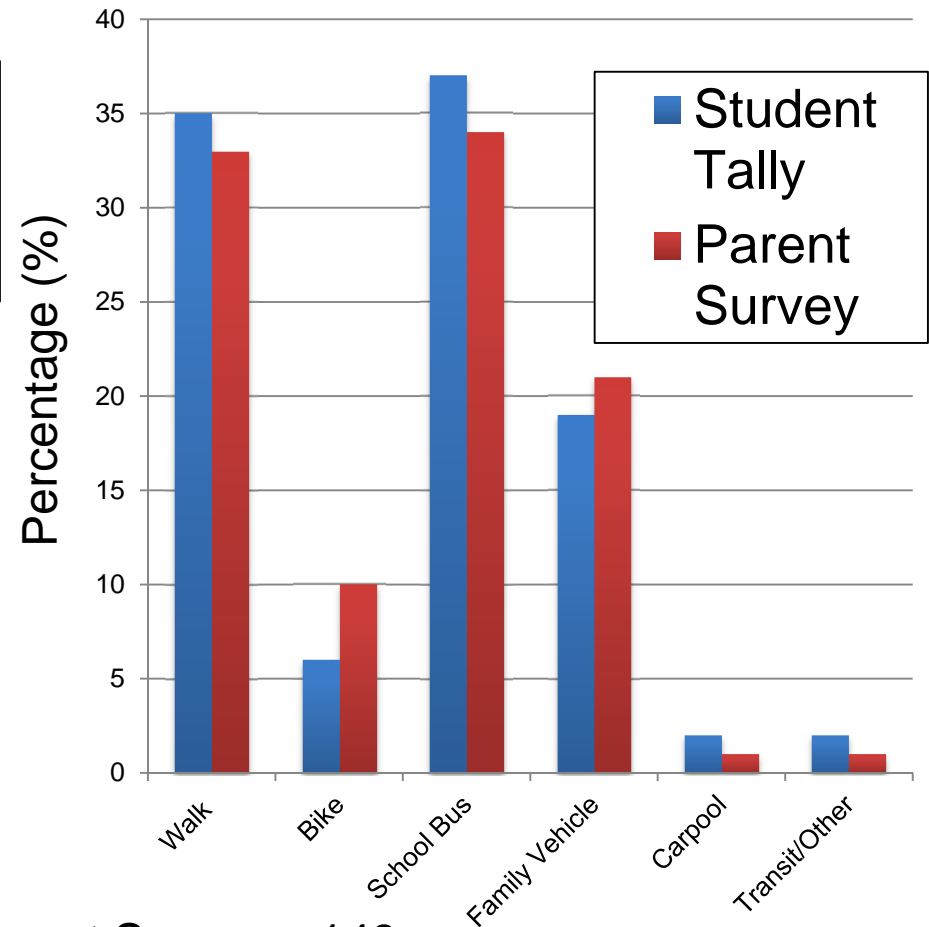
# School Travel Modes - Students



## To School

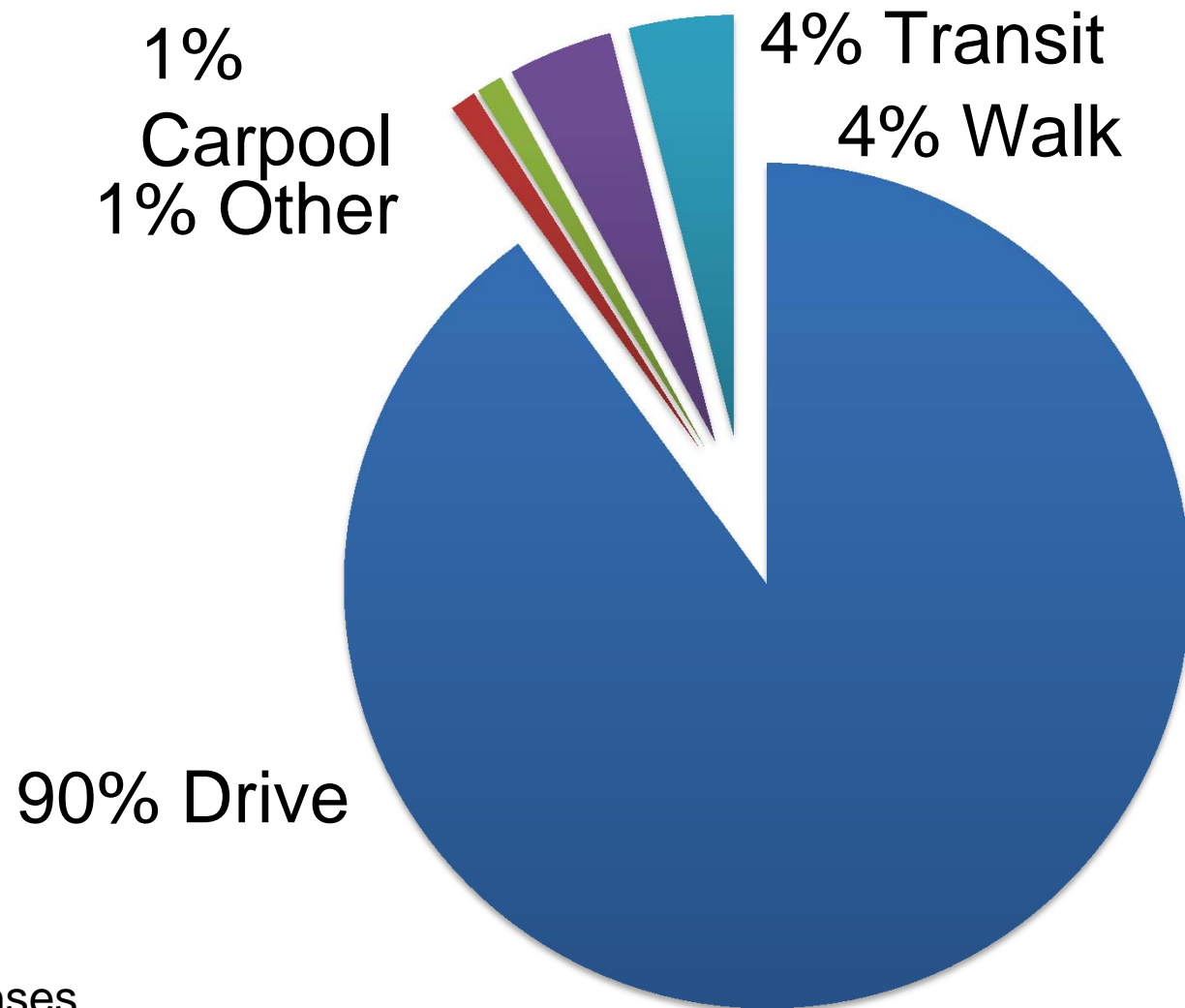


## From School



Student Tally = 22 classrooms reported, Parent Survey = 149 responses

# School Travel Modes - Staff



80 responses

# Vehicle Trip Generation Assumptions for Middle School



- Based on driveway counts and manual counts collected in June 2014
- At-capacity & Expanded Future Scenarios:
  - % students & % staff driving to school during peak hour matches existing
  - # of buses increase proportionately
  - Staff trip generation assumes slight decrease in staff-to-student ratio to match existing larger middle schools (over 900 students) in the County

# Existing Middle School (857 students)



Vehicle Trips to/from the site  
Middle School Peak Hours

	AM Trips (7:15-8:15 AM)		PM Trips (2:30-3:30 PM)	
	To Site	From Site	To Site	From Site
<b>Students (Vehicle Pick Up/Drop Off)</b>	197	197	64	64
<b>Staff</b>	42	0	0	63
<b>Buses</b>	11	11	11	11
<b>TOTAL</b>	<b>250</b>	<b>208</b>	<b>75</b>	<b>138</b>



# Vehicle Trip Generation Assumptions for Elementary School



- Student vehicle trips based on parent survey travel mode information from County elementary schools in similar context – assumed 75<sup>th</sup> percentile
- Staff vehicle trips based on staff survey travel mode information from schools with 9:00 AM start times
- Bus trips based on bus rates for County elementary schools in similar context – assumed 75<sup>th</sup> percentile

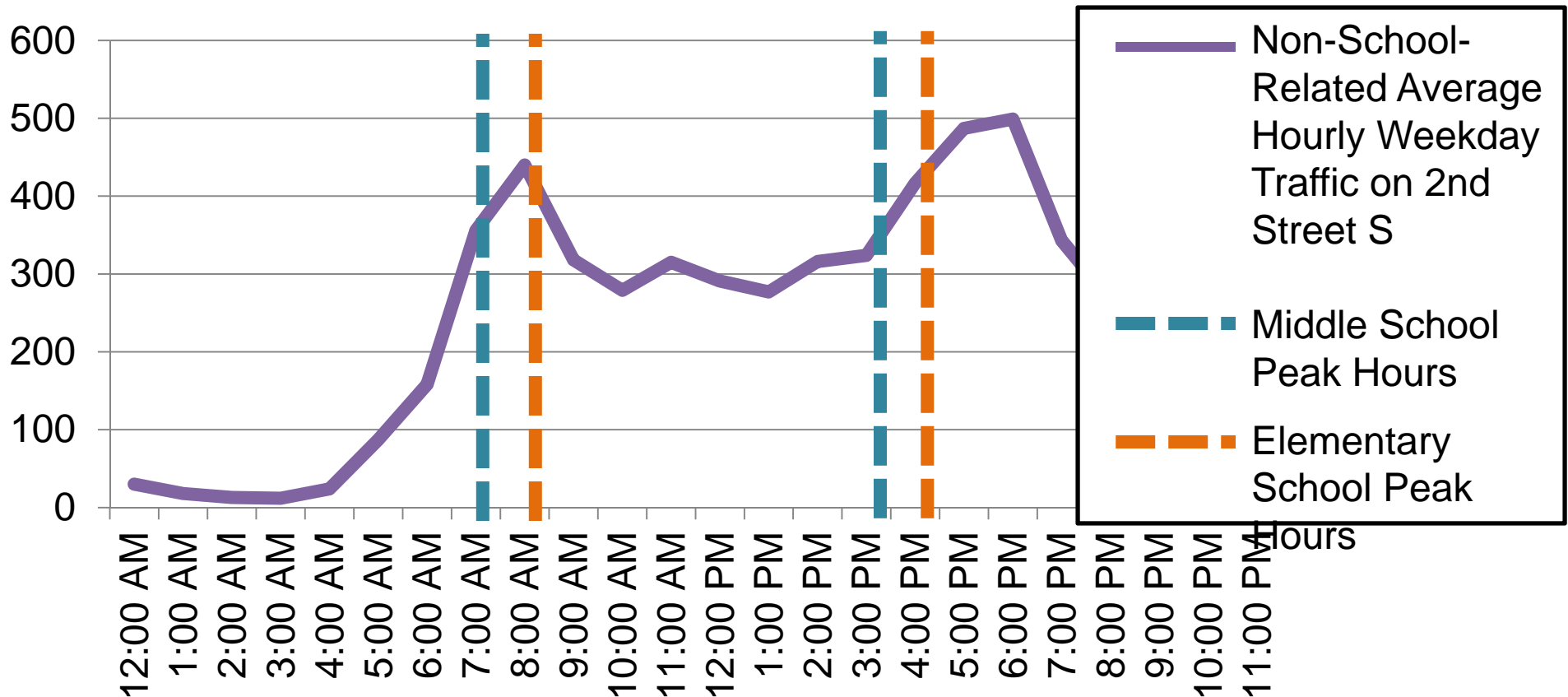
# Neighborhood Elementary School (725 students)



Vehicle Trips to/from the site  
Elementary School Peak Hours

	AM Trips (8:15-9:15 AM)		PM Trips (3:30-4:30 PM)	
	To Site	From Site	To Site	From Site
<b>Students (Vehicle Pick Up/Drop Off)</b>	225	225	203	203
<b>Staff</b>	32	0	0	23
<b>Buses</b>	8	8	8	8
<b>TOTAL</b>	<b>265</b>	<b>233</b>	<b>211</b>	<b>234</b>

# Non-school related traffic and school peak hours

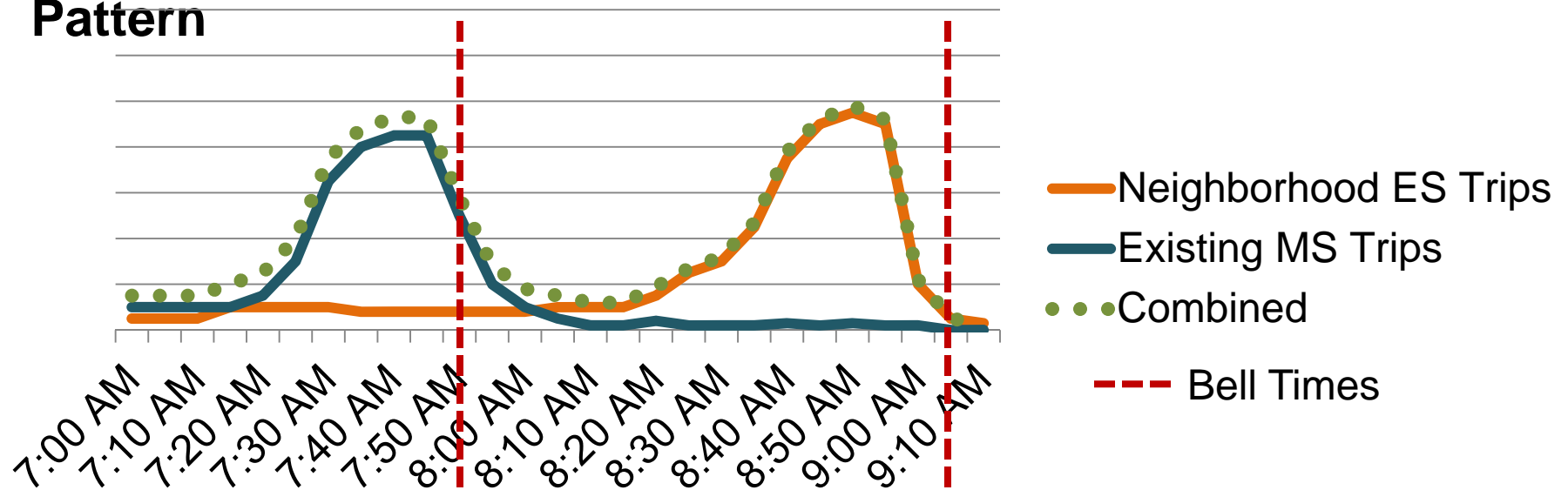


Vehicle Trip Generation for the Middle School and Elementary School is higher during the arrival and arrival overlaps with typical morning commuter travel

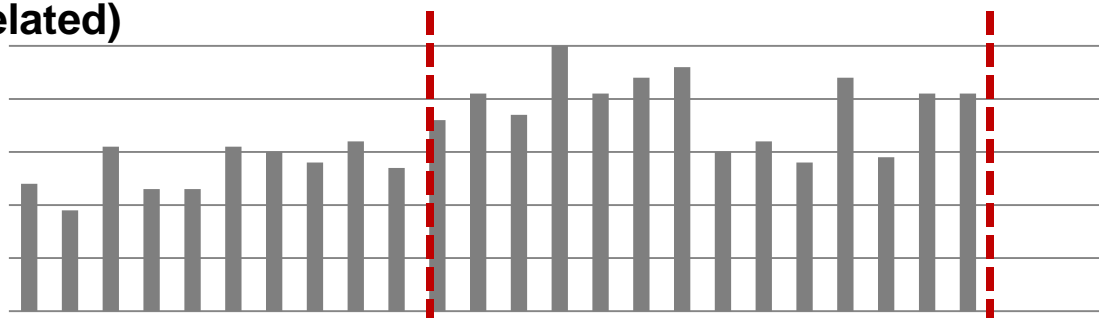
# How school hours affect when vehicular traffic is present (existing middle school)



## Existing Middle School & Proposed Elementary School Traffic Pattern



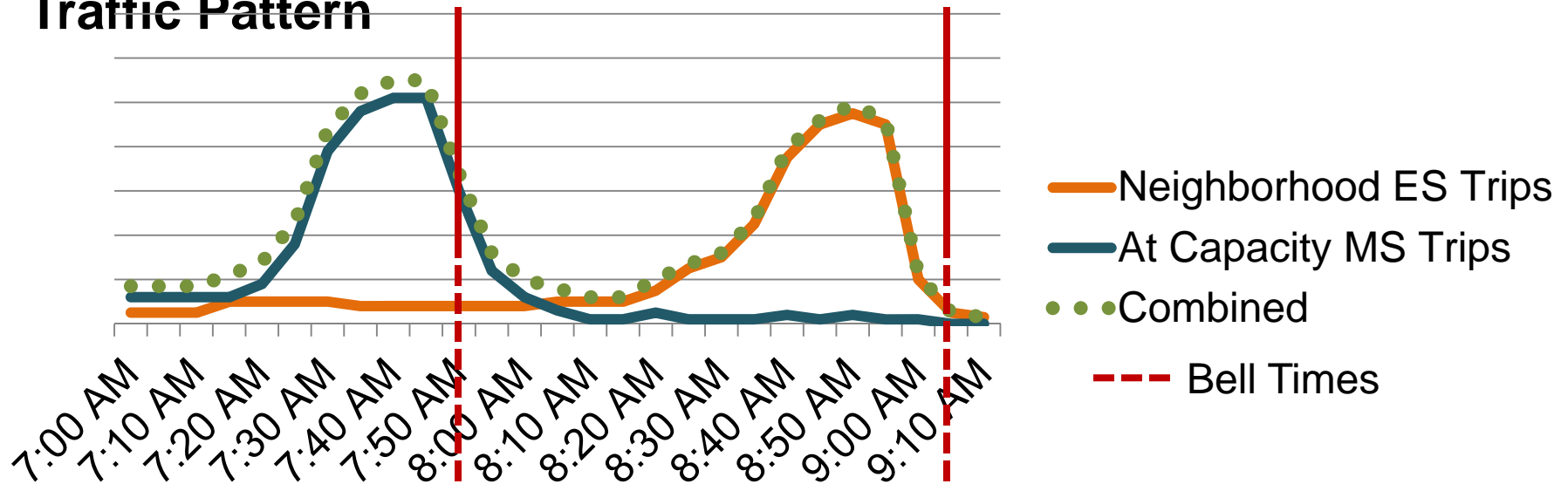
## Existing 2nd St Background Traffic Pattern (Non-School-Related)



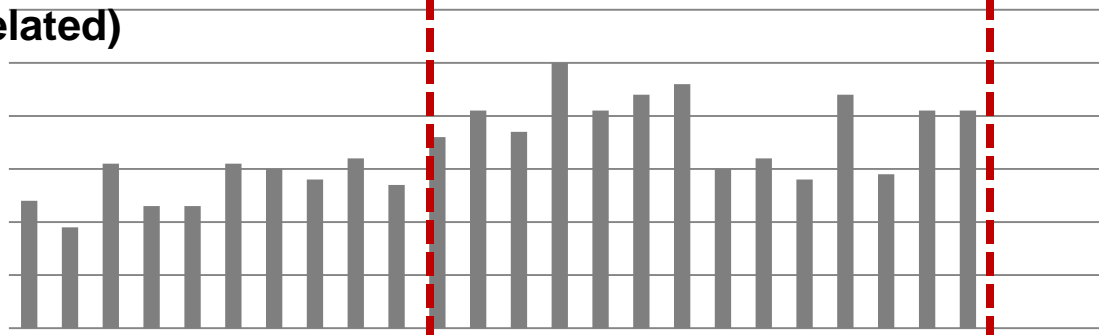
# How school hours affect when vehicular traffic is present (at-capacity middle school)



## At Capacity Middle School & Proposed Elementary School Traffic Pattern



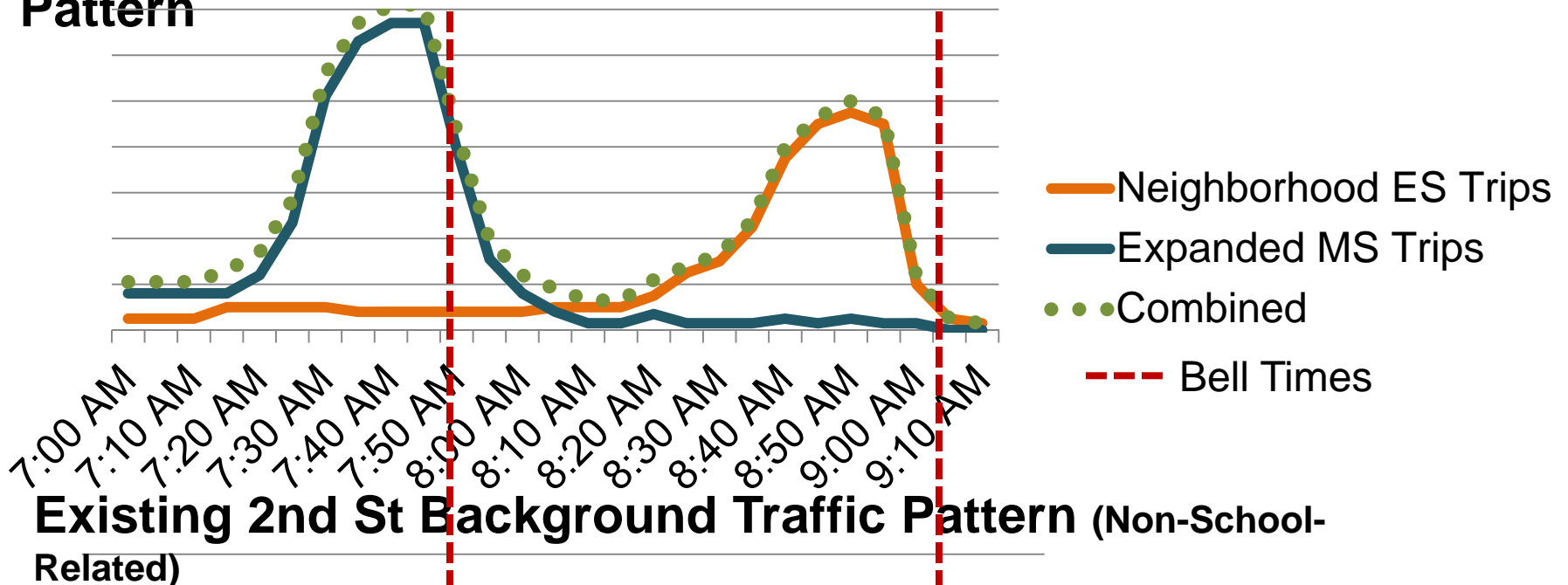
## Existing 2nd St Background Traffic Pattern (Non-School-Related)



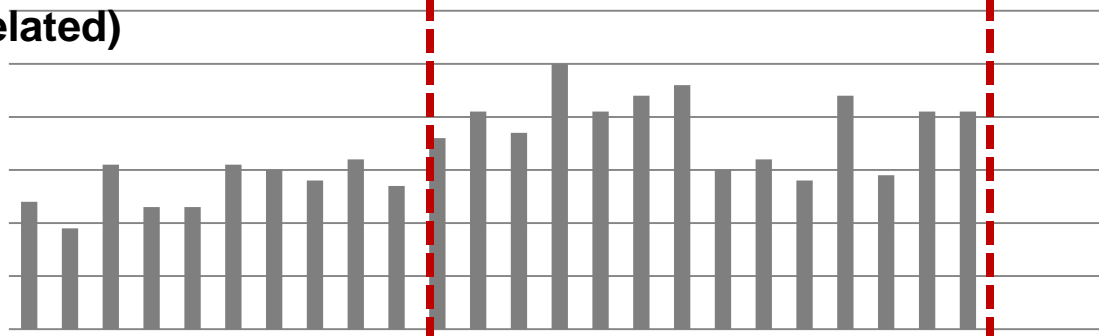
# How school hours affect when vehicular traffic is present (expanded middle school)



## Expanded Middle School & Proposed Elementary School Traffic Pattern



## Existing 2nd St Background Traffic Pattern (Non-School-Related)



# Neighborhood versus Choice Elementary School: Mode Splits



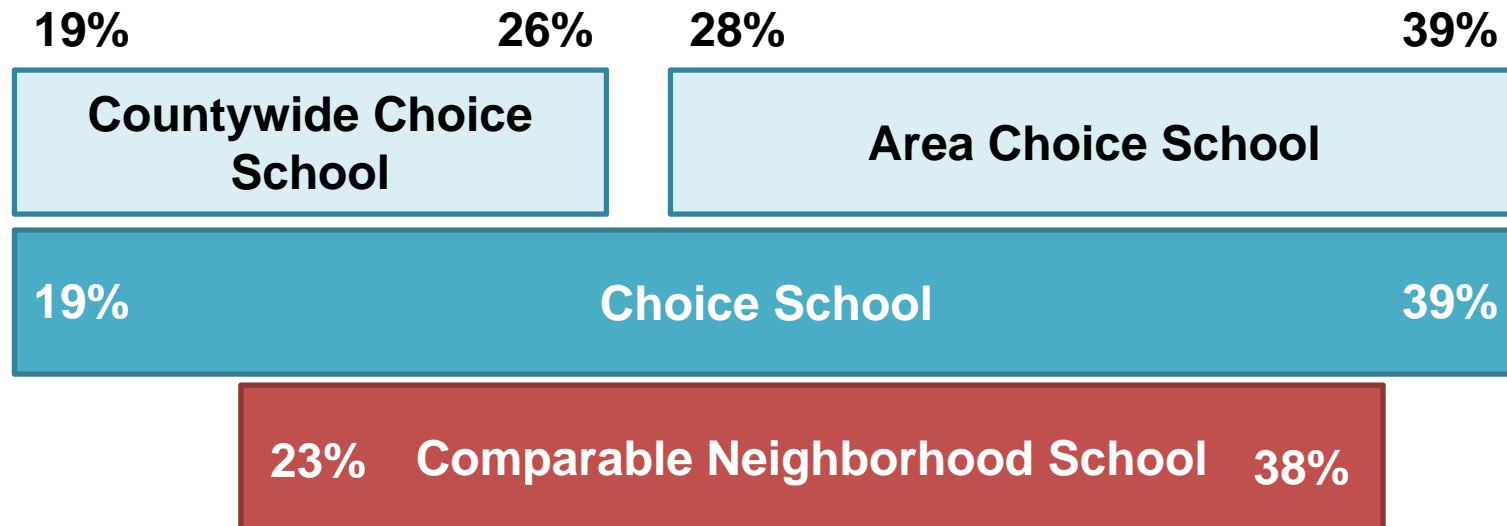
Compared to Neighborhood Elementary School...

- Countywide
  - Fewer walkers
  - Many more bus riders
  - Fewer car riders
- Area
  - Fewer walkers
  - More bus riders
  - Similar car riders

# Neighborhood versus Choice Elementary School: Mode Splits



## Comparison of student car riders







# TRANSPORTATION NETWORK

# Quick re-cap

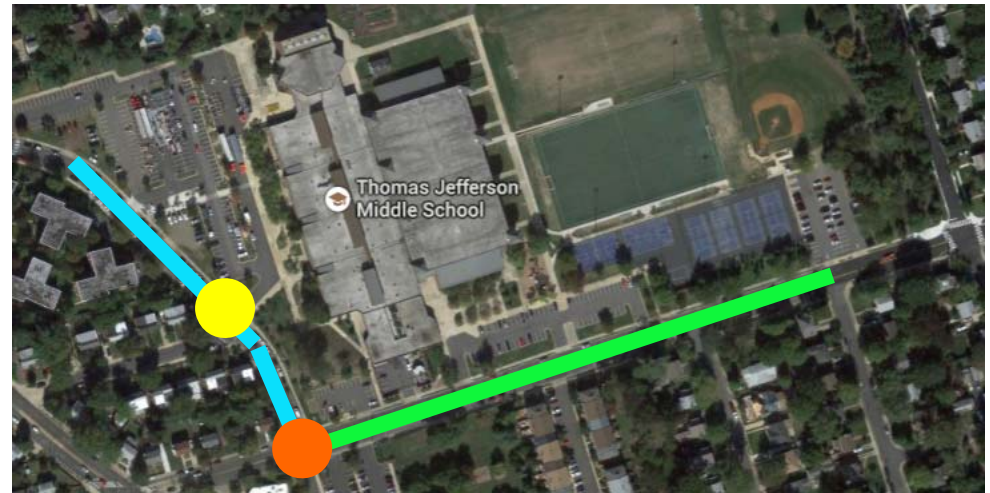


- Overall concerns
  - Safety and access
  - Managing multi-modal conflicts
  - Separation of modes
  - Amount of vehicular traffic
- What's working well?
  - Pedestrian and bicyclist bridge over Rt. 50 and pathway to campus
  - Pedestrian and bicyclist travel along 2<sup>nd</sup> Street S; most travel on north side either using sidewalk or bike lane
  - Placement of buses at school entrance and attention to safety by bus operators

# Location-specific concerns:



1. Along 2<sup>nd</sup> Street
2. Along S. Old Glebe Rd
3. At the intersection of 1<sup>st</sup> St & S. Old Glebe Rd
4. At the intersection of 2<sup>nd</sup> St & S. Old Glebe Rd



The following slides identify observations (what's working/what's not) and potential solutions for each location...

# 2<sup>nd</sup> Street S



## Observations (what's working and what's not)

(-) Difficult for pedestrians to cross the street due to speed at which motorists are traveling

(+) Most students walk along north side of 2<sup>nd</sup> street

(+) Bike lane provides space for commuter bicyclists and students (some students bike on sidewalk)

(+) Metrobus stop locations are convenient to school within reasonable walking distance

## Potential solutions

- 1) Reduce pedestrian crossing distance, make pedestrian crossing more visible, and reduce overall motor vehicle speeds with curb extensions or median island



# S. Old Glebe Road



## Observations (what's working and what's not)

## Potential solutions

(-) Buses have difficulty passing each other (buses leaving school have to wait while buses turn into driveway)

- 1) Implement additional parking restrictions
- 2) Improve street design
- 3) Reduce number of buses on S. Old Glebe Road (route buses around middle school/buses drop-off/pick-up on 2<sup>nd</sup> Street)\*

(-) Cars back-up on S. Old Glebe Road in both directions during arrival

(See discussions on intersections of S. Old Glebe Road & 2<sup>nd</sup> Street and S. Old Glebe Road & 1<sup>st</sup> Street)

(+) Slow speeds

*\*These potential solutions will be discussed later in the presentation*

# 2<sup>nd</sup> Street S & S. Old Glebe Road



## Observations (what's working and what's not)

## Potential solutions

(-) Difficult pedestrian crossing when crossing guard not present due to motorists behavior and line of sight

- 1) Convert from 2-way stop to 4-way stop
- 2) Reduce crossing distance to improve sight lines and reduce vehicle speeds with curb extensions or median island, high visibility crosswalks and signage\*

(-) Congested intersection when crossing guard stops all cars for pedestrians to cross); back-ups on southbound S. Old Glebe Road; difficult for motorists to see and judge a gap in traffic

- 1) Reduce number of buses turning at the intersection through re-routing\*
- 2) Provide separate ES and MS drop-off loops\*
- 3) Shift primary pedestrian crossing to mid-block east on 2<sup>nd</sup> Street S\*
- 4) Add second SB lane on S. Old Glebe Road at intersection
- 5) Adjust timings at signal at 2<sup>nd</sup> Street S & Glebe

(+) Pedestrian crossing managed by crossing guard. Students follow crossing guard direction.

*\*These potential solutions will be discussed later in the presentation*

# 1<sup>st</sup> Road S. & S. Old Glebe Road



## Observations (what's working and what's not)

(-) Backed-up cars, current street design and parked cars limit sight lines for motorists and pedestrians

(-) Parents coming from 1<sup>st</sup> Road S. drop students at corner, leaving them to cross through the backed up traffic

## Potential solutions

(1) Solutions for congestion and back-ups would reduce cars blocking the intersection



# Discussion of potential solutions



- Improved pedestrian crossings
- Bus drop-off/pick-up options
- Parent drop-off/pick-up options and operations
- Operation of the intersection of 2<sup>nd</sup> Street S. and S. Old Glebe Road



# Improved pedestrian crossings



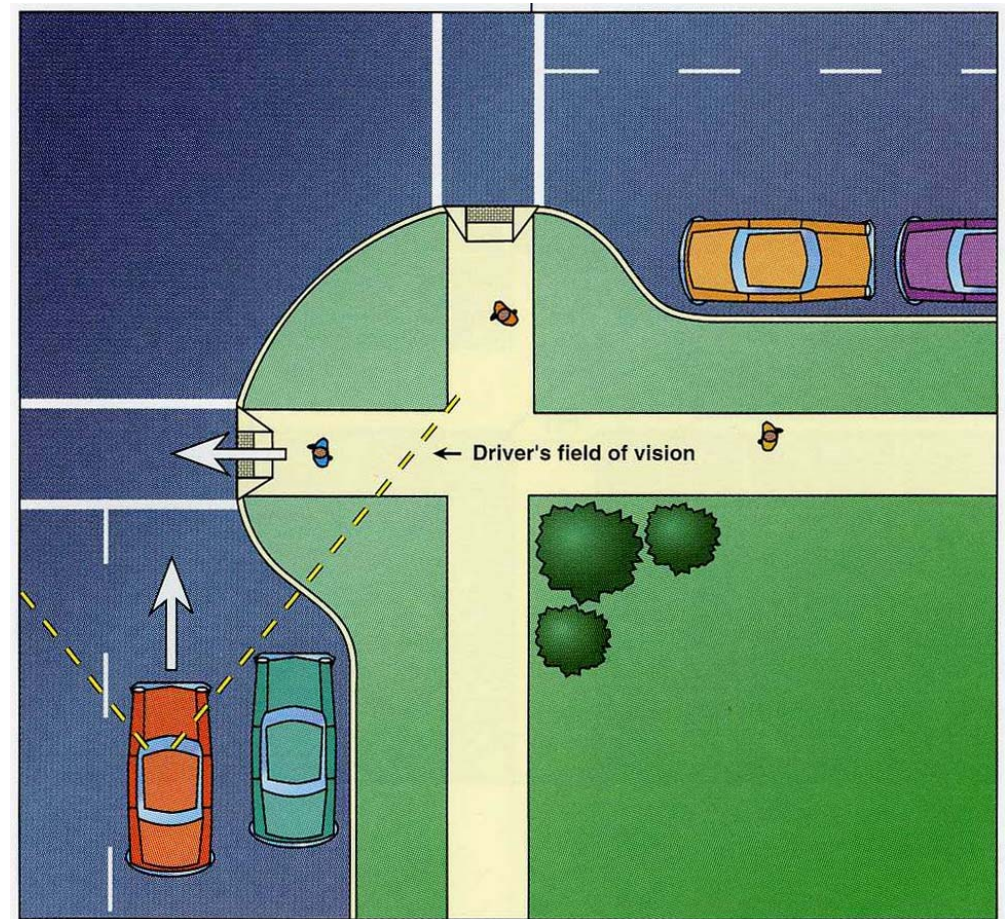
- Curb extensions
- Median island
- High visibility crosswalks
- Raised crosswalks
- Improved signage (consider Rectangular Rapid Flash Beacon)



# Curb extensions



- Reduce crossing distance
- Improve sight distance and sight lines
- Prevent encroachment by parked cars
- Create space for curb ramps and landings



# Example crossings



Plyers Mill Road, Kensington,  
MD



# Potential crosswalk treatment



# Bus drop-off/pick-up options



- Loop located west of middle school
- Bus loop around school
- Buses drop-off/pick on 2<sup>nd</sup> Street S.
- Bus pull-off parallel to 2<sup>nd</sup> Street S.

Advantage of a combined campus:  
schools will have alternate bell times  
so bus loop can be shared.

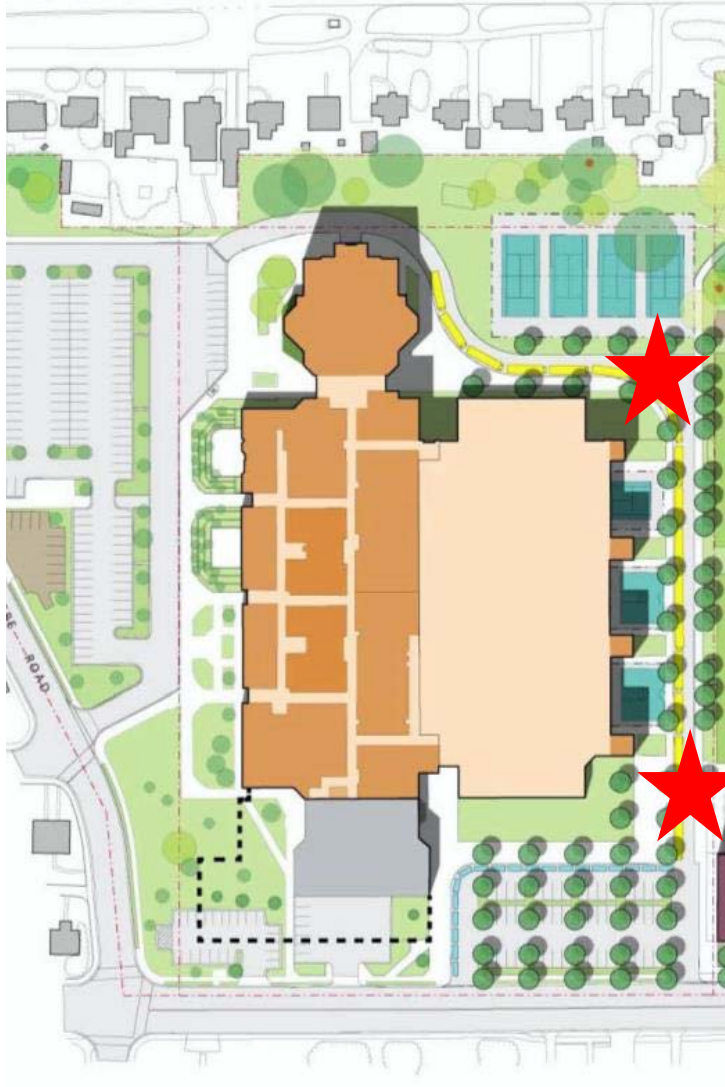
# Loop located west of middle school



- Several options to re-configure within existing parking lot area
- All buses travel through 2<sup>nd</sup> Street S. and S. Old Glebe Rd intersection
- May reduce points of conflict with pedestrians



# Bus loop around school



- Gates limit use for buses and emergency vehicles
- Loop only used during arrival and dismissal (not late or sport buses)
- Requires improved pedestrian crossings at key locations
- Reduces number of buses turning at 2<sup>nd</sup> & Old Glebe



# Bus drop-off/pick-up on 2<sup>nd</sup> Street



## – Options:

- On-street: Restrict parking during arrival/dismissal
- Separate bus pull-off on north side between roadway and sidewalk

## – Implications:

- Increases the number of people using sidewalk during arrival and dismissal
- Potential conflict with community center users
- May require all buses travel from east to west along 2<sup>nd</sup> Street S
- Removes buses from traffic along S. Old Glebe Road
- Reduces number of buses turning at the intersection of 2<sup>nd</sup> & Old Glebe



# Bus drop-off/pick-up on 2<sup>nd</sup> Street

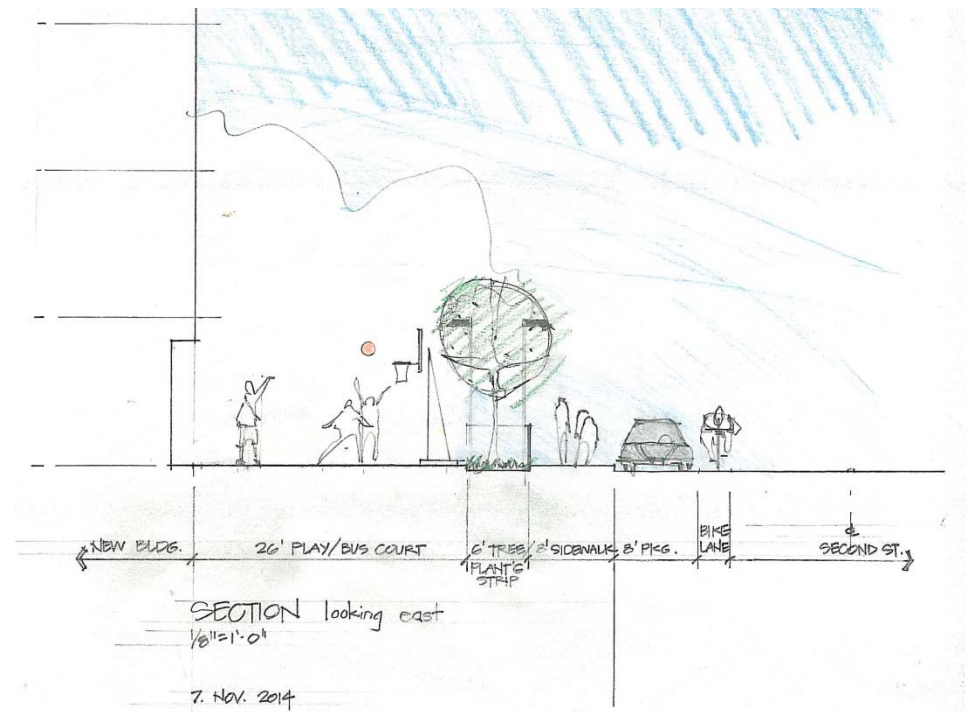
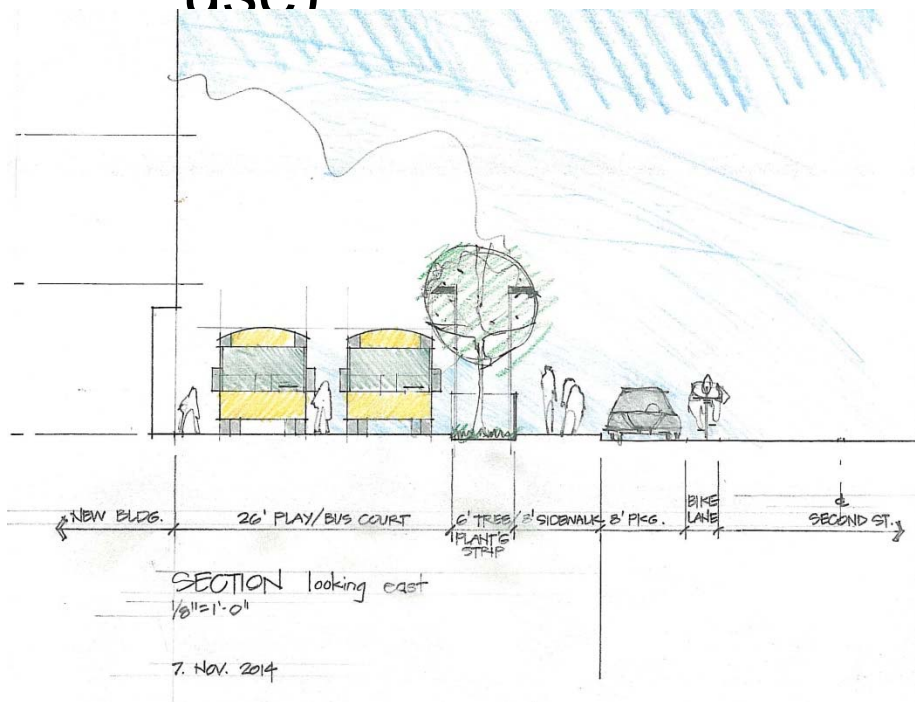


- Introduces conflicts with bike lane (widened sidewalk/shared use path recommended)
- Middle school buses would occupy most of curb space along 2<sup>nd</sup> Street S.
- Impacts to on-street parking during arrival/dismissal
- Could reduce on-site impervious surface

# Bus pull-off parallel to 2<sup>nd</sup> Street



- Removes some public space from pedestrian and bicycle use during arrival and dismissal (bus lane would revert to public space when not in use)



# Parent drop-off/pick-up options



Location of school and drop-off/pick-up loop will impact location of vehicular traffic

There are several options for drop-off/pick-up locations of both schools:

- Both ES/MS on S. Old Glebe Road
- ES via S. Old Glebe/MS via 2<sup>nd</sup> Street S.
- MS via S. Old Glebe/ES via 2<sup>nd</sup> Street S.
- Split MS drop-off in ES drop-off

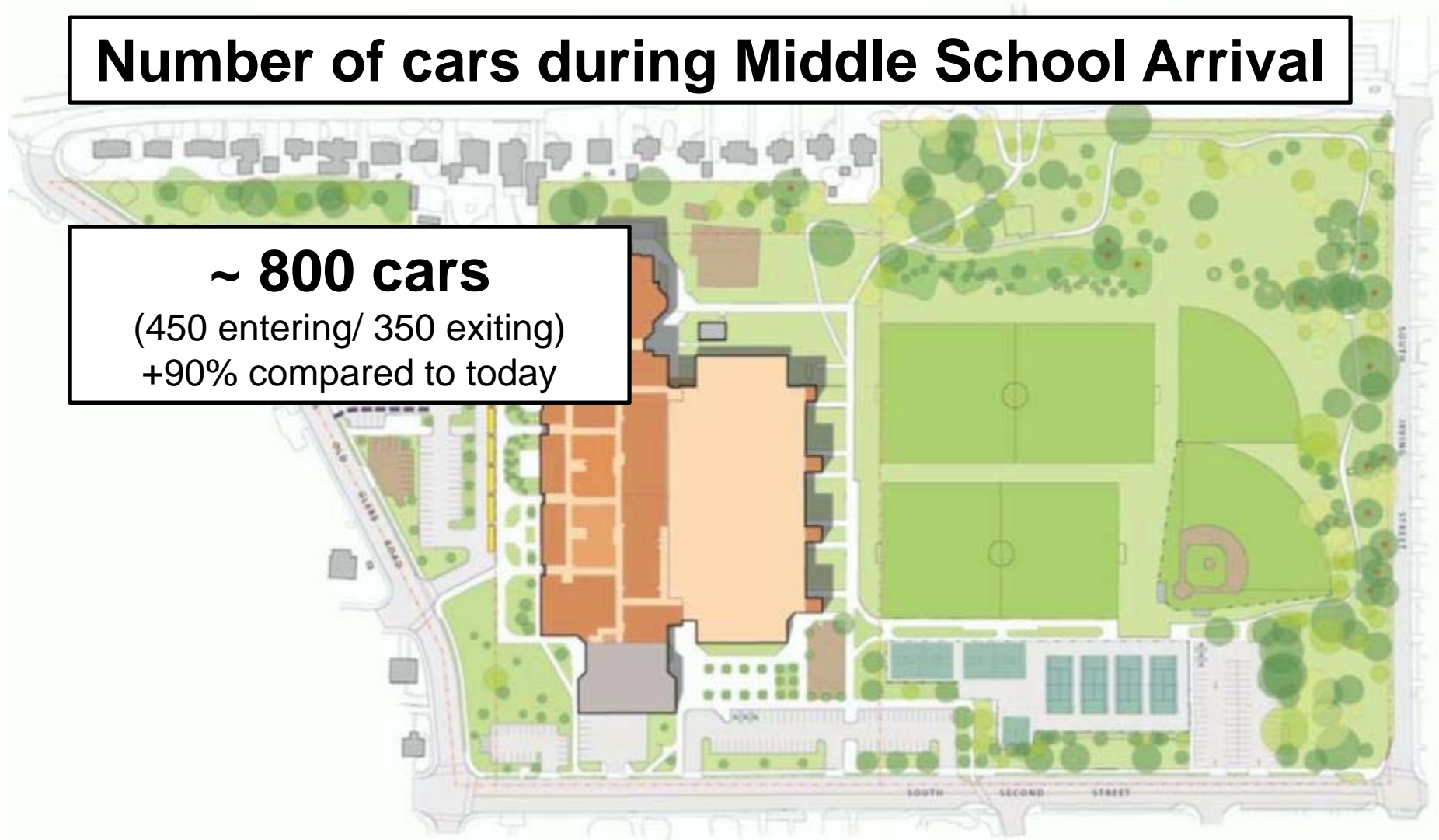
# Both ES/Expanded MS on S. Old Glebe



## Number of cars during Middle School Arrival

**~ 800 cars**

(450 entering/ 350 exiting)  
+90% compared to today



# ES via S. Old Glebe/Expanded MS via 2nd Street S.



## Number of cars during Middle School Arrival

**~ 130 cars**

(85 entering/45 exiting)  
Less than today

**~ 680 cars**

(370 entering/310 exiting)

# Expanded MS via S. Old Glebe/ES via 2nd Street S.



## Number of cars during Middle School Arrival

**~ 680 cars**

(370 entering/310 exiting)  
+55% compared to today

**~ 130 cars**

(85 entering/45 exiting)

# Expanded MS via S. Old Glebe/ES via 2nd Street w/split MS drop-off in ES drop-off



## Number of cars during Middle School Arrival

**~ 490 cars**

(380 entering/310 exiting)  
+10% compared to today

**~ 330 cars**

(185 entering/145 exiting)

# Operations at 2<sup>nd</sup> Street S. and S. Old Glebe Rd.



- Signal timing changes at 2<sup>nd</sup> Street S. and Glebe Road
- Add southbound lane on S. Old Glebe Rd





# VMDO Schemes





**VMDO ARCHITECTS**

18 Oct 2014

TJWG Meeting, November 10, 2014

## PROPOSED ES SCHEME 1

Thomas Jefferson Middle School + Community Center



**VMDO ARCHITECTS**  
18 Oct 2014

**PROPOSED ES SCHEME 2**  
Thomas Jefferson Middle School + Community Center



**VMDO ARCHITECTS**  
18 Oct 2014

**PROPOSED ES SCHEME 3**  
Thomas Jefferson Middle School + Community Center



**VMDO ARCHITECTS**  
18 Oct 2014

**PROPOSED ES SCHEME 4**  
Thomas Jefferson Middle School + Community Center

# Background information

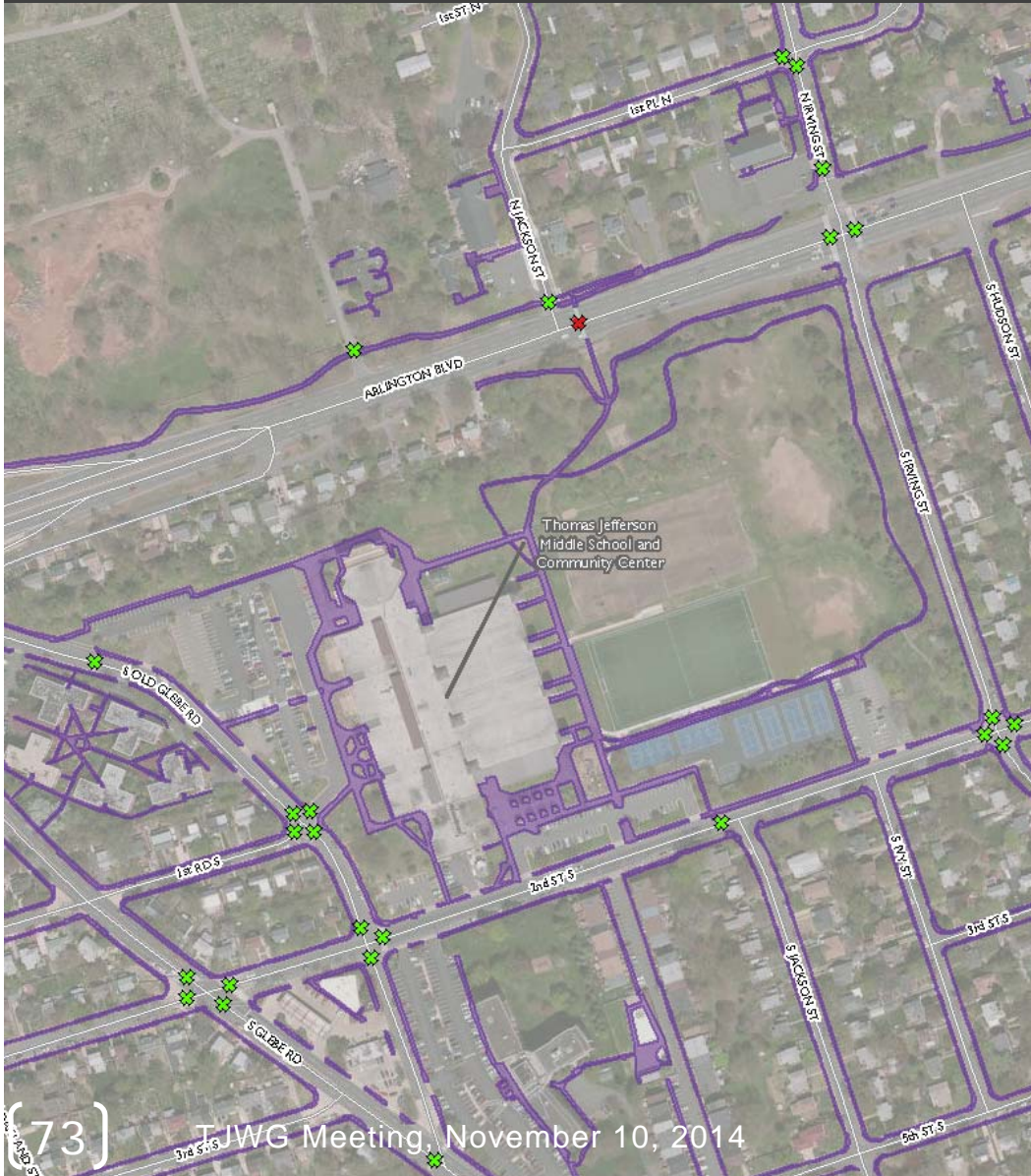




# **HOW DOES THE TRANSPORTATION SYSTEM CURRENTLY OPERATE ON AND AROUND THE TJ CAMPUS?**


Transportation System Infrastructure


# Pedestrian Infrastructure



## Pedestrian Facilities

 Marked Crossing

 Pedestrian Bridge





 Sidewalks



# Bicycle Infrastructure

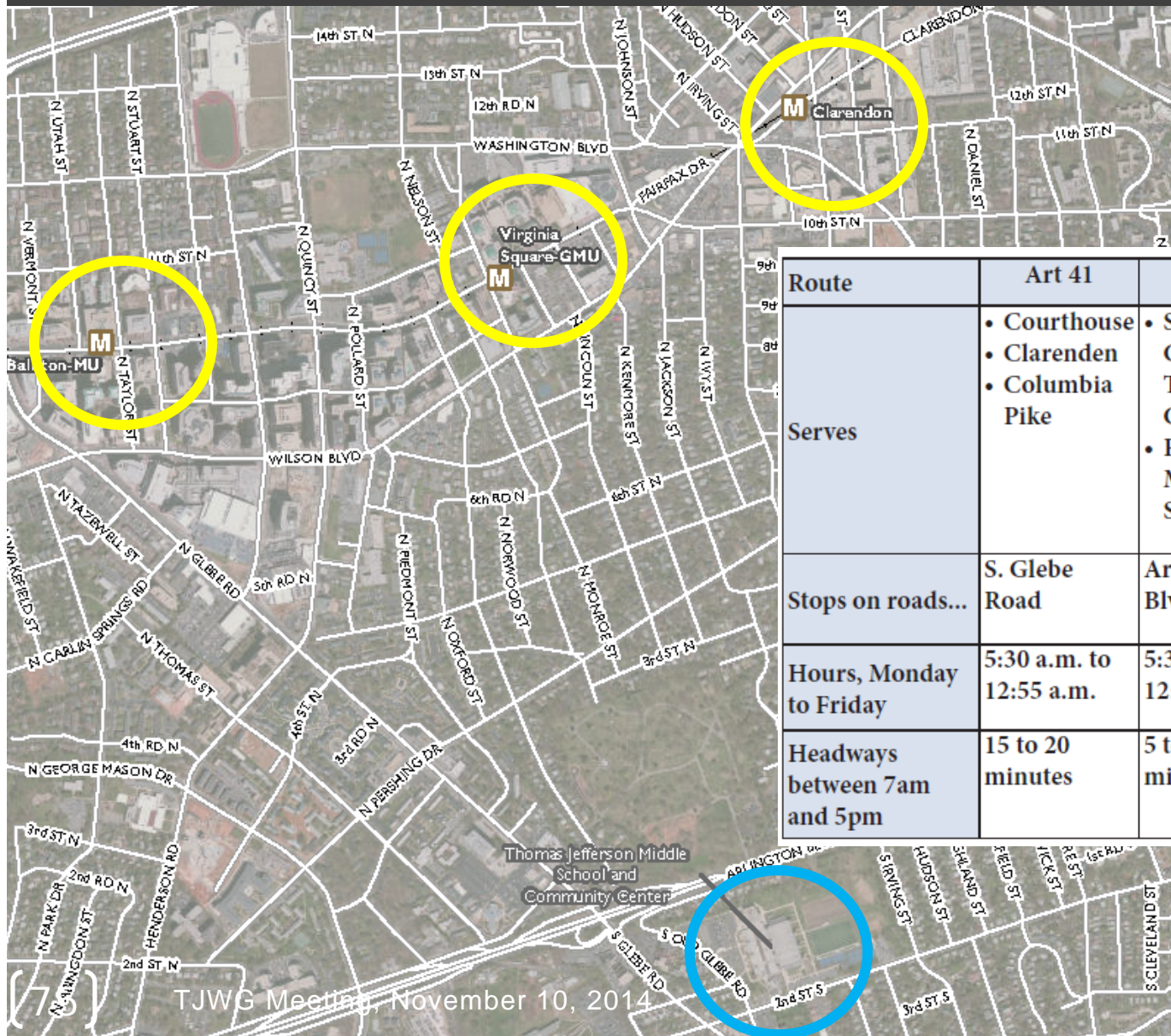


## Bicycle Facilities

-  Bike Share Station
-  Bike Parking
-  Bike Lane
-  Off Street Trail
-  Other On-Street Route



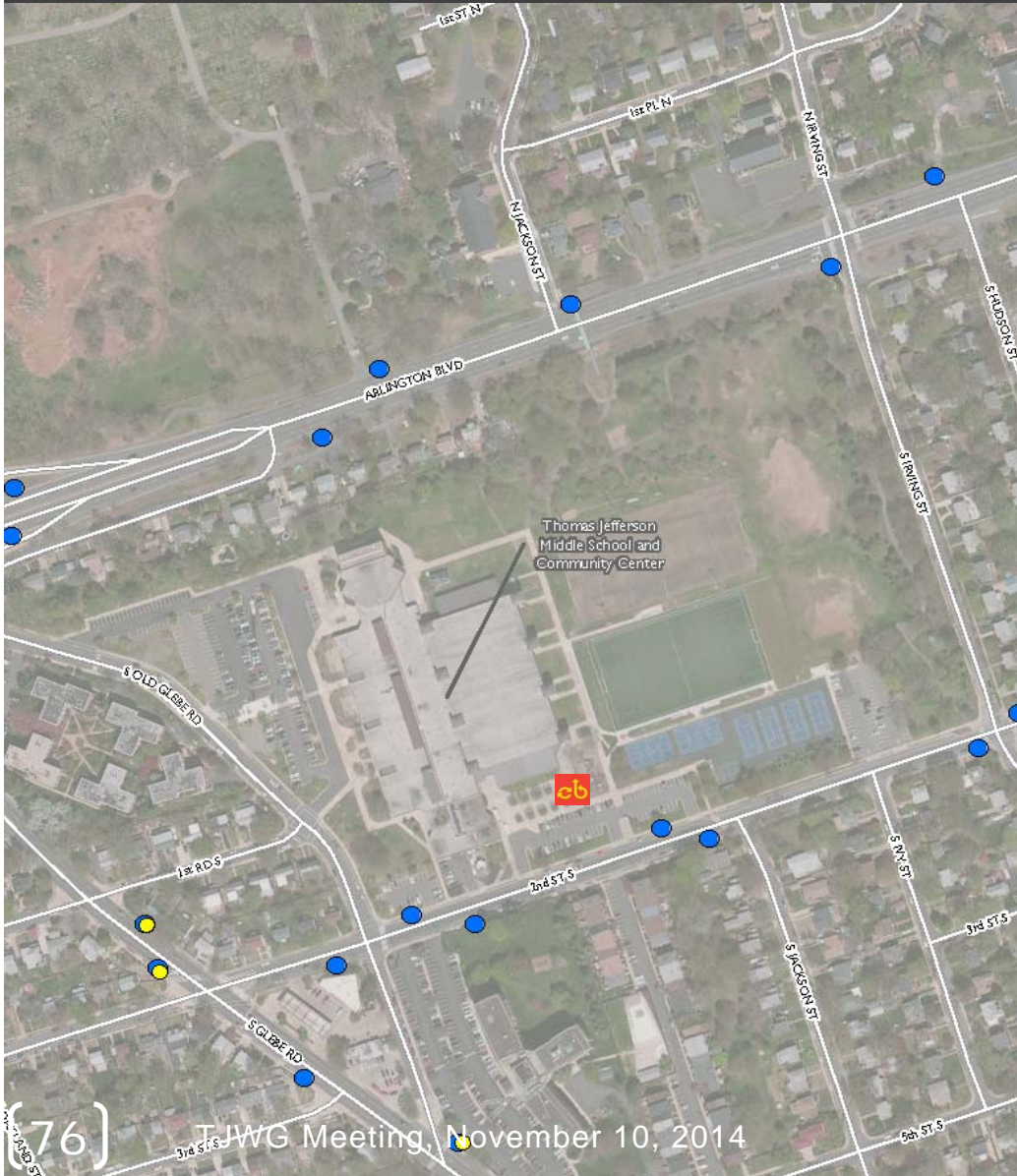
# Transit Infrastructure—Metro Stations




**M** Metro Station

Route	Art 41	4A	10B	23A/23B/23T
Serves	<ul style="list-style-type: none"> <li>Courthouse</li> <li>Clarendon</li> <li>Columbia Pike</li> </ul>	<ul style="list-style-type: none"> <li>Seven Corners Transit Center</li> <li>Rosslyn Metro Rail Station</li> </ul>	<ul style="list-style-type: none"> <li>Alexandria</li> <li>Balston</li> <li>Shirlington Transit Center</li> <li>Arna Valley</li> </ul>	<ul style="list-style-type: none"> <li>Crystal City</li> <li>Parkfairfax</li> <li>Shirlington Transit Center</li> <li>Ballston Transit Center</li> </ul>
Stops on roads...	S. Glebe Road	Arlington Blvd.	S. Glebe Road and 2nd Street	S. Glebe Road
Hours, Monday to Friday	5:30 a.m. to 12:55 a.m.	5:30 a.m. to 12:50 a.m.	5:35 a.m. to 1:40 a.m.	5:30 a.m. to 1:20 a.m.
Headways between 7am and 5pm	15 to 20 minutes	5 to 40 minutes	30 minutes	10 to 30 minutes combined

# Transit Infrastructure—Bus Stop and Bike Share Locations



## Transit

 Metrobus Stops

 ART Bus Stops

 Bike Share Station

# Parking Supply

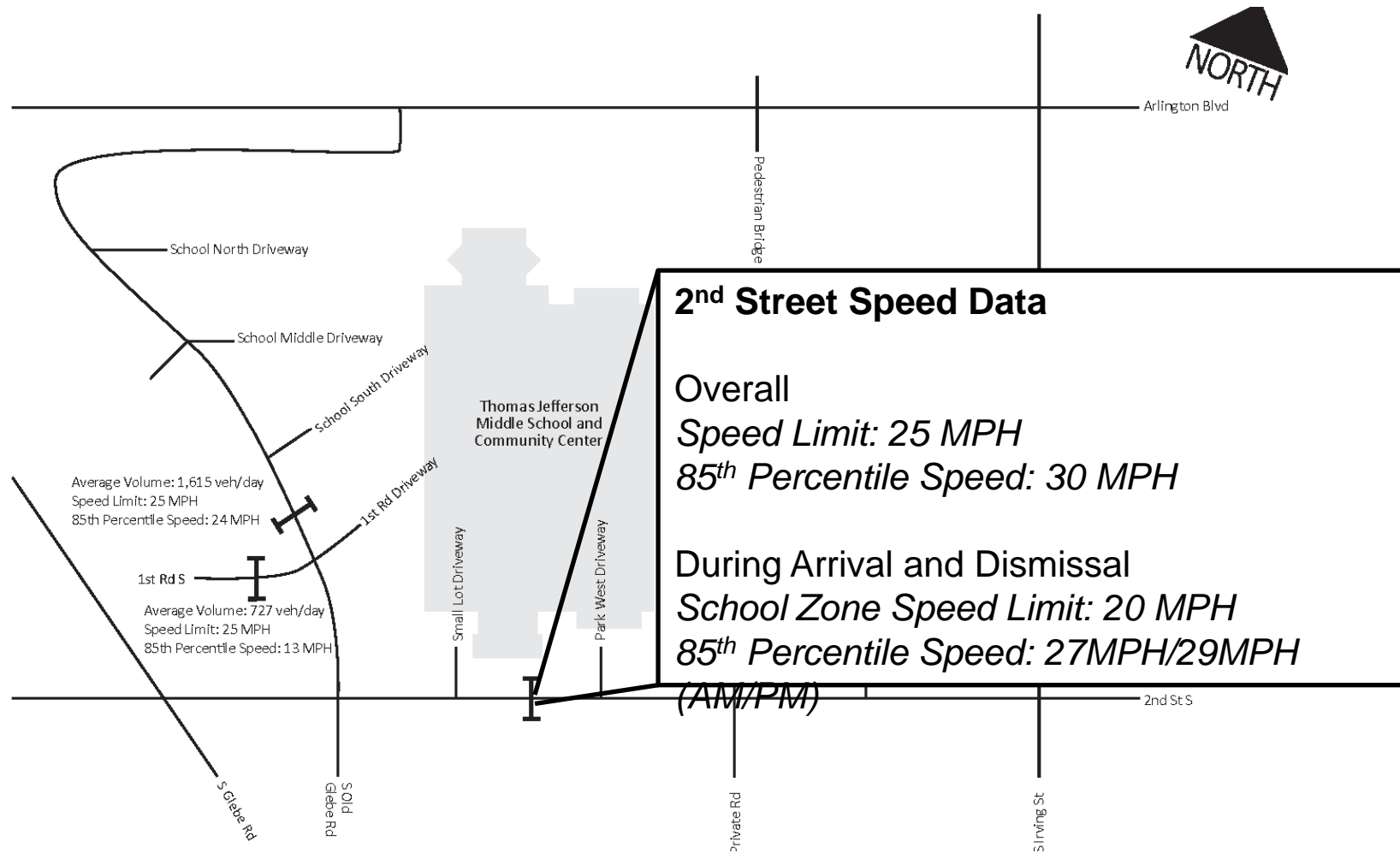


- On-site: 364 spaces, including 11 ADA spaces
  - Lots west of middle school
  - Community center lot
  - Tennis court lot
  - Shared lot (corner of 2<sup>nd</sup> Street & S. Old Glebe)
  - Kitchen/facilities lot
- On-street: spaces available throughout neighborhood



# **SURROUNDING TRANSPORTATION NETWORK**

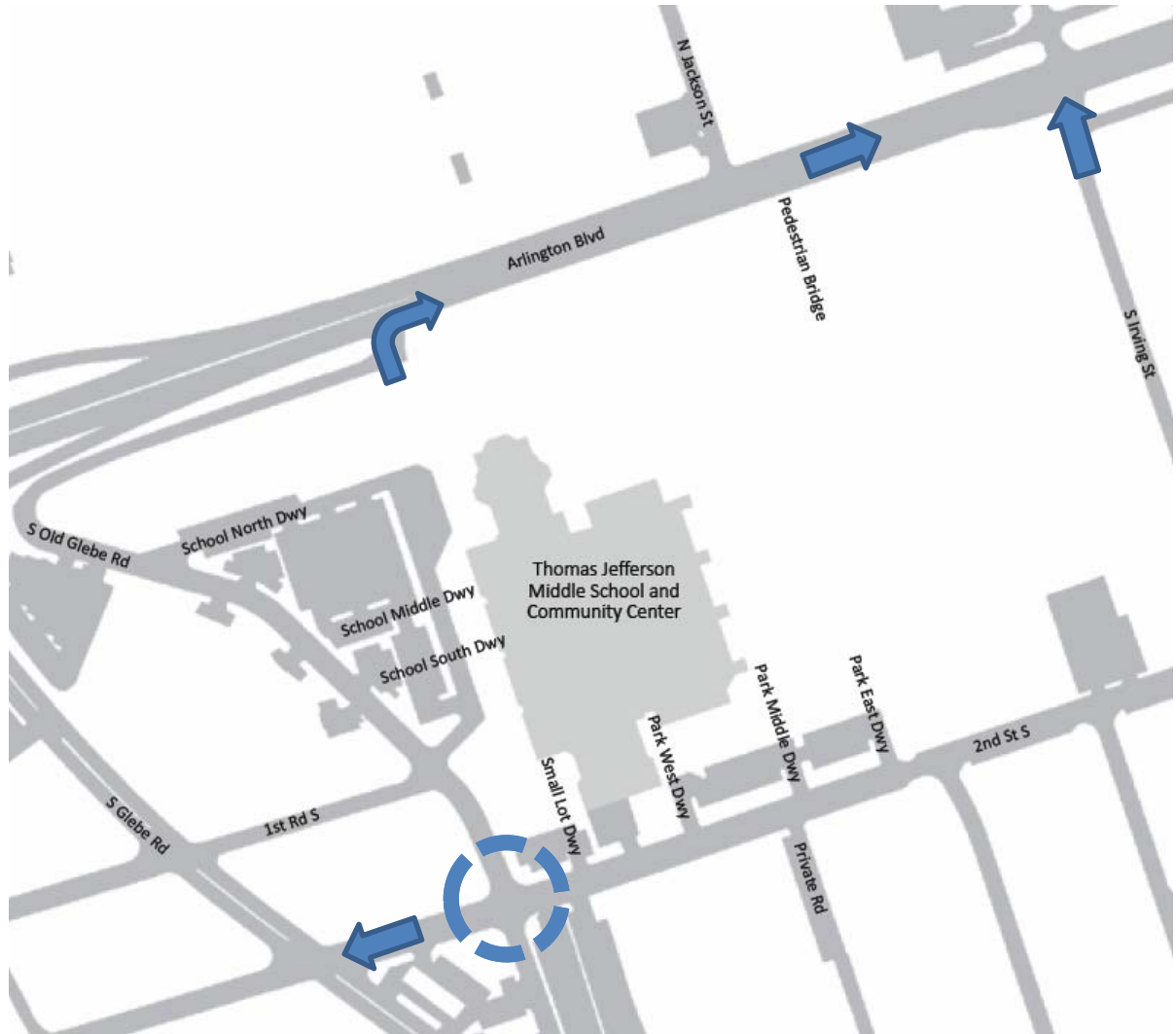
# Daily Traffic Counts & Speed Information



# Existing Intersection Operations for motorists



- During arrival, motorists may experience increased delay:
  - Turning right onto Arlington Blvd from S. Old Glebe Road
  - Crossing Arlington Blvd on Irving Street
  - Traveling east on Arlington Blvd
  - Traveling west on 2<sup>nd</sup> Street towards Glebe
  - Intersection of 2<sup>nd</sup> Street & Old Glebe Road
- During dismissal, the study intersections operate better due to less commuter traffic and fewer trips associated with the school



# At-Capacity Middle School (982 students)



Vehicle Trips to/from the site  
Middle School Peak Hours

	AM Trips (7:15-8:15 AM)		PM Trips (2:30-3:30 PM)	
	To Site	From Site	To Site	From Site
<b>Students (Vehicle Pick Up/Drop Off)</b>	234	234	76	76
<b>Staff</b>	50	0	0	75
<b>Buses</b>	13	13	13	13
<b>TOTAL</b>	<b>297</b>	<b>247</b>	<b>89</b>	<b>164</b>



# Expanded Middle School (1,300 students)



Vehicle Trips to/from the site  
Middle School Peak Hours

	AM Trips (7:15-8:15 AM)		PM Trips (2:30-3:30 PM)	
	To Site	From Site	To Site	From Site
<b>Students (Vehicle Pick Up/Drop Off)</b>	310	310	101	101
<b>Staff</b>	66	0	0	99
<b>Buses</b>	17	17	17	17
<b>TOTAL</b>	<b>393</b>	<b>327</b>	<b>118</b>	<b>217</b>