



## **APS Stratford Middle School *Transportation***

BLPC Meeting #17  
*December 21, 2015*



- Trip generation, an estimate of the number of trips that can be expected, is an essential part of the traffic analysis.
- There are substantial differences between Toole Design Group (TDG) and Coalition for a Safe Stratford (CSS) trip generation numbers.
- These differences are primarily due to assumptions about:
  - The % of students who will be driven (drive rate).
  - The % of students who live within the walk zone.
  - Staff trips during peak arrival and dismissal hours.

# Presentation Outline



1. Overview
2. Student Trips
  - A. Overall Drive Rate
  - B. Walk Zone Drive Rate
  - C. % Students in Walk Zone
3. Staff Trips



# 1. Overview



## AM Trip Generation

	<b>TDG</b> AM Peak Hour Trips	<b>CSS</b> AM Trips	<b>Difference</b>
Student Drop Offs	706	980	274
Staff	62	132	70
Visitors	10	0	10
Buses	26	20	6
<b>TOTAL</b>	<b>804</b>	<b>1132</b>	<b>328</b>

## 2. Student Trips



### AM Trip Generation

	<b>TDG</b> AM Peak Hour Trips	<b>CSS</b> AM Trips	<b>Difference</b>
Student Drop Offs	706	980	274
Staff	62	132	70
Visitors	10	0	10
Buses	26	20	16
<b>TOTAL</b>	<b>804</b>	<b>1132</b>	<b>328</b>

Two Calculation Methods:

- 1) TDG used Overall Drive Rate
- 2) CSS used Drive Rate by Walk/Bus Zone



# 2A. Student Trips—Overall Drive Rate

## TDG Overall AM Peak Hour Trip Calculation

$$1,000 \times 35.3\%^* \times 2 = 706$$

Number of Students	Overall Drive Rate	Trips per Drop-Off (In and Out)	Trips
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*\*75<sup>th</sup> percentile drive rate from 2013 and 2014 Student Travel Tally data for APS neighborhood middle schools*

## 2A. Student Trips—Overall Drive Rate



### CSS Overall AM Trip Calculation

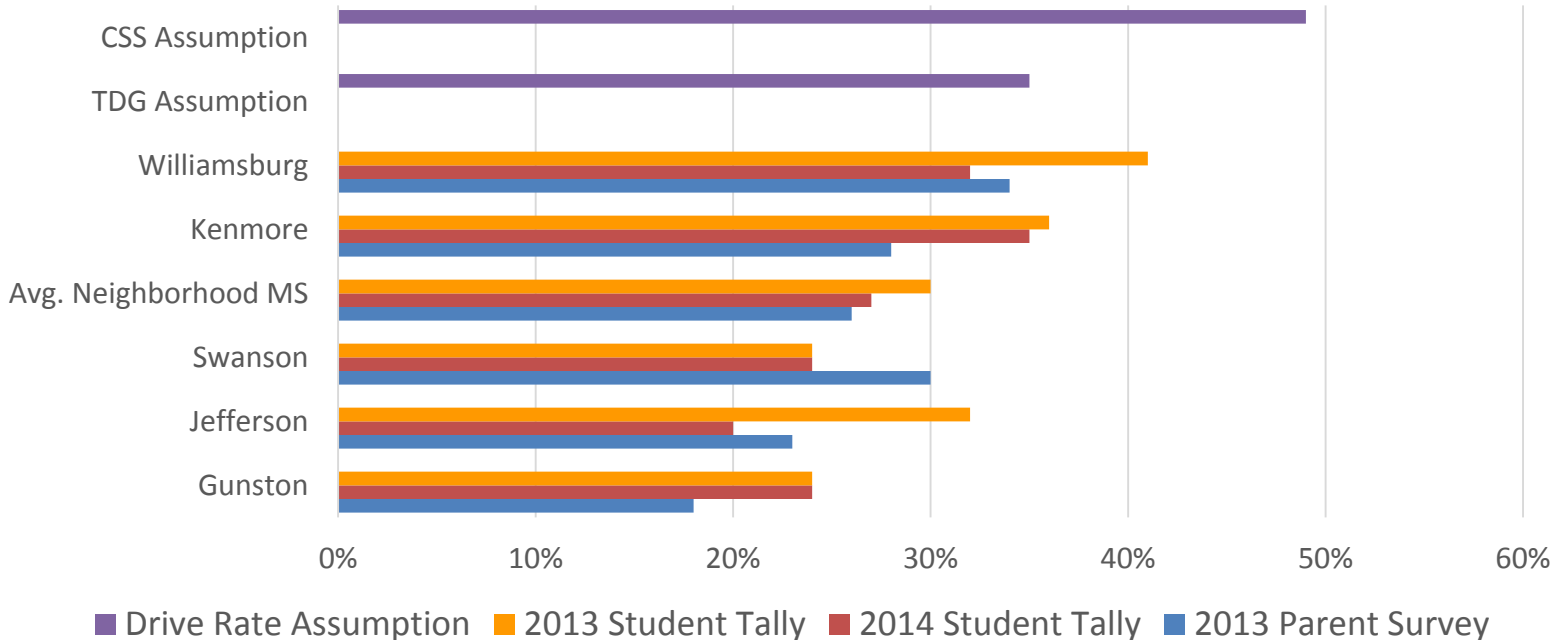
$$1,000 \times 49\% \times 2 = 980$$

Number of Students		<b>Overall Drive Rate</b>		Trips per Drop-Off (In and Out)		Trips
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# 2A. Student Trips—Overall Drive Rate



## Reported Overall AM Drive Rates vs. Assumptions





# 2B. Student Trips—Walk Zone Drive Rate



## CSS Walk Zone/Bus Zone Trip Calculation

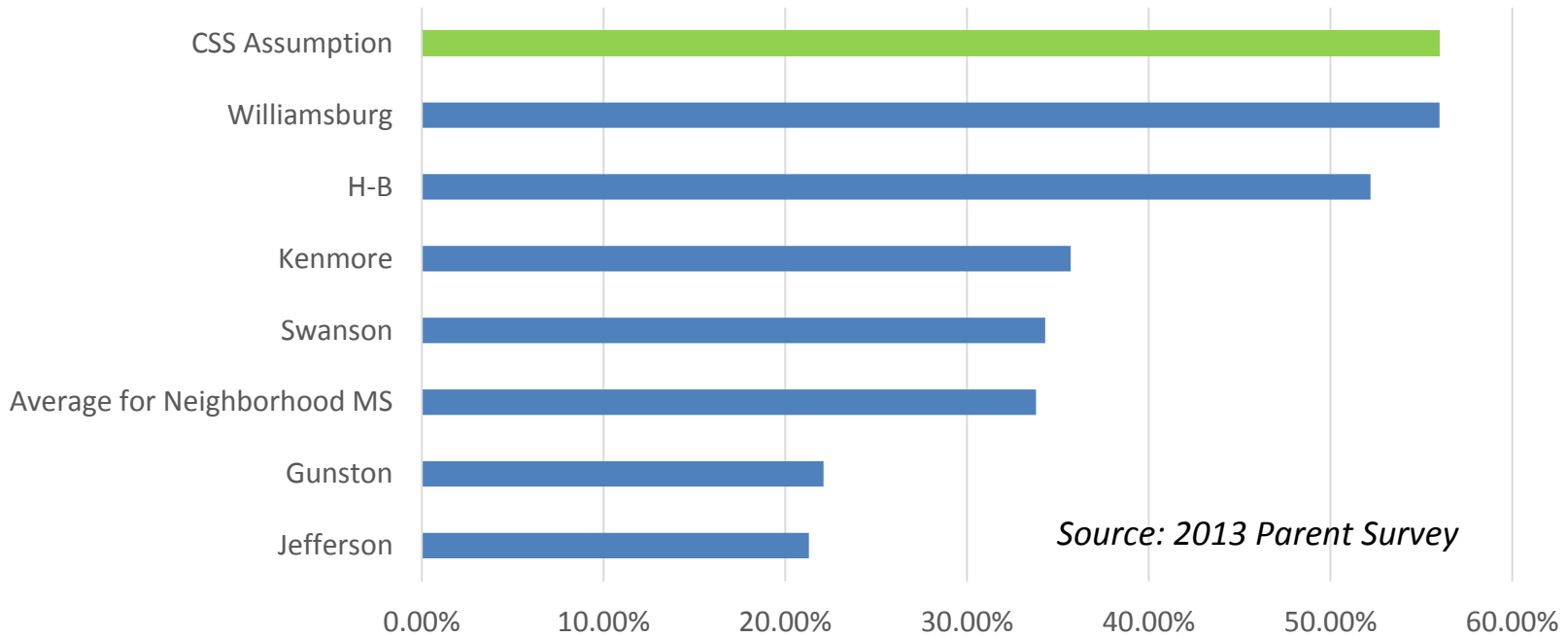
$$1,000 \times [ ( 56\% \times 80\% ) + ( 21\% \times 20\% ) ] \times 2 = 980$$

Number of Students	<b>Walk Zone Drive Rate</b>	Students in Walk Zone	Bus Zone Drive Rate	Students in Bus Zone	Trips per Drop-Off (In and Out)	Trips
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# 2B. Student Trips—Walk Zone Drive Rate



## Reported AM Walk Zone Drive Rates vs. CSS Assumption



Source: 2013 Parent Survey

## 2B. Student Trips—Walk Zone Drive Rate



### Reasons H-B Walk Zone Drive Rate is Not Appropriate for Stratford Site

- H-B did not have an active walking and biking encouragement program in 2013.
- H-B is countywide school where more than 4 in 5 students lives outside the walk boundary.\*
  - Makes it more difficult for students to walk together to school.
  - Makes it harder to establish a walking/biking culture.
- Rates are prior to expected ped/bike access improvements, including:
  - Old Dominion crossing
  - Sidewalk on south side of Old Dominion
  - Pedestrian crossing improvements at Five Points, Vacation/Lorcom, and Vacation/Military
  - Sidewalk and traffic calming improvements on Vacation Lane

*\*Bus eligibility data provided by APS in 2013*



# 2B. Student Trips—Walk Zone Drive Rate

## Reasons Williamsburg Walk Zone Drive Rate is Not Appropriate for Stratford Site

- Williamsburg rate is an outlier among neighborhood middle schools. It is 57% higher than the next highest value.
- Stratford will have more students living within easy walking distance of the school (1/2 mile)

APS Students (all Grades) by Distance

School	APS Students Within 1/2 Mile	APS Students Within 1 Mile
Swanson	901	3,183
Stratford	869	2,560
Williamsburg	500	1,753



# 2B. Student Trips—% Students in Walk Zone

## CSS Walk Zone/Bus Zone Trip Calculation

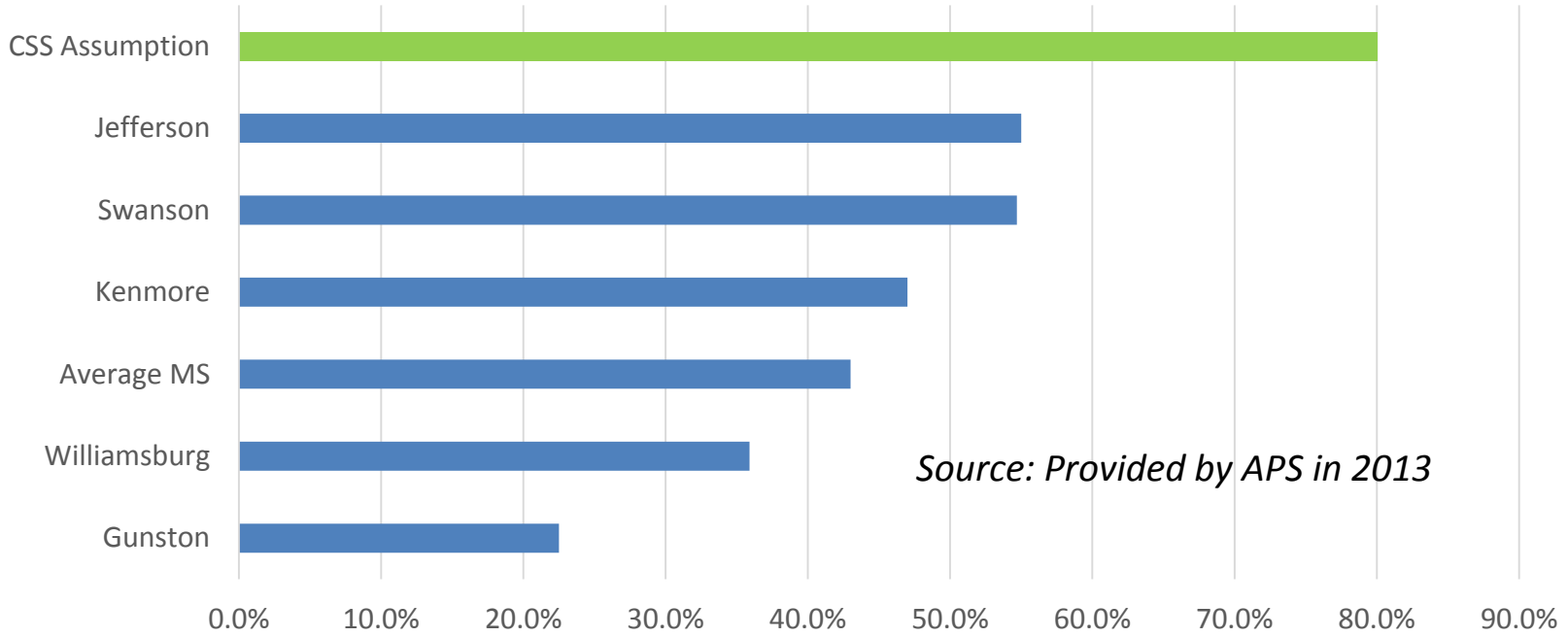
$$1,000 \times [ ( 56\% \times 80\% ) + ( 21\% \times 20\% ) ] \times 2 = 980$$

Number of Students	Walk Zone Drive Rate	<b>Students in Walk Zone</b>	Bus Zone Drive Rate	Students in Bus Zone	Trips per Drop-Off (In and Out)	Trips
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# 2C. Student Trips—% Students Inside Walk Zone



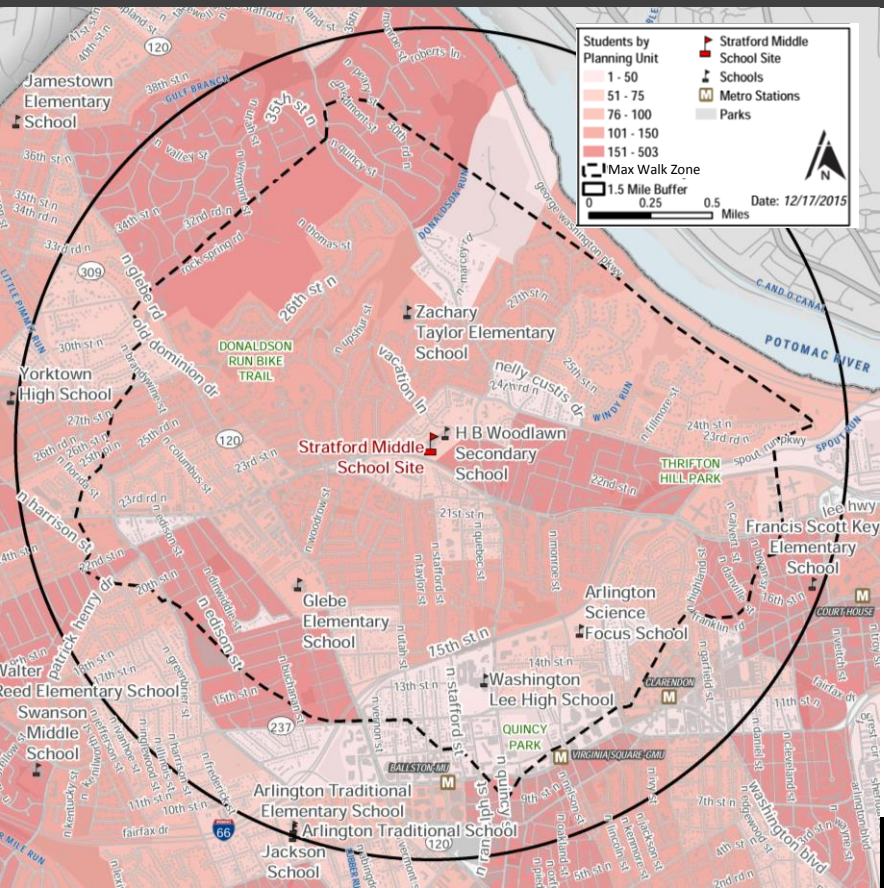
## % Students in Walk Zone vs. Assumptions



*Source: Provided by APS in 2013*



# 2C. Student Trips—% Students Inside Walk Zone



- Number of 6<sup>th</sup>-8<sup>th</sup> graders inside maximum walk zone: 679
- i.e. 68% of potential Stratford students.
- Actual percent within walk zone likely lower than 68%.

Source: Student location data provided by APS in 2013



# 2B. Student Trips—% Students in Walk Zone

## CSS Walk Zone/Bus Zone Trip Calculation

$$1,000 \times [ ( 56\% \times 80\% ) + ( 21\% \times 20\% ) ] \times 2 = 980$$

Number of Students	Walk Zone Drive Rate	<b>Students in Walk Zone</b>	Bus Zone Drive Rate	Students in Bus Zone	Trips per Drop-Off (In and Out)	Trips
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# 3. Staff Trips



## AM Trip Generation

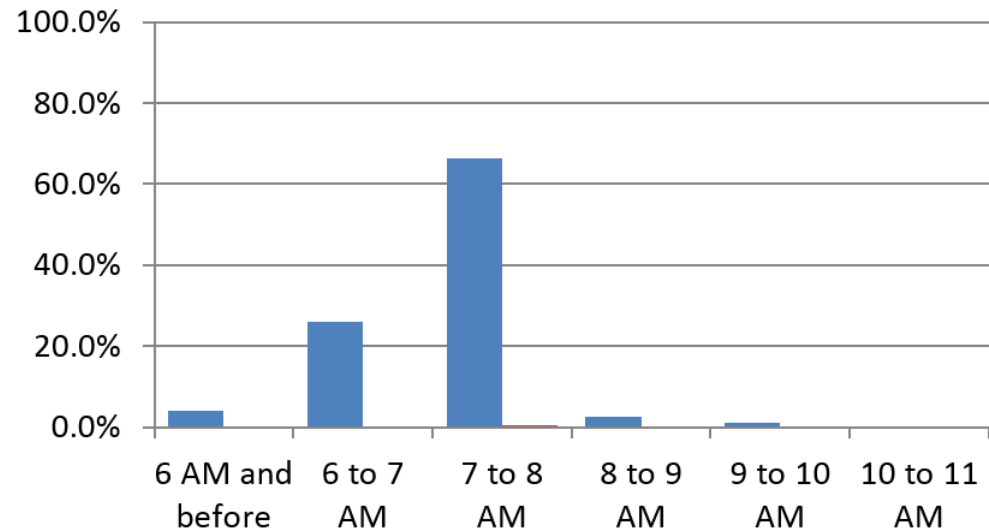
	<b>TDG</b> AM Peak Hour Trips	<b>CSS</b> AM Trips	<b>Difference</b>
Student Drop Offs	706	980	274
Staff	62	132	70
Visitors	10	0	10
Buses	26	20	16
<b>TOTAL</b>	<b>804</b>	<b>1132</b>	<b>328</b>
Combined Drive Rate	35%	49%	14%



### 3. Staff Trips

- 66% of Staff reported arriving between 7 and 8 AM
- TDG estimated 50% arrive during Arrival Peak Hour (7:15 and 8:15 AM)
- Full-time Staff Contract Hours: 7:20 AM to 2:54 PM
- 20% of Staff are Part-Time

**Staff Arrivals by Hour**



*Source: 2013 Staff Survey*



- There are substantial differences between TDG's and CSS's trip generation numbers are primarily due to assumptions about:
  - The % of students who will be driven (drive rate).
  - The % of students who live within the walk zone.
  - Staff trips during peak arrival and dismissal hours.
- TDG's trip generation numbers are based on transportation analysis best practices and supported by the data.

# Questions?

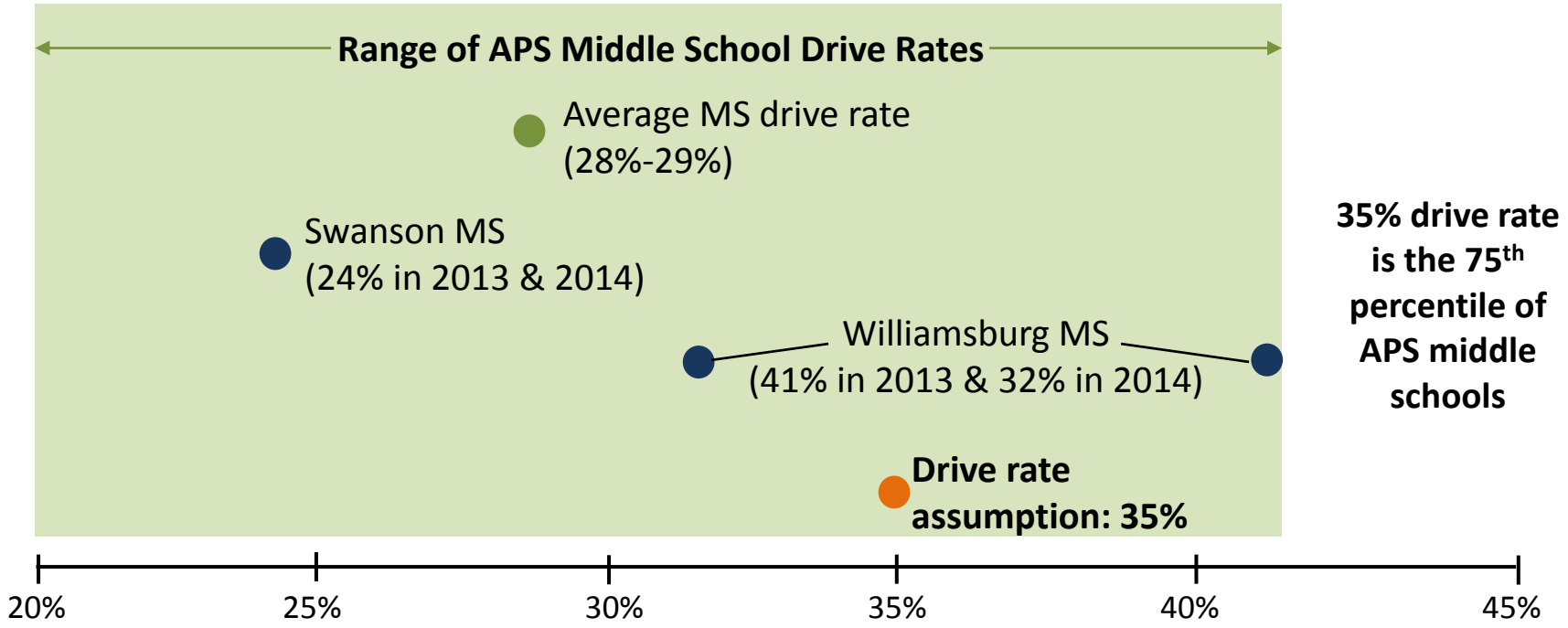


# Trips Based on Walk Zone/Bus Eligible Drive Rates with 65% students in Walk Zone



	Walk Zone	Bus-Eligible Zone	Total
Students Assumed in Zone	65%	35%	
Average Drive Rate by Zone	33.8%	21.8%	
No. of Trips Based on Average Drive Rate	439	156	<b>592</b>
75th %ile Drive Rate by Zone	35.7%	23.6%	
No. of Trips Based on 75 <sup>th</sup> %ile Drive Rate	464	165	<b>629</b>
<b>TDG Student Drop-Off Trips</b>			<b>706</b>
<b>CSS Student Drop-Off Trips</b>			<b>980</b>

# 35% Drive Rate



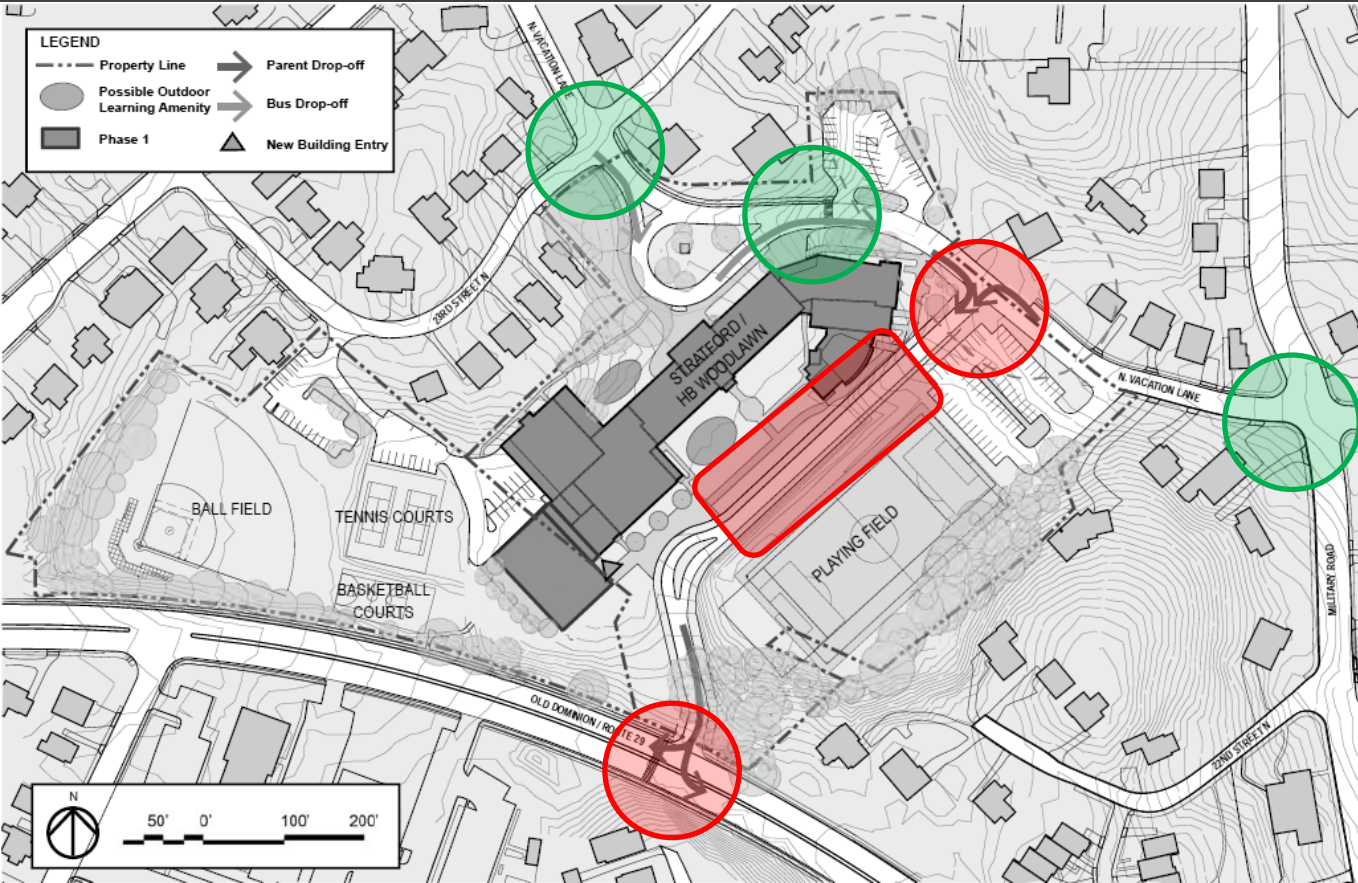
Source: 2013 and 2014 APS GO! Student Travel tallies (AM counts)

# Proposed Site Plan—Ped/Bike Access Impacts



**LEGEND**

--- Property Line	➔ Parent Drop-off
○ Possible Outdoor Learning Amenity	➔ Bus Drop-off
■ Phase 1	▲ New Building Entry



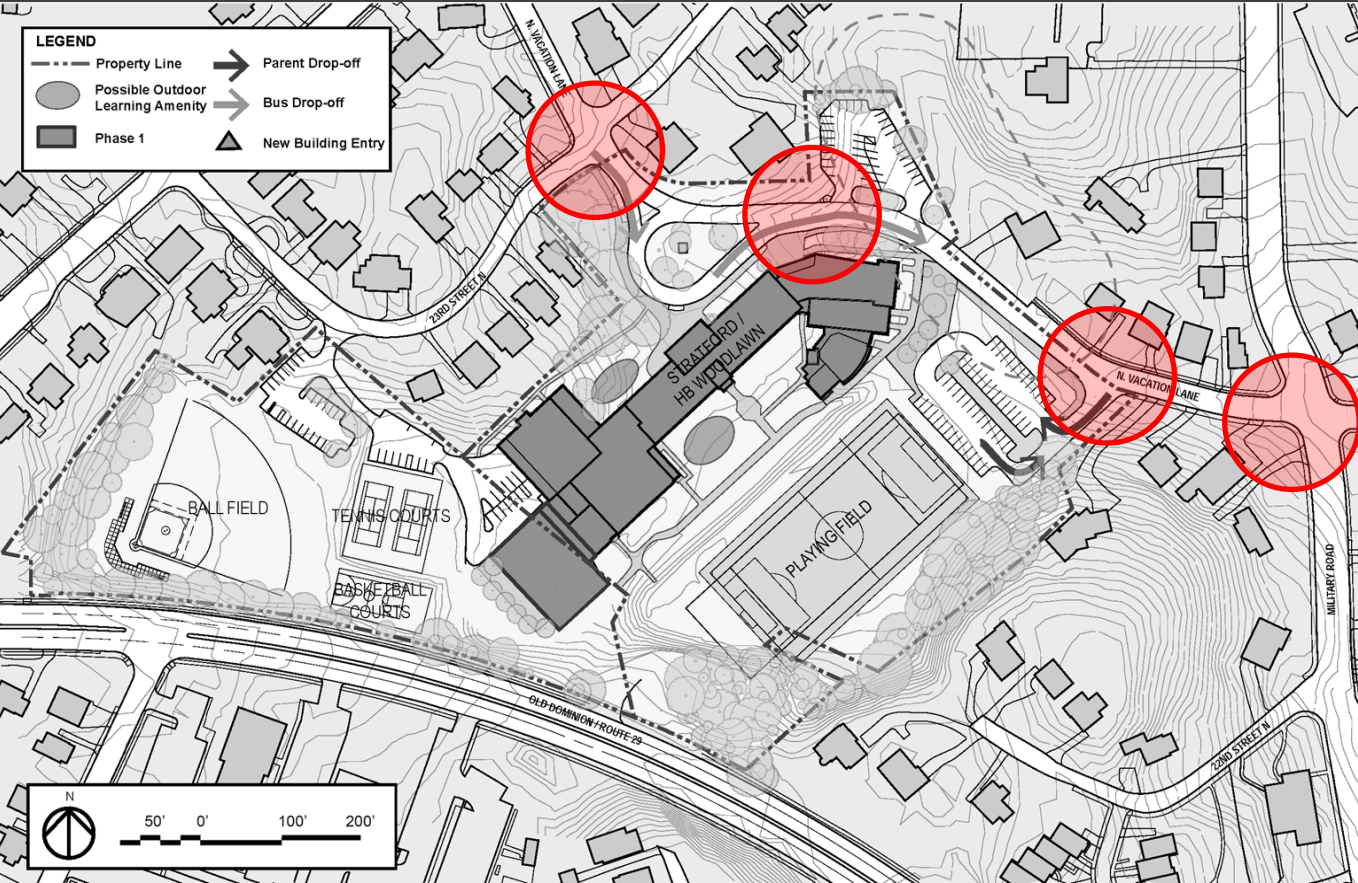
- Lower pedestrian exposure at crossings highlighted in green
- Additional conflict points at crossings highlighted in red



# Alternative Site Plan—Ped/Bike Access Impacts

**LEGEND**

--- Property Line	➔ Parent Drop-off
○ Possible Outdoor Learning Amenity	➔ Bus Drop-off
■ Phase 1	▲ New Building Entry



- Higher pedestrian exposure at intersections highlighted in red.
- No additional conflict points.



# Other Recommendations or Expected Improvements



**Two northbound thru lanes**

**New sidewalk**

**Signal or pedestrian hybrid beacon**

**Pedestrian crossing improvements**



# Vehicle Trip Summary—Existing vs. Projected Future



		AM	PM
Existing Trips	1 <sup>st</sup> peak hour*	179	96
	2 <sup>nd</sup> peak hour*	364	266
	TOTAL existing	543	362
Projected Future Trips (1.000 seats)	Peak hour**	804	505

Sources: \*March 2015 Driveway Counts and Manual Counts

\*\*Drive rate assumption: 35% (75<sup>th</sup> percentile of APS middle schools)



# Vehicle Trip Summary—By Trip Type

## New 1,000 Seat Neighborhood Middle School

	Arrival Peak Hour			Dismissal Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Students Drop Offs/Pick Ups*	353	353	706	219	219	438
Staff **	62	0	62	0	31	31
Visitors ***	10	0	10	0	10	10
Buses****	13	13	26	13	13	26
<b>TOTAL</b>	<b>438</b>	<b>366</b>	<b>804</b>	<b>232</b>	<b>273</b>	<b>505</b>

Sources: \*75<sup>th</sup> %ile neighborhood MS drive rate (2013 and 2014 student tallies)

\*\* Neighborhood MS staff surveys (2014)

\*\*\* Neighborhood MS visitor surveys (2015)

\*\*\*\* Bus estimates