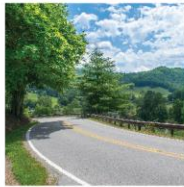




NORTH CAROLINA

Department of Transportation



MSTA Calculator and School study

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September 29, 2020

(MSTA) Definition and Purpose

- **Definition:** MSTA is a section in the Traffic Management Unit of the Transportation Mobility and Safety Division
- **Partners:** Municipalities, School Districts, Schools, Law Enforcement, Parent Teacher Associations, Developers and NCDOT
- **Purpose:** Continue to provide North Carolina with safe roads to safe schools through congestion mitigation around educational facilities.
- **Work Products:** By statute new, expanding or relocating schools. Prior to COVID, also included existing schools experiencing a problem.



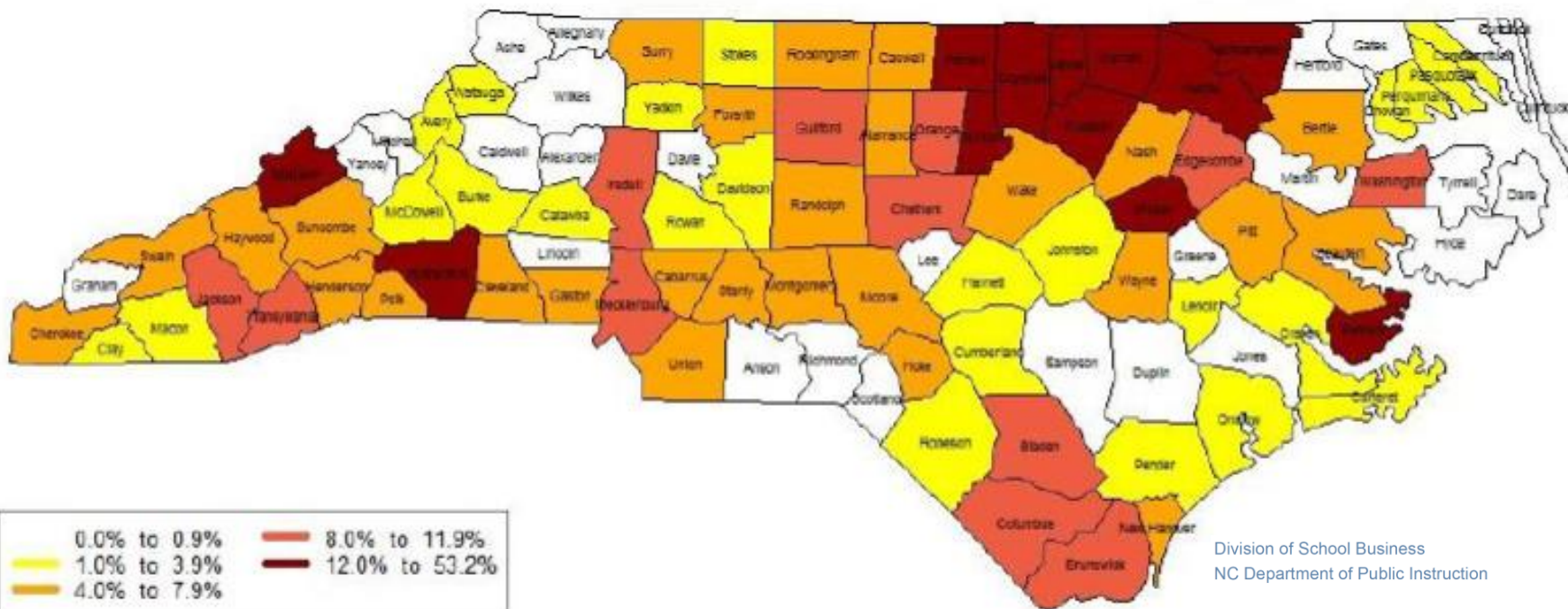
Some statistic

2019

• Preschools	8,097	• Public district schools	2,517
• Elementary schools	2,313	• Public charter schools	177
• Middle schools	1,370	• Private schools	7,694
• High schools	1,122	• All schools	10,388



2017 - 2018



Division of School Business
 NC Department of Public Instruction

THE Law

Legislation, GS 136-18 (29a) requires all school planners to provide NCDOT recommendations and evaluations of their traffic operations and safety impacts to the state highway system prior to construction.

Chapter 136.
Roads and Highways.
Article 1.

Organization of Department of Transportation.

§ 136-18. Powers of Department of Transportation.

The said Department of Transportation shall be vested with the following powers:

(29a) To coordinate with all public and private entities planning schools to provide written recommendations and evaluations of driveway access and traffic operational and safety impacts on the State Highway system resulting from the development of the proposed sites. All public and private entities shall, upon acquiring land for a new school or prior to beginning construction of a new school, relocating a school, or expanding an existing school, request from the Department a written evaluation and written recommendations to ensure that all proposed access points comply with the criteria in the current North Carolina Department of Transportation 'Policy on Street and Driveway Access'. The Department shall provide the written evaluation and recommendations within a reasonable time, which shall not exceed 60 days. This subdivision shall not be construed to require the public or private entities planning schools to meet the recommendations made by the Department, except those highway improvements that are required for safe ingress and egress to the State highway system.

Link

[GS_136-18.pdf](#)

A typical example of an existing school that has outgrown its functionality.



Chaos



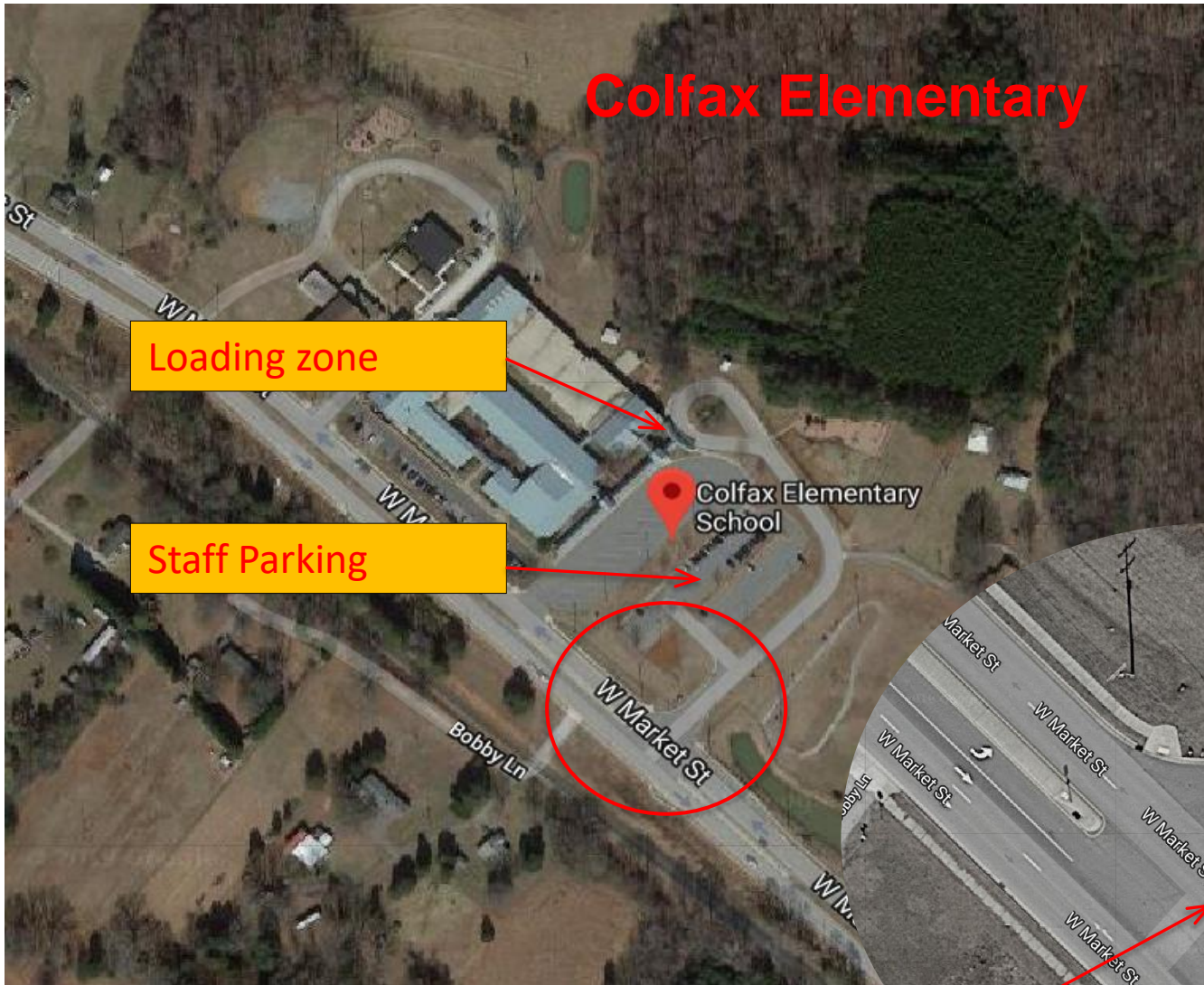
Chaos



Drone footage – Three school complex



Colfax Elementary



Loading zone

Staff Parking

Parent AND Staff
entrance and exit



Tools of the trade

MSTA Calculator

Connect NCDOT
BUSINESS PARTNER RESOURCES

Home Help Team Sites Site Map

Doing Business Bidding & Letting Projects Resources **Local Governments** Search...

Bridge Reuse Interagency Leadership Local Projects Planning **School Transportation** State Airport Aid State Street-Aid (Powell Bill) Utilities

Municipal School Transportation Assistance (MSTA)

MSTA performs studies that address the safety concerns with the overall pedestrian safety and traffic operations on a school campus, and how traffic affects adjacent state roadways

Connect NCDOT ► Local Governments ► School Transportation

Schools

MSTA performs studies that address the safety concerns with the overall pedestrian safety and traffic operations on a school campus, and how traffic affects adjacent state roadways. To calculate the school operations, MSTa has developed a database of specific data that is compared to similar schools across North Carolina.

Data indicates that AM traffic operations on a school campus usually operate safely and efficiently due to parent traffic arriving at a broader range of times. PM traffic operations are quite different, most often parents arrive well before the school dismissal and park or queue (back up) along the campus driveway. The PM queue often results with vehicles stopped in the roadway or along the shoulder of a major through route, which increase the chances of accidents and similar traffic related safety concerns.

<https://connect.ncdot.gov/municipalities/School/Pages/default.aspx>

MSTA School Calculator



The MSTa School Traffic Calculator

Provided by:

Municipal and School
Transportation Assistance

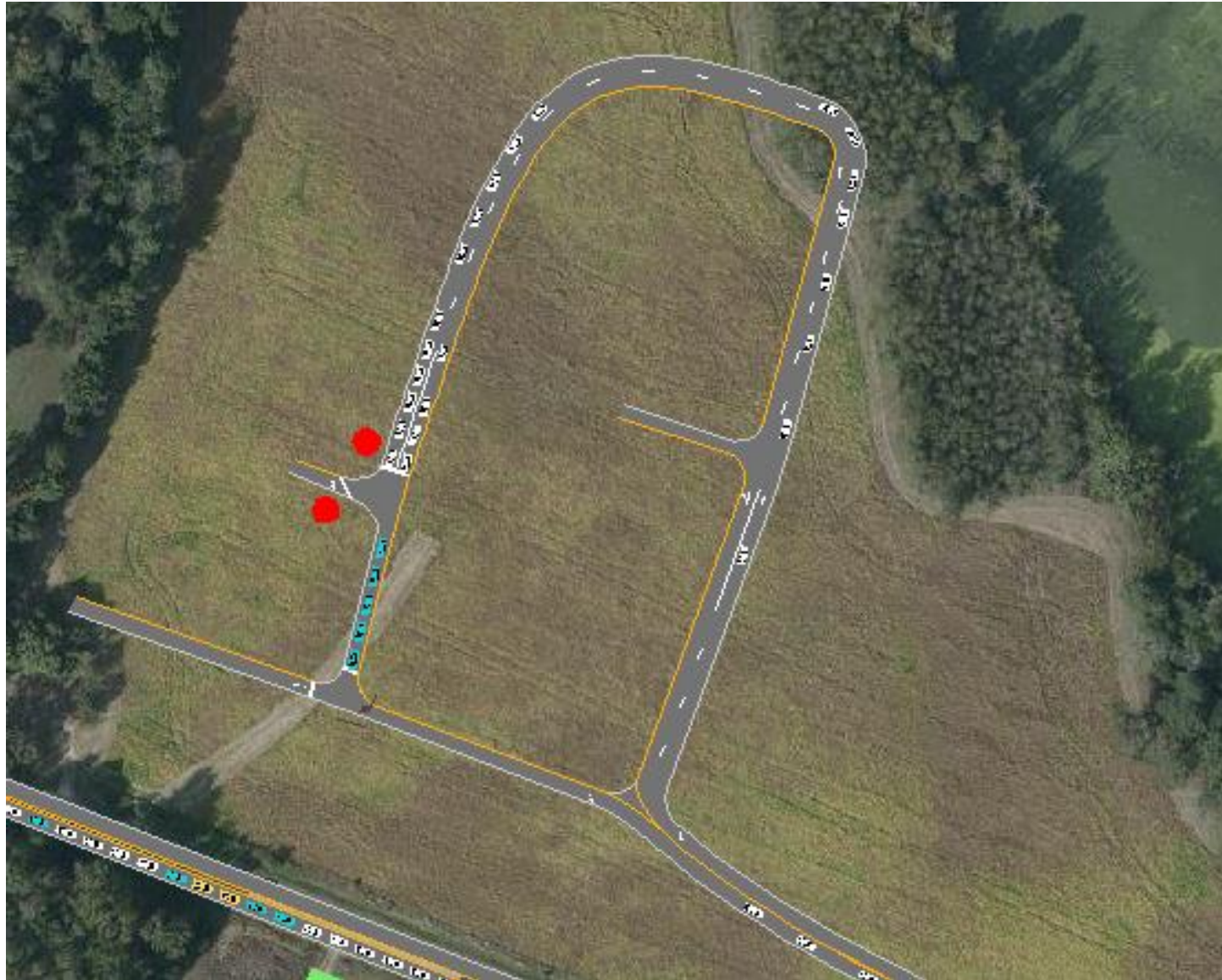
Transportation Mobility and Safety

Division of Highways

North Carolina Department of Transportation

Excel Required to Open Calculator

Loading Zone





School study - overview



Where to begin?



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- **Get MSTA involved as early in the process as possible**
- **Have a co-ordination meeting(s) with all stakeholders to scope study**
 - District Engineer
 - RTE
 - DTE
 - MSTA and Congestion Management
 - School officials
 - Town if applicable
 - NCDOT Bike/Ped if applicable
- **MSTA Checklist**
 - Have the school fill it out and make sure its signed. [Checklist for School Requesting Study.pdf](#)
- **Get counts** as applicable – THINK MINIMAL locations (COVID?)
- **The Site plan** should show MSTA required items (think calculator tab)

School study – overview continued

- **Obtain needed queue with the calculator or use Local data.**
 - Use queue length from the calculator or use local measured queue plus 30% for High Demand. If increasing number of students, set up a proportion.
 - Make sure you are using the correct tab.
 - Note that urban public schools have been shallowing. *Interim guidance coming.*
 - Staggering the bell schedules can have a 25% overlap
 - First step in design is to make sure queue can be maintained on campus.
- **Conduct a Field visit** to the school to observe AM & PM loading ops.
- **Set up Synchro/SimTraffic files** as per MSTA standards (think calculator tab)
- **Put together the report.** Make sure the recommended improvements are reasonable.
 - Schools have different rules. They are allowed to have an acceptable level of delay. Do not have to adhere to Driveway manual specifications completely.



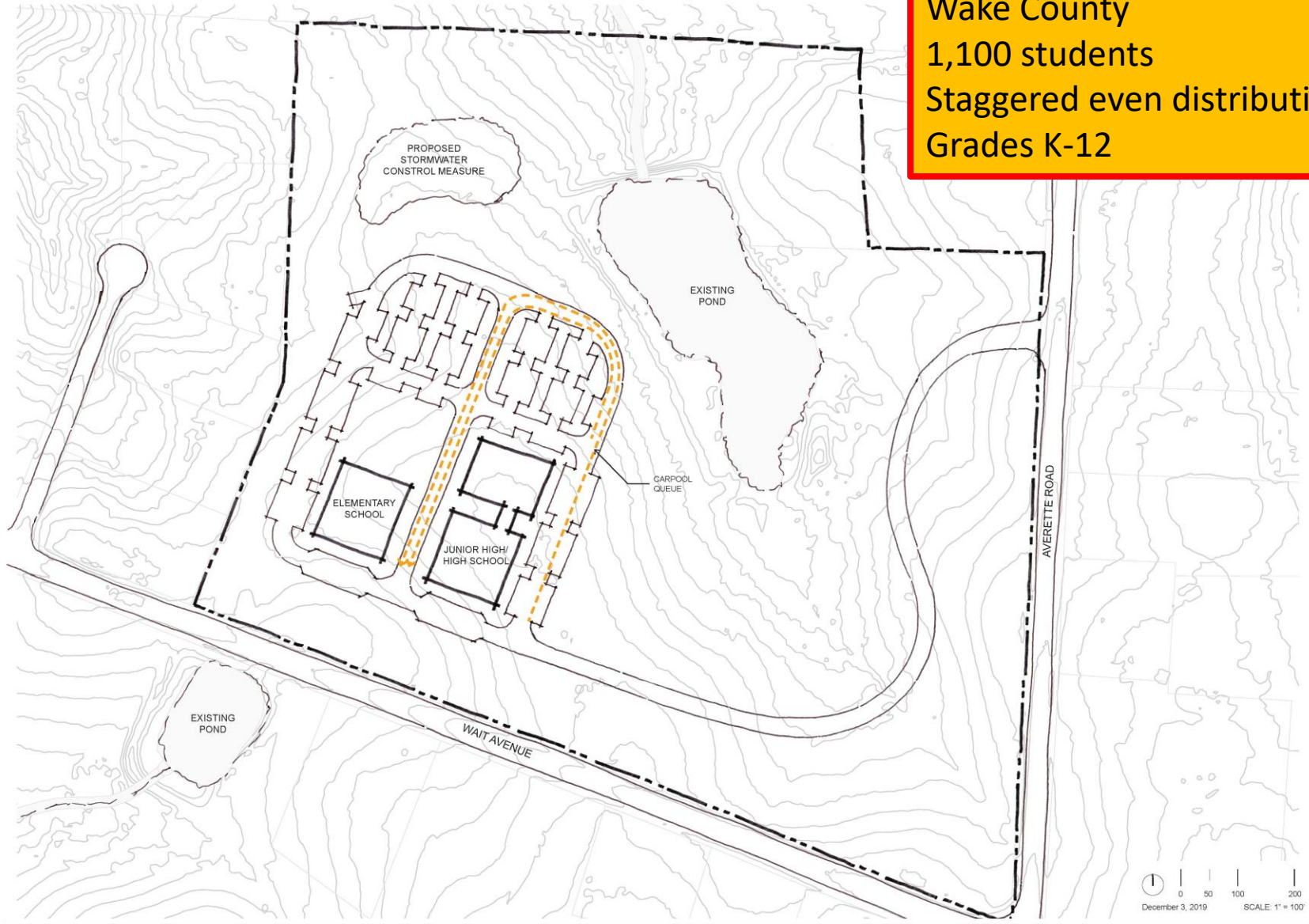
School study – overview continued

- **Follow MSTA’s principles of SOAR** with the design
 - SEPARATE modes of traffic
 - ORGANIZE student loading process
 - ASSIGN short term visitor parking
 - RESTRICT driver options
- MSTA preference is for **one ingress with a separate egress.**
 - Reasons?
- **Is a Traffic Management Plan (TMP)** needed?
 - Not a plan per se, but a list of instructions to give parents.
- **Submittals** (TIA’s and Traffic Operations)
 - Should go through the District Engineer
 - Will need to be reviewed by MSTA and Congestion Management.



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Wake County
1,100 students
Staggered even distribution
Grades K-12



MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates
(These numbers do not reflect peak hour traffic volumes)

School Name:					Version: 102816					
Type: Urban Charter										
MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	623	9	43		244	119	2641	740	531	30%
11th	31	1	5	10	15	7	155	38	35	202
12th	24	0	6	20	12	7	160	30	30	208
Sum >>	678		54		271	133	2956	808	596	3843

Grade K-10										
AM Trips Generated					PM Trips Generated					
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips		
IN	349		43	392	244			244		
OUT	349			349	244		43	287		
AM K-10 Trips				740	PM K-10 Trips				531	

Grade 11										
AM Trips Generated					PM Trips Generated					
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips		
IN	16		5	21	15			15		
OUT	16			16	15		5	20		
AM 11th Trips				38	PM 11th Trips				35	

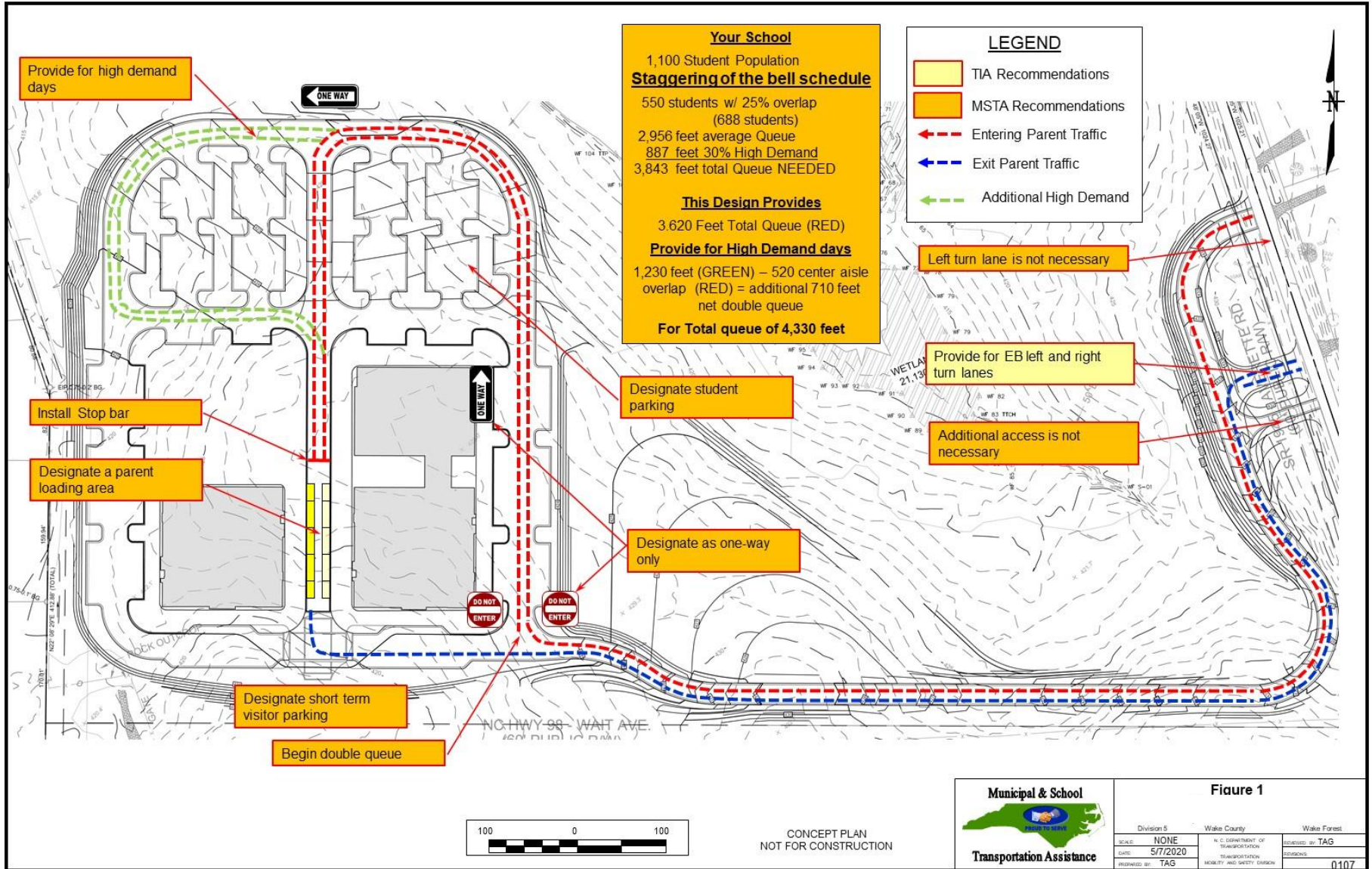
Grade 12										
AM Trips Generated					PM Trips Generated					
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips		
IN	12		6	18	12			12		
OUT	12			12	12		6	18		
AM 12th Trips				30	PM 12th Trips				30	

All AM TRIPS			All PM TRIPS		
	In	Out	In	Out	Total
	431	377	271	325	596
	Total 808		Total 596		1404

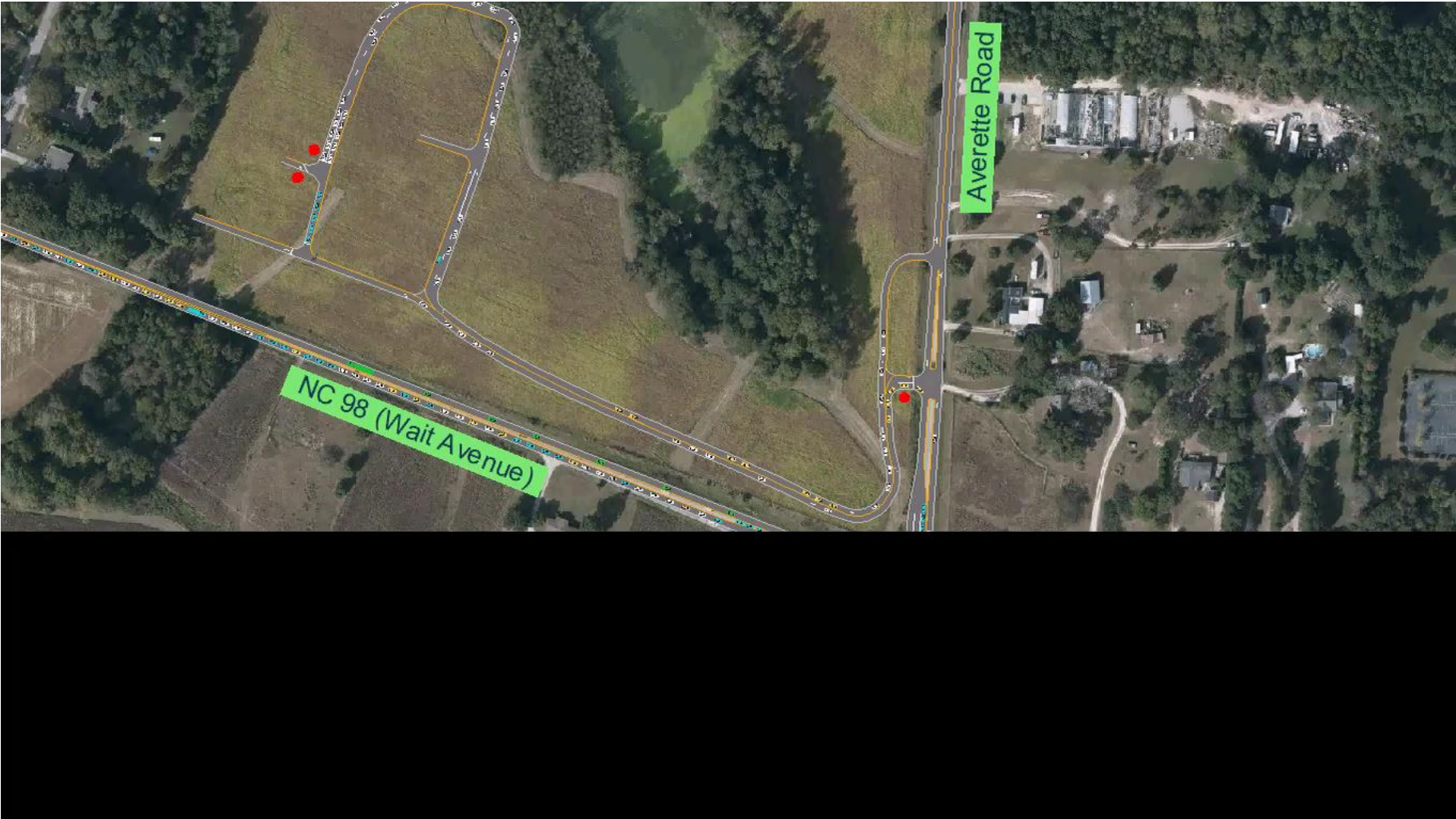
ADT
1271
73
60
1404

NOTES

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)







Questions?



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