

## **Technical Memorandum**

**To:** Ms. Suzanne Townsend — *St. Mark's School of Texas*  
**From:** Gabriel Dowell, P.E. — *DeShazo Group, Inc.*  
**Date:** March 11, 2021  
**Re:** Traffic Management Plan Update for St. Mark's School of Texas in Dallas, Texas  
*DeShazo Project Number 20149*



### **INTRODUCTION**

DeShazo Group, Inc. (DeShazo) is an engineering consulting firm based in Dallas, Texas, providing licensed engineers and planners skilled in the field of traffic and transportation engineering. The services of DeShazo were retained by **St. Mark's School of Texas** to provide a traffic management plan (TMP) update for the existing campus located at 10600 Preston Road in Dallas, Texas.

The academic institution currently has an enrollment of approximately 903 students in 1<sup>st</sup> through 12<sup>th</sup> grade. As of the time observations were performed, only 6.2 percent (approximately 56) students were attending classes remotely. While the school was severely damaged during the tornado that passed through the area in October of 2019, no driveways or queuing infrastructure were impacted.

This TMP update report consists of the existing and anticipated traffic conditions at the school during the morning drop-off and afternoon pick-up peak periods. It determines whether the previously submitted plans effectively fulfill the safe and effective traffic operation management around the school. Also, it provides the recommendations to improve the effectiveness of the existing traffic management plan.

The school site is zoned Planned Development (PD) District 553.

By consent of the TMP, the school agrees to be held self-accountable for the enforcement of the strategies presented herein until and unless the City of Dallas deems further measures are necessary. (NOTE: In this report, the term "parent" refers to any individual who is involved in the drop-off or pick-up of one or more students at the school).

## TRAFFIC MANAGEMENT PLAN

A school TMP is important to safely achieve an optimum level of traffic flow and circulation during peak traffic periods associated with student drop-off and pick-up. By properly managing the vehicular traffic generated during critical periods, the safety and efficiency of other modes of travel—including pedestrian traffic—will also inherently improve and the operational impact on the public street system should also be minimized. **This plan, however, should not be considered a comprehensive set of instructions to ensure adequate safety; it should be used as a tool to facilitate a safer and more efficient environment.**

The analysis summarized below identifies the projected vehicle demand including parking and queuing space (i.e. vehicle stacking) needed on site to accommodate projected school traffic demand during peak periods. A concerted effort and full participation by the school administration, staff, students and parents are essential to maintain safe and efficient traffic operations. The use of designated parking and queuing areas is necessary to minimize the operational impact on adjacent properties and the public street system.

### Site Access and Circulation

The school site is accessed via three driveways. Two driveways connect the west side of the site to Preston Road the most northern of which serves as the ingress point for the pick-up/drop-off queues. A third driveway intersects Orchid Lane to the north and serves a primary point of egress for the pick-up/drop-off queues.

### School Operational Characteristics

Table 1 summarizes the school’s operational characteristics assumed in this analysis.

**Table 1. School Operational Characteristics**

	Existing Condition (Full Capacity)	Existing Condition (94% capacity)
Enrollment (by grade)	1 <sup>st</sup> Grade – 32 students 2 <sup>nd</sup> Grade – 34 students 3 <sup>rd</sup> Grade – 36 students 4 <sup>th</sup> Grade – 50 students 5 <sup>th</sup> Grade – 75 students 6 <sup>h</sup> Grade – 81 students 7 <sup>th</sup> Grade – 89 students 8 <sup>th</sup> Grade – 94 students 9 <sup>th</sup> Grade – 106 Students 10 <sup>th</sup> Grade – 103 Students 11 <sup>th</sup> Grade – 101 Students 12 <sup>th</sup> Grade – 102 Students  <i>Total: 903 students</i>	1 <sup>st</sup> Grade – 30 students 2 <sup>nd</sup> Grade – 32 students 3 <sup>rd</sup> Grade – 34 students 4 <sup>th</sup> Grade – 47 students 5 <sup>th</sup> Grade – 70 students 6 <sup>h</sup> Grade – 76 students 7 <sup>th</sup> Grade – 84 students 8 <sup>th</sup> Grade – 88 students 9 <sup>th</sup> Grade – 99 Students 10 <sup>th</sup> Grade – 97 Students 11 <sup>th</sup> Grade – 94 Students 12 <sup>th</sup> Grade – 96 Students  <i>Total: 847 students</i>
Daily Start/End Schedule	Lower School: Start: 7:45 AM End: 3:15 PM Middle School: Start: 8:30 AM End: 3:20 PM	Lower School: Start: 7:45 AM End: 3:15 PM Middle School: Start: 8:30 AM End: 3:20 PM

	Upper School Start: 8:35 AM End: 3:35 PM	Upper School Start: 8:35 AM End: 3:35 PM
Approximate Percentage of Students Travelling by Mode Other Than Drop-off/Pick-up	By Walking: $\cong$ 0% Self-Driving: $\cong$ 22.1% Transit: $\cong$ 0%	By Walking: $\cong$ 0% Self-Driving: $\cong$ 22.1 % Transit: $\cong$ 0%

NOTE: To the highest degree practical, existing conditions presented in this report are based upon actual on-site observations conducted by DeShazo during typical school day(s) conditions and information provided by personal interviews of school representatives. Analyses and recommendations presented in this report for proposed conditions were based upon evaluations of existing conditions supplemented by DeShazo's professional judgment and experience

### ***Observation of Existing Traffic Operation at 94% Capacity***

As required by the City of Dallas, DeShazo observed on-site traffic on four different occasions at the following date and times. In general, most peak traffic activity occurred within thirty minutes.

- Tuesday, December 8, 2020, during student dismissal
- Wednesday, December 9, 2020, during student arrival
- Wednesday, December 9, 2020, during dismissal
- Thursday, December 10, 2020, during student dismissal
- Wednesday, March 10, 2021, during student dismissal

Field observations indicate that current practices during the morning drop-off and afternoon pick-up periods runs the traffic operation smoothly. Arrival of vehicles in the morning drop-off is more sporadic than traffic during the afternoon pick-up period. In general, vehicular traffic near the vicinity of the school operates without any evident traffic delay or congestion.

### **Site Access**

A total of three access driveways serve the school site: two driveways connect the west side of the site to Preston Road and a third driveway intersects Orchid Lane to the north. Each driveway provides access to both inbound and outbound traffic.

### **Site Circulation and Passenger Loading/Unloading**

During drop-off periods, parents enter the campus to unload students within the site. Most parent-vehicles enter the campus via the main (northernmost) driveway on Preston Road, unload students in front of their respective school building and proceed to the exit from the site on either Orchid Lane or the same driveway on Preston Road. Alternatively, parents are also permitted to proceed toward the visitor-designated parking area and walk students to the building.

During the pick-up period, parents enter the school campus via the main (northernmost) driveway on Preston Road and form a queue toward their respective loading area along the designated route. Once in queue, traffic operates as a single line of vehicles with the opportunity to exit (or bypass before reaching the loading area. Based upon actual on-site observations of existing traffic operations, vehicles have no problem exiting sequentially upon leaving the loading area. Exiting traffic drives back toward the egress driveway on either Preston Road or Orchid Lane. Student drivers may enter the site via the main (northernmost) driveway or Orchid Lane to proceed toward their designated parking area. Some lower school parents park and walk to the building to pick-up their student. For instance, during the March 20 observation period, 12 parents were observed retrieving their students. As evident from

observations and existing operations, however, school staff carefully patrol traffic activities and coordinate traffic in a timely and organized manner.

The school currently enforces a managed loading protocol during the afternoon pick-up periods whereby vehicles enter and circulate through a prescribed route and form a systematic queue. Lower School students are dismissed from school at specified times and wait inside the school building for school staff to deliver them to their parents' vehicles, thereby actively managing the loading process. School staff members are also positioned at strategic locations ahead of the pick-up areas to relay the sequence of parents' arrival back to the loading zone. School staff loads several vehicles simultaneously with the assistance of staff stationed at the loading area. Once loaded, vehicles are cleared by school staff to carefully egress along the designated route.

### Vehicle Queuing Observations

The goal of any TMP should be to accommodate the maximum pick-up/drop-off queue on-site such that it does not extend onto a public right-of-way. DeShazo's school observations consistently indicate that maximum queues occur during the afternoon peak period when students are being picked-up; the morning period is typically not a significant traffic issue since drop-off activities are more temporally distributed and occur much more quickly than pick-up. The observed peak number of vehicles during each dismissal time is provided as follows in **Table 2**.

**Table 2. Peak On-Site Vehicle Demand during Afternoon Pick-Up Period**

LOADING ZONE	LOWER SCHOOL	LOWER SCHOOL	MIDDLE SCHOOL	UPPER SCHOOL
(School Grades)	(1-2nd)	(3-4th)	(5-8th)	(9-12th)
Dismissal Time	2:55 PM	2:55 PM	3:35 PM	3:35 PM
Student Enrollment	66 Students	86 Students	339 Students	412 Students
Maximum Queue Observed	<b><u>49 vehicles at 2:55 PM</u></b>		<b><u>48 vehicles at 3:35 PM</u></b>	
Adjusted Maximum Queue*	<b><u>51 vehicles at 2:55 PM</u></b>		<b><u>51 vehicles at 3:35 PM</u></b>	
Projected Maximum Queue (Post-Pandemic)	<b><u>34 vehicles at 2:55 PM</u></b>		<b><u>51 vehicles at 3:35 PM**</u></b>	

\*Adjusted to account for the normal scenario wherein all students are attending classes in person.

\*\*NOTE: Middle and Upper School students, as of the time observations were performed, were participating in after-school activities.

As may be see above, the maximum lower school pick-up queue was observed to be greater than the middle and upper school pick-up queue. This is likely due to the following reasons:

- Lower School queue is single-stacked while middle and upper school queue is triple stacked.

- Lower school students, if not picked up at the school entrance by a parent, must be escorted to their parent's vehicle and loaded by a staff member.
- Nearly half (48%) of upper school students are self-driving and park on campus.
- For middle and upper school students, if the final period of the day is study hall, they may be dismissed from school early to be picked up by parents or leave campus themselves if they are self-driven.

It should further be noted that, unlike lower school students, many middle and upper school students are student athletes and do not leave campus until their various sports activities are finished, typically between 5:00 and 6:00 PM. Queue capacity calculations are shown in greater detail in **Exhibit 1**.

The school pick-up schedule has changed since the last TMP update. This year, St. Mark's School is implementing a new 'daily schedule'. As a result, all lower school students are dismissed at the same time (2:55 PM) while all middle and upper school students are dismissed at the same time (3:35 PM) with the exception of student athletes and those students who leave school during the final period study hall.

### ***Vehicular Queuing Analysis***

The lower school drop-off/pick-up queue length is 683 linear-feet (LF) or approximately 29 vehicles at a rate of 23.5 LF per vehicle. Observations on-site consistently showed that 27 to 30 vehicles could fit within the on-site queue length without spilling over onto Preston Road. Given the current abnormal circumstances the school has experienced during the COVID-19 pandemic, all lower school students are being dismissed at the same time with no after-school care or after-school activities available. According to school representatives, under normal circumstances, approximately 52 lower school students would be involved in after-school care and activities each day. This accounts for roughly 33 percent (33%) of the lower school student population. Furthermore, if the lower school pick-up zone is extended to the location shown in **Exhibit 1**, the effective queue length will be extended up to 810 LF. If this is done, there will be sufficient space on school property to accommodate the peak queue. Specifically, the peak queue adjusted to account for students participating in after-school activities is 34 vehicles or the equivalent of 802 LF of queuing length.

The middle and upper school drop-off/pick-up queue, when triple-stacked, provides a capacity of 1,633 LF or approximately 69 vehicles. The triple-stacked queuing method was observed to operate safely and efficiently with four members of security staff directing traffic in the queue, negating risk at cross-over points. As the adjusted maximum queue was 51 vehicles at 3:35 PM, a surplus of 18 vehicles was observed. Thus, no corrective action is needed for the middle and upper school queue.

### ***Parking and Event Management***

Approximately 430 parking spaces are provided by the school in accordance with their PD. While a small staff parking area will be eliminated due to construction (17 spaces), school parking supply once construction is completed will total more than 500 spaces. Currently, approximately 200 upper school students drive to school every day. Additionally, approximately 155 staff members drive to the campus every day. It is expected that this figure will increase to 190 staff members once the pandemic ends. Thus, under non-pandemic conditions, it may be expected that 390 parking spaces of the required supply of 430 spaces will be utilized on an average school day. Once full site build-out is complete, it is expected that 110 spaces will be left as excess supply.

Prior to the COVID-19 pandemic, the school would occasionally host athletic events on campus. However, these athletic events would not be held during school hours. Rather, events would occur after-hours once students and the majority of staff members had left. Due to pandemic conditions, athletic events were not being hosted on-campus, thus event observations were not possible. Instead, historic information was provided by school representatives. During events, the northwestern corner of the school property is used for overflow parking. The school plans to continue using this area for overflow parking as necessary upon full site build-out. Thus, the school has a sufficient parking supply to accommodate demand during school days and events.

## RECOMMENDATION

With the revision of the 'daily schedule', all lower school students are released at the same time (2:55 PM). The current circulation plan followed by St. Mark's School of Texas provides sufficient space for middle and upper school queues. However, a spillover onto Preston Road occurs for the lower school queue. Observations on-site consistently showed that 27 to 30 vehicles could fit within the on-site queue length with additional vehicles spilling over onto Preston Road. The average adjusted lower school pick-up queue was 51 vehicles at 2:55 PM which exceeds calculated queue capacity by 25 vehicles. This observed spillover is due to the implementation of the revised schedule, causing all lower school students to be dismissed at the same time. It should further be noted that observations consistently showed roughly half of parent vehicles arriving before the 2:55 PM pick-up time.

However, under normal circumstances, some lower school students participate in after-school extracurricular activities (on average, 12 students per day) with an even greater number waiting in after-school care (on average, 40 students per day) for their parents to arrive after the standard pick-up time. Taking this into account justifies a 33% reduction to the 152 lower school student population that would otherwise be picked up at the 2:55 dismissal time. This brings the calculated spillover down to only five vehicles. The school should correct this by taking the following actions:

- The current lower school student loading zone is centered around the main lower school entrance. The school should extend this zone to the halfway point between the neck of the cul-de-sac and the main school driveway as shown in **Exhibit 1**, thereby increasing effective on-site queue length from 683 LF to 810 LF to accommodate the calculated five vehicle deficiency.
- Currently, nearly half of parents arrive before 2:55 PM. It is recommended that the school encourage parents to arrive at the scheduled dismissal time.

If the school takes the above recommended actions, no queue is anticipated to spill-over onto Preston Road. Full cooperation of all school staff members, students and parents is crucial for the success of the systematic queue. Proper training of school staff on the duties and expectations pertaining to this plan is recommended. Sufficient communication at the beginning of each school term (and otherwise, as needed) with students and parents on their duties and expectations is also recommended. School administration should review details of this TMP on a regular basis to confirm its effectiveness.

**END OF MEMO**

### SCHOOL REVIEW AND COMMITMENT

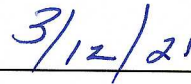
This plan was developed for St. Mark's School of Texas with the intent of optimizing safety and efficiency related to vehicular traffic generated by the School during peak traffic periods. A concerted effort and full participation by the School administration, staff, students and parents are essential to maintain safe and efficient traffic operations.

The School has reviewed the Traffic Management Plan and is in support of the strategies presented herein.

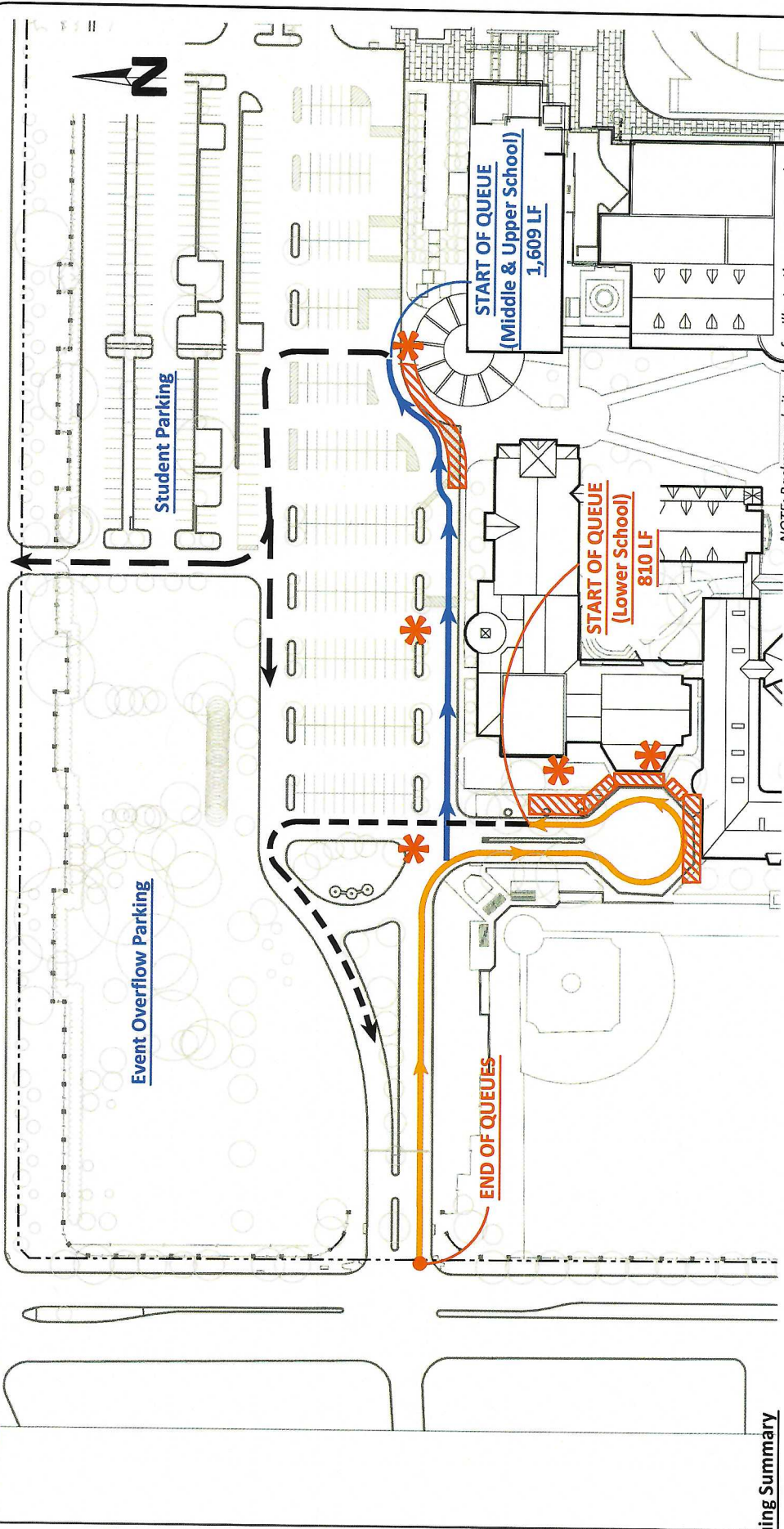
The School is committed to continually reviewing and assessing the effectiveness of the TMP and if warranted, will implement changes in the interest of increasing safety, efficiency and minimizing impacts on the surrounded community.



Suzanne Townsend, Chief Financial Officer  
St. Mark's School of Texas



Date



**Queuing Summary**

Student Group	Dismissal Times	Vehicular Traffic
Lower School (66 Students) Grades 1-2nd	2:55 PM	Provided: 810 LF (34 cars)
		Required: 802 LF (34 cars)
		Deficit: 8 LF (0 cars)
Lower School (86 Students) Grades 3-4th	2:55 PM	Provided: 810 LF (34 cars)
		Required: 802 LF (34 cars)
		Deficit: 8 LF (0 cars)
Middle School (339 Students) Grades 5-8th (Triple-Stacked)	3:25 PM	Provided: 1,609 LF (68 cars)
		Required: 1,199 LF (51 cars)
		Surplus: 410 LF (17 cars)
Upper School (412 Students) Grades 9-12th (Triple-Stacked)	3:25 PM	Provided: 1,609 LF (68 cars)
		Required: 1,199 LF (51 cars)
		Surplus: 410 LF (17 cars)

**Legend**

- School Staff
- Loading Area
- Queue Capacity (Lower School)
- Queue Capacity (Middle and Upper School)
- Outbound Route

NOTE: Background site plan for illustration purpose only.

The purpose of this Traffic Management Plan (TMP) is to evaluate traffic operations that promote safety and efficient vehicle circulation. This TMP was developed to prevent queuing of drop-off/pick-up related vehicles within the city rights-of-way. The school administration should adhere to this TMP.

I, Gabriel B. Dowell, P.E. #131604, certify that the results of the queuing analysis upon complete enforcement of this Traffic Management Plan and under normal, non-pandemic conditions indicated that no queuing of vehicles will extend onto City of Dallas right-of-way as a result of internal queuing constraints during the study peak hours of school operation.

\*Vehicular queue calculated at 23.5 feet/car based on field observations.

**Traffic Management Plan**

St. Mark's School of Texas  
10600 Preston Road, Dallas, Texas