

TRAFFIC MANAGEMENT PLAN

Richardson ISD White Rock Elementary School Dallas, Texas

July 27, 2017

Prepared for
Richardson ISD



D.S. Stuller

07/27/2017

AVO 32832



1201 North Bowser Road
Richardson, Texas 75081

TBPE Firm Registration No. 312

Table of Contents

I.	INTRODUCTION.....	1
II.	TRAFFIC MANAGEMENT PLAN	2
2.1	Operational Characteristics.....	2
2.2	Existing Traffic Conditions	3
2.2.1	Site Access and Circulation.....	3
2.2.2	Passenger Drop-Off and Pick-Up Operations	3
2.3	Projected Traffic Conditions.....	6
2.3.1	Site Access and Circulation.....	6
2.3.2	Passenger Drop-Off and Pick-Up Operations	6
2.4	Recommendations.....	10
III.	SUMMARY	12

I. INTRODUCTION

Halff Associates, Inc. (Halff) is a full service architectural/engineering firm based in Richardson, Texas with licensed engineers specializing in traffic and transportation. Halff was retained by Richardson ISD (Client) to prepare an updated Traffic Management Plan (TMP) for White Rock Elementary School located in Dallas, Texas. A TMP for this school was last prepared and submitted in June of 2016 for the addition of one portable building containing two classrooms.

White Rock Elementary School currently has an enrollment of 938 students in grades K-6th. The school is located within a residential neighborhood south of Walnut Hill Lane between Audelia Road and White Rock Trail. Figure 1 below is a map detailing the site location. A copy of the TMP has been included in the Appendix as Exhibit 1.



** Trafficware Synchro 8 screenshot reprinted with permission from Microsoft Bing Maps*

Figure 1 – Site Location Map

Due to existing and projected growth in the area over the next several years, the Richardson ISD (RISD) is planning to add 12 new classrooms to the existing building. The additional classrooms are scheduled to be in place by August 2018. With the increase in projected student population, an update to the current TMP for the school is required as part of the Planned Development (PD) submittal. With this TMP submittal, the school is agreeing to implement the management plan strategies as presented and will be self-accountable unless the City of Dallas deems further measures are appropriate or necessary.

II. TRAFFIC MANAGEMENT PLAN

The purpose of the Traffic Management Plan (TMP) is to have established procedures for traffic flow and circulation around the elementary school related to student drop-off and pick-up operations. Use of a TMP helps improve traffic/student safety and helps maximize the efficiency of drop-off and pick-up operations, reducing delays during those time periods. The analysis summarized in this report identifies critical elements of the TMP such as available queuing space that is both on and off site, circulation patterns for the school facilities, and the projected trip generation (and estimated queuing) during the morning and afternoon peaks. For a TMP to be successful, it requires effort and compliance by school administration, staff, students, and parents.

2.1 Operational Characteristics

Based on information from Richardson ISD and recent AM / PM peak period observations, the following are existing and projected conditions for the school:

	Existing Conditions	Projected Conditions
Enrollment (K – Grade 6)	938 students	1,150 students
Daily Schedule:	Start: 7:50 AM Dismissal: 3:00 PM	Start: 7:50 AM Dismissal: 3:00 PM
Travel Modes: AM Peak Hour	by School Bus <5% by Walking ~20% by Drop-off on site ~55% by Drop-off / park and walk off site <25%	by School Bus <5% by Walking ~20% by Drop-off on site ~55% by Drop-off / park and walk off site <25%
Travel Modes: PM Peak Hour	by School Bus <5% by Walking <30% by Pick-up on site ~30% by Pick-up / park and walk off site <40%	by School Bus <5% by Walking <30% by Pick-up on site ~30% by Pick-up / park and walk off site <40%

It should be noted that the drop-off and pick-up operations at this school are unique from other elementary schools in that a large percentage of the parents drive to the school area then park on residential streets in the area and walk children to the school in the morning and park and walk in the afternoon to pick up children. There are also parents who drop off and pick up along the adjacent streets. The parents that drop-off and pick-up on the streets were included with the parents that park and walk to represent a number of vehicles that never enter the site.

Although the operating times of the school are established, not all students enter/exit the site at the same time. Other activities at the school (such as breakfast program, after school tutoring, student clubs, etc.) may cause students to arrive/leave at times outside the normal class times. Occasional special events at the school may generate traffic peaks that are outside of the normal

drop-off and pick-up times. While these special events were not reviewed as part of the TMP, measures or recommendations discussed may be applicable.

2.2 Existing Traffic Conditions

2.2.1 Site Access and Circulation

White Rock Elementary School has frontage on two residential streets. To the southwest of the school (which is the front side of the school) is Chiswell Road, which is a two-lane residential road 36 feet in width adjacent to the school property. Access to the one-way main loop drive (counterclockwise flow) is located on Chiswell Road. Along the southeast edge of the site is Bellewood Drive, which also is a two-lane residential street and is 36 feet in width adjacent to the school site. On the south corner of the site is a staff/visitor parking lot with driveways on both Chiswell Road and Bellewood Drive. Along the southeast side of the school and around in back of the school is staff parking, which is accessed via two driveways on Bellewood Drive. The easternmost driveway on Bellewood Drive provides access to both the staff parking lots and the second designated drop-off / pick-up location on the backside of the school. The drive aisle along the southeast side of the school is also the unloading and loading area for two (2) small Special Education buses.

2.2.2 Passenger Drop-Off and Pick-Up Operations

Following the 2014 TMP update, the second loop (back loop) located in the back of the school has been operational providing another on-site location for the drop-off and pick-up of school children. The back loop has helped to distribute the vehicle demand for drop-off and pick-up on the site reducing delays in the front loop.

Halff conducted field observations during the school's AM and PM peak periods on two different days on two different weeks, Tuesday April 18th and Thursday April 27th. The morning observations were conducted between 7:00 AM and 8:00 AM and the afternoon observations were conducted between 2:15 PM and 3:15 PM. The data collected on the two different days was averaged to develop typical numbers for the modes of travel during the morning and afternoon peak periods.

Morning Peak Operations

Currently, the front loop serves as the main on-site location for dropping off children in the morning. It is available for the drop off of all grade levels. There are four staff in the front loop as well as five safety patrol (5th or 6th graders) out front before 7:30 AM to assist students exiting the vehicles. There are also five dads that assist with the management of traffic within the loop as well as assisting students out of the vehicles. Access to the back loop is off of Bellewood Drive. Students are dropped off at the cafeteria doors where there is one staff member on location before 7:30 AM assisting students exiting the vehicles. (There are no safety patrol assigned to the back loop.) The Special Education buses (2) drop off children in the drive aisle located along

the southeast side of the building. (Typically, there are 2-3 staff members to assist in unloading the students.)

The off-site dropping off of students primarily occurs along Bellewood Drive between Chiswell Road and Wildhaven Drive and on northbound Chiswell Road between Bellewood Drive and the front loop entrance. Many parents park and walk children to the school. Areas where this parking occurs include Chiswell Road, Bellewood Drive, Clearhurst Drive, Forestridge Drive and Wildhaven Drive.

The average number of morning vehicle trips related to student arrival (observed) for the two study days is provided in Table 1 below. (It was noted that there was an average number of 179 students walking to school in the morning.)

Table 1 – Vehicle Trips Generated Related to Drop-Off activities (Observed)

Elementary School 938 students	School AM Peak Period		
	In	Out	Total
Drop-off Loop (Front)	244	244	488
Drop-off Loop (Back)	58	58	116
On-Street Drop-off / Park & Walk	112	112	224
Total Trips - Observed	414	414	828

Regarding the queuing of vehicles, the front loop has two lanes allowing simultaneous left and right turns into the loop before going to two drop off points downstream. The average vehicle queue length for the right turn into the loop for the two mornings extended approximately 9-10 vehicles south of Bellewood Drive. Including on-site space and the short space between the loop and Bellewood Drive, the total number of vehicles queued averaged approximately 19 vehicles. The average queue length for the left turn movement into the loop was approximately 13 vehicles (to just south of Clearhurst Drive). Accounting for approximately 10 vehicle queue spaces in the loop, the total approximate maximum queue length for the left turn movement was 23 vehicles.

In the back loop, students are dropped off at the cafeteria doors. The queuing of vehicles in the back loop is totally contained on the site with the average queue length for the two days of 11 vehicles or approximately 275 feet. There was still approximately 160 feet of space between the end of queue and Bellewood Drive.

At both the front and back loops, the queues in the morning are rolling queues. The maximum queues identified occurred at one moment and then start to dissipate.

Afternoon Peak Operations

Currently, the front loop serves as the main on-site location for picking up children in the afternoon, but the vehicle volume is significantly lower when compared to the morning. In the afternoon, the front loop is primarily designated for pick-up of students in grades K-3rd with grades 4th-6th and younger siblings being picked up in the back loop. There are up to eight (8) staff working the front loop as well as five safety patrol (5th or 6th graders) out front before 3:00 PM to assist students into the vehicles. (There are no dads working the front loop in the afternoon.) In the back loop the pick up operations occur at the east end of the south wing of the school. This provides approximately 250 additional feet of on-site queuing than what is available in the morning for drop offs. At the back loop there are up to 4 staff on location before 3:00 PM assisting by calling names ahead to the cafeteria and assisting students into the vehicles. As in the morning, there are no safety patrol assigned to the back loop. The Special Education buses (2) pick up children in the drive aisle located along the southeast side of the building. (Typically, there are 2-3 staff members there to assist loading the students.)

The off-site picking up of students primarily occurs along Bellewood Drive between Chiswell Road and Wildhaven Drive. Many parents park and walk to meet the children at the school. Areas where this parking occurs include Chiswell Road, Bellewood Drive, Clearhurst Drive, Forestridge Drive, Wildhaven Drive and Broken Bow Road.

The average number of afternoon vehicle trips related to student pick-up (observed) for the two study days is provided in Table 2 below. (It was noted that there was an average number of 251 students walking from school in the afternoon.)

Table 2 – Vehicle Trips Generated Related to Pick-Up activities (Observed)

Elementary School 938 students	School PM Peak Period		
	In	Out	Total
Pick-up Loop (Front)	54	54	108
Pick-up Loop (Back)	35	35	70
On-Street Pick-up / Park & Walk	123	123	246
<i>Total Trips - Observed</i>	212	212	424

Regarding the queuing of vehicles in the afternoon, vehicles continue to make both right and left turns into the front loop, but do not turn simultaneously. Instead, parents take turns making their turns and pick up in one continuous line. The average queue length for the vehicles making a right turn into the loop was similar to the morning average of 9-10 vehicles queued south of Bellewood Drive. Adding the space for two vehicles between the loop drive and Bellewood Drive and accounting for the full loop drive, provided a total queue of approximately 22 vehicles. On both days, the queue to make a left turn into the loop was minimal, 1-2 vehicles at the most.

In the back loop, the average queue length was 15 vehicles, all contained within the site. There was over 250 feet of additional queue space available on the site before entering Bellewood Drive.

At both the front and back loops, the queues don't start moving until they start loading students into the vehicles. Once the loading begins, the queues become a rolling queue, similar to what is experienced during the morning peak.

2.3 Projected Traffic Conditions

2.3.1 Site Access and Circulation

Access to the site will remain the same. However, due to the reconstruction of the existing drive aisle and parking area along the southeast side of the building to address flood plain issues, access to the back loop, which will be relocated to the northeast corner of the building, will be from the west drive that aligns with Forest Ridge Drive. The existing east drive that currently serves both the parking area and the back loop will only serve Special Education buses entering the site due to the difference in grades. The front loop on Chiswell Road will not change. The two (2) Special Education buses will continue to unload and load students in the drive located along the southeast side of the building as they do today. (Refer to Exhibit 1 which depicts the proposed plan.)

2.3.2 Passenger Drop-Off and Pick-Up Operations

As part of the expansion, the school is planning to expand and encourage the use of the back loop for the drop off and pick up of students. The front loop will primarily serve grades K-2nd with the back loop serving grades 3rd-6th. The front loop could still be used by anyone to drop off in the morning, but use of the back loop is highly encouraged for grades 3rd-6th.

It is anticipated as the enrollment increases at the school, the pattern of how students arrive at the school in the morning and leave the school in the afternoon will not change. There will still be a large percentage of students that are either dropped-off / picked-up on one of the adjacent streets or parents will continue to park and walk the children to the school in the morning and do the same to pick them up in the afternoon. The school is being designed to provide up to four locations along the north side of the building where students can enter and exit the school in both the morning and afternoon. This is being planned to address the large number of walkers and park and walk students.

Based upon the information provided by the Client, Halff assumed 60 percent of the students would be dropped off in the front loop in the morning with 40 percent being dropped off in the back loop. In the afternoon, the assumption was made there would be an equal 50/50 split of students being picked up in the two loops.

Proposed Morning Peak Operations

As mentioned above, the front loop will primarily serve grades K-2nd, but can be used by anyone for drop off. The plan is to have three staff members work the front loop along with five safety patrol in place by 7:30 AM to assist students exiting the vehicles. There will be 5-6 stations to expedite the unloading of the vehicles. Four dads will also assist with the management of traffic within the loop as well as assisting students out of the vehicles.

The back loop drop-off location at the cafeteria will be set up to receive more students at one time to encourage more drop offs. The plan is to have two staff members work the back loop along with three safety patrol in place by 7:30 AM to assist students exiting the vehicles. There will be two unloading stations to receive students. There will be 2-3 dads working the back loop to manage the traffic flow and assist in the overall operation of the loop drive. The two (2) Special Education buses will continue to drop off in the drive aisle located on the southeast side of the school with 2-3 staff members assisting in unloading students.

The school is being designed to accommodate up to 1,150 students which is a 23 percent increase over the current enrollment of 938. Based upon the breakdown of how students arrive at the school today, the planned uses of the front and back loops and the 23 percent increase in student enrollment, the projected average generated number of morning vehicle trips related to getting students to school is provided in Table 3 below. (The projected numbers are based upon a straight line projection of the existing numbers.) (Based upon the number of students walking to school today, the projected number of walkers is 220.)

Table 3 – Projected Vehicle Trips Generated Related to Drop-Off activities

Elementary School 1,150 students	School AM Peak Period		
	In	Out	Total
Drop-off Loop (Front)	223	223	446
Drop-off Loop (Back)	148	148	296
On-Street Drop-off / Park & Walk	138	138	276
Total Vehicle Trips	509	509	1018

As mentioned above, the front loop is anticipated to operate similarly to the current conditions regarding how it will be staffed as well as the projected volume of vehicles (approximately 21 fewer vehicles entering in the future). Therefore, it is anticipated the projected vehicle queuing on Chiswell Road north and south of the entrance to the loop drive will be about the same, approximately 9-10 vehicles queued south of Bellewood Drive for right turns into the loop and approximately 13 vehicles queued north of the loop drive for left turns into the loop.

Based upon the proposed use for the back loop and the increase in enrollment, there will be an increase in the number of vehicles that will use the loop to drop off students in the morning peak.

Currently, an average of 58 vehicles drop off in the back loop. That number is projected to increase to 148. The existing average queue length is 11 vehicles, approximately 275 feet. For a worst case scenario based upon one staff member unloading vehicles at a single location, the queue will increase to 28 vehicles or approximately 700 feet. In the new plan, with the entrance and exit for the back loop drive located at the existing west drive that aligns with Forest Ridge Drive, there will be approximately 775 feet of queue space on the site before vehicles will start to spill out onto Bellewood Drive. In addition, as mentioned above, the plan is to have two staff members plus three safety patrol assisting the unloading of students at two drop-off locations which will expedite the unloading process. Assuming a conservative 1.5 vehicles can be unloaded at two stations in the same amount of time that one vehicle is unloaded today, the projected 700 foot queue can be reduced to approximately 470 feet which can easily be contained on the site. In addition, there will be 2-3 dads working the back loop to manage the traffic flow and assist in the overall operation of the loop drive.

As previously mentioned, these are moving queues at both loops, unlike the afternoon when vehicles stop and wait until a specific time before they can start moving.

Proposed Afternoon Peak Operations

As previously mentioned, the front loop will primarily serve grades K-2nd and function similarly as it does today. The plan is to have 6-8 staff members work the front loop along with five safety patrol that will be in place by 2:55 PM to assist students entering the vehicles. There will be 5-6 unloading stations to receive students.

In the back loop, currently students are being picked up at the east end of the south wing of the building. The plan includes extending the south wing to the east. Students will now be picked up at the east end of the extension. The pick-up operations will function similarly as they do today. There will be four staff members assisting in calling out names, getting students out of the building and into the cars. (There will be no safety patrol assisting in the afternoon.) Staff will be in place by 2:55 PM. Also, the plan is to have two loading stations, instead of the one that operates today, to expedite the loading process. The two (2) Special Education buses will continue to pick up in the drive aisle located on the southeast side of the school with 2-3 staff members assisting in loading students.

Based upon the breakdown of how students leave the school today, the planned uses of the front and back loops and the 23 percent increase in student enrollment, the projected average generated number of afternoon vehicle trips related to students leaving the school site is provided in Table 4 below. (The projected numbers are based upon a straight line projection of the existing numbers.) (Based upon the number of students walking home today, the projected number of walkers is 309.)

Table 2 – Projected Vehicle Trips Generated Related to Pick-Up activities

Elementary School 1,150 students	School PM Peak Period		
	In	Out	Total
Pick-up Loop (Front)	55	55	110
Pick-up Loop (Back)	55	55	110
On-Street Pick-up / Park & Walk	151	151	302
<i>Total Vehicle Trips</i>	261	261	522

Regarding the queuing of vehicles in the afternoon, the front loop should operate almost identical to how it operates today. (The projected number of vehicles entering the loop is only one more than what currently enters.) Therefore, it is anticipated the vehicle queue lengths will be about the same as they are today, a minimal queue of 1-2 vehicles to make the left turn into the loop drive and 9-10 vehicles queued south of Bellewood Drive to make a right turn into the loop.

The actual operations in the back loop will function similarly to how they operate today. There will be fewer staff members (two), but there will be three safety patrol, which don't exist today, to assist in loading the vehicles. Due to the change of use in the back loop and the projected increase enrollment, there is a projected increase in the number of vehicles picking up (55) from the current average of 35. The existing average maximum queue observed was 15 vehicles or approximately 375 feet. Assuming similar loading operations as exist today, similar number of people loading and one loading station, the projected maximum queue will increase to 24 vehicles or approximately 600 feet.

With the new plan layout, there will be approximately 950 feet of queue space from the location where students are loaded back to Bellewood Drive. Therefore, there should be adequate space on the site to accommodate the projected queue without spilling out onto Bellewood Drive. Since the plan calls for two loading stations instead of the existing one, loading will be more efficient making the projected maximum queue of 24 vehicles a worst case scenario.

At both the front and back loops, the queues don't start moving until they start loading students into the vehicles. Once the loading begins, the queues become a rolling queue, similar to what is experienced during the morning peak.

2.4 Recommendations

Based on the proposed addition of 12 classrooms and changes to the building layout, Halff offers the following recommendations to assist in providing for the safe and efficient movement of pedestrians and vehicles:

- Remove the existing “No Left Turn” symbol sign located on Chiswell Road at the front loop entrance drive for southbound vehicles.
- Remove the existing “No Left Turn” symbol sign located in the front loop exit drive at Chiswell Road.
- Install “No Parking or Standing “7:00 AM – 8:00 AM and “2:15 PM – 3:15 PM School Days” signs on the north side of Bellewood Drive between the alley on the school’s east property line west to the driveway that serves the staff parking / day care van lot.
- School staff should continue to encourage parents to use only designated areas located on-site for pick-up and drop-off activity. Pick-up and drop-off activity on public right-of-way should be discouraged.
- The school administration should continue to train school staff on their duties associated with pick-up and drop-off procedures as outlined in the TMP.
- The school administration should communicate to parents and students regarding expectations and responsibilities related to the TMP throughout the school year as needed. It is particularly important to communicate to parents of new students, who may not be familiar with pick-up/drop-off procedures.

It is recognized that for short periods of time during both the morning and afternoon periods there is significant vehicular traffic and some traffic congestion around the school. However, observations indicate that these conditions are short in duration and traffic dissipates within 15 to 20 minutes in the morning and 20 to 30 minutes in the afternoon. Since the school is located in the middle of a residential area, there is no through traffic in the immediate area to be impacted by the school related traffic. Almost all of the traffic around the school during the morning and afternoon peak periods is school related.

Based on Halff’s observations, the teams that are assembled now for the morning and afternoon operations do a very good job with the unloading and loading of students. Parents appear to be familiar with the operational plans of the TMP and generally adhere to it. Since the operational aspect of the TMP for the proposed addition is basically the same as the existing, it is anticipated the future morning and afternoon peak periods will look very similar to what takes place today, especially in the front loop. There will be more students and more traffic, but with more emphasis on utilizing the back loop and having more available queue space there, the queuing of

vehicles is projected to stay within the site as it does today. Exhibit 1 in Appendix A is a graphical representation of the TMP.

III. SUMMARY

The TMP presented above should be used by administrators and staff at White Rock Elementary School to promote safe and efficient pick-up/drop-off operations for students, parents, and staff. These procedures should also be reviewed periodically and modified/adjusted as needed to reflect current traffic conditions on and around the school campus.