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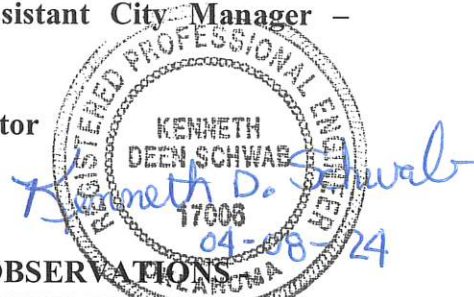
To: Mr. Michael L. Spurgeon, City Manager

From: Mr. Kenneth D. Schwab, P.E., S.E., CFM, Assistant City Manager – Operations

Copied: Mr. Rocky Henkel, Community Development Director

Date: April 8, 2024

Re: TUCSON STREET AND 3rd STREET TRAFFIC OBSERVATIONS,
CHILDERS MIDDLE SCHOOL AND SPRING CREEK ELEMENTARY
SCHOOL END OF DAY STUDENT RELEASE OPERATIONS



1.0 Purpose: In light of the fact that the City of Broken Arrow's Planning Commission unanimously recommended for approval a residential development for the approximately 37 acres situated immediately north of Tucson Street at the 3rd Street intersection, which is located directly across the street from Childers Middle School (CMS) and Spring Creek Elementary School (SCES), both Broken Arrow Public School (BAPS) District's facilities, coupled with the fact that 3rd Street is the entry way to the City of Broken Arrow's Ray Harral Nature Park, the City decided to gather evidence based upon actual field observations in order to provide more definitive information for the governing body.

2.0 Introduction: On April 1, 2024, Mr. Henkel and I visited the BAPS's CMS facility and SCES facility complexes located along 3rd Street and Tucson Street with the expressed purpose to observe the traffic operations directly associated with each individual facility's End of Day School Release (EDSR) operations. Our goal was to observe the traffic operations for each individual facility and their specific individual and collective impacts resulting on 3rd Street and Tucson Street during that period of operations.

It is important to note that at the time of our site visit it was 76 degrees, cloudy, with the threat of thunderstorms moving into the community from the southwest. In fact, we were under a Tornado Watch the entire time of our observation period. This fact suggests that more vehicles than usual would be involved in the EDSR operations. From an observation perspective, this is a good situation in which to evaluate and assessment the impacts.

3.0 Background: We arrived at CMS right at 3:00 pm and, in accordance to our standards of practice and protocols, we immediately checked in with the front office to let them know who we were and what we were doing, as well as obtain the proper permission. After a short discussion

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with CMS staff, we went across 3rd Street to SCES and checked in with its front office for the same expressed purpose.

City traffic count data reveals that in March 2022, the northbound traffic count at the Elm Place and Tucson Street intersection was 12,587 vehicles, while the southbound traffic count was 13,652 vehicles. The corresponding eastbound traffic count as 8,991 vehicles, while the westbound traffic count was 8,284 vehicles. Likewise, the northbound traffic count at the 9th Street and Tucson Street intersection was only 2,588 vehicles. The corresponding eastbound traffic count as 8,710 vehicles, while the westbound traffic count was 6,321 vehicles. Refer to Attachment A for a summary.

3.1 CMS Operations: Staff at CMS informed us that their operations truly work well. For their vehicle riders, CMS uses a single file entry line method as the vehicles enter the school parking lot on the west side of the facility. At some point near the southern boundary of the parking lot, the single file line splits into a double “pick-up” line as it wraps around the school parking lot in front of the facility. It should be noted that this parking has three drives, but the middle and southern drives are blocked off during the EDSR operations. Vehicles enter and exit through the northern drive only. In addition, school officials indicated that the line generally moves through the cycle in less than 5-minutes.

While observing the CMS EDSR operations, we noticed that several vehicles were parked facing northwards along the eastern side of 3rd Street along the curb line. This line of vehicles essentially created a third “pick-up” line. It extended from the south side of the entry drive to the main parking lot virtually to the Ray Harral entry way to the park approximately 900 feet. Removing the open distances for the “non-blocked” drive, this line was effectively about 850 feet in length which equates to around another 35 plus vehicles.

Furthermore, the bus riders are picked up in the north parking that borders Tucson Street. Only the bus riders are allowed in this parking lot during EDSR operations. If vehicle riders get in this parking lot, it creates some conflicts with the buses.

3.2 SCES Operations: While at SCES, we had an opportunity to meet with Ms. Samantha Troutman, the principal, both before and after our observations. She was a wealth of information regarding her operations. She explained how she had divided her EDSR operations into to two (2) distinct “pick-up/drop-off” lines and in different locations in order to provide for more stacking of vehicles. Her EDSR operations had one

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line for the younger students ranging from kindergarten through 2nd Grade, and another separate line for 3rd Grade through 5th Grade.

SCES has three parking lots that abut the west side 3rd Street. The northern most lot serves as the bus riders' EDSR operations loop. The bus riders are held in the gymnasium, which is located on the northern farther reaches of the facility, adjacent to the northern parking lot. This parking lot has two drives. The far northern drive serves as the entry, while the closer southern drive serves as the exit. The total stacking distance in the parking lot is only around 285 linear feet. That equates to about 6 full-size school buses (estimated at 45 feet in length) at once. According to the SCES officials, they only have 7 total buses and not all are full-size buses nor do these buses all arrive at the same time. They have sufficient stacking at present time.

Likewise, the middle parking lot has two (2) drives as well. The northern drive serves as the entry, while the southern drive serves as the exit. This parking lot serves the older group of vehicle riders, identified as Vehicular Rider Service Line 1 (VRSL1). (Refer to the red line on Attachment B). The distance from the crosswalk in front of the school's main entry doors to a point on Tucson Street in which the vehicular stacking would create a probably for eastbound (EB) through traffic on Tucson Street is approximately 1,150 linear feet. Once clear distances for the bus loop drives and the 3rd Street crosswalks are subtracted out of this total reach distance, there remains about 1,000 linear feet for stacking. (A typical vehicle distance with appropriate clearances is estimated at 24 feet). The equates to approximately 42 vehicles of stacking before there are conflict points with vehicles traveling EB on Tucson Street.

Additionally, the southern parking lot has two (2) drives as well. The northern drive serves as the entry, while the southern drive serves as the exit. This parking lot serves the younger group of vehicle riders, identified as Vehicular Rider Service Line 2 (VRSL2). (Refer to the blue line on Attachment B). The distance from the sidewalk along the back of the school that serves as the pick-up point to the 3rd Street and Tucson Street intersection in which the vehicular stacking would create a probably all directions of travel on Tucson Street is approximately 1,020 linear feet. Once clear distances for the Bus Loop drives, the 3rd Street crosswalk, and the middle parking lot drives are subtracted out of this total reach distance, there remains about 864 linear feet for stacking. This distance equates to approximately 36 vehicles of stacking before there are conflict points with vehicles traveling on Tucson Street.

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Ms. Troutman also noted that some of the middle school aged children will cross the 3rd Street in order to be picked up with a younger sibling who is attending SCES. As we stood there discussing her operations, we did in fact notice several older, middle school children crossing the street in the crosswalk and get in vehicles or wait in the appropriate “pick-up” lines.

4.0 Observations: The following narrative summaries Staff’s observations of each individual EDSR operations and well as the combined effect of the two operations on 3rd Street and on Tucson Street. Attachment B provides a map of the operations and Attachment C provides a timeline summary of the EDSR operations for CMS and SCES.

4.1 CMS Observations: CMS let out at 3:20 pm. Within a minute, students were already getting into vehicles and the vehicles were moving through the double “pick-up” line. By 3:24 pm, the double “pick-up” line had already been reduced to a single file line with only a few vehicles. The conflict points observed were first and foremost northbound vehicles on 3rd Street trying to make a left-hand or westbound turn on to Tucson Street. The stacking associated with this one turning movement caused a backup from the congestion with both double “pick-up” lines converging into a single exit line at the northern entry drive of the parking lot coupled with the single file third “pick-up” line located along the eastern side of 3rd Street converging with the stacked vehicles trying to make a left-hand turn at Tucson Street. In addition, a second conflict point occurred due to the same stacking lane on 3rd Street. The vehicles trying to make left-hand turning movements also created another conflict point with the late arriving vehicles, which were heading southbound and now stacking on 3rd Street, which were trying to make a left-hand turn into the main parking lot. These late arriving vehicles were conflicting with both the stacked vehicles on 3rd Street trying to make a left-hand turn on Tucson Street, as well as with some of the vehicles in the third “pick-up” line trying to exit along 3rd Street and make a right-hand turning movement on Tucson Street. This congestion began within a few minutes of the school letting the students out. But by 3:33 pm, the entire congestion on 3rd Street was alleviated and the EDSR operations were essentially complete.

4.2 SCES Observations: SCES let out at 4:00 pm. Within a few minutes, students were already getting into vehicles and the vehicles were moving through both single file “pick-up” lines. At 4:00 pm, there were 45 vehicles in VRSL1 and 35 vehicles in VRSL2. This is crucial to note. Neither eastbound (EB) nor westbound (WB) travel along Tucson Street were blocked from either “pick-up” line. However, by 4:01 pm, one additional vehicle arrived heading WB along Tucson Street, who was trying to turn southbound

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(SB) on to 3rd Street and enter the VRSL2 “pick-up” operations activity. This vehicle had to wait several minutes to make a left-turn onto 3rd Street. But, at no time, did it create any delays for other WB traveling vehicles on Tucson Street since it is a dedicated left-hand turn lane.

This is not quite the case for EB traffic traveling on Tucson Street. At 4:02 pm, vehicle 46 arrived. It caused a little bit of a conflict point with EB traveling vehicles. A couple of vehicles had to pull out slightly into the opposite WB traveling lane to maneuver around the back end of the vehicle. At 4:03 pm, vehicle 47 arrived which effectively shut down the EB travel until VRSL1 began to move freely. Fortunately, by 4:05 pm, the line had moved to the point that Tucson Street remained opened for the remainder of the SCES EDSR operations. In fact, the new dedicated right-turn lane that the City constructed this past summer was completely emptied of vehicles by 4:07 pm, and it remained free of vehicles for the rest of the EDSR operations effort.

Again, the most significant conflict point observed was 3rd Street traffic operations. As both the exiting vehicles from VRSL1 and VRSL2 coupled with the buses leaving the northern parking lot they all converge and combine into a single lane for the most part. Some will make a right-hand or EB turn on to Tucson Street, but most will try to make a left-hand or WB turn on to Tucson Street. Since Tucson Street and 3rd Street intersection is a stop-controlled intersection, these vehicles must wait until there is a break in the WB and EB traffic along Tucson Street. Although the traffic along Tucson Street is not heavy respect to traffic count, it can be spaced in such a manner that causes significant delays for the corresponding turning movements from 3rd Street on to Tucson Street. On multiple occasions, Staff observed vehicles on 3rd Street attempting to turn left on to Tucson and head WB having to wait upwards of 25 seconds and 30 seconds. This is the single most contributing factor to the delays on 3rd Street. In fact, Staff observed that the 3rd Street stacking was beginning to approach the VRSL1 entry point near the south drive of the middle parking lot. This was on the order of 500 linear feet, which equates to around 20 vehicles.

Moreover, Staff observed school officials stopping traffic on 3rd Street at the mid-block crosswalk to allow students to crossover from one side to the other. This stoppage further creates delays in the clearing of traffic along 3rd Street.

Lastly, a total number of 94 vehicles and six (6) buses were observed. One of the buses came twice. It was a smaller day care shuttle.

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4.3 General Observations: One other general observation of note should be identified. During the observation periods, Staff noticed that on a handful of occasions the pedestrian traffic walking along the south side of Tucson Street heading to the western crosswalk to cross to the north side of Tucson Street created a secondary unprotected turning movement with two points of conflict at 1st Street. 1st Street is located about 200 linear feet west of the point where Tucson Street merges back to a two-lane street west of the schools. When a WB vehicle on Tucson Street desired to turn left and head SB down 1st Street, the vehicle had to come to a complete stop and wait for a large group of pedestrians to cross 1st Street. This crossing is unmanned. So, the vehicle is in conflict with the pedestrians as well as in conflict with additional WB traveling vehicles.

5.0 Conclusions: Staff concludes that a signalized intersection will help immensely with the delays experienced with the traffic along 3rd Street due to the inability to efficiently make turning movements on to Tucson Street, specifically northbound traffic on 3rd Street trying to make a left-hand turn on to Tucson Street to head westbound. This problem exists currently due to the End of Day School Release operations individually for both Childers Middle School and Spring Creek Elementary School. Since the majority of the activity from Childers Middle School is complete before Spring Creek Elementary School lets it, the collective impact is minor. The collective impact affects only the Spring Creek Elementary School vehicles that arrive before the completion of the activity for Childers Middle School. A signalized intersection will greatly assist in allowing the 3rd Street stacking to exit along the street and turning on to Tucson Street in either direction. It will also allow a significant number of vehicles to exit during a single cycle. It is estimated that upwards of 20 vehicles counting buses could navigate the turning movements during a 30 second cycle. Based upon this estimation, Staff expects that 3rd Street could be cleared in a five (5) signal cycles for all of Spring Creek Elementary.

In addition, all walkers who are headed to the subdivisions located on the north side of Tucson Street can cross at the signalized intersection under the oversight of a single crossing guard. This provides additional safety measures since the traffic would be in an “All-Stop” condition allowing only pedestrians to maneuver across the intersection. This is not the situation today.

Today, the walkers must head either west or east along the side south of Tucson Street until they reach the crosswalk locations. Currently, both of the crosswalks are located approximately 1,800 feet from the Spring Creek Elementary School from doors. The one to the west, which sees the heaviest number of pedestrians who want to cross Tucson Street, is manned by a crossing guard. The second one to the east only sees a few pedestrians cross Tucson Street to the north and is not manned. Today, the crossing guard and pedestrians must make sure that the traffic is stopped in

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both directions before traveling the short distance of about 30 feet at the west crossing and 22 feet at the east crossing.

A future signalized crossing would help ensure that the traffic is stopped in all directions for the crossing guard to assist the pedestrians. It would be a longer distance to travel, but it would be under an “All-Stop” condition. Furthermore, it would help alleviate much of the secondary conflict with westbound pedestrian who cross 1st Street.

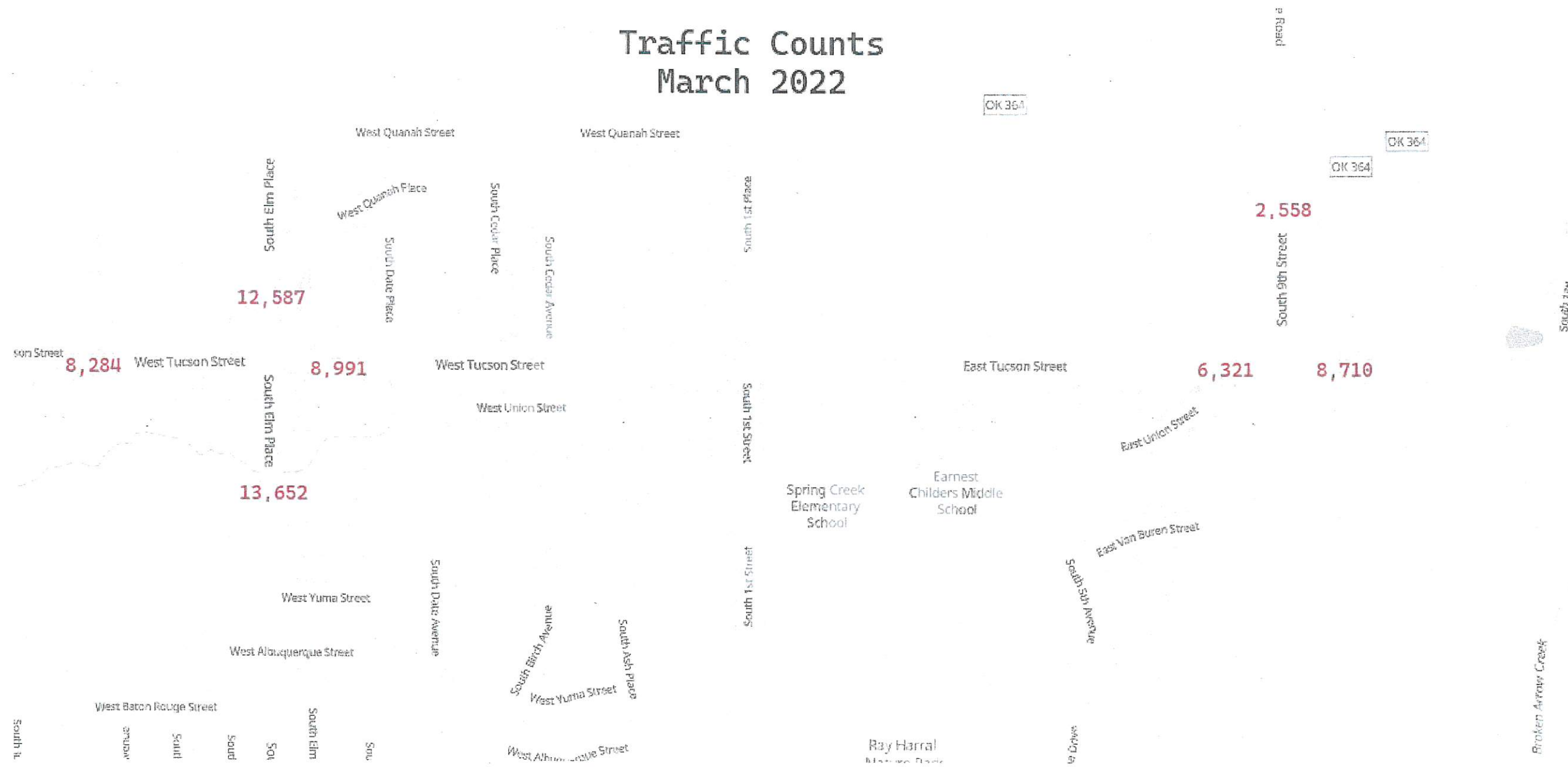
**ATTACHMENT A
TRAFFIC COUNTS
MARCH 2022**

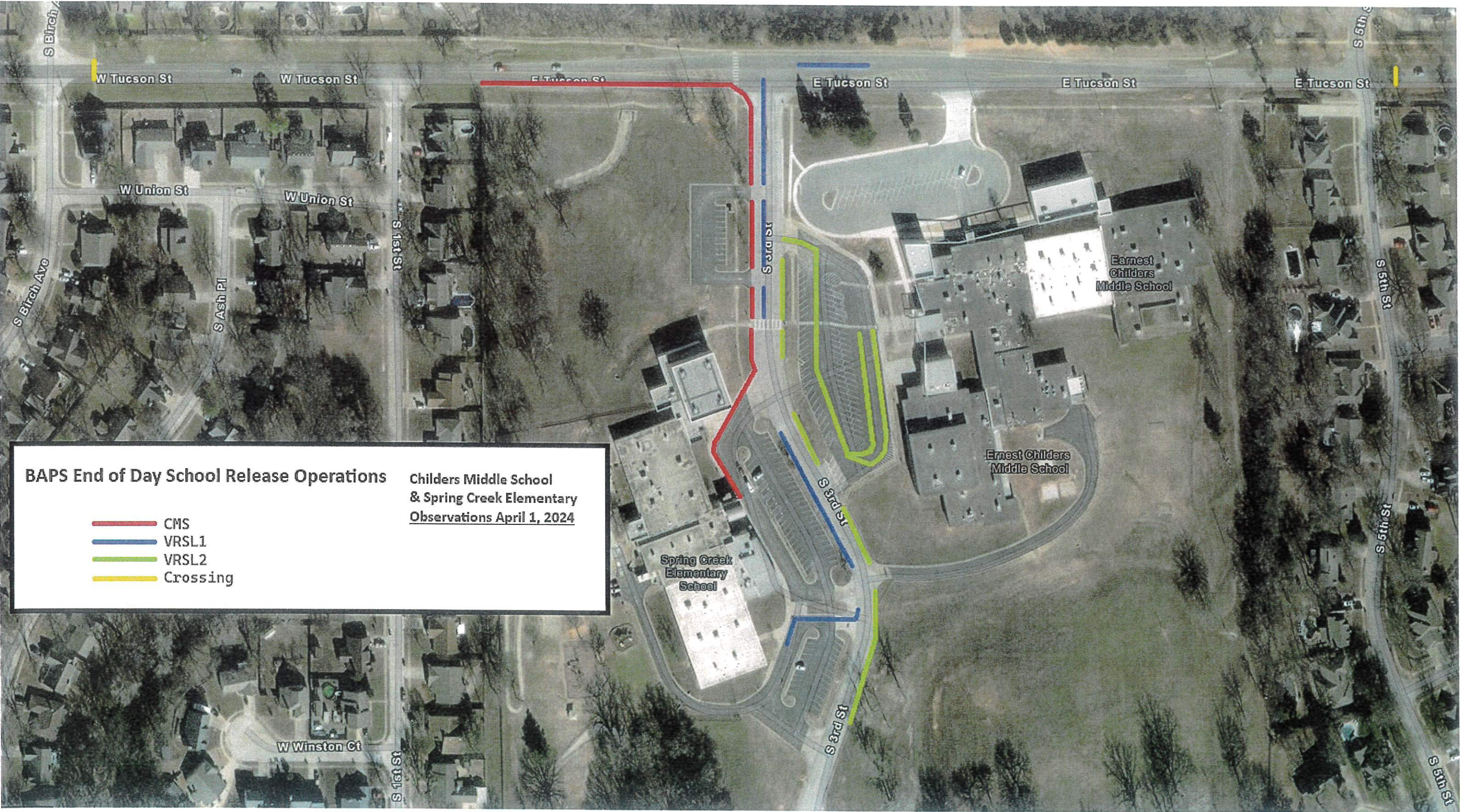
Elm Place and Tucson Street

Total North =	12,587	Avg. NB/SB =	13,120
Total South =	13,652		
Total East =	8,991	Avg. EB/WB =	8,638
Total West =	8,284		
		Total	21,757

9th Street and Tucson Street

Total North =	2,588	Avg. NB/SB =	2,588
Total South =	0		
Total East =	8,710	Avg. EB/WB =	7,516
Total West =	6,321		
		Total	10,104





ATTACHMENT C

TIMELINE SUMMARY CHILDERS MIDDLE SCHOOL AND SPRING CREEK ELEMENTARY SCHOOL END OF DAY STUDENT RELEASE OPERATIONS APRIL 1, 2024

CMS EDSR Operations:

3:00 pm	Arrive at school and meet with officials,
3:20 pm	School release begins,
3:22 pm	Congestion on 3 rd Street at Tucson Street begins,
3:23 pm	Congestion on 3 rd Street at entry/exit drive and with 3 rd Street "pick-up" line begins due to Tucson Street,
3:24 pm	Double "pick-up" lane reduces to single lane for late arriving vehicles, and
3:33 pm	Congestion on 3 rd Street is alleviated.

SCES EDSR Operations:

3:08 pm	Arrive at school and meet with officials (notice 5 to 6 vehicles already waiting in VRSL1 and first vehicle just arriving at VRSL2),
3:47 pm	Dedicated turn lane at Tucson Street becomes backed up with first vehicle at 3 rd Street,
4:00 pm	School release begins,
4:01 pm	First vehicle in dedicated left turn lane for WB traffic headed SB is stopped due to congestion on 3 rd Street (36 th vehicle in VRSL2),
4:02 pm	First vehicle to create a conflict point with dedicated right turn lane vehicles and EB through traffic on Tucson Street arrives (46 th vehicle in VRSL1),
4:03 pm	First vehicle to block the EB through traffic on Tucson Street arrives at dedicated right turn lane (47 th vehicle in VRSL1),
4:04 pm	Congestion on 3 rd Street due to turning movements on Tucson Street begins,
4:05 pm	Traffic in dedicated right turn lane for VRSL1 moves freely and Tucson Street is no longer blocked for the remainder of the EDSR operations,
4:07 pm	Dedicated right turn lane is free from stacking, and
4:17 pm	Congestion on 3 rd Street is alleviated.