



ARIZONA
TEXAS
NEW MEXICO
OKLAHOMA

September 28, 2020

Tim Porter, PE, CFM
Public Works Director
City of Wylie
949 Hensley Lane #300
Wylie, TX 75098

Dear Mr. Porter:

Lee Engineering has completed the review of existing reduced speed school zones at sixteen Wylie ISD campuses. For two of the campuses (Draper Intermediate School and Cooper Junior High School), an inventory had been performed previously in 2018. For the other fourteen campuses, a site visit was performed at each school zone to inventory existing signage and to find the limits of existing reduced speed school zones. Figures have been created to show the existing and proposed conditions at each school. Proposed conditions are based on engineering judgement informed by the following guiding principles:

- Pedestrian crossing activity should be the primary basis for reduced speed school zones. However, irregular traffic and pedestrian movements must also be considered when children are being dropped off and picked up from school. Source: *"Procedures for Establishing Speed Zones"*, TxDOT
- School speed limits should be installed based on the posted speed limit. Source: *"Speeds in School Zones"*, FHWA/TX-09/0-5470-1.
- A statewide survey of city and school district police officers indicated that over 85% of the officers agreed the posted speed limit with "End School Zone" plaque improved compliance. Source: *"Speeds in School Zones"*, FHWA/TX-09/0-5470-1.
- Operating speeds increase as the distance from the beginning of the school zone increases. For every quarter mile (1,320 feet) of school zone length, speeds can be expected to increase almost 2.5 mph. Studies have shown that compliance is highest in the first 350 feet of a school zone. By limiting the reduced speed school zone to 400 feet maximum, compliance to the 20-mph speed limit should be higher. Source: *"Speeds in School Zones"*, FHWA/TX-09/0-5470-1.

Some school zones were shortened or eliminated due to lack of pedestrian demand crossing the street (as indicated by traffic counts or attendance boundaries). Traffic counts were evaluated at ten intersections with uncontrolled approaches having the potential for pedestrian crossings – six of these were collected as part of a 2018 study for the City of Wylie and Wylie ISD, and four as part of this study. Traffic counts are included in the Appendix to this memorandum.

Recommended lengths for reduced speed school zones have been minimized in order to encourage driver compliance. **Table 1** shows the recommended distance for reduced speed school zone limits on roadways with posted speed limits of 25 mph or higher. This distance is measured from the school property line, crosswalk or conflict point (i.e. driveway).

Table 1: Recommended Distance from Conflict Point to School Zone Limit

Posted Speed Limit	Recommended Distance
25 – 35 mph	200 feet
40 – 45 mph	300 feet
50 – 55 mph	400 feet

The vehicular and pedestrian traffic counts were also used to evaluate potential crosswalk treatments based on two methodologies:

1. NCHRP 562 Method: The Texas Transportation Institute created a spreadsheet program that implements the guidance found in Transit Cooperative Research Program (TCRP) Report 112/National Cooperative Highway Research Program (NCHRP) Report 562, "Improving Pedestrian Safety at Unsignalized Crossings," dated 2006.

This methodology considers as inputs the posted speed, population of the surrounding area, peak hour pedestrian volume, 15th percentile pedestrian speed, major road traffic volumes, and general level of expected motorist compliance. It evaluates guidance in the MUTCD and calculates pedestrian delay to recommend one of six possible countermeasures:

1. No treatment
 2. A marked crosswalk
 3. Consider raised median islands, curb extensions, traffic calming, etc. as feasible
 4. An active/enhanced treatment (typically with flashing yellow beacons)
 5. A device that displays a circular red signal or beacon to motorists (typically a pedestrian hybrid beacon)
 6. A full traffic signal
2. FHWA Method: The Federal Highway Administration's (FHWA's) publication "Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations", dated July 2018 documents a procedure for identifying potential countermeasures at uncontrolled crossings. The methodology considers speed, number of lanes crossed, presence or absence of a median, and vehicular traffic volumes as inputs. The resulting recommendations include a wider array of nine different countermeasures than are included in the NCHRP 562 method:
 1. Crosswalk signs, markings & lighting
 2. Raised crosswalks
 3. Advance "Yield Here to Pedestrians" signing and markings
 4. In-street pedestrian crossing signs
 5. Curb extensions
 6. Pedestrian refuge islands
 7. Rectangular rapid flashing beacons (RRFB's)
 8. Road diets
 9. Pedestrian hybrid beacons (HAWK signals)

The methodology indicates whether each countermeasure is a candidate treatment or if it should always be considered. Multiple countermeasures may be selected if they are not mutually exclusive. No treatments are mandated or required, with engineering judgment recommended for the final selection of improvements. This methodology does not consider existing pedestrian volumes directly, based on the assumption that a context with difficult crossing conditions such as high speeds or a large number of lanes to cross can suppress

pedestrian crossing demand. However, the analyst may use known pedestrian demand as an input to their engineering judgment decisions on which countermeasures to select. Lee Engineering created a spreadsheet program to automate the identification of potential countermeasures based on this method.

Note that neither method considers crossings of stop-controlled approaches nor the presence or absence of crossing guards during school arrival and dismissal periods. Worksheets for evaluations under both methodologies are included in the appendix to this memorandum. **Table 2** summarizes the results, with the results selected for implementation between the two methods shown in bold italics. The FHWA methodology includes a table in the appendix with more detailed notes on the factors contributing to engineering judgment decisions.

Table 2: Recommended Intersection Crossing Treatments by Methodology

Location		Recommended Improvements	
Street Crossed (at Side Street)	School	NCHRP 562 Method	FHWA Method
1 - SW A Allen Blvd (south of Eagle Glen Dr)	Akin Elementary	Raised Median Island (already present)	<i>Adv. Yield Lines & Signing</i>
2 - Brown St (at Birmingham Elementary driveway)	Birmingham Elementary	Consider traffic calming, etc.	<i>None (cross with crossing guard @ existing crosswalk)</i>
3 - Cheyenne Rd (at Tuscalosa Dr)	Dodd Elementary	Crosswalk (already present)	<i>None (crossing guard already present)</i>
4 - Park Blvd (at Westgate Way)	Davis IS/ McMillan JHS	Crosswalk (already present)	<i>None (crossing guard already present)</i>
5 - Birmingham St (at Hartman Elementary driveway)	Hartman Elementary	Consider traffic calming, etc.	<i>None (cross with crossing guard @ Kirby St)</i>
6 - Ballard Ave (at Birmingham St)	Harrison IS	Ped. Hybrid Beacon (existing crossing guard judged sufficient)	<i>Adv. Yield Lines & Signing</i>
7 - Stone Rd (at Hilltop Ln)	Achieve Academy/ Burnett JHS/ Harrison IS	<i>Raised Median Island</i>	<i>Adv. Yield Lines & Signing, Ped. Refuge Island, RRFB's</i>
8 - Stone Rd (at Thomas St)		Consider traffic calming, etc.	<i>None (cross at Hilltop Lane instead)</i>
9 - Country Club Rd (at Smith Elementary driveway)	Smith Elementary	Consider traffic calming, etc.	<i>None</i>
10 - FM 544 (at Wylie High School bus loop driveway)	Wylie High	Consider traffic calming, etc.	<i>None</i>

The recommendations for each school, including both crosswalk treatments and reduced speed school zones, are summarized as follows.

Akin Elementary School (Figures 1 & 2):

- Remove speed zones on Foxwood Lane and Stone Road. Foxwood Lane is already a low-speed residential street that does not need to be crossed by schoolchildren to reach the school.

Stone Road is the southern attendance boundary for Akin Elementary School, so no elementary students should need to cross it in this area. While it may be desirable in the future for some students to use the Stone Road at SW A Allen Boulevard intersection to reach Burnett Junior High or Harrison Intermediate Schools to the west, sidewalks are currently missing to the north and east of the intersection, creating potentially dangerous walking conditions. If sidewalks are built in the future at these locations enabling safer and more convenient pedestrian travel, the City should consider re-instating shorter reduced speed school zones that are more narrowly focused on the signalized intersection.
- Shorten speed zones on Heatherwood Drive and SW A Allen Boulevard. Sidewalks along Heatherwood Drive are set back from the roadway far enough that schoolchildren walking there should not be at risk. Drivers should therefore not be delayed except in the area focused around the crosswalk at Lanwood Drive. The mid-block trail crossing north of Foxwood Lane should be retained but its signs should be changed to designate it a regular pedestrian crossing instead of a school crossing. No pedestrians or cyclists used the mid-block crossing during the AM or PM peaks when counted in February 2020.

Birmingham Elementary School (Figures 3 & 4):

- Shorten speed zones on Westgate Way and W Brown Street. Many homes are quite close to the school on the opposite side of the Brown St at Westgate Way intersection, with more under construction on the northwest corner parcel. Therefore, this signalized intersection should be retained as a reduced-speed location to allow schoolchildren to cross with greater conspicuity. The reduced speed zones along Westgate Way should be shortened to 200 ft on each side of the Brown Street intersection to maximize driver awareness at the crossing location.
- Remove Sign R1-6: In-Street Pedestrian Crossing. Sign R1-6 is not meant to be a post-mounted sign. From the Texas Manual on Uniform Traffic Control Devices (TMUTCD) Section 2B.12: "If used, the In-Street Pedestrian Crossing sign shall be placed in the roadway at the crosswalk location on the center line, on a lane line, or on a median island. The In-Street Pedestrian Crossing sign shall not be post-mounted..."

Dodd Elementary School, Davis Intermediate School, & McMillan Junior High School (Figures 5 & 6):

- Shorten speed zone on Park Boulevard. Sidewalks along Park Boulevard in the area where the reduced speed school zone is recommended to be removed are set back far enough that schoolchildren walking there should not be at risk. The reduced speed zone can therefore be focused more narrowly on critical crossing locations.
- Install crosswalk, signs, and sidewalk to connect neighborhood trail to westernmost school driveway. Some students were observed crossing here after school dismissal during the earlier Wylie ISD study. Also noted on the plans is the location of a potential pedestrian bridge that should be considered on the south side of Park Boulevard across the creek between Georgiana Drive and Davis Intermediate

School. If completed, this would fill a sidewalk gap for better connectivity and could help relieve pedestrian congestion on the northern sidewalk just after the school dismissal period.

Groves Elementary School (Figures 7 & 8):

- Remove speed zone on McCreary Road. Since McCreary Road is the attendance boundary between Groves Elementary School and Tibbals Elementary School in Murphy, no students should need to cross the road. Where sidewalk is provided along McCreary Road, it is set back from the travel lanes a sufficient distance that speeds should not need to be reduced. A gated sidewalk connection to the school is provided for the neighborhood to the north at the northeast corner of the school property to compensate for the absence of sidewalk along the east side of McCreary Road.
- Shorten speed zone on Waters Edge Way / Riverway Lane. Waters Edge Way west of McCreary Road does not need a reduced speed school zone since no schoolchildren need to cross at this intersection.

Achieve Academy, Burnett Jr. High School, Harrison Intermediate School, & Hartman Elementary School (Figures 9 & 10):

- Shorten speed zones on E Stone Road / Kirby Street, S Birmingham Street, and S Ballard Avenue. Along Stone Road, the school zone should be focused on the crossing at Hilltop Lane. Other potential crossing locations at 2nd Street and Thomas Street were evaluated.
At Thomas Street, pedestrian crossing activity was only one pedestrian per hour. At 2nd Street, 10 pedestrians were counted crossing Stone Road. The intent of the proposed crosswalk with rapid flashing beacons (see bullet below) is to direct pedestrians to cross at a more conspicuous location. Alternately, pedestrians who previously crossed at 2nd Street could instead cross at the traffic signal at Stone Road and Ballard Avenue.
Along Kirby Street, Birmingham Street, and Ballard Avenue, the reduced speed zones can be shortened to focus drivers' attention more specifically at the intersections where the crossing guards are located, where all student crossing activity should occur.
- Add median refuge island with RRFBS (Rectangular Rapid Flashing Beacons) at the Stone Road crossing just west of its intersection with Hilltop Lane.
- Retain reduced speed zone on Pirate Drive since this is not a route for through traffic and many parents were observed waiting along the side of the road to pick up students after dismissal.

Smith Elementary School (Figures 11 & 12):

- Shorten the speed zone on Country Club Road. No students were observed crossing the six lanes of traffic on Country Club Road to reach the school, and the density of housing on the opposite side of the road from Smith Elementary does not support latent demand for large numbers of students doing so. Two students were observed cycling on the sidewalk along the west side of Country Club Road between the school and neighborhoods to the south, so it is recommended that a portion of the reduced speed zone be retained closest to the school where sidewalk on the west side is not set back from the roadway north of Stonecrest Trail.
While some sidewalk farther south is also located directly behind the curb, the distance to the neighborhoods farthest to the south within the school attendance boundary likely already discourages students from walking or biking to school. It is recommended that the City of Wylie consider realigning sidewalk segments where possible along this part of Country Club Road to be set

back away from the roadway curb to provide greater safety and comfort for families who wish to have their children walk or bike to school in this area.

Watkins Elementary School (Figures 13 & 14):

- Shorten speed zone slightly on Elm Drive. Space is needed between subsequent signs on the east end of the speed zone to add a S1-1 sign in advance of the reduced speed school zone as required by the TMUTCD.

Wylie East High School (Figures 15 & 16):

- Shorten speed zone on Wylie East Drive by approximately 200 feet. The existing speed zone extends farther north than necessary beyond the school property.
- Retain other existing speed zones on E Brown Street, Bennett Road, and Stone Rd. Pedestrian crossings are not expected at the northern driveways to Wylie East Drive due to the lack of sidewalk on the west side of the street. However, it's desirable to maintain reduced speeds at the driveways to the student parking lots for safety with the large number of student drivers entering and exiting.

Wylie High School (Figures 17 & 18):

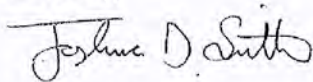
- Retain existing speed zone on Woodbridge Parkway. Install yield markings and "Yield Here to Pedestrians" signing in each direction before the crosswalk across Woodbridge Parkway. This helps to reduce the chances of a "dual threat" conflict where the vehicle of a yielding driver who yields too close to the crosswalk obscures visibility between the pedestrian and a moving driver in the adjacent lane.

Draper Intermediate School and Cooper Junior High School (Figures 23 & 24 from previous study):

- These schools were not evaluated as part of this study. Recommendations are included from a study performed in 2018.
- Shorten existing speed zone on New Hensley Lane by approximately 950 feet. The existing speed zone extends farther southeast than necessary to accommodate pedestrian crossings at the bus loop driveway.
- Shorten existing speed zone on Woodbridge Parkway by approximately 1,350 feet. The existing end of the school speed zone extends farther northeast than necessary to accommodate pedestrian crossings at New Hensley Lane.
- Move the existing speed zone boundary on New Hensley Lane west of Woodbridge Parkway to Hooper Road. The existing speed zone does not extend far enough to accommodate pedestrian crossings at Woodbridge Parkway.
- Address other signing deficiencies as detailed in the attached pages following the figures.

Please don't hesitate to contact me if you have any questions.

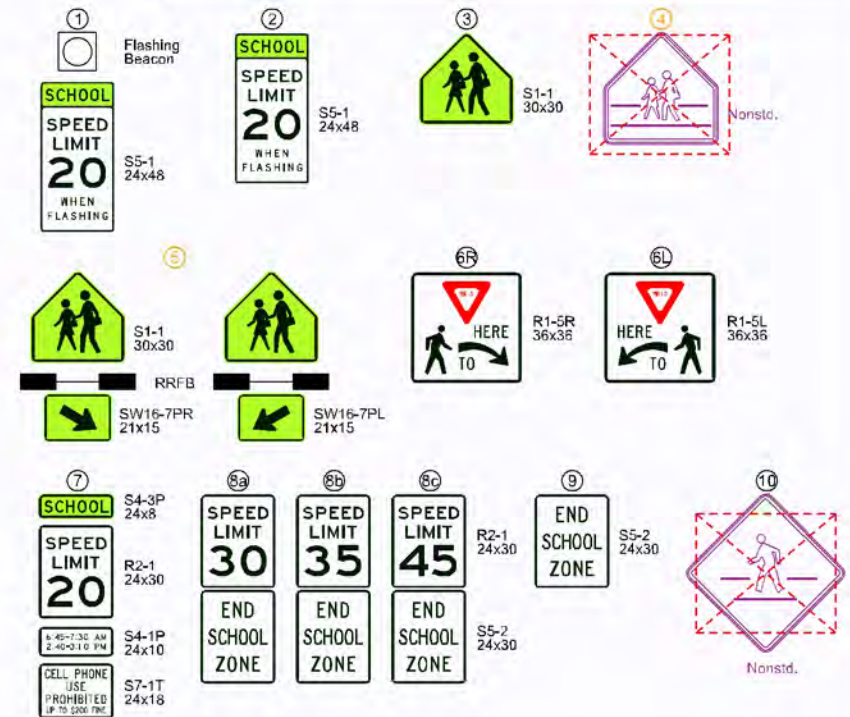
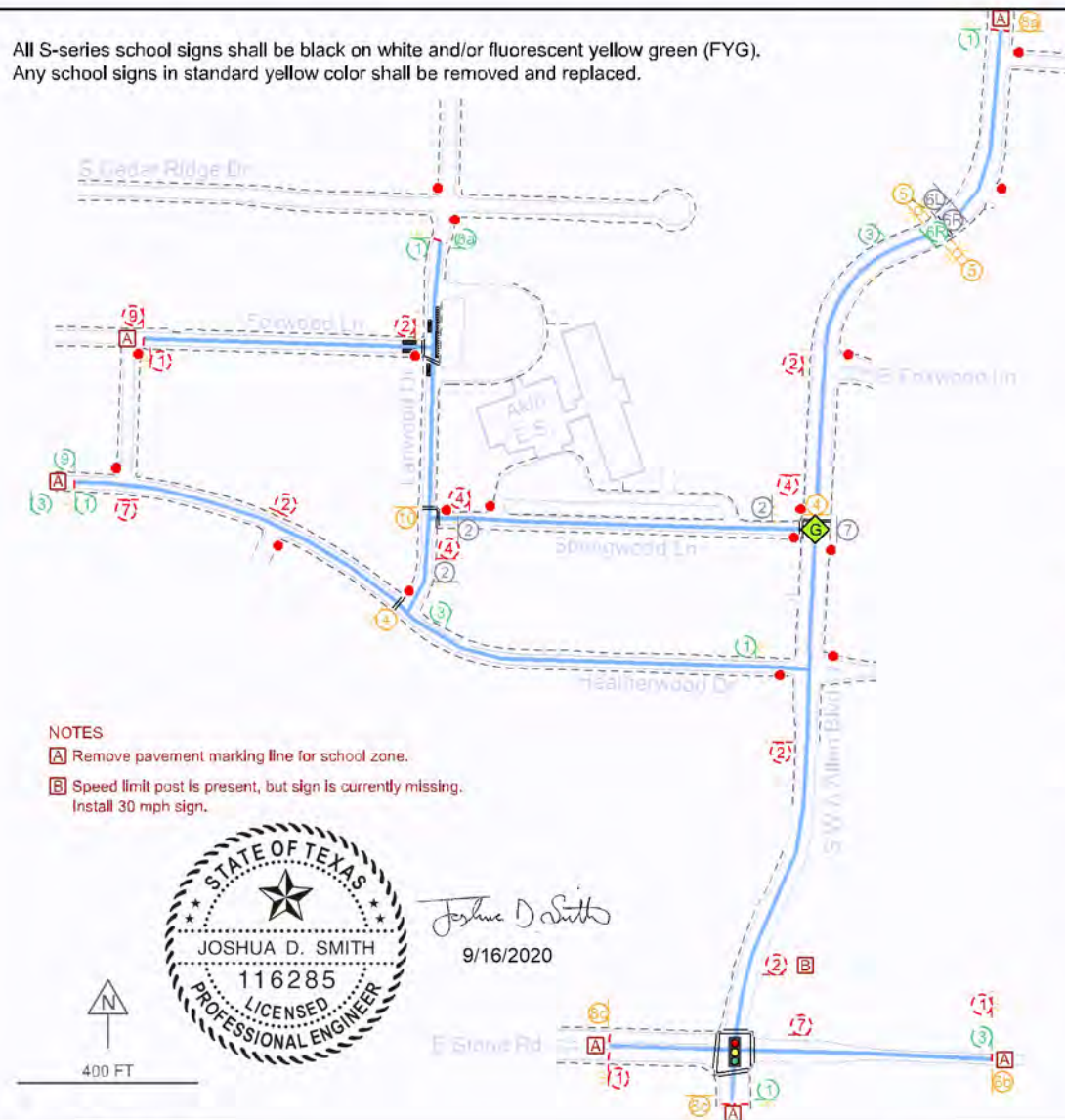
Sincerely,



Josh Smith, P.E., PTOE
Project Manager
Lee Engineering, TBPE Firm F-450



All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.



Akin Elementary School
Existing Conditions

Figure 1

All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.

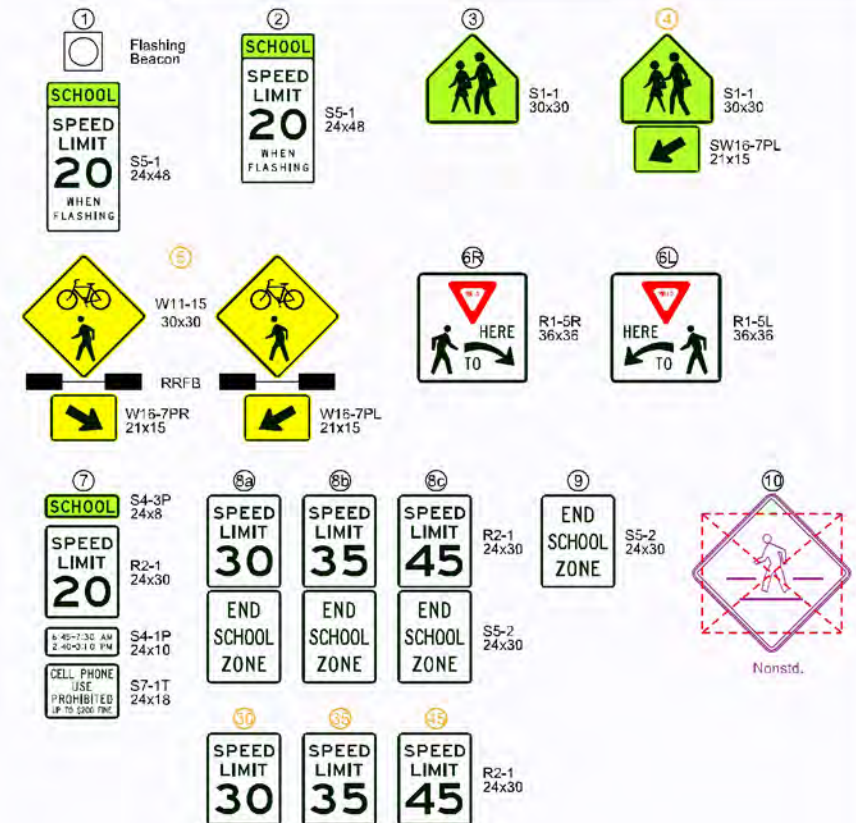
LEGEND

- Sign with Flasher
- Sign with LED border
- Relocated Sign
- Proposed Sign
- Modified Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign
- Crossing Guard
- Traffic Signal



NOTES

- A** Remove pavement marking line for school zone.
- B** Speed limit post is present, but sign is currently missing. Install 30 mph sign.
- C** Install pavement marking line for school zone.
- D** Install yield lines and "Yield Here to Pedestrians" signing 20 to 50 feet in advance of crosswalk.



Akin Elementary School
Proposed Conditions

Figure 2



400 FT

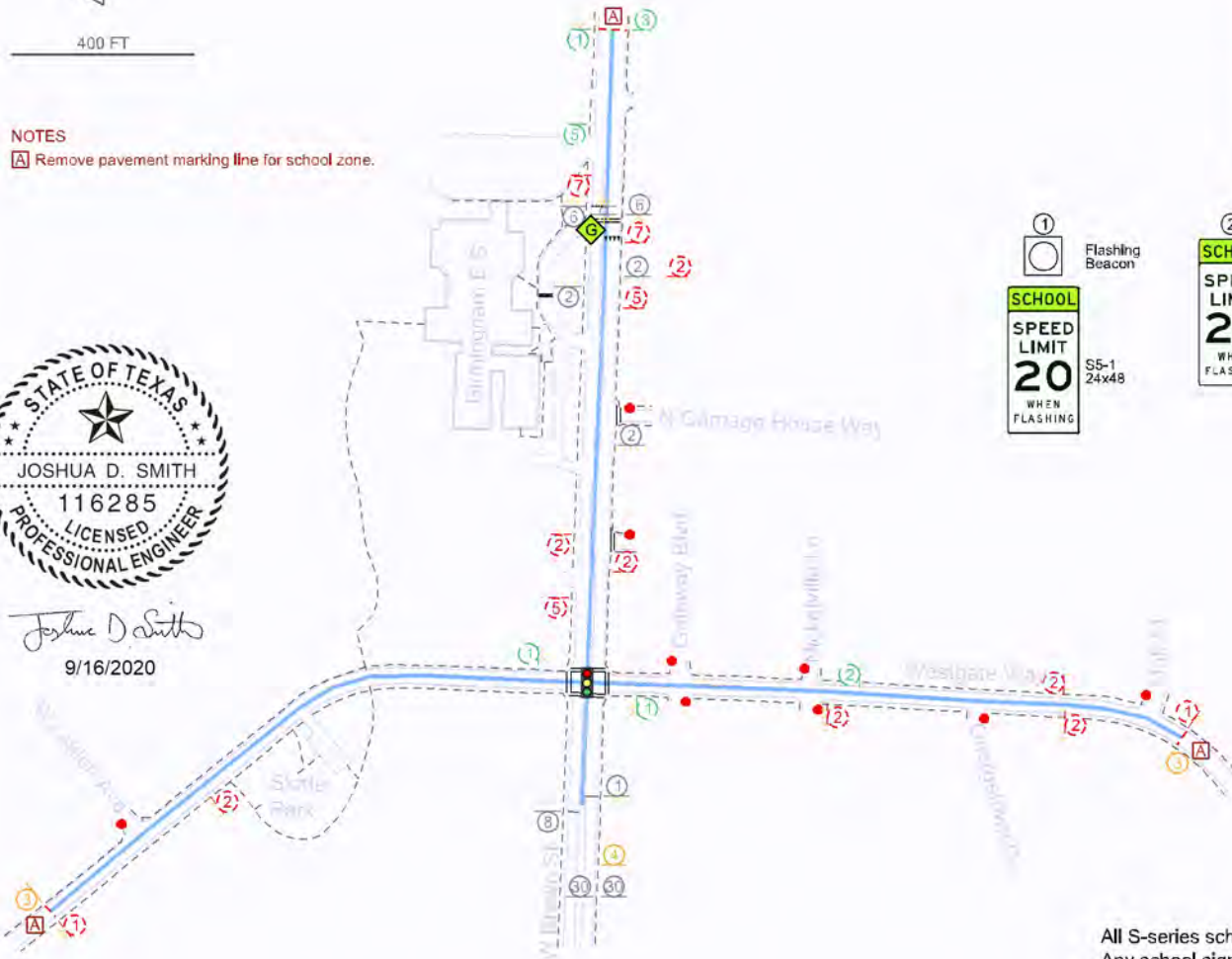
NOTES

Remove pavement marking line for school zone.



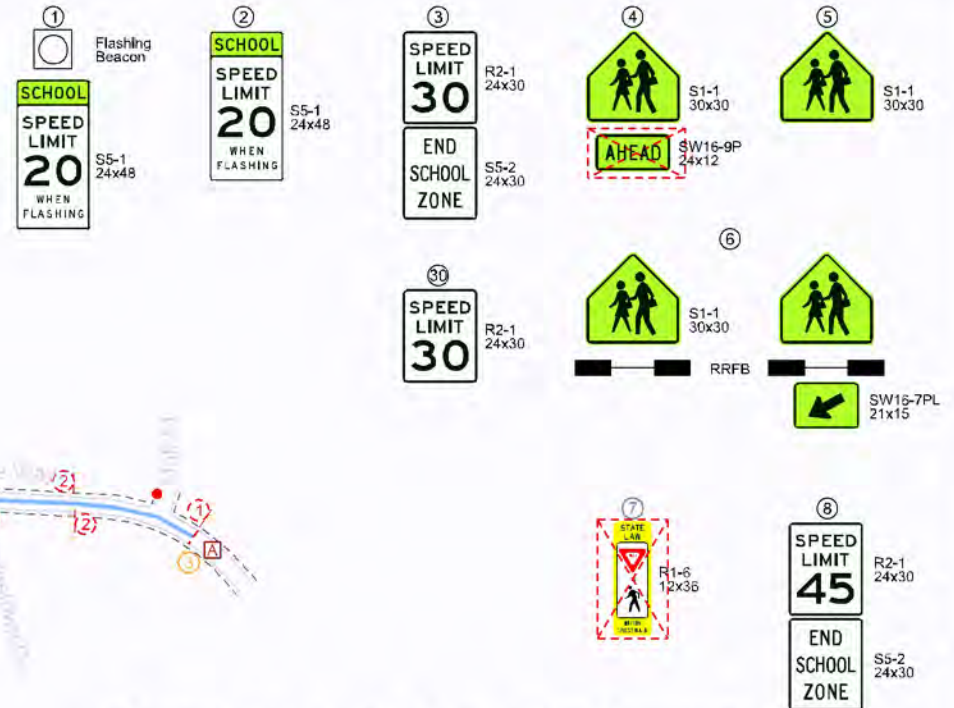
Joshua D. Smith

9/16/2020



LEGEND

- Sign with Flasher
- Sign with LED border
- Relocate Sign
- Remove Sign
- Modify Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign
- Crossing Guard
- Traffic Signal



All S-series school signs shall be black on white and/or fluorescent yellow green (FYG). Any school signs in standard yellow color shall be removed and replaced.



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Birmingham Elementary School Existing Conditions

Figure 3



400 FT

NOTES

- [A] Remove pavement marking line for school zone.
- [B] Install pavement marking line for school zone.



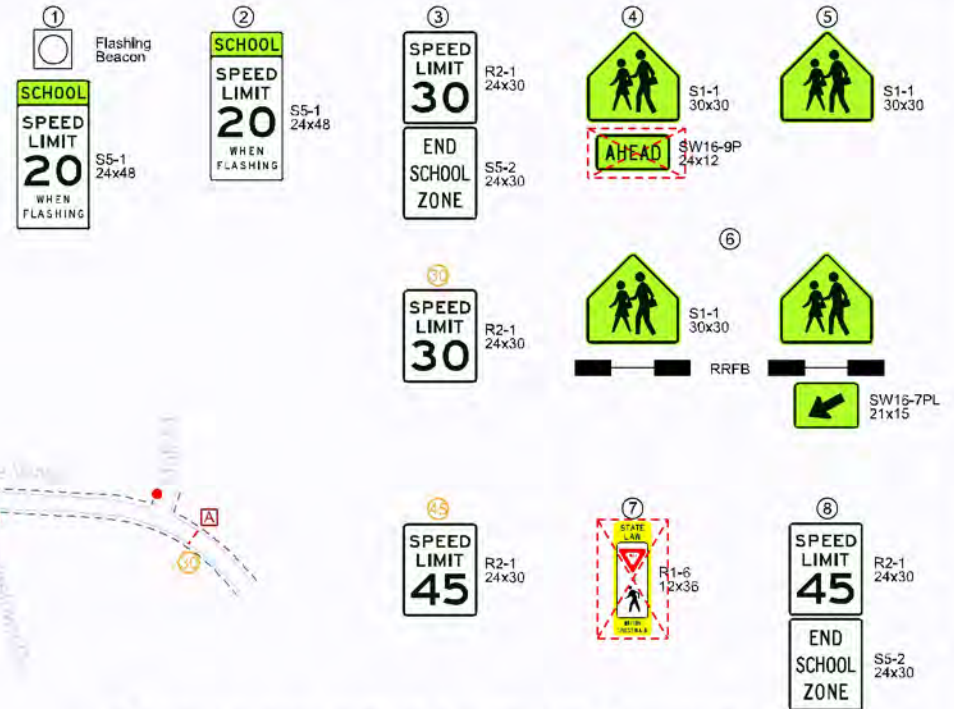
Joshua D. Smith

9/16/2020



LEGEND

- Sign with Flasher
- Sign with LED border
- Relocated Sign
- Proposed Sign
- Modified Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign
- Crossing Guard
- Traffic Signal



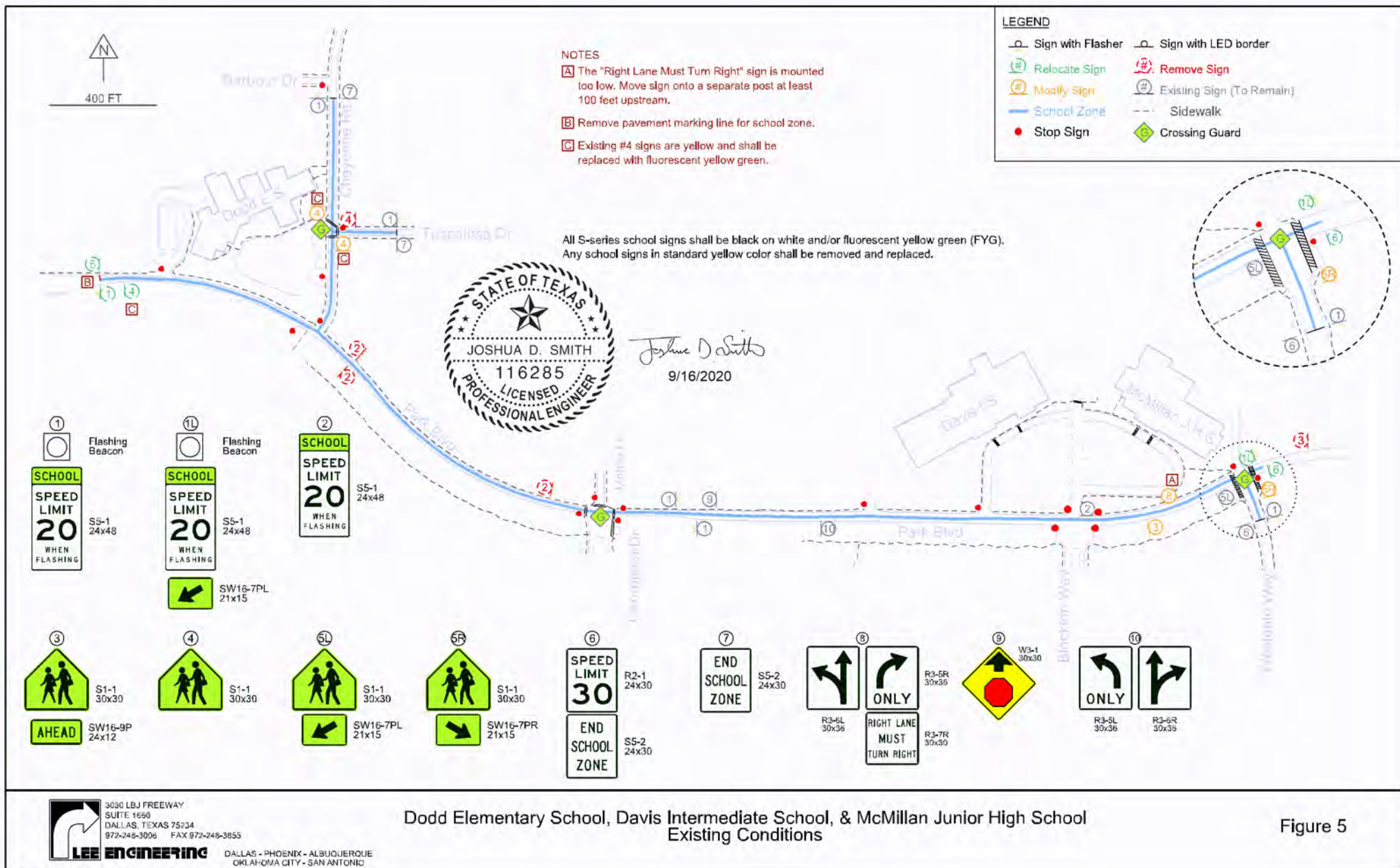
All S-series school signs shall be black on white and/or fluorescent yellow green (FYG). Any school signs in standard yellow color shall be removed and replaced.

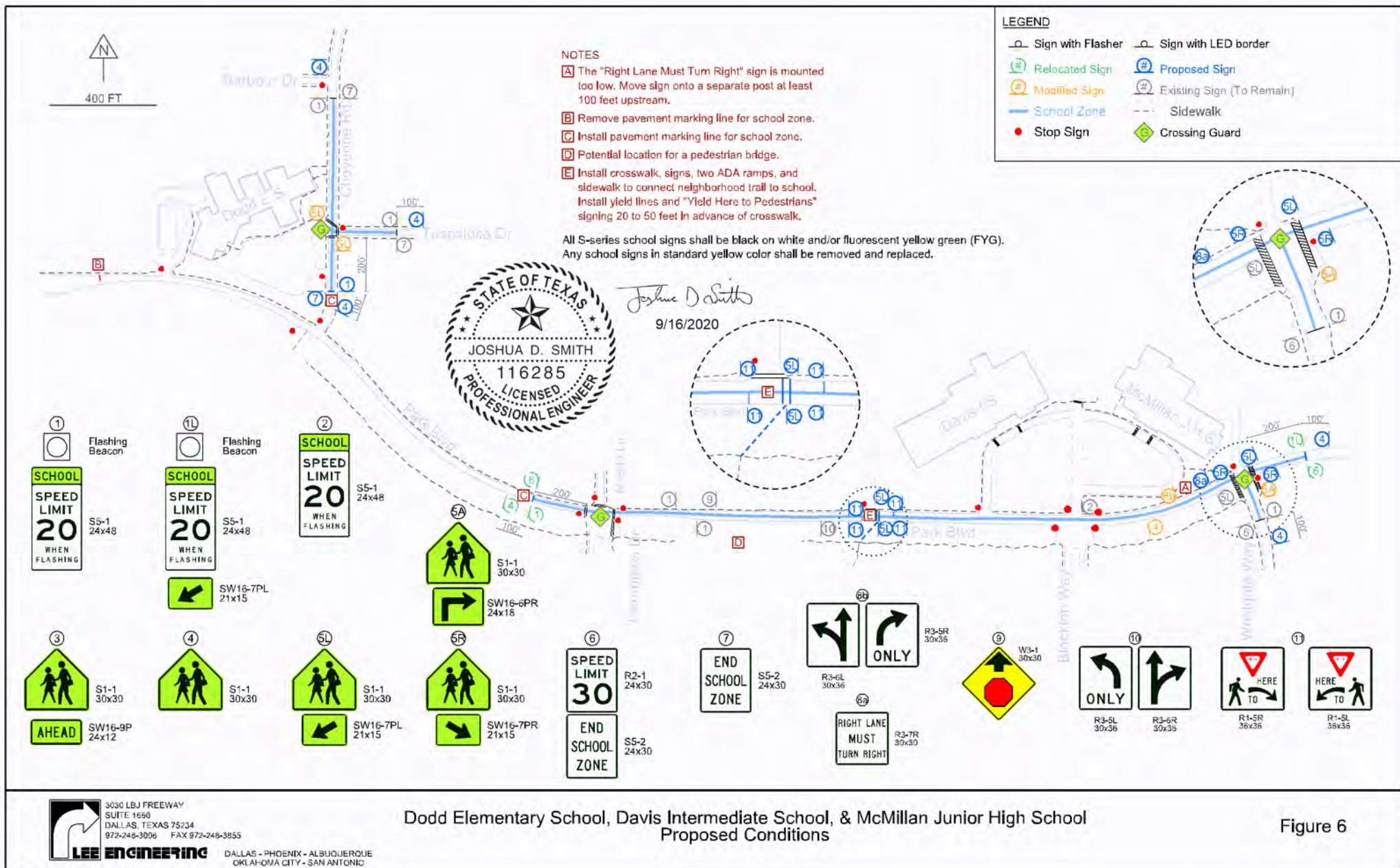


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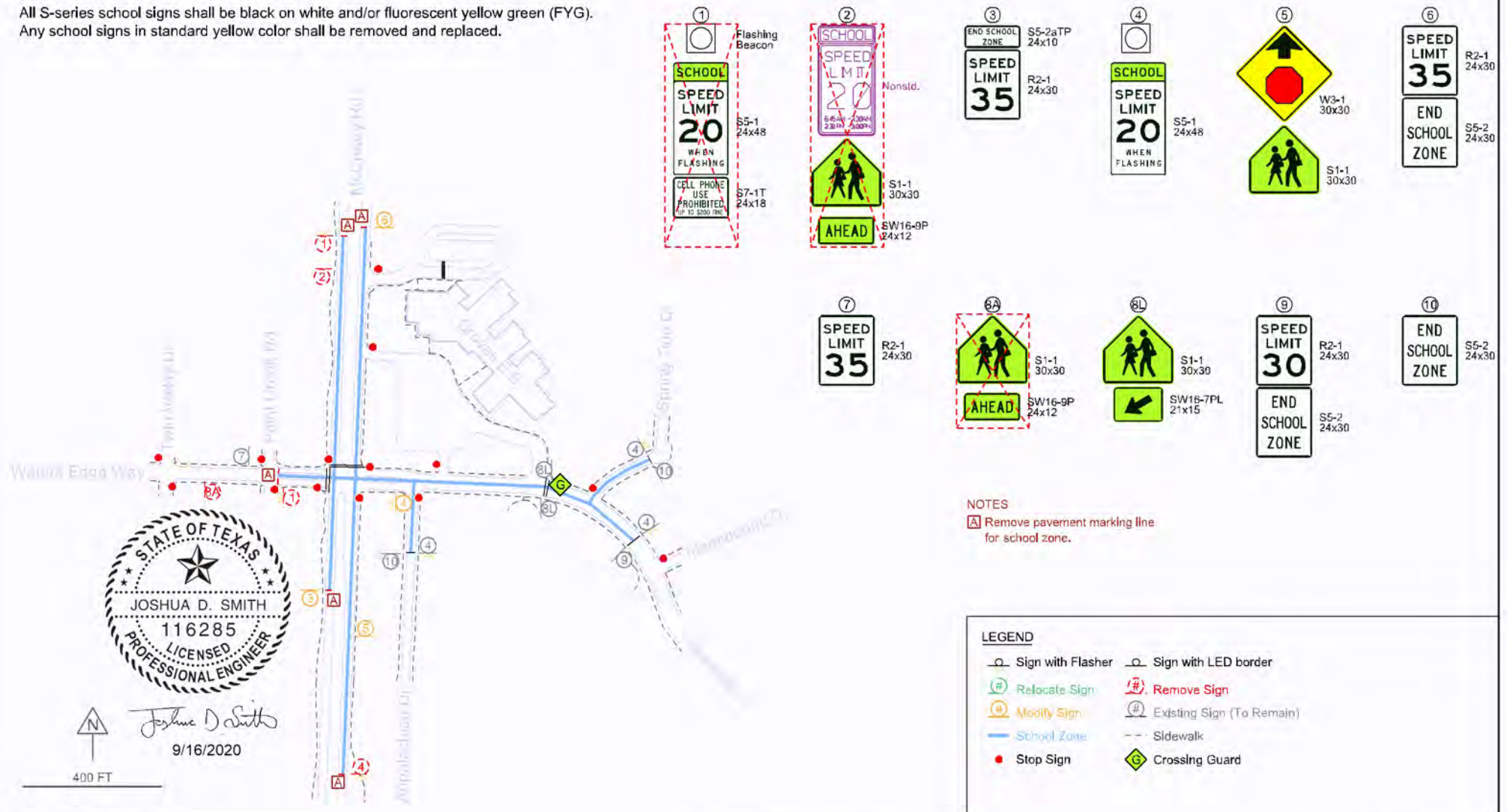
Birmingham Elementary School Proposed Conditions

Figure 4





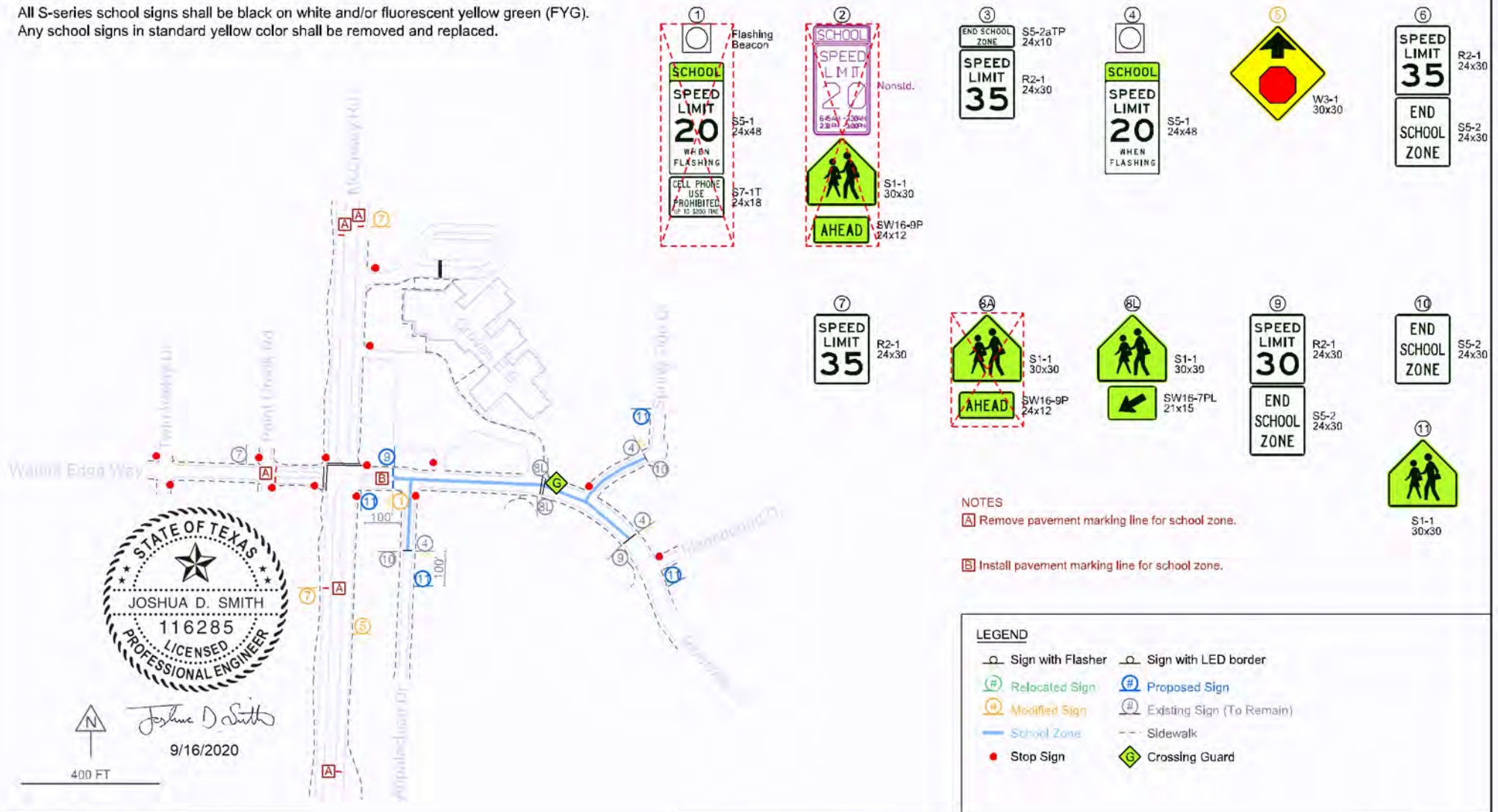
All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.



Groves Elementary School
Existing Conditions

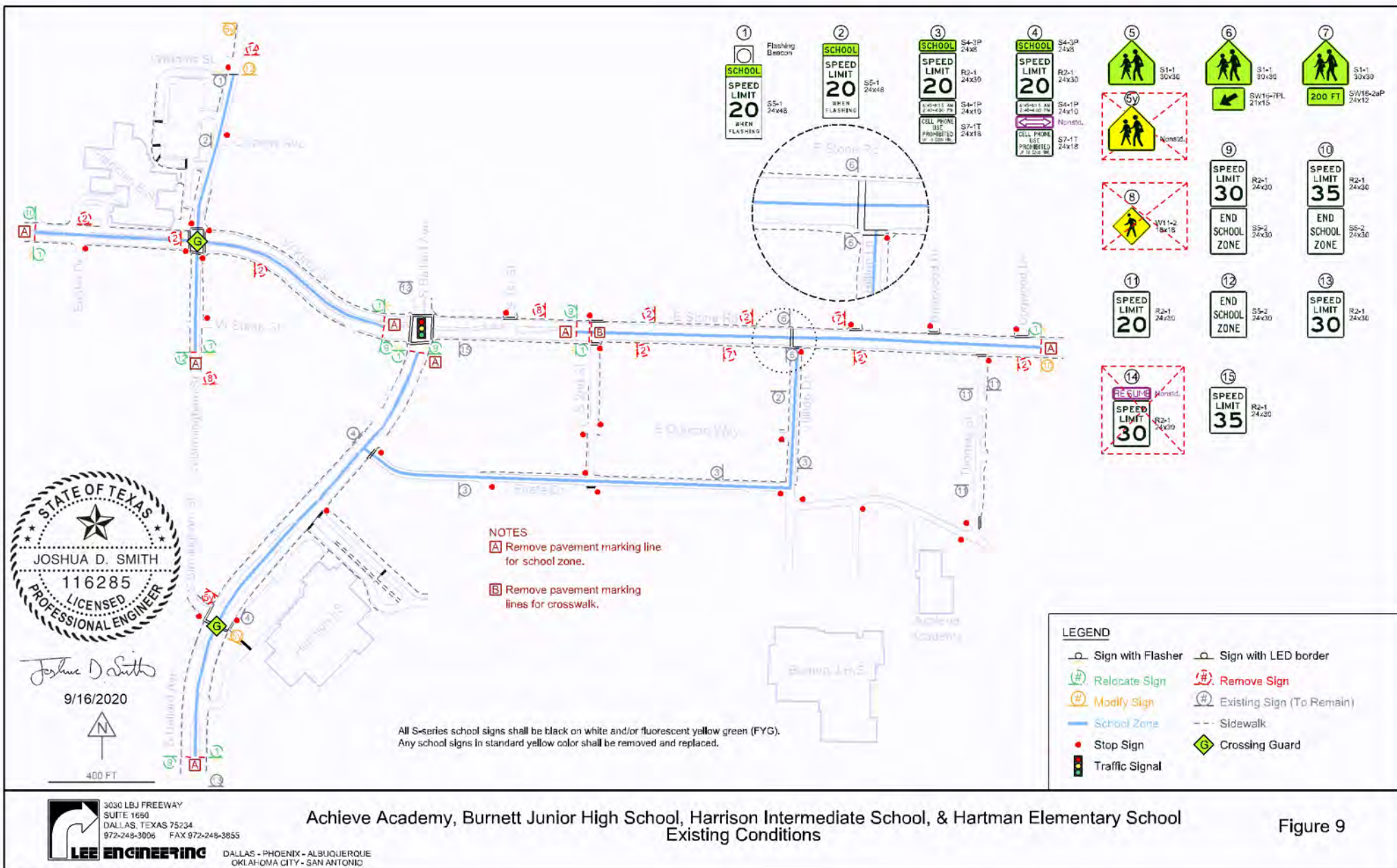
Figure 7

All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.



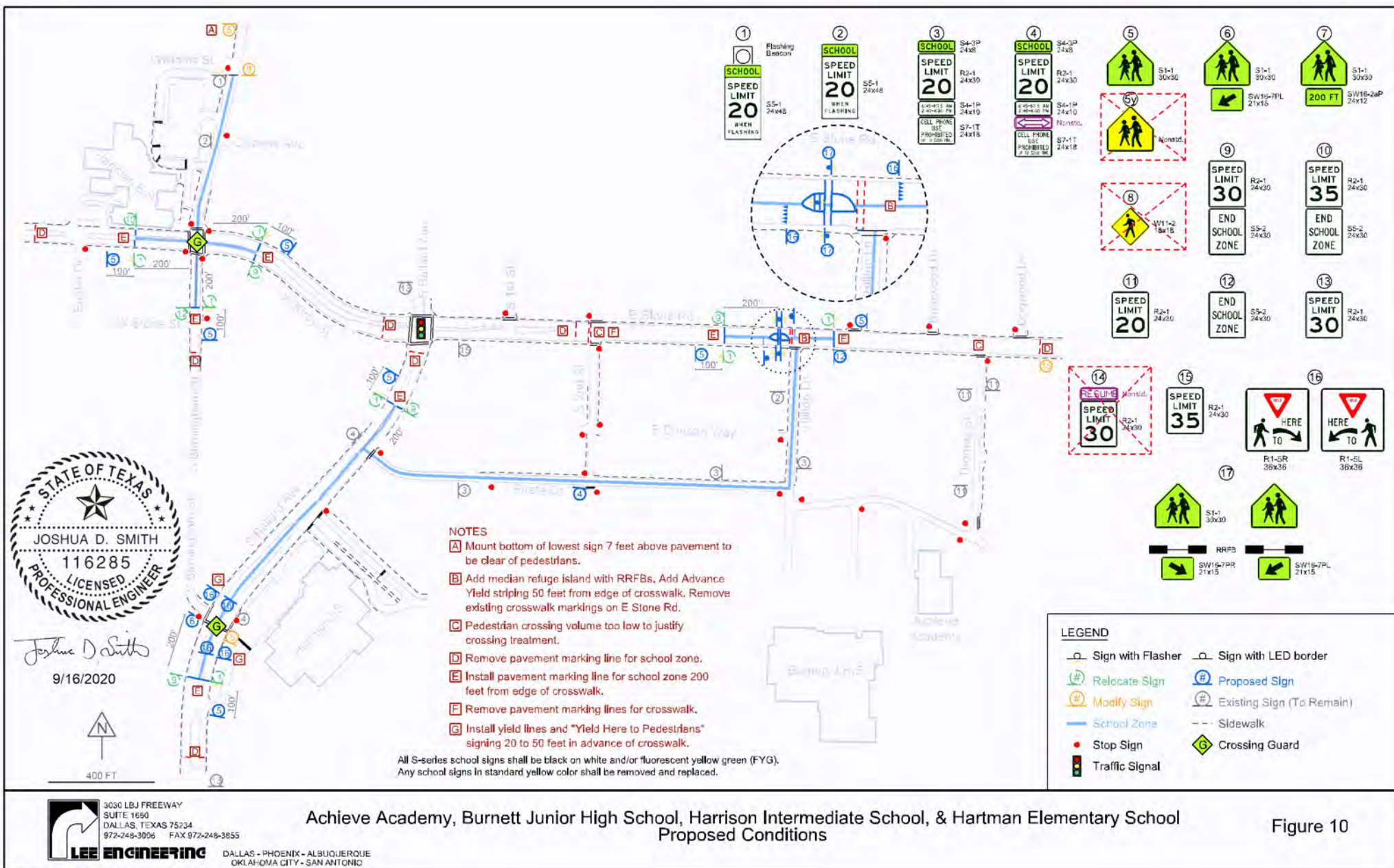
Groves Elementary School
Proposed Conditions

Figure 8



Achieve Academy, Burnett Junior High School, Harrison Intermediate School, & Hartman Elementary School
 Existing Conditions

Figure 9



Achieve Academy, Burnett Junior High School, Harrison Intermediate School, & Hartman Elementary School
Proposed Conditions

Figure 10

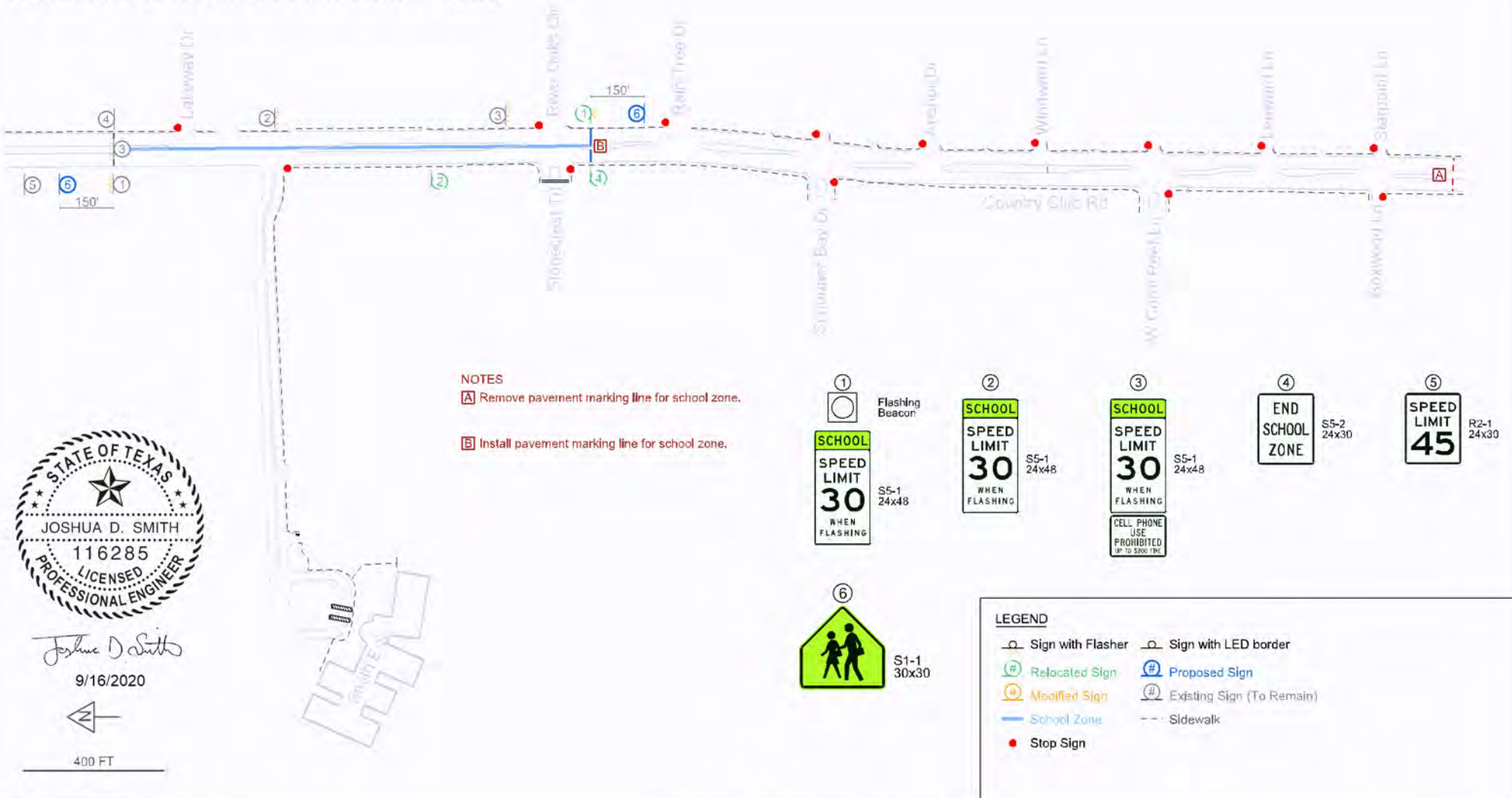
All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.



Smith Elementary School
Existing Conditions

Figure 11

All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.



All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.

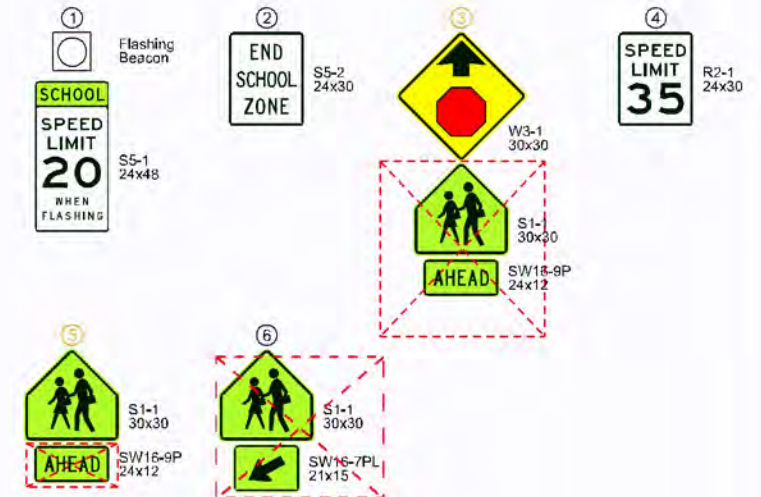
NOTES

- [A] Rotate sign to face oncoming traffic.
- [B] "CITY OF WYLIE MAINTENANCE" signs should be on separate posts.
- [C] "CITY OF WYLIE MAINTENANCE" sign on separate post.



LEGEND

- Sign with Flasher
- Sign with LED border
- Ⓜ Relocate Sign
- Ⓜ Remove Sign
- Ⓜ Modify Sign
- Ⓜ Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign



Watkins Elementary School
Existing Conditions

Figure 13

All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.

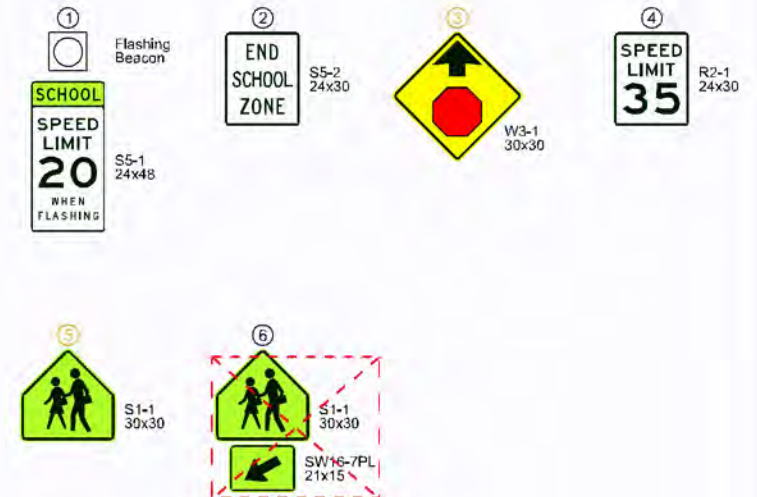
NOTES

- [A] Rotate sign to face oncoming traffic.
- [B] "CITY OF WYLIE MAINTENANCE" sign
Installed on separate post.



LEGEND

- Sign with Flasher
- Sign with LED border
- Relocate Sign
- Proposed Sign
- Modify Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign



Watkins Elementary School
Proposed Conditions

Figure 14

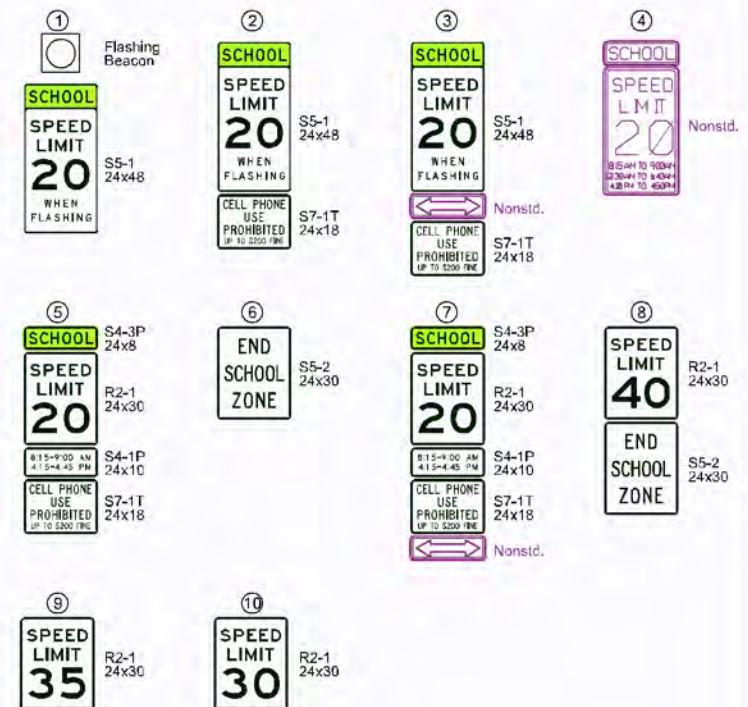
All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.

NOTES

- [A] Remove pavement marking line for school zone.

LEGEND

- Sign with Flasher
- Sign with LED border
- Relocate Sign
- Remove Sign
- Modify Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign



Wylie East High School
Existing Conditions

Figure 15

All S-series school signs shall be black on white and/or fluorescent yellow green (FYG).
Any school signs in standard yellow color shall be removed and replaced.

NOTES

[A] Remove pavement marking line for school zone.

[B] Install pavement marking line for school zone.

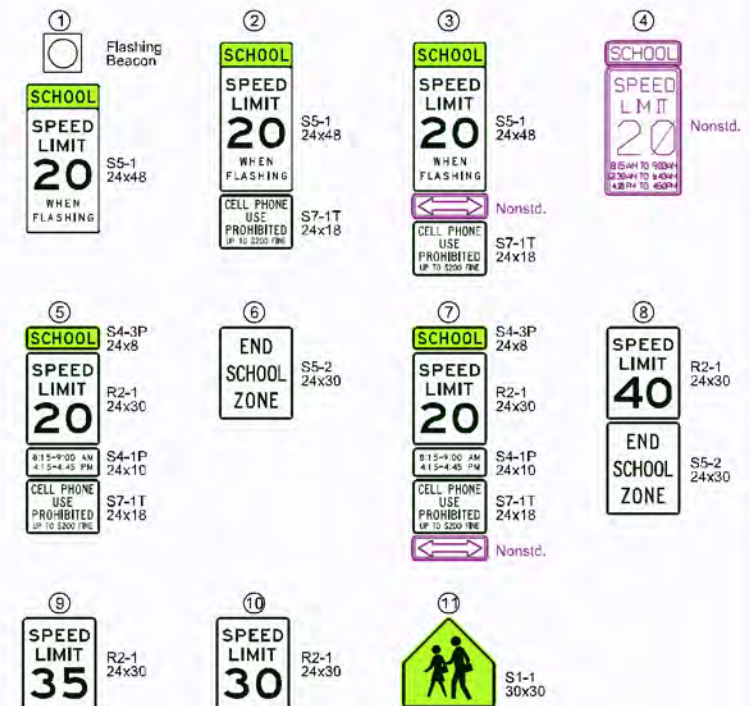
LEGEND

- Sign with Flasher
- Sign with LED border
- Relocated Sign
- Proposed Sign
- Modified Sign
- Existing Sign (To Remain)
- School Zone
- Sidewalk
- Stop Sign



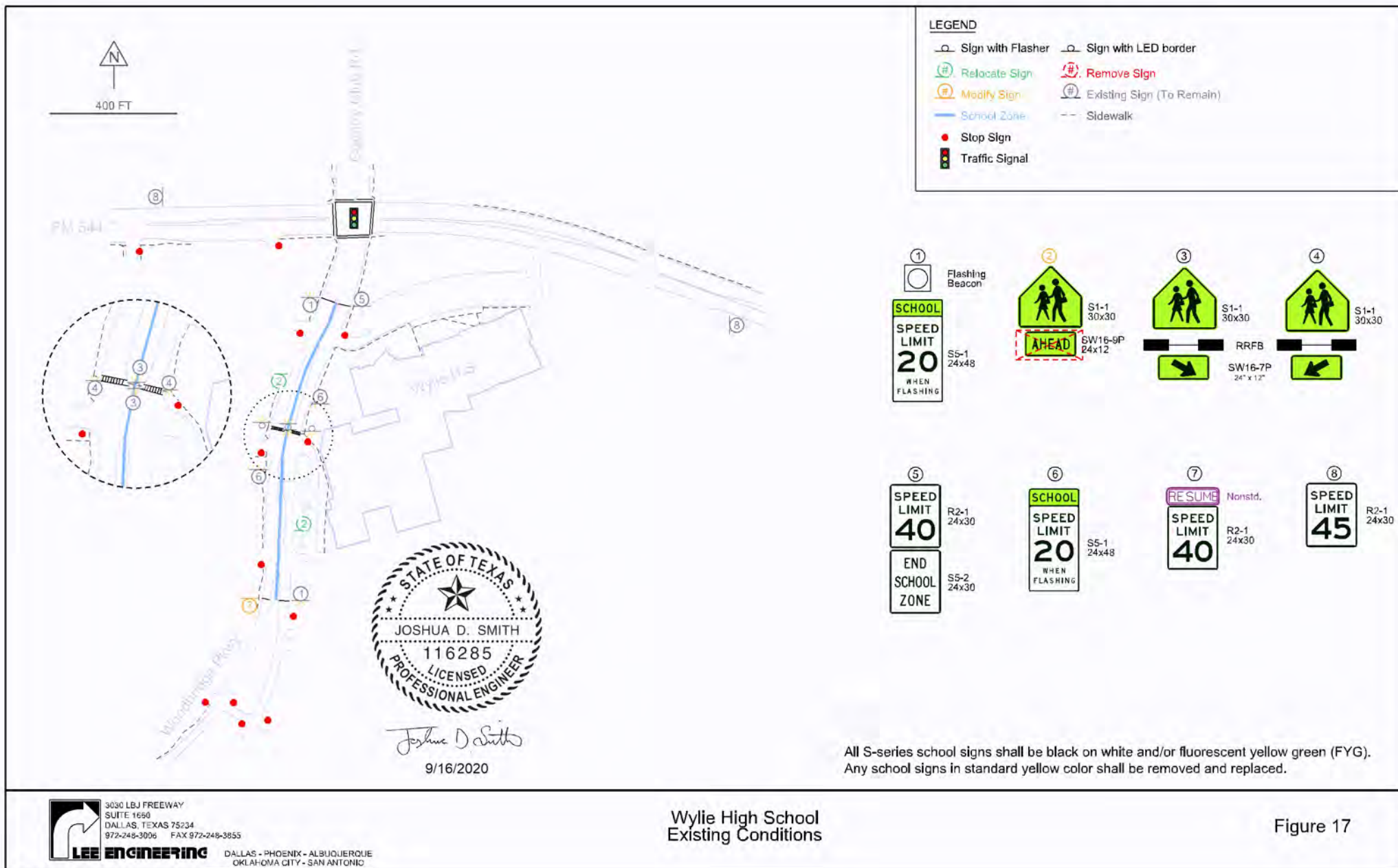
Joshua D. Smith

9/16/2020



Wylie East High School
Proposed Conditions

Figure 16



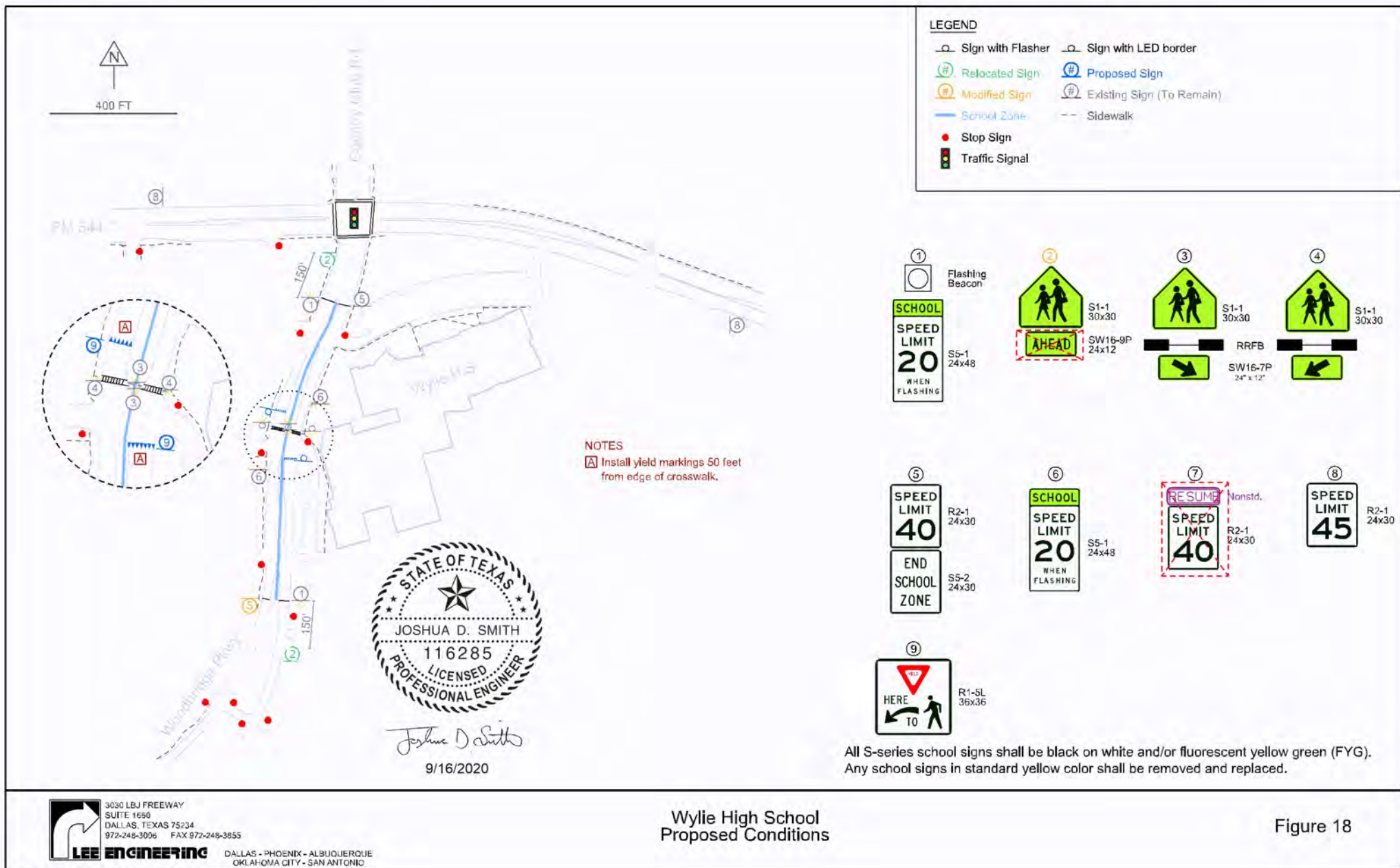


Figure 23: Existing School Zone Sign Locations

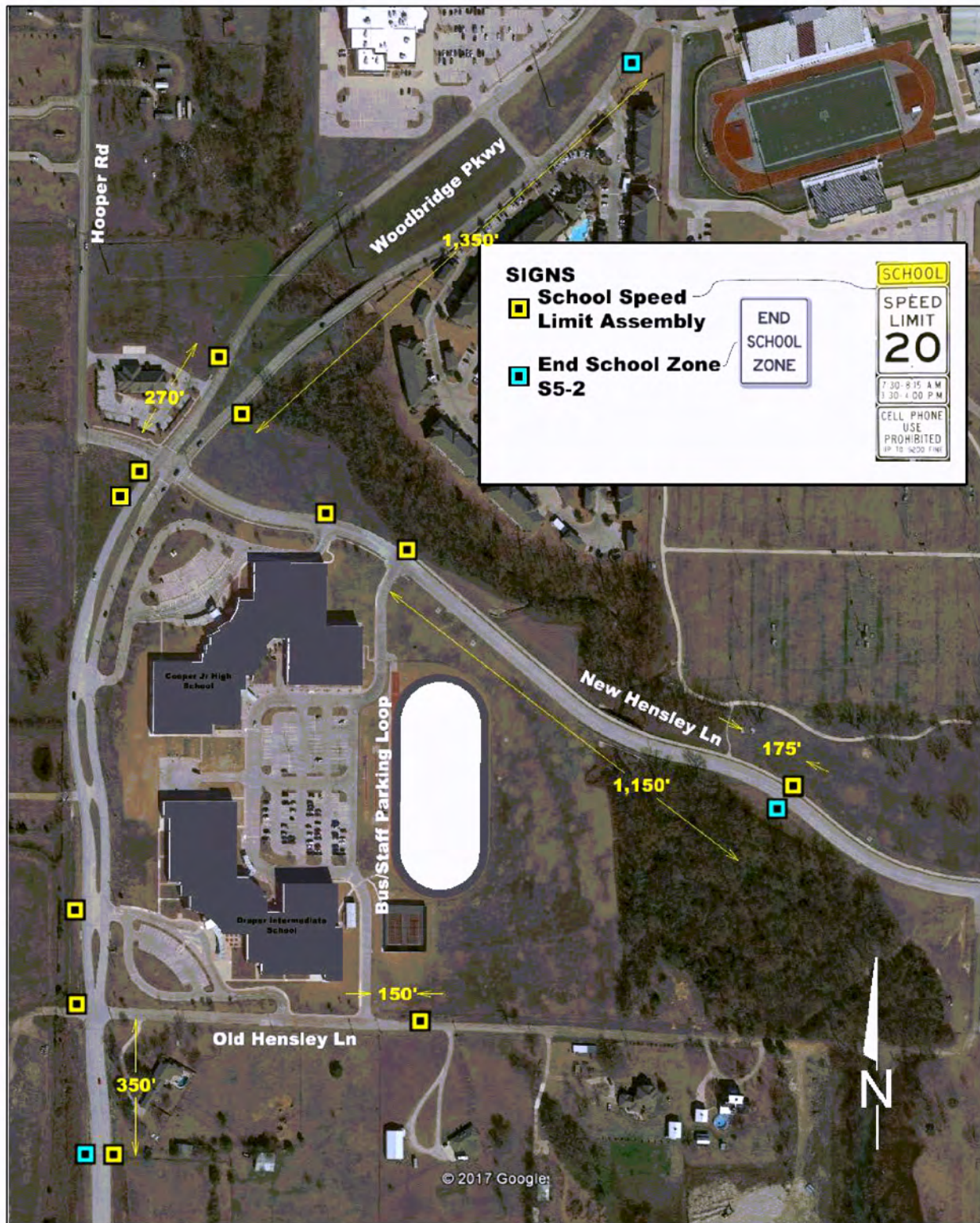
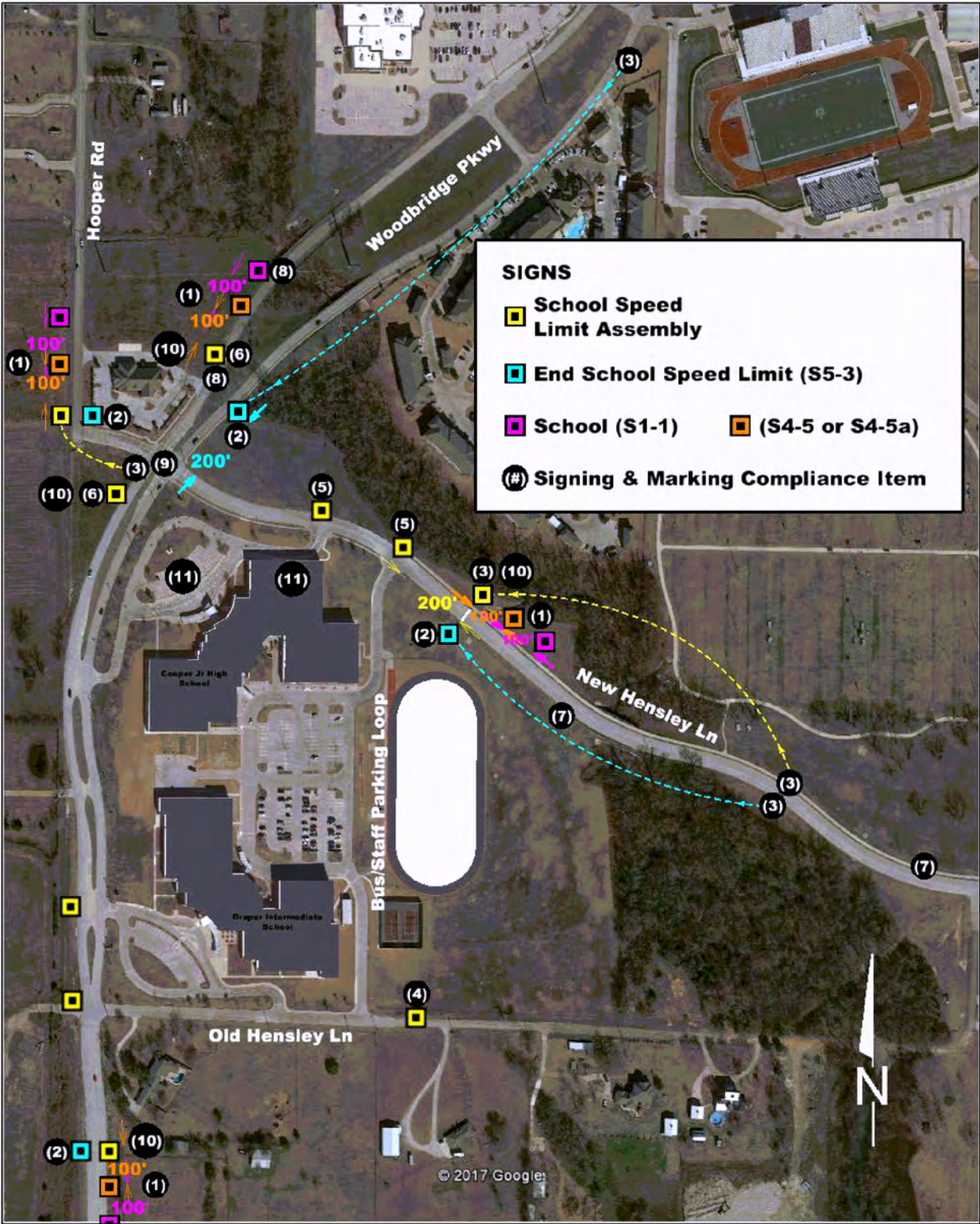


Figure 24: Proposed Changes to Signing



A review of the existing signing and comparison with the Texas MUTCD revealed:

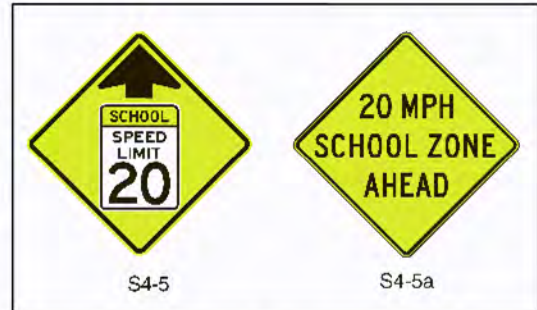
(1) The Texas MUTCD states in Section **7B.15.02**:

"If a reduced school speed limit zone has been established, a School (S1-1) sign shall be installed in advance (see Table 2C-4 for advance placement guidelines) of the first School Speed Limit sign assembly ... that is encountered in each direction as traffic approaches the reduced school speed limit zone."



Additionally, Texas MUTCD states in Section **7B.16.01**:

A Reduced School Speed Limit Ahead (S4-5, S4-5a) sign (see Figure 7B-1) should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates that advance notice would be appropriate.



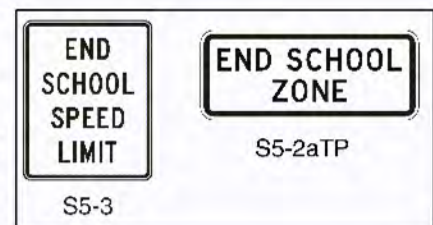
The required S1-1 signs are not present on the approaches to Cooper Junior High and Draper Intermediate Schools, and therefore need to be posted. The recommended S4-5 (or S4-5a) should also be considered. Because of the short distance existing along New Hensley Lane west of Woodbridge Parkway before the road turns north as Hooper Lane, signs located along Hooper Lane should be relocated to New Hensley Lane once it is extended in the near future.

The 20 mph school zones on Woodbridge Parkway and New Hensley Lane represent a 15- to 20-mph reduction in speed compared to the normal speed limit of 35 mph on these roadways. The speed limit on northbound Woodbridge Parkway is posted as 35 mph in Sachse south of the school campuses. At the end of the school zone in the northbound direction, the speed limit reverts to 40 mph, without the short 35 mph zone posted in the southbound direction of the same roadway.

According to Table 2C-4, the advance placement distance required for deceleration from 40 mph to 20 mph is the minimum distance of 100 ft. This minimum distance is intended to provide adequate spacing between signs. Therefore, these warning signs should be installed at least 100 feet in advance of the School Speed Limit sign assemblies.

(2) The Texas MUTCD states in Section **7B.15.03**:

"The downstream end of an authorized and posted reduced school speed limit zone shall be identified with an END SCHOOL SPEED LIMIT (S5-3) sign or a standard speed limit showing the speed limit for the section of highway that is downstream from the authorized and posted reduced school speed limit zone with an END SCHOOL ZONE (S5-2aTP) plaque..."



There is no "End School Zone" plaque posted on westbound New Hensley Lane west of Woodbridge Parkway (or on northbound Hooper Road beyond the 90-degree bend to the right); this sign should be added.

Southbound after exiting the Woodbridge Parkway school zone, the 35 mph speed limit is not posted; only an "End School Zone" sign is provided. This should either be changed to an "End School Speed Limit" sign, or a standard speed limit sign should be installed with an "End School Zone" plaque.

(3) The Texas MUTCD gives guidance in Section **7B.15.05**:

"The beginning point of a reduced school speed limit zone should be at least 200 feet in advance of the school grounds, a school crossing, or other school related activities; however, this 200-foot distance should be increased if the reduced school speed limit is 30 mph or higher."

The TxDOT Manual: Procedures for Establishing Speed Zones, Section 4, Introduction states:

***Pedestrian crossing activity** should be the primary basis for reduced school speed zones. However, irregular traffic and pedestrian movements must also be considered when children are being dropped off and picked up from school. (Speed Zones, 2-13)*

Based on the dimensions shown in Figure 23 above, it appears the beginning of the reduced school speed limit zone was located approximately 175 feet in advance of the intersection of two sidewalks. One sidewalk runs parallel along the north edge of New Hensley Lane; the other provides access to the Founders' Park athletic fields. While these fields may occasionally attract pedestrian traffic to and from the schools (such as for baseball practice after school), no such pedestrian trips were observed during the hours when the reduced school speed limit is applicable.

Because this location does not represent a pedestrian crossing, it does not merit extension of the school zone. The extra length of the school zone creates unnecessary delay for drivers, which may breed disrespect for school zones in general, which would have adverse effects in locations where they are indeed appropriate.

On New Hensley Lane, the reduced school speed zone should be located 200 feet or more in advance of the pedestrian crossing at the bus loop (which must be used where the sidewalk switches from the south to the north side when traveling east along New Hensley Lane). The 12-inch white marking across the roadway that demarcates the limit of the school reduced speed zone should be removed and a new marking added adjacent to the new sign location.

On Woodbridge Parkway, the northbound length of the school zone north of New Hensley Lane is also longer than necessary. While students walk along this stretch of sidewalk on the east side of Woodbridge Parkway between the schools and the apartments to the north, they do not cross Woodbridge Parkway.

Because school grounds, crossings, and other school related activities do not extend north of the intersection of Woodbridge Parkway and New Hensley Lane, the School Speed Limit assembly north of the intersection should be removed and replaced with an End School Speed Limit sign. A 12-inch white pavement marking across the northbound lanes should be placed at this location to denote the new end of the school zone. The End School Speed Limit sign farther north and the associated 12-inch marking across the northbound roadway should be removed.

(4) All signs should be mounted at 7 ft above the ground as per Section 2A.18 of the Texas MUTCD.

On Old Hensley Lane westbound approaching Draper Intermediate School, the School Speed Limit sign assembly is mounted too low to the ground, as shown in **Figure 25**, and should therefore be modified to achieve the required sign mounting height. Also, the double arrow sign (M6-4) which is mounted below the posted school zone times is unnecessary.

The double arrow sign is meant for cross streets where a school zone reduced speed limit is not in effect until after a turn at an intersection. Since the speed limit should be in effect along Old Hensley Lane, this panel should be removed. This panel is marked with  symbols in Figure 25.

Figure 25: School Zone Sign Recommended Change on Westbound Old Hensley Lane



- (5) The signs facing the exits for both the Cooper Junior High School drop-off/pick-up loop and bus loop (see **Figure 26**) should each have a double-headed arrow plaque mounted between the panel for the hours and the “Cell Phone Use Prohibited” plaque. Also note the signs (both school zone speed limit signs and stop signs) in these photographs are mounted too low to the ground. Consider replacing the somewhat faded stop signs when mounting on taller, compliant posts. A double-headed arrow plaque is shown in Figure 25.

- (6) The Texas MUTCD states in Section **7B.07**:

“School warning signs, including the “SCHOOL” portion of the School Speed Limit (S5-1) sign and including any supplemental plaques used in association with these warning signs, shall have a fluorescent yellow-green background with a black legend and border unless otherwise provided in this Manual for a specific sign.”

The “SCHOOL” panel at the top of the sign in Figure 25, as well as the top panels of the signs shown in **Figure 27** have a standard yellow background instead of a fluorescent yellow-green background for the “SCHOOL” panel and therefore need to be replaced.

Figure 26: Cooper Junior High School Drop-off/Pick-up Loop & Bus Loop Exits at New Hensley



Figure 27: Standard Yellow Signs on Southbound Woodbridge Pkwy



(7) Two “Slow Children at Play” signs posted along New Hensley Lane together with pedestrian warning signs are non-standard signs not found in the MUTCD or the Standard Highway Sign Designs for Texas. They should be removed. An example of this sign is shown in **Figure 28**. Justification for removal of such signs includes:

- Section **2C.02**: “The use of warning signs should be kept to a minimum as the unnecessary use of warning signs tends to breed disrespect for all signs.”
- Section **2C.03.01**: “Except as ... specifically designated otherwise, all warning signs shall be diamond-shaped (square with one diagonal vertical) with a black legend and border on a yellow background.” The “Slow Children at Play” sign does not meet this criterion due to its black legend and yellow background coupled with rectangular shape. The running child symbol on the sign does not appear in the MUTCD.
- Section **2A.06.09**: “All symbols shall be unmistakably similar to, or mirror images of, the adopted symbol signs, all of which are shown in the “Standard Highway Sign Designs for Texas” book (see Section 1A.11). Symbols and colors shall not be modified unless otherwise provided in this Manual. All symbols and colors for signs not shown in the “Standard Highway Sign Designs for Texas” book shall follow the procedures for experimentation and change described in Section 1A.10.”

Figure 28: Non-Standard “Slow Children at Play” Sign on New Hensley Lane



- (8) The Texas MUTCD gives guidance in Section **7B.01.05** that oversized signs (48" x 48" S1-1 "School" signs, 36" x 48" S5-2 "End School Zone" and R2-1 Speed Limit signs, etc.), "...should be used on roadways that have four or more lanes with posted speed limits of **40 mph** or higher."

The speed limit on southbound Woodbridge Parkway is 40 mph and transitions to 35 mph only about 100 feet in advance of the beginning of the 20 mph school speed zone. The replacement of existing signs along Woodbridge Parkway with larger signs from the "Oversized" column in Table 7B-1 of the MUTCD should therefore be implemented upstream of the transition from 40 mph to 35 mph, and considered as well for signs just downstream of the transition.

- (9) The Woodbridge North traffic impact analysis recommended that the intersection of Woodbridge Parkway and New Hensley Lane be upgraded to traffic signal control at some point in the future. When homes begin to develop in the Woodbridge North neighborhood, one or more marked crosswalks should be installed across Woodbridge Parkway, in addition to a marked crosswalk across the west leg of New Hensley Lane. Since prohibited by the MUTCD (see Sect. **7B.12.03**), these crosswalks should not be signed as school crosswalks while the conflicting approaches remain under stop-sign control.

However, if and when traffic signal control is constructed, school crosswalk signs (S1-1 with downward diagonal arrow panels mounted below) should be posted on either side of each crosswalk for emphasis to drivers making turns on a green light that there may be conflicting student pedestrians using the crosswalks. If separate left turn phases are provided, protected (rather than protected/permitted) left turn phasing is recommended to minimize the number of turning conflicts between drivers and pedestrians.

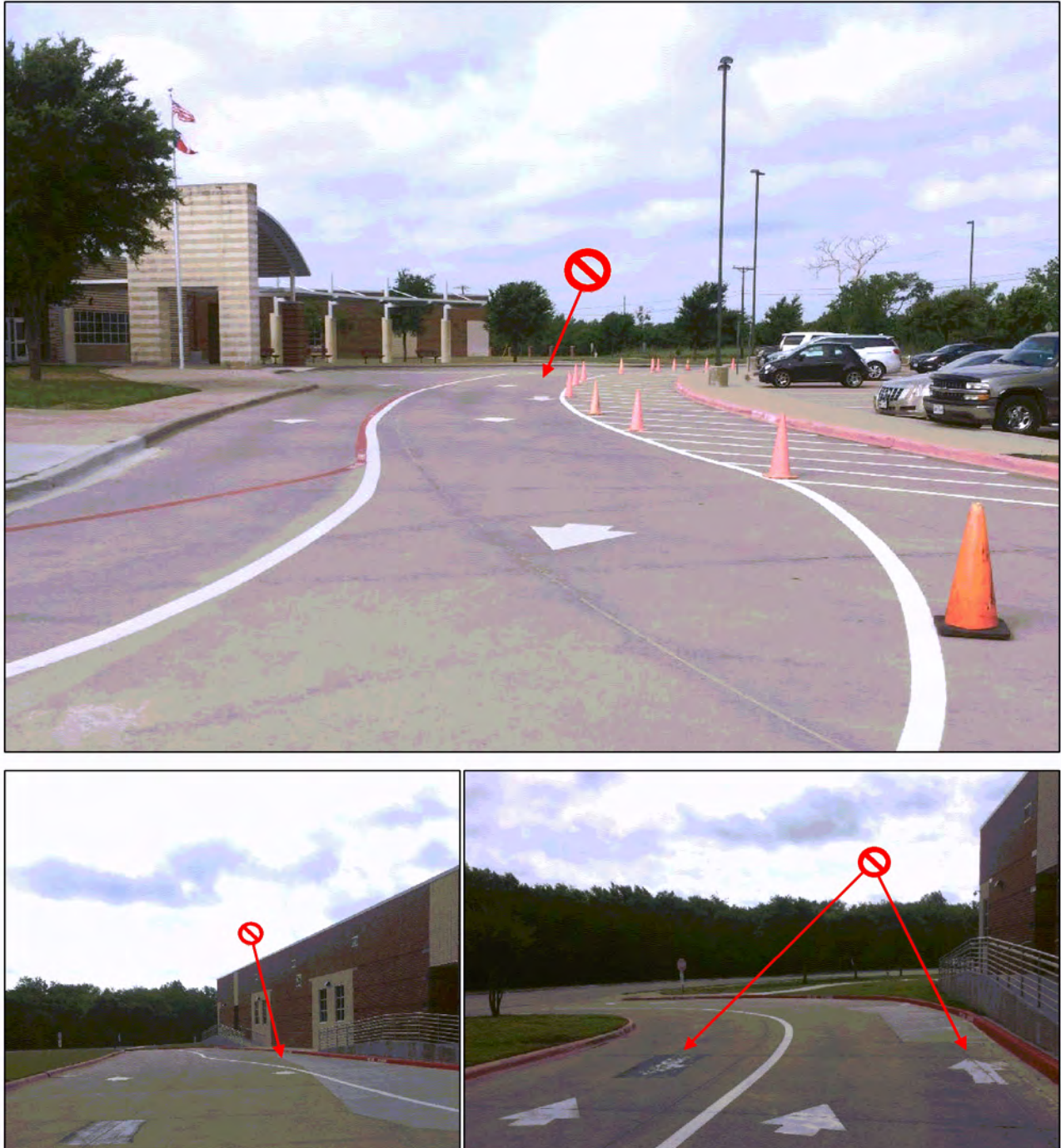
- (10) Consideration should be given to replacing School Speed Limit sign assemblies along Woodbridge Parkway and New Hensley Lane with “School Speed Limit 20 When Flashing” signs. Signs should be consistent in appearance and operation with those posted near Wylie High School to the north (see **Figure 29**), having flashing LED lights around the perimeter of the sign for added conspicuity. While current pedestrian crossing volumes near Cooper Junior High School and Draper Intermediate School are not as high as would normally be considered to warrant this type of treatment, pedestrian volumes are projected to increase in the future, and extra driver awareness of reduced speeds is important due to the queue spillback that occurs onto Woodbridge Parkway. These signs will also allow for the school calendar to be programmed so that flashing operations and reduced school speed limits occur at the appropriate time after dismissal for half days of school and for non-flashing operations and regular speed limits to be in effect on school holidays.

Figure 29: “School Speed Limit 20 When Flashing” sign on northbound Woodbridge Pkwy near Wylie H.S.



- (11) Internal to the Cooper Junior High School drop-off/pick-up loop area, several conflicting and potentially confusing pavement marking arrows are present. These are shown in **Figure 30** and should be removed.

Figure 30: Cooper Junior High School Pavement Marking Arrows to be Removed



In addition to MUTCD compliance, a brief, partial review was made for compliance with the United States Access Board's Proposed Rights-of-Way Guidelines². **Figure 31** shows that pedestrian ramps for the crosswalk across the east leg of New Hensley Lane at Woodbridge Parkway do not meet the requirement of having a 4' x 4' level landing area at the top of the ramp. A full review may identify other areas of deficiency for area sidewalks, pedestrian ramps, and street crossings, which should be rectified if possible when the intersection is converted to signal control or when homes generating additional pedestrian traffic to and from the east are constructed.

R304.2.1 Turning Space. A turning space 1.2 m (4.0 ft) minimum by 1.2 m (4.0 ft) minimum shall be provided at the top of the curb ramp and shall be permitted to overlap other turning spaces and clear spaces. Where the turning space is constrained at the back-of-sidewalk, the turning space shall be 1.2 m (4.0 ft) minimum by 1.5 m (5.0 ft) minimum. The 1.5 m (5.0 ft) dimension shall be provided in the direction of the ramp run.

Figure 31: Non-Compliant Pedestrian Ramps crossing east leg of New Hensley Ln at Woodbridge Pkwy



² <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines/chapter-r3-technical-requirements>

Appendix

Traffic Counts

Guidelines for Pedestrian Crossing Treatments (TTI) Evaluation Worksheets

Unsignalized Crosswalk Evaluations (FHWA) Worksheet

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: S W ALLEN BLVD
S OF SURREY CIR (AT MID-
BLOCK CROSSWALK)
Site Code:
Start Date: 02/06/2020
Page No: 1

Turning Movement Data

Start Time	S W ALLEN BLVD Southbound						CROSSWALK S OF SURREY CIR Westbound						S W ALLEN BLVD Northbound						CROSSWALK S OF SURREY CIR Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	0	49	0	0	0	49	0	0	0	0	0	0	0	39	0	0	0	39	0	0	0	0	0	0	88
6:45 AM	0	79	0	0	0	79	0	0	0	0	0	0	0	53	0	0	0	53	0	0	0	0	1	0	132
Hourly Total	0	128	0	0	0	128	0	0	0	0	0	0	0	92	0	0	0	92	0	0	0	0	1	0	220
7:00 AM	0	106	0	0	0	106	0	0	0	0	0	0	0	85	0	0	0	85	0	0	0	0	0	0	191
7:15 AM	0	131	0	0	0	131	0	0	0	0	2	0	0	93	0	0	0	93	0	0	0	0	1	0	224
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	237	0	0	0	237	0	0	0	0	2	0	0	178	0	0	0	178	0	0	0	0	1	0	415
2:30 PM	0	61	0	0	0	61	0	0	0	0	0	0	0	27	0	0	0	27	0	0	0	0	0	0	88
2:45 PM	0	56	0	0	0	56	0	0	0	0	7	0	0	96	0	0	0	96	0	0	0	0	1	0	152
Hourly Total	0	117	0	0	0	117	0	0	0	0	7	0	0	123	0	0	0	123	0	0	0	0	1	0	240
3:00 PM	0	40	0	0	0	40	0	0	0	0	0	0	0	36	0	0	0	36	0	0	0	0	0	0	76
3:15 PM	0	45	0	0	0	45	0	0	0	0	0	0	0	35	0	0	0	35	0	0	0	0	0	0	80
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	567	0	0	0	567	0	0	0	0	9	0	0	464	0	0	0	464	0	0	0	0	3	0	1031
Approach %	0.0	100.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	100.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-
Total %	0.0	55.0	0.0	0.0	-	55.0	0.0	0.0	0.0	0.0	-	0.0	0.0	45.0	0.0	0.0	-	45.0	0.0	0.0	0.0	0.0	-	0.0	-
Lights	0	553	0	0	-	553	0	0	0	0	-	0	0	450	0	0	-	450	0	0	0	0	-	0	1003
% Lights	-	97.5	-	-	-	97.5	-	-	-	-	-	-	-	97.0	-	-	-	97.0	-	-	-	-	-	-	97.3
Mediums	0	13	0	0	-	13	0	0	0	0	-	0	0	14	0	0	-	14	0	0	0	0	-	0	27
% Mediums	-	2.3	-	-	-	2.3	-	-	-	-	-	-	-	3.0	-	-	-	3.0	-	-	-	-	-	-	2.6
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	-	0.2	-	-	-	0.2	-	-	-	-	-	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	9	-	-	-	-	-	0	-	-	-	-	3	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: 4 - BROWN ST @
EAST CENTRAL DRIVEWAY
Site Code:
Start Date: 01/18/2018
Page No: 1

Turning Movement Data

Start Time	DRIVEWAY Southbound						BROWN ST Westbound						Northbound St. Northbound						BROWN ST Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	0	0	0	0	0	0	0	53	0	0	0	53	0	0	0	0	0	0	1	60	0	0	0	61	114
6:45 AM	0	0	0	0	0	0	0	81	2	0	0	83	0	0	0	0	0	0	2	51	0	0	0	53	136
Hourly Total	0	0	0	0	0	0	0	134	2	0	0	136	0	0	0	0	0	0	3	111	0	0	0	114	250
7:00 AM	0	0	0	0	5	0	0	77	16	0	4	93	0	0	0	0	0	0	23	69	0	0	0	92	185
7:15 AM	0	0	0	0	1	0	0	129	41	0	3	170	0	0	0	0	0	0	54	103	0	0	0	157	327
7:30 AM	0	0	0	0	0	0	0	94	11	0	2	105	1	0	1	0	2	2	13	58	0	0	0	71	178
7:45 AM	0	0	0	0	0	0	0	66	4	0	0	70	0	0	0	0	0	0	3	56	0	0	0	59	129
Hourly Total	0	0	0	0	6	0	0	366	72	0	9	438	1	0	1	0	2	2	93	286	0	0	0	379	819
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	0	0	0	0	0	0	0	40	3	0	0	43	0	0	0	0	0	0	4	55	0	0	0	59	102
2:15 PM	0	0	0	0	1	0	0	44	2	0	0	46	0	0	0	0	0	0	4	70	0	0	0	74	120
2:30 PM	0	0	0	0	1	0	0	46	4	0	33	50	0	0	0	0	3	0	3	55	0	0	0	58	108
2:45 PM	0	0	0	0	1	0	0	107	5	0	51	112	0	0	0	0	0	0	12	76	0	0	0	88	200
Hourly Total	0	0	0	0	3	0	0	237	14	0	84	251	0	0	0	0	3	0	23	256	0	0	0	279	530
3:00 PM	0	0	0	0	0	0	0	54	1	0	1	55	1	0	1	0	0	2	1	40	0	0	0	41	98
3:15 PM	0	0	0	0	1	0	0	33	0	0	1	33	0	0	0	0	0	0	2	48	0	0	0	50	83
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	10	0	0	824	89	0	95	913	2	0	2	0	5	4	122	741	0	0	0	863	1780
Approach %	0.0	0.0	0.0	0.0	-	-	0.0	90.3	9.7	0.0	-	-	50.0	0.0	50.0	0.0	-	-	14.1	85.9	0.0	0.0	-	-	-
Total %	0.0	0.0	0.0	0.0	-	0.0	0.0	46.3	5.0	0.0	-	51.3	0.1	0.0	0.1	0.0	-	0.2	6.9	41.6	0.0	0.0	-	48.5	-
Lights	0	0	0	0	-	0	0	810	85	0	-	895	2	0	2	0	-	4	115	726	0	0	-	841	1740
% Lights	-	-	-	-	-	-	-	98.3	95.5	-	-	98.0	100.0	-	100.0	-	-	100.0	94.3	98.0	-	-	-	97.5	97.8
Mediums	0	0	0	0	-	0	0	10	4	0	-	14	0	0	0	0	-	0	7	13	0	0	-	20	34
% Mediums	-	-	-	-	-	-	-	1.2	4.5	-	-	1.5	0.0	-	0.0	-	-	0.0	5.7	1.8	-	-	-	2.3	1.9
Articulated Trucks	0	0	0	0	-	0	0	4	0	0	-	4	0	0	0	0	-	0	0	2	0	0	-	2	6
% Articulated Trucks	-	-	-	-	-	-	-	0.5	0.0	-	-	0.4	0.0	-	0.0	-	-	0.0	0.0	0.3	-	-	-	0.2	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	95	-	-	-	-	-	5	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: 5 - CHEYENNE
RD @ TUSCALOSA DR
Site Code:
Start Date: 01/25/2018
Page No: 1

Turning Movement Data

Start Time	CHEYENNE RD Southbound						TUSCALOSA DR Westbound						CHEYENNE RD Northbound						DODD ES NORTH DRWY Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	0	14	0	0	0	14	11	0	3	0	0	14	3	3	2	1	0	9	0	0	0	0	0	0	37
6:45 AM	0	8	11	0	0	19	11	4	1	0	0	16	15	5	1	0	0	21	0	0	0	0	1	0	56
Hourly Total	0	22	11	0	0	33	22	4	4	0	0	30	18	8	3	1	0	30	0	0	0	0	1	0	93
7:00 AM	0	5	34	0	4	39	10	15	3	0	4	28	47	11	9	0	1	67	0	0	0	0	0	0	134
7:15 AM	3	7	56	0	15	66	4	19	1	0	6	24	53	29	23	0	0	105	0	0	0	0	0	0	195
7:30 AM	4	8	8	0	3	20	8	3	1	0	3	12	12	17	10	0	1	39	0	0	0	0	0	0	71
7:45 AM	2	13	0	0	2	15	15	0	3	0	2	18	2	10	4	0	0	16	0	0	0	0	0	0	49
Hourly Total	9	33	98	0	24	140	37	37	8	0	15	82	114	67	46	0	2	227	0	0	0	0	0	0	449
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	3	1	0	0	4	1	0	0	0	0	1	10	5	7	0	0	22	0	0	0	0	0	0	27
2:15 PM	0	5	5	0	3	10	3	1	0	0	0	4	14	3	6	0	0	23	0	0	0	0	4	0	37
2:30 PM	1	2	0	0	54	3	4	0	0	0	28	4	0	7	15	0	2	22	0	0	0	0	12	0	29
2:45 PM	2	3	33	0	22	38	2	38	3	0	12	43	12	21	25	0	3	58	0	0	0	0	7	0	139
Hourly Total	3	13	39	0	79	55	10	39	3	0	40	52	36	36	53	0	5	125	0	0	0	0	23	0	232
3:00 PM	2	2	5	0	0	9	3	1	0	0	0	4	9	8	2	0	0	19	0	0	0	0	1	0	32
3:15 PM	0	8	0	0	1	8	4	0	0	0	1	4	3	8	7	0	0	18	0	0	0	0	0	0	30
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	14	78	153	0	104	245	76	81	15	0	56	172	180	127	111	1	7	419	0	0	0	0	25	0	836
Approach %	5.7	31.8	62.4	0.0	-	-	44.2	47.1	8.7	0.0	-	-	43.0	30.3	26.5	0.2	-	-	0.0	0.0	0.0	0.0	-	-	-
Total %	1.7	9.3	18.3	0.0	-	29.3	9.1	9.7	1.8	0.0	-	20.6	21.5	15.2	13.3	0.1	-	50.1	0.0	0.0	0.0	0.0	-	0.0	-
Lights	12	75	153	0	-	240	76	81	14	0	-	171	179	124	110	0	-	413	0	0	0	0	-	0	824
% Lights	85.7	96.2	100.0	-	-	98.0	100.0	100.0	93.3	-	-	99.4	99.4	97.6	99.1	0.0	-	98.6	-	-	-	-	-	-	98.6
Mediums	2	3	0	0	-	5	0	0	1	0	-	1	1	3	1	0	-	5	0	0	0	0	-	0	11
% Mediums	14.3	3.8	0.0	-	-	2.0	0.0	0.0	6.7	-	-	0.6	0.6	2.4	0.9	0.0	-	1.2	-	-	-	-	-	-	1.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	1	-	1	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	100.0	-	0.2	-	-	-	-	-	-	0.1
Bicycles on Crosswalk	-	-	-	-	8	-	-	-	-	-	10	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	7.7	-	-	-	-	-	17.9	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	96	-	-	-	-	-	46	-	-	-	-	-	7	-	-	-	-	-	25	-	-
% Pedestrians	-	-	-	-	92.3	-	-	-	-	-	82.1	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: MCMILLAN JR
HIGH-DAVIS INTERMEDIATE
EAST DRWY
Site Code:
Start Date: 02/07/2018
Page No: 1

Turning Movement Data

Start Time	MCMILLAN JR HIGH-DAVIS INTERMEDIATE EAST DRWY						PARK BLVD						WESTGATE WAY						PARK BLVD						Int. Total
	Southbound						Westbound						Northbound						Eastbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	0	0	0	1	0	3	43	2	1	0	49	27	0	5	0	0	32	0	28	12	0	0	40	121
7:15 AM	0	0	0	0	9	0	1	63	1	0	3	65	36	1	3	0	0	40	0	26	24	0	3	50	155
7:30 AM	0	0	0	0	29	0	4	78	0	0	26	82	36	0	5	0	0	41	0	44	29	0	4	73	196
7:45 AM	4	3	5	0	27	12	3	49	0	0	26	52	42	0	4	0	0	46	0	43	30	0	14	73	183
Hourly Total	4	3	5	0	66	12	11	233	3	1	55	248	141	1	17	0	0	159	0	141	95	0	21	236	655
8:00 AM	1	3	1	0	8	5	2	37	0	0	7	39	36	0	9	0	0	45	0	42	28	0	1	70	159
8:15 AM	0	0	0	0	6	0	2	20	0	0	3	22	12	0	6	0	0	18	0	24	14	0	0	38	78
8:30 AM	1	0	0	0	0	1	2	22	0	0	0	24	7	0	6	0	0	13	0	16	6	0	0	22	60
8:45 AM	0	0	1	0	0	1	2	15	0	0	0	17	6	0	3	0	0	9	0	18	6	0	0	24	51
Hourly Total	2	3	2	0	14	7	8	94	0	0	10	102	61	0	24	0	0	85	0	100	54	0	1	154	348
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	9	23	0	0	0	32	17	0	3	0	0	20	0	21	16	0	0	37	89
Hourly Total	0	0	0	0	0	0	9	23	0	0	0	32	17	0	3	0	0	20	0	21	16	0	0	37	89
3:00 PM	0	0	1	0	1	1	5	37	0	0	1	42	16	0	2	0	0	18	0	17	11	0	0	28	89
3:15 PM	1	0	2	0	2	3	8	29	0	0	3	37	9	0	7	0	0	16	0	17	10	1	2	28	84
3:30 PM	9	3	2	0	105	14	7	35	0	0	86	42	19	0	12	0	0	31	0	36	20	0	122	56	143
3:45 PM	0	0	1	0	12	1	4	25	0	0	13	29	17	0	5	0	0	22	0	62	37	0	20	99	151
Hourly Total	10	3	6	0	120	19	24	126	0	0	103	150	61	0	26	0	0	87	0	132	78	1	144	211	467
4:00 PM	1	0	0	0	1	1	2	24	0	0	1	26	15	0	7	0	0	22	0	37	17	0	3	54	103
4:15 PM	0	0	0	0	1	0	3	26	0	0	1	29	12	0	7	0	0	19	0	56	13	1	1	70	118
4:30 PM	0	1	1	0	1	2	10	51	0	0	0	61	13	1	6	0	0	20	0	39	25	0	11	64	147
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2
Hourly Total	1	1	1	0	3	3	15	102	0	0	2	117	40	1	20	0	0	61	0	133	55	1	15	189	370
Grand Total	17	10	14	0	203	41	67	578	3	1	170	649	320	2	90	0	0	412	0	527	298	2	181	827	1929
Approach %	41.5	24.4	34.1	0.0	-	-	10.3	89.1	0.5	0.2	-	-	77.7	0.5	21.8	0.0	-	-	0.0	63.7	36.0	0.2	-	-	-
Total %	0.9	0.5	0.7	0.0	-	2.1	3.5	30.0	0.2	0.1	-	33.6	16.6	0.1	4.7	0.0	-	21.4	0.0	27.3	15.4	0.1	-	42.9	-
Lights	3	1	2	0	-	6	64	555	2	1	-	622	309	2	86	0	-	397	0	516	284	2	-	802	1827
% Lights	17.6	10.0	14.3	-	-	14.6	95.5	96.0	66.7	100.0	-	95.8	96.6	100.0	95.6	-	-	96.4	-	97.9	95.3	100.0	-	97.0	94.7
Mediums	14	9	12	0	-	35	3	23	1	0	-	27	11	0	4	0	-	15	0	11	14	0	-	25	102
% Mediums	82.4	90.0	85.7	-	-	85.4	4.5	4.0	33.3	0.0	-	4.2	3.4	0.0	4.4	-	-	3.6	-	2.1	4.7	0.0	-	3.0	5.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	19	-	-	-	-	-	13	-	-	-	-	-	0	-	-	-	-	14	-	-	-
% Bicycles on Crosswalk	-	-	-	-	9.4	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	7.7	-	-	-
Pedestrians	-	-	-	-	184	-	-	-	-	-	157	-	-	-	-	-	0	-	-	-	-	167	-	-	-
% Pedestrians	-	-	-	-	90.6	-	-	-	-	-	92.4	-	-	-	-	-	-	-	-	-	-	92.3	-	-	-

1120 W. Lovers Lane

Count Name: 4 - S
BIRMINGHAM ST @ SOUTH
CENTRAL DRWY
Site Code:
Start Date: 02/08/2018
Page No: 1

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: 8 - BALLARD AVE
@ BIRMINGHAM ST - DAY 2
Site Code:
Start Date: 01/18/2018
Page No: 1

Turning Movement Data

Start Time	BALLARD AVE Southbound						SCHOOL DRWY Westbound						BALLARD AVE Northbound						BIRMINGHAM ST Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	49	0	0	0	49	0	2	1	0	0	3	60	69	0	0	0	129	0	0	28	0	0	28	209
7:15 AM	0	70	1	0	0	71	1	1	8	0	0	10	48	72	0	0	0	120	0	0	41	0	0	41	242
7:30 AM	0	90	1	0	0	91	16	2	40	0	0	58	39	84	0	1	1	124	0	0	45	0	0	45	318
7:45 AM	0	111	5	0	0	116	33	3	73	0	0	109	28	105	0	1	10	134	0	0	36	0	2	36	395
Hourly Total	0	320	7	0	0	327	50	8	122	0	0	180	175	330	0	2	11	507	0	0	150	0	2	150	1164
8:00 AM	0	85	1	0	0	86	41	9	70	0	1	120	34	79	0	0	1	113	1	0	33	0	0	34	353
8:15 AM	0	40	2	0	0	42	6	2	10	0	0	18	34	56	0	0	0	90	2	0	25	0	0	27	177
8:30 AM	0	38	1	1	0	40	0	0	3	0	0	3	22	61	0	0	0	83	1	0	20	0	0	21	147
8:45 AM	0	38	0	0	0	38	1	1	1	0	0	3	26	44	0	0	0	70	3	0	12	0	0	15	126
Hourly Total	0	201	4	1	0	206	48	12	84	0	1	144	116	240	0	0	1	356	7	0	90	0	0	97	803
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	68	1	0	0	69	0	0	1	0	0	1	33	56	0	0	0	89	0	0	48	0	0	48	207
Hourly Total	0	68	1	0	0	69	0	0	1	0	0	1	33	56	0	0	0	89	0	0	48	0	0	48	207
3:00 PM	0	51	1	0	0	52	1	0	2	0	1	3	24	49	0	1	0	74	0	0	36	0	0	36	165
3:15 PM	0	54	0	0	0	54	2	0	4	0	0	6	21	68	0	2	4	91	1	0	40	0	0	41	192
3:30 PM	0	113	4	2	0	119	22	1	55	0	1	78	27	54	0	0	21	81	1	0	37	0	3	38	316
3:45 PM	0	85	3	0	0	88	5	1	6	0	2	12	24	48	0	0	3	72	0	0	41	0	0	41	213
Hourly Total	0	303	8	2	0	313	30	2	67	0	4	99	96	219	0	3	28	318	2	0	154	0	3	156	886
4:00 PM	0	50	2	0	0	52	4	2	3	0	0	9	22	66	0	0	2	88	1	0	45	0	0	46	195
4:15 PM	0	60	0	0	0	60	15	2	16	0	0	33	33	62	0	1	3	96	2	0	47	0	0	49	238
4:30 PM	0	94	2	0	0	96	6	3	7	0	0	16	25	53	0	0	0	78	0	0	40	0	0	40	230
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	204	4	0	0	208	25	7	26	0	0	58	80	181	0	1	5	262	3	0	132	0	0	135	663
Grand Total	0	1096	24	3	0	1123	153	29	300	0	5	482	500	1026	0	6	45	1532	12	0	574	0	5	586	3723
Approach %	0.0	97.6	2.1	0.3	-	-	31.7	6.0	62.2	0.0	-	-	32.6	67.0	0.0	0.4	-	-	2.0	0.0	98.0	0.0	-	-	-
Total %	0.0	29.4	0.6	0.1	-	30.2	4.1	0.8	8.1	0.0	-	12.9	13.4	27.6	0.0	0.2	-	41.1	0.3	0.0	15.4	0.0	-	15.7	-
Lights	0	1057	21	3	-	1081	152	29	293	0	-	474	497	974	0	6	-	1477	12	0	568	0	-	580	3612
% Lights	-	96.4	87.5	100.0	-	96.3	99.3	100.0	97.7	-	-	98.3	99.4	94.9	-	100.0	-	96.4	100.0	-	99.0	-	-	99.0	97.0
Mediums	0	34	3	0	-	37	1	0	7	0	-	8	3	43	0	0	-	46	0	0	6	0	-	6	97
% Mediums	-	3.1	12.5	0.0	-	3.3	0.7	0.0	2.3	-	-	1.7	0.6	4.2	-	0.0	-	3.0	0.0	-	1.0	-	-	1.0	2.6
Articulated Trucks	0	5	0	0	-	5	0	0	0	0	-	0	0	9	0	0	-	9	0	0	0	0	-	0	14
% Articulated Trucks	-	0.5	0.0	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.9	-	0.0	-	0.6	0.0	-	0.0	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	20.0	-	-	-	-	-	11.1	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	40	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	80.0	-	-	-	-	-	88.9	-	-	-	-	-	100.0	-	-

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: STONE RD @
HILLTOP LN
Site Code:
Start Date: 02/13/2020
Page No: 1

Turning Movement Data

Start Time	Southbound St. Southbound						STONE RD Westbound						HILLTOP LN Northbound						STONE RD Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:45 AM	0	0	0	0	0	0	12	121	0	0	0	133	1	0	1	0	0	2	0	22	18	0	0	40	175
Hourly Total	0	0	0	0	0	0	12	121	0	0	0	133	1	0	1	0	0	2	0	22	18	0	0	40	175
7:00 AM	0	0	0	0	0	0	10	149	0	0	0	159	10	0	1	0	0	11	0	48	23	0	0	71	241
7:15 AM	0	0	0	0	0	0	6	129	0	0	0	135	17	0	0	0	1	17	0	56	35	0	0	91	243
7:30 AM	0	0	0	0	0	0	28	150	0	0	0	178	14	0	3	0	0	17	0	73	25	0	1	98	293
7:45 AM	0	0	0	0	0	0	50	148	0	0	0	198	35	0	4	0	0	39	0	61	28	0	0	89	326
Hourly Total	0	0	0	0	0	0	94	576	0	0	0	670	76	0	8	0	1	84	0	238	111	0	1	349	1103
8:00 AM	0	0	0	0	0	0	20	128	0	0	0	148	27	0	2	0	0	29	0	86	23	0	1	109	286
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	20	128	0	0	0	148	27	0	2	0	0	29	0	86	23	0	1	109	286
2:30 PM	0	0	0	0	0	0	3	82	0	0	0	85	7	0	3	0	2	10	0	79	17	0	0	96	191
2:45 PM	0	0	0	0	0	0	7	83	0	0	0	90	12	0	3	0	3	15	0	90	11	0	1	101	206
Hourly Total	0	0	0	0	0	0	10	165	0	0	0	175	19	0	6	0	5	25	0	169	28	0	1	197	397
3:00 PM	0	0	0	0	0	0	6	91	0	0	0	97	8	0	2	0	0	10	0	100	12	0	0	112	219
3:15 PM	0	0	0	0	0	0	13	84	0	0	0	97	9	0	1	0	0	10	0	87	23	0	0	110	217
3:30 PM	0	0	0	0	0	0	9	89	0	0	0	98	42	0	6	0	0	48	0	138	16	0	8	154	300
3:45 PM	0	0	0	0	0	0	6	93	0	0	0	99	11	0	1	0	0	12	0	141	8	0	2	149	260
Hourly Total	0	0	0	0	0	0	34	357	0	0	0	391	70	0	10	0	0	80	0	466	59	0	10	525	996
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	170	1347	0	0	0	1517	193	0	27	0	6	220	0	981	239	0	13	1220	2957
Approach %	0.0	0.0	0.0	0.0	-	-	11.2	88.8	0.0	0.0	-	-	87.7	0.0	12.3	0.0	-	-	0.0	80.4	19.6	0.0	-	-	-
Total %	0.0	0.0	0.0	0.0	-	0.0	5.7	45.6	0.0	0.0	-	51.3	6.5	0.0	0.9	0.0	-	7.4	0.0	33.2	8.1	0.0	-	41.3	-
Lights	0	0	0	0	-	0	168	1298	0	0	-	1466	193	0	26	0	-	219	0	944	230	0	-	1174	2859
% Lights	-	-	-	-	-	-	98.8	96.4	-	-	-	96.6	100.0	-	96.3	-	-	99.5	-	96.2	96.2	-	-	96.2	96.7
Mediums	0	0	0	0	-	0	2	48	0	0	-	50	0	0	1	0	-	1	0	33	9	0	-	42	93
% Mediums	-	-	-	-	-	-	1.2	3.6	-	-	-	3.3	0.0	-	3.7	-	-	0.5	-	3.4	3.8	-	-	3.4	3.1
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	4	0	0	-	4	5
% Articulated Trucks	-	-	-	-	-	-	0.0	0.1	-	-	-	0.1	0.0	-	0.0	-	-	0.0	-	0.4	0.0	-	-	0.3	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: STONE RD @
THOMAS ST
Site Code:
Start Date: 02/13/2020
Page No: 1

Turning Movement Data

Start Time	Southbound St. Southbound						STONE RD Westbound						THOMAS ST Northbound						STONE RD Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:45 AM	0	0	0	0	0	0	9	128	0	0	0	137	0	0	9	0	0	9	0	23	0	0	0	23	169
Hourly Total	0	0	0	0	0	0	9	128	0	0	0	137	0	0	9	0	0	9	0	23	0	0	0	23	169
7:00 AM	0	0	0	0	0	0	12	148	0	0	0	160	4	0	14	0	1	18	0	51	3	0	0	54	232
7:15 AM	0	0	0	0	0	0	17	115	0	0	0	132	12	0	12	0	1	24	0	52	8	0	0	60	216
7:30 AM	0	0	0	0	0	0	16	167	0	0	0	183	4	0	19	0	0	23	0	69	2	0	0	71	277
7:45 AM	0	0	0	0	0	0	18	169	0	0	0	187	16	0	49	0	0	65	0	64	4	0	0	68	320
Hourly Total	0	0	0	0	0	0	63	599	0	0	0	662	36	0	94	0	2	130	0	236	17	0	0	253	1045
8:00 AM	0	0	0	0	0	0	25	139	0	0	0	164	10	0	60	0	0	70	0	73	7	0	0	80	314
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	25	139	0	0	0	164	10	0	60	0	0	70	0	73	7	0	0	80	314
2:30 PM	0	0	0	0	0	0	1	74	0	0	0	75	11	0	6	0	2	17	0	81	3	0	0	84	176
2:45 PM	0	0	0	0	0	0	4	78	0	0	1	82	12	0	15	0	0	27	0	86	3	0	0	89	198
Hourly Total	0	0	0	0	0	0	5	152	0	0	1	157	23	0	21	0	2	44	0	167	6	0	0	173	374
3:00 PM	0	0	0	0	0	0	6	85	0	0	0	91	3	0	7	0	0	10	0	96	3	0	0	99	200
3:15 PM	0	0	0	0	0	0	15	98	0	0	0	113	6	0	8	0	0	14	0	84	7	0	0	91	218
3:30 PM	0	0	0	0	0	0	16	81	0	0	0	97	17	0	65	0	0	82	0	119	10	0	0	129	308
3:45 PM	0	0	0	0	0	0	8	86	0	0	0	94	8	0	16	0	0	24	0	141	1	0	0	142	260
Hourly Total	0	0	0	0	0	0	45	350	0	0	0	395	34	0	96	0	0	130	0	440	21	0	0	461	986
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	147	1368	0	0	1	1515	103	0	280	0	4	383	0	939	51	0	0	990	2888
Approach %	0.0	0.0	0.0	0.0	-	-	9.7	90.3	0.0	0.0	-	-	26.9	0.0	73.1	0.0	-	-	0.0	94.8	5.2	0.0	-	-	-
Total %	0.0	0.0	0.0	0.0	-	0.0	5.1	47.4	0.0	0.0	-	52.5	3.6	0.0	9.7	0.0	-	13.3	0.0	32.5	1.8	0.0	-	34.3	-
Lights	0	0	0	0	-	0	147	1333	0	0	-	1480	91	0	273	0	-	364	0	904	49	0	-	953	2797
% Lights	-	-	-	-	-	-	100.0	97.4	-	-	-	97.7	88.3	-	97.5	-	-	95.0	-	96.3	96.1	-	-	96.3	96.8
Mediums	0	0	0	0	-	0	0	34	0	0	-	34	12	0	7	0	-	19	0	30	2	0	-	32	85
% Mediums	-	-	-	-	-	-	0.0	2.5	-	-	-	2.2	11.7	-	2.5	-	-	5.0	-	3.2	3.9	-	-	3.2	2.9
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	5	0	0	-	5	6
% Articulated Trucks	-	-	-	-	-	-	0.0	0.1	-	-	-	0.1	0.0	-	0.0	-	-	0.0	-	0.5	0.0	-	-	0.5	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Count Name: COUNTRY CLUB
RD @ SMITH ELEMENTARY
ENTRANCE
Site Code:
Start Date: 02/06/2020
Page No: 1

Start Time	COUNTRY CLUB RD Southbound						Westbound St. Westbound						COUNTRY CLUB RD Northbound						SMITH ELEMENTARY ENTRANCE Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	0	66	7	0	0	73	0	0	0	0	0	0	7	103	0	0	0	110	0	0	0	0	0	0	183
6:45 AM	0	88	15	0	0	103	0	0	0	0	0	0	33	119	0	0	0	152	5	0	12	0	0	17	272
Hourly Total	0	154	22	0	0	176	0	0	0	0	0	0	40	222	0	0	0	262	5	0	12	0	0	17	455
7:00 AM	0	86	44	0	0	130	0	0	0	0	0	0	84	161	0	1	0	246	12	0	71	0	0	83	459
7:15 AM	0	123	60	0	0	183	0	0	0	0	1	0	109	158	0	0	0	267	13	0	125	0	0	138	588
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	209	104	0	0	313	0	0	0	0	1	0	193	319	0	1	0	513	25	0	196	0	0	221	1047
2:30 PM	0	80	18	0	0	98	0	0	0	0	0	0	52	73	0	0	0	125	11	0	38	0	0	49	272
2:45 PM	0	109	10	0	0	119	0	0	0	0	0	0	22	91	0	1	0	114	23	0	94	0	0	117	350
Hourly Total	0	189	28	0	0	217	0	0	0	0	0	0	74	164	0	1	0	239	34	0	132	0	0	166	622
3:00 PM	0	79	6	0	0	85	0	0	0	0	0	0	5	86	0	0	0	91	3	0	11	0	0	14	190
3:15 PM	0	107	6	0	0	113	0	0	0	0	0	0	10	72	0	0	0	82	4	0	13	0	0	17	212
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	738	166	0	0	904	0	0	0	0	1	0	322	863	0	2	0	1187	71	0	364	0	0	435	2526
Approach %	0.0	81.6	18.4	0.0	-	-	0.0	0.0	0.0	0.0	-	-	27.1	72.7	0.0	0.2	-	-	16.3	0.0	83.7	0.0	-	-	-
Total %	0.0	29.2	6.6	0.0	-	35.8	0.0	0.0	0.0	0.0	-	0.0	12.7	34.2	0.0	0.1	-	47.0	2.8	0.0	14.4	0.0	-	17.2	-
Lights	0	716	155	0	-	871	0	0	0	0	-	0	316	831	0	1	-	1148	69	0	346	0	-	415	2434
% Lights	-	97.0	93.4	-	-	96.3	-	-	-	-	-	-	98.1	96.3	-	50.0	-	96.7	97.2	-	95.1	-	-	95.4	96.4
Mediums	0	19	11	0	-	30	0	0	0	0	-	0	6	30	0	1	-	37	2	0	18	0	-	20	87
% Mediums	-	2.6	6.6	-	-	3.3	-	-	-	-	-	-	1.9	3.5	-	50.0	-	3.1	2.8	-	4.9	-	-	4.6	3.4
Articulated Trucks	0	3	0	0	-	3	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	5
% Articulated Trucks	-	0.4	0.0	-	-	0.3	-	-	-	-	-	-	0.0	0.2	-	0.0	-	0.2	0.0	-	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: 8 - FM 544 @
WYLIE HS BUS LOOP DRWY -
DAY 1
Site Code:
Start Date: 01/24/2018
Page No: 1

Turning Movement Data

Start Time	DRIVEWAY Southbound						FM 544 Westbound						WYLIE HS BUS LOOP DRWY Northbound						FM 544 Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	0	0	0	0	0	0	1	409	0	8	0	418	0	0	0	0	0	0	0	156	4	0	0	160	578
7:45 AM	0	0	0	0	0	0	0	369	1	6	0	376	1	0	2	0	0	3	0	222	1	3	0	226	605
Hourly Total	0	0	0	0	0	0	1	778	1	14	0	794	1	0	2	0	0	3	0	378	5	3	0	386	1183
8:00 AM	0	0	0	0	0	0	0	395	0	4	0	399	1	0	0	0	0	1	0	149	0	3	0	152	552
8:15 AM	0	0	0	0	1	0	0	327	0	9	0	336	0	0	5	0	0	5	0	149	12	0	0	161	502
8:30 AM	0	0	0	0	0	0	1	279	1	14	0	295	0	0	21	0	0	21	0	144	13	3	0	160	476
8:45 AM	0	0	0	0	0	0	0	287	0	20	0	307	0	0	0	0	0	0	2	210	0	3	0	215	522
Hourly Total	0	0	0	0	1	0	1	1288	1	47	0	1337	1	0	26	0	0	27	2	652	25	9	0	688	2052
9:00 AM	1	0	0	0	0	1	2	258	3	4	0	267	0	0	4	0	0	4	0	126	3	1	0	130	402
9:15 AM	0	0	4	0	0	4	0	217	1	3	0	221	0	0	1	0	0	1	0	147	0	0	0	147	373
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	0	4	0	0	5	2	475	4	7	0	488	0	0	5	0	0	5	0	275	3	1	0	279	777
3:30 PM	0	0	0	0	0	0	0	248	0	1	0	249	1	0	0	0	0	1	0	312	1	7	0	320	570
3:45 PM	0	0	1	0	0	1	0	253	0	1	0	254	0	0	0	0	0	0	2	291	0	11	0	304	559
Hourly Total	0	0	1	0	0	1	0	501	0	2	0	503	1	0	0	0	0	1	2	603	1	18	0	624	1129
4:00 PM	1	0	0	0	0	1	2	194	0	0	0	196	0	0	0	0	0	0	0	357	6	6	1	369	566
4:15 PM	0	0	0	0	0	0	0	212	0	0	0	212	0	0	0	0	0	0	0	401	7	11	0	419	631
4:30 PM	0	0	0	0	0	0	0	239	0	1	0	240	0	0	15	0	0	15	0	372	0	31	0	403	658
4:45 PM	0	0	0	0	0	0	0	226	1	0	0	227	0	0	1	0	0	1	1	388	1	15	0	405	633
Hourly Total	1	0	0	0	0	1	2	871	1	1	0	875	0	0	16	0	0	16	1	1518	14	63	1	1596	2488
5:00 PM	0	0	2	0	0	2	0	279	0	2	0	281	0	0	0	0	0	0	0	418	0	12	1	430	713
5:15 PM	0	0	1	0	0	1	1	269	0	4	0	274	1	0	1	0	0	2	0	430	1	6	0	437	714
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	0	8	0	1	10	7	4461	7	77	0	4552	4	0	50	0	0	54	5	4274	49	112	2	4440	9056
Approach %	20.0	0.0	80.0	0.0	-	-	0.2	98.0	0.2	1.7	-	-	7.4	0.0	92.6	0.0	-	-	0.1	96.3	1.1	2.5	-	-	-
Total %	0.0	0.0	0.1	0.0	-	0.1	0.1	49.3	0.1	0.9	-	50.3	0.0	0.0	0.6	0.0	-	0.6	0.1	47.2	0.5	1.2	-	49.0	-
Lights	2	0	8	0	-	10	4	4342	7	77	-	4430	4	0	9	0	-	13	5	4192	10	112	-	4319	8772
% Lights	100.0	-	100.0	-	-	100.0	57.1	97.3	100.0	100.0	-	97.3	100.0	-	18.0	-	-	24.1	100.0	98.1	20.4	100.0	-	97.3	96.9
Mediums	0	0	0	0	-	0	3	86	0	0	-	89	0	0	41	0	-	41	0	58	39	0	-	97	227
% Mediums	0.0	-	0.0	-	-	0.0	42.9	1.9	0.0	0.0	-	2.0	0.0	-	82.0	-	-	75.9	0.0	1.4	79.6	0.0	-	2.2	2.5
Articulated Trucks	0	0	0	0	-	0	0	33	0	0	-	33	0	0	0	0	-	0	0	24	0	0	-	24	57
% Articulated Trucks	0.0	-	0.0	-	-	0.0	0.0	0.7	0.0	0.0	-	0.7	0.0	-	0.0	-	-	0.0	0.0	0.6	0.0	0.0	-	0.5	0.6
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

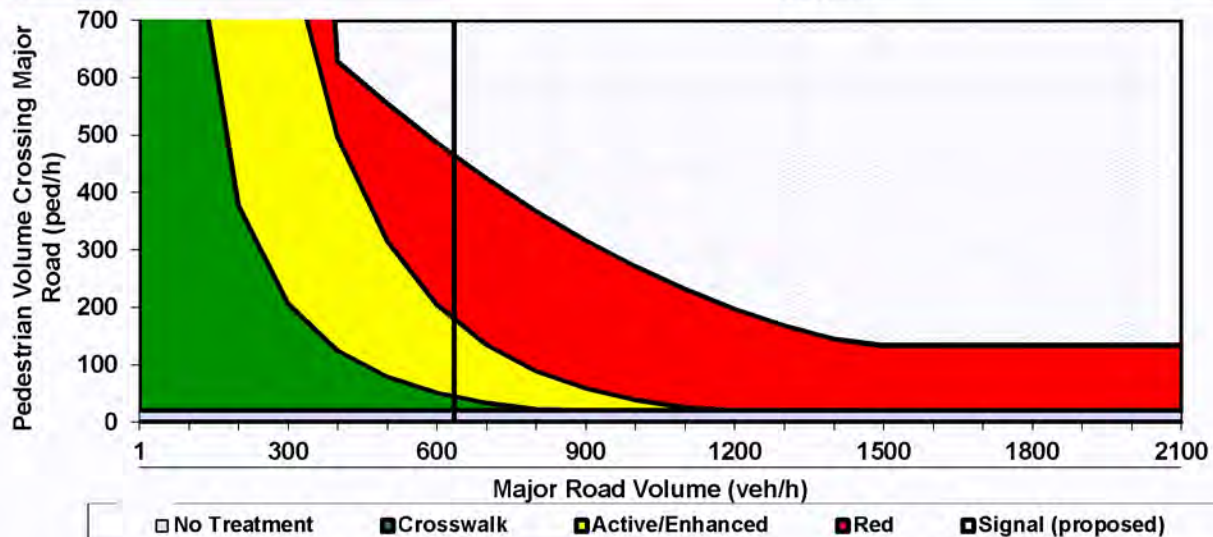
This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

Key

	Blue fields contain descriptive information.
	Green fields are required and must be completed.
	Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
	Gray fields are automatically calculated and should not be edited.

This spreadsheet is still under development. please inform TTI if errors are identified.

Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	SW A Allen Blvd
Analysis Date	April 17, 2020	Minor Street or Location	Mid-block Crosswalk
Data Collection Date	February 6, 2020	Peak Hour	6:30 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	635
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	465
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	465
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	52
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	18
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	635
Major road flow rate (veh/s), v		4f	0.18
Average pedestrian delay (s/person), d_p		4g	115
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

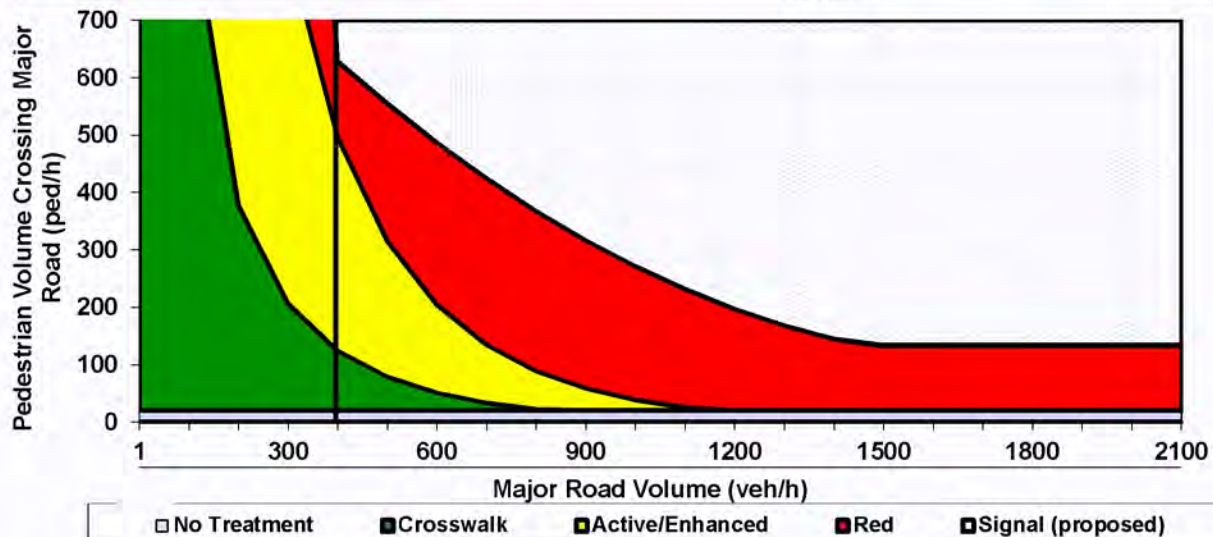
This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

Key

	Blue fields contain descriptive information.
	Green fields are required and must be completed.
	Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
	Gray fields are automatically calculated and should not be edited.

This spreadsheet is still under development. please inform TTI if errors are identified.

Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	SW A Allen Blvd
Analysis Date	April 17, 2020	Minor Street or Location	Mid-block Crosswalk
Data Collection Date	February 6, 2020	Peak Hour	2:30 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	396
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	632
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	632
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			632
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	52
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	18
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	396
Major road flow rate (veh/s), v		4f	0.11
Average pedestrian delay (s/person), d_p		4g	38
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

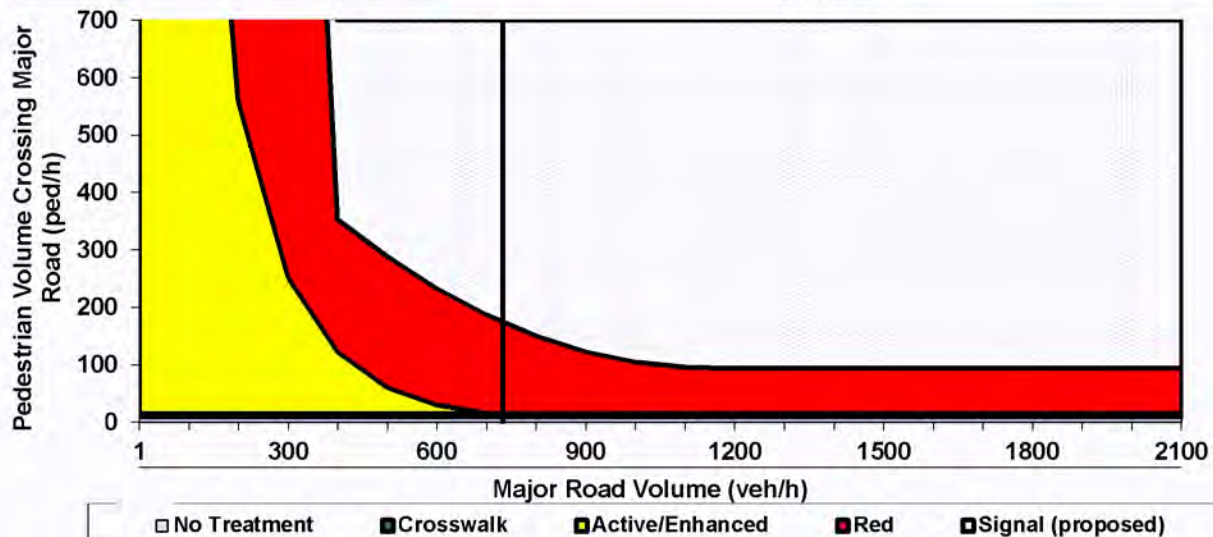
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Brown St
Analysis Date	July 29, 2020	Minor Street or Location	Birmingham East Central Driveway
Data Collection Date	January 18, 2018	Peak Hour	6:45 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	8
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	732
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	174
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	174
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			174
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	64
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	21
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	732
Major road flow rate (veh/s), v		4f	0.29
Average pedestrian delay (s/person), d_p		4g	1629
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	3.6
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

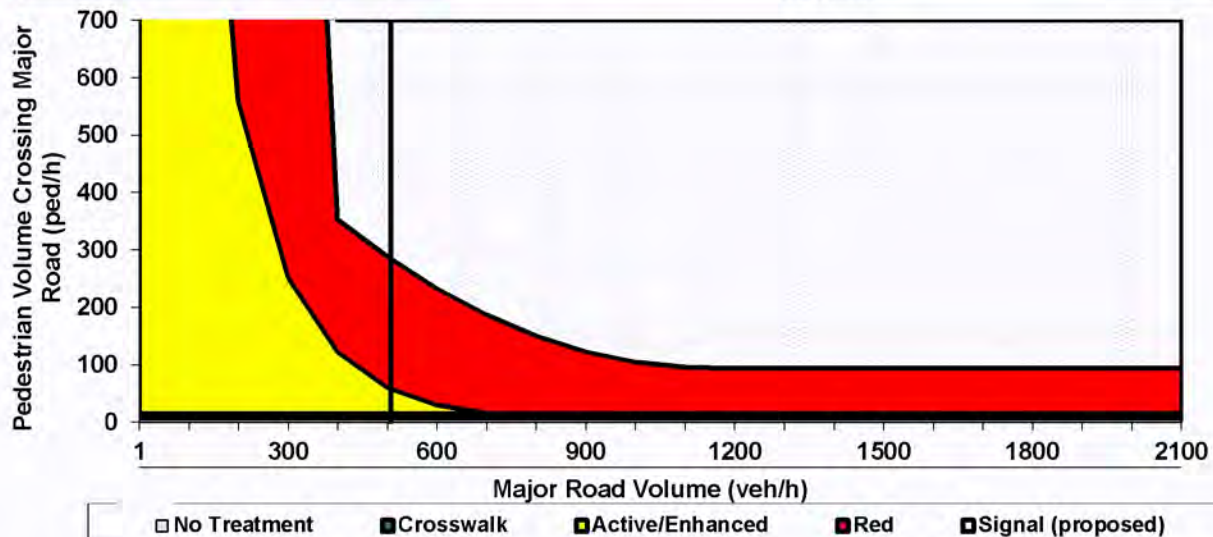
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Brown St
Analysis Date	July 29, 2020	Minor Street or Location	Birmingham East Central Driveway
Data Collection Date	January 18, 2018	Peak Hour	2:00 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	6
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	507
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	284
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	284
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			284
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	64
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	21
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	507
Major road flow rate (veh/s), v		4f	0.20
Average pedestrian delay (s/person), d_p		4g	327
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.5
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

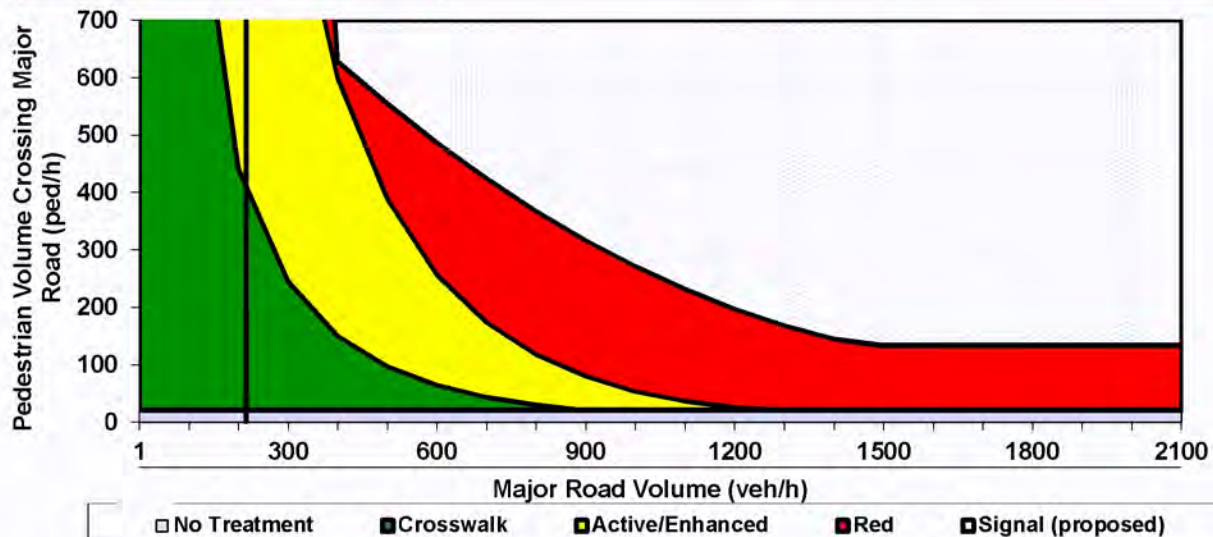
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Cheyenne Rd
Analysis Date	July 29, 2020	Minor Street or Location	Tuscalosa Dr
Data Collection Date	January 25, 2018	Peak Hour	7:00 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	21
Result: Go to step 3.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	215
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	779
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	779
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result: The signal warrant is not met. Go to step 4.			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	48
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	17
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	215
Major road flow rate (veh/s), v		4f	0.06
Average pedestrian delay (s/person), d_p		4g	12
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.1
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		CROSSWALK	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

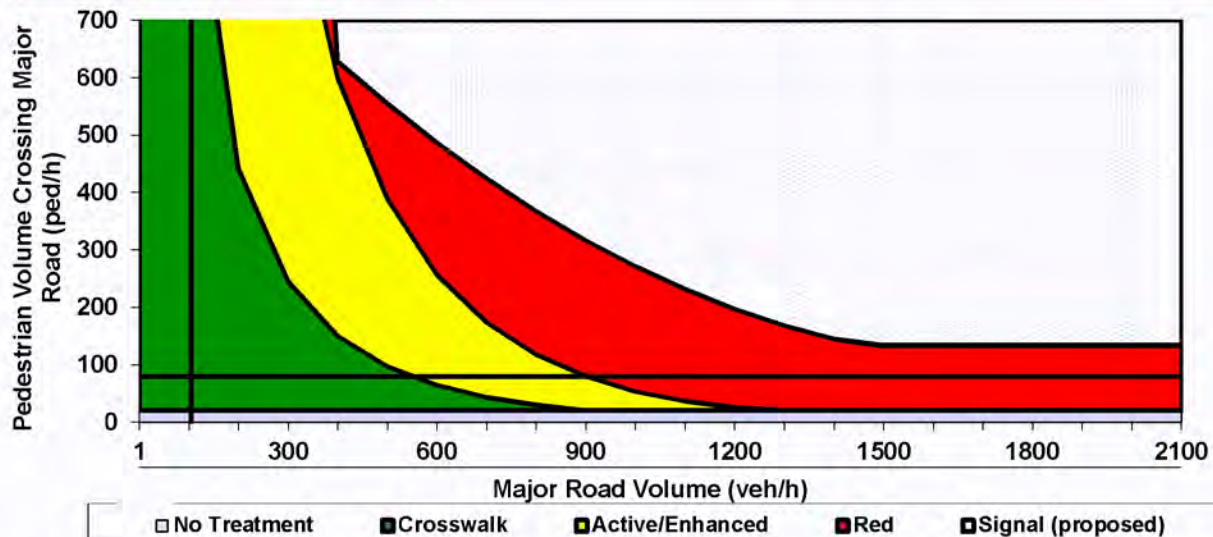
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Cheyenne Rd
Analysis Date	July 29, 2020	Minor Street or Location	Tuscalosa Dr
Data Collection Date	January 25, 2018	Peak Hour	2:30 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	79
Result: Go to step 3.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	105
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	878
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	878
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result: The signal warrant is not met. Go to step 4.			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	48
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	17
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	105
Major road flow rate (veh/s), v		4f	0.03
Average pedestrian delay (s/person), d_p		4g	5
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.1
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		CROSSWALK	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

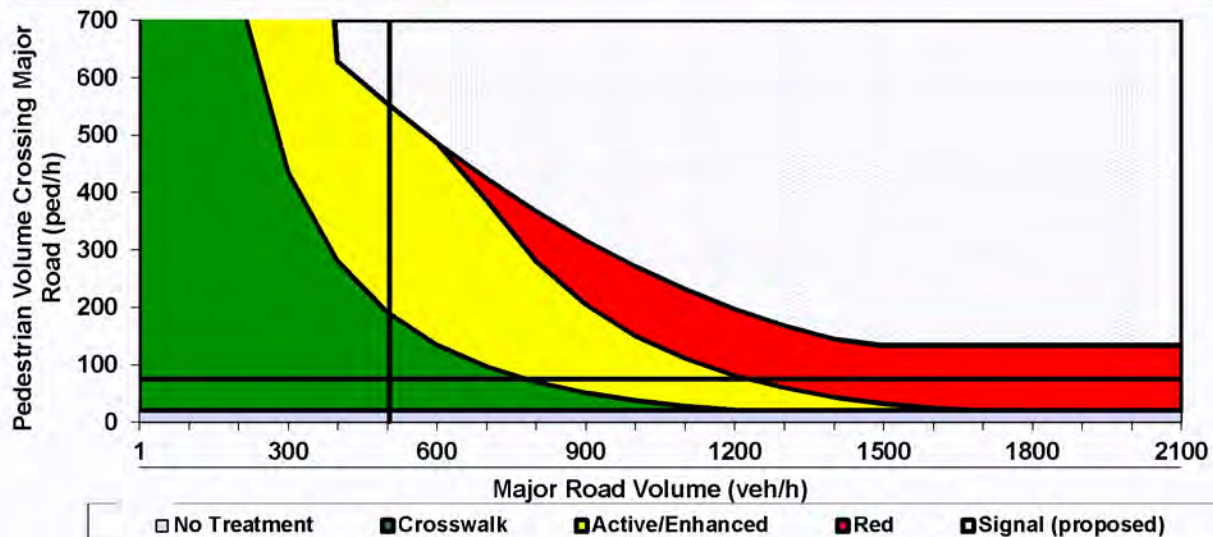
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Park Blvd
Analysis Date	July 29, 2020	Minor Street or Location	Westgate Way
Data Collection Date	February 7, 2018	Peak Hour	7:15 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	74
Result: Go to step 3.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	504
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	552
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	552
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result: The signal warrant is not met. Go to step 4.			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	36
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	504
Major road flow rate (veh/s), v		4f	0.14
Average pedestrian delay (s/person), d_p		4g	25
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.5
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		CROSSWALK	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

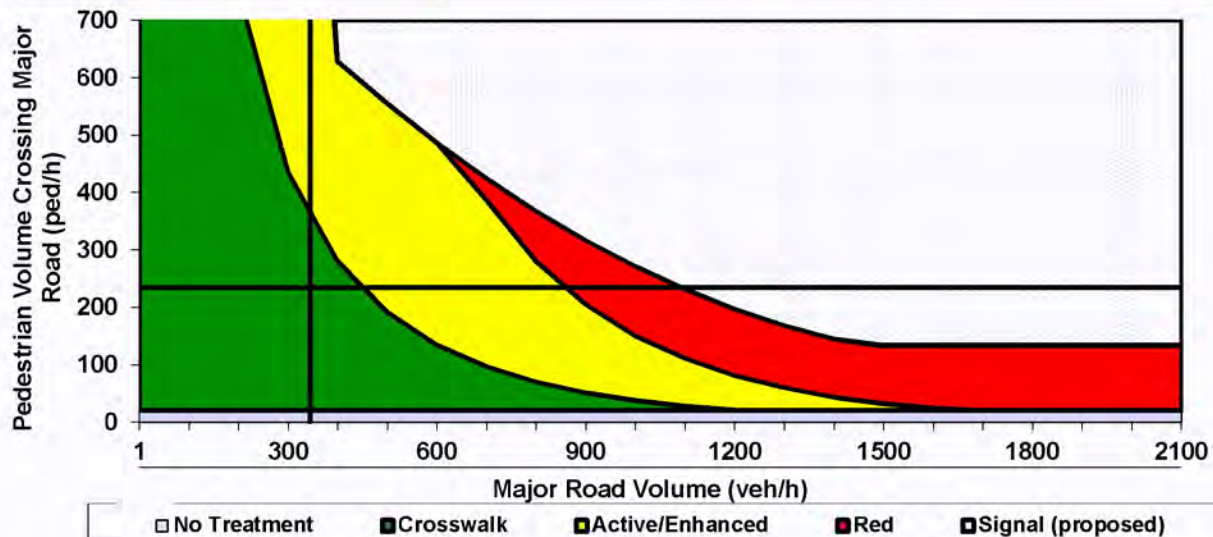
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Park Blvd
Analysis Date	July 29, 2020	Minor Street or Location	Westgate Way
Data Collection Date	February 7, 2018	Peak Hour	3:15 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	234
Result: Go to step 3.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	344
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	672
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	672
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			672
Result: The signal warrant is not met. Go to step 4.			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	36
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	344
Major road flow rate (veh/s), v		4f	0.10
Average pedestrian delay (s/person), d_p		4g	14
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.9
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		CROSSWALK	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

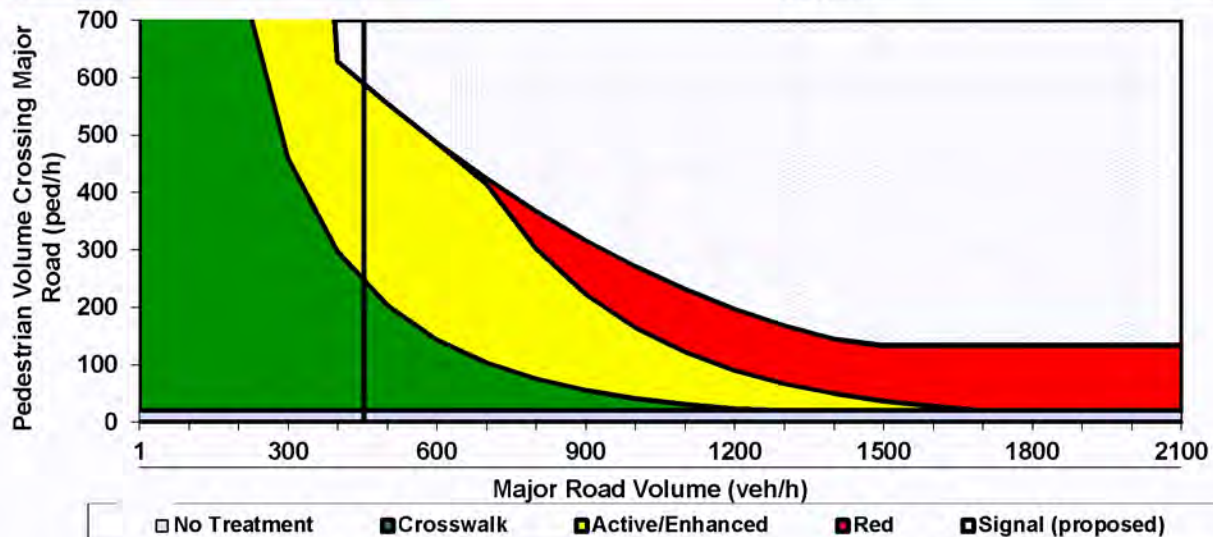
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	S Birmingham St
Analysis Date	July 29, 2020	Minor Street or Location	Hartman South Central Dwy
Data Collection Date	February 8, 2018	Peak Hour	6:45 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	453
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	589
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	589
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			589
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	35
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	453
Major road flow rate (veh/s), v		4f	0.13
Average pedestrian delay (s/person), d_p		4g	21
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

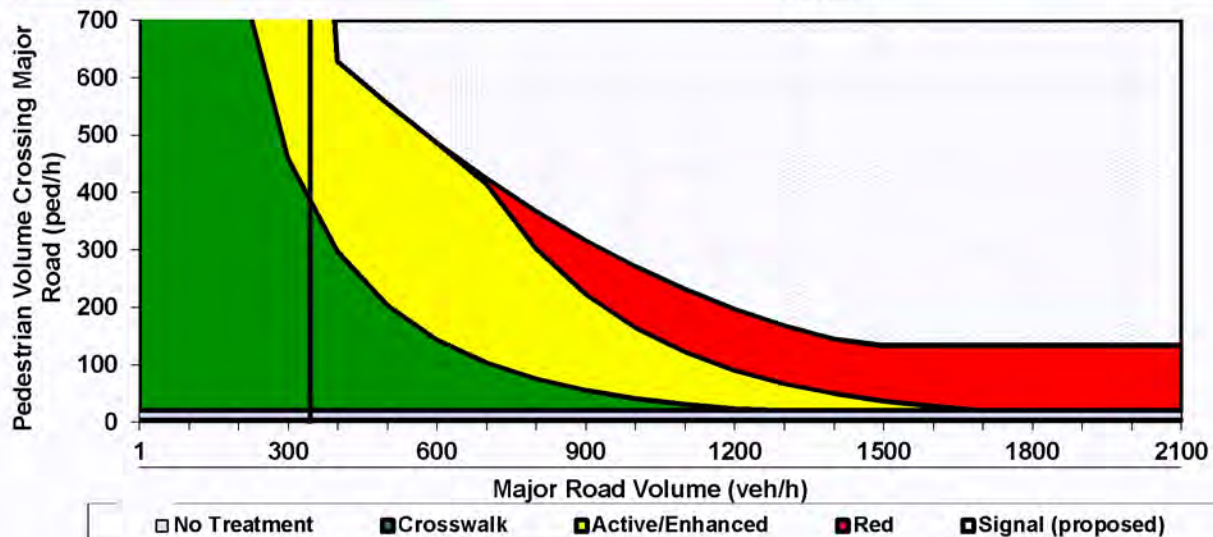
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Key

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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	S Birmingham St
Analysis Date	July 29, 2020	Minor Street or Location	Hartman South Central Dwy
Data Collection Date	February 8, 2018	Peak Hour	2:00 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	4
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	344
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	672
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	672
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			672
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	35
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	344
Major road flow rate (veh/s), v		4f	0.10
Average pedestrian delay (s/person), d_p		4g	14
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

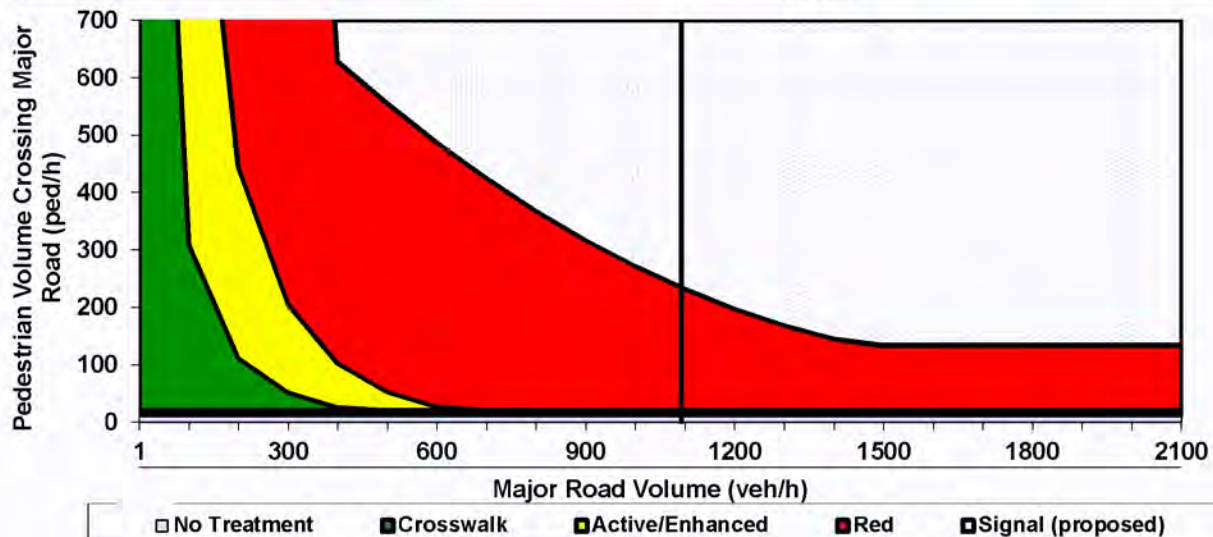
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Ballard Ave
Analysis Date	July 29, 2020	Minor Street or Location	Birmingham St
Data Collection Date	January 18, 2018	Peak Hour	7:15 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	12
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	1093
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	234
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	234
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			234
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	91
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	29
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	1093
Major road flow rate (veh/s), v		4f	0.30
Average pedestrian delay (s/person), d_p		4g	19977
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	66.6
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

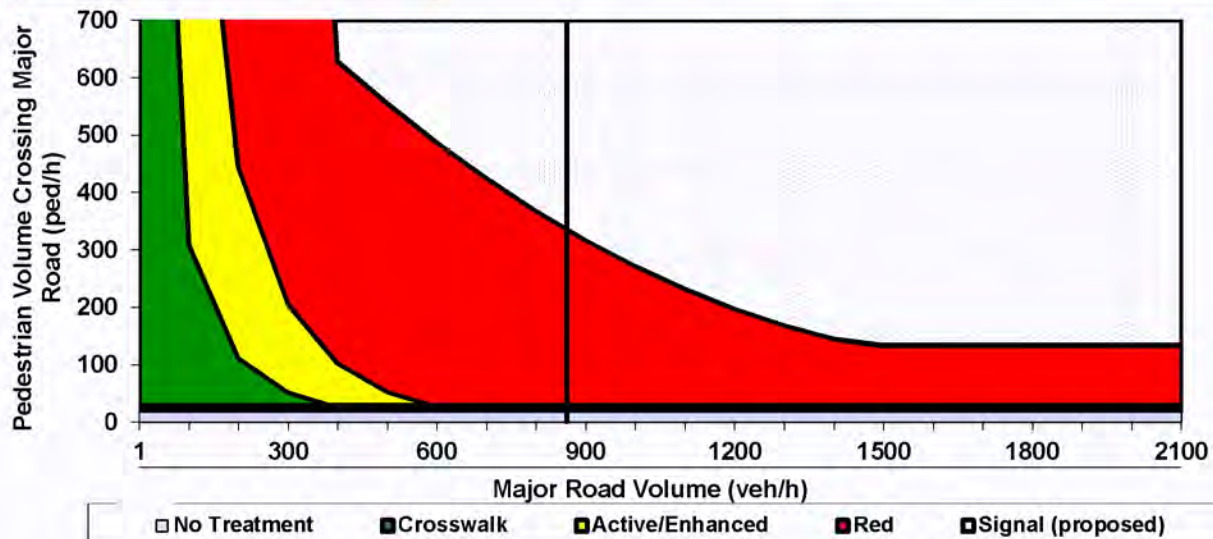
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Ballard Ave
Analysis Date	July 29, 2020	Minor Street or Location	Birmingham St
Data Collection Date	January 18, 2018	Peak Hour	3:30 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	30
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	29
Result: Go to step 3.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	861
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	336
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	336
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result: The signal warrant is not met. Go to step 4.			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	91
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	29
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	861
Major road flow rate (veh/s), v		4f	0.24
Average pedestrian delay (s/person), d_p		4g	4357
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	35.1
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		RED	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

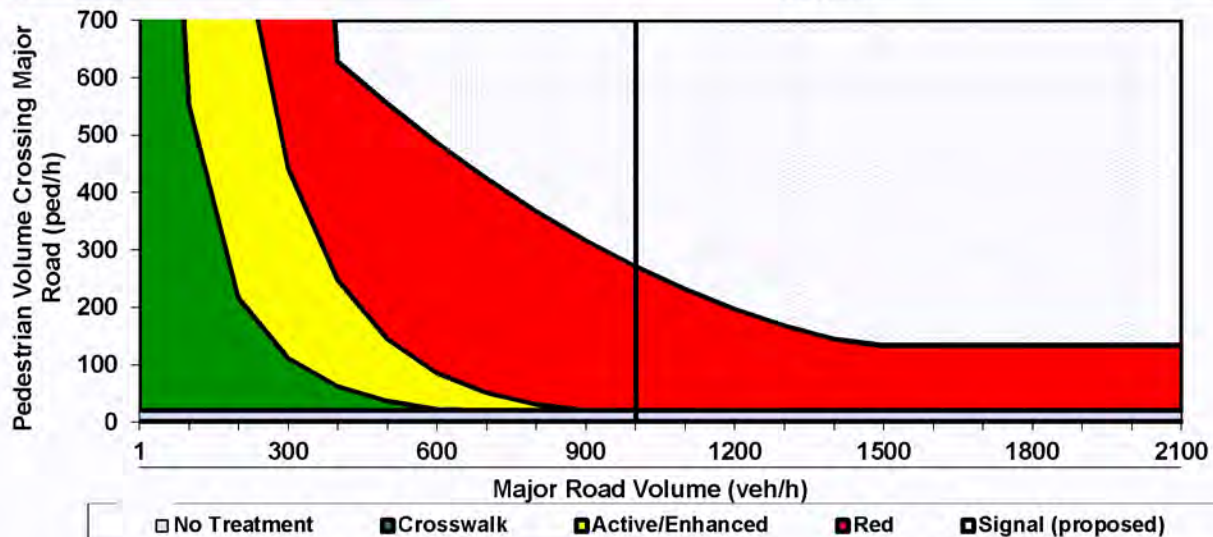
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Stone Rd
Analysis Date	April 17, 2020	Minor Street or Location	Hilltop Ln
Data Collection Date	February 13, 2020	Peak Hour	7:00 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	35
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	1
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	1001
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	271
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	271
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			271
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	68
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	22
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	1001
Major road flow rate (veh/s), v		4f	0.28
Average pedestrian delay (s/person), d_p		4g	1890
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.5
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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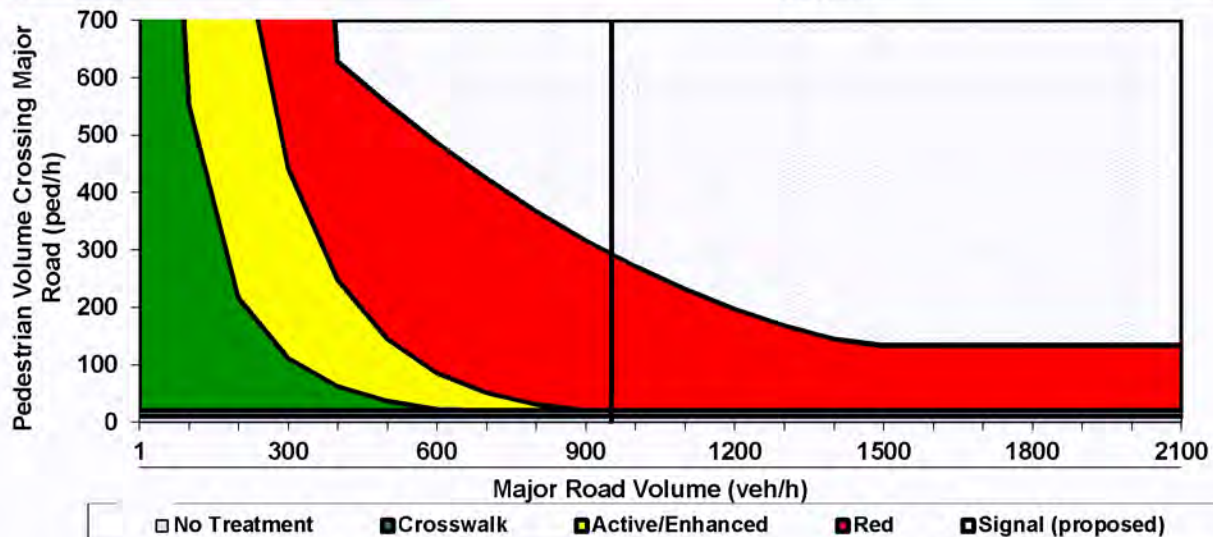
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Stone Rd
Analysis Date	April 17, 2020	Minor Street or Location	Hilltop Ln
Data Collection Date	February 13, 2020	Peak Hour	3:00 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	35
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	10
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	952
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	292
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	292
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			292
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	68
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	21
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	952
Major road flow rate (veh/s), v		4f	0.26
Average pedestrian delay (s/person), d_p		4g	1285
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.			4h
			4i
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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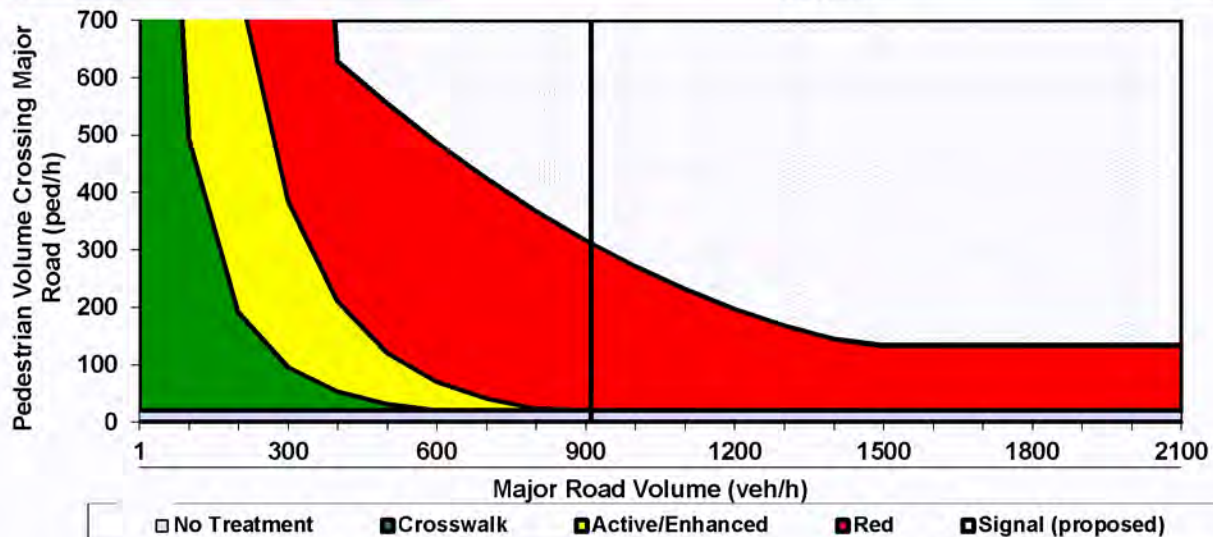
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Stone Rd
Analysis Date	April 17, 2020	Minor Street or Location	Thomas St
Data Collection Date	February 13, 2020	Peak Hour	7:15 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	35
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	YES
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	911
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	120
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	120
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			120
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	72
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	24
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	911
Major road flow rate (veh/s), v		4f	0.36
Average pedestrian delay (s/person), d_p		4g	13432
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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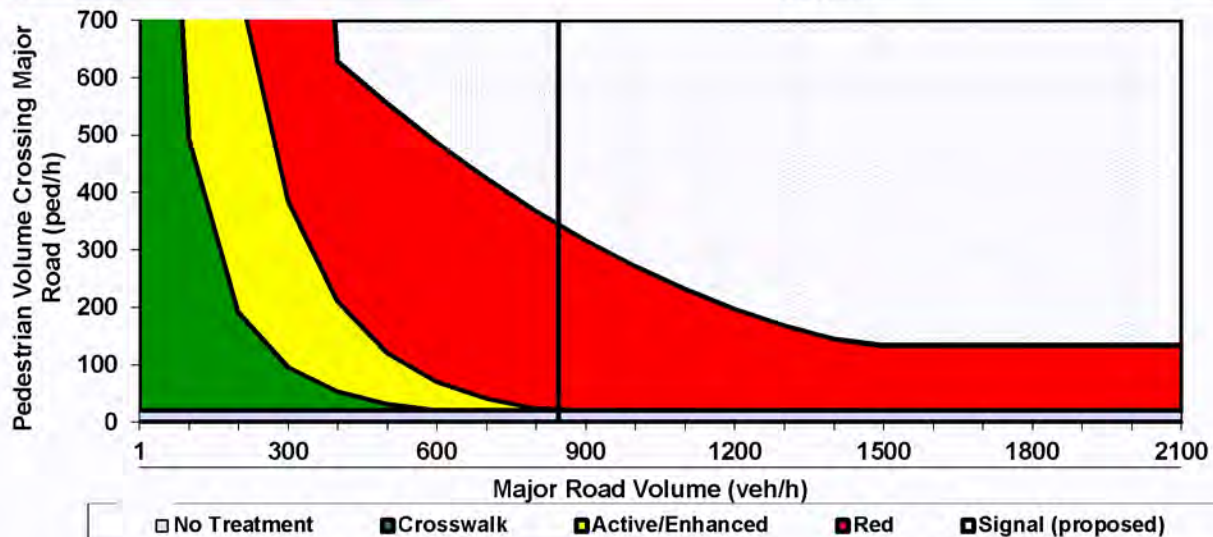
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Stone Rd
Analysis Date	April 17, 2020	Minor Street or Location	Thomas St
Data Collection Date	February 13, 2020	Peak Hour	3:00 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	35
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	YES
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	845
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	137
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	137
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	72
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	24
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	845
Major road flow rate (veh/s), v		4f	0.34
Average pedestrian delay (s/person), d_p		4g	8867
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

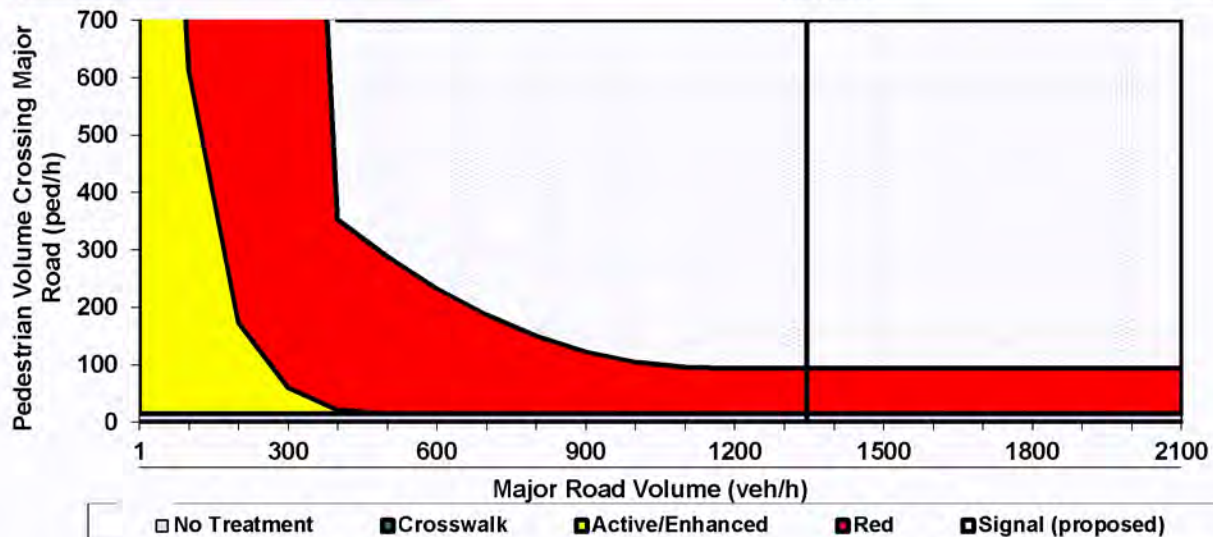
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Country Club Rd
Analysis Date	April 17, 2020	Minor Street or Location	Smith Elementary Entrance
Data Collection Date	February 6, 2020	Peak Hour	6:30 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	1345
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	93
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	93
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	100
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	32
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	1345
Major road flow rate (veh/s), v		4f	0.53
Average pedestrian delay (s/person), d_p		4g	34890825
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.			4h
			4i
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

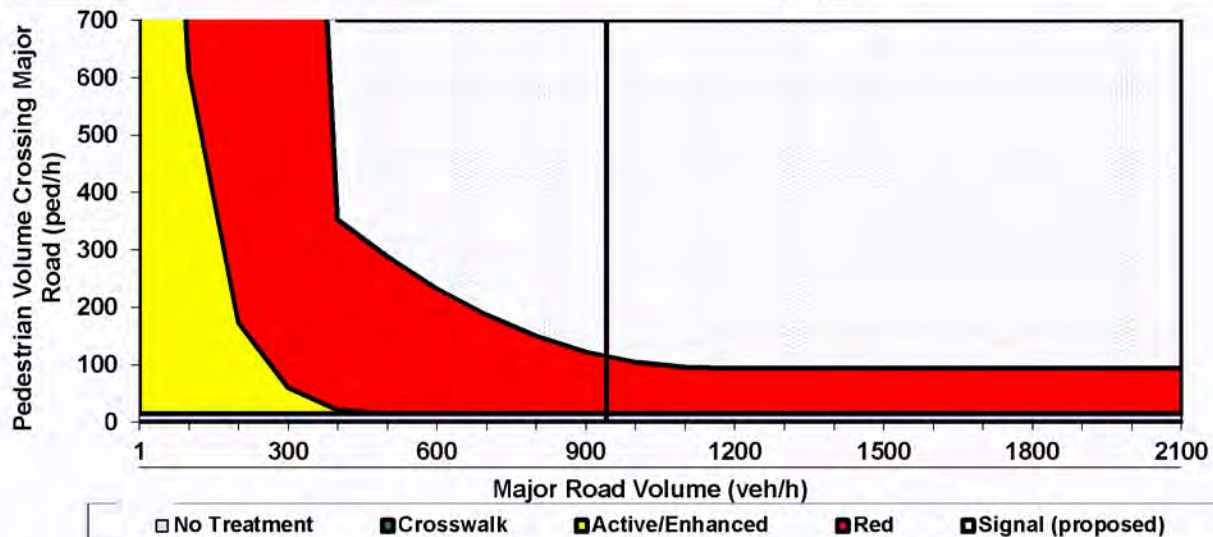
This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

Key

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This spreadsheet is still under development. please inform TTI if errors are identified.

Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	Country Club Rd
Analysis Date	April 17, 2020	Minor Street or Location	Smith Elementary Entrance
Data Collection Date	February 6, 2020	Peak Hour	2:30 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	942
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	114
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	114
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
Result:			114
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	100
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	32
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	942
Major road flow rate (veh/s), v		4f	0.37
Average pedestrian delay (s/person), d_p		4g	319839
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.			4h
			4i
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

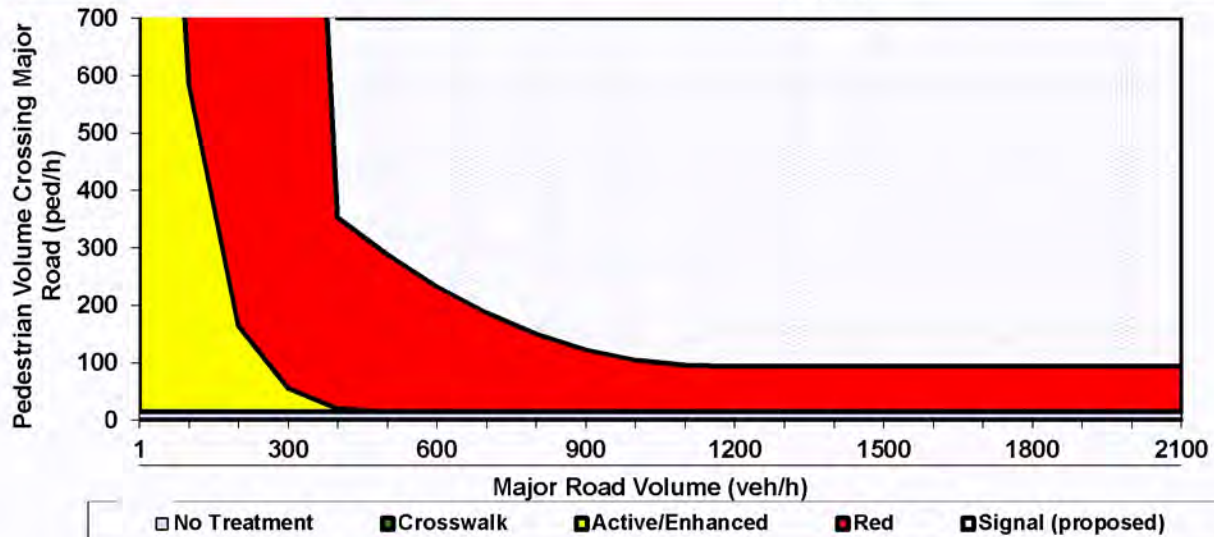
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Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	FM 544
Analysis Date	August 4, 2020	Minor Street or Location	Bus Loop Driveway
Data Collection Date	January 24, 2018	Peak Hour	7:30 AM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	0
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	2203
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	93
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	93
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			93
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	102
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	32
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	2203
Major road flow rate (veh/s), v		4f	0.87
Average pedestrian delay (s/person), d_p		4g	1604041955135
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



The intersection of pedestrian volume and vehicle volume cannot be seen because the vehicle volume exceeds the limits of the graph.

This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

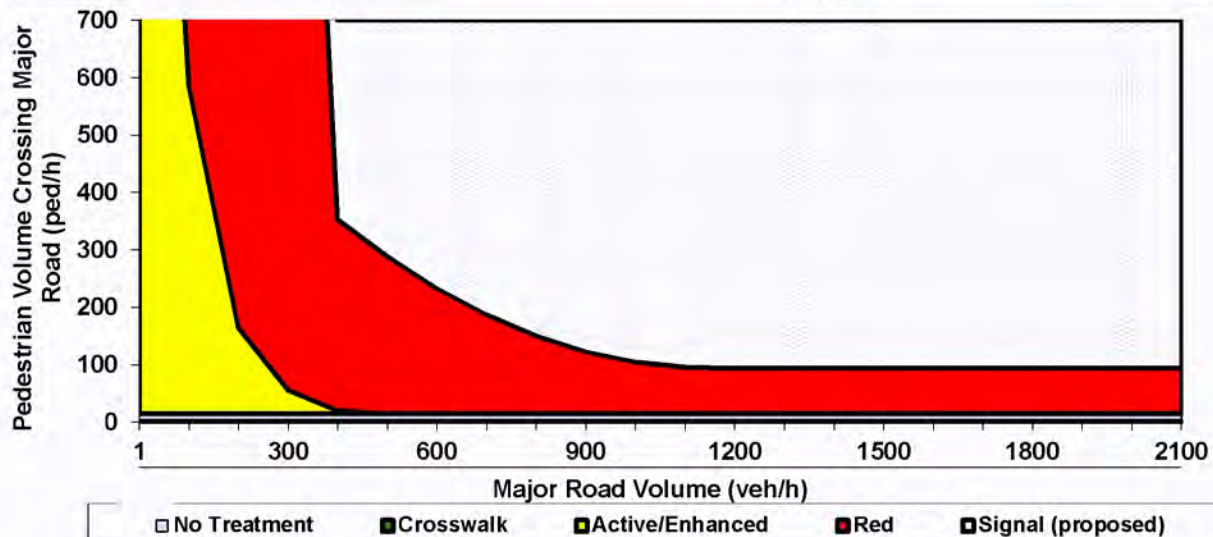
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This spreadsheet is still under development. please inform TTI if errors are identified.

Analyst and Site Information			
Analyst	Curtis Hefner	Major Street	FM 544
Analysis Date	August 4, 2020	Minor Street or Location	Bus Loop Driveway
Data Collection Date	January 24, 2018	Peak Hour	4:30 PM
Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		1a	45
Is the population of the surrounding area <10,000? (enter YES or NO)		1b	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		2a	1
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		3a	2628
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		3b	93
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		3c	93
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)		3d	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50%.		% rate of reduction for 3c (up to 50%)	3e
		Reduced value or 3c	3f
			93
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		4a	102
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		4b	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		4d	32
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		4e	2628
Major road flow rate (veh/s), v		4f	1.04
Average pedestrian delay (s/person), d_p		4g	#####
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4h	88005186833.2
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter HIGH for High Compliance or LOW for Low Compliance		5a	LOW
Treatment Category:		Consider raised median islands, curb extensions, traffic calming, etc. as feasible.	



The intersection of pedestrian volume and vehicle volume cannot be seen because the vehicle volume exceeds the limits of the graph.

This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

Unsignalized Crosswalk Evaluations

- 1 Refer to FHWA's "Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations", July 2018, for analysis context.
https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf
- 2 Fill in blue shaded input cells on "Unsignalized Crossings" tab.
- 3 If AADT estimate is unavailable (Column G), estimate the AADT as follows:
 - a. Estimate the predominant land use contributing to traffic on the street being crossed. Enter codes "R" for residential, "O" for office, "S" for shopping, "M" for mix.
 - b. Conduct a 2-minute traffic count (sum of both directions, any time of day on a weekday). Enter the time of day in 24-hour format in Column J and the 2-minute traffic volume in Column K.
 - c. Columns L and M will automatically expand the 2-minute traffic count into an AADT estimate based on the data on the "AADT Conversion" tab.
 - d. Column N will return the higher of the two values from Columns G and M if both AADT methods are used.
- 4 After all inputs have been made, Columns O-W will list the countermeasure options that may be considered. The spreadsheet uses conditional formatting to designate the level of consideration that should be given, consistent with the source document.
- 5 Enter actual analyst recommendation numbers in Column X.
- 6 Add further notes about the improvement (constraints, conditions, etc.) as needed in Column Y.
- 7 Spreadsheet cells that aren't inputs have been protected to prevent accidental overwriting of formulae. If additional rows are needed on the "Unsignalized Crossings" table, unprotect the sheet by right-clicking on the "Unsignalized Crossings" word on the tab selector below and selecting "Unprotect Sheet...". After inserting rows, ensure that all formulae in Columns O-W and AA-BA are copied down into the new row(s).



Contact Josh Smith in Lee Engineering's Dallas office (jsmith@lee-eng.com) with any questions.

Table 1 provides initial countermeasure options for various roadway conditions. Each matrix cell indicates possibilities that may be appropriate for designated pedestrian crossings. Not all of the countermeasures listed in the matrix cell should necessarily be installed at a crossing.

For multi-lane roadway crossings with vehicle AADTs exceeding 10,000, a marked crosswalk alone is typically insufficient (Zegeer, 2005). Under such conditions, more substantial crossing improvements (such as the refuge island, PHB, and RRFB) are also needed to prevent an increase in pedestrian crash potential.

Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6 7 9	① 5 6 7 9	① 5 6 ⑨
3 lanes with raised median (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	① 3 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑦ ⑨	① ③ 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑨
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑨	① 3 4 5 6 7 9	① ③ 5 6 ⑦ ⑨	① ③ 5 6 ⑨	① ③ 4 5 6 7 9	① ③ 5 6 ⑨	① ③ 5 6 ⑨
4+ lanes with raised median (2 or more lanes in each direction)	① ③ 5 7 8 9	① ③ 5 7 8 9	① ③ 5 8 ⑨	① ③ 5 7 8 9	① ③ 5 ⑦ 8 ⑨	① ③ 5 8 ⑨	① ③ 5 ⑦ 8 ⑨	① ③ 5 8 ⑨	① ③ 5 8 ⑨
4+ lanes w/o raised median (2 or more lanes in each direction)	① ③ 5 6 7 8 9	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ 8 ⑨
Given the set of conditions in a cell, # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location. ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location. ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.* The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.					1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs 2 Raised crosswalk 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line 4 In-Street Pedestrian Crossing sign 5 Curb extension 6 Pedestrian refuge island 7 Rectangular Rapid-Flashing Beacon (RRFB)** 8 Road Diet 9 Pedestrian Hybrid Beacon (PHB)**				

*Refer to Chapter 4, "Using Table 1 and Table 2 to Select Countermeasures," for more information about using multiple countermeasures.

**It should be noted that the PHB and RRFB are not both installed at the same crossing location.

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition. (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse. <http://www.cmfclearinghouse.org/>; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). <http://www.pedbikesafe.org/PEDSAFE/>; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

Unsignalized Crosswalk Evaluations
Wylie School Zones

September 2020

Wylie School Zones		Posted Speed of Street Crossed	Number of Lanes Crossed	Median Present ?*	Source	Land Use	Hourly Traffic Count			AADT Estimate	Improvements									Notes		
Street Crossed	At/Between						Time	2-Min Cnt*	Count		Options						Recommended					
1 - SW A Allen Blvd	South of Surrey Circle	30	4	Y	2/6/2020 peak hour traffic counts	R	7:15 AM	8:15 AM	13	400	5,500	1		3		5		7	8	9	3	Crosswalk with RRFB that was currently present at this location was relocated to new location of trail crossing (also with RRFB) south of Eagle Glen Dr in late 2018. A yield line should be added in the southbound direction. The type of crosswalk installed is appropriate. Yield line striping and "Yield Here to Pedestrians" signs (both in the median and on the right side) should be installed farther in advance of the crosswalk in the northbound direction. This may have been avoided due to the absence of a good location for the right-hand "Yield Here to Pedestrians" sign on the bridge over the creek. If a sign cannot be attached to the outside of the bridge or its handrail, the median sign and the yield line should still be installed in advance to reduce the risk of a dual threat situation.
2 - Brown St	Birmingham - East Central Dwy	30	5	N	1/18/2018 peak hour traffic counts	R	7:00 AM	8:00 AM	24	720	10,800	1		3		5	6	7	8	9	None	Crosswalk with RRFB is currently posted at this location and includes Yield markings.
3 - Cheyenne Rd	Tuscaloosa Dr	30	2	N	1/25/2018 peak hour traffic counts	R	7:00 AM	8:00 AM	7	210	3,200	1	2		4	5	6				None	Intersection is all-way stop controlled due to presence of a crossing guard. There were 21 peds/hour on north leg crosswalk in AM peak hour, and 79 peds/hour in PM peak.
4 - Park Blvd	Davis/McMillan - Westgate	30	3	N	2/7/2018 peak hour traffic counts	R	7:15 AM	8:15 AM	17	510	7,000	1	2	3	4	5	6	7		9	None	Crosswalk with crossing guard already present is sufficient for context.
5 - S Birmingham St	Hartman - South Central Dwy	30	2	N	2/8/2018 peak hour traffic counts	R	7:00 AM	8:00 AM	15	450	6,800	1	2		4	5	6				None	Traffic counts show only 4 pedestrians crossing Birmingham St during afternoon peak hour (zero during morning peak hour). Recommend requiring peds to cross with crossing guard at Kirby St intersection instead.
6 - Ballard Ave	Birmingham St	30	5	N	1/18/2018 peak hour traffic counts	R	7:15 AM	8:15 AM	36	1,080	14,800	1		3		5	6	7	8	9	3	Crossing guard is provided
7 - Stone Rd	Hilltop Ln	35	5	N	2/13/2020 peak hour traffic counts	R	3:00 PM	4:00 PM	31	930	13,000	1		3		5	6	7	8	9	1, 3, 6, 7	Install advance yield lines & signing, pedestrian refuge island & RRFB at existing uncontrolled crosswalk.
8 - Stone Rd	Thomas St	35	5	N	2/13/2020 peak hour traffic counts	R	7:15 AM	8:15 AM	35	1,040	14,300	1		3		5	6	7	8	9	None; remove school zone	Only 1 pedestrian / hour recorded crossing here, so the count data is ample justification that the school zone does not need to extend to include this intersection.
9 - Country Club Rd	Smith Elementary School Entrance	45	7	N	2/6/2020 peak hour traffic counts	R	7:00 AM	7:30 AM	45	1,350	20,200	1		3		5	6		8	9	None	Traffic count confirms no existing demand for pedestrian crossings across Country Club Road. No action recommended.
10 - FM 544	WHS Bus Loop Dwy	45	7	N	1/24/2018 peak hour traffic counts	O	7:30	8:30 AM	73	2,190	20,900	1		3		5	6		8	9	None	Only 1 pedestrian / hour recorded crossing here, so no crossing treatment is recommended.



* with sufficient 6' width for ped. refuge?

Land Use Codes
R = Residential
O = Office
S = Shopping
M = Mix

*Back-calculated from hourly volume for input here

Unsignalized Crosswalk Improvements
1 - Crosswalk Signs, Markings & Lighting
2 - Raised Crosswalk
3 - Advance "Yield Here" Sign
4 - In-Street Pedestrian Crossing

5 - Curb Extension
6 - Pedestrian Refuge Isl
7 - RRFB
8 - Road Diet
9 - Pedestrian Hybrid Beacon

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- # Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- # Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.