



## ***Technical Memorandum***

**To:** William Marshall — Building Solutions  
**From:** David Nevarez, PE, PTOE — DeShazo Group, Inc.  
**Date:** February 6, 2017  
**Re:** All-Way Stop Control Analysis of Joseph Hardin Dr. at Exchange Services Dr. in Dallas, Texas  
*DeShazo Project Number 16133.02*

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### **INTRODUCTION**

DeShazo Group, Inc. (DeShazo) is an engineering consulting firm providing professional services in traffic and transportation engineering and planning. The services of DeShazo were retained by Building Solutions to conduct a technical analysis of the intersection at Joseph Hardin Drive and Exchange Services Drive in Dallas, Texas.

The subject intersection is immediately adjacent to Advantage Academy—an open-enrollment charter school serving 487 students from Pre-K to Grade 8. The school operates in two separate blocks. Students in Pre-K through Grade 5 attend classes at 4010 Joseph Hardin Drive; a separate building located at 4009 Joseph Hardin serves Grades 6, 7, and 8. DeShazo previously prepared a Traffic Management Plan for a proposed expansion of the school to accommodate a total enrollment of 700 students. A site location map is provided for reference in **Exhibit 1**.

The subject intersection currently operates as a minor-road-only stop control. An adult school crossing guard assists pedestrians during the afternoon school dismissal time.

#### ***Purpose***

The purpose of this analysis is to ascertain the need of an all-way stop control at the subject intersection based on traffic and pedestrian volume-related warrants in accordance with industry standards. Of special interest to the analysis is the assessment of pedestrians across Joseph Hardin Drive during school peak hours.

Findings and recommendations presented in this study are intended to provide information to the public and the governing agency regarding the need of an all-way stop control at the subject intersection. This report is strictly based on traffic volumes; however, the City of Dallas has the authority to dictate if an all-way stop control is required for reasons other than the findings presented herein.

# ALL-WAY STOP CONTROL ANALYSIS

## *All-Way Stop Control Analysis Standards*

This memorandum summarizes the results of an analysis of select all-way stop control in accordance with the procedures defined in the *Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD is a national publication developed to ensure that a high degree of uniform standards is applied to the use of traffic control devices. Individual states also have the authority to develop a state version of the manual though the premises must be generally consistent with national standards. The State of Texas is currently governed by the 2011 *Texas Manual on Uniform Traffic Control Devices* (TMUTCD).

The 2011 *TMUTCD* defines a list of criteria to be used in the investigation of an All-Way Stop installation. These criteria are listed as follows<sup>1</sup>:

- A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop. Crashes include right- and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
  - 1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours; and*
  - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
  - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

The *TMUTCD* maintains that engineering judgment based upon “an engineering study of traffic conditions, and pedestrian and physical characteristics of the location” shall be used to determine whether installation of a multi-way stop control is justified. The *TMUTCD* further states alternative criteria to be included in the analysis:

- A. *The need to control left-turn conflicts;*
- B. *The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;*
- C. *Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and*

## *Roadway Conditions*

For purposes of this analysis, main roadway conditions on Joseph Hardin Drive are summarized as follows:

- ❑ Operation and cross-section: *four lanes, two-way, undivided collector*
- ❑ Posted/Observed Speed Limit: *30 MPH, 20 MPH during school hours*

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<sup>1</sup> 2011 *TMUTCD* - Sect. 2B.07 page 52

## Traffic Volumes

DeShazo commissioned intersection turning movement counts—including pedestrian traffic—in 15-minute increments at the study intersection on Wednesday, January 25, 2017. The morning data was collected between 6:00 and 10:00 AM while the evening data was collected from 2:30 to 6:30 PM. Detailed traffic data of Joseph Hardin Drive is provided in **Appendix A**.

## Traffic Volume Analysis

The traffic volumes used in the analysis include the sum of the approach volumes (i.e., traffic volumes entering the intersection) in both directions on the major street versus the sum of minor street approach volume and pedestrian volume. **Table 1** presents a summary of the traffic volume analysis.

**Table 1. Multi-Way Stop Control Analysis**

Study Hour	Major Street Approach (MUTCD Criterion C1, >300 vph)					&	Minor Street Approach (MUTCD Criterion C2, >200 vph)					RESULTS (meets minimum Criteria?)
	NB Approach		SB Approach				EB Approach		WB Approach			
	Cars	Peds	Cars	Peds	TOTAL		Cars	Peds	Cars	Peds	TOTAL	
6:00-7:00 AM	311	--	13	--	324	0	2	20	2	24	no	
7:00-8:00 AM	522	--	52	--	574	85	114	41	84	324	YES	
8:00-9:00 AM	135	--	15	--	150	1	17	39	19	76	no	
9:00-10:00 AM	38	--	8	--	46	2	14	19	11	46	no	
2:30-3:30 PM	113	--	96	--	209	71	61	51	97	280	no	
3:30-4:30 PM	45	--	251	--	296	5	9	137	10	161	no	
4:30-5:30 PM	57	--	179	--	236	6	6	128	6	146	no	
5:30-6:30 PM	28	--	82	--	110	7	3	64	2	76	no	

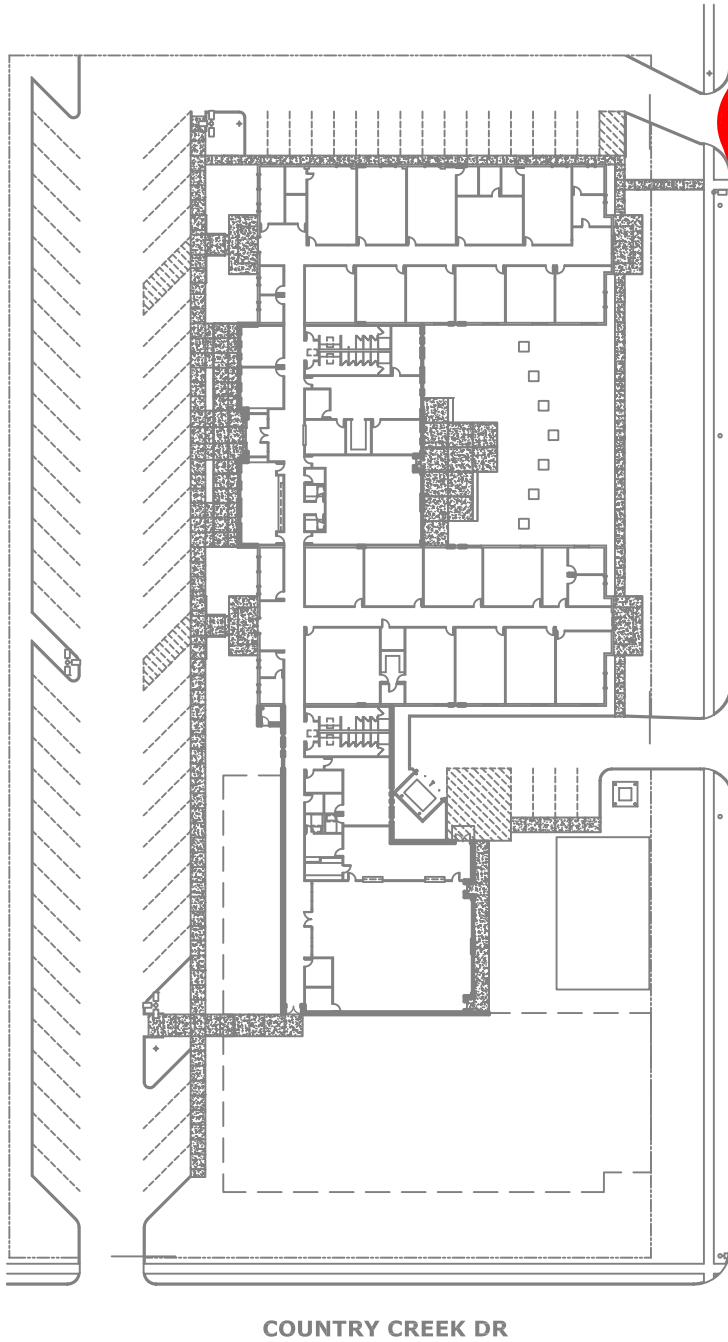
## SUMMARY OF FINDINGS AND RECOMMENDATIONS

DeShazo performed an analysis of the traffic and pedestrian volume-related criteria to ascertain the need of an all-way stop control as defined in the *TMUTCD*. In order for the installation of an all-way stop control to be warranted, one or more of the criteria must be satisfied and the agency responsible for traffic control devices on the facility must then approve of the installation based upon an evaluation of the merits and operational feasibility. Results and recommendations are summarized as follows:

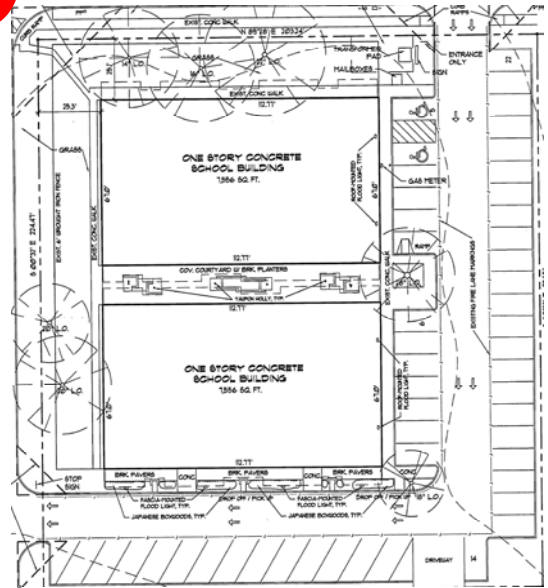
**FINDING:** The subject intersection currently operates as a minor-road stop-control. An adult crossing guard assists pedestrians during the afternoon school dismissal time. Existing traffic volumes do not meet the criteria for the installation of an all-way stop control. However, school peak hour observations suggest that an all-way stop control would likely provide a better pedestrian safety environment.

- ❖ **RECOMMENDATION:** DeShazo recommends the installation of an all-way stop at the intersection of Joseph Hardin Drive at Exchange Services Drive at the discretion of the City of Dallas staff. However, under no circumstance should the proposed traffic signs constitute a substitute for the need of an adult school crossing guard during school peak periods.

**END OF MEMO**



EXCHANGE SERVICE DRIVE



JOSEPH HARDIN RD


COUNTRY CREEK DR

EXHIBIT  
**1**

**Site Location Map**

AWSA of Joseph Hardin Drive at Exchange Services Drive  
Dallas, Texas

**Legend**

 - Study Intersection

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## ***Appendix***

**Intersection Traffic Movements** DeShazo Group, Inc.

Location: **Joseph Hardin Drive and Exchange Services Drive**  
 City/State: **Dallas, TX** Data Collector(s): **Camera**  
 Day/Date: **Wednesday, January 25, 2017** Weather Conditions: **Mild/Normal Conditions**  
 Project-ID #: **16133-01** Traffic Control: **Unsignalized**  
 Data Source: **CJ Hensch** Description: **Minor-Street STOP Controlled**

Time of Count		Northbound on Joseph Hardin Drive				Southbound on Joseph Hardin Drive				Eastbound on School Driveway				Westbound on Exchange Services Drive			
Begin	End	Ped	L	T	R	Ped	L	T	R	Ped	L	T	R	Ped	L	T	R
6:00 AM	6:15 AM	0	0	14	21	0	1	3	0	1	0	0	0	2	4	0	4
6:15 AM	6:30 AM	0	1	29	43	0	1	2	1	1	0	0	0	0	0	0	4
6:30 AM	6:45 AM	0	0	46	43	0	1	0	0	0	0	0	0	0	2	0	1
6:45 AM	7:00 AM	0	0	64	50	0	1	3	0	0	0	0	0	0	2	0	3
7:00 AM	7:15 AM	1	0	56	50	3	5	5	0	7	4	4	2	5	2	1	5
7:15 AM	7:30 AM	0	0	56	106	1	3	8	0	42	1	8	3	27	4	0	9
7:30 AM	7:45 AM	0	0	51	82	2	6	12	0	39	8	16	16	30	7	0	5
7:45 AM	8:00 AM	0	0	67	54	0	7	6	0	26	6	10	7	22	2	0	6
8:00 AM	8:15 AM	0	0	43	14	0	3	1	0	5	0	0	0	7	5	0	9
8:15 AM	8:30 AM	0	0	19	21	0	1	2	0	1	0	0	0	4	3	0	5
8:30 AM	8:45 AM	0	0	14	12	0	2	2	0	5	0	0	0	3	3	0	4
8:45 AM	9:00 AM	0	0	2	10	0	2	2	0	6	0	1	0	5	3	0	7
9:00 AM	9:15 AM	0	0	4	2	0	1	0	0	2	0	0	0	1	3	0	0
9:15 AM	9:30 AM	0	0	7	5	0	1	3	0	0	1	0	0	1	2	0	2
9:30 AM	9:45 AM	0	0	5	7	0	1	2	0	5	0	1	0	5	2	0	3
9:45 AM	10:00 AM	0	0	5	3	1	0	0	0	7	0	0	0	4	5	0	2

Intersection PHV:	0	230	292	21	31	0	19	38	28	15	1	25
PHF:	0.00	0.86	0.69	0.75	0.65	0.00	0.59	0.59	0.44	0.54	0.25	0.69

Intersection Peak Hour: 7:00 AM - 8:00 AM Intersection PHF: 0.86

Study Area PHV:	0	230	292	21	31	0	19	38	28	15	1	25
PHF:	0.00	0.86	0.69	0.75	0.65	0.00	0.59	0.59	0.44	0.54	0.25	0.69

Study Peak Hour: 7:00 AM - 8:00 AM Study Area PHF: 0.86

2:30 PM	2:45 PM	0	0	15	26	0	6	27	0	21	7	17	16	33	11	0	2
2:45 PM	3:00 PM	0	0	9	17	0	1	11	0	23	7	7	12	55	5	0	2
3:00 PM	3:15 PM	0	0	13	16	0	4	32	0	10	0	0	2	7	13	0	4
3:15 PM	3:30 PM	0	0	4	13	0	4	11	0	7	1	2	0	2	13	0	1
3:30 PM	3:45 PM	0	0	7	7	0	6	86	0	2	0	0	1	2	31	0	15
3:45 PM	4:00 PM	0	0	5	6	0	1	31	0	2	0	0	0	3	13	0	3
4:00 PM	4:15 PM	0	0	4	3	0	8	78	0	3	0	0	1	0	39	0	8
4:15 PM	4:30 PM	0	0	9	4	0	5	36	0	2	1	0	2	5	20	0	8
4:30 PM	4:45 PM	0	0	7	12	0	6	65	0	2	0	2	3	0	39	1	7
4:45 PM	5:00 PM	0	0	6	7	0	7	37	1	2	0	0	0	3	22	0	1
5:00 PM	5:15 PM	0	0	15	3	0	7	36	0	0	0	1	0	1	32	0	5
5:15 PM	5:30 PM	0	0	4	3	0	2	18	0	2	0	0	0	2	19	0	2
5:30 PM	5:45 PM	0	0	6	2	0	2	28	0	1	0	2	0	1	20	0	6
5:45 PM	6:00 PM	0	0	2	4	0	4	14	0	1	0	1	1	1	10	0	2
6:00 PM	6:15 PM	0	0	4	2	0	3	14	1	0	0	0	1	0	13	0	5
6:15 PM	6:30 PM	0	0	5	3	1	6	9	1	1	1	0	1	0	7	0	1


Intersection PHV:	0	26	26	26	216	1	1	2	6	120	1	24
PHF:	0.00	0.72	0.54	0.81	0.69	0.25	0.25	0.25	0.50	0.77	0.25	0.75

Intersection Peak Hour: 4:00 PM - 5:00 PM Intersection PHF: 0.79

Study Area PHV:	0	26	26	26	216	1	1	2	6	120	1	24
PHF:	0.00	0.72	0.54	0.81	0.69	0.25	0.25	0.25	0.50	0.77	0.25	0.75

Study Peak Hour: 4:00 PM - 5:00 PM Study Area PHF: 0.79

Observations:



File: C2X3HRS - 4L&12Mv\_Peds.XLS