

Technical Memo

November 8, 2022

The County of Hidalgo, Texas

Victor Borrego III

Contract Specialist III

Hidalgo County Purchasing Department

(Via email only - To: victor.borrego@co.hidalgo.tx.us; Cc: eduardo.belmarez@co.hidalgo.tx.us; hector.garcia1@co.hidalgo.tx.us)

RE: New Hidalgo County Courthouse - Interim Traffic Control Recommendations

Dear Mr. Borrego,

Consor Engineers, LLC (Consor) is providing this technical memo to offer the following recommendations for the proposed interim traffic control for the new Hidalgo County Courthouse:

RECOMMENDATIONS:

- **High-Visibility Crosswalks:** Most of the existing crosswalks at the eight (8) signalized intersections immediately surrounding the courthouse are comprised of the traditional crosswalk pattern consisting of a pair of white parallel lines that span the width of the street (as shown in Figure 1). Only the following two (2) existing crosswalks are comprised of the high-visibility crosswalk pattern (as shown in Figure 2):

- The existing crosswalk across Closner Boulevard (BUS 281) located along the north edge of McIntyre Street
- The existing crosswalk across Closner Boulevard (BUS 281) located along the south edge of Cano Street

The crosswalks identified above were updated as part of the Closner Boulevard (BUS 281) pavement overlay project completed by the Texas Department of Transportation (TxDOT) this year.



Figure 1 - Existing Traditional Crosswalk (2 Parallel Lines)



Figure 2 - Existing High-Visibility Crosswalk

Earlier this year, TxDOT released a new standard for crosswalk pavement markings, PM(4)-22 (see attachment 1), stating that the high-visibility crosswalk is the preferred crosswalk pattern on state roadways. The standard states that other crosswalk patterns as shown in the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* may still be used, but because the high-visibility crosswalk pattern is the preferred crosswalk pattern by TxDOT, **Consor recommends updating all existing traditional crosswalks at the eight (8) signalized intersections immediately surrounding the courthouse to high-visibility crosswalks.** Potential benefits of high-visibility crosswalks include improved safety for pedestrians crossing at the intersections, and a potential reduction of vehicular encroachment into the crosswalks because the high visibility crosswalk pattern provides a stronger distinction between the "stop line" for vehicles and the crosswalk lines.

➤ **Five (5)-Section Traffic Signal Heads:** Five (5)-section (🚦) traffic signal heads are typically used for left-turn lanes to provide protected/permmissive traffic movements, meaning a green arrow indication will provide protected left turns, and a green circular indication will provide the chance for permmissive left turns (after yielding to oncoming traffic and pedestrians). Out of the eight (8) signalized intersections immediately surrounding the courthouse, the following two (2) intersections currently have five (5)-section traffic signal heads:

- Closner Boulevard (BUS 281) & McIntyre Street, eastbound-to-northbound left-turn lane
- Closner Boulevard (BUS 281) & Cano Street, westbound-to-southbound left-turn lane

Based on Synchro software analysis results and the potential to improve traffic safety and traffic flow, **ConSOR recommends upgrading the following two (2) intersection approaches from the existing 3-section signal heads to 5-section traffic signal heads (as part of the implementation of the optimized, coordinated traffic signal timing plan):**

- **10th Avenue & University Boulevard (SH 107), northbound-to-westbound left-turn lane**
- **12th Avenue & University Boulevard (SH 107), southbound-to-eastbound left-turn lane**

The Synchro software reports supporting this recommendation are included with this memo (see Attachment 2).

➤ **"TURNING VEHICLES STOP FOR PEDESTRIANS" R10-15a Signs:** Out of the eight (8) signalized intersections immediately surrounding the courthouse, the following four (4) intersections currently have "TURNING VEHICLES YIELD TO PEDESTRIANS" R10-15 signs installed on the traffic signal poles (mast arms):

- Closner Boulevard (BUS 281) & McIntyre Street, southbound
- Closner Boulevard (BUS 281) & Cano Street, northbound and eastbound
- 10th Avenue & University Boulevard (SH 107), eastbound
- 12th Avenue & University Boulevard (SH 107), westbound and northbound

Last year, TxDOT's Traffic Safety Division issued a memo (see Attachment 3) to provide guidance on pedestrian related traffic control devices in response to SB 1055, which amended the Texas Transportation Code to add that the operator of a vehicle must stop in addition to yield the right-of-way to pedestrians. The change impacted the design of several pedestrian related traffic signs, including all existing "TURNING VEHICLES YIELD TO PEDESTRIANS" R10-15 signs. Per TxDOT's memo, these signs are no longer recommended for crosswalks. Instead, "TURNING VEHICLES STOP FOR PEDESTRIANS" R10-15a signs are now the recommended signs. **ConSOR recommends updating all existing "TURNING VEHICLES YIELD TO PEDESTRIANS" R10-15 signs with "TURNING VEHICLES STOP FOR PEDESTRIANS" R10-15a signs prior to the opening of the new courthouse to comply with the SB 1055 amendment to the Texas Transportation Code.**

Please feel free to contact us if you have any questions or would like clarification on any of the recommendations listed above.

Sincerely,

ConSOR Engineers, LLC (Firm Registration # F-12040)



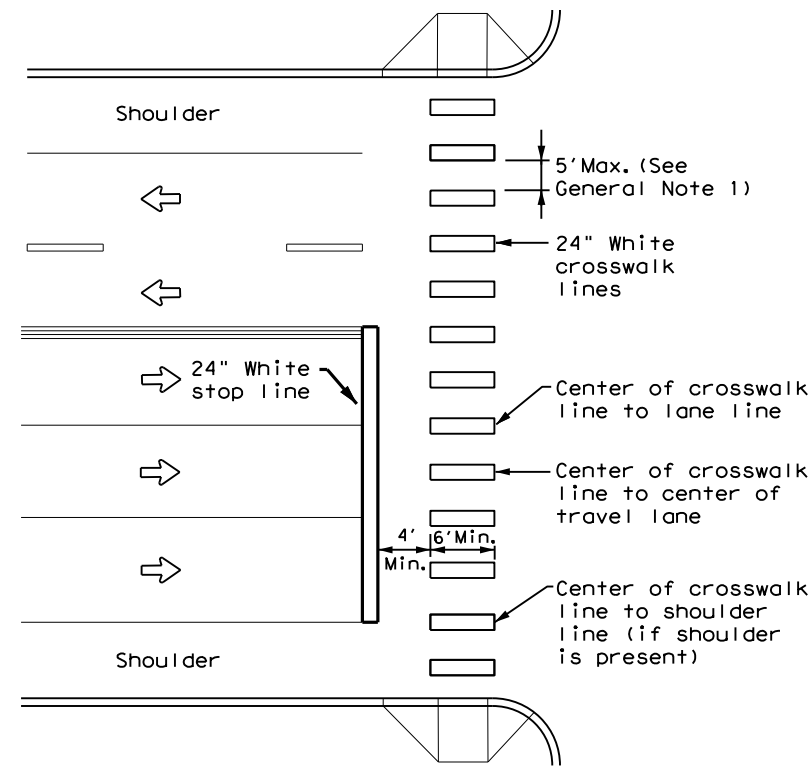
Mike Miranda, P.E., PTOE, Senior Project Manager
956.291.3995 ext. 55433 | mike.miranda@consoreng.com

Attachments:

1. TxDOT Traffic Safety Division Standard – "Crosswalk Pavement Markings" PM(4)-22
2. Synchro reports – Signalized intersections of 10th Ave. & University Blvd. (SH 107), and 12th Ave. & University Blvd. (SH 107) with recommended 5-section traffic signal heads for left turn lanes onto University Blvd. (SH 107)
3. TxDOT Memo dated Sept. 1, 2021 – "Signing and Pavement Marking Updates Related to SB 1055 Pedestrian Safety"

Attachment 1

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

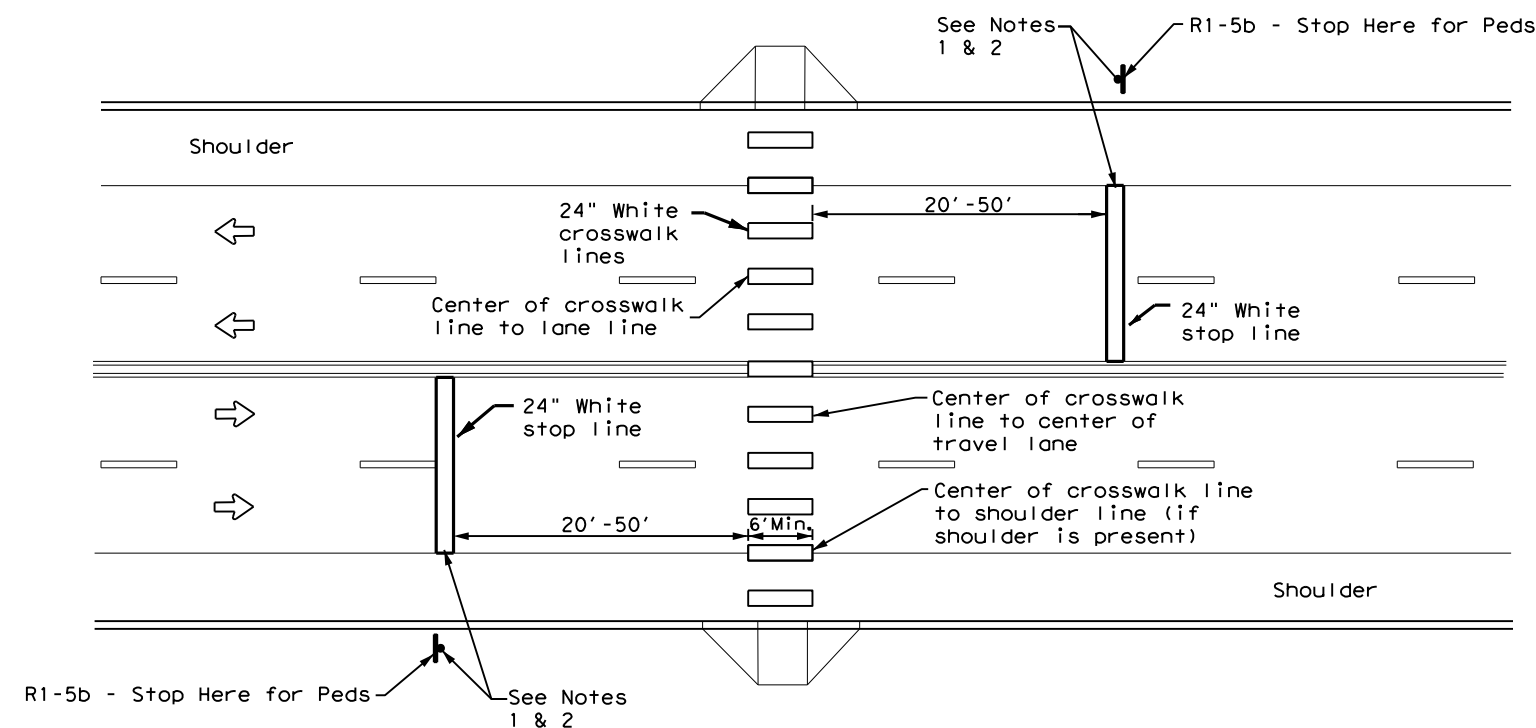
GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.



CROSSWALK PAVEMENT MARKINGS

PM(4) - 22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
3-22 REVISIONS	DIST	COUNTY	SHEET NO.	

DATE:
FILE:

Attachment 2

Timings

Year 2023 Existing Conditions Including Site Generated Trips

4: S 10th Ave/N 10th Ave & W University Dr

Timing Plan: AM Peak Hour



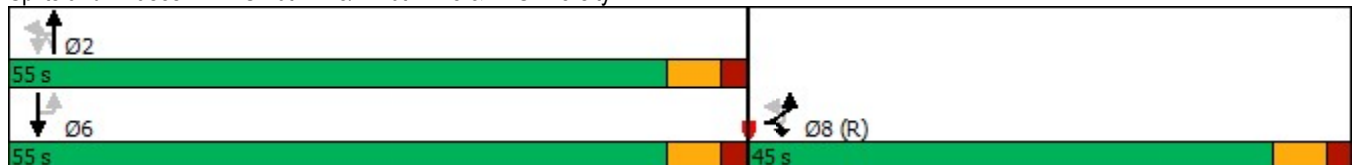
Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT
Lane Configurations	↔	↔		↔	↑↑		↑↑
Traffic Volume (vph)	337	347	2	131	78	2	125
Future Volume (vph)	337	347	2	131	78	2	125
Turn Type	Prot	Prot	Perm	Perm	NA	Perm	NA
Protected Phases	8	8			2		6
Permitted Phases			2	2		6	
Detector Phase	8	8	2	2	2	6	6
Switch Phase							
Minimum Initial (s)	10.0	10.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	45.0	45.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Max	Max	Max	Max	Max
Act Effct Green (s)	39.0	39.0		49.0	49.0		49.0
Actuated g/C Ratio	0.39	0.39		0.49	0.49		0.49
v/c Ratio	0.57	0.65		0.65	0.06		0.45
Control Delay	28.1	31.0		26.8	7.4		5.9
Queue Delay	0.0	0.0		0.0	0.0		0.5
Total Delay	28.1	31.0		26.8	7.4		6.4
LOS	C	C		C	A		A
Approach Delay	29.6				19.6		6.4
Approach LOS	C				B		A

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 8:EBL, Start of Green, Master Intersection
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 18.5
 Intersection Capacity Utilization 66.6%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 4: S 10th Ave/N 10th Ave & W University Dr



Timings

Year 2023 Existing Conditions Including Site Generated Trips

4: S 10th Ave/N 10th Ave & W University Dr

Timing Plan: PM Peak Hour



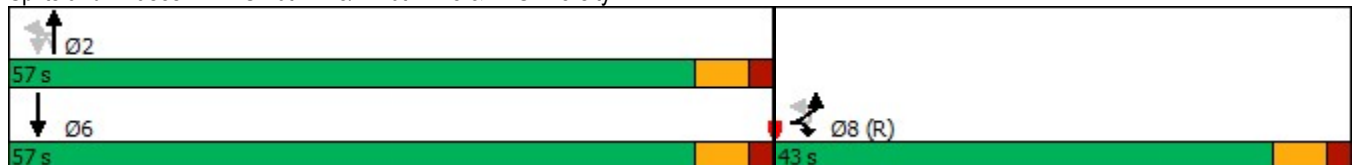
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	367	416	168	90	235
Future Volume (vph)	367	416	168	90	235
Turn Type	Prot	Prot	Perm	NA	NA
Protected Phases	8	8		2	6
Permitted Phases			2		
Detector Phase	8	8	2	2	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	15.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0
Total Split (s)	43.0	43.0	57.0	57.0	57.0
Total Split (%)	43.0%	43.0%	57.0%	57.0%	57.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	37.0	37.0	51.0	51.0	51.0
Actuated g/C Ratio	0.37	0.37	0.51	0.51	0.51
v/c Ratio	0.65	0.76	1.02	0.06	0.50
Control Delay	31.8	37.8	104.4	23.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.1
Total Delay	31.8	37.8	104.4	23.0	2.2
LOS	C	D	F	C	A
Approach Delay	34.9			78.0	2.2
Approach LOS	C			E	A

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 8:EBL, Start of Green, Master Intersection
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 28.1
 Intersection Capacity Utilization 78.1%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: S 10th Ave/N 10th Ave & W University Dr



Timings

Year 2023 Existing Conditions Including Site Generated Trips

5: S 12th Ave/N 12th Ave & E University Dr

Timing Plan: AM Peak Hour

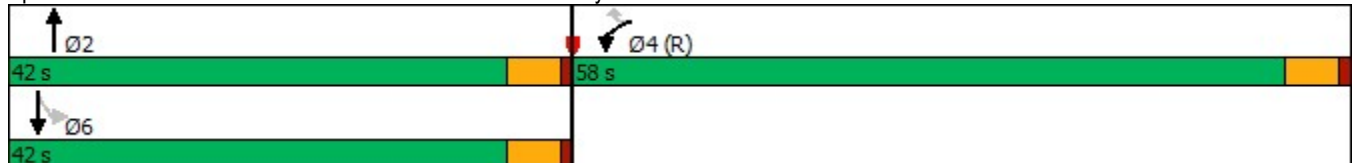


Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↖	↗	↕↔	↘	↕↕
Traffic Volume (vph)	378	447	148	103	135
Future Volume (vph)	378	447	148	103	135
Turn Type	Prot	Perm	NA	Perm	NA
Protected Phases	4		2		6
Permitted Phases		4		6	
Detector Phase	4	4	2	6	6
Switch Phase					
Minimum Initial (s)	18.0	18.0	12.0	18.0	18.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	58.0	58.0	42.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%	42.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Ped	Max	Max
Act Effct Green (s)	53.0	53.0	37.0	37.0	37.0
Actuated g/C Ratio	0.53	0.53	0.37	0.37	0.37
v/c Ratio	0.50	0.47	0.33	0.51	0.13
Control Delay	17.4	2.7	8.0	29.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	2.7	8.0	29.0	17.2
LOS	B	A	A	C	B
Approach Delay	9.8		8.0		22.8
Approach LOS	A		A		C

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 35 (35%), Referenced to phase 4:WBL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 11.9
 Intersection Capacity Utilization 58.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 5: S 12th Ave/N 12th Ave & E University Dr



Timings

Year 2023 Existing Conditions Including Site Generated Trips

5: S 12th Ave/N 12th Ave & E University Dr

Timing Plan: PM Peak Hour



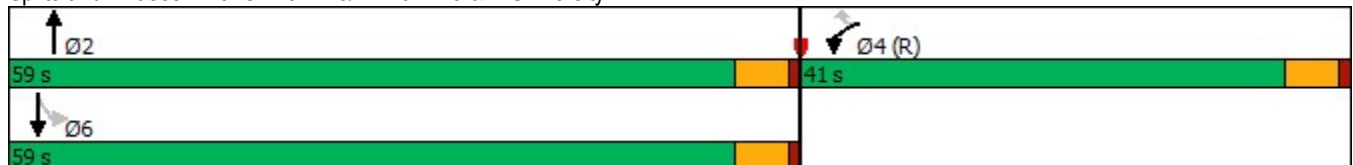
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↶	↷	↕	↷	↕
Traffic Volume (vph)	240	368	286	172	137
Future Volume (vph)	240	368	286	172	137
Turn Type	Prot	Perm	NA	Perm	NA
Protected Phases	4		2		6
Permitted Phases		4		6	
Detector Phase	4	4	2	6	6
Switch Phase					
Minimum Initial (s)	18.0	18.0	12.0	18.0	18.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	41.0	41.0	59.0	59.0	59.0
Total Split (%)	41.0%	41.0%	59.0%	59.0%	59.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Ped	Max	Max
Act Effct Green (s)	36.0	36.0	54.0	54.0	54.0
Actuated g/C Ratio	0.36	0.36	0.54	0.54	0.54
v/c Ratio	0.43	0.50	0.43	0.71	0.09
Control Delay	26.8	4.5	2.8	26.2	4.8
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	26.8	4.5	2.9	26.2	4.8
LOS	C	A	A	C	A
Approach Delay	13.4		2.9		16.8
Approach LOS	B		A		B

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 68 (68%), Referenced to phase 4:WBL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 9.6
 Intersection Capacity Utilization 63.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 5: S 12th Ave/N 12th Ave & E University Dr



Timings
4: S 10th Ave/N 10th Ave & W University Dr

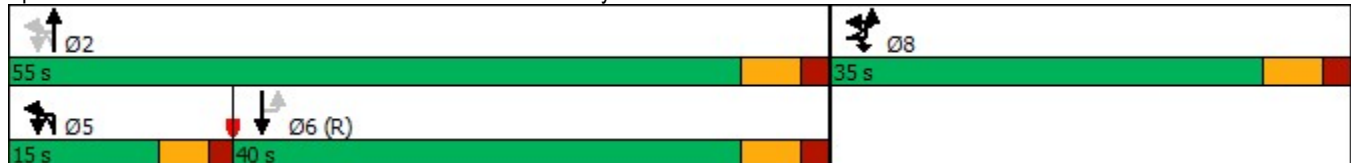
Proposed Timing Plan AM Peak Hour

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT
Lane Configurations							
Traffic Volume (vph)	337	347	2	131	78	2	125
Future Volume (vph)	337	347	2	131	78	2	125
Turn Type	Prot	Prot	pm+pt	pm+pt	NA	Perm	NA
Protected Phases	8	8	5	5	2		6
Permitted Phases			2	2		6	
Detector Phase	8	8	5	5	2	6	6
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	8.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	12.9	12.9	33.0	33.0	33.0
Total Split (s)	35.0	35.0	15.0	15.0	55.0	40.0	40.0
Total Split (%)	38.9%	38.9%	16.7%	16.7%	61.1%	44.4%	44.4%
Yellow Time (s)	4.0	4.0	3.3	3.3	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.6	1.6	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0		4.9	6.0		6.0
Lead/Lag			Lead	Lead		Lag	Lag
Lead-Lag Optimize?			Yes	Yes		Yes	Yes
Recall Mode	Ped	Ped	None	None	Max	C-Max	C-Max
Act Effct Green (s)	28.0	28.0		51.1	50.0		35.8
Actuated g/C Ratio	0.31	0.31		0.57	0.56		0.40
v/c Ratio	0.72	0.82		0.46	0.05		0.52
Control Delay	36.1	43.9		24.7	19.9		2.0
Queue Delay	0.0	0.0		0.0	0.0		0.1
Total Delay	36.1	43.9		24.7	19.9		2.1
LOS	D	D		C	B		A
Approach Delay	40.1				22.9		2.1
Approach LOS	D				C		A

Intersection Summary











Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 6:SBTU, Start of Green, Master Intersection
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 21.8
 Intersection Capacity Utilization 66.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 4: S 10th Ave/N 10th Ave & W University Dr



Timings
4: S 10th Ave/N 10th Ave & W University Dr

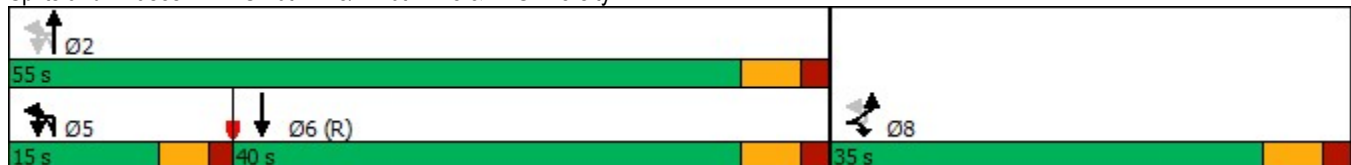
Proposed Timing Plan PM Peak Hour

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	367	416	168	90	235
Future Volume (vph)	367	416	168	90	235
Turn Type	Prot	Prot	pm+pt	NA	NA
Protected Phases	8	8	5	2	6
Permitted Phases			2		
Detector Phase	8	8	5	2	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	33.0	33.0	12.9	33.0	33.0
Total Split (s)	35.0	35.0	15.0	55.0	40.0
Total Split (%)	38.9%	38.9%	16.7%	61.1%	44.4%
Yellow Time (s)	4.0	4.0	3.3	4.0	4.0
All-Red Time (s)	2.0	2.0	1.6	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.9	6.0	6.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	Ped	Ped	None	Max	C-Max
Act Effct Green (s)	28.4	28.4	50.7	49.6	34.9
Actuated g/C Ratio	0.32	0.32	0.56	0.55	0.39
v/c Ratio	0.76	0.90	0.71	0.06	0.59
Control Delay	38.1	52.3	34.3	19.0	2.9
Queue Delay	0.0	1.0	0.0	0.0	0.1
Total Delay	38.1	53.2	34.3	19.0	2.9
LOS	D	D	C	B	A
Approach Delay	45.9			29.3	2.9
Approach LOS	D			C	A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green, Master Intersection
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 25.0
 Intersection LOS: C
 Intersection Capacity Utilization 73.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: S 10th Ave/N 10th Ave & W University Dr



Timings
5: S 12th Ave/N 12th Ave & E University Dr

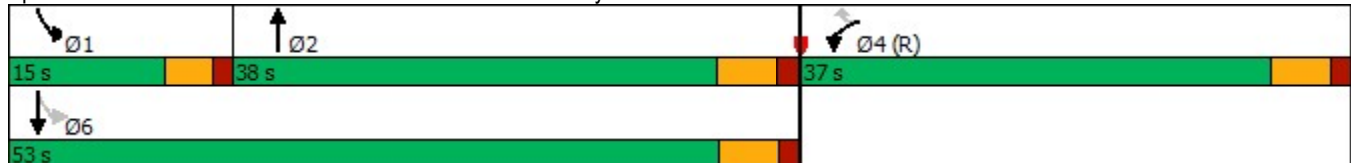
Proposed Timing Plan AM Peak Hour

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙	↖	↑↓	↘	↑↑
Traffic Volume (vph)	378	447	148	103	135
Future Volume (vph)	378	447	148	103	135
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	4		2	1	6
Permitted Phases		4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	18.0	18.0	12.0	8.0	18.0
Minimum Split (s)	33.5	33.5	31.6	12.6	31.5
Total Split (s)	37.0	37.0	38.0	15.0	53.0
Total Split (%)	41.1%	41.1%	42.2%	16.7%	58.9%
Yellow Time (s)	4.0	4.0	4.0	3.3	4.0
All-Red Time (s)	1.5	1.5	1.6	1.3	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.6	4.6	5.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Max
Act Effct Green (s)	31.5	31.5	33.4	48.4	47.5
Actuated g/C Ratio	0.35	0.35	0.37	0.54	0.53
v/c Ratio	0.76	0.57	0.33	0.31	0.09
Control Delay	35.6	5.0	5.0	18.3	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	5.0	5.0	18.3	15.2
LOS	D	A	A	B	B
Approach Delay	19.8		5.0		16.7
Approach LOS	B		A		B

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 4:WBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 50.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: S 12th Ave/N 12th Ave & E University Dr



Timings
5: S 12th Ave/N 12th Ave & E University Dr

Proposed Timing Plan PM Peak Hour

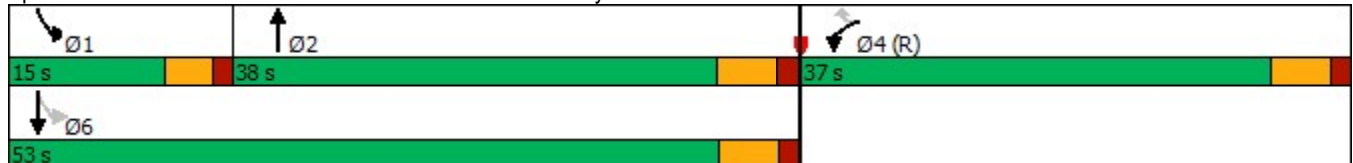
	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙	↖	↑↓	↘	↑↑
Traffic Volume (vph)	240	368	286	172	137
Future Volume (vph)	240	368	286	172	137
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	4		2	1	6
Permitted Phases		4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	8.0	10.0
Minimum Split (s)	33.5	33.5	31.6	12.8	31.5
Total Split (s)	37.0	37.0	38.0	15.0	53.0
Total Split (%)	41.1%	41.1%	42.2%	16.7%	58.9%
Yellow Time (s)	4.0	4.0	4.0	3.3	4.0
All-Red Time (s)	1.5	1.5	1.6	1.3	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.6	4.6	5.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Max
Act Effect Green (s)	31.5	31.5	33.0	48.4	47.5
Actuated g/C Ratio	0.35	0.35	0.37	0.54	0.53
v/c Ratio	0.44	0.50	0.59	0.60	0.09
Control Delay	25.2	4.6	6.1	28.8	17.9
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	25.2	4.6	6.3	28.8	17.9
LOS	C	A	A	C	B
Approach Delay	12.9		6.3		24.0
Approach LOS	B		A		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 40 (44%), Referenced to phase 4:WBL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 12.3
 Intersection Capacity Utilization 57.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 5: S 12th Ave/N 12th Ave & E University Dr



Attachment 3



MEMO

September 1, 2021

To: District Engineers

From: Michael A. Chacon, P.E.
Director, Traffic Safety Division

DocuSigned by:

Michael A. Chacon, P.E.

06D7FD6C5CEC46B...

Subject: Signing and Pavement Marking Updates Related to SB 1055 Pedestrian Safety

In response to SB 1055 (effective date September 1, 2021), TRF is offering the following guidance related to pedestrian related traffic control devices. SB 1055 amended Transportation Code to add that the operator of a vehicle must stop in addition to yield the right-of-way to pedestrians. Impacted pedestrian signing is revised from YIELD TO PEDESTRIANS to STOP FOR PEDESTRIANS and associated yield lines are revised to stop line pavement markings. Applicable signs and pavement markings are detailed in the attached table.

The revised signs and markings should be used in PS&E plans as soon as possible. Signs and pavement markings that are in the field should be updated through regular maintenance cycles.

We have revised the SHSD sign details for the STOP FOR PEDESTRIANS signs and these revisions will be incorporated into the next SHSD update. We have also created the SignCAD templates to help facilitate sign design. Please access the [Stop for Pedestrian Signs – August 2021](#) folder on the TRF SharePoint site.











The SignCAD templates provided may also be added to the Favorites tab in SignCAD under “Add to Favorites” or C:\ProgramData\SignCAD\Favorites\Texas. If for any reason there is a SignCAD upgrade version, you will have to do this again.







If you have any questions, please contact Rafael Riojas.

CC:

ADM_ALL	Jennifer Woodard, AGC
Craig Otto, AUD	Thomas Bohuslav, AGC
Jeffrey M Graham, GCD	Herbert Bickley, ATSSA
Gerald J Haddican II, GOV	Stephen Ratke, FHWA
Eric Gleason, PTN	Ed Burgos-Gomez, FHWA
#EO-DDD	Amelia Hayes, FHWA
#Traffic Engineers	Bryan Sims, UTA
Daryl Starkes, SSD	Kathy Stone, TEEX

Attachment

<p>No Longer Recommended for Crosswalks</p>	<p>Follows SB 1055 <i>See Federal MUTCD for these signs.</i></p>	<p>See References & Guidance TMUTCD: Link MUTCD: Link</p>
 <p>R1-5</p>  <p>R1-5a</p>	 <p>R1-5b</p>  <p>R1-5c</p>	<p>TMUTCD & MUTCD</p> <ul style="list-style-type: none"> Section 2B.11 Section 3B.16 Figure 3B-17 <p>TxDOT Standards</p> <ul style="list-style-type: none"> PM(4)-20 <p>FHWA Interpretation (Guidance)</p> <ul style="list-style-type: none"> Click Here
 <p>R1-6</p>	 <p>R1-6a</p>	<p>TMUTCD & MUTCD</p> <ul style="list-style-type: none"> Figure 2B-2 Section 2B.12
 <p>R1-9</p>	 <p>R1-9a</p>	<p>TMUTCD & MUTCD</p> <ul style="list-style-type: none"> Figure 2B-2 Section 2B.12 Section 7B.12
 <p>R10-15</p>	 <p>R10-15a</p>	<p>TMUTCD</p> <ul style="list-style-type: none"> Figure 2B-27 Section 2B.53 <p>FHWA Interpretation (Guidance)</p> <p>Click Here</p>

<p>No Longer Recommended for Crosswalks</p>	<p>Follows SB 1055 <i>See Federal MUTCD for these signs.</i></p>	<p>See References & Guidance TMUTCD: Link MUTCD: Link</p>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>R1-6 with S4-3P plaque</p> </div> <div style="text-align: center;"> <p>OR</p>  <p>R1-6b</p> </div> </div>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>R1-6a with S4-3P plaque</p> </div> <div style="text-align: center;"> <p>OR</p>  <p>R1-6c</p> </div> </div>	<p>TMUTCD & MUTCD</p> <ul style="list-style-type: none"> • Section 7B.11 • Section 7B.12 • Figure 7B-6
<p>Figure 3B-17 & PM(4) Midblock Diagram <i>Use of Striping</i></p>		<p>TMUTCD</p> <ul style="list-style-type: none"> • Section 3B.16 • Figure 3B-17
 <p>Yield Line**</p>	 <p>Stop Line**</p>	<p>TxDOT Standards</p> <ul style="list-style-type: none"> • PM(4)-20
<p>**This is only intended to apply to Figure 3B-17 & PM(4) in reference to midblock crosswalks, when striping is used. If striping is used, it should be a stop bar to correlate with the stop here for pedestrians signage (R1-5b or R1-5c) which should now be used in-lieu of the yield option.</p>		