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Project Overview

The city of Buda in Texas has concerns that the current design for the intersection of FM2770 and Main Street in Downtown does not provide safe and efficient connectivity for pedestrians and vehicular traffic. There are wide driveways, and no dedicated turn lanes, bicycle lanes, protected crosswalks, or sidewalk curbs.



Our goal is to improve the Intersection to allow for better pedestrian connectivity and improve Intersection geometrics.

Constraints & Standards

- TxDOT Codes
- Austin, TX Standards
- FHWA Standards
- Environmental Regulation
- ADA Accessibility Regulations
- Traffic Regulations

Engineering Solutions



Figure 1: Signalized T-intersection

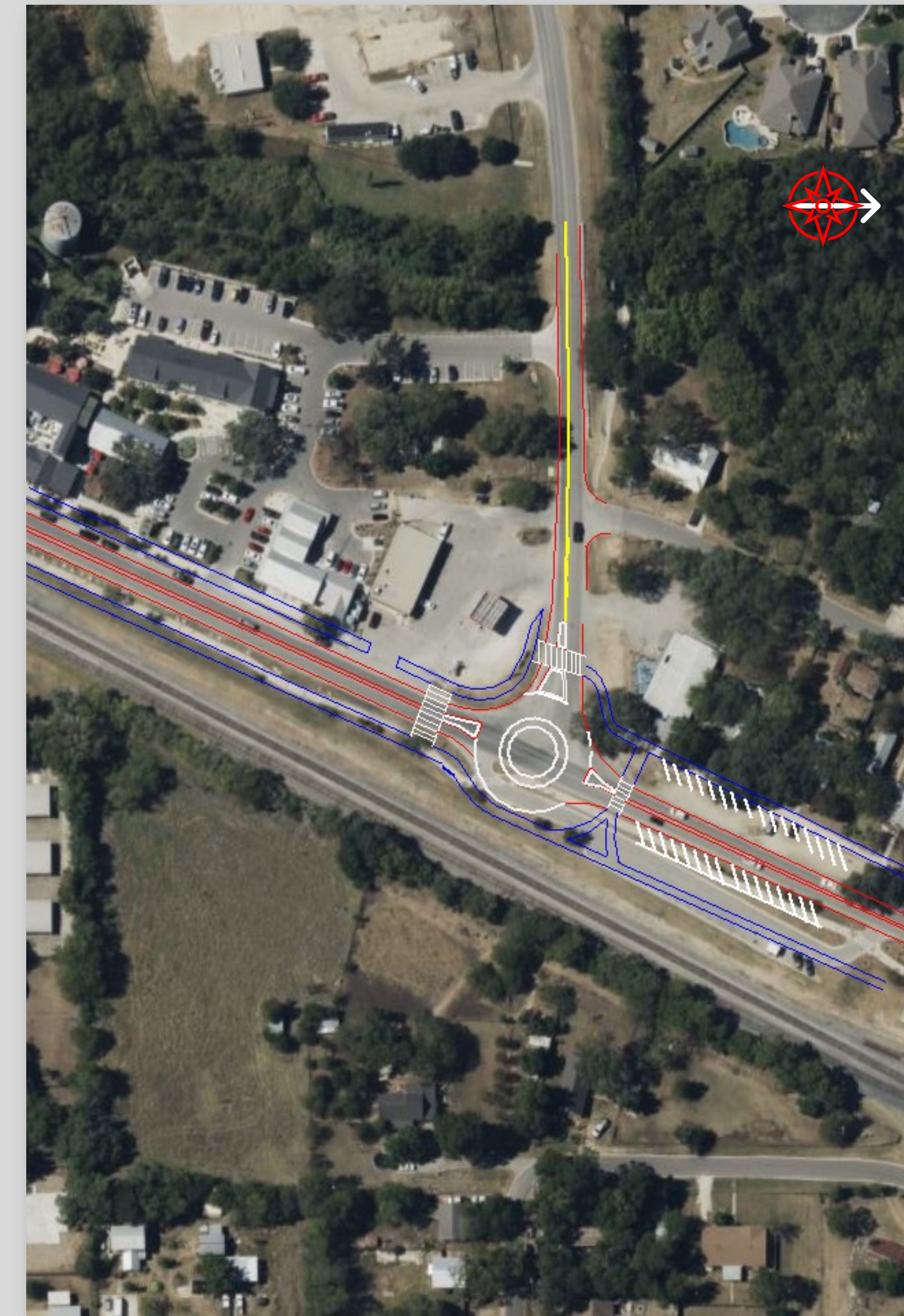


Figure 2: Single-Lane Roundabout

Capital & Life Cycle Costs

Alternative 1 Cost Summary

Item	Measurement	Unit	Unit Cost	Cost
Concrete Sidewalk/SUP (4"-6")	2,357	SY	\$ 90	\$ 213,000
Asphalt Pavement	3,224	TON	\$ 244	\$ 787,000
Concrete Curb or Curb and Gutter	123	LF	\$ 38	\$ 5,000
Driveways and Intersections	389	SY	\$ 93	\$ 36,000
Linear Striping (4"-6")	7,075	LF	\$ 15	\$ 107,000
Thick Linear Striping (12"-24")	280	LF	\$ 25	\$ 7,000
Allowance for Earthwork	1	LS	5%	\$ 58,000
Allowance for Drainage	1	LS	5%	\$ 58,000
Allowance for Electrical Work	1	LS	10%	\$ 116,000
Contingency	1	LS	30%	\$ 417,000
Total:				\$ 1,804,000

Alternative 1 Life Cycle Cost

Total Capital Cost	\$ 1,804,000
40-Year Maintenance and Operation Cost	\$ 292,560
Life Cycle Cost	\$ 2,096,560
Net Present Value	\$ 8,720,000

Alternative 2 Cost Summary

Item	Measurement	Unit	Unit Cost	Cost
Concrete Sidewalk/SUP (4"-6")	1,861	SY	\$ 90	\$ 168,000
Asphalt Pavement	3,295	TON	\$ 244	\$ 804,000
Concrete Curb or Curb and Gutter	309	LF	\$ 38	\$ 12,000
Driveways and Intersections	350	SY	\$ 93	\$ 33,000
Linear Striping (4"-6")	4,784	LF	\$ 15	\$ 73,000
Thick Linear Striping (12"-24")	64	LF	\$ 25	\$ 20,000
Allowance for Earthwork	1	LS	5%	\$ 56,000
Allowance for Drainage	1	LS	5%	\$ 56,000
Allowance for Electrical Work	1	LS	10%	\$ 111,000
Contingency	1	LS	30%	\$ 400,000
Total:				\$ 1,733,000

Alternative 2 Life Cycle Cost

Total Capital Cost	\$ 1,733,000
40-Year Maintenance and Operation Cost	\$ 102,000
Life Cycle Cost	\$ 1,835,000
Net Present Value	\$ 8,430,000

The Engineers



Sustainability

Envision is a framework developed by the Institute of Sustainable Infrastructure (ISI) that evaluates civil infrastructure based on **five** categories.



After careful analysis, alternatives 1 and 2 received a score of 30% and 33%, respectively—giving both alternatives a silver envision rating. A minimum of 20% was needed to pass.

Design II

Our second semester will be geared more towards design specifics for drainage, traffic control, and pavement design to obtain a finalized alternative selection.