

C2.02 - City of Buda Intersection Redesign

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Problem Summary



The intersection at Jack C Hays Trail and Main Street located in the City of Buda needs improvements to its traffic control pedestrian crossings, intersection geometry, surrounding driveway connections, and parking accessibility.

Sustainability Summary

Credit Category	Applicable	Submitted	Percentage
Quality of Life	148	113	76%
Leadership	110	51	46%
Resource Allocation	12	3	25%
Natural World	46	24	52%
Total Points/ %	316	191	60%

- Platinum Rating
- ISI Envision Manual



Acknowledgments

Thank you to our professors, sponsors and most importantly our family and friends

System & Element Design

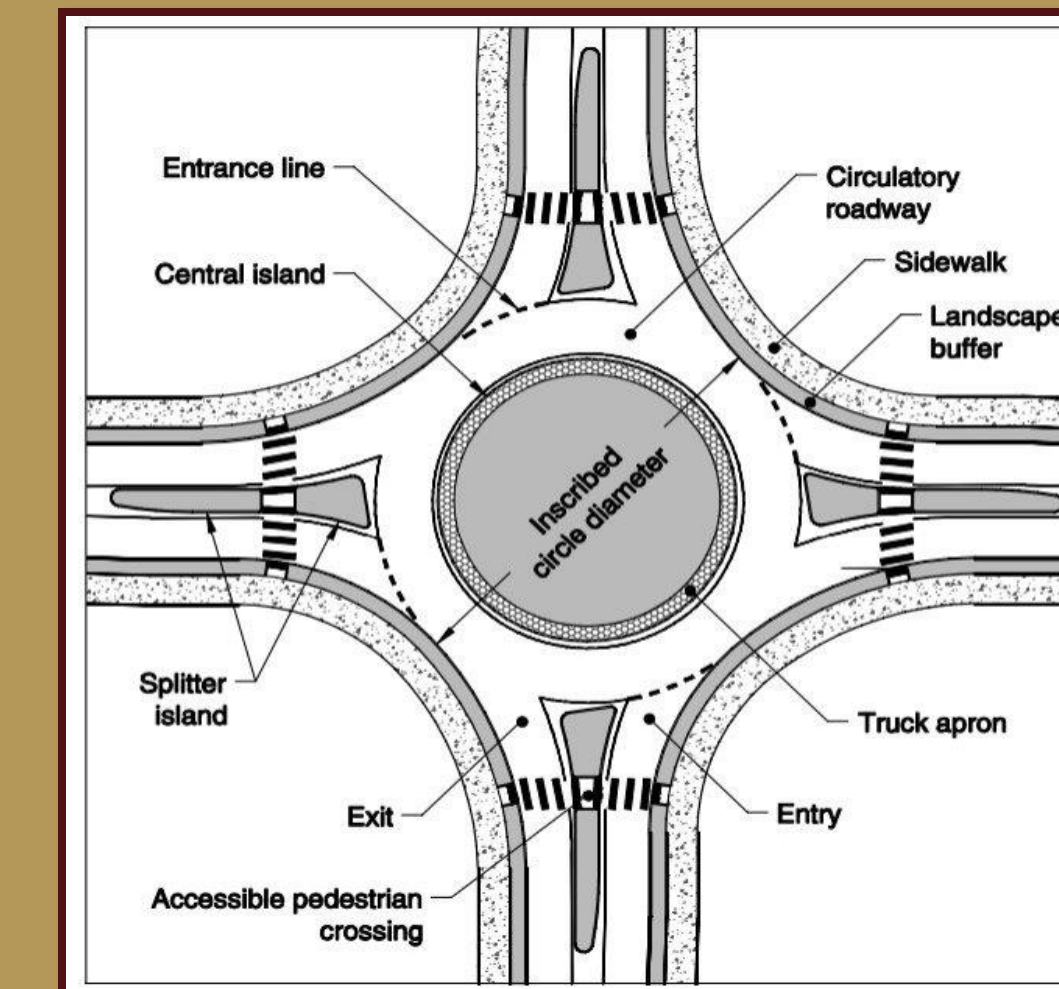
Roundabout Capacity

Design Element	Mini-Roundabout	Single-Lane Roundabout	Multilane Roundabout
Desirable maximum entry design speed	15 to 20 mph (25 to 30 km/h)	20 to 25 mph (30 to 40 km/h)	25 to 30 mph (40 to 50 km/h)
Maximum number of entering lanes per approach	1	1	2+
Typical inscribed circle diameter	45 to 90 ft (13 to 27 m)	90 to 180 ft (27 to 55 m)	150 to 300 ft (46 to 91 m)
Central island treatment	Fully traversable	Raised (may have traversable apron)	Raised (may have traversable apron)
Typical daily service volumes on 4-leg roundabout below which may be expected to operate without requiring a detailed capacity analysis (veh/day)*	Up to approximately 15,000	Up to approximately 25,000	Up to approximately 45,000 for two-lane roundabout

*Operational analysis needed to verify upper limit for specific applications or for roundabouts with more than two lanes or four legs.

Design Measurements

- Entry Width: 16 to 20-ft
- Circulatory Road Width: 18 to 20-ft
- Entry Curve Radius : 50 to 100-ft
- Exit Curve Radius: 100 to 200-ft
- Truck Apron: 3 to 15-ft



Allowable Vehicles

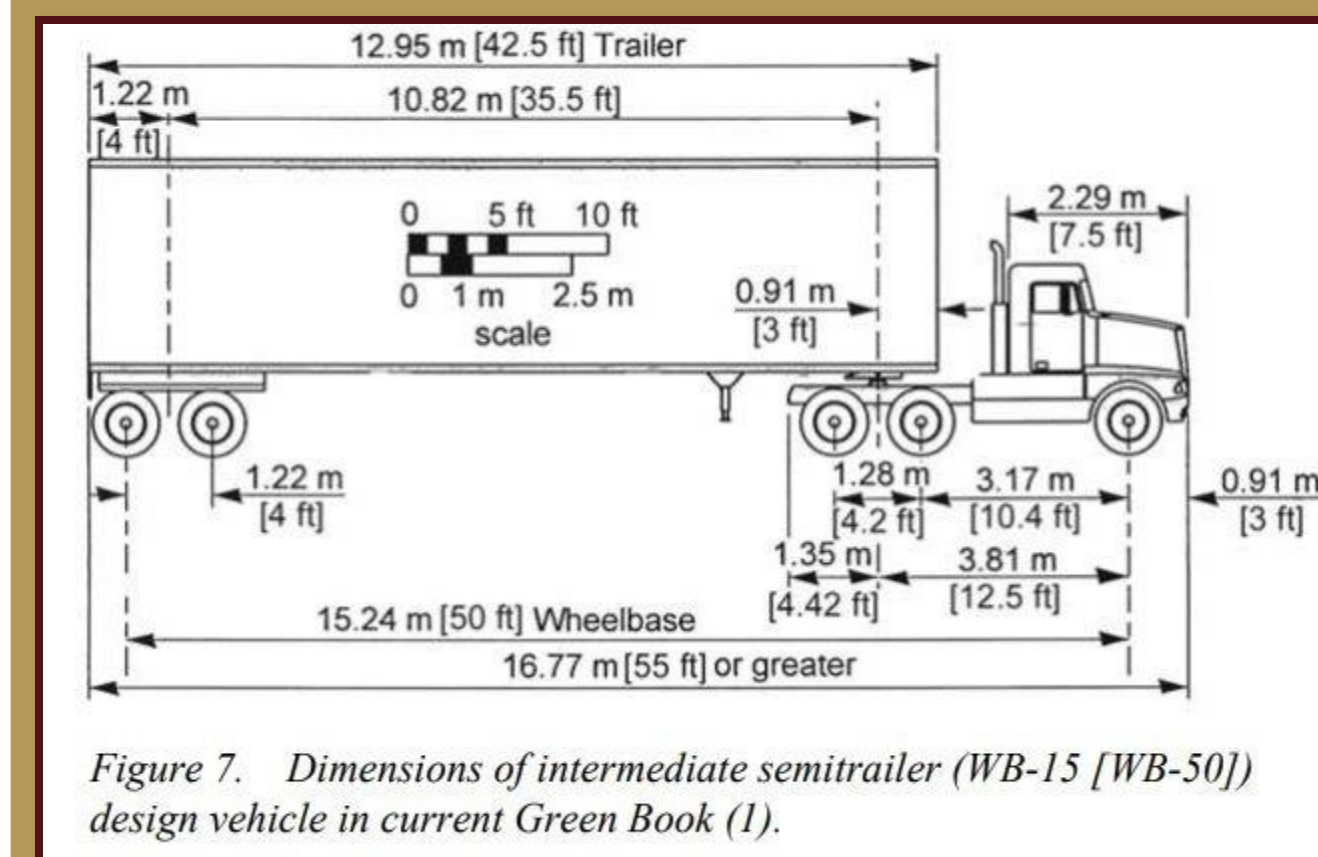
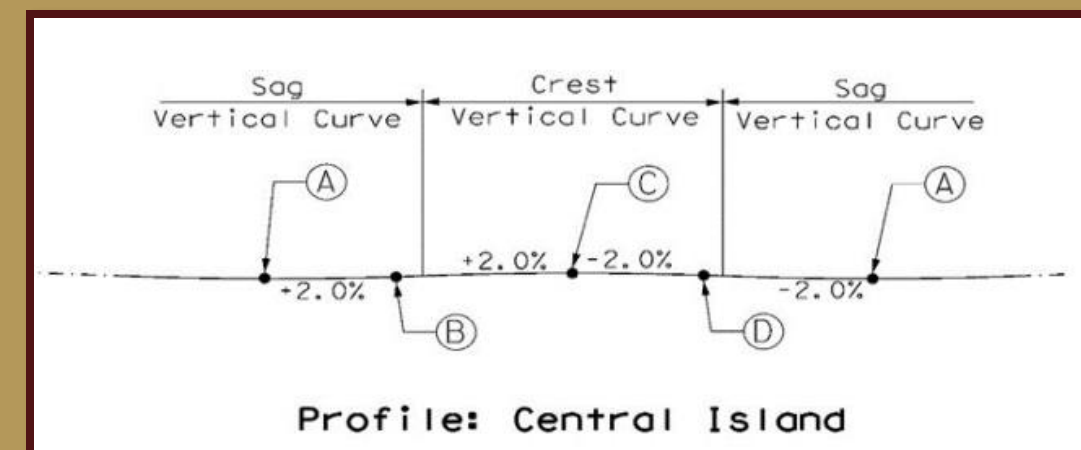


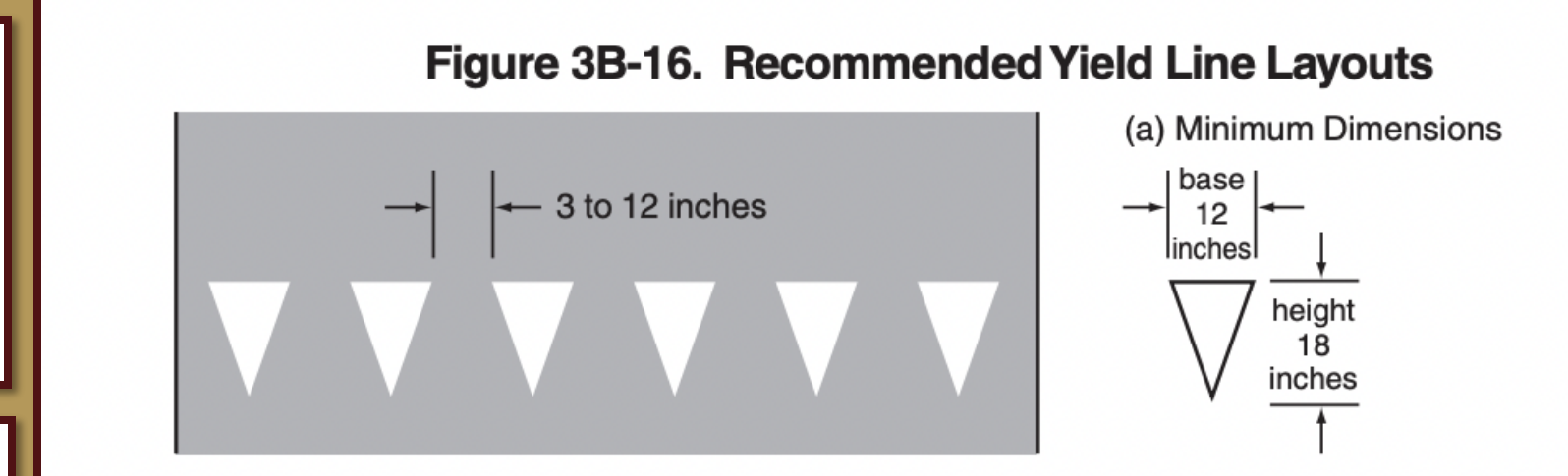
Figure 7. Dimensions of intermediate semitrailer (WB-15 [WB-50]) design vehicle in current Green Book (1).

Vertical Geometry

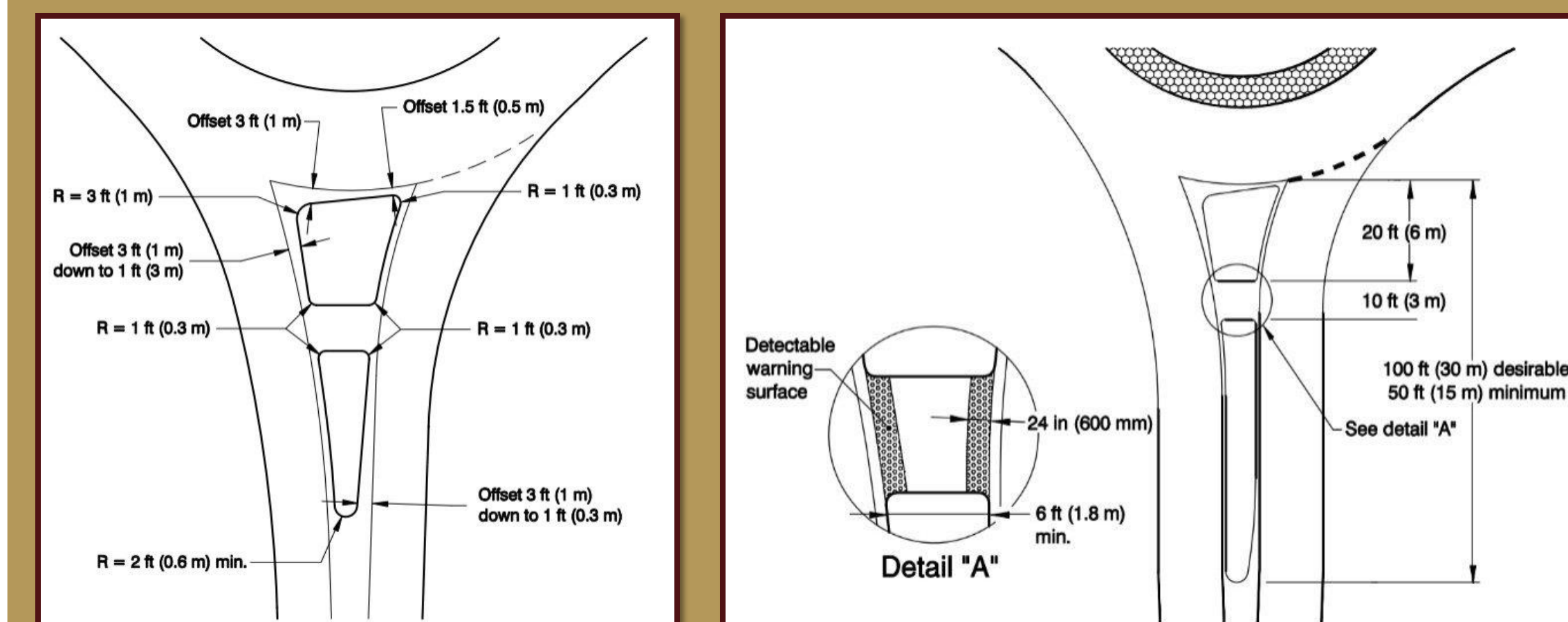


Signage and Pavement Markings

- Temporary and Permanent



Splitter Island Design



Roadway Design

Entering Lanes per Approach

Desirable Speed

Peak Flows

Right of way

Traffic Control

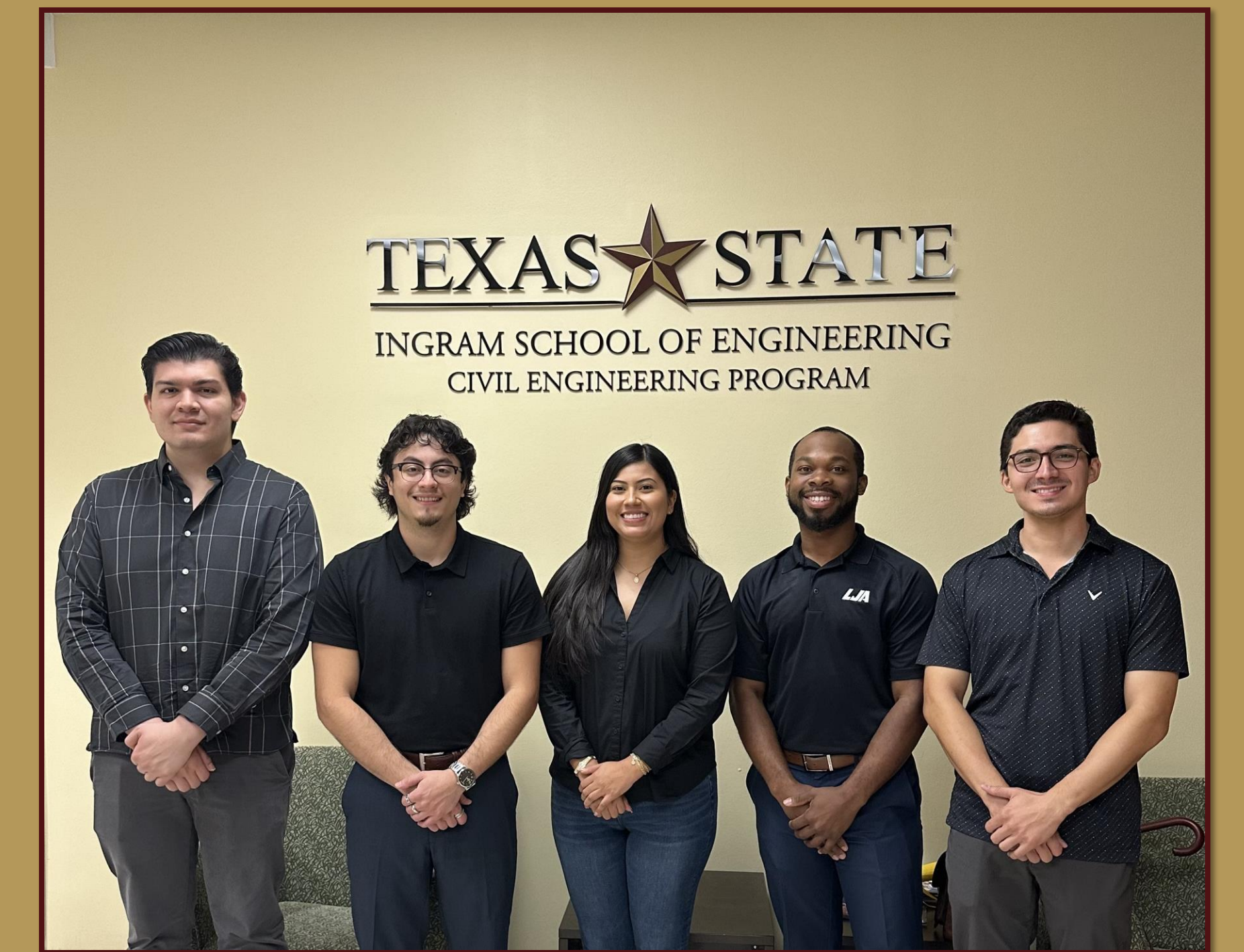
- 3 Phases

$$Q = C \cdot I \cdot A$$

Engineering Solution

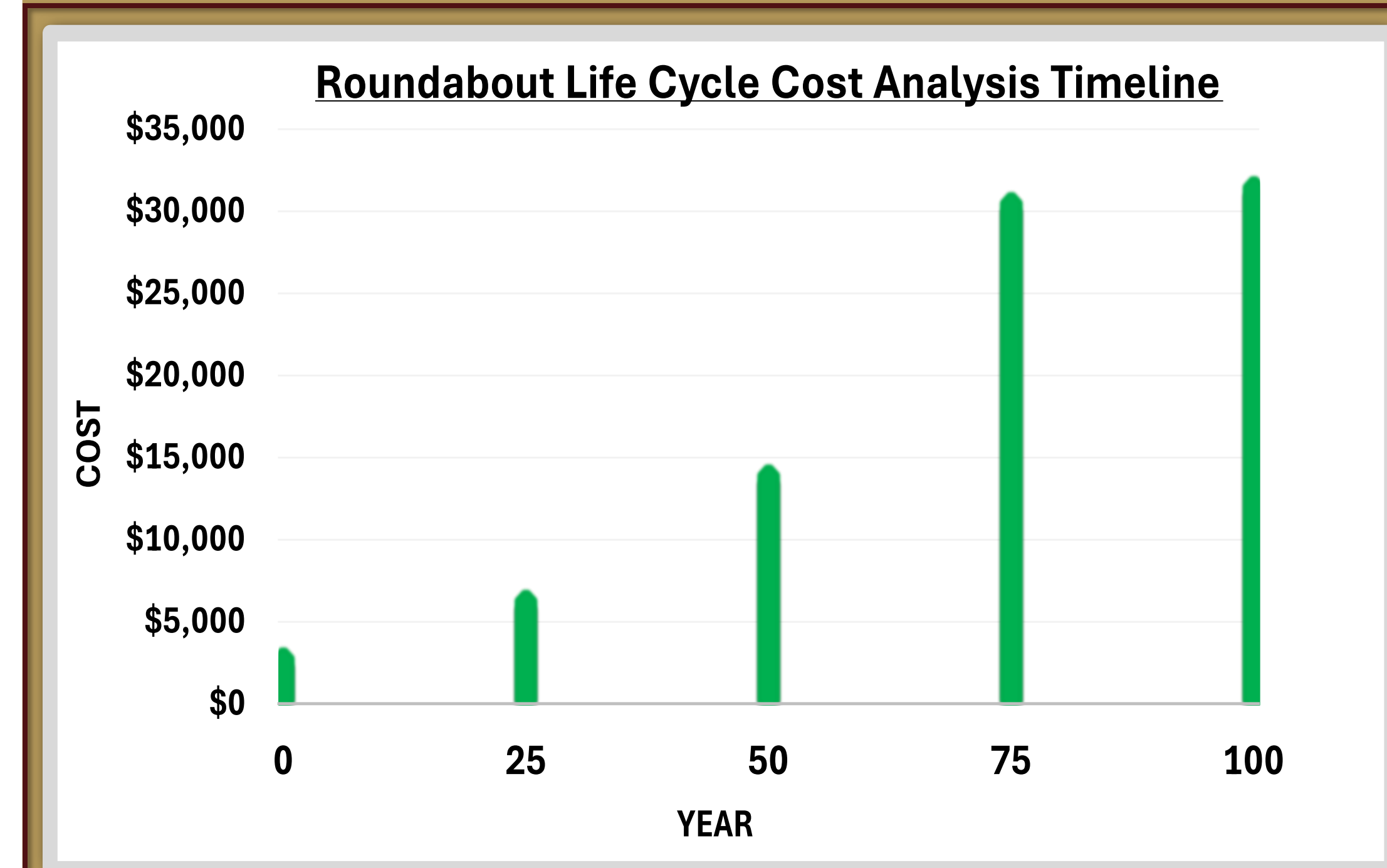


Team Photo



Capital & Life Cycle Cost

Projected Cost:
\$1.4 Million



Constraints and Standards

- TxDOT (MUTCD, HDM, & RDM)
- TDLR (TAS)
- FHWA/AASHTO
- USDOT (MUTCD)
- ISI Envision
- LCCA