Todd Lane Alternative Geometric Design Study
Ben White to St. Elmo
Austin, Texas

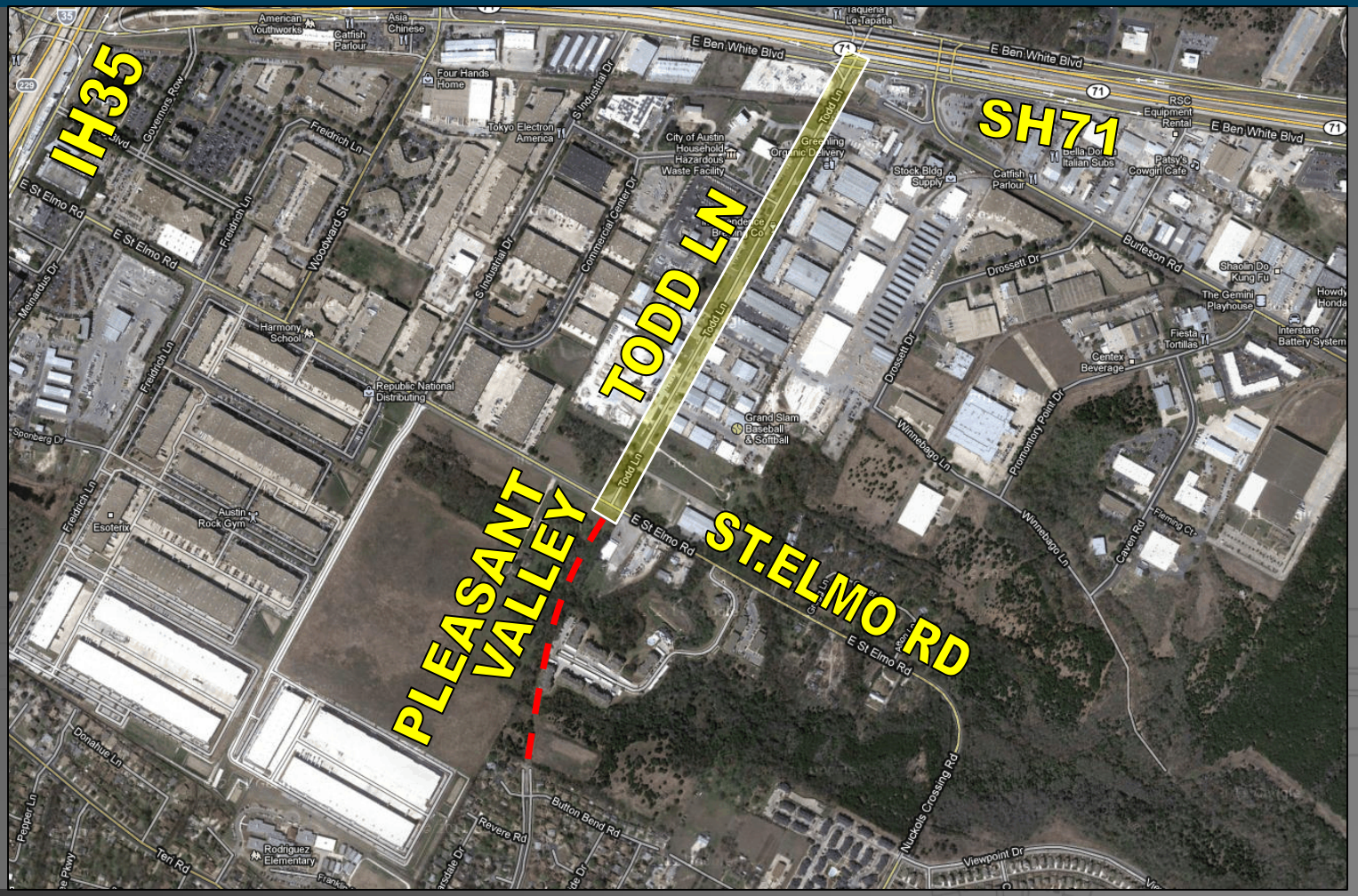
Presented by:

Clay Harris, PMP - City of Austin

Federico Mendoza, PE, PTOE – Brown & Gay Engineers, Inc.

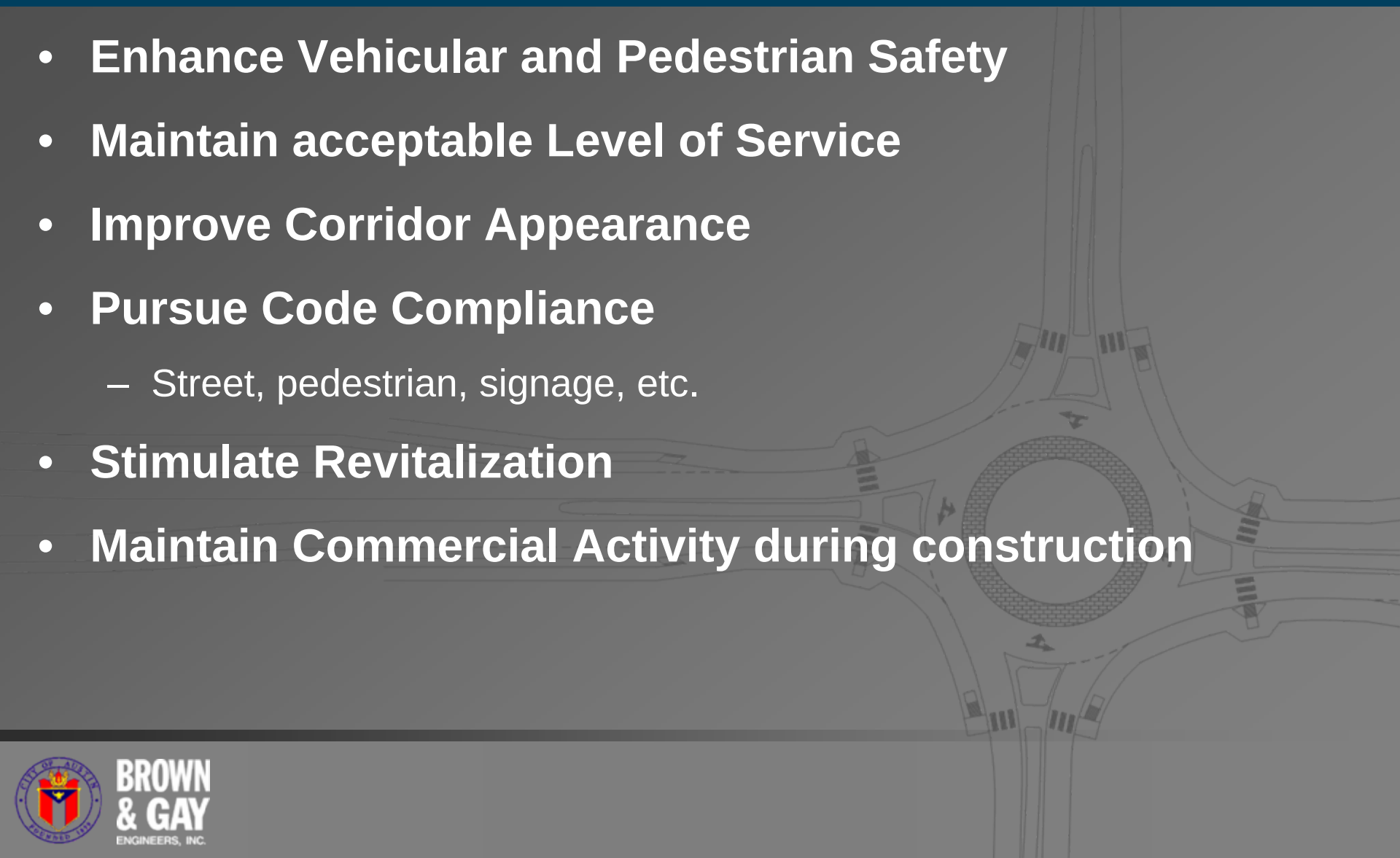
September 15, 2011

Project History



Critical Goals and Concerns

- **Enhance Vehicular and Pedestrian Safety**
- **Maintain acceptable Level of Service**
- **Improve Corridor Appearance**
- **Pursue Code Compliance**
  - Street, pedestrian, signage, etc.
- **Stimulate Revitalization**
- **Maintain Commercial Activity during construction**



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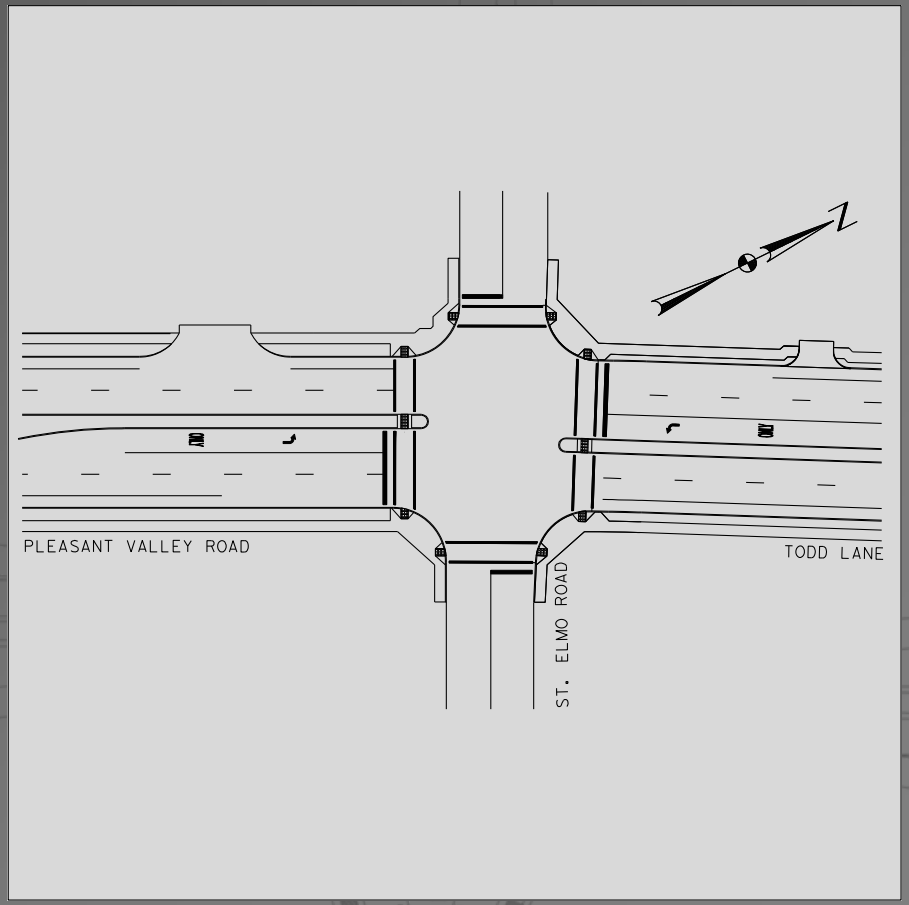
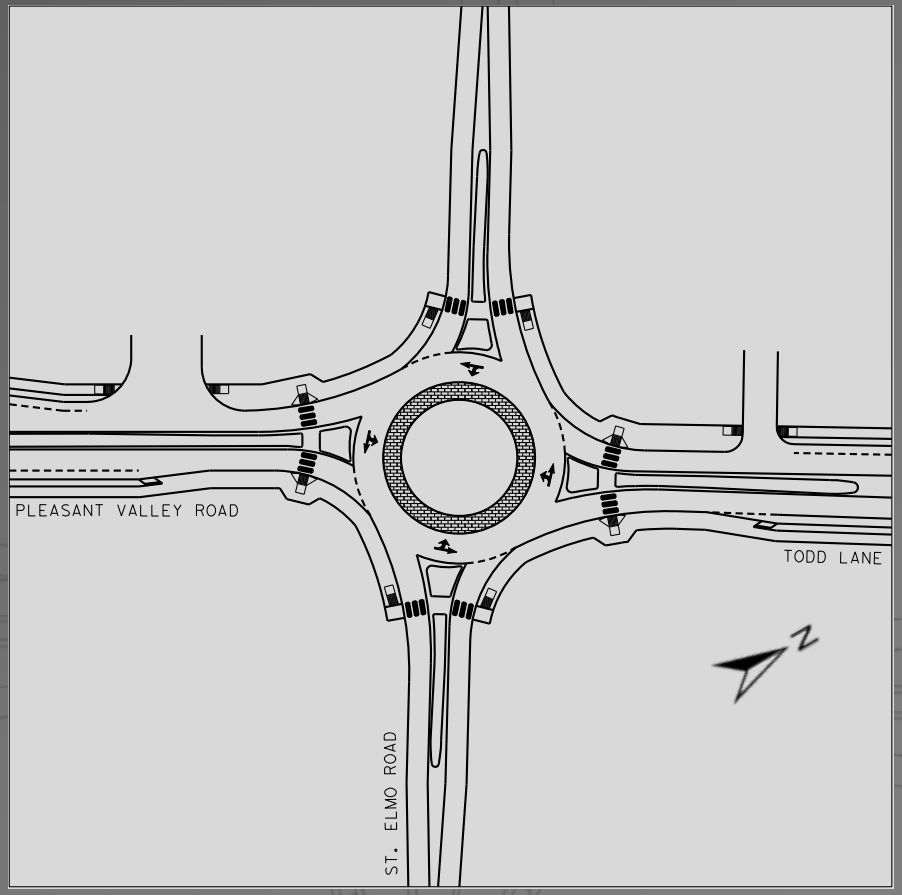
Original Project Design

- **Alternative 1**
  - 4-lane divided on Todd Lane
  - 4-lane divided boulevard on Pleasant Valley Road
  - Standard signalized intersection at Todd Lane and St. Elmo Road
  - Real Estate acquisition cost prohibitive (2.5 M), substantially delaying project schedule.



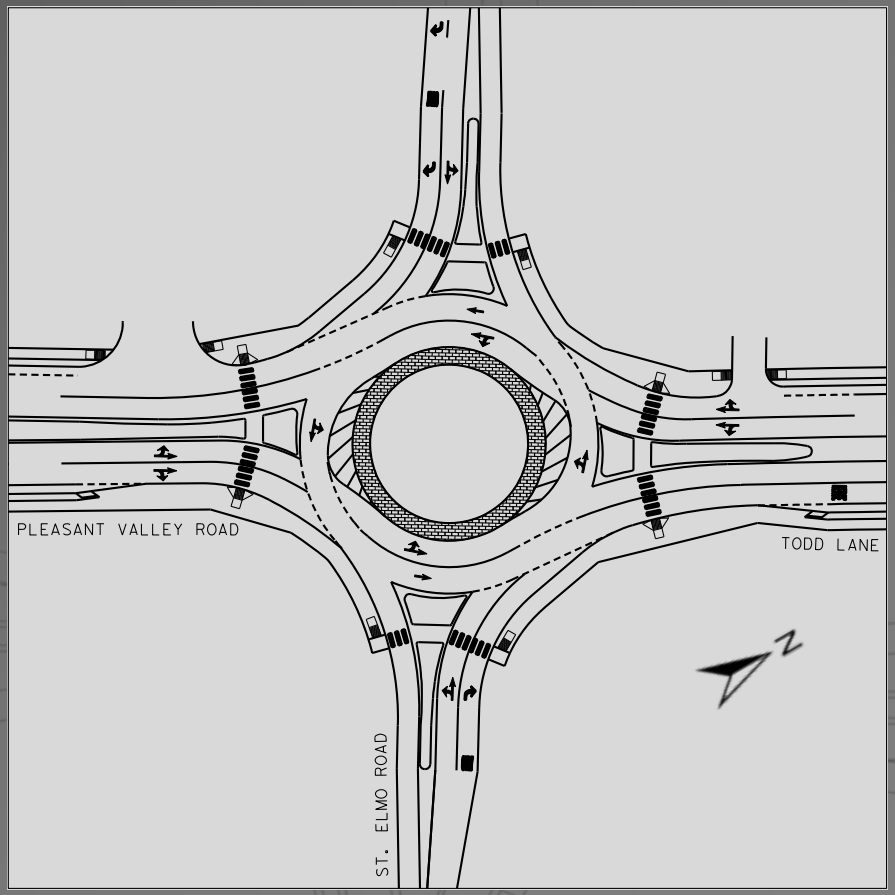
Alternate Design

- **Alternative 2A**
  - 3-lane roadway section on Todd Lane
  - 4-lane divided on Pleasant Valley Road; Single-lane NB approach
  - Single-lane Roundabout at Todd Lane and St. Elmo Road
  - Fits within existing ROW
  - Real Estate acquisition estimated at $1m



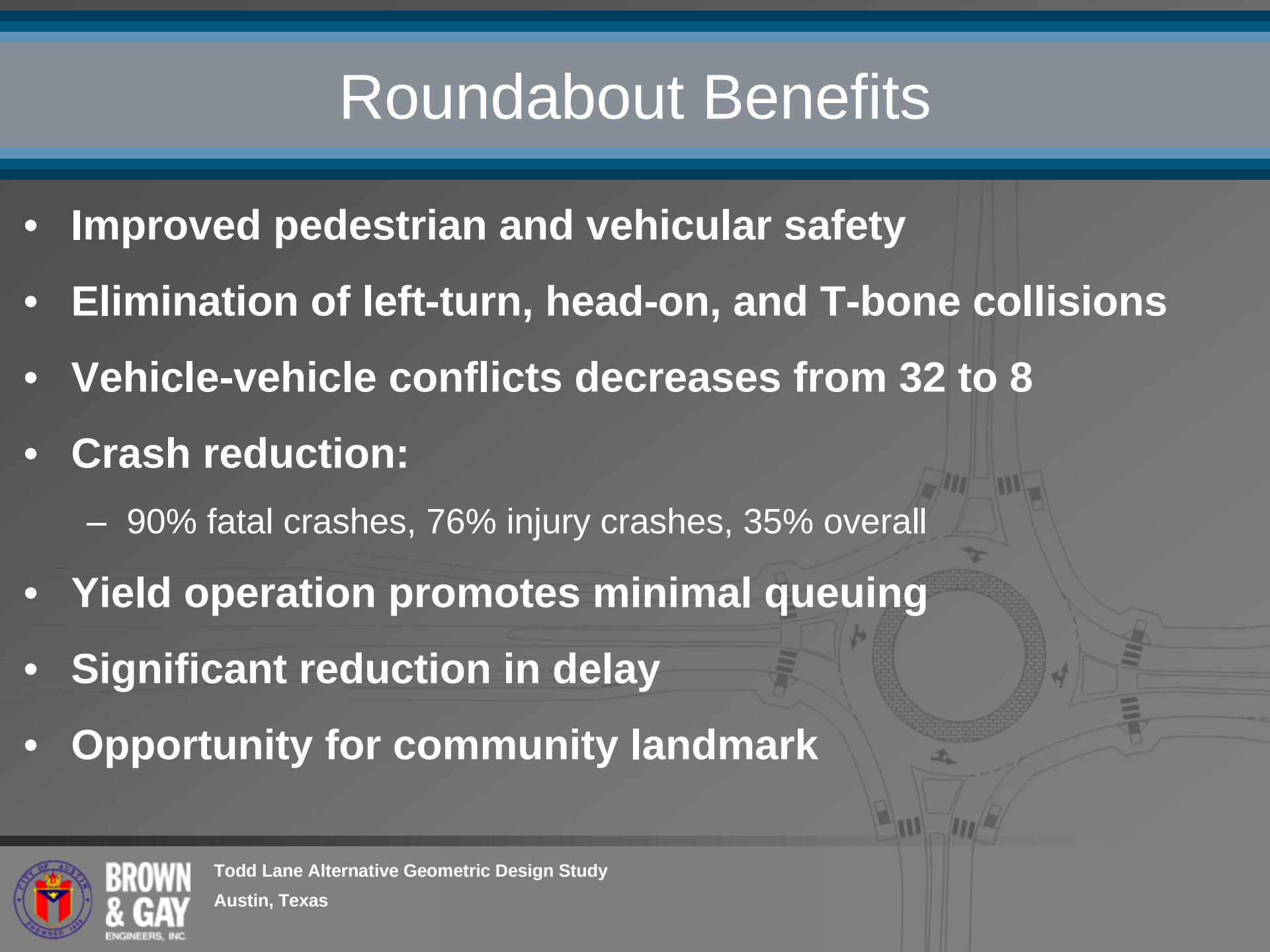
Alternate Design

- **Alternative 2B**
  - 3-lane roadway on Todd Lane North, expanded on the approach
  - 4-lane divided on Pleasant Valley Road
  - Two-lane Roundabout at Todd Lane and St. Elmo Road
  - Additional ROW corner clips required



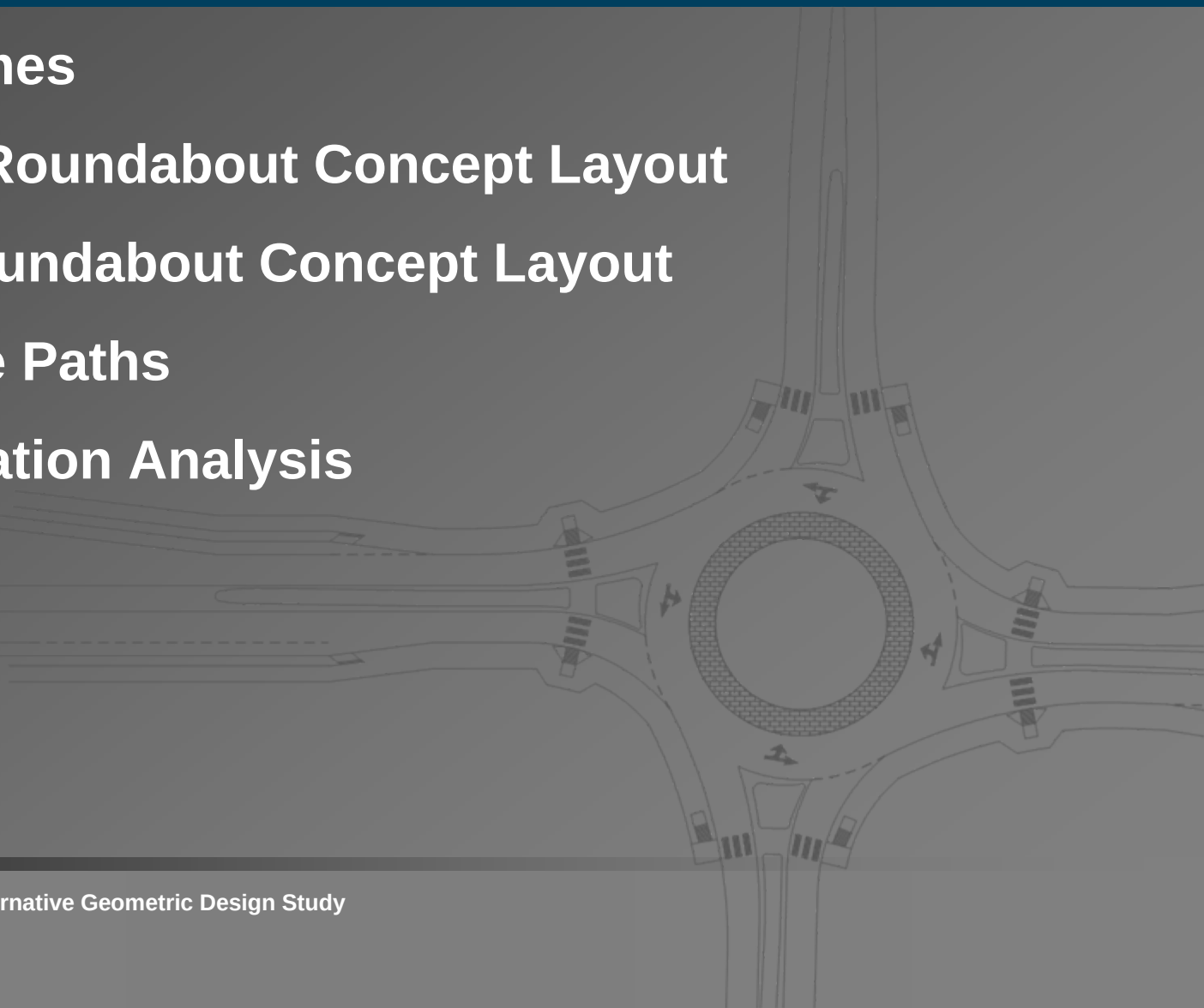
Roundabout Benefits

- **Improved pedestrian and vehicular safety**
- **Elimination of left-turn, head-on, and T-bone collisions**
- **Vehicle-vehicle conflicts decreases from 32 to 8**
- **Crash reduction:**
  - 90% fatal crashes, 76% injury crashes, 35% overall
- **Yield operation promotes minimal queuing**
- **Significant reduction in delay**
- **Opportunity for community landmark**



Study Scope

- **Traffic Volumes**
- **Single-Lane Roundabout Concept Layout**
- **Two-Lane Roundabout Concept Layout**
- **Truck Vehicle Paths**
- **Traffic Simulation Analysis**
- **Conclusions**



Traffic Volumes

- **Existing Peak Hour Volumes – Todd Lane at St. Elmo Rd.**
  - AM Peak: Heavier Volumes
  - PM Peak: Relatively Balanced Flows

Approach	AM Peak Hour (Vehicles per hour)	PM Peak Hour (Vehicles per hour)
Northbound	-	-
Southbound	301	474
Eastbound	458	523
Westbound	677	327
Total	1,436	1,324

Traffic Projections

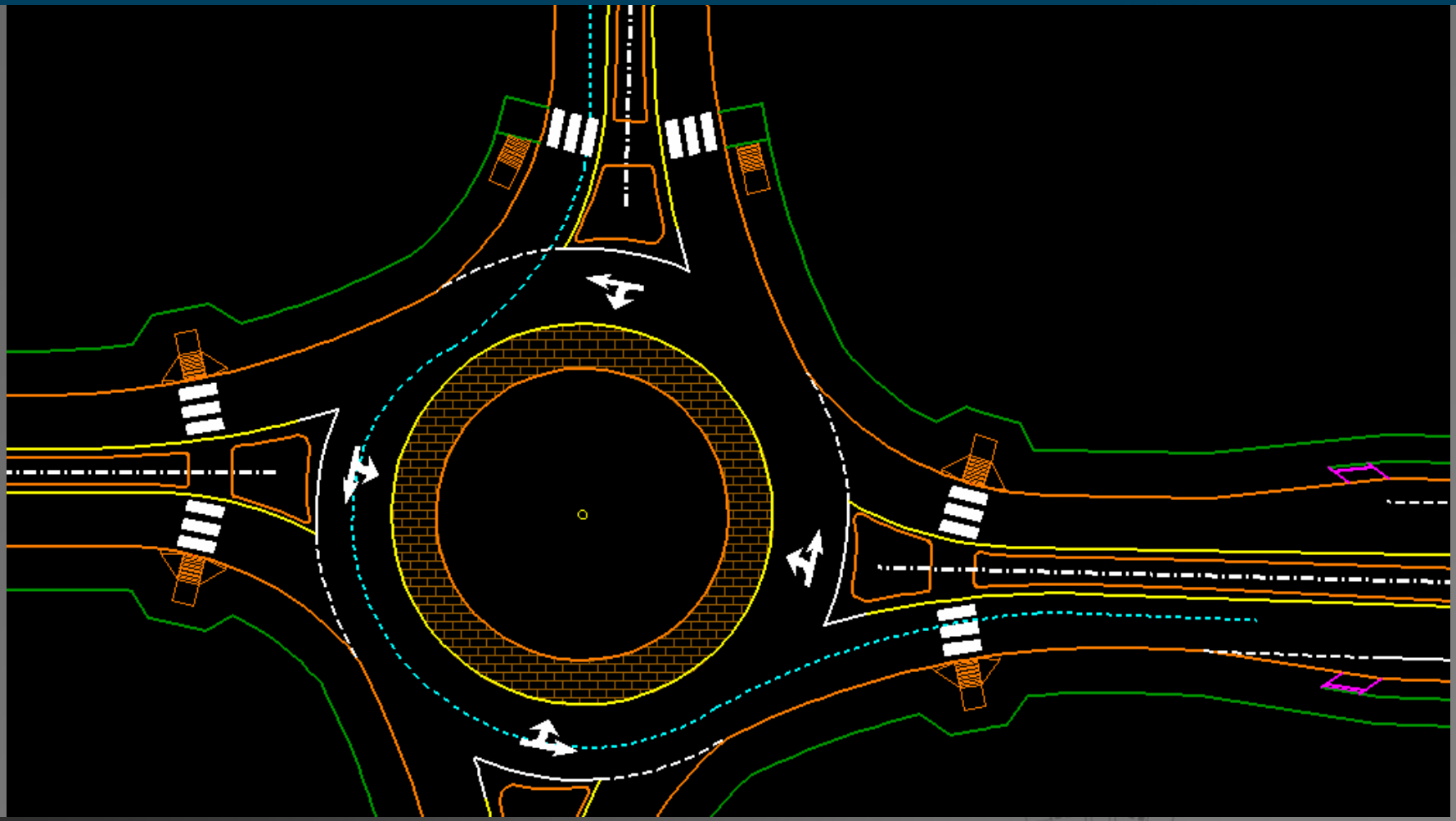
- **Derived from Existing Counts and CAMPO Estimates**
- **Daily Traffic Volume Forecasts – Todd Lane at St. Elmo Road**

Intersection Leg	2015 Daily Volumes (Vehicles per day)	2025 Daily Volumes (Vehicles per day)	2035 Daily Volumes (Vehicles per day)
North	11,100	14,000	18,000
South	11,400	15,400	15,500
East	3,370	5,518	7,000
West	9,100	8,500	7,900

Single-Lane Roundabout Concept

Two-lane Roundabout Concept

WB-50 Design Vehicle



WB-50 Design Vehicle

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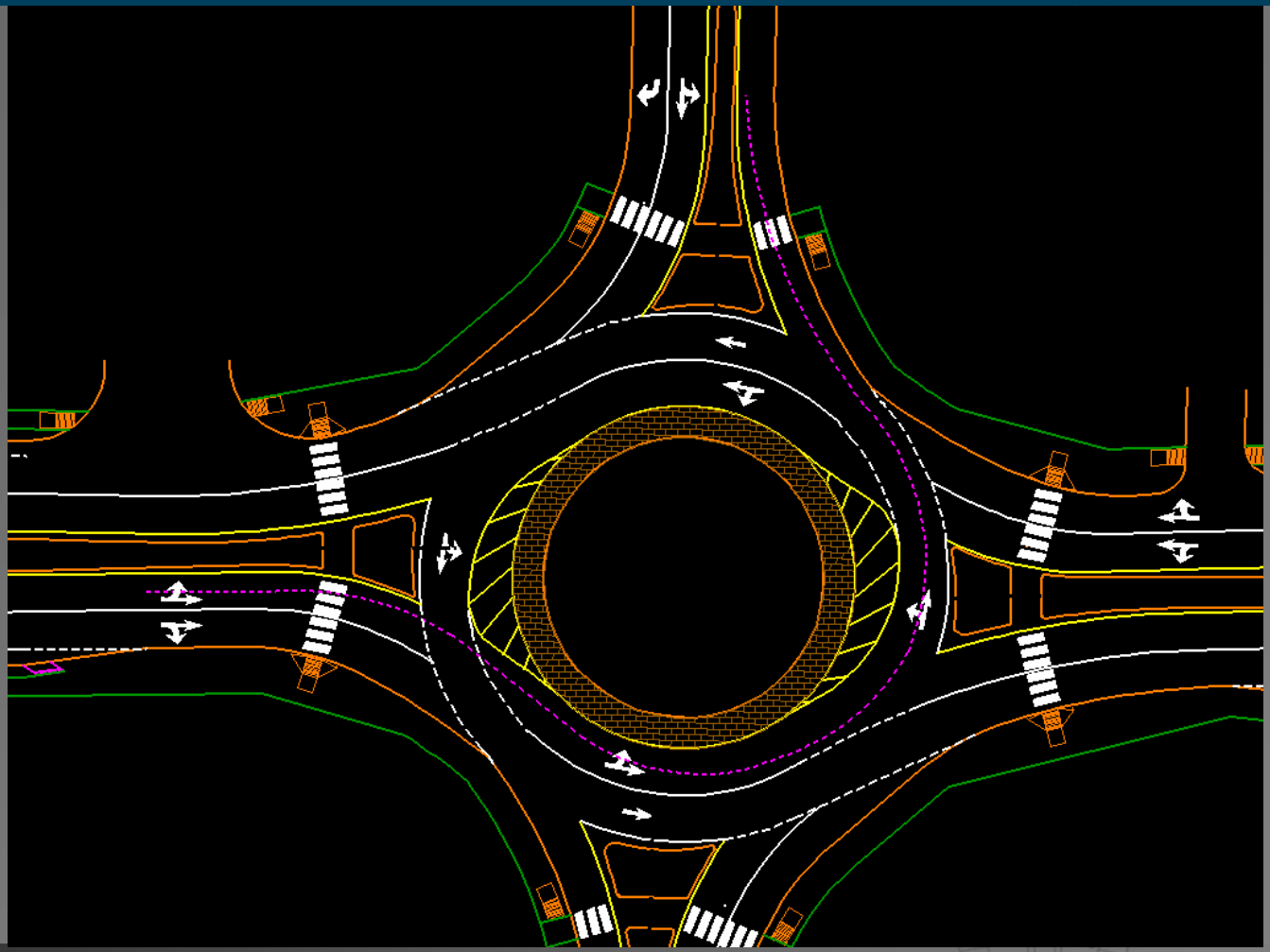


Traffic Simulation Results – Year 2025

Peak Hour Period	Approach	Control Delay (sec/veh)	
		Alternative 1	Alternative 2A
		Standard Intersection	Single Lane Roundabout
AM PEAK	Northbound	50.9	10.4
	Southbound	17.3	8.0
	Eastbound	63.1	4.4
	Westbound	90.6	62.8
	ALL	53.8	20.1
PM PEAK	Northbound	37.0	4.9
	Southbound	38.4	9.8
	Eastbound	29.2	17.5
	Westbound	31.9	6.5
	ALL	34.9	10.0

Traffic Simulation Results – Year 2035

Peak Hour Period	Approach	Control Delay (sec/veh)	
		Alternative 1	Alternative 2B
		Standard Intersection	Two Lane Roundabout
AM PEAK	Northbound	57.3	38.8
	Southbound	21.0	6.1
	Eastbound	75.4	22.0
	Westbound	105.1	112.6
	ALL	63.0	52.6
PM PEAK	Northbound	41.0	7.2
	Southbound	41.9	7.0
	Eastbound	33.9	10.4
	Westbound	52.4	7.0
	ALL	40.9	8.4

Vissim Micro-simulation: 2025 AM Peak

2025 AM Peak – Signal vs. Roundabout

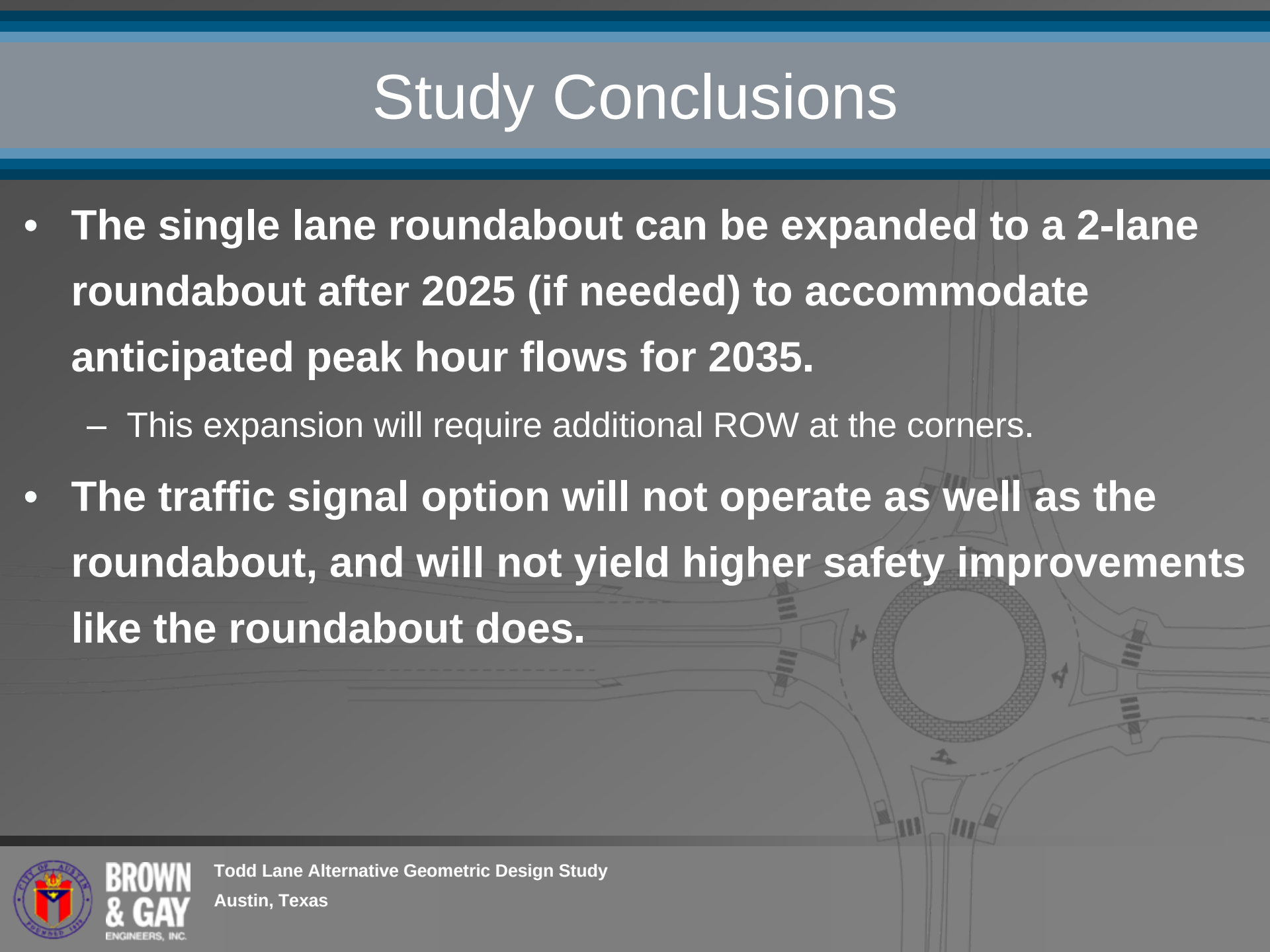
Vissim Micro-simulation: 2035 AM Peak

Study Conclusions

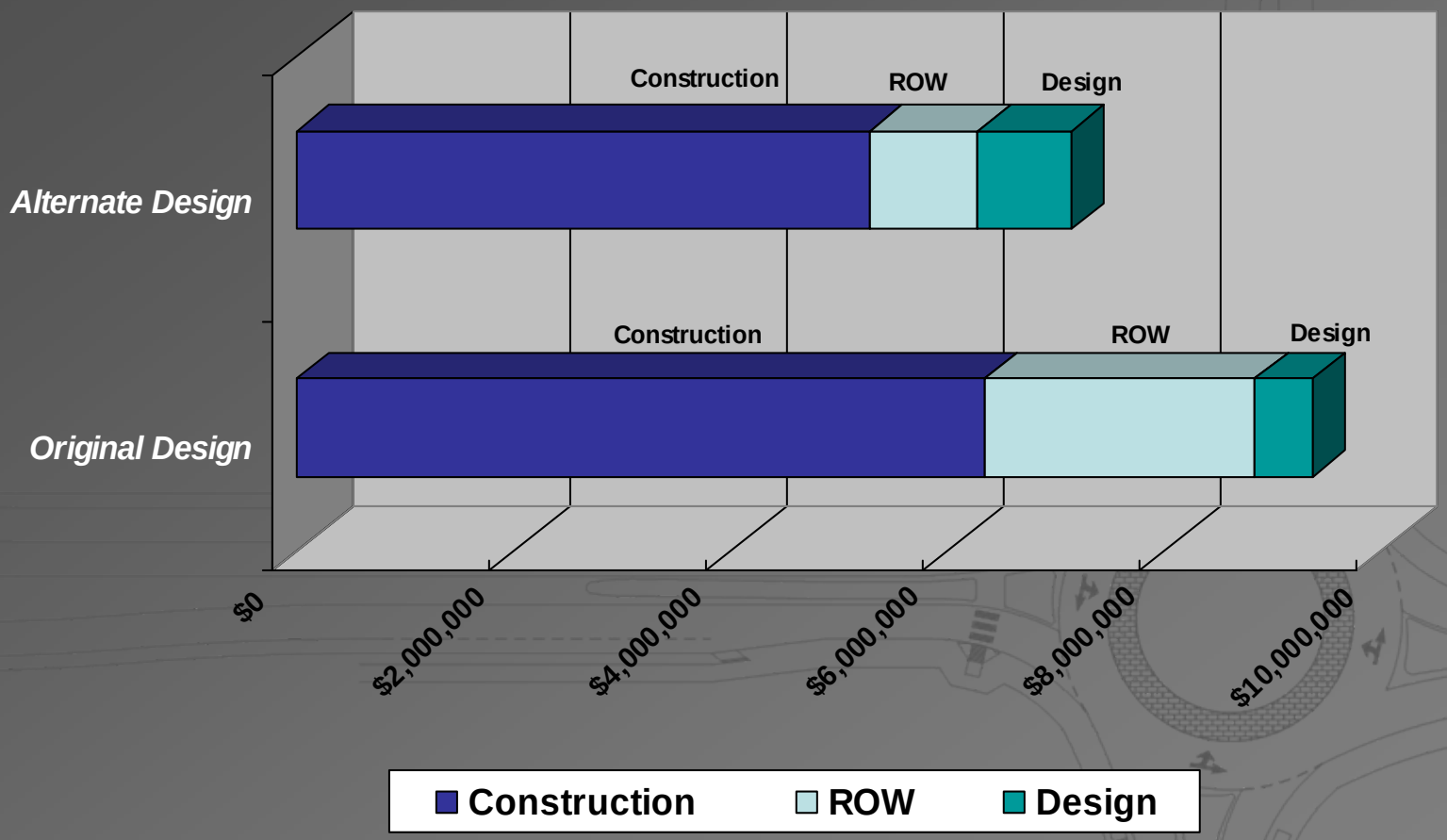
- **The single-lane roundabout will provide:**
  - Acceptable level of service through year 2025 during peak hours
  - Least amount of delay to motorists during off-peak hours
  - Higher level of safety (reduction in crashes) for vehicles
  - Higher level of safety for pedestrians and bicyclists
  - A safe and efficient alternative to a standard signal that will fit within the R.O.W. footprint
  - Significant cost savings in R.O.W. and construction costs

Study Conclusions

- **The single lane roundabout can be expanded to a 2-lane roundabout after 2025 (if needed) to accommodate anticipated peak hour flows for 2035.**
  - This expansion will require additional ROW at the corners.
- **The traffic signal option will not operate as well as the roundabout, and will not yield higher safety improvements like the roundabout does.**



Project Budget



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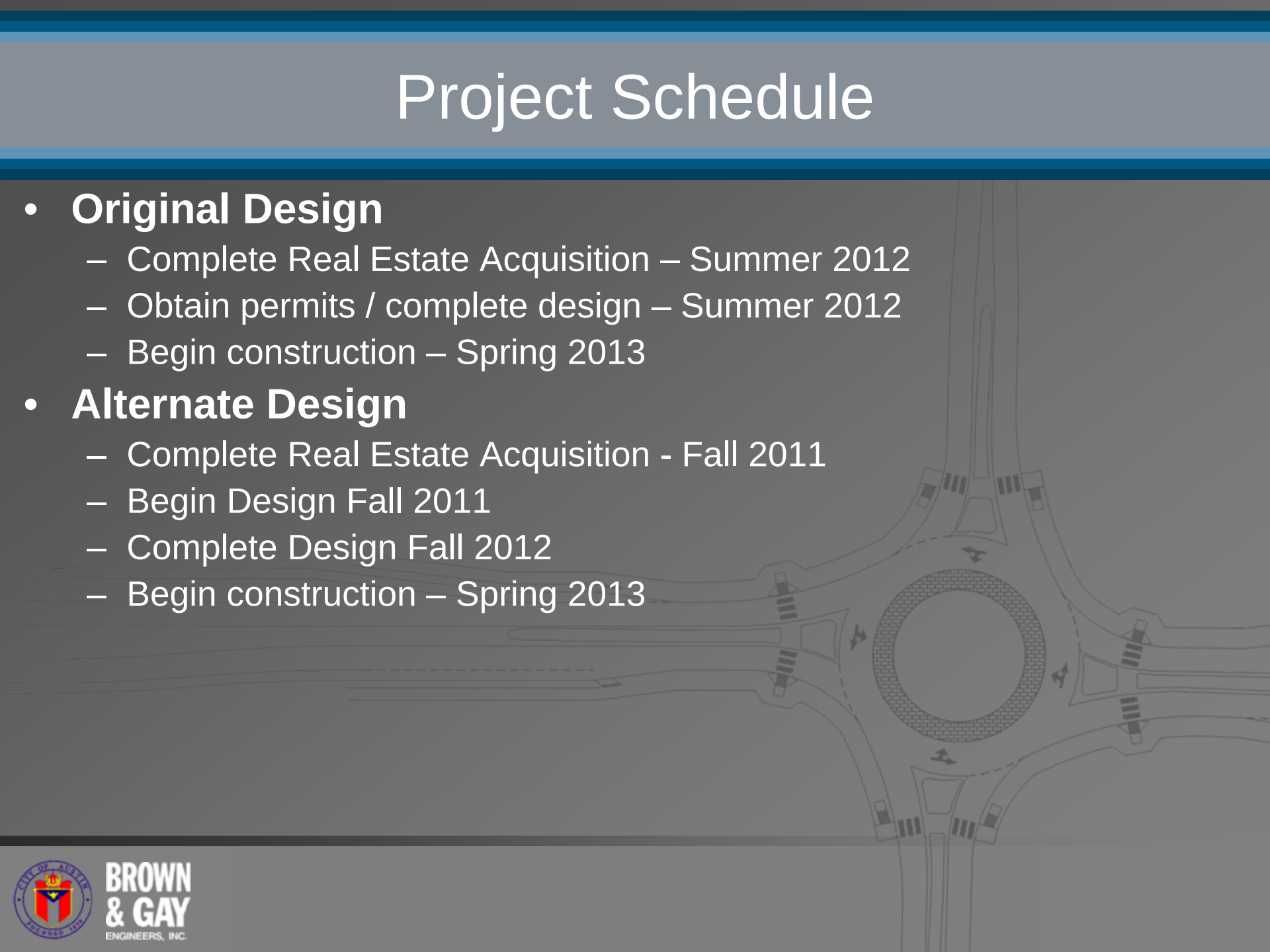
Project Schedule

- **Original Design**
  - Complete Real Estate Acquisition – Summer 2012
  - Obtain permits / complete design – Summer 2012
  - Begin construction – Spring 2013
- **Alternate Design**
  - Complete Real Estate Acquisition - Fall 2011
  - Begin Design Fall 2011
  - Complete Design Fall 2012
  - Begin construction – Spring 2013



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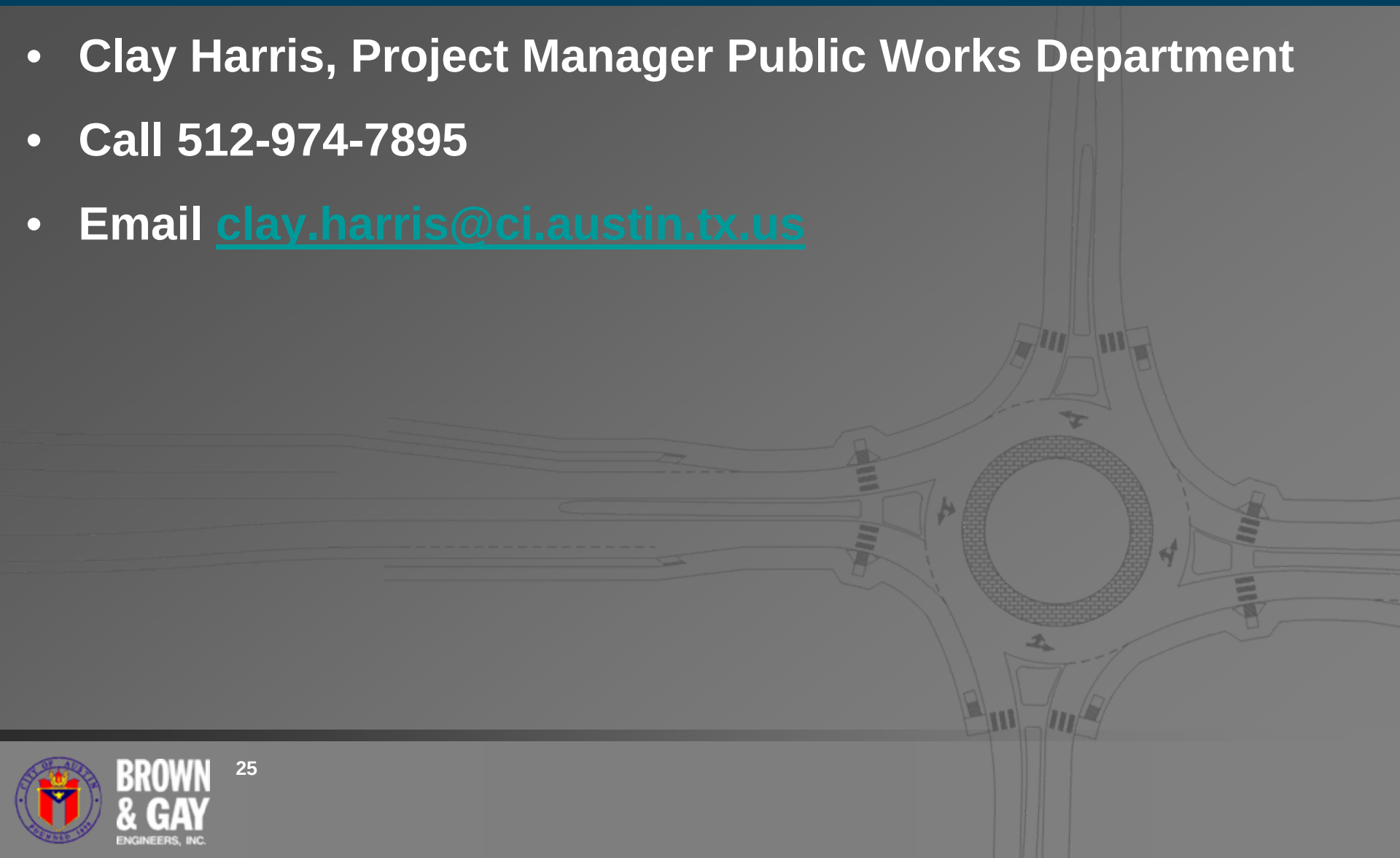
Questions? Comments?

- **Clay Harris, Project Manager Public Works Department**
- **Call 512-974-7895**
- **Email clay.harris@ci.austin.tx.us**



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