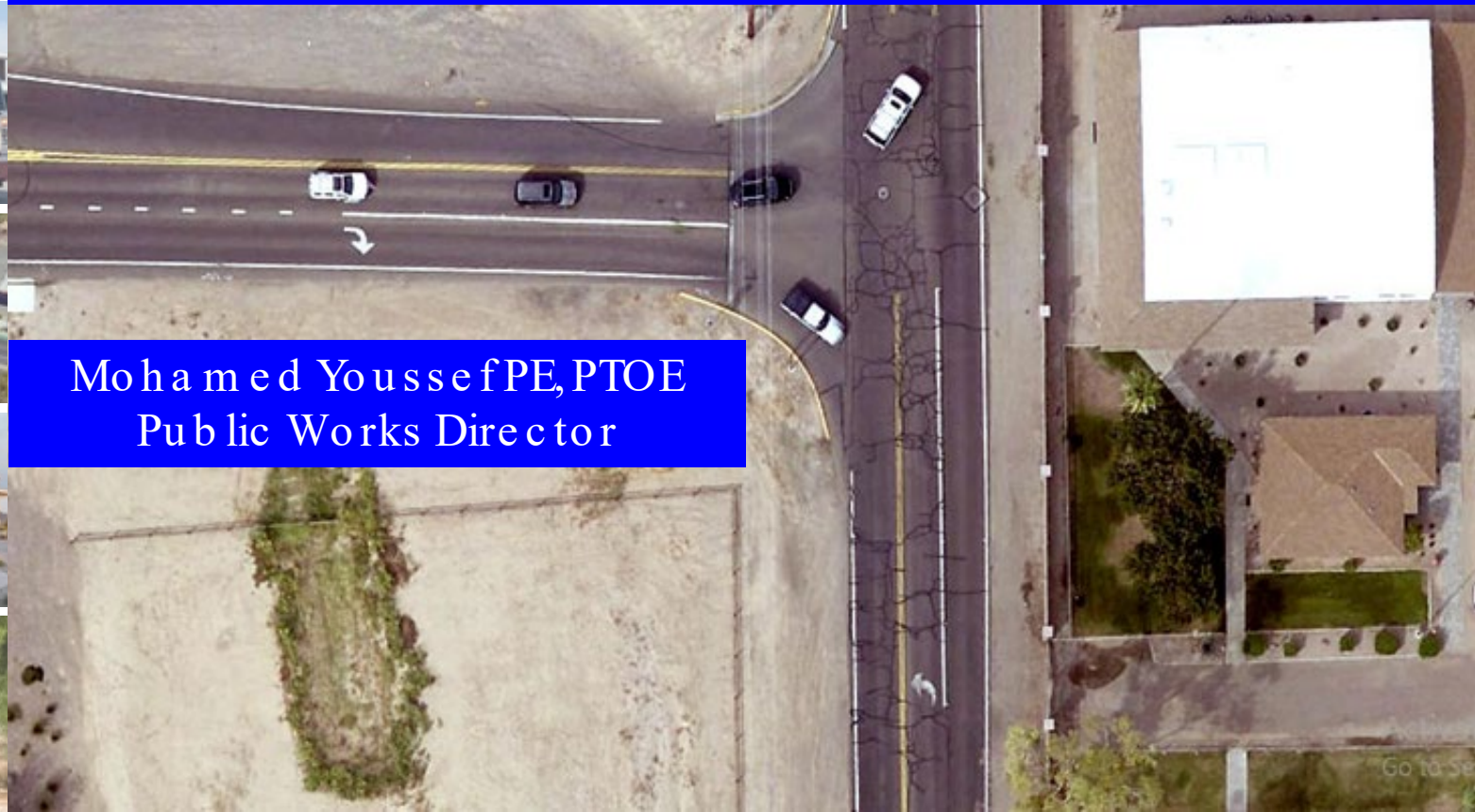
Hawes Road at Queen Creek Road

Intersection Design Options



Mohamed Youssef PE, PTOE
Public Works Director





Project Background

- Queen Creek and Hawes Road intersection is a T-intersection with only eastbound Queen Creek Road stop controlled.
- Current Intersection does not function efficiently.
- CIP project: Hawes Road: Ocotillo to Rittenhouse
  - Design funded in the adopted FY21/22 CIP.
  - Project includes Hawes Road full cross-section design and construction including Queen Creek Road intersection.
- The Town proposes a temporary traffic signal at this location to enhance traffic circulation while the full design is undertaken.
- Project team evaluated a traditional signalized intersection and a roundabout option.

Existing Condition (Queen Creek Rd and Hawes Rd)

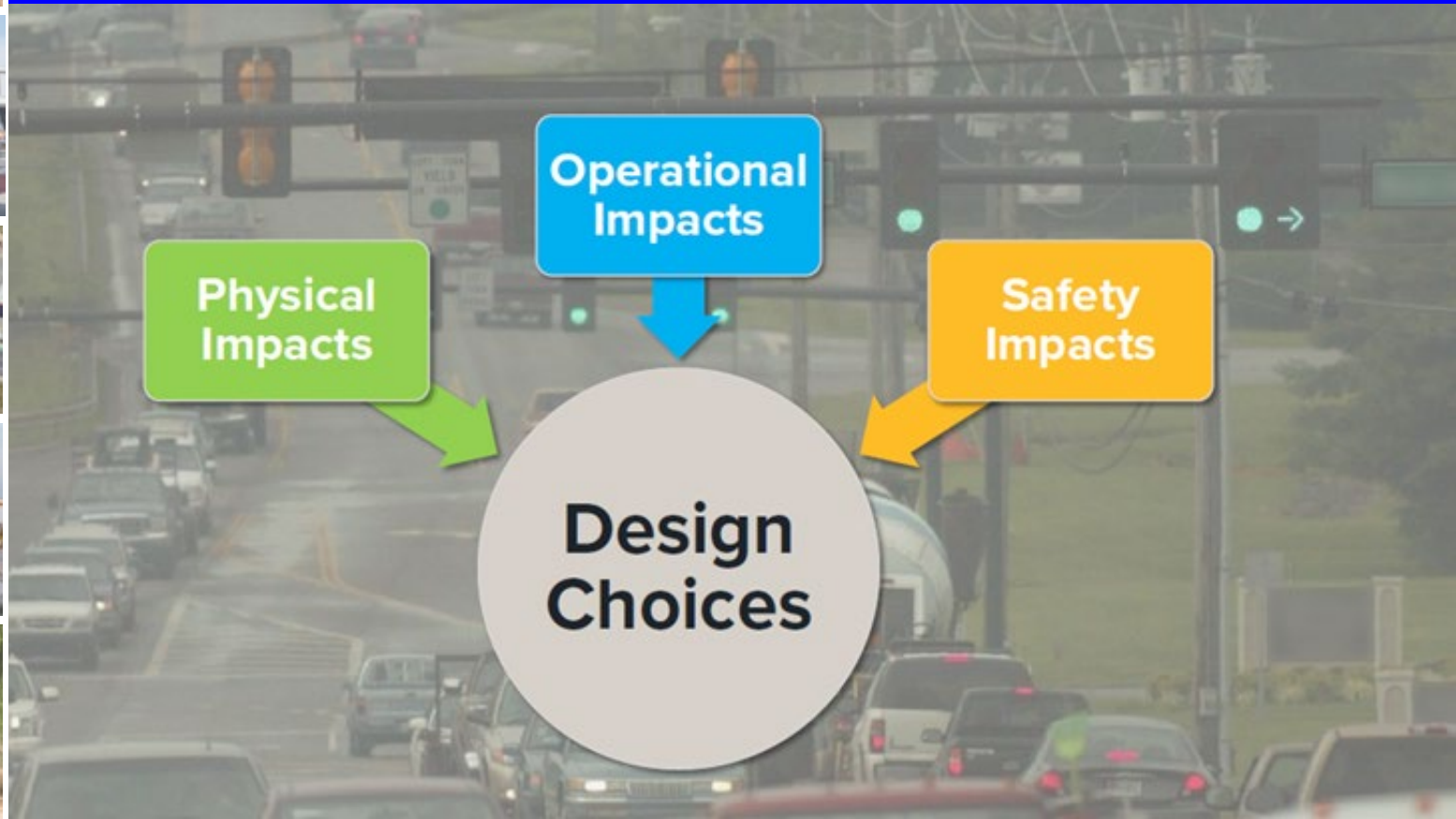
Types of Intersection Traffic Control

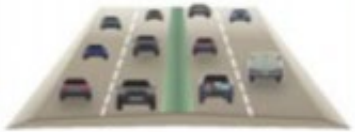
Stop Signs

Traffic Signals

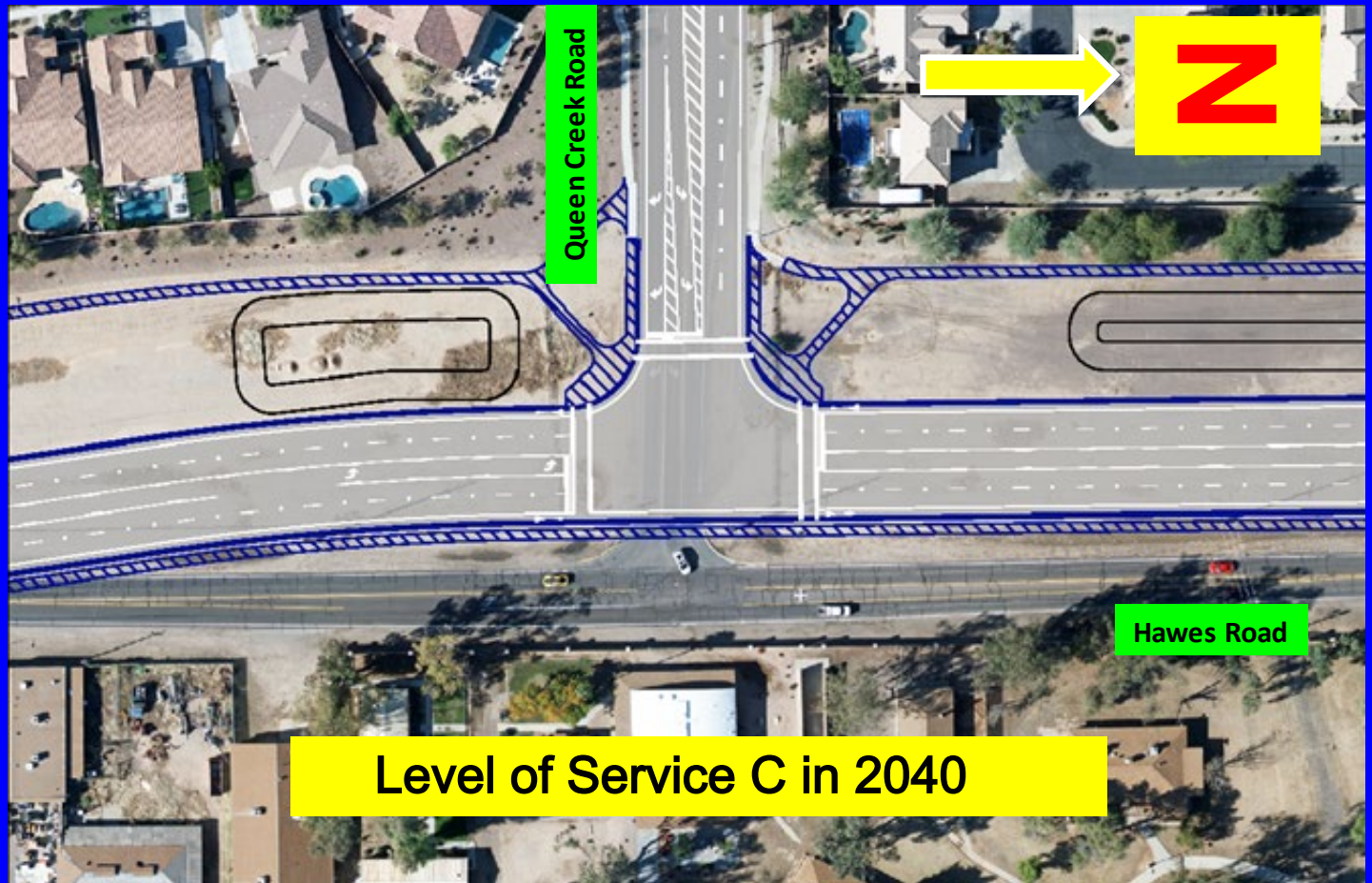
Roundabouts

Elements of Traffic Analysis

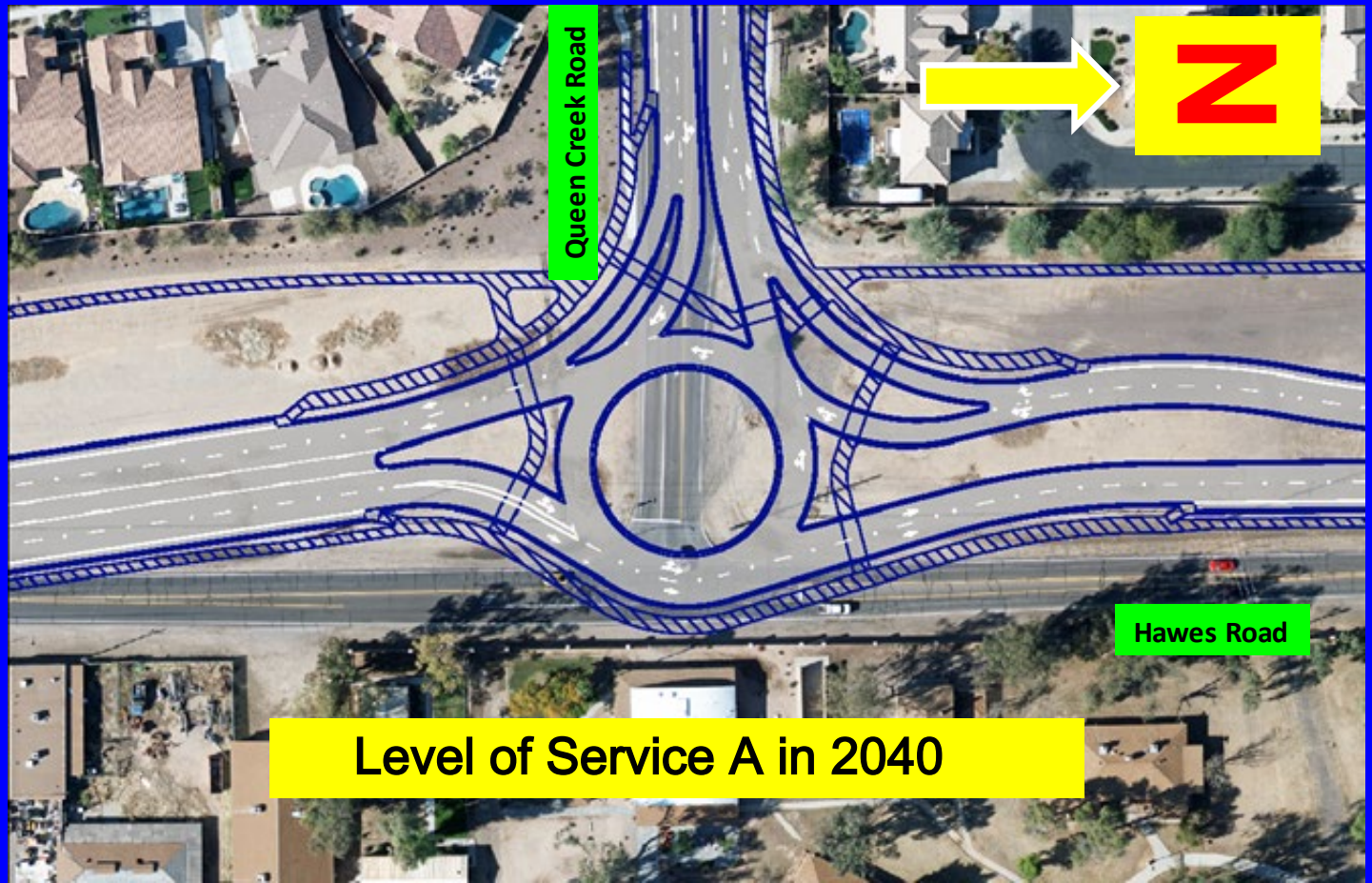


LOS A		Free flow conditions with minimal delays. minimum congestion
LOS B		Stable flow conditions with occasional delays. minimum congestion
LOS C		Stable flow conditions with periodic delays. low congestion
LOS D		Restricted flow conditions with regular delays due to moderate congestion. moderate congestion
LOS E		Constrained flow conditions with extended delays due to high congestion. high congestion
LOS F		Forced flow conditions with excessive delays due to excessive congestion. very high congestion

Option 1 - Traffic Signal

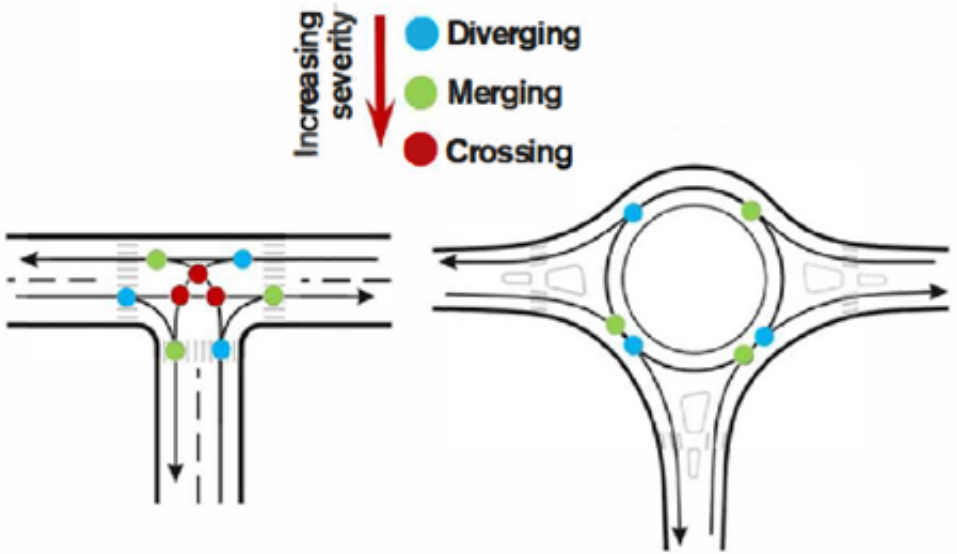


Option 2 - Roundabout



Roundabout Benefits

Conflict Comparison
(Typical 2-Lane T Intersection)

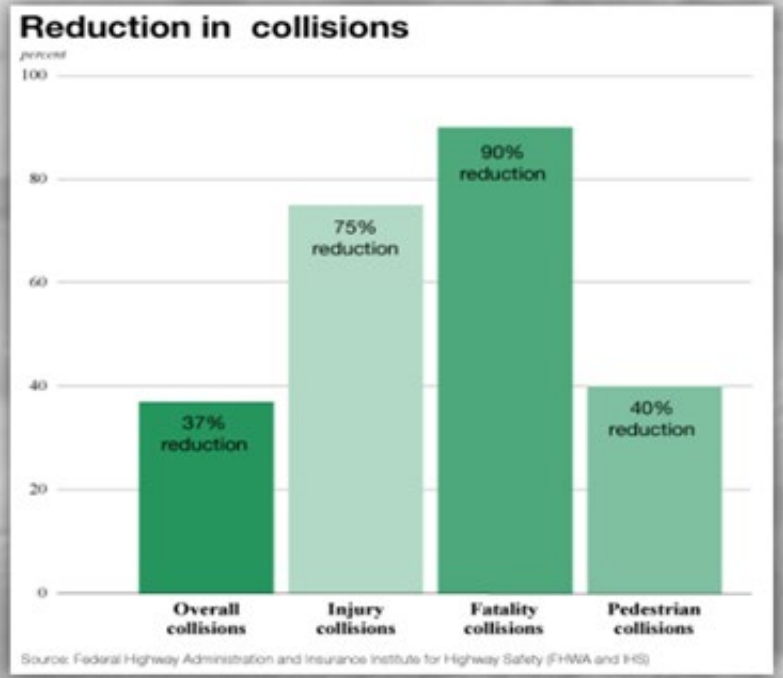


9 Conflicts

6 Conflicts

Safety Benefits

- FHWA and "Insurance Institute for Highway Safety" studies show roundabouts reduce crashes

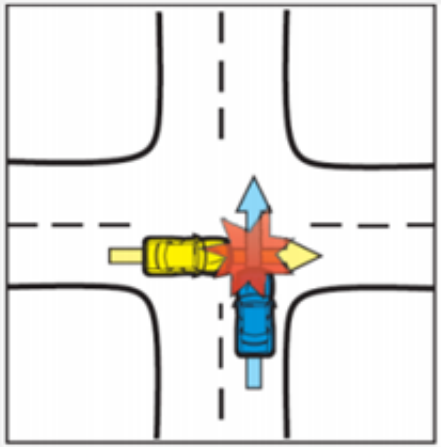


Severity of Conflicts: REDUCED

- Roundabouts remove the most severe head-on and right-angle crash types.

Typical 4-leg intersection

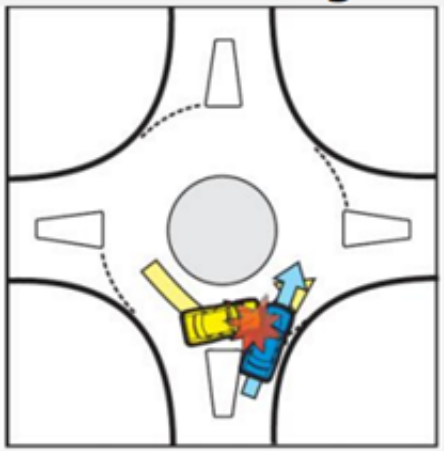
Right-Angle



Left Turn

Roundabout

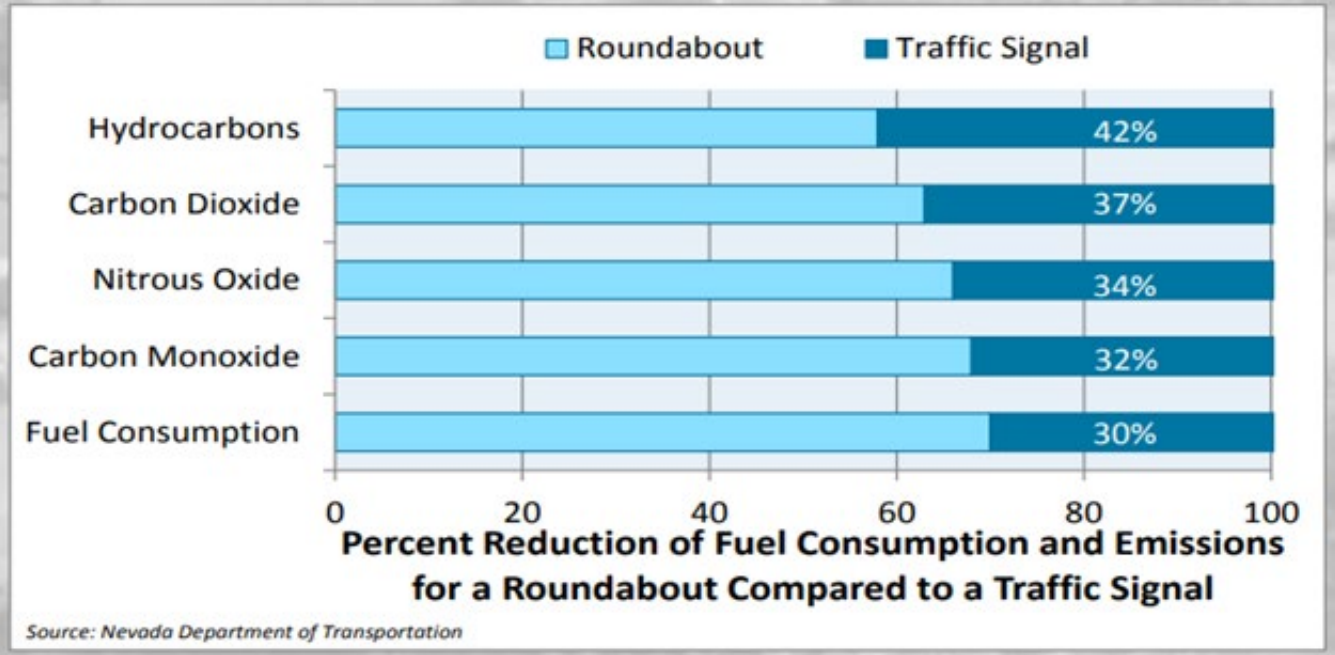
Sideswipe / Shallow-Angle



Kansas Roundabout Guide, Second Edition

Additional Benefits

- Limit noise pollution
- Reduce fuel consumption and emissions



Cost Comparison
Roundabout Vs Traffic Signal

- Lower cost of construction
  - Less capital equipment.
- Lower maintenance costs
  - Less equipment to maintain
  - Reduced maintenance
  - Reduced electricity charges
  - Reduced equipment upgrades and updates

Roundabouts

- ❖ Increasingly more common in the United States.
- ❖ Roundabouts are only recommended at certain locations based on:
  - ➢ Traffic volumes
  - ➢ Traffic movement balance
  - ➢ Pedestrian/bicycle volumes
  - ➢ Vehicle types using intersection
  - ➢ Adjacent speed limits
  - ➢ Other constraints such as right-of-way, utilities
- ✓ Hawes Road at Queen Creek Road meets all the above criteria

Team Recommendation: Utilize a roundabout at this location

Nearby Roundabouts

There are over 80 roundabouts in the Phoenix Metro Area

Princess Blvd & Princess Dr., Scottsdale

Rio Salado Parkway & Ash Ave., Tempe

Roundabout Public Opinion ITE Study*

	Before Construction	After Construction
Strongly Favor	16%	32%
Somewhat Favor	15%	31%
	31%	63%
Don't Know	14%	9%
Somewhat Oppose	14%	13%
Strongly Oppose	41%	15%
	55%	28%

* ITE Journal, Sept. 2002 (Retting, et al.) Survey in KS, MD, and NV


FIRE STATION NO. 1


Thank you
YOU GOT THIS