

2 Review of Large Circular Intersections

Opportunities

- Supporting/creating unique land use pattern around circle
- Place-making/Public space opportunity inside circle
- Joining more intersecting streets than a conventional intersection

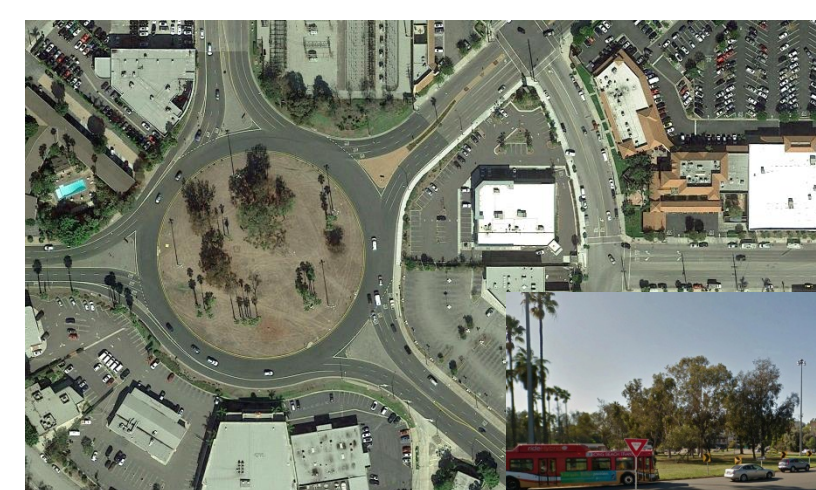
Potential Challenges

Safety

- Rear-end crashes at entries if priority given to entering traffic
- Side-swipe crashes at exits if lane-changing within circle is allowed
- Crash severity concerns related to high entry speed

Operations

- Potential for gridlock if priority given to entering traffic
- Weaving issues if lane-changing within circle is allowed



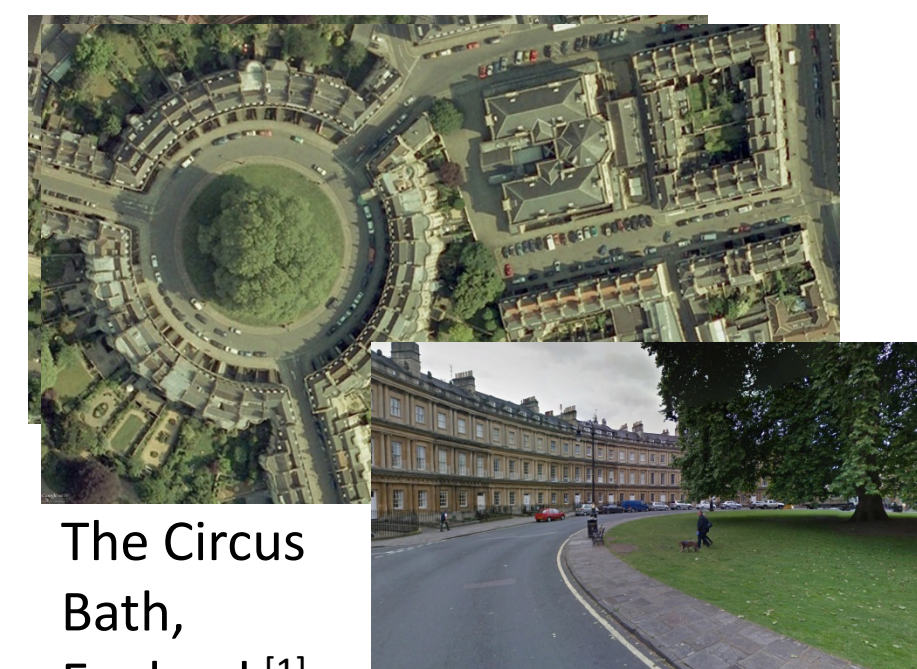
Los Alamitos Traffic Circle
Long Beach, California ^[1]



Armdale Rotary
Halifax, Nova Scotia ^[1]



Place de l'Etoile
Paris, France ^[1]

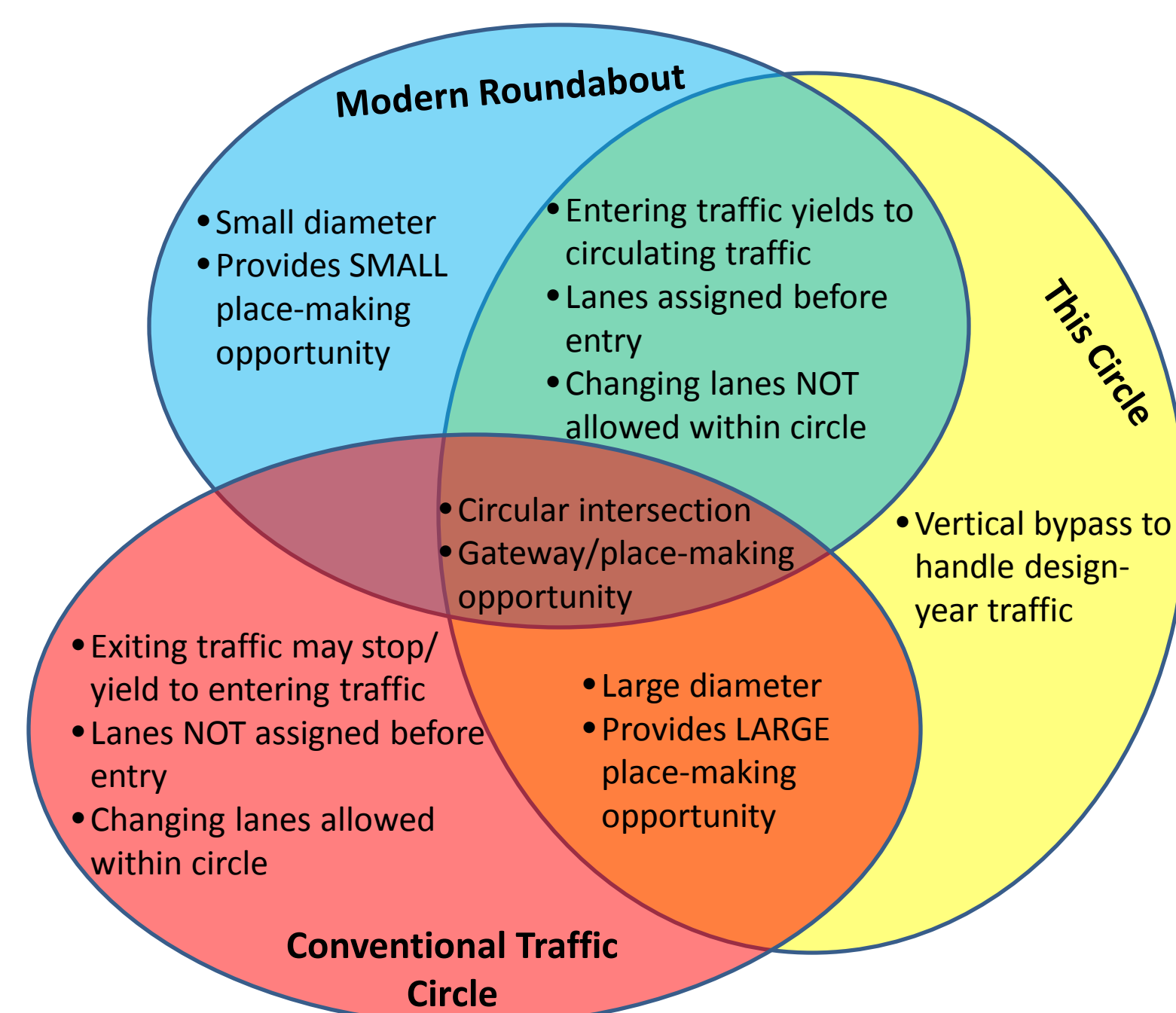


The Circus Bath,
England ^[1]

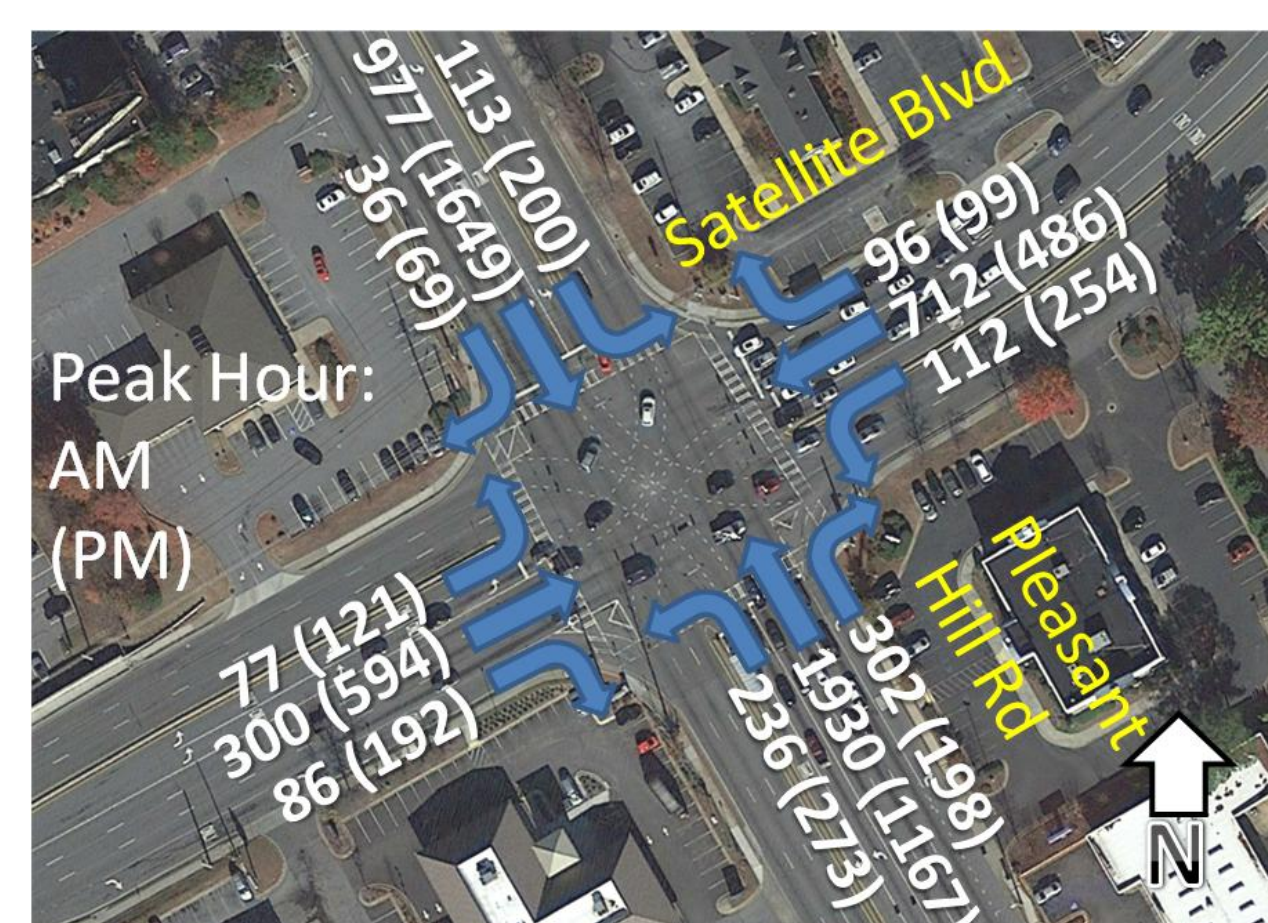
3 Designing a Large Circle That Operates Like a Roundabout

Key design considerations

- Design speed – limited to 35 mph
- Exit radius – design for speed similar to circulating speed
- Entrance angle – limit entry speed, encourage “gap-seeking” vs. “merging” behavior
- Avoid path overlap



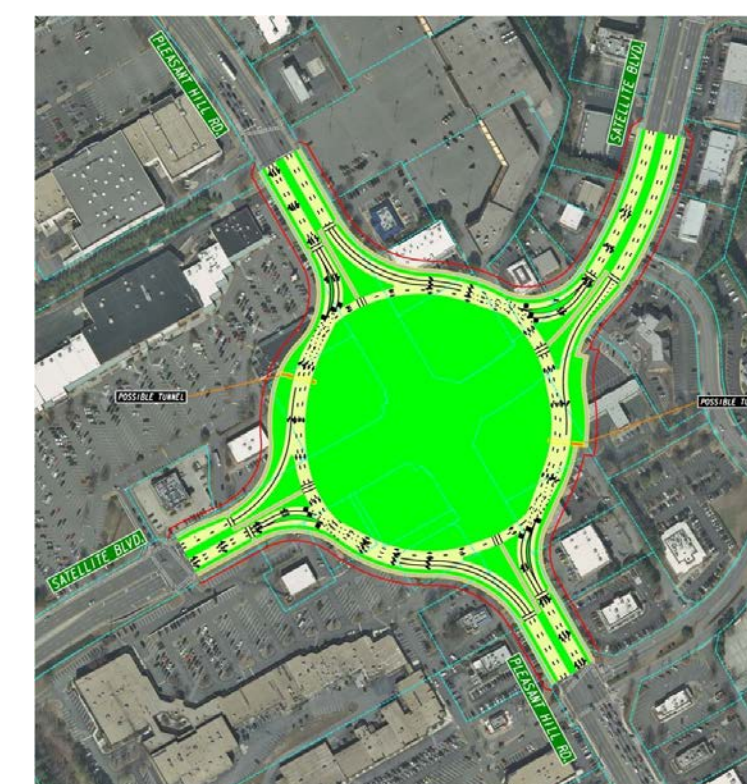
Existing Traffic



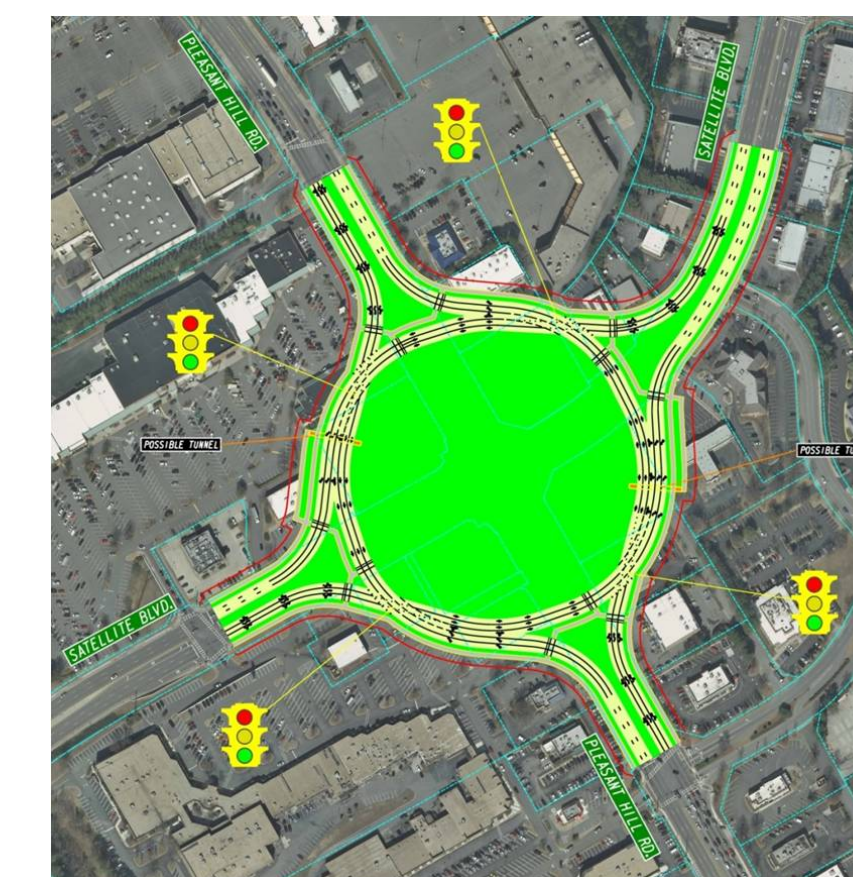
Average Daily Traffic:
NB: 29,874
SB: 23,083
EB: 10,853
WB: 11,786

Map source: [1]

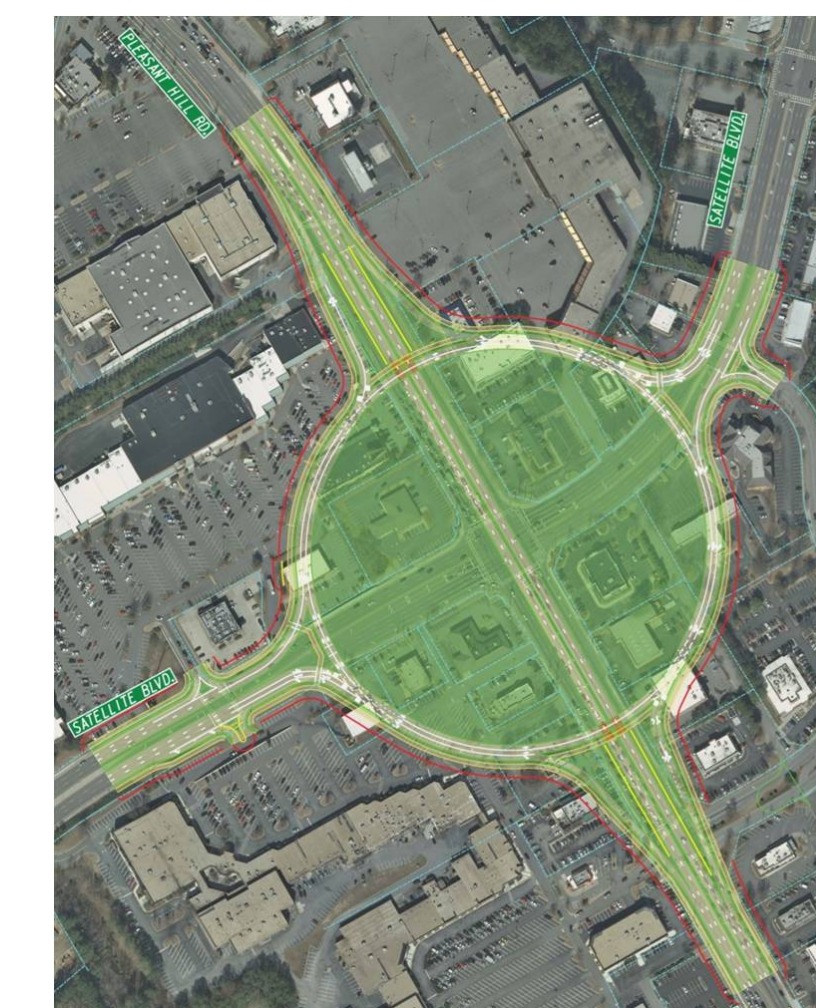
4 Analysis



Alternative 1:
Yield Entry



Alternative 2:
Signalized Entry



Alternative 3:
Yield Entry + Thru Bypass



Alternative 4:
Continuous Flow Intersection (CFI)

The Big Circle Is Not Dead

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1 Background

Need and purpose:

- Place-making opportunities at the intersection of Pleasant Hill Road and Satellite Boulevard
- Economic redevelopment
- Handle design year traffic

Context:

- Existing large suburban signalized intersection
- AECOM tasked with feasibility study of a concept developed previously by another consultant

Goals:

- Further develop the traffic circle concept introduced in a previous planning study
- Investigate its potential to contribute to place-making and economic redevelopment goals
- Compare with other alternative intersection types



Traffic circle concept developed in previous study ^[2]

Citations

- [1] Google Earth. Accessed Dec. 16, 2016; Apr. 4, 2017; April 12, 2017; May 4, 2017
[2] Pond & Co. et al. *Activate Gwinnett Place: Multi-Modal Green Corridor Master Plan*. 2015.

Acknowledgements:

Gwinnett Place CID, Mark Lenters,
Purvil Patel, Erick Fry

(1) Travel time for PM peak hour
(2) Travel times of future alternatives labeled as equivalent if within 10% of 2035 No Build travel time

Legend	
	= travel time decreased
	= travel time equivalent
	= travel time increased

5 Results & Conclusions

Travel Time Comparison

Direction	From Intersection	To Intersection	Move-ment	Existing	2035 Analysis Year				
					No-Build	Unsignal-ized Traffic Circle	Signal-ized Traffic Circle	Unsig. Bypass Traffic Circle	CFI/ DLT
				Min.	Min.	Minute	Minute	Minute	Min
SB	Pleasant Hill Road SB @ Old Norcross Rd	Satellite Boulevard & Old Norcross Rd	L	2.7	4.8	7.2	2.9	2.5	3.0
		Pleasant Hill Road & Venture Pkwy	T	1.9	4.7	6.3	2.0	1.1	1.6
		Satellite Boulevard & Steve Reynolds Blvd	R	2.0	5.0	5.6	1.9	1.6	1.4
WB	Satellite Boulevard WB @ Old Norcross Rd	Pleasant Hill Road & Venture Pkwy	L	2.1	2.1	4.5	10.0	1.3	1.4
		Satellite Boulevard & Steve Reynolds Blvd	T	2.3	2.2	7.3	3.8	1.6	1.7
		Pleasant Hill Road & Old Norcross Rd	R	2.4	2.4	6.9	3.8	1.6	3.0
NB	Pleasant Hill Road NB @ Venture Pkwy	Satellite Boulevard & Steve Reynolds Blvd	L	1.3	1.3	1.4	3.0	1.5	1.3
		Pleasant Hill Road & Old Norcross Rd	T	1.7	1.8	1.5	4.2	1.1	1.5
		Satellite Boulevard & Old Norcross Rd	R	2.5	2.6	1.8	8.3	2.1	2.9
EB	Satellite Boulevard EB @ Steve Reynolds Blvd	Pleasant Hill Road & Old Norcross Rd	L	1.3	1.4	7.1	1.9	1.2	1.3
		Satellite Boulevard & Old Norcross Rd	T	2.5	2.4	11.4	2.6	2.1	1.7
		Pleasant Hill Road & Venture Pkwy	R	2.7	2.7	10.3	3.0	2.4	3.0
Total Travel Time (Minutes)				25.4	33.4	71.3	47.4	20.2	23.5

Alternatives Discussion

- Of the circle alternatives considered, **only the yield-entry bypass alternative handled traffic adequately** (a key project priority)
- The continuous flow intersection (CFI) also handled traffic adequately
- For pedestrian access to the center island, all three circle alternatives could be fitted with pedestrian signals and/or pedestrian bridges/tunnels
- Compared with the CFI, the yield-entry bypass circle alternative provided superior economic re-development and place-making potential and also handled traffic better; however, it also came with significantly higher costs and property impacts compared with the CFI.

Conclusions

- A large circle can uniquely contribute to place-making goals while addressing traffic demands.
- Operational concerns commonly associated with large circles can be mitigated by designing to operate like a modern roundabout.