

4 Safe System Design Elements

2-layer protection

Driver Workload layer (allow one party to notice and compensate for a mistake made by the other party – **people make mistakes**)

- FHWA Tier 3) Spread out conflict points (simplicity, perception/reaction)
- FHWA Tier 4) Ensure direct interaction between conflicting parties (no intermediary signals)

Crash Energy layer (reduce energy to a human-tolerable level – low angle and speed because **people are vulnerable**)

- FHWA Tier 1) Eliminate severe conflicts (left turn/head on)
- FHWA Tier 2) Reduce speed using physical elements (self-enforcing)

Tier 1 Remove Severe Conflicts	Tier 2 Reduce Vehicle Speeds	Tier 3 Manage Conflicts in Time	Tier 4 Increase Attentiveness and Awareness	CRF (FSI)	Cost
✓				< 25%	\$
✓				< 30%	\$\$
✓				< 50%	\$\$
✓	✓	✓	✓	80-90%	\$\$\$

City of San Diego Prefabricated Permanent Roundabouts

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Credit: FHWA Small Business Program.



YIELD

YIELD

30

PEDESTRIAN

30

30

30

30

ONLY

YIELD

30

30

Cycle 11 vs Cycle 12

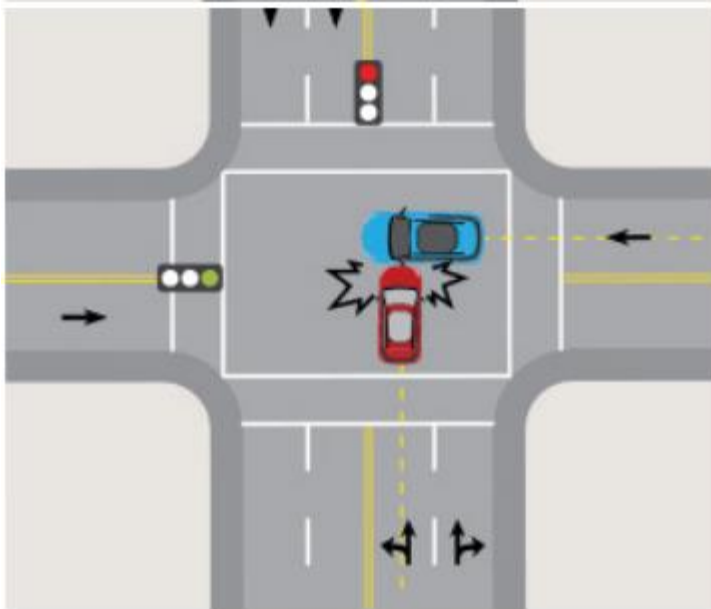
Taylor St. & Hotel Circle North/South

- Version 1: \$400k B/C = 13 (failed to meet threshold)
- Version 2: \$220k B/C = 27 (successful grant award)



Past fatals are poor predictors

Most common features?



- 4x2
- Transit routes
- 3+ injury crashes

A high production rate solves many ills.

ROW

- screen for 4x2

Capacity

- screen for 1-lane
- removable, use today's traffic

Design

- screen for templates

Outreach

- pressure is off, efficient
- focus between the RABs



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You got this!



Ribbon cutting > everything else.

- Political support is only rewarded if installation happens *before* re-election
- The public hates construction
- You don't have to sell the value of saving money
- Every week, 1 life is lost in SD
- Only installation saves lives

