

Safety Evaluation of Alternative Intersections



BACKGROUND

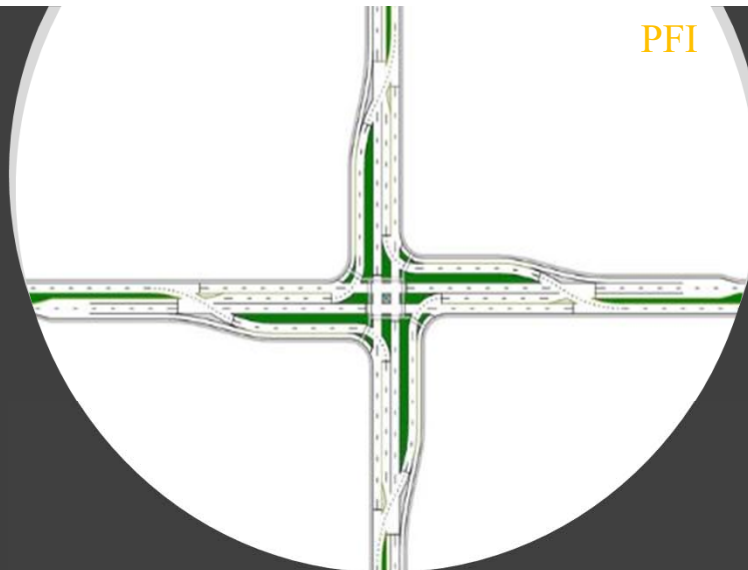
- **Roadway intersections are principal points for operations and safety.**
- **Conventional intersections have limitations such as conflict between cross paths by different users, congestion, and risk for crash.**
- **Alternative intersections are developed and implemented to improve safety and efficiency of the intersections.**

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Parallel Flow Intersection (PFI)

Left turn bypasses the main intersection by turning into a cross street frontage road.

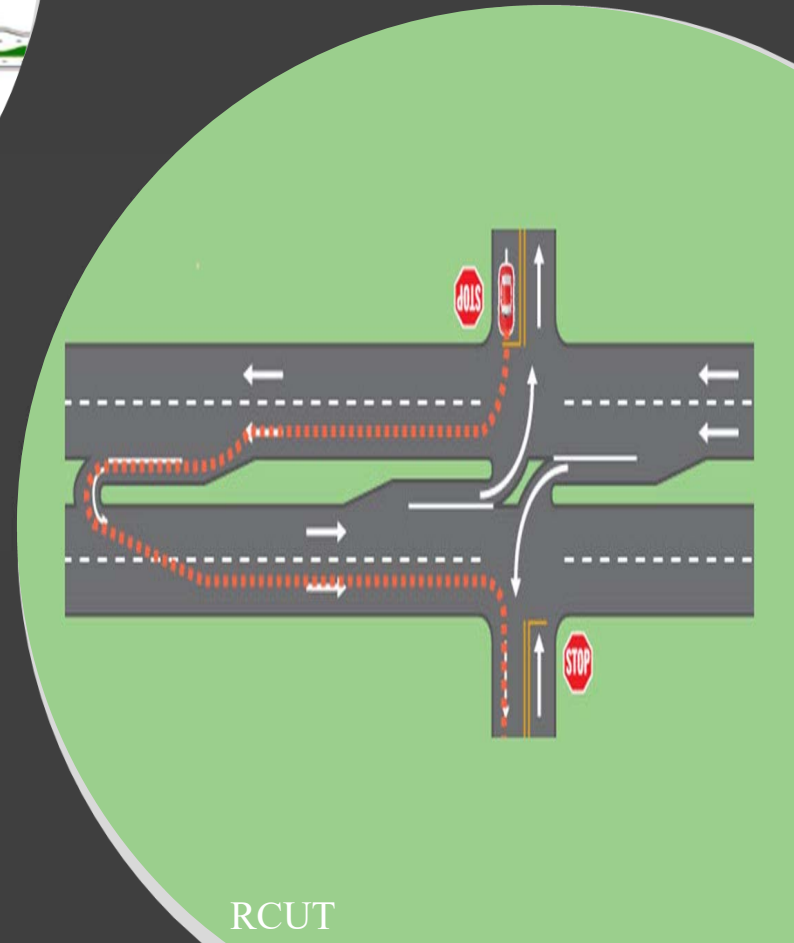


-There is no study that has been done to determine the CMF for PFI, but we intend to do so post data analysis.

Restricted Crossing U-Turn (RCUT)

RCUT replaces direct left turn and through movement with U-turn in wide median.

Crash Type	All	Injury
Severity	All	All
CMF	0.85	0.78
Standard Error	N/A	N/A



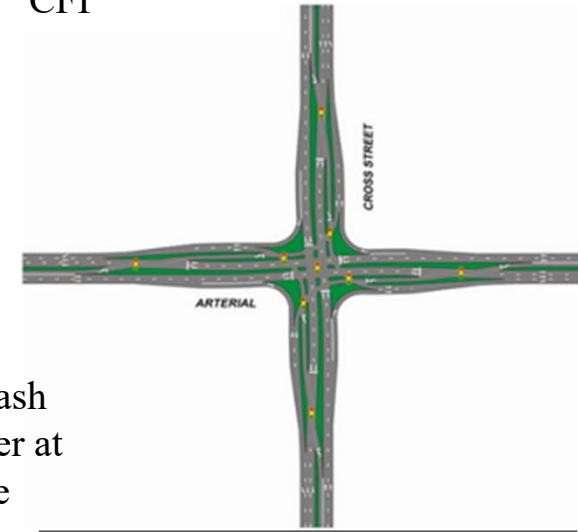
Continuous Flow Intersections (CFI)
 Left turning vehicles begin their turn at a signalized crossover before the main intersection for two-phase intersection signal control.

Crash Type	All
Severity	All
CMF	0.877
Standard Error	0.045

Jug Handle Intersections

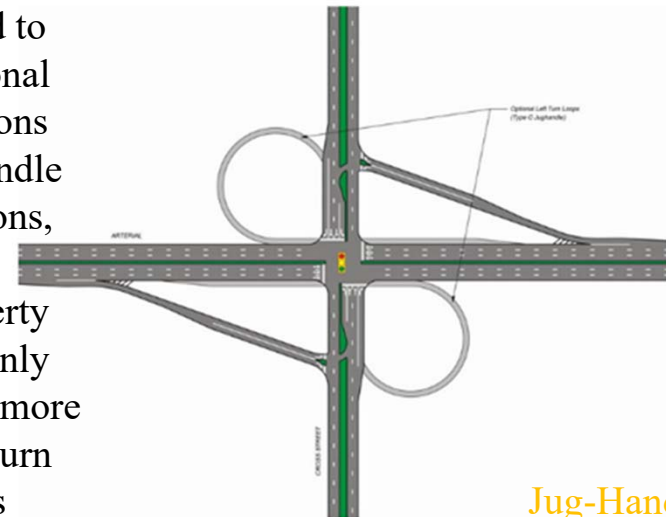
Ramps diverge from the right side of the arterial in advance of the intersection, removing left turn movement.

CFI



-Head on crash rates are lower at jug handle intersections compared to conventional intersections
 -At jug handle intersections,

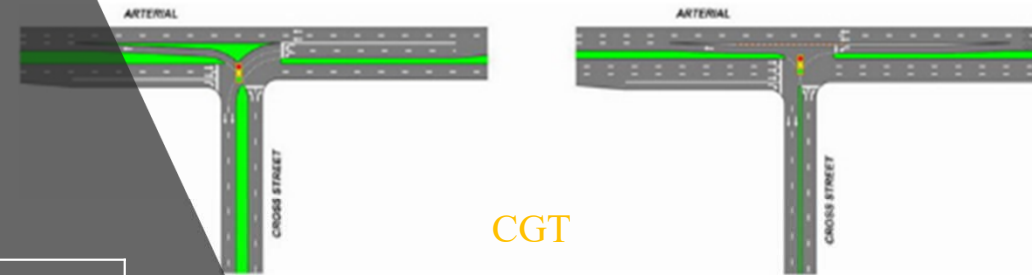
rear-end/property damage only crashes are more than left-turn crashes



Jug-Handle

Continuous Green T-Intersections (CGT)
 Used at T-intersections. CGT provides free flow in the arterial and reduces the amounts of approach movements by using acceleration/merge lanes for left turn.

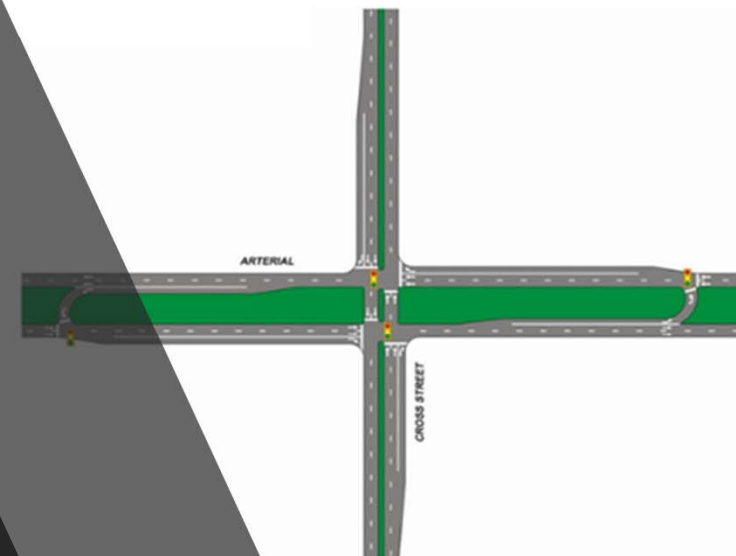
Crash Type	Severity	CMF	Standard Error
All	All	0.958	0.106
All	KABC	0.846	0.114
Angle, Rear-end, Sideswipe	All	0.92	0.12



Median U-Turn Intersections (MUT)

Indirect left turns using directional U-turn crossovers closest to the intersection.

Crash Type	Severity	CMF	Standard Error
All	All	0.40	N/A



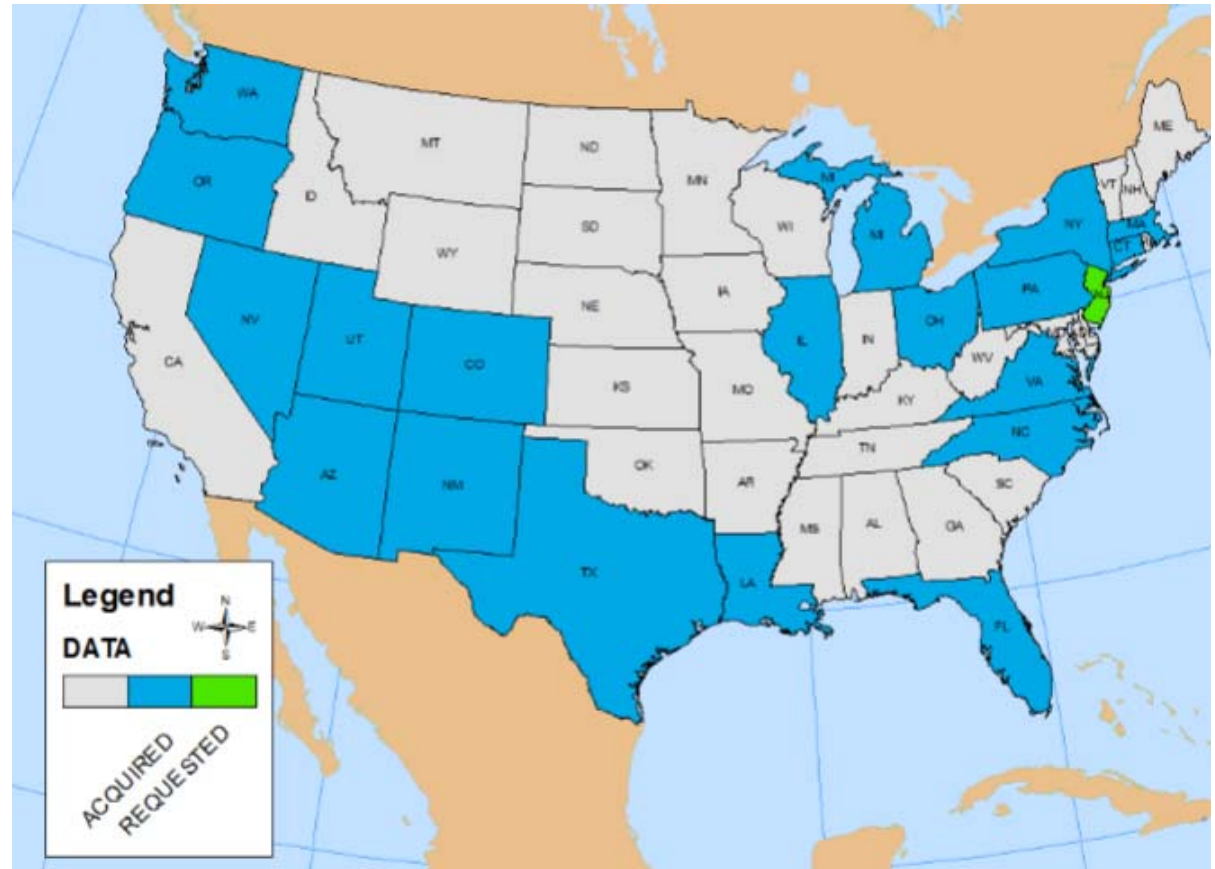
MUT

DATA COLLECTION

- The crash, traffic, and roadway data were collected from 18 states in the US.
- Specific geometric characteristics of the intersections were obtained from Google Earth and Street view.

CONCLUSION

- Previous studies have proven that many alternative intersections provide improved safety and reduced congestions. From our study, we will investigate the safety effects specifically by crash types. Thus, decision makers can determine which alternative intersections are the most appropriate considering the crash characteristics of the existing intersection.



CITATIONS

All alternative intersection designs are from :
<https://attap.gitbooks.io/muid/content/index.html>

All CMF information is from: <http://www.cmfclearinghouse.org/>