

2024 UPDATE: SIGNAL CHANGES CONTINUE TO REDUCE CRASHES INVOLVING LEFT TURNING VEHICLES

— August 2024 —

SUMMARY

Austin's Vision Zero program has new data showing the positive impact that low-cost changes to traffic signals can have in reducing crashes involving left-turning vehicles at intersections. As a follow up to [a report](#) published by the program in 2022, the updated analysis shows that locations which previously received low-cost changes, such as flashing yellow arrows or enhanced signage and signal heads, have seen **a 47% reduction** in the annualized number of Opposite Direction-Left Turn (OD-LT) injury and fatal crashes, a sustained improvement but lower than the initial decrease of 64%. More recently, Vision Zero worked with City traffic signal engineers to adopt Left Turn Protection Guidelines, which are informing the ongoing implementation of protected left turn phasing at hundreds of traffic signals. Early data show **72% fewer OD-LT injury and fatal crashes** at a subset of completed locations.

PROBLEM STATEMENT

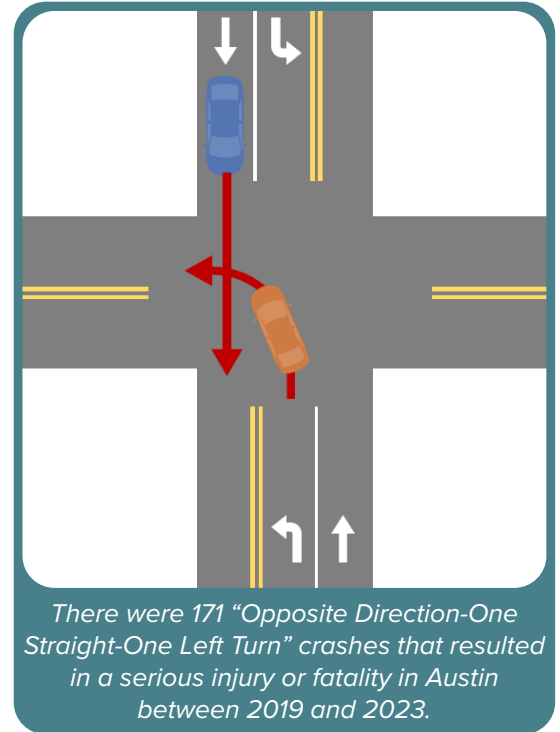
Between 2019 and 2023, there were 171 crashes resulting in a serious injury or fatality involving one motor vehicle turning left and one motor vehicle going straight in the opposite direction. **This type of collision accounted for over 12% of all serious injury and fatal, non-freeway crashes over that time period**, making it the third highest severe crash type in the city. These crashes are often the result of left-turning drivers' inability to accurately judge the speed of oncoming vehicles, poor visibility, or simply driver frustration and risk-taking. The City can deploy countermeasures to reduce this crash type at signalized intersections across the city.

SOLUTIONS

In 2022, Austin's Vision Zero program [published a report](#) on efforts to address left turn crashes through various low-cost traffic signal treatments such as flashing yellow arrows, signal head and signage upgrades, and protected left turn phasing. In that report, initial results examining 18 intersections where treatments were implemented showed a 64% reduction in the annualized number of Opposite Direction-Left Turn injury and fatal crashes.

On the heels of those positive results, Vision Zero has since worked to scale up the use of signal safety treatments across the city. In 2023, Vision Zero staff worked with City traffic signal engineers to develop Left Turn Protection Guidelines to standardize the process by which left turn protection phasing is implemented at Austin's traffic signals. The new guidelines consider crash history, vehicle speeds, lane configuration, intersection geometry, sight distance, multimodal activity, and other factors to systematically recommend whether left turn protection is an appropriate treatment at traffic signals.

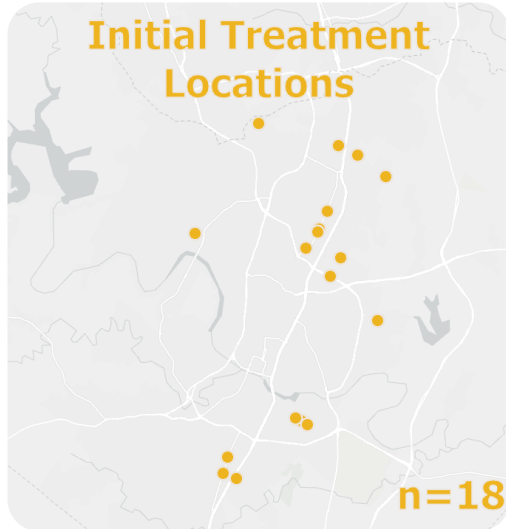
Through this effort, Austin Transportation and Public Works (TPW) staff and its consultants have applied the guidelines to over 1,600 movements (e.g. a northbound left turn) at 473 signalized intersections. Based on these resulting recommendations, TPW has implemented over 100 protected left turns—either all day or by certain times of day—and continues to systematically evaluate traffic signals across the city.



RESULTS

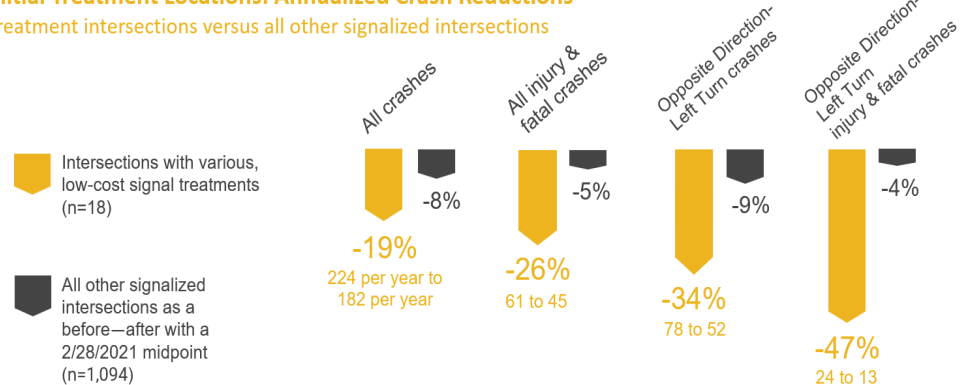
Updated analysis shows that the initial 18 treatment locations evaluated in the 2022 report are seeing sustained safety improvements, showing a **47% decrease** in the annualized number of Opposite Direction-Left Turn (OD-LT) injury and fatal crashes across all locations.

- At treatment sites, OD-LT crashes fell by 34% for all severities (26 fewer per year), by 47% for all injuries and fatalities (11 fewer per year), and by 60% for serious injuries and fatalities (two fewer per year).
- At comparison sites, OD-LT crashes fell by 9% for all severities (86 fewer per year) and by 4% for all injuries and fatalities (12 fewer per year) but rose by 8% for serious injuries and fatalities (three more per year).



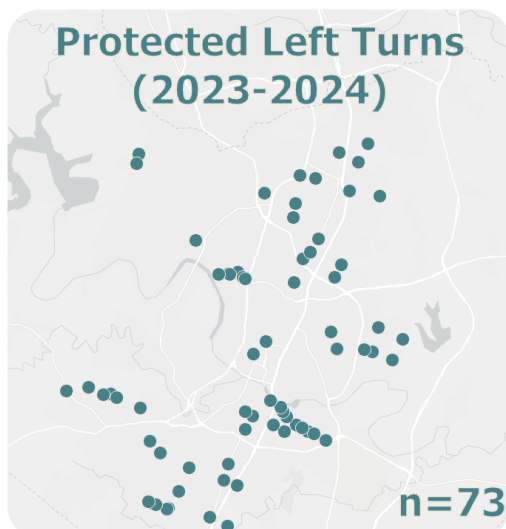
Initial Treatment Locations: Annualized Crash Reductions

Treatment intersections versus all other signalized intersections



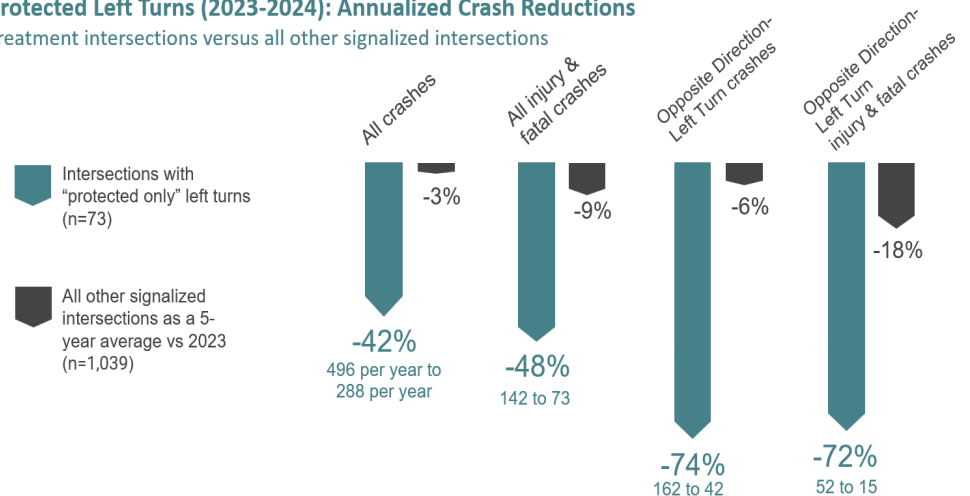
For locations that have more recently received left turn protection through the Left Turn Protection Guidelines effort, there are 73 that have at least three months of crash data after implementation. While the sample timeframe is relatively short for some sites, the early data show that these intersections are seeing **72% fewer Opposite Direction-Left Turn injury and fatal crashes per year** when compared to the five years prior. Additionally, other types of crashes declined at a higher rate than in the comparison group, suggesting that there may be a positive multiplier effect from these protected left turns.

- At treatment sites, OD-LT crashes fell by 74% for all severities (120 fewer per year), by 72% for all injuries and fatalities (37 fewer per year), and by 100% for serious injuries and fatalities (nine fewer per year).
- At comparison sites, OD-LT crashes fell by 6% for all severities (49 fewer per year), by 18% for all injuries and fatalities (42 fewer per year), and by 9% for serious injuries and fatalities (three fewer per year).



Protected Left Turns (2023-2024): Annualized Crash Reductions

Treatment intersections versus all other signalized intersections



DISCUSSION AND NEXT STEPS

With over 1,100 active traffic signals in Austin, there is a significant opportunity to reduce injuries and fatalities at intersections by operating our traffic signals in a way that prioritizes the safety of all road users through relatively inexpensive treatments like flashing yellow arrows or protected left turns. The findings in this report support the idea that these kinds of low-cost safety countermeasures are a critical component to achieving our Vision Zero goals.

Moving forward, TPW eventually plans to evaluate all signalized intersections in Austin using the Left Turn Protection Guidelines. This process will analyze signals in monthly batches and could take about two years to complete. Depending on its findings, TPW may decide to use the guidelines on a recurring or rolling basis. This approach could provide regular, continuous evaluations of left turn protection opportunities. In the future, TPW will also consider infrastructure upgrades needed to enable protected left turns depending on the intersection.

When all of the initial 100 intersections with protected left turns have at least three months of crash data after the last implementation dates, Vision Zero will expand its analysis to include all treatment locations. The program can regularly evaluate the safety impacts of these treatments, especially reductions in OD-LT crashes and any multiplier effects.

The collaboration between Vision Zero staff and TPW traffic signal engineers in developing the Left Turn Protection Guidelines serves as a great example of how transportation agencies can operationalize Safe Systems principles within their day-to-day work. This process provided a platform for TPW staff to discuss the safety risks associated with different intersection contexts, as well as the operational tradeoffs in implementing protected left turns, to arrive at a consensus on how to systematically improve the safety of the City's signalized intersections.

This process is serving as a model for a similar initiative to scale up the use of leading pedestrian intervals (LPIs) across Austin. As of the publishing of this report, City traffic signal engineers have implemented over 640 LPIs in the summer of 2024 alone.

These efforts complement other work to improve the safety of Austin's roadways, such as Vision Zero's Major Intersection Safety Projects. A recent analysis shows that signal timing adjustments are proving to be one of the most effective countermeasures at Vision Zero's Major Intersection Safety Projects, where total Opposite-Direction Left Turn crashes have declined by 38% and injury and fatal OD-LT crashes have declined by 45%, representing 15 fewer people injured or killed in these types of crashes every year.



Vision Zero Analytics is a series of reports on innovative research and initiatives conducted by the Austin Transportation and Public Works Department in an effort to significantly reduce fatalities and serious injuries in our community. Questions or comments on this report can be sent to VisionZero@AustinTexas.gov.