



Midtown Atlanta, Before and After Safety Study at Pedestrian All-Walk Phase

Background

Midtown Alliance is a membership organization that has been the driving force behind the revitalization of Midtown Traffic Operations Program, which supported the traffic signal system management and intersection improvements within the Midtown area for vehicles, bicyclists, and pedestrians. Pedestrian safety is a primary objective of Midtown Atlanta.

Challenge: Identifying High-Risk Pedestrian Behaviour

Located in the heart of the Georgia Institute of Technology's Tech Square in Midtown Atlanta, the intersection of Spring Street and 5th Street experiences a large volume of pedestrians and bicycles, some of which are crossing the paths of right- and left-turning vehicles. The observed conflicts led to the opportunity to install an all-pedestrian phase, also known as a pedestrian scramble.

The safety of an intersection is typically measured by the number of crashes that occur at the location. However, crash data alone is not adequate for evaluating the safety of an intersection for pedestrians because the frequency of pedestrian-vehicle crashes is relatively low and allowing an appropriate amount of time for the evaluation period may require years. Pedestrian crash data is also typically under reported, and crash reports often lack sufficient detail to determine what action may be appropriate.

Midtown Alliance needed an effective pedestrian safety evaluation technique that quickly identifies performance changes in high-risk behaviour to effectively quantify pedestrian safety before and after the integration of an all-WALK pedestrian phase into the signal cycle at the intersection.



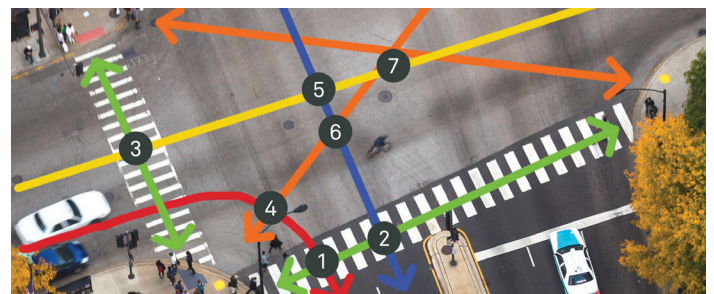
Solution: TrafxSAFE

In January 2018, a pedestrian scramble phase was integrated into the signal cycle at the intersection of Spring Street and 5th Street in Midtown Atlanta. The project deployment team, which included Midtown Alliance, Jacobs, and AECOM, decided to use TrafxSAFE as their on-demand automated video-based road conflict analysis solution.

TrafxSAFE was implemented with temporary cameras to track and classify all individual road users from video data, and automatically detect near-misses and other dangerous interactions between them that are indicative of future potential collisions.

Video data was collected at this intersection before and after the implementation of the all-WALK phase. The AI-driven software platform evaluated the potential conflicts between users of the all-WALK phase on pedestrian safety at the intersection.

For conflict analysis, the main safety measures to detect and identify collision risk are Post Encroachment Time (PET) and vehicle speed, between any groups of scenario movements among vehicles, pedestrians, or cyclists. PET is used to calculate the severity of each conflict, which was defined by the project team as less than 3 seconds. Six conflicting movement scenarios were analyzed in 60 hours each for the before and after conditions.



Results: 75% Reduction of Pedestrian Conflict Rates



The results indicate that the all-WALK pedestrian phase provides a significant benefit to pedestrians. Overall, the percentage of pedestrians involved in near collisions (**PET < 3 seconds**) at the intersection of Spring Street and 5th Street reduced from 4% before to 1% after intervention, representing a **75% improvement**.

5 th Street and Spring Street		BEFORE	AFTER
SEVERITY OF POTENTIAL CONFLICTS	HIGHT RISK	2	0
	MEDIUM RISK	38	6
	LOW RISK	150	26
	TOTAL	190	32
% OF PEDESTRIANS INVOLVED IN A POTENTIAL CONFLICT		4%	1%
TOTAL PEDESTRIAN COUNT		4,409	2,520

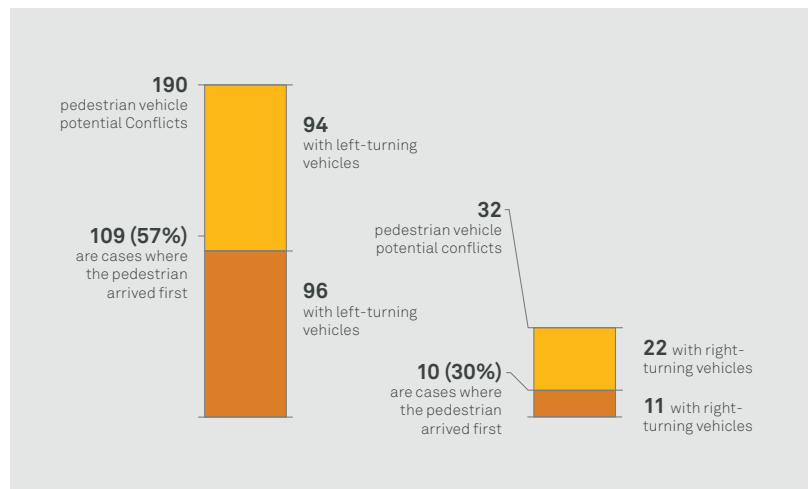


In addition, the percentage of potential conflicts where the pedestrian arrives to the potential conflict point first, decreased from 57% to 30% (approximately 47% reduction) of the total potential conflicts.

While the number of potential pedestrian-vehicle conflicts reduced, the average speed of vehicles making turning movements increased by approximately 4 mph. The pedestrian scramble removes pedestrians on the south leg crosswalk during the vehicle phase, so the right and left-turning vehicles are essentially free-flowing.

Overall, the analysis validated that there was a 75% performance improvement in near collisions between vehicles and pedestrians with the implementation of the pedestrian scramble, which results in a safety improvement. It also provided the safety engineers with insight that further modifications may be required to reduce vehicle speed.

The project implementation team was very satisfied with this quick and effective way of evaluating and validating “before and after” pedestrian safety numbers.



“The study required quantifying pedestrian behavior and comparing the results within a short amount of time. The analytics provided by TrafXSAFE was extremely helpful towards objectively evaluating the safety impact of a pedestrian scramble, and we found the numerical results to be sufficiently detailed and reliable for measuring the safety improvement.”

AECOM, Atlanta