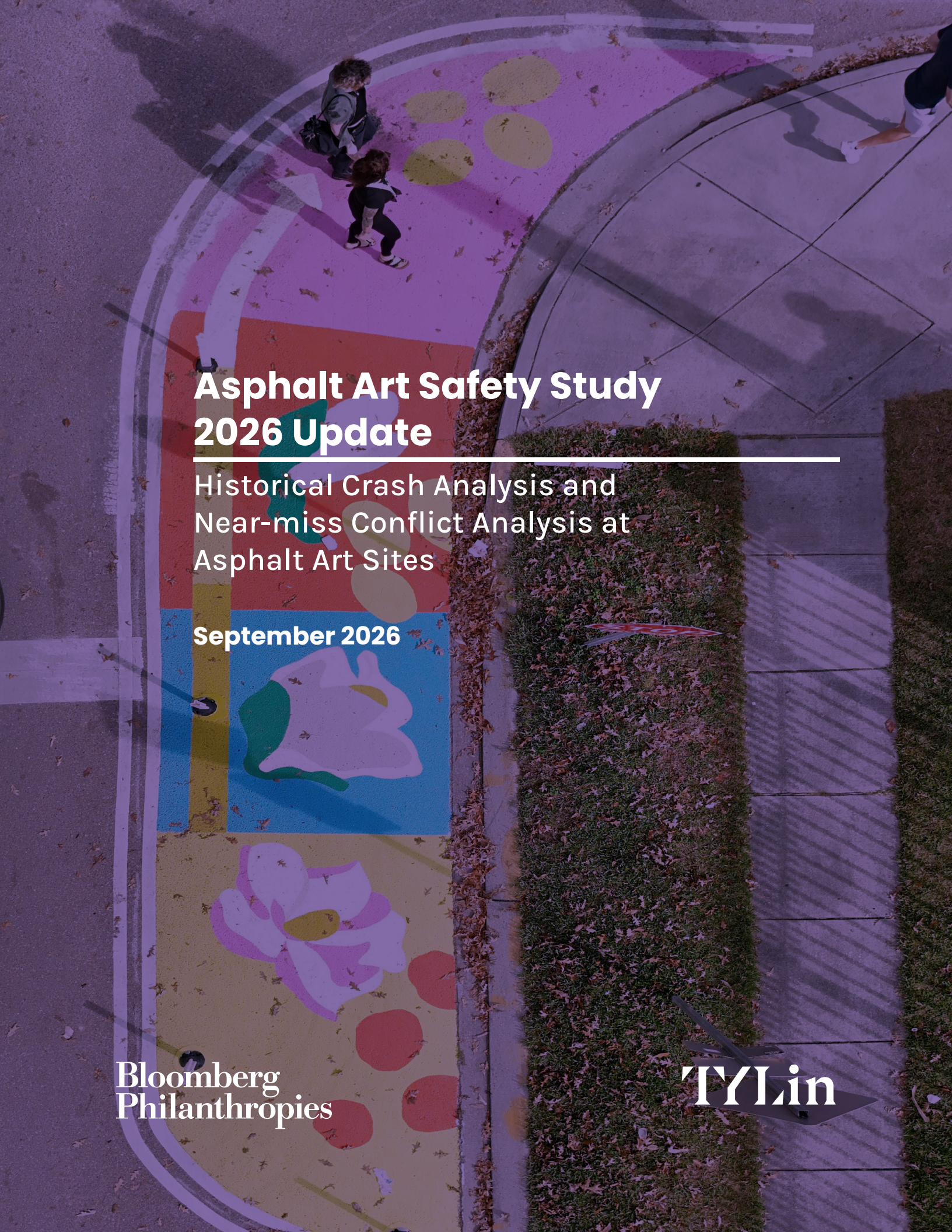


Asphalt Art Safety Study 2026 Update

Historical Crash Analysis and Near-miss Conflict Analysis at Asphalt Art Sites

September 2026

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Executive Summary

Streets are the most valuable public assets in our cities, and communities are increasingly looking for ways to use them to advance safety, public health, economic vitality, and social connection. Asphalt art—murals and other creative treatments applied to roadways and public spaces—has emerged as a widely adopted, low-cost strategy to enhance both safety and the quality of the public realm. Often implemented alongside quick-build safety improvements, these treatments help make streets more visible, engaging, and responsive to community needs.



While earlier implementation of asphalt art was supported by anecdotal or site-specific evidence, the safety effects of such interventions were largely unstudied. Some practitioners saw the potential of asphalt art in increasing motorist awareness of people outside of vehicles and providing traffic calming while others expressed concern that asphalt art might conflict with engineering standards or confuse road users.

The initial Asphalt Art Safety Study (2022), conducted as part of Bloomberg Philanthropies' Asphalt Art Initiative (AAI), provided some of the first quantitative data showing measurable safety benefits from this type of intervention. Since then, regulatory barriers have eased, including federal recognition of aesthetic surface treatments in the 11th Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). Adoption of asphalt art has since expanded across the United States.



As cities in the United States and around the world expand their efforts to improve street safety, more high quality research is needed to confirm that asphalt art projects continue to demonstrate improvements in crash outcomes and user behavior. This update to the 2022 Asphalt Art Safety Study contributes to the growing literature by expanding the original sample size and strengthening the methodology. It features a larger historical crash analysis across more locations and a more robust near-miss conflict analysis procedure that evaluates interactions among all road users.

Across both crash and near-miss conflict analyses, results from this study demonstrate similar or even greater improvements in safety performance following the installation of asphalt art as part of street improvement projects as those found in 2022, adding more data points to the literature demonstrating that asphalt art contributes to safer streets.

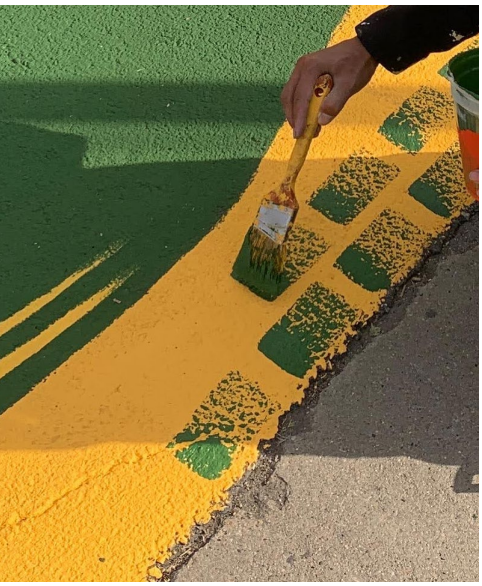




Table 1: Comparison of 2022 and 2026 Study Data

	2022 Study	2026 Study
Total Locations in Crash Analysis	17	40
Total Cities in Crash Analysis	12	19
Total Months of Before Crash Data	819	2,186
Total Months of After Crash Data	559	1,841
Total Crashes Analyzed	390	355
Total Locations in Behavioral Analysis	5	12
Hours of Footage Reviewed for Near-Miss Analysis	80	432

The 2026 study substantially increases the body of safety data analyzed compared to the original study (Table 1). Key findings from the 2026 update include:

Historical Crash Analysis Results

- Total crashes per year fell 32% following asphalt art installation at the average site.
- Vulnerable road user crashes per year decreased 52% following asphalt art installation at the average site.
- Injury crashes per year dropped 29% following asphalt art installation at the average site.

Near-miss Conflict Analysis Results

- Vehicle-pedestrian near-miss conflicts decreased 26% following asphalt art installation across the 12 study sites.
- The most potentially dangerous high crash potential near-miss conflicts fell 32% following asphalt art installation across the 12 study sites.
- Total near-miss conflicts, including those involving drivers alone, fell 19% following asphalt art installation across the 12 study sites.

Overall, the results presented in this larger, updated analysis reinforce earlier evidence that asphalt art is associated with meaningful improvements in roadway safety for all users. When compared to the 2022 study, safety outcomes are similar or improved, reaffirming the original findings and demonstrating that the observed safety benefits remain consistent across a larger dataset. The expanded sample also provides stronger statistical evidence of these benefits, suggesting that comparable projects implemented in similar contexts can be expected to produce consistent safety benefits. These findings strengthen empirical support for cities and practitioners seeking to implement arts-driven street design interventions and contribute to the growing body of research informing safer, more people-centered streets.

1. Introduction

Since the publication of the 2022 Asphalt Art Safety Study, communities across the United States have continued to address the unacceptable number of people killed or seriously injured in crashes on the nation's streets and roadways. Crash deaths in the United States contrast starkly with global peers. As of 2021, the most recent date for which comparable data are available, the United States had an estimated 14.2 crash deaths per 100,000 population, compared to 2.1 in Japan, 2.6 in the United Kingdom, and 4.7 in Canada.[1]

To drive down crash deaths, safety practitioners have embraced new and innovative practices and utilized new sources of funding like the federal Safe Streets and Roads for All (SS4A) program created under the Bipartisan Infrastructure Law (BIL) to implement proven safety countermeasures at greater scale. These efforts are having the desired effect: early estimates of fatalities from 2025 have fallen to levels last seen in 2019, largely reversing gains in national aggregate crash deaths seen during the early years of the Covid-19 pandemic in 2020 and 2021.[2]

Asphalt art treatments have become an accepted part of the toolbox used to address the broader underlying roadway safety crisis in cities across the country as well as around the globe.

Asphalt art treatments encompass a broad range of aesthetic improvements to public rights-of-way, implemented within the traveled area, parking lanes, pedestrian-only plazas, and on sidewalks. Asphalt art is conspicuous and serves to indicate active, people-centered environments. Used as a complement to quick-build safety improvements like paint-and-post curb extensions or in conjunction with high visibility crosswalk markings, asphalt art can inspire action and community ownership.

1 The Global Health Observatory. 2024. Indicator: Road Traffic Death Rate (per 100,000 Population), Estimate. World Health Organization.
2 National Center for Statistics and Analysis, 2026. Early Estimate of Motor Vehicle Traffic Fatalities and Fatality Rate in 2025 (Traffic Safety Crash Facts Crash Stats Brief Statistical Summary. Report No. DOT HS 813 800). National Highway Traffic Safety Administration. Pg. 1



The 11th Edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), which took effect on January 18, 2024, enabled asphalt art applications—referred to as aesthetic surface treatments—"within a crosswalk, in islands, in medians, in shoulders, within sidewalk [curb] extensions designated by pavement markings, or in other areas outside of the traveled way."[3] Results reported in the 2022 Asphalt Art Safety Study informed the incorporation of aesthetic surface treatments in the manual. Inclusion in the MUTCD, and the standards and guidance presented therein, established that asphalt art could be compliant with federal standards for markings in the public way (given adherence to the standards in the MUTCD), resolving prior uncertainty. The use of asphalt art has since proliferated further and has been funded through private, local, and federal sources.

Growing the literature that analyzes the impact of asphalt art on safety outcomes for all users remains necessary. All serious safety treatments should be backed by multiple studies that provide robust evidence for the efficacy of the treatment for crash types and contexts of concern, with results that are broadly generalizable. Practitioners should have current and clear information to make decisions on where tools like asphalt art may or may not be most effective. By growing the quantitative literature, this study can also influence data-driven decision making to support future guidance.

3 Federal Highway Administration, 2023. Manual on Uniform Traffic Control Devices for Streets and Highways, 11th Edition. United States Department of Transportation. Pg. 622





1.1 Study Goals and Objectives

The goal of this study largely mirrors that of the 2022 Asphalt Art Safety Study: to assess the impact of asphalt art installations on traffic safety outcomes for all roadway users. The study was conducted through quantitative analysis of crashes and near-miss conflicts before and after the installation of asphalt art at study sites across the United States. The study is broken into two distinct yet complementary analyses:

- **Historical Crash Analysis** – Site characteristics and publicly available crash data were obtained at 40 asphalt art sites in 11 states and the District of Columbia. Safety performance was evaluated using simple before and after analysis following a standard methodology for comparability across sites. Crash analysis metrics include:
  - Change in average annual total crashes
  - Change in average annual crashes involving vulnerable roadway users (i.e., pedestrians and bicyclists)
  - Change in average annual crashes resulting in fatality or injury (all severities)

- **Near-miss Conflict Analysis** – Critical conflicts between vehicles and other roadway users were identified through manual video review at 12 asphalt art installation sites in seven states during peak travel periods before and after asphalt art installation. Near-miss conflict metrics were broken down into two levels of severity and include:
  - Vehicle-vehicle low and high crash potential conflicts
  - Vehicle-pedestrian low and high crash potential conflicts
  - Vehicle-bicyclist low and high crash potential conflicts

Together, these analyses provide a more holistic picture of the safety impacts of asphalt art treatments. Crashes remain the best indicators of safety outcomes but are not without drawbacks. Crashes, especially those involving people walking and biking, are comparatively rare events and may be underreported. Where available, crash data may take months or years to publish. Near-miss conflicts, like other surrogate safety metrics, offer timely assessment of potential safety risks, complementing crash data findings and quantifying safety performance where crashes are uncommon.

1.2 Literature Review

In 2022, the project team conducted a literature review of the safety impacts of asphalt art. At that time, there were no analyses that employed a standardized methodology to assess the safety performance at multiple locations at the national level. Standalone case studies from cities such as Boulder, CO, Atlanta, GA, and Fort Wayne, IN did tend to indicate that behaviors such as drivers' yielding to pedestrians improved following asphalt art installation. Given that, the 2022 Asphalt Art Safety Study was, to the project team's knowledge, the first comprehensive study with empirical findings. A follow-up review of the literature produced in the intervening years found one published study and information about one in-progress study of relevance.

Researchers from the University of North Carolina and Portland State University studied the effects of curb extensions on driver yielding rates and pedestrian satisfaction across multiple sites in Washington, D.C.[4] The study addresses a known gap in the literature by conducting separate analyses for locations with permanent curb extensions, tactical curb extensions with asphalt art murals, and tactical extensions without asphalt art. The researchers found that each type of curb extension was associated with higher driver yielding rates than control locations without curb extensions. Notably, tactical curb extensions with murals were the most associated with higher yielding rates. (It's worth noting that the research team did not find a statistically significant difference in generalized yielding between treatment and control locations.) Further, survey respondents also reported a higher crossing satisfaction at intersections with asphalt art than at control locations and locations with other types of curb extensions. Of pedestrians surveyed, 94% felt safe crossing at locations with tactical curb extensions with mural art and 92% felt seen and acknowledged by drivers.[5] The authors concluded that "tactical curb extensions with or without mural art offer a feasible alternative to improve pedestrian satisfaction and safety compared to control locations."[6]

One in-progress study may provide more information on the behavioral effects of specific asphalt art treatments. A technical report for the Federal Highway Administration (FHWA)-funded *Evaluation of Crosswalks with Surface Treatments* is anticipated.

4 Wesley Kumfer, Sarah Worth O'Brien, Mike Vann, Nathan McNeil, Sirisha Kothuri, Minju Kim Song. 2026. Evaluation of Different Curb Extension Treatments for Pedestrian Comfort and Safety at Intersections (DDOT-RDT-26-02). District of Columbia Department of Transportation.
5 Ibid. pg. 2
6 Ibid. pg. 2



Several major innovations achieved since 2022 informed the 2026 Asphalt Art Safety study.

The 11th Edition of the MUTCD, adopted in 2023, enabled asphalt art in the public way, clarifying much of the prior uncertainty around regulatory compliance. Section 3H.03, “Aesthetic Surface Treatments” provides standards and guidance for its application. Other sections of Chapter 3H. “Colored Pavement” provide additional support and direction for practitioners; for example, Section 3H.01 explicitly clarifies that asphalt art “not intended to communicate regulations, warnings, guidance, or other information to road users, the colored pavement is not considered to be a traffic control device even if it is located between the lines of a crosswalk.”[7] In particular, the standards shape how asphalt art and traffic control devices can interact and additional guidance mitigates potential impacts of colored pavement on accessibility.

Innovations have also been made in the evaluation of safety projects. The use of safety surrogates—data that indicate increased crash risk—has expanded. In particular, the widescale uptake of machine learning has enabled detection of near-miss conflicts, events in which the trajectories of multiple users cross in close proximity in space and time, for instance, where a turning driver nearly collides with a pedestrian crossing in a crosswalk. These data points can be harvested from real-time video feeds or collected footage. While definitions for near-miss conflicts have not been fully standardized, researchers and practitioners have coalesced around metrics such as post encroachment time (PET) and time to collision (TTC). These techniques supplement other established safety surrogates like yielding rates, supplementing crash data with more timely and frequent observations. These techniques were considered in the development of the behavioral analysis methodology included in this study.

7 Federal Highway Administration, 2023. Pg. 622



2. Historical Crash Analysis





2.1. Background and Scope

The historical crash analysis in the 2026 update builds on Bloomberg Philanthropies' 2022 Asphalt Art Safety Study, demonstrating the impact of asphalt art installations on traffic safety outcomes. The analysis is intended to inform practitioners exploring the deployment of asphalt art in the United States but may have international relevance. A simple before-after analysis methodology was selected for its ability to demonstrate the direction and general magnitude of crash outcomes observed at asphalt art sites.

The analysis does not explore the effects of asphalt art in isolation, but rather in combination with other safety treatments with which it is typically installed, often other pavement markings, flexible delineators, and signage. While the intent of the analysis is not to develop a crash modification factor (CMF), elements of studies used to develop CMFs were used as a model for this analysis.

The first safety study demonstrated that the average site where asphalt art was installed, often in combination with quick build curb extensions or high visibility crosswalks, experienced an annual reduction in total crashes, crashes involving a person walking or biking, and crashes resulting in one or more injuries.

Since the completion of the first safety study, more cities have implemented asphalt art treatments and more sites have been in place for multiple years, enabling more robust analyses than were feasible in 2022. The updated 2026 crash analysis substantially follows the previously established methodology while taking advantage of the number, diversity, and longevity of asphalt art sites across the United States. Multi-year and average annual total crashes, crashes involving people walking and biking (referred to as vulnerable road user or VRU crashes), and crashes resulting in an injury (K, A ,B, and C on the Federal Highway Administration's KABCO injury severity scale) are presented for each site for periods before and after asphalt art installation. To ensure that the results are replicable, defensible, and clear, minor updates have been made to site selection and analysis criteria. The total number of eligible sites is more than two times greater than the sample available for the first study, representing more cities, states, and regions of the United States.

2.2. Site Selection Criteria

Asphalt art has been installed at hundreds of sites in the United States. Installations take many forms, from short-term demonstrations to long-term placemaking or safety treatments. They are installed in the street or on the sidewalk, within intersections, midblock, or outside of the traveled way.

The study team defined site selection criteria to screen asphalt art sites for fitness for before-after crash analysis across a range of locations to produce comparable and interpretable findings. The study team reviewed over 100 asphalt art sites. Of those reviewed, 40 met each of the below eligibility criteria.

- Asphalt art installations include aesthetic crosswalk treatments and/or geometric changes that incorporate asphalt art at an intersection on a street open to vehicle traffic. Treatments must be made independently of other major changes (e.g., adding a separated bike lane) in an area of the public right-of-way open to or adjacent to vehicular traffic. This criterion excludes locations where aesthetic treatments are solely installed on sidewalks, off-street trails, vertical structures, or private property.
- Before and after periods for eligible asphalt art sites each span at least two full years for which crash data are available. Crash data covering at least two full years (24 months) and up to five years (60 months) for each analysis period balance acceptable site-level analysis and overall study sample size.
- No major alterations were made to the roadway during the before or after analysis periods. Where changes to roadway cross-section, intersection geometry, or traffic control were implemented in the years preceding or following asphalt art installation, analysis windows were shortened up to the minimum of two years.
- Asphalt art must be in good condition for at least two years post installation. The study team assessed the condition of asphalt art using Nearmap and/or historical imagery from Google Maps to confirm that the art was generally visible and interpretable to roadway users.
- Multi-year, spatial crash data are publicly available. The state, municipality, or metropolitan planning organization where the asphalt art site is located provide historical crash data via a publicly available GIS repository. Crash data include latitude, longitude, date, injury severity, and vulnerable roadway user involvement, at minimum.

2.3. Summary of Study Sites

The 40 asphalt art sites selected for study represent a range of locations, land use contexts, and facility types (Table 2). Sites span urban areas around the country (Figure 1), representing multiple geographic regions encompassing 11 states and Washington D.C. (Table 3). While asphalt art has been installed in a wider sample of states, lack of publicly available, high quality crash data constrained site selection. Similarly, while asphalt art is present in suburban or rural areas, no identified sites met all defined site selection criteria, restricting the analysis to an urban sample.

Sites span urban land use contexts including the urban core (downtowns, central business districts, high-density mixed-use areas) as well as medium/low density residential areas and commercial corridors (Table 4). Facility types where asphalt art treatments were analyzed include mid-block crossings and stop- and signal-controlled intersections (Table 5).

Figure 1: Map of 2026 Historical Crash Analysis Study Sites

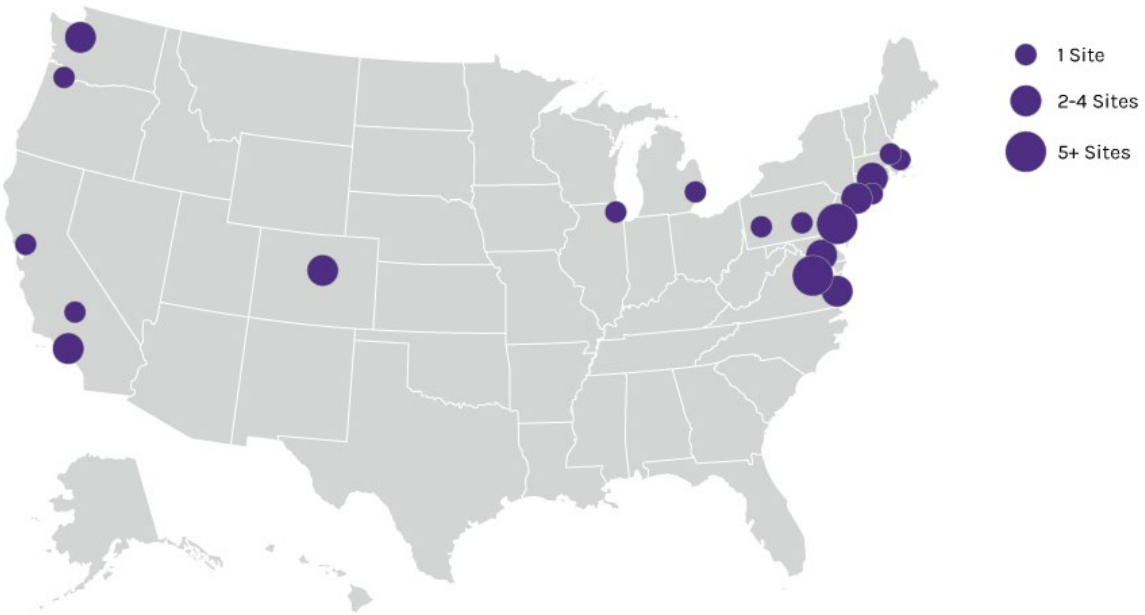


Table 2: Crash Analysis Study Site Location Information

#	City	State	Location	Land Use Context	Facility Type	AAI Site
1	Long Beach	CA	Long Beach Blvd & Bixby Rd	Neighborhood Commercial	Intersection - Signal	
2	Long Beach	CA	627 Pine Ave	Urban Core	Mid-Block	
3	Long Beach	CA	Chestnut Ave & W 15th St	Neighborhood Residential	Intersection - Stop	Y
4	Sausalito	CA	Bridgeway & Bay St	Neighborhood Commercial	Intersection - Signal	
5	Lancaster	CA	W Lancaster Blvd & Elm Ave	Urban Core	Intersection - Stop	Y
6	Denver	CO	Morrison Rd & W Virginia Ave	Neighborhood Commercial	Intersection - Stop	Y
7	Denver	CO	Larimer St & 26th St	Urban Core	Intersection - Stop	
8	New Britain	CT	Arch St & Pearl St	Neighborhood Commercial	Intersection - Stop	
9	New Britain	CT	Arch St & Grand St	Neighborhood Commercial	Intersection - Stop	
10	New Haven	CT	Derby Ave, George St, & Norton St	Neighborhood Residential	Intersection - Signal	
11	Chicago	IL	Halsted St & Waveland Ave	Neighborhood Commercial	Intersection - Signal	
12	Cambridge	MA	Massachusetts Ave & Inman St	Urban Core	Intersection - Signal	
13	Somerville	MA	Dimick St & Waldo Ave	Neighborhood Residential	Intersection - Stop	
14	Baltimore	MD	921 Chase St	Neighborhood Residential	Mid-Block	Y
15	Baltimore	MD	Biddle St & Valley St	Neighborhood Residential	Intersection - Stop	Y
16	Baltimore	MD	Chase St & Valley St	Neighborhood Residential	Intersection - Stop	Y
17	Ferndale	MI	230 W Nine Mile Rd	Neighborhood Commercial	Mid-Block	
18	NYC (Brooklyn)	NY	Fulton St & Gates Ave	Urban Core	Intersection - Signal	
19	NYC (Brooklyn)	NY	Hooper St & Division Ave	Urban Core	Intersection - Stop	
20	Portland	OR	NE 21st & Clackamas St	Neighborhood Residential	Intersection - Stop	
21	Lancaster	PA	S Mulberry St & N Strawberry St	Neighborhood Residential	Intersection - Stop	
22	Philadelphia	PA	S 13th St & Locust St	Urban Core	Intersection - Signal	
23	Philadelphia	PA	S 12th St & Locust St	Urban Core	Intersection - Signal	
24	Philadelphia	PA	N 2nd St & W Laurel St	Neighborhood Commercial	Intersection - Stop	
25	Philadelphia	PA	17th St & Christian St	Neighborhood Residential	Intersection - Signal	
26	Philadelphia	PA	20th St & Catharine St	Neighborhood Residential	Intersection - Stop	
27	Pittsburgh	PA	Harriet St & Roup Ave	Neighborhood Residential	Intersection - Stop	Y
28	Seattle	WA	7th Ave & Westlake Ave	Urban Core	Intersection - Signal	
29	Seattle	WA	S Jackson St & Occidental Ave S	Urban Core	Intersection - Signal	
30	Seattle	WA	S Jackson St & 12th St	Urban Core	Intersection - Signal	
31	Seattle	WA	E Yesler Way & 24th St	Neighborhood Residential	Intersection - Stop	
32	Virginia Beach	VA	Virginia Beach Blvd & Mediterranean Ave	Urban Core	Intersection - Signal	
33	Virginia Beach	VA	Virginia Beach Blvd & Baltic Ave	Urban Core	Intersection - Signal	
34	Washington D.C.	-	1st St NW & U St NW	Neighborhood Residential	Intersection - Stop	
35	Washington D.C.	-	Texas Ave SE & B St SE	Neighborhood Residential	Intersection - Stop	
36	Washington D.C.	-	53rd St SE & C St SE	Neighborhood Residential	Intersection - Stop	
37	Washington D.C.	-	6th St NW & O St NW	Neighborhood Residential	Intersection - Stop	
38	Washington D.C.	-	New Hampshire Ave NW & Newton Pl NW	Neighborhood Residential	Intersection - Stop	
39	Washington D.C.	-	18th St NW & Newton St NW	Neighborhood Residential	Intersection - Stop	
40	Washington D.C.	-	14th St NW & Meridian St NW	Neighborhood Commercial	Intersection - Signal	



Table 3: Crash Analysis Study Sites by Geographic Region

Region	#	%
Northeast	14	35%
Midwest	2	5%
South	12	30%
West	12	30%
TOTAL	40	100%

Table 4: Crash Analysis Study Sites by Land Use Context

Setting	#	%
Urban Core	13	32.5%
Neighborhood Residential	18	45.0%
Neighborhood Commercial	9	22.5%
TOTAL	40	100%

Table 5: Crash Analysis Study Sites by Facility Type

Facility Type	#	%
Intersection - Signal	15	37.5%
Intersection - Stop	22	55.0%
Mid-Block	3	7.5%
TOTAL	40	100%

2.4. Improvements at Study Sites

All sites included in this study include at least one of two improvement types: crosswalk art or roadway art (Figures 2-3, Table 6). These categories represent asphalt art that complements a traffic control device or traffic calming treatment. Crosswalk art, present at 40% of sites, includes the installation of visually impactful art along the width and length of one or more crosswalks at an intersection or midblock crossing. Roadway art, which is included at 60% of sites, includes art installed within curb extensions, pedestrianized plazas, and other changes to intersection geometry that repurpose underutilized pavement to improve safety.

Figure 2: Example of Crosswalk Art



Figure 3: Example of Roadway Art

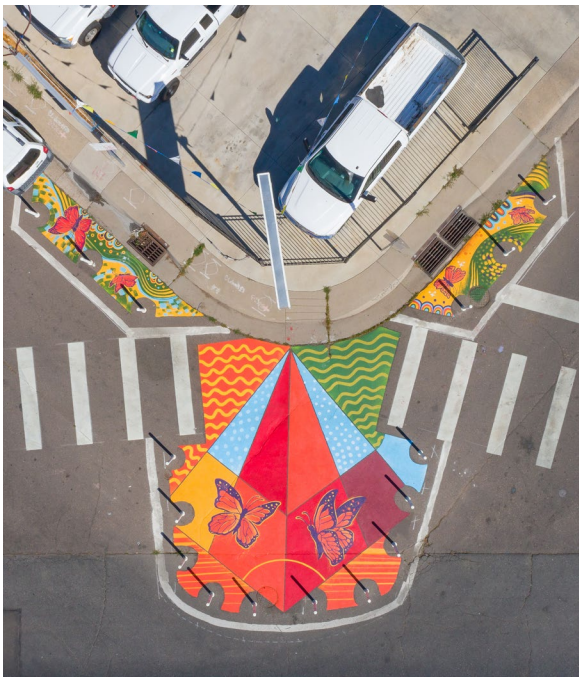


Table 6: Crash Analysis by Asphalt Art Improvement Type

#	City	State	Crosswalk Art	Roadway Art
1	Long Beach	CA	X	
2	Long Beach	CA	X	
3	Long Beach	CA		X
4	Sausalito	CA	X	
5	Lancaster	CA	X	
6	Denver	CO		X
7	Denver	CO	X	
8	New Britain	CT		X
9	New Britain	CT		X
10	New Haven	CT		X
11	Chicago	IL	X	
12	Cambridge	MA	X	
13	Somerville	MA		X
14	Baltimore	MD		X
15	Baltimore	MD		X
16	Baltimore	MD		X
17	Ferndale	MI	X	
18	NYC (Brooklyn)	NY		X
19	NYC (Brooklyn)	NY		X
20	Portland	OR		X
21	Lancaster	PA		X
22	Philadelphia	PA	X	
23	Philadelphia	PA	X	
24	Philadelphia	PA	X	
25	Philadelphia	PA		X
26	Philadelphia	PA		X
27	Pittsburgh	PA		X
28	Seattle	WA	X	
29	Seattle	WA	X	
30	Seattle	WA	X	
31	Seattle	WA		X
32	Virginia Beach	VA	X	
33	Virginia Beach	VA	X	
34	Washington D.C.	-		X
35	Washington D.C.	-		X
36	Washington D.C.	-		X
37	Washington D.C.	-		X
38	Washington D.C.	-		X
39	Washington D.C.	-		X
40	Washington D.C.	-		X
TOTAL		#	16	24
		%	40%	60%

2.5. Historical Crash Data Analysis Methodology

Crash data sets for all 40 sites were obtained from open-source state, regional, or local databases (Table 7). The study team reviewed each data set to confirm that the date of occurrence, crash severity, and the involvement of vulnerable road users could be discerned. While data sets were checked for general spatial accuracy, the study team did not validate individual crashes or modify crash data sets in any way.

The number of crashes before and after treatment at each site was quantified based on installation date and spatial proximity of crashes to the site (Table 8). The study team used exact installation dates where publicly available. Where installation information could not be found, the study team assumed installation dates coinciding with the first appearance of asphalt art on Nearmap, an online resource with regularly updated historical aerial imagery. The study team also used Nearmap to review up to five years of imagery before and after installation to adjust the frame of analysis to exclude roadway changes or substantial deterioration. Crashes were spatially queried using a standard buffer distance, typically 25 feet beyond the center of each crosswalk. This enabled the study team to overcome differences in reporting practices across agencies and to account for the diverse installations and contexts in the study.

Average crashes per year were calculated to account for differences in analysis periods and facilitate comparison across sites.





Table 7: Crash Data Sources and Dates Analyzed for All Study Sites

#	City	State	Data Source	Dates Analyzed
1	Long Beach	CA	UC Berkeley Transportation Injury Mapping System	1/2014 - 2/2022
2	Long Beach	CA	UC Berkeley Transportation Injury Mapping System	1/2014 - 6/2022
3	Long Beach	CA	UC Berkeley Transportation Injury Mapping System	5/2018 - 9/2025
4	Sausalito	CA	UC Berkeley Transportation Injury Mapping System	7/2018 - 9/2025
5	Lancaster	CA	UC Berkeley Transportation Injury Mapping System	9/2014 - 9/2024
6	Denver	CO	Denver Regional Council of Governments Regional Data Catalog	8/2017 - 8/2024
7	Denver	CO	Denver Regional Council of Governments Regional Data Catalog	4/2014 - 3/2023
8	New Britain	CT	University of Connecticut's Connecticut Crash Data Repository	8/2018 - 12/2025
9	New Britain	CT	University of Connecticut's Connecticut Crash Data Repository	9/2018 - 12/2025
10	New Haven	CT	University of Connecticut's Connecticut Crash Data Repository	3/2018 - 12/2025
11	Chicago	IL	Illinois Department of Transportation Open Data	7/2014 - 6/2024
12	Cambridge	MA	IMPACT MassDOT	9/2011 - 8/2021
13	Somerville	MA	IMPACT MassDOT	8/2012 - 8/2022
14	Baltimore	MD	Maryland Crash Data Download, Maryland Department of State Police	1/2019 - 12/2024
15	Baltimore	MD	Maryland Crash Data Download, Maryland Department of State Police	1/2019 - 12/2024
16	Baltimore	MD	Maryland Crash Data Download, Maryland Department of State Police	1/2019 - 12/2024
17	Ferndale	MI	Michigan Traffic Crash Facts	7/2017 - 12/2024
18	NYC (Brooklyn)	NY	New York City Open Data	3/2018 - 12/2025
19	NYC (Brooklyn)	NY	New York City Open Data	10/2013 - 9/2023
20	Portland	OR	Oregon Metro Regional Land Information System	7/2014 - 12/2023
21	Lancaster	PA	Pennsylvania Department of Transportation	9/2016 - 12/2024
22	Philadelphia	PA	Pennsylvania Department of Transportation	7/2014 - 6/2024
23	Philadelphia	PA	Pennsylvania Department of Transportation	7/2014 - 6/2024
24	Philadelphia	PA	Pennsylvania Department of Transportation	10/2016 - 6/2025
25	Philadelphia	PA	Pennsylvania Department of Transportation	10/2016 - 6/2024
26	Philadelphia	PA	Pennsylvania Department of Transportation	10/2016 - 12/2024
27	Pittsburgh	PA	Pennsylvania Department of Transportation	8/2016 - 12/2024
28	Seattle	WA	Seattle Department of Transportation Collision All Years, Seattle GeoData	3/2016 - 7/2024
29	Seattle	WA	Seattle Department of Transportation Collision All Years, Seattle GeoData	4/2018 - 12/2025
30	Seattle	WA	Seattle Department of Transportation Collision All Years, Seattle GeoData	9/2014 - 9/2022
31	Seattle	WA	Seattle Department of Transportation Collision All Years, Seattle GeoData	9/2014 - 7/2023
32	Virginia Beach	VA	Virginia Department of Transportation	1/2017 - 10/2024
33	Virginia Beach	VA	Virginia Department of Transportation	1/2017 - 10/2024
34	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	11/2014 - 11/2024
35	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	1/2017 - 12/2025
36	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	6/2017 - 12/2025
37	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	10/2016 - 2/2025
38	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	10/2016 - 12/2025
39	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	10/2016 - 12/2025
40	Washington D.C.	-	Washington D.C. District Department of Transportation Open Data	7/2016 - 12/2025

Table 8: Crash Study Site Analysis Periods and Installation Dates

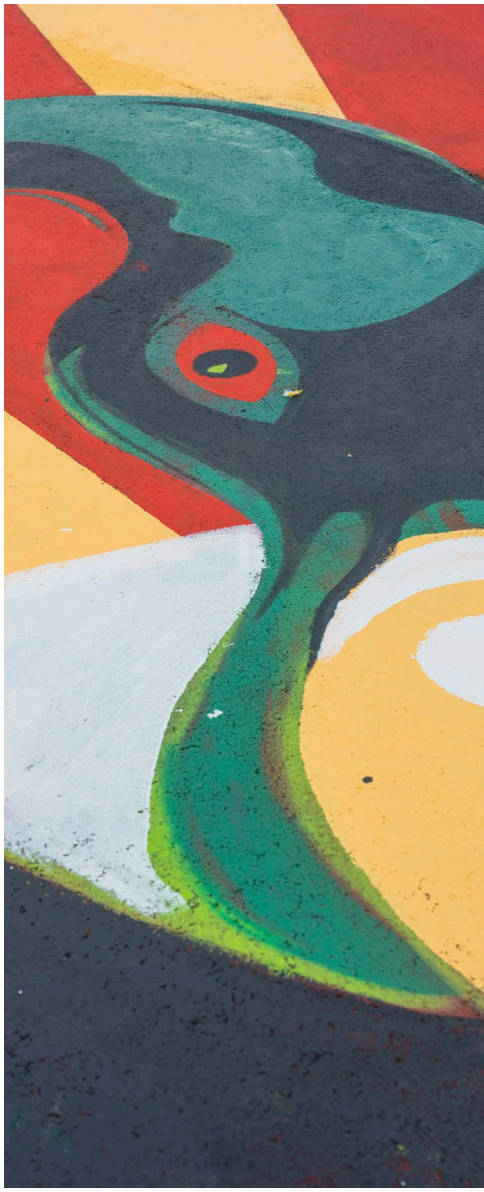
#	City	State	Location	Before Period, Months	After Period, Months	Installation Date
1	Long Beach	CA	Long Beach Blvd & Bixby Rd	37	60	1/31/2017*
2	Long Beach	CA	627 Pine Ave	41.5	60	6/1/2017*
3	Long Beach	CA	Chestnut Ave & W 15th St	60	28.9	5/3/2023
4	Sausalito	CA	Bridgeway & Bay St	60	26.7	7/8/2023*
5	Lancaster	CA	W Lancaster Blvd & Elm Ave	60	60	9/6/2019*
6	Denver	CO	Morrison Rd & W Virginia Ave	60	28.9	8/2/2022*
7	Denver	CO	Larimer St & 26th St	60	48.5	4/4/2019*
8	New Britain	CT	Arch St & Pearl St	60	28	9/1/2023
9	New Britain	CT	Arch St & Grand St	60	28	9/1/2023
10	New Haven	CT	Derby Ave, George St, & Norton St	60	33.1	3/29/2023
11	Chicago	IL	Halsted St & Waveland Ave	60	60	7/1/2019
12	Cambridge	MA	Massachusetts Ave & Inman St	60	60	9/1/2016
13	Somerville	MA	Dimick St & Waldo Ave	60	60	8/26/2017*
14	Baltimore	MD	921 Chase St	39.4	32.6	4/12/2022
15	Baltimore	MD	Biddle St & Valley St	39.4	32.6	4/12/2022
16	Baltimore	MD	Chase St & Valley St	39.4	32.6	4/12/2022
17	Ferndale	MI	230 W Nine Mile Rd	60	29	4/1/2022
18	NYC (Brooklyn)	NY	Fulton St & Gates Ave	60	34	3/1/2023*
19	NYC (Brooklyn)	NY	Hooper St & Division Ave	60	60	10/1/2018
20	Portland	OR	NE 21st & Clackamas St	60	53.6	4/11/2019*
21	Lancaster	PA	S Mulberry St & N Strawberry St	60	39.9	9/1/2021*
22	Philadelphia	PA	S 13th St & Locust St	60	60	4/1/2019*
23	Philadelphia	PA	S 12th St & Locust St	60	60	4/1/2019*
24	Philadelphia	PA	N 2nd St & W Laurel St	60	33	10/1/2021*
25	Philadelphia	PA	17th St & Christian St	60	38.5	10/14/2021*
26	Philadelphia	PA	20th St & Catharine St	60	38.5	10/14/2021*
27	Pittsburgh	PA	Harriet St & Roup Ave	60	40.7	8/8/2021
28	Seattle	WA	7th Ave & Westlake Ave	40.2	60	7/25/2019*
29	Seattle	WA	S Jackson St & Occidential Ave S	60	32.1	4/27/2023*
30	Seattle	WA	S Jackson St & 12th St	36	60	9/11/2017*
31	Seattle	WA	E Yesler Way & 24th St	46.1	60	7/5/2018*
32	Virginia Beach	VA	Virginia Beach Blvd & Mediterranean Ave	33.7	60	10/23/2019*
33	Virginia Beach	VA	Virginia Beach Blvd & Baltic Ave	33.7	60	10/23/2019*
34	Washington D.C.	-	1st St NW & U St NW	60	60	11/1/2019
35	Washington D.C.	-	Texas Ave SE & B St SE	60	47.7	1/10/2022*
36	Washington D.C.	-	53rd St SE & C St SE	60	42.7	1/10/2022*
37	Washington D.C.	-	6th St NW & O St NW	60	49.7	11/1/2021*
38	Washington D.C.	-	New Hampshire Ave NW & Newton Pl NW	60	49.7	11/1/2021*
39	Washington D.C.	-	18th St NW & Newton St NW	60	49.7	11/11/2021*
40	Washington D.C.	-	14th St NW & Meridian St NW	60	53.5	4/15/2021*

Note: Installation dates with an asterisk (*) are assumed based on historical aerial imagery.

Annual crash averages for total, vulnerable road user, and injury crashes across all 40 study sites were calculated using two methods.

- The “average site” reflects the average of crashes per year before and after installation across all sites divided by the total number of sites.
- Aggregate averages reflect the total crashes across all sites divided by the total years of before data of the before and after periods.

The 2026 study reduces the sensitivity of the results to outliers by increasing the overall sample size and average before-after period. The sample increased from 17 to 40 treatment sites, with no site representing more than 10% of total crashes in the study. The average before period (pre-implementation) was 55 months, over seven months higher than the average before period in the 2022 study, while the average after period (post-implementation) was 46 months, over 12 months more than was available in the earlier study.



2.6. Historical Crash Analysis Results

Total, vulnerable user, and injury crashes reported before and after asphalt art installation at the 40 treatment sites are detailed in Tables 9-11.

At the site level, the difference in average crashes per year represents the percent change between crashes per year in the before period and crashes per year in the after period. A negative percentage indicates that average crashes per year decreased following asphalt art treatment while a positive percentage indicates that the average crashes per year increased following treatment.

Results for the site average across all 40 sites are presented for each of the three crash metrics and include: total months included in the analysis period before and after treatment, total crashes in the before and after period, average crashes per year in the before and after period, and the average percent change or difference across the sample.

Table 9: Total Crashes by Site

#	City	State	Analysis Period (Months)		Total Crash Quantity		Total Crashes per Year		
			Before	After	Before	After	Before	After	Difference
1	Long Beach	CA	37	60	1	4	0.3	0.8	146%
2	Long Beach	CA	41.5	60	0	0	0.0	0.0	0%
3	Long Beach	CA	60	28.9	3	0	0.6	0.0	-100%
4	Sausalito	CA	60	26.7	2	0	0.4	0.0	-100%
5	Lancaster	CA	60	60	5	3	1.0	0.6	-40%
6	Denver	CO	60	28.9	2	3	0.4	1.2	211%
7	Denver	CO	60	48.5	20	5	4.0	1.2	-69%
8	New Britain	CT	60	28	2	0	0.4	0.0	-100%
9	New Britain	CT	60	28	8	3	1.6	1.3	-19%
10	New Haven	CT	60	33.1	23	8	4.6	2.9	-37%
11	Chicago	IL	60	60	6	5	1.2	1.0	-17%
12	Cambridge	MA	60	60	19	11	3.8	2.2	-42%
13	Somerville	MA	60	60	0	1	0.0	0.2	UND
14	Baltimore	MD	39.4	32.6	1	0	0.3	0.0	-100%
15	Baltimore	MD	39.4	32.6	3	1	0.9	0.4	-60%
16	Baltimore	MD	39.4	32.6	1	0	0.3	0.0	-100%
17	Ferndale	MI	60	29	0	0	0.0	0.0	0%
18	NYC (Brooklyn)	NY	60	34	11	7	2.2	2.5	12%
19	NYC (Brooklyn)	NY	60	60	13	4	2.6	0.8	-69%
20	Portland	OR	60	53.6	3	1	0.6	0.2	-63%
21	Lancaster	PA	60	39.9	2	1	0.4	0.3	-25%
22	Philadelphia	PA	60	60	3	1	0.6	0.2	-67%
23	Philadelphia	PA	60	60	7	2	1.4	0.4	-71%
24	Philadelphia	PA	60	33	1	0	0.2	0.0	-100%
25	Philadelphia	PA	60	38.5	4	1	0.8	0.3	-61%
26	Philadelphia	PA	60	38.5	0	0	0.0	0.0	0%
27	Pittsburgh	PA	60	40.7	0	0	0.0	0.0	0%
28	Seattle	WA	40.2	60	5	3	1.5	0.6	-60%
29	Seattle	WA	60	32.1	2	1	0.4	0.4	-7%
30	Seattle	WA	36	60	14	16	4.7	3.2	-31%
31	Seattle	WA	46.1	60	8	4	2.1	0.8	-62%
32	Virginia Beach	VA	33.7	60	13	18	4.6	3.6	-22%
33	Virginia Beach	VA	33.7	60	5	11	1.8	2.2	24%
34	Washington D.C.	-	60	60	1	3	0.2	0.6	200%
35	Washington D.C.	-	60	47.7	3	1	0.6	0.3	-58%
36	Washington D.C.	-	60	42.7	2	0	0.4	0.0	-100%
37	Washington D.C.	-	60	39	13	5	2.6	1.5	-41%
38	Washington D.C.	-	60	49.7	1	3	0.2	0.7	262%
39	Washington D.C.	-	60	49.7	2	3	0.4	0.7	81%
40	Washington D.C.	-	60	53.5	6	11	1.2	2.5	106%
AVERAGE SITE			54.7	46	5.4	3.5	1.23	0.84	-32%

Note: UND indicates the percent change in crashes per year is undefined.

Table 10: Vulnerable Road User Crashes by Site

#	City	State	Analysis Period (Months)		VRU Crash Quantity		VRU Crashes per Year		
			Before	After	Before	After	Before	After	Difference
1	Long Beach	CA	37	60	0	1	0.0	0.2	UND
2	Long Beach	CA	41.5	60	0	0	0.0	0.0	0%
3	Long Beach	CA	60	28.9	2	0	0.4	0.0	-100%
4	Sausalito	CA	60	26.7	2	0	0.4	0.0	-100%
5	Lancaster	CA	60	60	3	2	0.6	0.4	-33%
6	Denver	CO	60	28.9	0	0	0.4	0.0	0%
7	Denver	CO	60	48.5	4	0	0.8	0.0	-100%
8	New Britain	CT	60	28	0	0	0.0	0.0	0%
9	New Britain	CT	60	28	2	1	0.4	0.4	7%
10	New Haven	CT	60	33.1	1	0	0.2	0.0	-100%
11	Chicago	IL	60	60	0	1	0.0	0.2	UND
12	Cambridge	MA	60	60	3	4	0.6	0.8	33%
13	Somerville	MA	60	60	0	0	0.0	0.0	0%
14	Baltimore	MD	39.4	32.6	0	0	0.0	0.0	0%
15	Baltimore	MD	39.4	32.6	0	0	0.0	0.0	0%
16	Baltimore	MD	39.4	32.6	1	0	0.3	0.0	-100%
17	Ferndale	MI	60	29	0	0	0.0	0.0	0%
18	NYC (Brooklyn)	NY	60	34	3	1	0.6	0.4	-41%
19	NYC (Brooklyn)	NY	60	60	1	1	0.2	0.2	0%
20	Portland	OR	60	53.6	0	0	0.0	0.0	0%
21	Lancaster	PA	60	39.9	0	0	0.0	0.0	0%
22	Philadelphia	PA	60	60	2	0	0.4	0.0	-100%
23	Philadelphia	PA	60	60	5	1	1.0	0.2	-80%
24	Philadelphia	PA	60	33	0	0	0.0	0.0	0%
25	Philadelphia	PA	60	38.5	1	1	0.2	0.3	56%
26	Philadelphia	PA	60	38.5	0	0	0.0	0.0	0%
27	Pittsburgh	PA	60	40.7	0	0	0.0	0.0	0%
28	Seattle	WA	40.2	60	2	0	0.6	0.0	-100%
29	Seattle	WA	60	32.1	0	0	0.0	0.0	0%
30	Seattle	WA	36	60	6	3	2.0	0.6	-70%
31	Seattle	WA	46.1	60	1	0	0.3	0.0	-100%
32	Virginia Beach	VA	33.7	60	2	2	0.7	0.4	-44%
33	Virginia Beach	VA	33.7	60	0	1	0.0	0.2	UND
34	Washington D.C.	-	60	60	0	0	0.0	0.0	0%
35	Washington D.C.	-	60	47.7	0	1	0.0	0.3	UND
36	Washington D.C.	-	60	42.7	0	0	0.0	0.0	0%
37	Washington D.C.	-	60	39	1	0	0.2	0.0	-100%
38	Washington D.C.	-	60	49.7	0	0	0.0	0.0	0%
39	Washington D.C.	-	60	49.7	1	0	0.2	0.0	-100%
40	Washington D.C.	-	60	53.5	2	2	0.4	0.4	12%
AVERAGE SITE			54.7	46	1.1	0.6	0.26	0.12	-52%

Note: UND indicates the percent change in crashes per year is undefined.

Table 11: Injury Crashes by Site

#	City	State	Analysis Period (Months)		Injury Crash Quantity		Injury Crashes per Year		
			Before	After	Before	After	Before	After	Difference
1	Long Beach	CA	37	60	0	4	0.3	0.8	146%
2	Long Beach	CA	41.5	60	0	0	0.0	0.0	0%
3	Long Beach	CA	60	28.9	3	0	0.6	0.0	-100%
4	Sausalito	CA	60	26.7	2	0	0.4	0.0	-100%
5	Lancaster	CA	60	60	5	3	1.0	0.6	-40%
6	Denver	CO	60	28.9	0	1	0.0	0.4	UND
7	Denver	CO	60	48.5	7	1	1.4	0.2	-82%
8	New Britain	CT	60	28	2	0	0.4	0.0	-100%
9	New Britain	CT	60	28	8	3	1.6	1.3	-19%
10	New Haven	CT	60	33.1	5	3	1.0	1.1	9%
11	Chicago	IL	60	60	0	1	0.0	0.2	UND
12	Cambridge	MA	60	60	4	2	0.8	0.4	-50%
13	Somerville	MA	60	60	0	0	0.0	0.0	0%
14	Baltimore	MD	39.4	32.6	0	0	0.0	0.0	0%
15	Baltimore	MD	39.4	32.6	1	1	0.3	0.4	21%
16	Baltimore	MD	39.4	32.6	1	0	0.3	0.0	-100%
17	Ferndale	MI	60	29	0	0	0.0	0.0	0%
18	NYC (Brooklyn)	NY	60	34	6	5	1.2	1.8	47%
19	NYC (Brooklyn)	NY	60	60	1	1	0.2	0.2	0%
20	Portland	OR	60	53.6	2	1	0.4	0.2	-44%
21	Lancaster	PA	60	39.9	2	0	0.4	0.0	-100%
22	Philadelphia	PA	60	60	2	0	0.4	0.0	-100%
23	Philadelphia	PA	60	60	7	1	1.4	0.2	-86%
24	Philadelphia	PA	60	33	1	0	0.2	0.0	-100%
25	Philadelphia	PA	60	38.5	3	1	0.6	0.3	-48%
26	Philadelphia	PA	60	38.5	0	0	0.0	0.0	0%
27	Pittsburgh	PA	60	40.7	0	0	0.0	0.0	0%
28	Seattle	WA	40.2	60	3	1	0.9	0.2	-78%
29	Seattle	WA	60	32.1	1	0	0.2	0.0	-100%
30	Seattle	WA	36	60	4	7	1.3	1.4	5%
31	Seattle	WA	46.1	60	2	0	0.5	0.0	-100%
32	Virginia Beach	VA	33.7	60	5	6	1.8	1.2	-33%
33	Virginia Beach	VA	33.7	60	2	4	0.7	0.8	12%
34	Washington D.C.	-	60	60	0	1	0.0	0.2	UND
35	Washington D.C.	-	60	47.7	1	1	0.2	0.3	26%
36	Washington D.C.	-	60	42.7	1	0	0.2	0.0	-100%
37	Washington D.C.	-	60	39	4	3	0.8	0.9	15%
38	Washington D.C.	-	60	49.7	1	0	0.2	0.0	-100%
39	Washington D.C.	-	60	49.7	2	0	0.4	0.0	-100%
40	Washington D.C.	-	60	53.5	3	7	0.6	1.6	162%
AVERAGE SITE			54.7	46	2.3	1.5	0.52	0.37	-29%

Note: UND indicates the percent change in crashes per year is undefined.

Study Sites - Combined

Results indicate that total crashes per year at the average asphalt art treatment site in the sample fell 32% after the installation of asphalt art. Averages vulnerable road user and injury crashes decreased by 52% and 29%, respectively (Table 12).

The study team also observed a decrease in aggregated average crashes per year following asphalt art installation at the 40 treatment sites. Total crashes fell 23%, vulnerable user crashes 42%, and injury crashes 25% (Table 13).

A paired t-test was applied to assess the statistical significance of the difference in means between total crashes, vulnerable road user crashes, and injury crashes per year before and after asphalt art treatment. The results of a single tail test indicate that the difference in means was statistically significant for total crashes per year ($p \leq 0.01$), vulnerable road user crashes per year ($p \leq 0.01$), and injury crashes per year ($p \leq 0.05$). Two-tailed testing yielded similar findings with all metrics statistically significant at a probability value ≤ 0.05. Therefore, the study team rejected the null hypothesis that the results were likely due to chance.

Table 12: Change in Crashes at the Average Site

Sites	Crash Type	Analysis Period (Months)		Quantity		Crash per Year		
		Before	After	Before	After	Before	After	Difference
Average Asphalt Art Installation Site	Total	54.7	46	5.4	3.5	1.23	0.84	-32%
	Vulnerable Road Users	54.7	46	1.1	0.6	0.26	0.12	-52%
	Injury	54.7	46	2.3	1.5	0.52	0.37	-29%

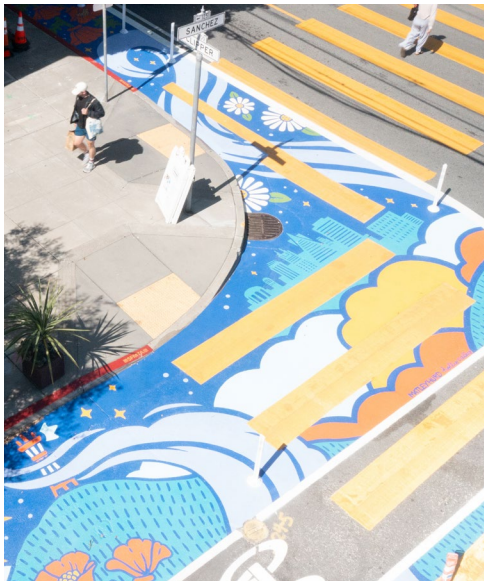
Table 13: Change in Aggregated Crash Averages, All Sites

Sites	Crash Type	Analysis Period (Months)		Quantity		Crash per Year		
		Before	After	Before	After	Before	After	Difference
All Sites	Total	2,186	1,841	215	140	1.18	0.91	-23%
	Vulnerable Road Users	2,186	1,841	45	22	0.25	0.14	-42%
	Injury	2,186	1,841	92	58	0.50	0.38	-25%

Key findings are summarized below and discussed in more detail on the following pages:

- Between the before and after analysis periods, total, vulnerable road user, and injury crashes per year decreased by 32%, 52% and 29%, respectively at the average study site.
- Using the average aggregate method, total, vulnerable road user, and injury crashes per year decreased by 23%, 42%, and 25%, respectively, following asphalt art treatment.
- Change in total average crashes per year after treatment ranged from -100% (seven locations) to +262% (one site in Washington, D.C.).
- Across all three metrics, average crashes per year decreased or remained at zero for 78% or more of individual asphalt art treatment sites. Total crashes fell by 100% at 18% of sites, vulnerable road user crashes fell by 100% at 25% of sites, and injury crashes dropped by 100% at 30% of sites.
- Four sites in the sample experienced zero reported crashes in both the before and after periods.
- No vulnerable road user crashes were reported during both analysis periods at 16 sites, or 40% of all study sites.
- No injury crashes were reported during both analysis periods at six sites, or 15% of all study sites.
- Crashes at two sites, one in Virginia Beach, VA and the second in New Haven, CT, each represented 9% of total crashes. Virginia Beach saw the highest number of total crashes in the before period at 23 crashes (11% of total crashes) while New Haven saw the highest number of crashes in the after period at 18 total crashes (13% of total crashes).
- There were two fatalities across all the sites during the before period, one in Seattle and one in New York City. There were no fatalities in the after period. Notably, this is a very small sample size and therefore the impact of asphalt art on fatal crash reduction is likely inconclusive.









2.7. Discussion of Historical Crash Analysis Results

Phase 2 Results

Historical crash analysis results from the 40 sites included in the 2026 update demonstrate that asphalt art treatments that complement traffic control devices and geometric improvements are associated with a reduction in total crashes, vulnerable road user crashes and injury crashes in urban settings. This finding is consistent with the crash reductions observed in the 2022 Asphalt Art Safety Study. Through increased sample size, the study team was able to demonstrate that the change is not the result of random variation with a high probability of statistical significance for the three crash metrics analyzed.

At the average site in the sample, total crashes per year fell 32%, vulnerable roadway users crashes fell 52%, and injury crashes fell 29%. These trends generally aligned with disaggregated results that examined specific site characteristics, with nearly all metrics including geographic region, site context, facility type, and improvement type seeing a reduction in crashes per year following treatment.

Safety performance varied across sites. This is expected as sites represent different contexts with different anticipated user mixes, travel patterns, and population-level risk tolerance. However, the majority of sites trended towards improvement in crash outcomes. Of the 40 study sites, crash averages at 31 sites (78%) either decreased or remained at zero following treatment. At the nine sites where crashes per year increased, smaller sample sizes may overemphasize crash rate increases. For example, a site in Washington D.C. experienced an increase of 262%, explained by just two additional crashes following treatment.

Small sample size affects the interpretation of disaggregated results, so the study team has not emphasized specific conclusions based on region, context, facility/traffic control type, or asphalt art improvement type. This is a limitation of the analysis that could be expanded in future studies. However, the results, which show decreases in total, vulnerable user, and injury crash averages almost across the board, suggest that the safety effect of asphalt art treatments installed in combination with other safety treatments is broadly generalizable within urban areas in the United States.

Sites represent the largest cities in the United States as well as small regional cities and inner ring suburban downtowns. Asphalt art safety performance may not be the same in suburban, exurban, and rural areas. The site selection criteria, especially the requirement to utilize publicly available crash data, likely introduce selection bias. Many of the states and local communities that publish open-source crash data are nationally recognized safety leaders, have implemented Vision Zero programs, and are more likely to use widely available safety data in their work.

No adjustments were made to the analysis to correct for the possible effects of the Covid-19 pandemic. While fatalities increased, total crashes dropped 22% across the United States between 2019 and 2020.[4] As of 2024, the most recent year for which national crash statistics are available, total crashes have rebounded but have not reached pre-pandemic levels. They are still down 9% from 2019 (NHTSA Traffic Safety Facts: Overview of Motor Vehicle Traffic Crashes in 2024).[5] Results from this study show a larger decrease in total crashes at asphalt art sites than the national post-pandemic trend.

The inclusion of 2020 crashes potentially affects all sites in the sample. Asphalt art is a recent addition to the placemaking and safety toolkit. The earliest location meeting the site criteria for this study was installed in September 2016 (Cambridge, MA). Therefore, crash data from 2020 are represented in either the before or after period at all sites. For the 17 of the 40 sites installed prior to 2020, early pandemic crash data are in the post installation period. For the 23 sites installed in 2021 or later, early pandemic crash data are in the before period. The effect on the difference in crashes, therefore, may be mitigated. The study team verified that the high-level finding of improved safety performance following treatment would hold without inclusion of 2020 data. Given this assessment, 2020 crash data were left in this analysis for simplicity of reporting.



4 National Center for Statistics and Analysis, 2025. Traffic Safety Facts 2023 Data: Summary of Motor Vehicle Traffic Crashes (Report No. DOT HS 813 762). National Highway Traffic Safety Administration.

5 National Center for Statistics and Analysis, 2026.





The study does not demonstrate that aesthetic treatments alone account for observed improvements in safety performance. At all locations in the sample, art accompanied other interventions. Some of these treatments, like high visibility crosswalk markings, have proven crash modification factors (e.g., Countermeasure ID 4123 has a CMF of 0.6 for vehicle-pedestrian crashes, for a demonstrated reduction of 40%). Others, like curb extensions, increase visibility of all users, reduce exposure by shortening crossing distances, and limit unsafe driving behaviors like passing on the right. This study demonstrates that these treatments continue to provide strong safety outcomes in conjunction with asphalt art. Asphalt art does not appear to cancel out the benefits of these improvements and may enhance them by increasing conspicuity and communicating to users that they have entered a special context. Further research would be necessary to isolate the effects of asphalt art and demonstrate causal links.

Phase 1 & Phase 2 Comparison

The second phase of the Asphalt Art Safety Study aims to expand the body of research on the use of asphalt art to increase traffic safety for all roadway users. Historical crash analysis conducted for the 2026 update corroborates the results from 2022: total crashes, vulnerable road user crashes, and injury crashes per year fell following the installation of asphalt art at study sites. All users benefited.

The 2026 study improves on the analysis from 2022 by substantially increasing and diversifying the locations represented. The 2026 study almost tripled the number of months of before and after data as compared to the original, increasing the average number of months analyzed per site from 48.3 to 54.7 in the before period and from 32.9 to 46.0 in the after period. Sites increased to new areas of the country, spanning the Northeast, South, Midwest, and West. This study therefore allows for a longer view of asphalt art outcomes and greater generalizability.

Table 14: Phase 1 and Phase 2 Historical Crash Analysis Comparison

Crash Type	Metric	Phase 1		Phase 2	
		Before	After	Before	After
Total	Total Crashes	233	157	215	140
	% Change in Average Crashes per Year at Average Site	-17%		-32%	
	% Change Aggregate Average Crashes per Year	-1%		-23%	
Vulnerable Road Users	Total VRU Crashes	13	6	45	22
	% Change in Average Crashes per Year at Average Site	-50%		-52%	
	% Change Aggregate Average Crashes per Year	-32%		-42%	
Injury	Total Injury Crashes	60	28	92	58
	% Change in Average Crashes per Year at Average Site	-37%		-29%	
	% Change Aggregate Average Crashes per Year	-31%		-25%	

The 2026 study demonstrates improvements in total crash reduction and vulnerable road user crash reduction beyond that found in the original 2022 study (Table 14). The change in average crashes per year at the average site improved from a 17% to a 32% decrease.

Vulnerable road user crashes saw a slight improvement between the two studies, moving from a 50% decrease to a 52% decrease in crashes per year at the average site. Moreover, the number of crashes examined for vulnerable road users more than tripled and nearly doubled for injury crashes, lending more certainty to the results.

Injury crashes still demonstrated similar improvement, but at a lesser magnitude than that originally observed, notching down from a reduction of 37% to a reduction of 29%.

Together, both studies indicate that asphalt art installed at study sites have clear directionality—they tend to improve safety performance, rather than degrade it—and have substantial and relevant impacts on safety outcomes for all users, but especially those outside of vehicles.



3. Near-miss Conflict Analysis



3.1. Background and Scope

Crashes, especially those involving people walking and biking, are relatively uncommon events. Additional behavioral metrics, also known as safety surrogates, can provide insights of how user behavior may change after treatment. Surrogates like near-misses, yielding behavior, and user compliance enable safety practitioners to proactively assess performance and make modification before crashes occur.

The first phase of the Asphalt Art Safety Study supplemented crash data analysis with observed surrogate safety measures to better understand safety impacts associated with asphalt art installations without having to wait for crash data. The project team observed three metrics: vehicle stopping and yielding compliance, pedestrian-vehicle conflicts, and pedestrian crossing compliance. Across each metric, behavioral results improved after asphalt art installation at the five sites surveyed.

The second phase of the study builds on the approach established in 2022 by supplementing historical crash data with a broader assessment of road user behavior before and after asphalt art installation, expanding beyond vehicle-pedestrian interactions to include vehicle-vehicle and vehicle-bicyclist events. For the 2026 update, 12 sites were selected from cities in the United States participating in the most recent phase of Bloomberg Philanthropies' Asphalt Art Initiative (AAI), more than doubling the sample size of the 2022 study.

While the original study examined behavior at sites with a variety of asphalt art treatments, including crosswalk art, intersection medallions, bump-outs, and other geometric changes, locations in the 2026 study predominantly featured asphalt art in curb extensions. Both studies include signalized and non-signalized intersections. At each 2026 site, visual observations were performed to assess near-miss conflicts between motorists and other users before and after installation. The observation assessment methodology, information about sites selected, and findings are presented in the following sections.

3.2. Summary of Study Sites

A total of 12 sites were selected for analysis from among the participants in the 2024 AAI cohort. Sites within the United States were chosen based on local video collection capabilities, installation schedule, and the scope of improvements. Table 15 provides a summary of locations by site setting, facility type, and posted speed limit. Table 16 details installation and observation dates for each site in the sample. Representative images of study sites following asphalt art installation follow.

Table 15: Near-miss Conflict Analysis Site Overview

City	State	Region	Intersection	Site Setting	Facility Type	Speed Limit	AAI Site
Minneapolis	MN	Midwest	31st St E & 21st Ave S	Neighborhood Residential	Intersection - Stop Controlled	20 MPH	Y
Minneapolis	MN	Midwest	35th St E & 21st Ave S	Neighborhood Residential	Intersection - Stop Controlled	20 MPH	Y
Honolulu	HI	West	Leoku St & Leolua St	Neighborhood Commercial	Intersection - Stop Controlled	25 MPH	Y
Honolulu	HI	West	Leoku St & Waipahu St	Neighborhood Commercial	Intersection - Signal Controlled	25 MPH	Y
Louisville	KY	South	S 28th St & Dumesnil St	Neighborhood Residential	Intersection - Signal Controlled	25 MPH	Y
Louisville	KY	South	S 28th St & Virginia St	Neighborhood Residential	Intersection - Signal Controlled	25 MPH	Y
Fort Collins	CO	West	W Magnolia St, Sherwood St & Canyon Ave	Neighborhood Residential	Intersection - Stop Controlled	30 MPH	Y
San Francisco	CA	West	Sanchez St & 29th St	Neighborhood Residential	Intersection - Stop Controlled	20 MPH	Y
San Francisco	CA	West	Sanchez St & Clipper St	Neighborhood Residential	Intersection - Stop Controlled	20 MPH	Y
New Orleans	LA	South	St Louis St & N Dorgenois St	Neighborhood Residential	Intersection - Stop Controlled	25 MPH	Y
Stamford	CT	Northeast	Smith St & Schuyler St	Neighborhood Residential	Intersection - Stop Controlled	25 MPH	Y
Stamford	CT	Northeast	Smith St, Mill River St & Greenwood Hill St	Neighborhood Residential	Intersection - Stop Controlled	25 MPH	Y

Table 16: Near-Miss Conflict Analysis Study Period

City	State	Intersection	Installation Date(s)	Before Observation Date	After Observation Date
Minneapolis	MN	31st St E & 21st Ave S	5/28/24 – 6/10/24	5/15/24 - 5/17/24	9/18/24 - 9/20/24
Minneapolis	MN	35th St E & 21st Ave S	5/28/24 – 6/10/24	5/15/24 - 5/17/24	9/18/24 - 9/20/24
Honolulu	HI	Leoku St & Leolua St	10/24 – 11/24	9/10/24 - 9/12/24	12/3/24 - 12/5/24
Honolulu	HI	Leoku St & Waipahu St	10/24 – 11/24	9/10/24 - 9/12/24	12/3/24 - 12/5/24
Louisville	KY	S 28th St & Dumesnil St	9/20/24 – 11/8/24	8/27/24 - 8/29/24	12/17/24 - 12/19/24
Louisville	KY	S 28th St & Virginia St	9/20/24 – 11/8/24	9/10/24 - 9/12/24	12/17/24 - 12/19/24
Fort Collins	CO	W Magnolia St, Sherwood St & Canyon Ave	8/12/24 – 8/18/24	6/4/24 - 6/6/24	9/24/24 - 9/26/24
San Francisco	CA	Sanchez St & 29th St	9/10/25 – 9/20/25	9/17/24 - 9/19/24	12/9/25 - 12/11/25
San Francisco	CA	Sanchez St & Clipper St	9/10/25 – 9/20/25	9/17/24 - 9/19/24	12/9/25 - 12/11/25
New Orleans	LA	St Louis St & N Dorgenois St	12/11/2025	5/15/25 - 5/17/25	1/15/26 - 1/17/26
Stamford	CT	Smith St & Schuyler St	5/18/26 – 5/29/26	6/11/24 - 6/13/24	6/16/26 - 6/18/26
Stamford	CT	Smith St, Mill River St & Greenwood Hill St	5/18/26 – 5/29/26	6/11/24 - 6/13/24	6/16/26 - 6/18/26

Improvements at Study Sites

Minneapolis, MN

Figure 4: 31st St E & 21st Ave S



Figure 5: 35th St E & 21st Ave S



Honolulu, HI

Figure 6: Leoku St & Leolua St

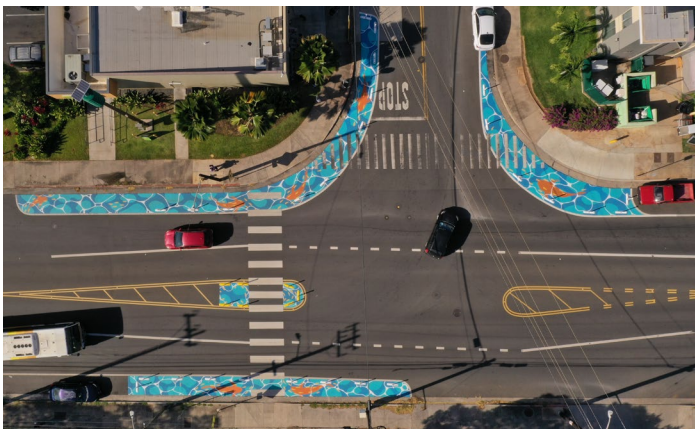
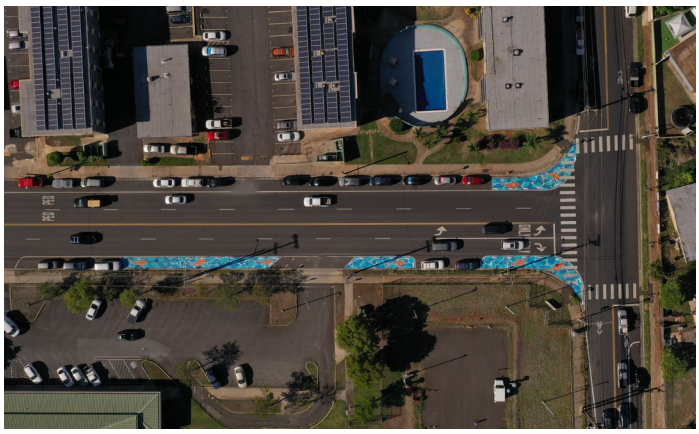


Figure 7: Leoku St & Waipahu St



Louisville, KY

Figure 8: S 28th St & Dumesnil St



Figure 9: S 28th St & Virginia St



San Francisco, CA

Figure 10: Sanchez St & 29th St

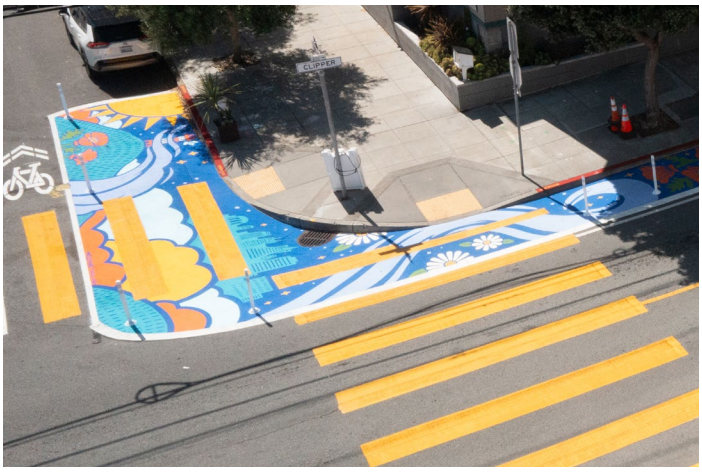


Figure 11: Sanchez St & Clipper St



Fort Collins, CO

Figure 12: W Magnolia St, Sherwood St & Canyon Ave



New Orleans, LA

Figure 13: St Louis St & N Dorgenois St



Stamford, CT

Figure 14: Smith St & Schuyler St



Figure 15: Smith St, Mill River St & Greenwood Hill St



3.3. Near-miss Conflict Analysis Methodology

Like the original 2022 study, the 2026 update follows a simple before and after methodology using video from multiple days prior to and following asphalt art installation assessed by trained reviewers to quantify any change in user behavior.

The project team established a consistent methodology for near-miss conflict analysis that could be employed across all sites, including signalized and non-signalized intersections. The methodology updates the approach used in 2022 to incorporate ongoing development of best practices for near-miss analysis. Specifically, it limits the definition of a near-miss to exclude conflicts in which users are exercising appropriate yielding behavior and incorporates user speeds, consistent with the Safe System approach.

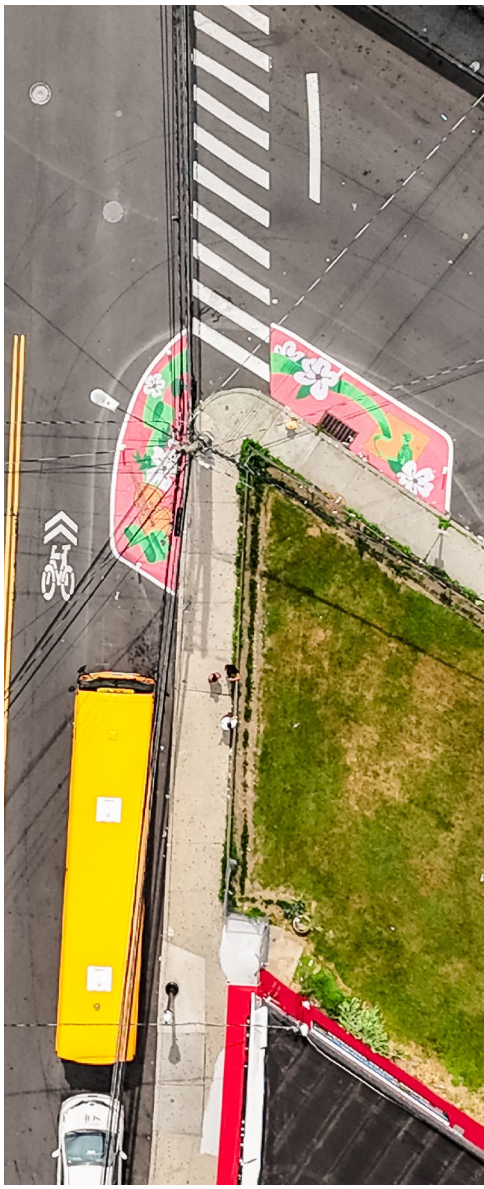
Data Collection

For the 2026 study, videos were collected by AAI cities or traffic data collection vendors at intersections for 72-hour periods during comparable days of the week before and after asphalt art installation. The field of view was set to capture approaching users and crossing movements at each leg of the study intersection. Six hours of video were reviewed for each day collected, focusing on peak morning (8 AM to 11 AM) and evening (3 PM to 6 PM) travel periods when there were the greatest number of users present.



Near-miss Conflict Identification

Although similar near-miss conflict identification parameters were applied in the initial Asphalt Art study, this follow-up refines the definition of conflicts to reduce the potential influence of false positives. The 2026 study excludes interactions where users yielded properly and were appropriately separated in space and time, given contextual speeds, to other road users.



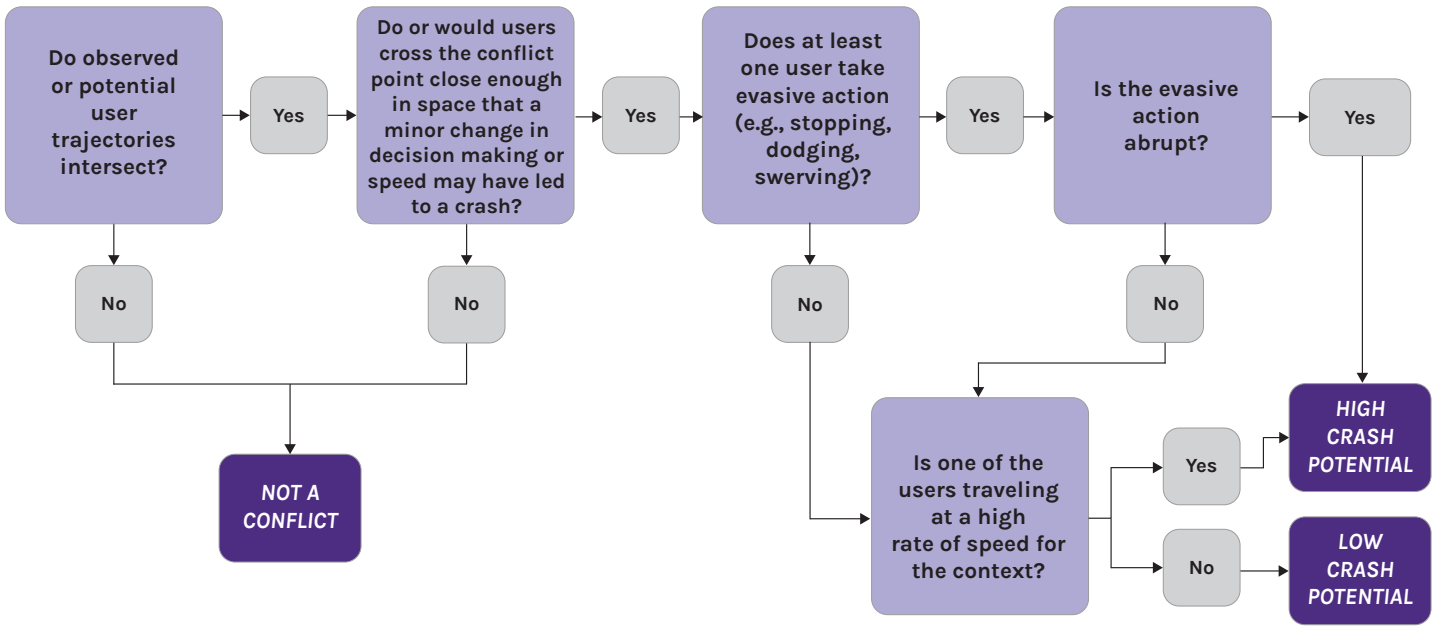
As in the 2022 study, a group crossing counts as a single potential conflict. For example, if a child and parent arrived at an intersection together and crossed the roadway together, they would be counted as a single crossing and potential conflict. Two individuals arriving together but crossing at different times, one during a "flashing don't walk phase" and the other pedestrian during the next interval, would be counted as separate crossings and potential conflicts. The same definition is applied to bicyclists.

Near-miss conflicts with collision potential were identified using a standardized four-step identification process (see Figure 16) that draws from concepts established in near-miss analysis such as post encroachment time (PET) and time to collision (TTC), which consider the gaps in time to actual or potential conflict points based on user trajectories, as well as potential severity in the event of a collision. A conflict is determined to have crash potential if, absent slight changes to decision making or trajectory, user actions might have brought users close enough in space and time to lead to a collision. Exact PET and TTC were not calculated. Events were classified as either low crash potential or high crash potential based on trajectory, proximity, evidence of evasive action, and apparent vehicle speed.

To assess the severity of potential conflicts, the following example definitions were used to guide video reviewers:

- Low Crash Potential – A motorist noticeably brakes to avoid striking a pedestrian or group; a pedestrian or group of pedestrians stops to avoid being in the path of an oncoming or turning vehicle, although the driver has appropriately yielded. Neither action is sudden, atypical, or extreme.
- High Crash Potential – A motorist suddenly stops or swerves to avoid striking a pedestrian, group of pedestrians, or cyclist in a fashion that suggests reduced control of the vehicle; pedestrian, group of pedestrians, or cyclist jumps, runs, stops, or suddenly steps or lunges to avoid being struck by a vehicle. Cases where one or more users is traveling at a high rate of speed for conditions are considered to have high crash potential.

Figure 16: Near-miss Conflict Identification Flowchart



Metrics at All Activation Sites

To compare road user behavior before and after asphalt art installation, pedestrian-vehicle, bike-vehicle and vehicle-vehicle near-miss conflicts were recorded. A conflict is defined as an observed event in which two or more road users nearly overlap in space and time. Conflicts for each metric were graded as low crash potential and high crash potential.

- Vehicle-Vehicle Conflicts – Vehicle-vehicle conflicts refer to interactions between two or more vehicles, including cars, trucks, and motorcycles.
- Pedestrian-Vehicle Conflicts – Pedestrian-vehicle conflicts refer to near-miss conflicts between people walking or using an assistive mobility device and a motor vehicle.
- Bicycle-Vehicle Conflicts – Bicycle-vehicle conflicts refer to near-miss conflicts between people biking or using a scooter and a motor vehicle.

For the 2026 study, the project team evaluated the viability of using machine learning-enabled imagery analysis platforms to identify near-miss conflicts. Offerings from multiple vendors were piloted at several study sites. Due to the practical parameters of the study, principally the need to collect video from multiple sources with varying technical specifications, automated detection of near-miss conflicts across the 12 sites was determined to be infeasible. These platforms show promise for efficiently processing many days of footage to identify specific conflict types and may be best employed over a more limited geographic study area where video collection can be more tightly controlled.

3.4. Near-miss Conflict Analysis Results

A summary of results by road users and for each study site are shown in Table 17 and Table 18, respectively.

Table 17: Near-miss Conflicts Before and After Asphalt Art Installation by Mode

Road User	Conflict Type	Conflicts Before	Conflicts After	Percent Change
Vehicle - Vehicle Conflicts	High Crash Potential	4	4	0%
	Low Crash Potential	77	73	-5%
	Total Vehicle - Vehicle Events	81	77	-5%
Pedestrian - Vehicle Conflicts	High Crash Potential	11	5	-55%
	Low Crash Potential	130	99	-24%
	Total Pedestrian - Vehicle Events	141	104	-26%
Bicycle - Vehicle Conflicts	High Crash Potential	4	4	0%
	Low Crash Potential	34	25	-26%
	Total Bicycle - Vehicle Events	38	29	-24%
TOTAL NEAR-MISS CONFLICTS	High Crash Potential	19	13	-32%
	Low Crash Potential	241	197	-18%
	Total Conflicts	260	210	-19%

Table 18: Near-miss Conflicts Before and After Asphalt Art Installation by Site

City	State	Intersection	Road User	Total Conflicts		
				Before	After	Difference
Minneapolis	MN	31st St E & 21st Ave S	Pedestrian-Vehicle Conflict	21	26	24%
			Bicycle-Vehicle Conflict	6	8	33%
			Vehicle-Vehicle Conflict	13	15	15%
			Total Conflicts	40	49	23%
Minneapolis	MN	35th St E & 21st Ave S	Pedestrian-Vehicle Conflict	9	1	-89%
			Bicycle-Vehicle Conflict	0	5	UND
			Vehicle-Vehicle Conflict	10	4	-60%
			Total Conflicts	19	10	-47%
Honolulu	HI	Leoku St & Leolua St	Pedestrian-Vehicle Conflict	31	18	-42%
			Bicycle-Vehicle Conflict	1	0	-100%
			Vehicle-Vehicle Conflict	1	6	500%
			Total Conflicts	33	24	-27%
Honolulu	HI	Leoku St & Waipahu St	Pedestrian-Vehicle Conflict	2	0	-100%
			Bicycle-Vehicle Conflict	2	0	-100%
			Vehicle-Vehicle Conflict	4	3	25%
			Total Conflicts	8	3	-63%
Louisville	KY	S 28th St & Dumesnil St	Pedestrian-Vehicle Conflict	10	4	-60%
			Bicycle-Vehicle Conflict	0	0	UND
			Vehicle-Vehicle Conflict	4	9	125%
			Total Conflicts	14	13	-7%
Louisville	KY	S 28th St & Virginia St	Pedestrian-Vehicle Conflict	2	3	50%
			Bicycle-Vehicle Conflict	10	3	-70%
			Vehicle-Vehicle Conflict	5	4	-20%
			Total Conflicts	17	10	-41%
New Orleans	LA	St Louis St & N Dorgenois St	Pedestrian-Vehicle Conflict	3	5	67%
			Bicycle-Vehicle Conflict	4	2	-50%
			Vehicle-Vehicle Conflict	17	18	6%
			Total Conflicts	24	25	4%
Fort Collins	CO	W Magnolia St, Sherwood St & Canyon Ave	Pedestrian-Vehicle Conflict	0	1	UND
			Bicycle-Vehicle Conflict	2	2	0%
			Vehicle-Vehicle Conflict	4	1	-75%
			Total Conflicts	6	4	-33%
San Francisco	CA	Sanchez St & 29th St	Pedestrian-Vehicle Conflict	19	13	-32%
			Bicycle-Vehicle Conflict	3	5	67%
			Vehicle-Vehicle Conflict	6	8	33%
			Total Conflicts	28	26	-7%
San Francisco	CA	Sanchez St & Clipper St	Pedestrian-Vehicle Conflict	26	20	-23%
			Bicycle-Vehicle Conflict	9	3	-67%
			Vehicle-Vehicle Conflict	7	3	-57%
			Total Conflicts	42	26	-38%
Stamford	CT	Smith St & Schuyler St	Pedestrian-Vehicle Conflict	12	6	-50%
			Bicycle-Vehicle Conflict	0	1	UND
			Vehicle-Vehicle Conflict	2	2	0%
			Total Conflicts	14	9	-36%
Stamford	CT	Smith St, Mill River St & Greenwood Hill St	Pedestrian-Vehicle Conflict	6	7	-17%
			Bicycle-Vehicle Conflict	1	0	-100%
			Vehicle-Vehicle Conflict	8	4	-50%
			Total Conflicts	15	11	-27%
TOTAL NEAR MISS CONFLICTS, ALL SITES				260	210	-19%

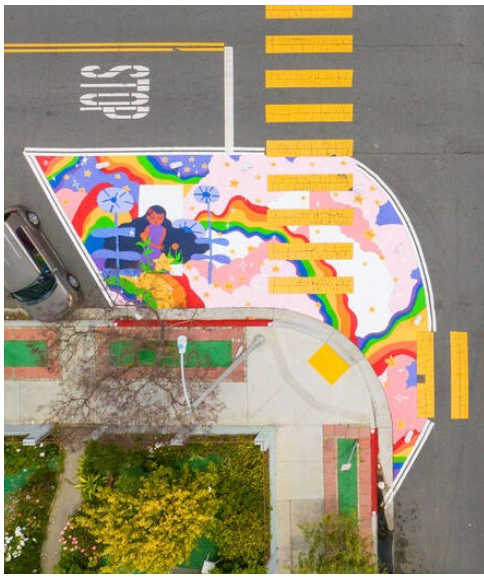
Note: UND indicates the percent change in crashes per year is undefined.

Findings - All Near-miss Conflicts

Across the full sample, total near-miss conflicts decreased following the installation of asphalt art, with reductions observed across most road user groups and conflict severities. Total near-miss conflicts decreased by 19%, with high crash potential conflicts decreasing by 32% and low crash potential conflicts decreasing by 18%. Across all sites, total vehicle-vehicle, pedestrian-vehicle, and bicyclist-vehicle conflicts dropped by 5%, 26% and 24%, respectively.

At the site level, ten of twelve sites experienced fewer conflicts overall following asphalt art installation. The largest reductions were observed at Sanchez St & Clipper St in San Francisco, where near-miss conflicts decreased by 16, or 38%, following installation. Other notable reductions were observed at sites in Minneapolis (35th St E & 21st Ave S), Honolulu (Leoku St & Leolua St), and Stamford (Smith St & Schuyler St).

Several sites showed less substantial improvements (fewer than five conflicts), including 28th St & Dumesnil St in Louisville; W Magnolia St, S Sherwood St & Canyon Ave in Fort Collins; Sanchez St & 29th St in San Francisco; and Smith St, Mill River St & Greenwood Hill St in Stamford. Near-miss conflicts increased by 23% at 31st St E & 21st Avenue S in Minneapolis and marginally at St Louis St & N Dorgenois St in New Orleans.





Findings - Conflicts by User

» Pedestrian-Vehicle Conflict Assessment – Pedestrian-vehicle conflicts decreased across study sites on the aggregate. Overall, total pedestrian-vehicle conflicts declined by 26%. Conflicts with low crash potential saw a substantial reduction following asphalt art installation, decreasing by 31 occurrences (a 24% reduction). High crash potential conflicts involving pedestrians were rare across all locations. These conflicts fell from 11 in the before period to six in the after, a 55% drop.

  At the site level, eight locations experienced reductions in pedestrian-vehicle near-miss conflicts. The largest reduction occurred at Leoku St & and Leolua St in Honolulu, with 13 fewer conflicts (a 42% reduction). Conflicts rose at four sites, most notably at 31st St E & 21st Ave S in Minneapolis, where near-miss conflicts increased by five in the after period (a 24% increase).



» Bicycle-Vehicle Conflict Assessment – Bicycle-vehicle conflicts also decreased overall, with total conflicts reduced by 24%, driven primarily by low crash potential conflicts. High crash potential bicycle-vehicle conflicts remained stable. Where sample sizes are small, the results show more variability, particularly for high crash potential conflicts, which represent less than 15% of total observed bicycle-vehicle near-miss events.

Reductions in bicycle-vehicle conflicts were observed at six of the 12 study sites. The largest decreases occurred at S 28th St & Virginia St in Louisville, where conflicts decreased from 10 to three and at Sanchez St & Clipper St in San Francisco, where conflicts decreased from nine to three.

Bicycle-vehicle conflicts were unchanged at two sites and increased at four. In particular, bicycle-vehicle near-misses increased from zero to five at 35th St E & 21st Ave S in Minneapolis, primarily due to lower apparent yield compliance by bicyclists following diverter installation. Vehicle-vehicle conflicts and vehicle-pedestrian conflicts dropped considerably at this location. This example demonstrates that individual treatments may have very different outcomes for specific users.

» Vehicle-Vehicle Conflict Assessment – Vehicle-vehicle conflicts fell by 5% after asphalt art installation across the full sample, driven by a small change in low crash potential events. High crash potential conflicts were unchanged with four in both periods, consistent with the low posted speeds at study sites. At five locations, vehicle-vehicle conflicts fell, with 35th St E & 21st Ave S in Minneapolis leading the way. This was counterbalanced by increases at the other five asphalt art sites and no change at two asphalt art sites.

While motorists did not see a strong increase in safety performance, the near-miss conflict analysis does not indicate that safety for motorists decreased following asphalt art installation. This finding is in line with the typical improvements at asphalt art sites in the study, which are predominantly intended to improve safety for people outside of vehicles. These findings suggest that these benefits do not come at a cost to the safety of people inside vehicles.

3.4. Discussion of Near-miss Conflict Analysis Results

Road user behavior is a critical indicator of road safety performance and complements crash data. Across the metrics analyzed in this study, results indicate that near-miss conflicts involving vulnerable road users fell at sites where asphalt art was installed. Both high and low crash potential conflicts declined overall, suggesting improved safety outcomes following installation. The benefits of asphalt art were more pronounced for pedestrian near-miss conflicts, consistent with the treatments installed. Vehicle-vehicle near-miss conflicts trended down, providing evidence that asphalt art does not appear to come at the cost of motorist safety.

Behavioral outcomes varied at the site level, especially for high crash potential conflicts due to their low frequency. However, the observed reductions in conflicts, particularly those involving pedestrians and bicyclists, suggest an overall improvement in road user interactions at these locations, particularly in scenarios of low crash potential.

Several limitations should be considered when interpreting these results:

- Small sample size for high-severity conflicts – The low number of high crash potential events limits statistical reliability and increases sensitivity to small changes in observations.
- Limited observation period – The results reflect behaviors shortly after installation and may not capture long-term changes. Over time, users may become more familiar with the treatment, which can influence yielding compliance, crossing behavior, and overall user interaction dynamics.
- Subjective conflict classification – Conflict severity is inherently subjective and may introduce variability or bias to findings.
- Accounting for change in exposure – The number of pedestrians, bicyclists, and vehicles (i.e., user volumes) may have differed between the before and after periods, which can influence the number of observed conflicts. As a result, changes in conflict frequency may reflect shifts in exposure rather than the effect of the treatment alone. The project team attempted to control for major swings in exposure by accounting for school hours, weather, and seasonality when collecting before and after video.



4. Conclusion/Next Steps





The 2026 update to the Asphalt Art Safety Study demonstrates that safety for all users tends to improve at sites where asphalt art is implemented as part of safety and placemaking projects. The update and the original study combine crash analysis and behavioral observations in multiple cities to arrive at this conclusion and are supported by findings in the broader literature. The overall magnitude of changes in the average total, vulnerable road user, and injury crashes per year before and after asphalt art installation is remarkably similar across both studies. By increasing sample size, the 2026 update demonstrates that the decreases in average crashes after asphalt art installation are statistically significant.

The results are encouraging and should illustrate the potential of this topic for researchers and practitioners. Beyond safety, exploration of the effects of asphalt art on accessibility, local quality of life, and impacts on adjacent economic activity can illustrate the full impacts of these treatments. The project team has highlighted some areas where more research may be beneficial to measure the safety outcomes associated with asphalt art installation.

- The simple before-after methodology utilized in both phases of the Asphalt Art Safety Study provides findings that are easy for many planners and engineers to interpret but may not satisfy the level of rigor required by all audiences. Studies that employ more advanced statistical methods would address valid methodological critiques.
- The safety results demonstrated in this study do not isolate the effect of asphalt art alone. Rather, the potential effects of asphalt art comingle with other changes at asphalt art sites. Recent analysis of sites in Washington, D.C., however, have begun to isolate these effects for certain behaviors.
- As the number of asphalt art sites grow, so will studies that can assess the safety effects of asphalt art across a wider range of contexts. The findings from this study are generally applicable in urban areas at intersections with lower vehicle volumes. Studies that assess suburban and rural sites as well as sites on larger roadways like multi-lane arterials can provide more detailed guidance to practitioners in determining where to effectively deploy these treatments.


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