

Electronic Speed Safety Program

Program Report for CY 2022



*Delaware Department of Transportation
Nicole Majeski, Secretary*

Introduction

In accordance with Section 142 of Senate Bill 200 of the 151st General Assembly of the State of Delaware, the Department of Transportation (DelDOT) was authorized to and did enter into an agreement for the installation of temporary mobile speed enforcement devices along the work zone of the I-95 Restore the Corridor project to reduce speeding and crashes, and increase safety. This technology can only be used within the work zone limits and during construction of the project. Once construction was substantially complete, the devices were removed. DelDOT is providing this final report to the Joint Committee on Capital Improvements following the conclusion of the pilot speed monitoring program.

The devices were first made operational on January 17, 2022, issuing warnings only. Starting on April 17, 2022, first violations were still issued a warning, but subsequent violations were issued citations. The program ended and monitoring was removed following the return to full capacity on I-95 on November 4, 2022.

DelDOT's number one priority is the safety of all users, motorists, bicyclists, pedestrians, and workers on our roads. The Wilmington Viaduct "Restore the Corridor" project was a significant DelDOT transportation project along the I-95 corridor in Wilmington that made the repairs needed to extend the bridges' service life and avoid major and costly rehabilitation work for a minimum of 30 years. Planned construction included the repair of 19 bridges, I-95 pavement, and ramps within the project limits. Major construction on I-95 began in February 2021, with capacity reduced by a lane in both directions throughout the duration of the nearly two-year project.

Despite the reduced traffic volume on I-95 through Wilmington, crashes had increased significantly in 2021 compared to "baseline" crash rates from 2018 and 2019. Total crashes had increased 35% and severe (personal injury and fatal) crashes had increased 47%. Reducing speeds is a proven way to reduce the severity of crashes when they do occur but also give motorists more time to react to avoid potential crashes all together. However, traditional enforcement was not possible in the work zone area due to limited access points and construction occurring directly adjacent to travel lanes throughout much of the area.

Crash Data Analysis

DelDOT’s pilot Electronic Speed Safety Program (ESSP) has resulted in significant reductions in crashes, and in particular, injury crashes. Analysis was performed to compare crash data through the I-95 Restore the Corridor work zone before and after the beginning of the program on January 16, 2022.

During the 9.5 months of the deployment of the ESSP (January 17, 2022 – November 4, 2022), 191 total work zone crashes were reported, including 31 crashes resulting in personal injury (1 fatality crash).

During the same timeframe in 2021 (January 17, 2021 – November 4, 2021), 357 total work zone crashes were reported, including 50 crashes resulting in personal injury (1 fatality crash). The “after” ESSP crash data reflects a **46% reduction in total crashes** and a **38% reduction in injury crashes**.

Because the 2021 data may be skewed by the beginning of construction along I-95 and the first driver experience with contraflow conditions, crash data prior to construction and the COVID-19 pandemic was also analyzed. In the same timeframe in 2019 (January 17, 2019 – November 4, 2019), 237 total work zone crashes were reported, including 39 crashes resulting in personal injury. The “after” ESSP crash data reflects a **19% reduction in total crashes** and a **23% reduction in injury crashes**.

As demonstrated by the substantial reduction in total and injury crashes, the safety benefits of the ESSP were significant during the approximately 10 months of monitoring.

Speed Data

During the weekend of December 18-19, 2021, the I-95 Restore the Corridor project executed a major construction phase shift, moving all traffic from the southbound lanes (northbound in contraflow) to the northbound lanes (southbound in contraflow). Traffic remained in this arrangement until October 17, 2022, when a major traffic shift occurred to end the contraflow operation and return southbound traffic to the southbound side of the road.

To determine the impact of automated speed enforcement, a before period of December 19, 2021 through January 16, 2022 was compared to an after period of January 17, 2022 through October 16, 2022. As shown in the table below, average speeds recorded by Wavetronix devices within the work zone reported significantly lower speeds following the camera activation and warning notices being issued.

Table I: Average Speed Comparisons Before & After Enforcement

Daily Average Speeds		
	NB	SB
<i>Before Cameras</i>	54.3	49.0
<i>After Cameras</i>	49.0	43.1
Difference (mph)	-5.4	-5.9
<i>% Difference</i>	-9.9%	-12.1%

Camera Locations

The cameras were located only on I-95 in Wilmington, one northbound in the area of 5th Street, and one southbound in the area of SR 52/Delaware Avenue, both within the work zone for the I-95 Restore the Corridor project through the City of Wilmington. The camera locations were selected based on multiple factors, including:

- Critical Crash Areas – much of the work area maintains two travel lanes in each direction; however, between Maryland Avenue and Delaware Avenue, only one travel lane in each direction is maintained. A crash in this area has the potential to close an entire direction of I-95 until cleared, so lowering speeds and reducing crash rates in these areas is paramount.
- Central Location – the cameras are positioned between the two primary project work areas: the Brandywine River Bridge to the north and the Wilmington Viaduct section to the south.
- Maintenance Practicality – locations were identified that were easily accessible to safely perform any required maintenance and repairs to the cameras.

Warning signs indicating Automated Speed Enforcement Ahead were installed in advance of the camera locations. In addition, radar speed signs were also installed in advance of the cameras to notify motorists of their current speed.

Violations

A violation was recorded if a vehicle was traveling at a speed of 58 miles per hour (mph) or greater (13+ mph in excess of the posted 45 mph work zone speed limit). For a first violation, the notice carried no financial penalty and was a written warning. For each subsequent violation, the fine included multiple components:

- a base fine of \$20.00,
- an additional fine for the speed difference over the 45 mph work zone speed limit:
 - \$1.00 for each mph over 45 for recorded speeds of 58-60 mph,
 - \$2.00 for each mph over 45 for recorded speeds of 61-64 mph,
 - \$3.00 for each mph over 45 for recorded speeds of 65 mph or greater
- a surcharge of 50% of the speed violation,
- a \$10.00 assessment for the Volunteer Ambulance Company Fund,
- and a \$15.00 assessment for the Fund to Combat Violent Crimes.

A summary table of fines at each speed is provided in the Appendix.

The \$20.00 plus additional fine for the speed difference is authorized under Title 21 §4169 (c).

The surcharge originates from Title 11. Title 11 Del. C. §4101 requires any fines or fees levied for violations of Title 21 (such as speed camera enforcement violations) include an additional 50% surcharge.

In accordance with 11 Del. C. Section 4101(j), a \$10.00 assessment is placed on all Title 21 violations for the Volunteer Ambulance Company Fund. This assessment became effective in December 2014. All funds collected from this assessment are transferred to this fund.

In accordance with 11 Del. C. Section 4101(h), a \$15.00 assessment is placed on all Title 21 violations for the Fund to Combat Violent Crimes. This assessment became effective in July 2015. All funds collected from this assessment are transferred to this fund.

Under the State of Delaware's ESSP, violation notices were sent directly to the registered owner of the vehicle. Unlike traditional violations cited by a police officer, the camera violations are considered a civil offense and not a criminal offense. Because of this, the violation and fine do not affect the motorist's insurance rate or accumulate points on their driving record. Unpaid violations are subject to restrictions on renewal at time of vehicle registration. If delinquent, the Department increases the fine by \$10.00 for each 30-day period past the event, up to \$30.00 for 90 days.

From January 17, 2022 to April 17, 2022, only warnings were issued, as this was a new program. Citation notices began on April 17, 2022; however, motorists receiving their first offense received a warning. It is after the second offense that they received a citation.

Since the program began, 63,714 warnings were issued for speeding in the work zone between January 17, 2022 and November 4, 2022.

During the citation period, 8,765 Notices of Civil Violations were issued for speeding in the work zone between April 17, 2022 and November 4, 2022. All citations are reviewed by Delaware State Police before a warning or violation is issued.

The table on the next page breaks down total warnings and notices issued by speed and direction travelled.

Table II: Warnings and Notices Issued by Travelled Speed

Speed	SB Warnings	NB Warnings	Total Warnings	SB Notices	NB Notices	Total Notices
58	9,132	5,422	14,554	1,164	556	1,720
59	7,606	4,263	11,869	1,027	461	1,488
60	6,073	3,143	9,216	875	385	1,260
61	4,751	2,350	7,101	704	281	985
62	3,635	1,623	5,258	524	196	720
63	2,743	1,193	3,936	412	154	566
64	2,124	924	3,048	318	104	422
65	1,587	640	2,227	269	87	356
66	1,213	449	1,662	193	66	259
67	906	339	1,245	156	58	214
68	663	239	902	140	43	183
69	490	195	685	101	31	132
70	367	157	524	80	29	109
71	256	97	353	59	12	71
72	221	67	288	35	12	47
73	158	53	211	37	8	45
74	100	50	150	30	15	45
75	68	30	98	19	7	26
76	69	20	89	25	5	30
77	50	15	65	20	5	25
78	42	7	49	12	3	15
79	28	10	38	6	1	7
80	20	12	32	9	2	11
81	11	5	16	7	1	8
82	15	5	20	5	0	5
83	6	6	12	2	1	3
84	7	3	10	3	0	3
85	5	5	10	2	0	2
86	3	4	7	4	0	4
87	7	2	9	0	0	0
88	1	3	4	0	0	0
89	5	3	8	1	0	1
90	1	3	4	0	0	0
91	3	0	3	1	0	1
92	3	1	4	0	0	0
93	1	0	1	0	0	0
94	2	0	2	0	0	0
95	0	0	0	1	0	1
97	0	1	1	0	0	0
98	0	1	1	0	0	0
102	1	0	1	0	0	0
105	0	0	0	1	0	1
110	1	0	1	0	0	0
TOTALS	42,374	21,430	63,714	6,242	2,523	8,765

Revenue / Expenses

Although the ESSP's priority is safety and not revenue generation, the program is expected to produce more money than it costs to operate. Finance data from the program's inception through November 30, 2022, **which included a 90-day warning-only period where fines/revenue were not being generated**, are as follows:

- Expenses: \$722,811.00
 - \$712,900.00 to Conduent (2 cameras @ \$35,645 each, monthly)
 - \$9,911.00 in payroll expenses to Delaware State Police
- Fines Issued: \$977,403.50
 - \$664,918.50 in base fines and surcharges
 - \$93,360.00 in late fees
 - *Includes fees for second (\$10) and third (\$10) notices issued through November 21, 2022. Breakdown of final \$10 late fee and ongoing late fees for unpaid recent violations are still in processing.*
 - \$219,125.00 for Violent Crimes and Ambulance Funds
- Actual Receipts: \$434,780.60
 - *Total currently includes funds owed to Violent Crimes and Ambulance Funds. Processing for transfer to these funds based on violations paid in full and in part is ongoing.*

Supporting Contractor

DelDOT operated the Electronic Speed Safety Program with the vendor, Conduent (formerly Xerox) under Agreement 1671 – Electronic Red Light Safety Program. Conduent has managed the State's Electronic Red Light Safety Program since 2014 and was able to accommodate the needs of this pilot program through an addendum of the existing Agreement. The authorizing legislation dictated entering an agreement with the existing vendor.

Conduent utilized the Vitronic POLISCAN FM1, LIDAR measurement technology that accurately detects the speed of the vehicle as well as the number plate and vehicle class. The device records two high-resolution digital photographs of vehicle, showing progression past a fixed object, and a close-up image of the license plate for each speeding event. Each unit is calibrated prior to initial deployment and annually thereafter by a third-party testing lab approved by DelDOT. The Certificate of Calibration is available to police, violators, and courts for review.

APPENDIX

**I-95 Restore the Corridor
Automated Speed Enforcement
Speed Violation Fine Matrix**

Recorded Speed (MPH)	Base Fine	Additional Fine for Speed Difference (21 Del. C. §4159(c))	Initial Speed Fine	TIF Surcharge 50% Surcharge of Fine (11 Del. C. 4101(g))	Fund to Combat Violent Crimes (11 Del. C. 4101(h))	Volunteer Ambulance Company Func (\$10) (11 Del. C. 4101(j))	Total Fine
≤ 57 MPH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
58	\$20.00	\$13.00	\$33.00	\$16.50	\$15.00	\$10.00	\$74.50
59	\$20.00	\$14.00	\$34.00	\$17.00	\$15.00	\$10.00	\$76.00
60	\$20.00	\$15.00	\$35.00	\$17.50	\$15.00	\$10.00	\$77.50
61	\$20.00	\$16.00	\$36.00	\$18.00	\$15.00	\$10.00	\$79.00
62	\$20.00	\$17.00	\$37.00	\$18.50	\$15.00	\$10.00	\$80.50
63	\$20.00	\$18.00	\$38.00	\$19.00	\$15.00	\$10.00	\$82.00
64	\$20.00	\$19.00	\$39.00	\$19.50	\$15.00	\$10.00	\$83.50
65	\$20.00	\$20.00	\$40.00	\$20.00	\$15.00	\$10.00	\$85.00
66	\$20.00	\$21.00	\$41.00	\$20.50	\$15.00	\$10.00	\$86.50
67	\$20.00	\$22.00	\$42.00	\$21.00	\$15.00	\$10.00	\$88.00
68	\$20.00	\$23.00	\$43.00	\$21.50	\$15.00	\$10.00	\$89.50
69	\$20.00	\$24.00	\$44.00	\$22.00	\$15.00	\$10.00	\$91.00
70	\$20.00	\$25.00	\$45.00	\$22.50	\$15.00	\$10.00	\$92.50
71	\$20.00	\$26.00	\$46.00	\$23.00	\$15.00	\$10.00	\$94.00
72	\$20.00	\$27.00	\$47.00	\$23.50	\$15.00	\$10.00	\$95.50
73	\$20.00	\$28.00	\$48.00	\$24.00	\$15.00	\$10.00	\$97.00
74	\$20.00	\$29.00	\$49.00	\$24.50	\$15.00	\$10.00	\$98.50
75	\$20.00	\$30.00	\$50.00	\$25.00	\$15.00	\$10.00	\$100.00
76	\$20.00	\$31.00	\$51.00	\$25.50	\$15.00	\$10.00	\$101.50
77	\$20.00	\$32.00	\$52.00	\$26.00	\$15.00	\$10.00	\$103.00
78	\$20.00	\$33.00	\$53.00	\$26.50	\$15.00	\$10.00	\$104.50
79	\$20.00	\$34.00	\$54.00	\$27.00	\$15.00	\$10.00	\$106.00
80	\$20.00	\$35.00	\$55.00	\$27.50	\$15.00	\$10.00	\$107.50
81	\$20.00	\$36.00	\$56.00	\$28.00	\$15.00	\$10.00	\$109.00
82	\$20.00	\$37.00	\$57.00	\$28.50	\$15.00	\$10.00	\$110.50
83	\$20.00	\$38.00	\$58.00	\$29.00	\$15.00	\$10.00	\$112.00
84	\$20.00	\$39.00	\$59.00	\$29.50	\$15.00	\$10.00	\$113.50
85	\$20.00	\$40.00	\$60.00	\$30.00	\$15.00	\$10.00	\$115.00
86	\$20.00	\$41.00	\$61.00	\$30.50	\$15.00	\$10.00	\$116.50
87	\$20.00	\$42.00	\$62.00	\$31.00	\$15.00	\$10.00	\$118.00
88	\$20.00	\$43.00	\$63.00	\$31.50	\$15.00	\$10.00	\$119.50
89	\$20.00	\$44.00	\$64.00	\$32.00	\$15.00	\$10.00	\$121.00
90	\$20.00	\$45.00	\$65.00	\$32.50	\$15.00	\$10.00	\$122.50
91	\$20.00	\$46.00	\$66.00	\$33.00	\$15.00	\$10.00	\$124.00
92	\$20.00	\$47.00	\$67.00	\$33.50	\$15.00	\$10.00	\$125.50
93	\$20.00	\$48.00	\$68.00	\$34.00	\$15.00	\$10.00	\$127.00
94	\$20.00	\$49.00	\$69.00	\$34.50	\$15.00	\$10.00	\$128.50
95	\$20.00	\$50.00	\$70.00	\$35.00	\$15.00	\$10.00	\$130.00
96	\$20.00	\$51.00	\$71.00	\$35.50	\$15.00	\$10.00	\$131.50
97	\$20.00	\$52.00	\$72.00	\$36.00	\$15.00	\$10.00	\$133.00
98	\$20.00	\$53.00	\$73.00	\$36.50	\$15.00	\$10.00	\$134.50
99	\$20.00	\$54.00	\$74.00	\$37.00	\$15.00	\$10.00	\$136.00
100	\$20.00	\$55.00	\$75.00	\$37.50	\$15.00	\$10.00	\$137.50

Speed Enforcement Equipment Calibration: The speed camera and radar devices meet the requirements and tolerance specified in the technical directive of the manufacturer for the calibration.

The international usually accepted tolerances for placing on the market are: 1 mph for measurement values up to 100 mph and 1% of the right value for measurement values over 100 mph by rounding up to the nearest integer value.