



**PENNSYLVANIA STATE
TRANSPORTATION ADVISORY COMMITTEE**

**EVALUATION OF THE
AUTOMATED SPEED ENFORCEMENT PILOT ON
ROOSEVELT BOULEVARD**

FINAL REPORT

DRAFT



December 2022



Table of Contents

Acknowledgments 1

About the Transportation Advisory Committee 1

Transportation Advisory Committee 1

Ad Hoc Automated Speed Enforcement Task Force 3

Contributing Participants 3

Executive Summary 4

Introduction: Program Overview 7

Study Objectives 8

ASE Pilot Program Overview 8

Legislative Requirements 9

Key Pilot Program Information 12

ASE Pilot Program Administration and Roles 12

ASE Pilot Program Locations 13

Violation History 14

Vehicle Speeds 16

Crashes 17

Economic Value of Crash Reduction 17

Public Engagement and Transparency 18

Fees and Payment 19

Financial Overview 19

Equity 20

Collection of Fines 21

ASE Funding Program 21

ASE Program Expansion 23

Speed Enforcement Camera Systems - Operational Guidelines 23

Public Support 23

Cost of ASE Implementation 24

Expertise Required for Implementation 27

ASE – National Perspective 28

Major Findings 30

Recommendations 33



**Pennsylvania State
Transportation Advisory Committee**

Appendix A – Legislation and Regulations Related to Speed Enforcement.....	36
<i>Title 75 Pa. C.S. §3368. Speed timing devices.....</i>	<i>36</i>
<i>Title 75 Pa. C.S. §3369. Automated speed enforcement systems in active work zones</i>	<i>36</i>
<i>67 Pa. Code §105. Mechanical, Electrical, and Electronic Speed-Timing Devices and §105a. Automated Speed Enforcement Systems – Temporary Regulations.....</i>	<i>36</i>
Appendix B – ASE Deployment Rationale.....	38
Appendix C – Other State Case Studies	40
<i>Legislative Issues</i>	<i>42</i>
Appendix D – Example Violation Notice.....	44
Appendix E – Philadelphia Vision Zero Presentation.....	46
Appendix F – References.....	47



Acknowledgments

About the Transportation Advisory Committee

The Pennsylvania Transportation Advisory Committee (TAC) was established in 1970 by Act 120 of the State Legislature, which also created the Pennsylvania Department of Transportation (PennDOT).

TAC has two primary duties. First, it "consults with and advises the State Transportation Commission and the Secretary of Transportation on behalf of all transportation modes in the Commonwealth." In fulfilling this task, TAC assists the Commission and the Secretary "in the determination of goals and the allocation of available resources among and between the alternate modes in the planning, development, and maintenance of programs, and technologies for transportation systems."

TAC's second duty is "to advise the several modes (about) the planning, programs, and goals of the Department and the State Transportation Commission." TAC undertakes in-depth studies on important issues and serves as a liaison between PennDOT and the general public.

TAC consists of the following members: the Secretary of Transportation; the heads (or their designees) of the Department of Agriculture, Department of Education, Department of Community and Economic Development, Public Utility Commission, Department of Environmental Protection, and the Governor's Policy Office; two members of the State House of Representatives; two members of the State Senate; and 18 public members—six appointed by the Governor, six appointed by the President Pro Tempore of the Senate, and six appointed by the Speaker of the House of Representatives.

Transportation Advisory Committee

Honorable Jody L. Holton, AICP

Chair
Assistant General Manager
SEPTA

Honorable Yassmin Gramian, P.E.

Secretary
PA Department of Transportation

Honorable Gladys M. Brown Dutrieuille

Chair
PA Public Utility Commission

Honorable Neil Weaver

Acting Secretary
PA Department of Community and Economic
Development

Honorable Allison Jones

Secretary of Planning and Policy
Office of the Governor

Honorable Patrick McDonnell

Secretary
PA Department of Environmental Protection

Honorable Russell Redding

Secretary
PA Department of Agriculture

Honorable Eric Hagarty

Acting Secretary
PA Department of Education

Honorable Wayne Langerholc, Jr.

Senate of Pennsylvania
Majority Chair of Senate
Transportation Committee
Alt: Nolan R. Ritchie

Honorable Timothy P. Kearney

Senate of Pennsylvania
Transportation Committee
Alt: Sam Arnold



**Pennsylvania State
Transportation Advisory Committee**

Honorable Tim Hennessey

PA House of Rep.
Majority Chair of House
Transportation Committee
Alt: Josiah Shelly

Honorable Mike Carroll

PA House of Rep.
Minority Chair of House
Transportation Committee
Alt: Meredith Biggica

Mr. Michael Carroll, P.E.

Office of Transportation and Infrastructure
Systems
City of Philadelphia

Ms. Felicia Dell, AICP

Director of Planning
York County Planning Commission

Mr. Donald L. Detwiler

New Enterprise Stone and Lime Co., Inc
Bedford County

Mr. Richard Barcaskey

Executive Director, Constructors Association of
Western Pennsylvania
Allegheny County

Mr. Mark Murawski

TAC Vice-Chair
Transportation Planner
Lycoming County

Mr. John Pocius, P.E., PLS

LaBella Associates
Lackawanna County

Mr. L. Ashley Porter, P.E.

Porter Consulting Engineers, P.C.
Crawford County

Ms. Karina Ricks

Director, Department of Mobility and
Infrastructure
City of Pittsburgh

Ms. Brenda A. Sandberg

Executive Director at Erie-Western PA Port
Authority
Erie County

Mr. Jeffrey J. Stroehmann

JDM Consultants
Union County

Mr. Alan Blahovec, CCTM

Executive Director, Westmoreland County
Transit Authority
Westmoreland County

Mr. Charles F. Welker, P.E.

EADS Group, Inc. (ret.)
Blair County

Larry J. Nulton, Ph.D.

Nulton Aviation Services, Inc.
Cambria County

Mr. Elam Herr

Pennsylvania State Association of Township
Supervisors (retired)
Lancaster County

Mr. Ron G. Wagenmann

Manager, Upper Merion Township (retired)
Montgomery County

Ms. Rebecca Oyler

President & CEO
Pennsylvania Motor Truck Association
Camp Hill



Ad Hoc Automated Speed Enforcement Task Force

The TAC thanks the members of the Task Force formed to guide the direction of this study effort. Their knowledge and expertise of automated speed enforcement helped guide the course of the study process.

Honorable Jody L. Holton, AICP

TAC Chair
Assistant General Manager
SEPTA

Mr. Michael Carroll, P.E.

Deputy Managing Director
Office of Transportation and Infrastructure
Systems
City of Philadelphia

Mr. Daniel Farley, P.E.

Director, Bureau of Operations
PA Department of Transportation

Mr. Steve Gault, P.E., PTOE

Chief, Traffic Systems Management and
Operations (TSMO) Arterials and Planning
Section
PA Department of Transportation

Mr. Elam Herr

Pennsylvania State Association of Township
Supervisors (retired)
Lancaster County

Mr. Dan Keane

Transportation Planning Manager,
Program Center
PA Department of Transportation

Mr. Terry Pinder

Transportation Planning Specialist,
Program Center
PA Department of Transportation

Mr. Gustave Scheerbaum, P.E.

Director of Transportation Strategic Initiatives
Department of Streets
City of Philadelphia

Mr. Mark Tobin

Manager, Funding and 12-Year Program
Division
PA Department of Transportation

Contributing Participants

The TAC acknowledges the contributions of the following individuals and organizations who helped broaden and inform the team's understanding of this topic.

Erick Guerra, Ph.D., University of Pennsylvania, City and Regional Planning

Corinne O'Connor, Philadelphia Parking Authority

Michael Smakulski, Philadelphia Parking Authority

Casey Wech, Philadelphia Parking Authority

Abdul Zineddin, Ph.D., Federal Highway Administration, Office of Safety



Executive Summary

Introduction

Automated Speed Enforcement (ASE) is growing in prominence as an effective countermeasure for improving roadway safety. Currently 19 states and the District of Columbia presently operate some form of ASE, primarily in work zones and school zones. Both the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA) have directives for transportation agencies to consider implementation of automated enforcement.

The Pennsylvania General Assembly enacted legislation through Act 86 of 2018 that formally introduced automated speed enforcement in the state through a five-year pilot involving a portion of US 1 or Roosevelt Boulevard in the City of Philadelphia between Ninth Street and the Bucks County line.¹

With the ASE pilot set to expire on December 18, 2023, the state Transportation Advisory Committee (TAC) undertook this evaluation to determine the merits of the ASE pilot and its effectiveness in meeting its objectives of reducing speeds, fatalities, and suspected serious injuries.

Strong Legislation

ASE's effectiveness is rooted not only in the technology, but also in the cogency of the language of the law allowing its operation. Pennsylvania's law regarding ASE is well crafted and has avoided miscues made by other States.² Among Pennsylvania's laws, many provisions include those that protect the driver from surveillance (with images taken only of the rear of the vehicle), and opportunities to contest any violations believed to have been received in error. The law is also well structured in that it dictates that program revenue not go to the vendor based on the total number of violations – thus minimizing incentive, or public skepticism of a perceived incentive, to have violations issued for the purposes of generating revenue. Despite this tenet of the law, the ASE pilot program has demonstrated its ability to be self-sustaining for the City of Philadelphia, with a violation fine structure that is based on a sliding scale, dependent on the margin of speed registered in excess of the posted speed limit.

ASE: A Successful Pilot

The “unblinking eye” of ASE has been effective at changing driver behavior by reducing speeds and roadway fatalities. A summary of data collected a year before (2019) and a year after (2021) the height of the COVID-19 pandemic offers a compelling rationale of the ASE pilot's success in achieving its stated objectives: total crashes declined by 36 percent along Roosevelt Boulevard over the period while falling only six percent citywide. Other measures of effectiveness such as the number of suspected serious injuries and crashes related to aggressive driving also exhibited similar positive results, as shown in the accompanying table.

¹ The Act also included the Automated Work Zone Speed Enforcement (AWZSE) program. This report focuses on the fixed-location type on Roosevelt Boulevard, and not the work zone type.

² The National Conference of State Legislatures (NCSL) has referenced and specifically called out Pennsylvania's legislation as a model.



Table 1: Crash Data for Roosevelt Boulevard and all of Philadelphia before ASE Implementation and After

Crash Statistic	2019 Before ASE	2021 After ASE	Percent Change
Roosevelt Boulevard			
Total crashes	374	239	-36%
Total crashes with fatalities or suspected serious injuries	27	24	-11%
Total speeding related crashes (where at least one vehicle was speeding, racing, or driving too fast for conditions)	47	39	-17%
Total crashes with at least one aggressive driver action	200	132	-34%
Philadelphia			
Total crashes	11,131	10,463	-6%
Total crashes with fatalities or suspected serious injuries	479	555	+16%
Total speeding related crashes (where at least one vehicle was speeding, racing, or driving too fast for conditions)	1,730	1,931	+12%
Total crashes with at least one aggressive driver action	5,147	5,151	0%

Source: [Pennsylvania Crash Information Tool](#)

The Philadelphia Parking Authority (PPA), as the ASE program’s system administrator, has engaged the public regarding the program’s implementation, from an initial public outreach campaign, to the production of YouTube videos, numerous press releases, and transparency with the media regarding the program’s operation.

Recommendations

Given the Pilot’s success, the TAC recommends that the ASE program not only continue beyond the legislatively prescribed sunset of December 18, 2023, but that **its use be widened to become a statewide program**, similar to the successful Automated Red Light Enforcement program (ARLE) that preceded it.

A proposed expansion should be bound by several parameters, including requiring PennDOT oversight and approval of future ASE locations as proposed by a municipality; establishing consequences for nonpayment of fines or repeat offenders; and exploring opportunities for interested communities to enter into multi-municipal partnerships. Such partnerships would be advantageous for municipalities seeking to share the program’s administrative and operating burden and maintain corridor continuity for an ASE program that crosses municipal boundaries.

The TAC is also recommending that PennDOT **establish a policy for requiring engineering studies related to ASE site selection** using a study process that conveys the applicability of ASE for the study



area/corridor. Study outcomes would be initially approved by the municipality and forwarded to PennDOT for a final decision on ASE implementation.

PennDOT will have to assume a more technical role if expansion occurs. Establishing a central program of technical expertise would greatly benefit municipalities interested in deploying ASE in the future.

Public campaigns to bring awareness to ASE and its benefits should be continued, as more sites are proposed, and cameras are installed.

The TAC also believes **the current funding program process should continue**, with net revenue from the program continuing to be remitted to PennDOT for the funding safety and mobility projects in accordance with Title 75 Pa. C.S. §3370.

Conclusion: Working Toward Zero Deaths

The TAC's objective evaluation of the ASE pilot program on Roosevelt Boulevard quantifies the program's success at changing driver behavior, improving safety, and saving lives. ASE has demonstrated its effectiveness and deserves consideration by the General Assembly for continuation and expansion beyond Roosevelt Boulevard to a statewide application.

Crashes, injuries, and deaths that occur because of speeding or poor driver behavior are preventable. One death is too many, and ASE can be used throughout Pennsylvania as another effective safety countermeasure that can help PennDOT and the state's municipalities bring the annual number of roadway deaths down to zero.



Introduction: Program Overview

- The use of automated enforcement systems to address speeding and red-light running are in use across the United States. Many States have enabling legislation and/or parameters on the use of the technology, while others still have no legislation that addresses the technology's use.
- The National Highway Traffic Safety Administration (NHTSA) encourages the use of automated speed enforcement (commonly referred to as "photo radar") and red-light camera systems as a component of a broader traffic safety and speed management program supported by a demonstrated need through problem identification. As of June 2020, over 150 municipalities nationwide are using automated speed cameras.
- This study was an independent evaluation of the five-year Automated Speed Enforcement (ASE) pilot on Roosevelt Boulevard within the City of Philadelphia.
- The study evaluated the ASE pilot to determine its effectiveness and the potential for making the pilot permanent, or at least consider a 10-year extension, similar to what was done for the Automated Red Light Enforcement Program (ARLE) in 2017.³ Moreover, the TAC sought to answer the question of what the future of ASE should be, beyond Roosevelt Boulevard.
- Given ARLE's success in reducing crashes and red light running, the ASE study process explored the potential to expand the ASE pilot to other locations, perhaps even to areas where it may not be self-sustaining.
- The study also addressed what are the next logical steps for speed enforcement, which could include an expanded program into other jurisdictions. Philadelphia is a "Vision Zero" community and PennDOT has a Toward Zero policy in relation to fatalities. With an intent of eliminating all traffic fatalities by 2030, the TAC believes that new innovative approaches need to be explored.
- The ASE pilot itself was implemented to evaluate its potential effectiveness in reducing speed-related fatalities, and became effective on December 19, 2018 under Title 75, §3370 - Pilot program for automated speed enforcement system on designated highway. It will expire on December 18, 2023. Roosevelt Boulevard has one of the highest crash rates within the City of Philadelphia.

Roosevelt Boulevard Overview



Designation: US 1

Limits: 14 miles, from Center City Philadelphia to Bucks County

Functional Class: principal arterial, with separate local and express lanes (12 total)

Posted Speed Limit: 40 or 45 mph

Crash History (2013-17): 2,846, or 14% of all crashes in Philadelphia (with 81 severe injuries; 62 fatalities)

³ The law permitting ARLE was extended several times. The work of the TAC was key to the program being successfully extended after it issued a report on the program in 2011, and then extended again after the TAC's follow-up report in 2017. Given this history, the TAC wished to preclude the need for any "last minute" temporary extensions of the ASE pilot with an in-depth analysis of the program.



- The TAC study was scheduled for completion at the end of 2022 so that the transportation committees in the state legislature will have time to review and deliberate its merits.

Study Objectives

The main objectives of this report include:

- Assess the effectiveness of the ASE program as it is currently being administered.
- Evaluate other states' practices and national issues pertaining to ASE.
- Provide considerations for extending the program beyond the pilot's December 18, 2023 expiration.
- Provide considerations for expanding the program statewide.

ASE Pilot Program Overview

- ASE uses speed measurement devices to detect speeding and capture photographic evidence of vehicles that are traveling a set threshold above the posted speed limit.
- Recognizing the potential of ASE, the Pennsylvania General Assembly passed Act 86 in 2018 as a response to the high occurrence of severe and fatal crashes on Roosevelt Boulevard. Act 86 amended Title 75 of the Pennsylvania Consolidated Statutes (Pa. C.S.) to create Section 3370.
- This amendment provided the authority to establish an ASE system pilot program along U.S. Route 1 (Roosevelt Boulevard) between Ninth Street and the Philadelphia County/Bucks County line. Section 3370 is legislated to expire on December 18, 2023, which is five years from its effective date.
- The City of Philadelphia passed Ordinance 190184 in June 2019, allowing the use of automated cameras to determine speeding violations on Roosevelt Boulevard. Eight camera locations were initially identified and approved by the Pennsylvania Department of Transportation (PennDOT), and camera installation began in January 2020.⁴ The COVID-19 pandemic however delayed the anticipated April 18, 2020 start of the 60-day warning period until June 1, 2020, and also delayed the beginning of violations, from June 16, 2020 until August 1, 2020. This timeline is depicted in **Figure 1**.
- The purpose of the ASE pilot program on Roosevelt Boulevard has been to save lives by managing driving speeds.

Speed cameras have been shown to reduce crashes on urban principal arterials, like Roosevelt Boulevard, by 54 percent for all crashes and by 47 percent for injury crashes.

⁴ Two additional locations were added afterward, based on data that indicated certain portions of the Boulevard did not experience the same reductions in violations and speeds. The Office of Transportation, Infrastructure, and Sustainability (OTIS) and PennDOT agreed with these conclusions and approved the additional locations.

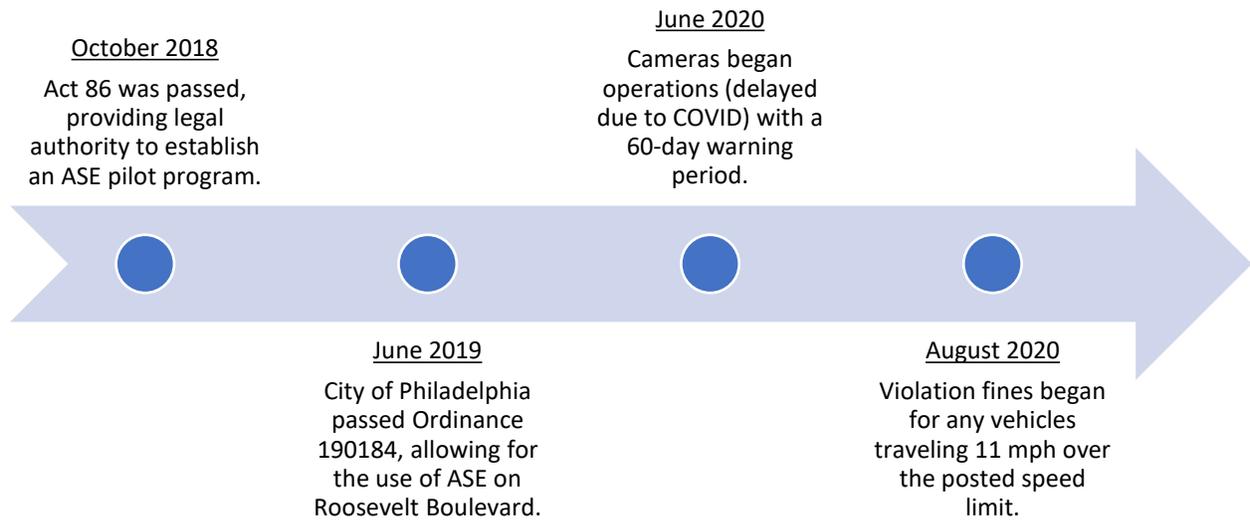


Figure 1. Automated Speed Enforcement Timeline

Legislative Requirements

Title 75 Pa. C.S. §3370 legislates the ASE pilot program on Roosevelt Boulevard at a state level and Ordinance 190184 establishes the regulations for its use within the City of Philadelphia. Other regulations affecting automated speed enforcement are expanded upon in **Appendix A**.

State Law – Title 75 Pa. C.S. §3370. Pilot program for automated speed enforcement system on designated highway

Section 3370 establishes the following rules and regulations for the ASE pilot program:

- A violation of the section is driving in excess of the posted speed limit by 11 mph or more.
- Violations are assessed to the vehicle owner, not the driver.
- Fines for violations may not exceed \$150.
- Fines are not authorized during the first 30 days of operation of an ASE system.
- An owner to whom a notice of violation was issued may request a hearing to contest the violation.
- Locations of ASE must be posted on PennDOT’s website throughout the period of enforcement.
- Violations are not criminal convictions, and no points are assessed to operating records.
- Two warning signs must be placed at the start and end of the system and at two-mile intervals notifying the public that an ASE device is in use.
- Recorded images of the front of vehicles cannot be used as evidence of violations.



- Images shall not be used for any surveillance purposes.
- Images must be destroyed within one year of the final disposition of the recorded event or, if subject to a court order, two years after the date of the order.
- Camera sites must be approved by PennDOT.
- Violations must be issued by the police.
- Compensation to the vendor shall be based on the value of the equipment and services provided and shall not be based on the number of citations issued.
- Fines from the program shall be used for the Transportation Enhancement Grants Program and used for safety and mobility projects in PA.
- The ASE devices shall be tested at regular intervals as defined by PennDOT.
- The Philadelphia Parking Authority shall be the system administrator to supervise and coordinate the administration of notices of violation.
- The system administrator shall submit an annual program report no later than April 1.

City Law – City of Philadelphia Ordinance 190184

In June 2019, the City of Philadelphia passed Ordinance 190184, which added Chapter 12-3400 to The Philadelphia Code. The Ordinance allowed for the use of automated cameras along Roosevelt Boulevard and established a system of enforcement and administration. Ordinance 190184 is also set to expire on December 18, 2023.

While Act 86 created guidance and criteria for instituting an ASE system on Roosevelt Boulevard under 75 Pa. C.S. §3370, Ordinance 190184 further developed the criteria set forth in Act 86 as follows:

- The fine amount is a sliding scale dependent on the vehicle's speed:
 - 11 to 19 mph over the posted speed limit: \$100;
 - 20 to 29 mph over the posted speed limit: \$125;
 - >30 mph over the posted speed limit: \$150.
- The warning period shall be 60 days (exceeding the 30-day minimum in Act 86).
- No more than three violation notices shall be issued for violations occurring within any 30-minute period, provided the notices issued are for violations with the highest fine amounts.
- Additional penalties for failure to answer a notice of violation.
- Any vehicle parked on a public street that has any combination of three or more delinquent parking tickets, Automated Red-Light Enforcement (ARLE) violation notices, or ASE violation notices may be towed or immobilized.



- The ordinance will expire in conjunction with Section 3370, either on December 18, 2023 or later if Section 3370 is extended.

Technologies used in Pennsylvania

Per Title 75 Pa. C.S. §3368, two technologies are permitted to detect vehicles exceeding the posted speed limit as part of an ASE system: radar and lidar speed timing devices. Lidar devices use reflected light to determine target range and speed based on the time-of-flight of laser light pulses reflected off a target. Radar devices work on the same principle but use radio waves instead of light.

Radar speed timing devices can either be “down-the-road” or “across-the-road” radar. Both types transmit continuous-wave microwave beams, monitor the signals reflected back from moving vehicles, and process the Doppler shifts of the reflected signals to measure vehicle speeds. Down-the-road radar monitors signals reflected from vehicles moving within the microwave beam. Across-the-road radar monitors signals reflected from vehicles crossing the microwave beam. Currently, ASE on Roosevelt Boulevard uses across-the-road radar. The Automated Work Zone Speed Enforcement (AWZSE) program uses both down-the-road and across-the-road radar, where both radar measurements must match for a violation to occur.

67 PA. Code §105a “Automated Speed Enforcement Systems” provides the necessary provisions that the automated enforcement units are tested to. Per the NHTSA technical specifications, the required accuracy of each speed timing technology approved for use in Pennsylvania is as follows:

- Down-the-Road Radar: +1 mph, -2 mph
- Across-the-Road Radar: +1 mph, $-(2 \text{ mph} + 0.01 * \text{actual speed})$
- Lidar: +1 mph, -2 mph

While authorized, lidar is not currently used for ASE in Pennsylvania.



Key Pilot Program Information

ASE Pilot Program Administration and Roles

There are several different agencies involved in managing and implementing the ASE pilot program. **Table 1** identifies the primary entities involved and their role and responsibilities within the pilot.

Table 2. ASE Pilot Program Roles and Responsibilities

Agency	Roles and Responsibilities
PennDOT	<ul style="list-style-type: none"> • Approves ASE equipment to Temporary Regulations in Pennsylvania Code Title 67, Chapter 105a • Approves ASE location requests • Administers the Transportation Enhancement Grants Program based on generated revenue
City of Philadelphia Office of Transportation, Infrastructure, and Sustainability (OTIS)	<ul style="list-style-type: none"> • Approves the locations based on known crash concerns as well as other factors being considered along the corridor
City of Philadelphia - Department of Streets	<ul style="list-style-type: none"> • Provides input on and approval of ASE deployment locations
City of Philadelphia – Police Department	<ul style="list-style-type: none"> • Reviews and verifies speed limit violations
City of Philadelphia – Traffic Court	<ul style="list-style-type: none"> • Hears all of the contested violations
Philadelphia Parking Authority (PPA)	<ul style="list-style-type: none"> • System Administrator of the ASE program as defined in 75 Pa. C.S. §3370 • Responsible for program reporting, including an annual report, and management of the automated enforcement vendor • Determines locations of ASE deployments with input from OTIS and the Department of Streets • Coordinates the entire process, from obtaining the images, getting them through the process, assisting Philadelphia Police with the review, and ensuring the proper mailing of violations from the vendor • Dedicates personnel to the ARLE and ASE programs and currently includes 17 full-time employees. Typically, two to four people are dedicated to the daily operation of the ASE program, with the remaining focused on ARLE operations
Verra Mobility (ASE Vendor)	<ul style="list-style-type: none"> • Responsible for equipment maintenance, enforcement software, annual calibrations, processing of violations, and ensuring and tracking of payments
City of Philadelphia Department of Finance Office of Administrative Review	<ul style="list-style-type: none"> • Conducts hearings to determine the liability of ASE violations
Duncan Solutions	<ul style="list-style-type: none"> • Parking management provider • Processes overdue ASE violations

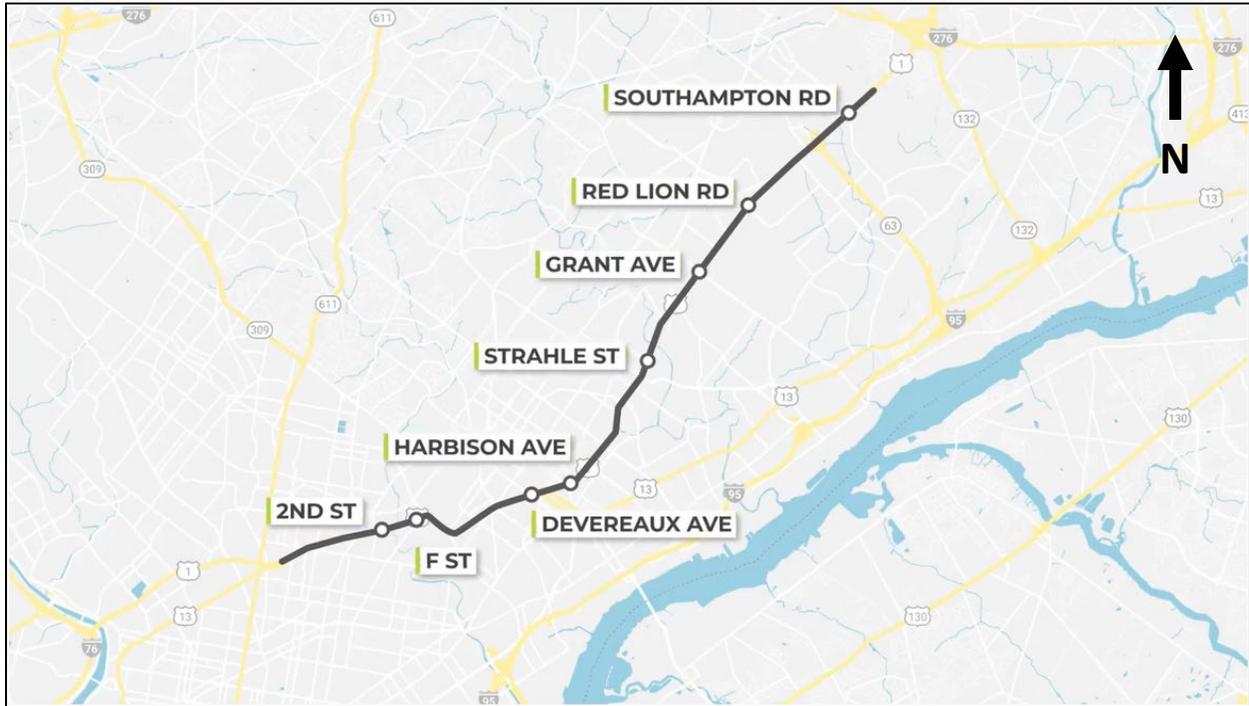


Agency	Roles and Responsibilities
	<ul style="list-style-type: none"> • Manages the system that tracks delinquent parking tickets, ARLE violation notices, and ASE violation notices for towing or immobilization per Ordinance 190184
PRWT Services	<ul style="list-style-type: none"> • Payment processing service • Provides the Customer Service Center and call center
Harris and Harris; Professional Account Management; and TSI	<ul style="list-style-type: none"> • Debt collection agencies that are assigned debt from unanswered violations • Debt is split between the three debt collectors, and they retain a percentage of the payment they recover • The percentage they retain varies from 12-24%, starting at 12% for debt that is less than one year old and increasing as the debt ages • If a debt is paid directly to PPA, the debt collection agencies do not receive any percentage

ASE Pilot Program Locations

- To select the locations for ASE deployment, all of the agencies (with OTIS in a lead role) obtained data on crashes, speeds, and aggressive driving to determine the best locations for the initial deployment along the corridor. Initially, eight locations along Roosevelt Boulevard were designated for ASE deployments, as shown in **Figure 2**.⁵ A rationale for deploying ASE at each location is included in **Appendix B**.
- Locations for speed cameras were selected using a methodology that balanced consistent camera spacing throughout the corridor with concentrated enforcement in areas experiencing the greatest cluster of crashes resulting in a fatality or serious injury.
- After the locations were identified, site inspections and analyses were conducted to confirm the construction and operational feasibility of the site. Following collaborative approvals from PennDOT and the City of Philadelphia, PPA’s vendor (Verra Mobility) installed the cameras.

⁵ Since the original eight ASE locations have been in operation, PPA has proposed two new locations for ASE: 700 West Roosevelt Boulevard and 5000 Roosevelt Boulevard. These two proposed locations were recommended based on the data found in PPA’s *2021 Automated Speed Enforcement Pilot Program-Roosevelt Boulevard Annual Report* indicating that certain portions of the Boulevard did not experience the same reductions in violations and speed. Additionally, these areas include large segments of Roosevelt Boulevard without any ASE deployments. Department of Streets and PennDOT approved the locations, and the warning period began on June 1, 2022, with fines beginning in August 2022.



Source: PPA “Automated Speed Enforcement Cameras” YouTube Video

Figure 2. ASE Pilot Program Locations

Violation History

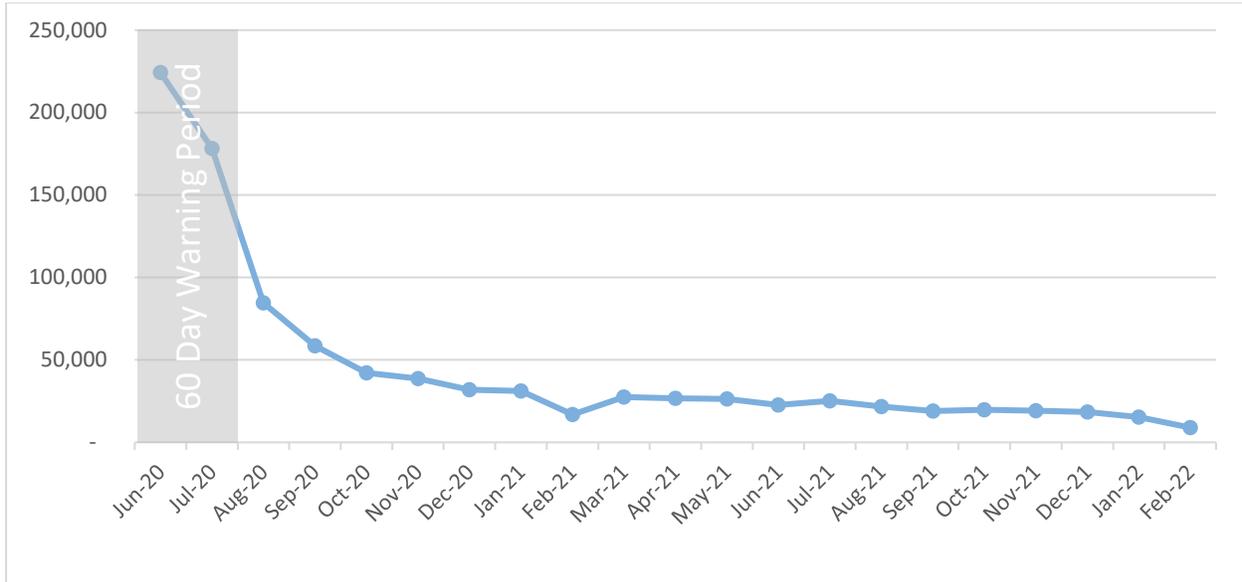
- The annual PPA ASE reports include violation and speed data for each deployment location, along with fine collection data.
- **Figure 3** summarizes the trends in total violations from June 2020 to February 2022. The data shows violations significantly decreasing after the 60-day warning period ended, after which fines for violations began in August 2020. Since then, violations have been steadily trending downward. Overall, total violations per month have decreased 96%, from 224,206 in June 2020 to 8,939 in February 2022.⁶

Violation Process

When a violation occurs, the following process is followed to identify and ticket vehicles:

1. The ASE camera captures a vehicle traveling 11 mph or more over the posted speed limit.
2. The vendor (Verra Mobility) sends the images to PPA for a manual review.
3. PPA reviews the image to ensure information is correct, video data is present, and to verify recorded travel speeds are more than 11 mph over the posted speed limit.
4. Philadelphia Police Department reviews and verifies the image.
5. PPA transmits the violation notices through Verra Mobility.

⁶ Violation data from December 2021 through February 2022 were not yet complete at the time of PPA’s annual report. (When violations are captured, registration information is not always immediately provided, and registration information is requested from the respective Department of Motor Vehicles (DMV) until 90 days after the violation.)



Source: [PPA's Annual ASE Reports](#)

Figure 3. Violation History

Table 2 depicts a breakdown of the total violations by location. As seen in the table, a vast number of violations occur at F Street and Devereaux Street. The two locations comprise 48% of all total violations.^{7; 8}

Table 3: Total Violations by ASE Pilot Program Location

Month	Banks Way	F Street	Devereaux Ave	Harbison Ave	Strahle Street	Grant Ave	Red Lion Rd	Southampton Rd
Jun-20	27,084	39,033	61,719	11,814	16,657	1,465	33,336	33,098
Jul-20	16,083	37,907	47,794	8,159	12,724	1,336	27,273	26,877
Aug-20	6,485	14,078	15,583	1,433	3,697	462	7,648	7,486
Sep-20	5,793	12,935	15,150	2,218	3,606	421	8,411	10,105
Oct-20	4,355	9,537	11,156	1,671	2,556	279	5,650	6,953
Nov-20	4,327	7,770	12,045	599	2,001	295	4,961	6,662
Dec-20	3,803	7,272	9,836	321	1,561	219	3,908	5,043
Jan-21	3,789	7,136	9,549	246	1,597	211	3,694	5,141
Feb-21	2,139	3,744	5,675	352	1,009	152	2,389	3,247
Mar-21	3,068	5,251	8,415	228	1,494	204	3,730	5,032

⁷ It is important to note that a significant portion of the pilot program occurred during the COVID-19 pandemic, which impacted traffic volume and data. After quarantine restrictions were lifted in June 2020, traffic volume increased; however, there was another decline in traffic volumes during the winter of 2020 when COVID cases increased. Regardless of the variation in traffic volume, violations have been decreasing since the start of the program.

⁸ Data for the locations at 700 West Roosevelt Boulevard and 5000 Roosevelt Boulevard were not available in PPA's most recent annual report, as the warning period began on June 1, 2022, with fines beginning in August 2022.



Month	Banks Way	F Street	Devereaux Ave	Harbison Ave	Strahle Street	Grant Ave	Red Lion Rd	Southampton Rd
Apr-21	3,094	5,451	7,605	225	1,622	212	3,802	4,789
May-21	3,231	5,867	7,199	168	1,575	247	3,561	4,438
Jun-21	2,938	5,788	4,874	138	1,727	234	2,621	4,294
Jul-21	3,601	6,293	5,471	234	1,658	186	3,532	4,166
Aug-21	2,923	5,589	3,765	462	1,506	203	3,360	3,809
Sep-21	2,353	4,665	3,587	553	1,264	224	2,978	3,435
Oct-21	2,556	5,067	4,273	309	1,108	194	2,999	3,467
Nov-21	2,740	4,813	4,167	248	1,045	186	3,004	3,067
Dec-21	2,681	4,329	3,951	225	1,084	165	2,729	3,222
Jan-22	2,375	3,870	3,410	249	843	148	2,005	2,383
Feb-22	1,304	1,978	2,011	89	573	68	1,324	1,592
Total	106,722	198,373	247,235	29,941	60,907	7,111	132,915	148,306

Source: [PPA's Annual ASE Reports](#)

Vehicle Speeds

- ASE deployments have been effective in reducing instances of excessive speeding.
- ASE has also had a significant impact on lowering average speeds at most locations.
- Reduced vehicle speeds not only improve the safety of motorists, but also has a significant impact on pedestrian safety. In a study by *AAA Foundation for Traffic Safety*, researchers found that a pedestrian has a 90% risk of death when struck by a vehicle driving at 58 mph. The risk of death decreases to 75% at 50 mph and 50% at 42 mph. Reducing the speed of impact by five mph decreases the risk of death by about 12%.
- **Table 3** depicts the percent change of average speeds from June 2020 to February 2022 for each set of lanes at each camera location. Average speeds went down at all but four locations, with many decreases being more than 10%. One location, the northbound express lanes at Red Lion Road, experienced a 37.8% reduction in average speeds.

Table 4: Change in Average Vehicle Speeds, from June 2020 to February 2022

ASE Pilot Location	Northbound		Southbound	
	Express Lanes	Local Lanes	Express Lanes	Local Lanes
Banks Way	-11.2%	-11.0%	-11.4%	-13.7%
F Street	-5.8%	-4.5%	-8.9%	-9.8%
Devereaux Avenue	-18.8%	-17.9%	+8.2%	+6.1%
Harbison Avenue	-16.7%	-16.3%	-5.9%	-11.0%
Strahle Street	-6.1%	-8.5%	+2.1%	+0.7%
Grant Avenue	-10.4%	-6.6%	-5.1%	-8.1%
Red Lion Road	-37.8%	-9.5%	-10.0%	-7.6%
Southampton Road	-8.6%	-10.0%	-9.9%	-8.3%

Source: [PPA's Annual ASE Reports](#)



Crashes

- To independently confirm that the ASE program is having a positive impact on safety along Roosevelt Boulevard, crash data was compared for a full year before ASE implementation (2019) and a full year after ASE implementation (2021). This data is shown in **Table 4**. To confirm that the improvements in safety were not due to changes in traffic patterns as a result of the COVID-19 pandemic, the same statistics were compared for Philadelphia, city-wide.

Table 5: Crash Data for Roosevelt Boulevard and all of Philadelphia Before ASE Implementation and After

Crash Statistic	2019 Before ASE	2021 After ASE	Percent Change
Roosevelt Boulevard			
Total crashes	374	239	-36%
Total crashes with fatalities or suspected serious injuries	27	24	-11%
Total speeding related crashes (where at least one vehicle was speeding, racing, or driving too fast for conditions)	47	39	-17%
Total crashes with at least one aggressive driver action	200	132	-34%
City of Philadelphia			
Total crashes	11,131	10,463	-6%
Total crashes with fatalities or suspected serious injuries	479	555	+16%
Total speeding related crashes (where at least one vehicle was speeding, racing, or driving too fast for conditions)	1,730	1,931	+12%
Total crashes with at least one aggressive driver action	5,147	5,151	0%

Source: [Pennsylvania Crash Information Tool](#)

- The results show a reduction in crashes along Roosevelt Boulevard at a much greater percentage than the reduction experienced city-wide.
- Crashes along the Roosevelt Boulevard are also becoming less severe, as crashes with fatalities or suspected serious injuries decreased 11%, whereas they increased 16% throughout Philadelphia.
- Crashes are less severe most likely because of reduced speeds along Roosevelt Boulevard. In fact, speeding related crashes have dropped 17% along the Boulevard, whereas they have risen 12% across Philadelphia. In addition, total crashes with at least one aggressive driver decreased by 34% versus remaining virtually unchanged in Philadelphia.

Economic Value of Crash Reduction

- The monetary value of the cost of crashes from before and after ASE pilot program implementation was compared using established crash severity average crash costs obtained from PennDOT’s *2020 Pennsylvania Crash Facts and Statistics* booklet. These average costs and before and after findings are shown in the following tables.



Table 6: 2020 Cost of Crashes According to Maximum Severity Level

Maximum Severity	Average Cost
Fatal Injury (crashes)	\$13,383,153
Suspected Serious Injury (crashes)	\$759,652
Suspected Minor Injury (crashes)	\$244,045
Possible Injury (crashes)	\$134,172
Property Damage Only (crashes)	\$12,446

Source: [2020 Pennsylvania Crash Facts and Statistics](#)

Table 7: Economic Loss of Speeding Related Crashes before ASE Implementation and After

Maximum Severity	2019 - Before ASE		2021 - After ASE	
	# of Crashes	Crash Cost	# of Crashes	Crash Cost
Fatal Injury	4	\$53,532,612	3	\$40,149,459
Suspected Serious Injury	4	\$3,038,608	2	\$1,519,304
Suspected Minor Injury	13	\$3,172,585	14	\$3,416,630
Possible Injury	13	\$1,744,236	11	\$1,475,892
Property Damage Only	13	\$161,798	9	\$112,014
Total	47	\$61,649,839	39	\$46,673,299

- The reduction in speeding-related crashes from 2019 to 2021 resulted in an economic benefit of \$14,976,540. PennDOT data shows that overall crashes have decreased when comparing 2019 to 2021.
- While it cannot be definitively stated that ASE is solely responsible for the reduction in speeding related crashes, it is reasonable to assume that the program played a major role in the reduction, especially considering speeding related crashes increased over the same period across Philadelphia.

Preventing crashes provides an economic benefit that outweighs the cost of operating ASE.

Public Engagement and Transparency

- Prior to the deployment, OTIS held a public forum in June 2019 to gather community input and feedback on the ASE program along Roosevelt Boulevard, including discussing other ideas for improving safety. In January 2020, PPA held a press conference along the Roosevelt Boulevard, which produced media coverage from major outlets concerning the pilot program’s implementation.
- Subsequently, PPA has created an ASE program website (<https://philapark.org/speed-cameras/>) that presents information about the program, allows users to pay for violations and view an image of the speeding violation. The website features a video that presents a program overview, drone footage of most ASE locations, a frequently asked questions section, and each annual ASE report.
- As required by 75 Pa. C.S. §3370, the locations of ASE deployments are posted on PennDOT’s website at https://www.dot.state.pa.us/public/Bureaus/BOMO/Portal/ASE_Locations.pdf.



Fees and Payment

- While Act 86 set the penalty of violation to be a maximum fine of \$150, Ordinance 190184 established a tiered structure of fines based on the speed a vehicle exceeds the posted speed limit. (Legislation allows for the agency to establish a violation up to \$150, but it needs to be established by ordinance prior to beginning the program.) **Table 7** depicts the fine structure.

Table 8: Fine Structure

Exceed Posted Speed Limits by:	Fine
11 up to 20 MPH	\$100
20 up to 30 MPH	\$125
Over 30 MPH	\$150

- If the notices are unanswered either through no payment or hearing request, additional penalties are issued as follows:
 - \$20 for each unanswered notice more than 30 days from issuance
 - An additional \$25 for each unanswered notice more than 60 days from issuance
 - An additional \$30 for each unanswered notice more than 90 days from issuance.

Thereafter, if the notice remains unanswered, the citation is assigned to debt collections. Although non-payment of fines is not addressed or defined in 75 Pa. C.S. §3370, PPA has opted to assign outstanding debt to collection agencies.

- Within the first 30 days after the violation has been issued, the vehicle owner may pay the violation online at <https://www.violationinfo.com/> using the notice number and PIN to login and view images and video of the violation and pay the fine. The website provides a receipt. The website is operated by Verra Mobility and is linked from PPA’s ASE program website at <https://philapark.org/speed-cameras/>.
- More than after 30 days after the violation has been issued, the vehicle owner may pay the violation directly through PPA’s Parking Portal website at <https://onlineserviceshub.com/ParkingPortal/Philadelphia> by entering the notice number to pay the violation.

Financial Overview

- **Table 8** depicts a breakdown of the program’s total revenue and expenses as reported in PPA’s 2021 and 2022 ASE program annual reports.
- Verra Mobility is paid \$2,995 for each camera per month, which covers the cost of the camera, maintenance of the camera, backend system, staffing, and customer service department. Prior to the June 2022 expansion to two additional locations, there were 32 cameras in operation. The vendor is paid a flat fee for the installation, leasing, and operation of each camera per month. In total, Verra Mobility was paid \$1,150,080 per year, but the amounts shown in **Table 8** are lower due to the abbreviated reporting periods.



Table 9: PPA Speed Camera Financial Overview

Financial Item	Apr 1, '20 to Feb 28, '21	Apr 1, '21 to Feb 28, '22	Notes
Violation Revenue	\$17,717,004	\$22,795,765	Violation revenue less the refund amounts.
Interest and Misc. Income	\$2,440	\$2,713	
Total Revenue	\$17,719,444	\$22,798,478	
Equipment	\$940,062	\$856,328	Paid to Verra Mobility, which installs and maintains the cameras and tech support.
Program Costs / Collection Fees	\$331,025	\$1,094,839	Paid to Duncan, PRWT, Harris and Harris, Professional Account Management and TSI for processing and collection services.
Philadelphia Police Department	\$197,229	\$79,402	Expenses in the review and approval/rejection of violations.
Philadelphia Department of Finance	\$23,067	\$64,063	The Office of Administrative Review is the office responsible for the 1 st level hearings.
Personnel Costs	\$610,052	\$576,305	Includes current staff and fringe benefits.
PPA Support	\$377,087	\$448,487	The ASE program's share of PPA support service expenses, such as HR, Purchasing, IT, Management, Security, Finance and Accounting.
Rent Expenses	\$36,820	\$47,384	The ASE program's share of PPA's office rent expense.
Other Expenses	\$239,110	\$266,686	The ASE program's share of miscellaneous expenses, such as auto expenses, insurance, printing, office, professional and telephone fees.
Total Expenses	\$2,754,452 (16%)	\$3,433,494 (15%)	
Revenue Remitted to PennDOT	\$13,150,092 (74%)	\$19,364,984 (85%)	In FY 2021, the ASE program incurred \$839,900 for its share of expenses related to Other Postemployment Benefits (OPEB).

Source: [PPA's Annual ASE Reports](#)

Equity

- An important aspect of ASE entails its equitable enforcement of traffic laws.
- Traffic stops are the most common interactions people have with police, and there is a racial imbalance with respect to police-initiated contact through traffic stops. A special report by the U.S. Department of Justice examined data from the Bureau of Justice Statistics' 2015 Police-Public Contact Survey. The special report found that black people were more likely to be pulled over in traffic stops than white and Hispanic people.



- ASE provides an approach to speed enforcement without human subjectivity and profiling based on race, socioeconomic status, or any other factor. It is a transparent, unambiguous process for the enforcement of speeding.

Collection of Fines

- As required by 75 Pa. Code §3370(j), PPA reports the number of fines paid, partially paid, and unpaid for the previous fiscal year. The 2021 report stated that as of February 28, 2021, 51% of fines from August 2020 to February 2021 were paid in full. The 2022 report stated that as of February 28, 2022, 57% of fines from March 2021 to February 2022 were paid in full.
- Since the annual reports do not include updated data from previous years, the current payment status for all violations since program inception could not be quantified. However, during an interview, PPA indicated the collection rate is typically 80% within one year after the violation was issued and as of August 2022, the payment rate of violations issued in 2020 is 90%. While including updated data from previous years in the annual report is not mandated, providing these statistics would help portray the true collection rate of fines.
- PPA also noted some vehicle owners have incurred several violations for hundreds of dollars of fines before receiving the first notice of violation in the mail. Being unable to pay the entire fine amount at once, PPA advised the individuals to request a hearing with the Office of Administrative Review so they may set up a payment plan to pay the fines.
- When violation fines went into effect in August 2020, vehicle owners requested hearings for 3.1% of violations. Since October 2020, the percentage of hearing requests has remained below 2%. PPA indicated that when violations are dismissed, even though infrequently, they are dismissed in accordance with one of the four defenses detailed in Section 3370(g), with the most common defense being that the vehicle or license plate was stolen.
- PPA also stated that the Office of Administrative Review has dismissed some violations for additional defenses not stated in the legislation, giving some latitude to vehicle owners for valid reasons. Examples include first responders in violation when responding to an emergency, particularly during the COVID-19 pandemic, and violations associated with medical emergencies.

ASE Funding Program

- Per the statute, all revenue from the program minus the operation and maintenance cost to sustain the program is remitted to PennDOT. PennDOT then deposits the amount into a restricted account in the Motor License Fund. The fines deposited into this account are used for the Transportation Enhancement Grants Program, which was established by 75 Pa. C.S. §3116 under the Automated Red-Light Enforcement (ARLE) program.
- The Transportation Enhancement Grants Program provides funding to projects focusing on improving the safety and mobility of the traveling public, such as traffic signal improvements, bicycle and pedestrian improvements, and roadway safety improvements. Grants are awarded on a competitive basis, selected by a selection committee consisting of four PennDOT representatives



appointed by the Secretary of Transportation and four Philadelphia representatives appointed by the Mayor of Philadelphia.

- The ASE Funding Program is incorporated into the existing ARLE Funding Program framework. Applications, program administration, and selection criteria are the same between the ASE Funding Program and the ARLE Funding Program; however, priority shall be given to applications seeking grant funds for transportation enhancements where the ASE system is operational in accordance with 75 Pa. C.S. §3370.
- PennDOT accepts applications for the Transportation Enhancement Grants Program annually during the month of June. Beginning with the June 2021 application period, grants were considered for both ARLE and ASE funds. Projects are selected based on criteria within the [Program Guidelines](#).

In December 2021, Governor Tom Wolf announced the first round of investment in traffic safety projects using the new grant funding through the ASE program. A total of \$22.1 million was distributed to projects within Philadelphia and for technical assistance with the statewide AWZSE program, as shown in **Table 9**.

Table 10: Projects Awarded Grants from ASE Funding Program

Project Description	Funding
Designing intersection modification identified as 2025 improvements in the Roosevelt Boulevard Route for Change program	\$6 Million
Safety Improvements on Cottman Avenue between Roosevelt Boulevard and Castor Avenue	\$4 Million
Safety Improvements on Castor Avenue	\$3 Million
Business Access and transit (BAT) lanes implementation through pavement markings and signs along Roosevelt Boulevard	\$2 Million
Alternative Analysis Development to further Roosevelt Boulevard Route for Change report concepts	\$2 Million
Roosevelt Boulevard Parallel Corridor ITS and Emergency Preemption Program	\$1.5 Million
Delivering safer, more accessible, and more comfortable bus stops along Roosevelt Boulevard	\$1 Million
Improvements to Spring Garden Street between Columbus Boulevard and 23 rd Street	\$500,000
Technical Assistance for the Pennsylvania AWZSE program statewide	\$2.1 Million



ASE Program Expansion

One of the objectives of this report is to provide considerations for expanding the ASE program beyond Philadelphia. This section details some concerns municipalities may have in implementing automated speed enforcement, should the legislature expand ASE to other Pennsylvania municipalities.

Public Support

For ASE to be deployed within a municipality, at a minimum, the local population must not actively oppose the initiative. Two common misconceptions about ASE could lead to opposition: (1) ASE is a means to generate revenue for the local government, and (2) automated photography is an invasion of privacy. Both misconceptions are directly addressed in Pennsylvania's legislation authorizing the use of ASE along Roosevelt Boulevard.

Title 75 Pa. C.S. §3370 explicitly states that the compensation paid to a manufacturer or vendor of an ASE system **may not** be based on the number of violations issued or as a percentage of fine revenue generated.

In other words, vendors must be paid a flat fee based on the value of the equipment and services provided in support of the program. There is no incentive for the vendor to issue more citations; the vendor is paid a flat rate whether one violation is issued, or 1,000 violations are issued.

Another concern of ASE entails being a “money-making scheme” for the government. Since fine revenue goes to a restricted account in the motor license fund for transportation enhancement grants, there is no incentive for the government to use automated enforcement to subsidize the general fund. Without such an incentive, ASE is less likely to be deployed at locations where the posted speed limit is unexpectedly low and without a speeding-related safety issue. The program intent is to encourage motorists to obey the posted speed limit.⁹

Speed Enforcement Camera Systems - Operational Guidelines

In 2008, Federal Highway Administration and NHTSA published *Speed Enforcement Camera Systems Operational Guidelines*. The guide is intended to assist program managers, administrators, law enforcement, traffic engineers, program evaluators, and other individuals responsible for the strategic vision and daily operations of a speed enforcement program. The guidelines address the major components of a program including planning, startup, field operations, violation processing and adjudication, and program evaluation.

FHWA is currently updating the guide to provide newer, evidence-based guidance for planning and operating ASE. The updated guide will also include considerations for installing cameras for point-to-point (P2P) deployments. Rather than measuring speed at a single site, P2P units use multiple cameras to capture the average speed of vehicles over a specified distance. While the project team could not find any instances of P2P units in operation in the U.S. (if at all), this method of enforcement will most likely develop into another deployment alternative in the future.

⁹ As of this writing, these guidelines are being updated by FHWA and are anticipated to be announced in December 2022. PennDOT will need to coordinate with them regarding needed updates.



The other misconception about ASE is that the photographs taken by the systems invade a person's privacy. This misunderstanding is also addressed by Title 75 Pa. C.S. §3370(f):

- No system shall use an image of the frontal view of the vehicle as evidence of violation.¹⁰
- Cameras used as part of a system must be incapable of automated or user-controlled remote surveillance.
- Recorded images may not be used for any other surveillance purposes.
- All violation images must be destroyed within one year after final disposition except for images subject to court order.
- The information collected and prepared as part of a violation may not be subject to Right-to-Know Law requests, shall not be discoverable by court-order, nor shall it be offered in evidence in any action or proceeding which is not directly related to an ASE violation.
- Registered vehicle owner information obtained as part of an ASE violation shall not be the property of the manufacturer or vendor of the ASE system. Driver information is properly wiped one year after final determination.

Cost of ASE Implementation

Local officials may have apprehension about using ASE in their municipality due to the program costs and accountability needed which may create local budget concerns. Additionally, the possible risk that revenue generated from fines might not offset the cost of implementing and operating the system provides additional concerns that local tax dollars aren't being used for other services. This is a legitimate concern, as many municipalities may not have the budget to pay for expenses, including vendor fees that are not covered by fine revenue.

The following scenario offers municipalities a realistic, yet hypothetical, example of ASE program costs. The example uses financial data from PPA's ASE program and the Authority's experience with operating the program. The scenario uses the following assumptions:

- Vendor payment: \$3,000 per camera per month.
- Cameras per site: Two. Roosevelt Boulevard has a set of local and express lanes in each direction, requiring four cameras per site. It is reasonable to assume most municipalities will have smaller sites with fewer roadway lanes, requiring two cameras.
- Administrative cost per violation: \$10.00. Using information from PPA's 2022 ASE program report, PPA incurred \$1,814,609 in expenses for program collection fees, payment to the Philadelphia Police Department, payment to the Philadelphia Department of Finance, and personnel costs. During that

¹⁰ It should be noted that frontal images *are* used for AWZSE, although legislation indicates it is only to obtain the front of the license plate and that the driver needs to be masked. This approach captures information on CMVs, which would be much more difficult relying on just rear license plates.



time period, PPA issued 223,368 violations. This results in an administrative cost per violation of roughly \$8.25, which is rounded up to \$10.00 for this example.

- Fine amount: \$100.
- Collection rate: 80%. This is based on PPA’s statement that by one year, the collection rate of fines is at 80%.

Using these reasonable assumptions, a municipality would need to issue about 1,030 fines per year (between 85 and 86 per month) per site for the program to break even. Fewer violations would result in a net cost for the municipality, as shown in **Figure 4**. Municipalities uncertain whether ASE would pay for itself on a particular roadway should consider the following research. In the *2020 Traffic Safety Culture Index*, 35.3% of respondents stated that they had driven 10 mph over the speed limit on a residential street in the past 30 days. Although it is reasonable to assume that most drivers will adhere to the speed limit while driving through an ASE site, even if 1% of total vehicles traveling through an ASE deployment in a month triggered a violation, a roadway would require only 8,600 vehicles per month to reach 86 violations.

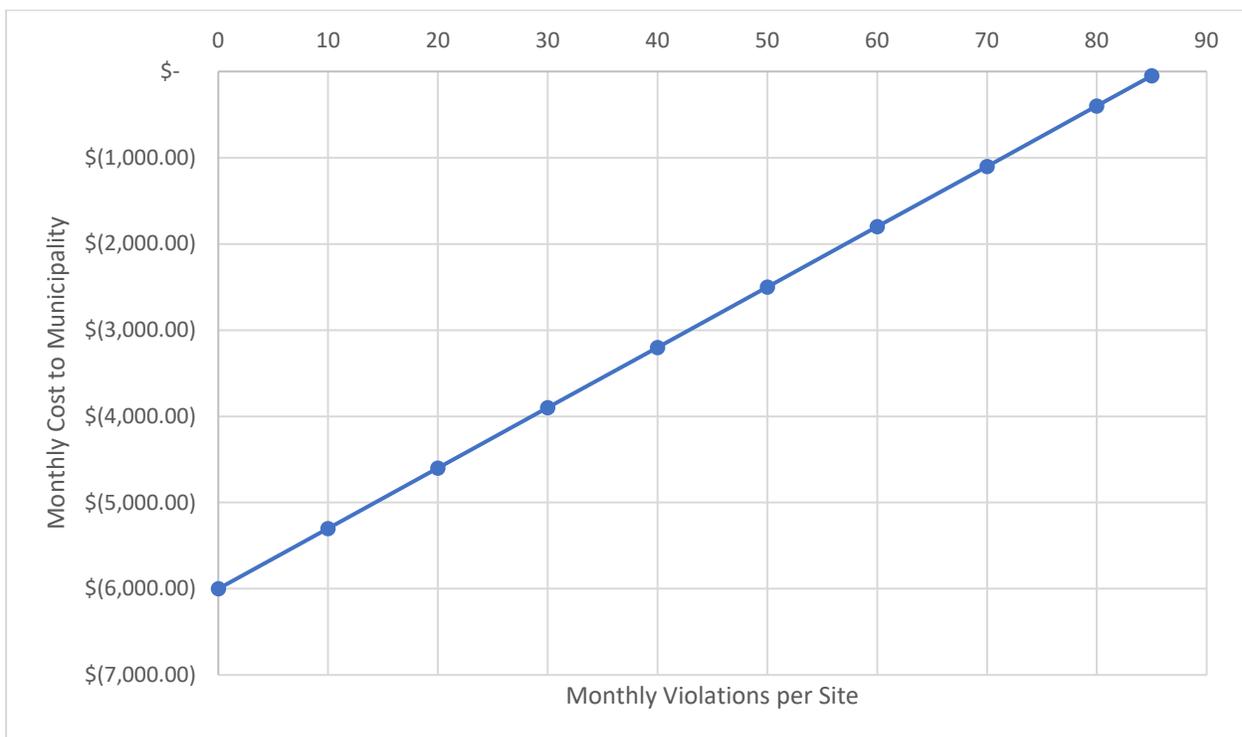


Figure 4: Breakeven Cost Analysis for Monthly Violations per Site

If a municipality cannot budget for ASE and does not want to risk the possibility of incurring a cost due to ASE operation, the municipality could consider structuring contracts with vendors to place more of



the cost risk on the vendor. There is precedence of vendors willing to structure contracts for automated enforcement systems such that the fees paid to the vendor do not exceed violation fine revenue. This is the case with Abington Township and ARLE cameras they have installed at three intersections in the Township. Since 2017, GATSO USA, Inc. has been the vendor providing a turn-key solution of installing the equipment, maintaining the software, assisting with processing violations, and tracking payments. The contract between Abington Township and GATSO assigns the cost risk to GATSO, because all of Abington's operations and maintenance costs are paid first using fine revenue. GATSO is paid using any fine revenue leftover, up to the monthly contracted fee or the fine revenue is depleted, whichever occurs first.

Finally, local officials should remain cognizant of the fact that the purpose of ASE is to make roadways safer. Dedicating a part of the municipality budget in operating ASE is an investment for the greater good of the local community, similar to other law enforcement costs. Not only does ASE improve driver behavior and reduce speeds, but as **Table 5** shows, the economic value of preventing one fatal crash would pay for the system several times over.

Funding Opportunities

There are also opportunities for municipalities to obtain funding from federally funded programs and competitive grants. Local officials should consider collaborating with other municipalities interested in ASE and/or their local planning partner to share resources in applying for these funding opportunities.

Highway Safety Improvement Program

Each year, as part of the Highway Safety Improvement Program (HSIP), PennDOT receives federal funding to reduce traffic fatalities and serious injuries on all public roads throughout the Commonwealth. PennDOT distributes funding for projects proposed by the Engineering Districts and planning organizations. Local municipalities may also apply for HSIP funds through their planning organization.

The Infrastructure Investment and Jobs Act (IIJA) eliminated the FAST Act prohibition of HSIP funds being used to purchase, operate, or maintain ASE systems. ASE may now be eligible for HSIP if all Federal-aid highway funding requirements are met.¹¹

Safe Streets and Roads for All Grant Program

The IIJA also introduced the Safe Streets and Roads for All (SS4A) discretionary grant program with \$5 billion in appropriated funds over the next five years. The program funds local and regional projects and initiatives that help prevent roadway deaths and serious injuries. There are two types of SS4A grants: action plan grants and implementation grants. ASE cameras are specifically cited as an eligible project for implementation grant funding.

¹¹ See also: https://safety.fhwa.dot.gov/hsip/rulemaking/docs/BIL_HSIP_Eligibility_Guidance.pdf, page 9. ASE would provide an appropriate Benefit Cost Ratio to meet Pennsylvania's program, which is to drive down the number of fatalities. The higher the ratio, the more appropriate the project.



Transportation Enhancement Grants Program

Municipalities may also apply for a grant from the state's Transportation Enhancement Grants Program (funded with revenue from the ARLE and ASE deployments) to help establish an ASE program or fund new camera installation.

Expertise Required for Implementation

Implementing ASE in a municipality will require technical expertise in several areas:

- local ordinances must be passed allowing ASE,
- sites must be evaluated in terms of their suitability for automated speed enforcement, and
- processes must be established for processing violations, issuing notices, and collecting fine payment.

There may be municipalities that are eligible and interested in implementing ASE, but do not have the expertise to complete one of the tasks listed above. The Local Technical Assistance Program (LTAP) may be a useful resource to create guidance, provide training, and directly aid those municipalities. The LTAP could provide these services for both ASE and ARLE implementations.



ASE – National Perspective

As shown in **Figure 5**, 19 states, including the District of Columbia, operate ASE programs. Eight states have legislation prohibiting ASE programs, with Texas being the most recent state to ban automated enforcement.

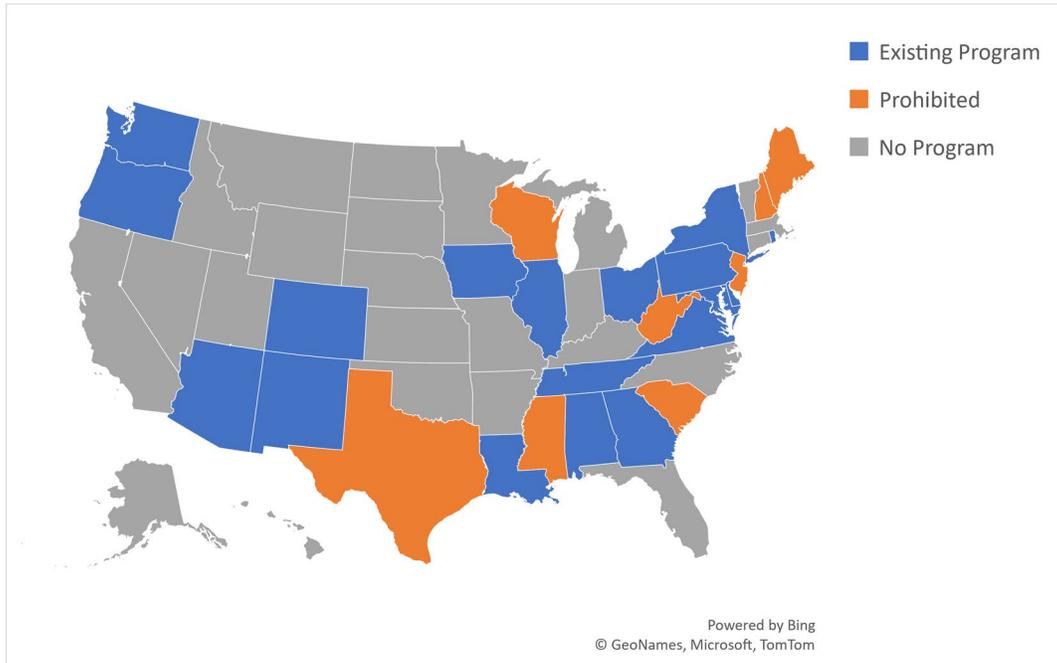


Figure 5. Automated Speed Enforcement in States

Automated speed enforcement programs have been deployed and evaluated throughout the country since the 1990s. While the programs may differ slightly from one jurisdiction to another, the majority of programs operate similarly and follow the *Speed Enforcement Camera Systems Operational Guidelines*.

Table 10 presents a summary of ASE programs in each of the states highlighted above. Many of the existing programs are limited to either school zones or work zones.

Table 11: Summary of State ASE Programs

State	Number of Jurisdictions with Programs	Locations where cameras are permitted	Legislation
Alabama	3	Specified Jurisdictions	Local law/City Ordinance
Arizona	10	Statewide; not allowed on state highways or within 600' of posted speed limit change except near school crossing	State law



**Pennsylvania State
Transportation Advisory Committee**

State	Number of Jurisdictions with Programs	Locations where cameras are permitted	Legislation
Colorado	4	School zones, work zones, residential neighborhood, streets bordering a municipal park	State law and City Ordinance
Delaware	1	I-95 Restore the Corridor Work Zones	State Law
District of Columbia	1	Citywide	City Law
Georgia	22	School zones	State Law
Illinois	1	Work Zones and Safety Zones (within 1/8 th mile of school or park) in municipalities with a population of 1,000,000 or more	State Law
Iowa	13	Specified Jurisdictions	City and County Ordinance
Louisiana	6	Specified Jurisdictions; not permitted on interstates except in work zones	State Law and City Ordinance
Maryland	40	Work zones and specified school zones	State Law and City Ordinance
New Mexico	2	Specified jurisdiction	City Ordinance
New York	2	School zones in specified jurisdictions and work zones	State Law
Ohio	19	Statewide; not permitted on interstates if program is operated by township	State law and city ordinance
Oregon	5	Specified jurisdictions – must be mobile and manned systems except for City of Portland which is allowed a fixed system.	State Law
Pennsylvania	3	Work zones and specified corridor/jurisdiction	State Law and City Ordinance
Rhode Island	3	School Zones	State Law
Tennessee	15	School zones and S-curve of roadway	State Law and City Ordinance
Virginia	4*	Highway Work Zone and School Crossing Zones	State Law
Washington	14	School zones, Public Parks, Hospitals	State Law and City Ordinance

*State law allowing for automated speed enforcement was passed in 2020 and multiple jurisdictions are in the process of implementing enforcement.



Major Findings

The TAC has determined that the ASE pilot is working and has been effective at improving safety. Based on the research and analysis conducted, the following items represent the key findings pertaining to the ASE program on Roosevelt Boulevard.

Legislation

The current state legislation is a good framework for ASE in Pennsylvania, even though it limits automated speed enforcement to Roosevelt Boulevard. Some key highlights from the legislation include:

- Fees are defined in the legislation.
- Vendor fees are fixed and not dependent on the number of violations.
- Images cannot be used for surveillance purposes and must be destroyed after two years.
- Violations are associated with vehicle owners rather than drivers.
- Vehicle owners have several options for defense against violations.
- Camera sites must be approved by PennDOT.

The ASE pilot program legislation defines a violation as driving 11 mph or more over the posted speed limit. This is more lenient toward violators when compared to Title 75 Pa. C.S. §3368(c)(4) which states that no person may be convicted upon evidence obtained using radar unless the speed recorded is six or more miles per hour in excess of the legal speed limit. An obvious distinction is that differences in speed are more pronounced on roadways with lower posted speed limits.

Another observation regarding §3370 is that there are no additional punitive measures applied to vehicle owners cited for multiple ASE violations. Escalating sanctions for repeat offenses may establish a better disincentive for those with multiple infractions to continue speeding.

Safety

The ASE program on Roosevelt Boulevard has been effective improving driving behavior by reducing excessive speeding and crash severity:

- Violations have been decreasing since the start of the program.
- Average vehicle speeds have decreased at most ASE enforcement locations. Total crashes decreased by 36% from 2019 to 2021.
- Total crashes with injuries decreased by 36% from 2019 to 2021.
- Speeding related crashes dropped 17% from 2019 to 2021, compared to a 12% increase across all of Philadelphia.
- Total crashes with at least one aggressive driver decreased by 34% along Roosevelt Boulevard, compared with staying the same across all of Philadelphia.



Financial

The cost to operate and maintain the ASE program exceeded \$2.8 million in FY 2021 and \$3.4 million in FY 2022. The camera vendor is paid \$2,995 for each camera every month, and other program costs include PPA personnel and support staff, Philadelphia Police Department staff to review violations, Philadelphia Department of Finance staff to hold the first level hearings, account management contractors for processing and collection services, and other miscellaneous expenses.

The ASE program is currently self-sustaining and in the first two years has generated a total of \$32.5 million in net revenue. This revenue is deposited in the Motor License Fund and made available to fund safety and mobility projects in Philadelphia and across the state through the Transportation Enhancement Grants Program.

Collection of Fines

Many violations have required extended time to collect fine payments. Improved reporting of collections for prior fiscal years should be required to substantiate claims made by PPA regarding the payment rate during interviews. Should the ASE program survive, measures will need to be explored to fine out-of-state violators.

Institutional

Per the legislation for the pilot program, PPA was specifically named as the system administrator to supervise and coordinate the program if a city of first class (Philadelphia), elects to implement the program. Since the beginning of the program, PPA has been successful in establishing the necessary relationships to administer the program, including, but not limited to, contracting vendors for camera deployments, coordinating with police for ticket review, and staffing as needed for the program. PPA is very familiar with administering automated enforcement programs, having administered the ARLE program since 2005.

Site Selection

While the legislation requires PennDOT to approve each camera site, there is no formal criteria for selecting an ASE site nor does it require any engineering study to be performed prior to the installation of a camera. PennDOT and the Department of Streets approved ASE locations based on crash and speed data. OTIS also examined appropriate locations that have safety concerns while evaluating whether the introduction of ASE would address previous concerns. Having a formal process for selecting sites for ASE installation will increase accountability as selection criteria will be consistent at all locations. This will also ensure transparency with the public since the public will know the procedures and reasoning behind selecting a location.

Public Engagement and Transparency

Most of the public engagement focuses on improving general awareness of the program and its benefits. The legislated requirement for PPA to release an annual report maintains transparency. Moreover, PPA has a section of its website dedicated to the program and PennDOT also posts ASE locations on its website.



Funding Program

The first round of ASE grant funding was announced in December 2021, and a total of \$22.1 million was awarded to nine different projects. A majority of the funding went toward projects in Philadelphia and within proximity to Roosevelt Boulevard. These projects will further improve safety, especially along the Roosevelt Boulevard.

Reporting Timeframe

In accordance with Title 75 Pa. C.S. §3370, the system administrator of the ASE program, PPA, is required to submit an annual program report no later than April 1. PPA's fiscal year ends on March 31. To complete and submit the report by the April 1 deadline, PPA compiles the report in March and includes financial, violation, speed, and other data up to the end of February. As a result, each annual report does not include an entire fiscal year of data and does not provide a comprehensive update of the status of the program, leading to some discrepancies and confusion when reviewing the data.

Equity

An important aspect of ASE is the enforcement of traffic laws equitably. Traffic stops are the most common interactions people have with police, and there is a racial imbalance with respect to police-initiated contact through traffic stops. A special report by the U.S. Department of Justice examined data from the Bureau of Justice Statistics' 2015 Police-Public Contact Survey. The special report found that black people were more likely to be pulled over in traffic stops than white and Hispanic people. Additionally, the special report found that when police initiate contact, black and Hispanic people were more likely to experience the threat or use of physical force than white people.

ASE provides an approach to speed enforcement without human subjectivity and profiling based on race, socioeconomic status, or any other factor. It is a transparent, unambiguous process for the enforcement of speeding – if a vehicle is traveling 11 mph or more over the posted speed limit, a violation is issued. As such, camera automated enforcement is the best equitable practice for enforcing the posted speed limit.



Recommendations

Enact Legislation to Extend and Expand the ASE Program

The TAC recommends an extension of the ASE program along Roosevelt Boulevard and expansion of the ASE program to additional municipalities and locations. To achieve this, the following legislative elements should be considered:¹²

- Removing the December 18, 2023 expiration of the ASE program along Roosevelt Boulevard
- Expanding the ASE program to allow the inclusion of other municipalities and locations. Prospective municipalities would need to demonstrate the following requisites for participation:
 - Presence of local law enforcement to issue violations
 - Regular Monday through Friday business hours at a physical location to administer the ASE program in a responsive manner
 - Publicly accessible internet website with program information and ability to securely accept online payment for violations

ASE location selection criteria would include:

- Posted speed limit established with a documented engineering traffic study
- Focus on areas with:
 1. Speeding-related crash history to maximize safety benefit
 2. Pedestrian activity and infrastructure to focus on vulnerable road users
 3. Speeding concerns related to roadway geometrics and / or sight distance limitations
- Requiring PennDOT oversight for the approval of the engineering need and safety benefit based on documentation provided by the municipalities.
- Establishing consequences for nonpayment of fines or repeat offenders. Considerations could include preventing vehicle registration from being renewed, prohibiting an owner from transferring vehicle title, or requiring attendance at a traffic school. Similar consequences should be considered for Pennsylvania's other automated enforcement programs.¹³
- Explore opportunities to establish multi-municipal partnerships for municipalities to partner to have the ability to have automated enforcement to enforce traffic laws. These partnerships could be advantageous for municipalities seeking to share the program's administrative and

¹² Any implementation of an expanded ASE Program should be made with pending FHWA guidance in view.

¹³ This is similar to Governor Wolf's October 2022 action (Act 112 of 2022) signing into law legislation that suspends vehicle registrations for unpaid Turnpike tolls.



operating burden and maintain corridor continuity for an ASE program that crosses municipal boundaries. These agreements could be scaleable.

- Establishing consequences for repeat offenders in the form of higher fines.
- Revising reporting requirements to require cumulatively updated information (such as fine payment data) and reference a revised deadline of May 15, which would provide more time to get documentation submitted by the end of the State fiscal year.

Develop a Formal Process for Evaluating Proposed ASE Locations

- Should legislation be passed expanding the ASE program, PennDOT should establish a policy for requiring engineering studies related to ASE site selection using a study process that conveys the applicability of ASE for the study area/corridor.
- Interested municipalities would administer a traffic engineering study that documents traffic characteristics, volume, speed data, roadway and roadside characteristics, and existing or previously implemented speed and traffic calming measures. The study report would also include the presence of or proximity to nearby ASE locations, and offer an assessment of the safety benefits of introducing ASE. The study outcomes would be initially approved by the municipality and forwarded to PennDOT for a final decision on ASE.

Provide Technical Assistance to Municipalities

- Establishing a central program of technical expertise could greatly benefit municipalities interested in deploying ASE.
- PennDOT will have to assume a more technical role if expansion occurs. The Department should develop a technical collaborative team to provide guidance for establishing the administrative components of local ASE programs, assist with creating local ordinance language, maintain a database of cost information to give municipalities perspective on the potential costs of operating the program, and use PennDOT personnel and resources to assist with the engineering studies to select appropriate sites for ASE deployment.
- PennDOT should consider developing and hosting a technical summit on automated enforcement for municipal officials interested in adopting and using the technology.

Increase Public Engagement and Transparency

- Public engagement and public perception of the program is crucial, especially if the program is to be extended and expanded. As more sites are proposed and cameras are installed, public campaigns to bring awareness to the program and its benefits should be continued. A public awareness campaign or survey could also be conducted to garner local residents' feedback and opinions, allowing respondents to provide input on the program.
- PennDOT could provide a more detailed website that is more accessible identifying ASE deployments, benefits, and other technical information. The PennDOT website should be one location identifying providing direct links to all of the automated enforcement programs. By



providing this additional safety and outreach materials can be provided on the website identifying overall automated enforcement benefits throughout the Commonwealth.

Continue Funding Safety Projects near ASE Locations

- The current funding program process should continue, i.e., the net revenue from the program should continue to be remitted to PennDOT for funding safety and mobility projects in accordance with Title 75 Pa. C.S. §3370.
- The Transportation Enhancements Grants Program, from which safety and mobility projects are awarded, should consider “installation of new ASE systems” as an eligible project type.



Appendix A – Legislation and Regulations Related to Speed Enforcement

Title 75 Pa. C.S. §3368. Speed timing devices

Title 75 Pa. C.S. §3368 authorizes the use of certain speed timing devices by police officers. Prior to Act 86, subsection (c) allowed the use of radio-microwave devices, or radar, only by members of the Pennsylvania State Police. Act 86 amended subsection (c) to allow the use of radar only as part of an automated speed enforcement system or by members of the Pennsylvania State Police.

Act 86 also amended Section 3368 by adding light detection and ranging devices (lidar) as allowable speed timing devices. As with radar, lidar is allowed only as part of an automated speed enforcement system or by members of the Pennsylvania State Police.

Title 75 Pa. C.S. §3368(c)(4) states that no person may be convicted upon evidence obtained using radar unless the speed recorded is six or more miles per hour in excess of the legal speed limit. This requirement does not apply if the radar is used in a school zone or active work zone.

Title 75 Pa. C.S. §3369. Automated speed enforcement systems in active work zones

Act 86 also created Title 75 Pa. C.S. §3369 to establish an automated speed enforcement system in active work zones. The Automated Work Zone Speed Enforcement (AWZSE) program is applicable to Federal aid highways under the jurisdiction of PennDOT and the Pennsylvania Turnpike Commission. While AWZSE and ASE on Roosevelt Boulevard are separate programs administered by separate entities, the programs do share some commonalities. Both §3369 and §3370 define a violation by driving in excess of the posted speed limit by at least 11 miles per hour.

67 Pa. Code §105. Mechanical, Electrical, and Electronic Speed-Timing Devices and §105a. Automated Speed Enforcement Systems – Temporary Regulations

67 Pa. Code §105 governs the procedure for calibrating and testing of mechanical, electrical, and electronic speed-timing devices by stations appointed by PennDOT. The approved stations are included in 51 Pennsylvania Bulletin 8058 (December 25, 2021). Since this section does not address ASE systems, PennDOT promulgated Title 67 Chapter 105a under the authority of Title 75 Pa. C.S. §3368 and §3369. 67 Pa. Code §105a puts forth temporary regulations for the approval, testing, certification, calibration, and use of automated speed enforcement systems. Under this regulation, the minimum requirements of an automated speed enforcement system are as follows:

- A system must automatically detect vehicles exceeding the posted speed limit with a type of speed timing device (as used in Title 75 Pa. C.S. §3368) and produce a recorded image that shows a clear and legible identification of only the vehicle's license plate, location, date, and time.



- Each speed timing device used in a system must be approved by PennDOT, meaning the speed timing device used in a system has been published in the Pennsylvania Bulletin as meeting the following:
 - it is listed on the current [Conforming Product List](#) maintained by the National Highway Traffic Safety Administration (NHTSA); or
 - the speed timing device is tested and approved by an independent third party as capable of meeting the calibration standards of 67 Pa. Code §105a.4 or the current technical specifications of NHTSA, which are available as follows:
 - [Speed-Measuring Device Specifications: Down-the-Road Radar Module](#)
 - [Speed-Measuring Device Performance Specifications: Across-the-Road Radar Module](#)
 - [Lidar Speed-Measuring Device Performance Specifications](#)

Each person operating an ASE system must complete training offered by the manufacturer of the system. When an ASE system is used the operator must complete a daily log which states the date, time, and location of the device setup and states that the system device operator successfully performed, and the ASE system passed the self-tests specified by the manufacturer of the system device.

An annual inspection and calibration of the ASE system must be performed by an approved calibration laboratory. Each speed timing device used in an ASE system must be calibrated to meet one of the following standards:

- the existing regulations within 67 Pa. Code §105,
- the aforementioned technical specifications of NHTSA, or
- the manufacturer's specifications and calibration standards if an approved calibration laboratory confirms the device meets the manufacturer's specification and calibration standards and the device is accurate when field tested against a speed timing device approved under 67 Pa. Code §105.

Finally, each notice of violation must include written verification that the system was operating correctly at the time of the alleged violation and the date of the most recent inspection. A system administrator or system operator shall also include the then-current certificates of calibration and inspection and the daily log with the written verification.



Appendix B – ASE Deployment Rationale

The following list provides the reasoning for deploying ASE at each location, as stated in PPA's 2020 *Roosevelt Boulevard Automated Speed Camera Annual Report*.

- 2nd Street/Banks Way – “Banks Way was selected due to the history of the location. Due to a tragic accident that occurred at the location, a crosswalk and traffic signals were added. This was not enough to prevent the excessive speed of vehicles observed in this area. This is in a mostly residential neighborhood near the overpass for N. 5th St.”
- F Street – “F St. was selected due to its location. It is near an overpass over Tacony/Frankford Creek, which provides a long stretch without a traffic signal that encourages speeding. On the north end is a large commercial area which results in high pedestrian traffic. This location has experienced a high number of crashes.”
- Devereaux Avenue – “Devereaux registered a high percentage of crashes due to speeding and/or aggressive driving. Devereaux is located near the intersections of Bustleton, Levick, and Oxford Circle that are heavily traversed and is also heavily residential.”
- Harbison Avenue – “Harbison was selected due to the high volume of traffic. The long stretch of roadway encourages speeding. It also had a high percentage of crashes involving aggressive driving and/or speeding.”
- Strahle Street – “Strahle was selected due to the long stretch of road over the Pennypack Creek, and the underpass of Holme Avenue. It is an area that encourages a high rate of speed. It is near the Woodward location that had a high percentage of crashes involving aggressive and/or speeding according to the OTIS report.”
- Grant Avenue – “Grant has had a long history of dangerous and aggressive driving. The intersection near this location was greatly improved with the addition of the Red-Light camera and having a speed camera near the location may further improve the area. In addition, there are a lot of commercial properties, with a large number of vehicles entering and exiting driveways. According to the OTIS report, 79 percent of crashes at this location involved speeding and/or aggressive driving.”
- Red Lion Road – “Red Lion (Whitting St.) is further up in the Northeast where there are large stretches of road, with fewer intersections to slow down. There are some commercial properties located near this location that produces a lot [of] tractor-trailer traffic. There is a large recreational field, and a school is near this location as well. The OTIS report showed 63 percent of crashes were due to speeding and/or aggressive driving.”
- Southampton Road – “Southampton (Horning Rd.) was selected due to its proximity near the city border. Vehicles entering or exiting Bucks County tend to be traveling at a high rate of speed. There are also ramps to Woodhaven Rd (Rt. 63), which adds to the vehicles going at a higher rate of speed to enter and exit the area. This location is also in proximity to a school and a large recreational field.”

On October 1, 2019, PPA, PennDOT, OTIS, and the Philadelphia Streets Department held a field meeting to determine pole locations for the ASE cameras, and in January 2020, installation of the cameras began. The program installed 32 cameras across the eight intersections (four cameras at each intersection).



While Section 3370 requires that two warning signs must be placed at the start and end of the system and at two-mile intervals, PPA exceeds this requirement by installing signs throughout the corridor at a shorter interval than two miles. Additionally, signs are installed prior to each camera location notifying drivers that the posted speed limit is photo enforced, as shown in **Figure 6**.



Source: Google Street View

Figure 6: Photo Enforced Sign Approaching ASE Camera at Grant Avenue



Appendix C – Other State Case Studies

As part of the study effort, Portland, Oregon’s Fixed Photo Radar System and Montgomery County’s automated speed enforcement program in Maryland were examined in further detail.

Portland (OR) Fixed Radar System

In 2015, Portland was granted the authority to implement fixed photo radar on urban high crash corridors. Portland approved the use of the cameras in May 2016 and installed cameras in August 2016. The current system includes eight fixed cameras, with more locations being considered for 2022. While Portland had photo radar prior to 2015, the state law only allowed photo radar systems operating in mobile vans. The photo radar must be operated by a uniformed police officer and out of a marked police vehicle. The state law specified which jurisdictions may operate a mobile van photo radar system, restricted the operations to residential areas and school zones, and limited the use of the system to only four hours per day in one location. The system, however, could be deployed in other areas if the jurisdiction found that speeding had a negative impact on traffic safety. Photo radar systems may also be deployed within highway work zones; however, the systems must also be operated by a police officer, out of a marked police vehicle, and located within 100 yards of where highway works are present.

The Portland Bureau of Transportation (PBOT) operates and manages the program and works in conjunction with the Portland Police Bureau, which reviews and approves the citation, and the Multnomah County Circuit Court, which processes the citations. Legislation previously restricted only police to review and approve the citation; however, a recent Oregon House bill passed in 2022 provides the option to appoint a non-police “duly authorized traffic enforcement agent” to review and approve citations.

Violation Experience and Safety Benefits

After the implementation of the fixed radar system in 2016, Portland saw a significant decrease in speeding at every location where a speed camera system was installed. An initial speed study after the camera installation saw a 61% decrease in speeding (between one and ten mph over the posted speed limit) and an 87% decrease in top-end speeding (11 mph or more over the posted speed limit). A 2020 speed study found the reductions have continued to remain over time, with a 71% decrease in speeding and a 94% decrease in top-end speeding.

Cost and Revenue

The program costs for the administration and operation of the fixed radar system include the vendor fees and City’s administrative costs. The vendor is paid a fixed monthly fee of \$3,195 per camera per direction enforced, as well as a variable fee dependent on the number of violation fines paid.

Fine amounts are based on the speed a vehicle was traveling over the speed limit. Table 11 shows the fines associated with each violation type and excess speed limit. The typical speeding citation in Oregon is a Class C violation. Drivers have the option to take a traffic safety class and dismiss the speeding citation; however, drivers must not have received any speeding tickets or red-light violations in the past three years. Safety class registration fees vary depending on the violation but are typically less than the presumptive fine.



Table 12: Portland ASE Program Fine Structure

Exceed Posted Speed Limits by:	Violation	Presumptive Fine
One to 10 MPH	Class D	\$115
11 to 20 MPH	Class C	\$165
21 to 30 MPH	Class B	\$265
Over 30 MPH	Class A	\$440

Per Oregon’s Revised Statute, a majority of the fine revenue goes toward the State of Oregon’s General Fund. Sixty-five dollars of the fine must be paid to the state before any other distribution of the fine. That amount is then deposited in the Criminal Fine Account, which is established in the General Fund. The remaining fine amount is then distributed equally to the local government and the state. The remaining funds (i.e., 50% distributed to the local government minus \$65) are used to pay for the operation and maintenance of the program, and any additional revenue is dedicated to improving traffic safety for all modes of transportation.

Public Perception

Part of the administration costs for the program includes public outreach. In 2018, PBOT conducted a telephone survey to assess the acceptance of automated speed enforcement. Of the 400 residents surveyed, two-thirds are familiar with photo radar; however, more are familiar with the red-light cameras and mobile speed vans programs that were deployed in the late 90s. Three-quarters of the residents support using fixed speed cameras on streets with high crash rates. This sentiment was shared across people of all income levels, but support is lowest among residents with the highest incomes. Despite the slight opposition, the survey results trended positively for automated speed enforcement on high crash corridors in Portland.

Montgomery County (MD) Automated Speed Enforcement Program

Montgomery County was authorized to deploy Maryland’s first automated speed enforcement program in 2007. Cameras were limited to residential streets with speed limits of 35 mph and school zones. Citations would be issued to vehicles traveling at least 10 mph over the posted speed limit.

In 2009, Maryland authorized the use of ASE in work zones and specified school zones statewide. However, the hours of operation were restricted to 6:00 AM to 8:00 PM on weekdays for school zone cameras, and citations would be issued to vehicles traveling at least 12 mph over the posted speed limit. Local jurisdictions are also required to pass a local ordinance authorizing the use of ASE prior to deployment and provide reasonable public notice and public hearing before passing the ordinance. The current Montgomery County program includes 38 fixed-pole speed cameras, 34 portable cameras, and five mobile vans with plans to install 25 more fixed-pole speed cameras in the near future.

Under state law, local law enforcement agencies are required to operate the automated traffic enforcement system, therefore the Montgomery County Police Department (MCPD) operates the system in Montgomery County. In 2021, Montgomery County’s delegates presented a bill allowing the County to transfer the operation of the automated traffic enforcement programs from the police



department to the Montgomery County Department of Transportation. However, the bill was not enacted, and MCPD still operates and manages the automated traffic enforcement programs.

Violation Experience and Safety Benefits

A 2016 report evaluating the effect of the program in Montgomery County found that mean vehicle speeds decreased by 10%, and the percentage of vehicles exceeding the speed limit by more than 10 mph decreased by 59%. The program also resulted in a 39% reduction in the likelihood of a crash resulting in an incapacitating or fatal injury.

Cost and Revenue

The table below shows the total cost and revenue from FY 2020 (July 1, 2019, to June 30, 2020). Fines for speed violations are set at a fixed price of \$40 and 355,786 citations were issued during the 2020 fiscal year.

Table 13. Montgomery County ASE Program Revenue and Cost (July 1, 2019 to June 30, 2020)

Costs and Revenue	Amount
Total Revenue	\$12,920,309
Contractor Costs	\$7,224,960
Other Costs	\$2,070,625
Total Costs	\$9,295,585
Net Revenue	\$3,624,724

Public Perception

In November 2014, Montgomery County conducted a telephone survey of its residents to assess the public’s awareness and attitude towards the ASE program. A total of 900 eligible residents (licensed drivers ages 18 and older) completed the interviews. Of the 900 residents surveyed, 62% favored the use of speed cameras, and 76% stated the camera enforcement caused them to reduce their speeds while traveling.

Legislative Issues

Legislation is the first step in deploying an ASE program and the key to a successful program. Some local governments have suspended programs due to litigation, as is the case in Missouri. The automated speed and red light enforcement programs in Missouri were given authority through city ordinances. In 2015, Missouri’s Supreme Court issued opinions on two separate court cases regarding the automated enforcement cameras, ruling the programs, as authorized by the local ordinances, to be unconstitutional. In response to the ruling, several municipalities suspended their programs with only one municipality, the City of Hannibal, still operating its red-light program as their local ordinance was not affected by the court’s decision.

Some states have preemptively prohibited the use of automated enforcement, with Texas being one of the most recent examples. In 2019, Texas passed a bill prohibiting the use of photographic traffic signal



enforcement systems, stating it violates the right to due process since it is presumed the registered owner of the vehicle committed the violation.

While other states have struck down or prohibited automated enforcement, Pennsylvania has not experienced this backlash, mainly due to the way the legislation has been crafted. The Pennsylvania statute is comprehensive, balanced, and not over-reaching in that it addresses privacy concerns and specifies that net revenue be spent on projects that enhance safety and mobility. It prohibits a vendor from being paid on a per-violation basis, and further includes safeguards for the registered owner to establish a defense against violations. Subsection (g) of Title 75 Pa. C.S. §3370 defines the allowable defenses, which are:

- The owner may submit evidence that the owner was not the driver at the time of the alleged violation. In addition, the owner may not be required to disclose the identity of the operator of the vehicle at the time of the violation.
- The vehicle was reported as stolen and had not been recovered prior to the time the violation occurred.
- The person receiving the notice of violation was not the owner of the vehicle at the time of the offense.
- The device being used to determine speed was not in compliance with Title 75 Pa. C.S. §3368 with respect to testing for accuracy, certification, or calibration.



Appendix D – Example Violation Notice

The following figures show an example violation notice, the envelope that the notice is mailed in, and return envelope for mailing payment.

<p>PHILADELPHIA PARKING AUTHORITY CITY OF PHILADELPHIA COMMONWEALTH OF PENNSYLVANIA Speed Camera Enforcement Program 49 N 8th Street, Philadelphia, PA 19106</p>	  										
	<p>View your records online at www.ViolationInfo.com NOTICE #: 123450001234 PIN: 1234</p>										
<p>NOTICE OF VIOLATION</p>	<p>ISSUE DATE: 08/05/2022 DUE DATE: 09/04/2022</p> <table border="1"> <tr> <td>VIOLATION DATE: 07/26/2022</td> <td>VIOLATION TIME: 10:42:49 AM</td> <td>FINE AMOUNT: \$100.00</td> </tr> </table> <p>LOCATION: NB 4000 BLK ROOSEVELT BLVD INNER</p> <table border="1"> <tr> <td>SPEED: 53 MPH</td> <td>POSTED SPEED: 40 MPH</td> </tr> </table>	VIOLATION DATE: 07/26/2022	VIOLATION TIME: 10:42:49 AM	FINE AMOUNT: \$100.00	SPEED: 53 MPH	POSTED SPEED: 40 MPH					
VIOLATION DATE: 07/26/2022	VIOLATION TIME: 10:42:49 AM	FINE AMOUNT: \$100.00									
SPEED: 53 MPH	POSTED SPEED: 40 MPH										
<p>THE CITY OF PHILADELPHIA VS. JOHN SMITH 1234 EAST MAIN STREET PHILADELPHIA, PA 12345</p>	<p>Response to this Notice of Violation shall be returned personally, by mail or by an agent duly authorized in writing, within 30 days of issuance. A hearing may be obtained upon the written request of the registered owner. Failure to return payment for this Notice of Violation, or to request a hearing within 30 days of mailing of this Notice of Violation, shall be considered an admission of liability, and will result in additional penalties which may make your vehicle eligible to be booted and towed. See reverse for further information and instructions.</p>										
<p>I am a fully commissioned officer for the City of Philadelphia Police Department and am authorized to enforce the laws of the State of Pennsylvania. Based upon my review of the recorded images captured by an automated traffic safety camera, I have probable cause to believe, and do believe, that on the date and at the time and location indicated above, the operator of the vehicle described below was in violation of Title 75, Sections 3362 and 3370 of the Pennsylvania Consolidated Statutes and Chapter 12-3400 of the Philadelphia Code. The electronic images taken together showing the vehicle and its license plate portray a true and correct representation of the location listed above and indicate the vehicle was operated to a speed in excess of the posted speed limit. The registered owner is named below.</p>											
<p><i>JANE ANDERSON</i> JANE ANDERSON, City of Philadelphia Police Department</p>											
<p>The fastest and easiest way to pay is online! Go to www.ViolationInfo.com and enter with your NOTICE # and PIN.</p>	<table border="1"> <tr> <td>NAME: JOHN SMITH</td> <td>DUE DATE: 09/04/2022</td> </tr> <tr> <td>NOTICE NUMBER: 123450001234</td> <td>VERSION: 1</td> </tr> <tr> <td>ISSUE DATE: 08/05/2022</td> <td></td> </tr> <tr> <td>PLATE: ABCD123</td> <td>STATE: PA</td> </tr> <tr> <td></td> <td>PIN: 1234</td> </tr> </table>	NAME: JOHN SMITH	DUE DATE: 09/04/2022	NOTICE NUMBER: 123450001234	VERSION: 1	ISSUE DATE: 08/05/2022		PLATE: ABCD123	STATE: PA		PIN: 1234
NAME: JOHN SMITH	DUE DATE: 09/04/2022										
NOTICE NUMBER: 123450001234	VERSION: 1										
ISSUE DATE: 08/05/2022											
PLATE: ABCD123	STATE: PA										
	PIN: 1234										
<ul style="list-style-type: none"> ✓ Returned checks are electronically represented and charged the State allowed fee. ✓ Make your check or money order payable to the Philadelphia Parking Authority. ✓ DO NOT MAIL CASH. ✓ Write the Notice # on the front of your payment. ✓ Do not tape, staple, or paperclip items. ✓ If requesting a hearing, sign the reverse side of this notice. ✓ Insert this tear-off coupon in the enclosed envelope with the address (at the right) showing through the window. ✓ Payment is admission of liability. 	<p>Philadelphia Parking Authority Speed Camera Enforcement PO Box 35131 Seattle, WA 98124-5131</p>										
<p>AMOUNT DUE: \$100.00</p>	<p>1 123450001234 000065045285 100000</p>										

Figure 7: Example ASE Violation Notice



Figure 8: Example Envelope used to Mail ASE Violation Notice

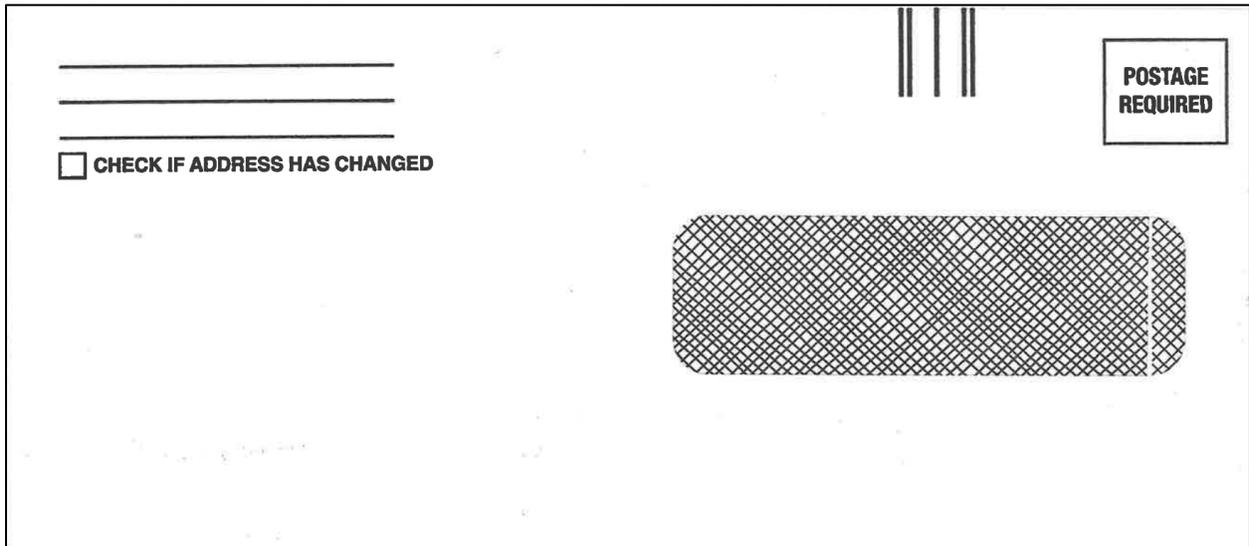


Figure 9: Example Return Envelope for Mailing ASE Violation Payment



Appendix E – Philadelphia Vision Zero Presentation

Dr. Erick Guerra, Assistant Professor – City & Regional Planning at University of Pennsylvania, presented at the Philadelphia Vision Zero Conference in April 2022 regarding automated enforcement and the impacts the Roosevelt Boulevard speed cameras had on reported collisions and traffic fatalities. Table 13 shows the monthly average of PennDOT reported crashes and fatalities for June through December of 2018, 2019, and 2020. While only 2020 crash data was publicly available at the time of the presentation, Dr. Guerra found that in the first seven months of the program, there was a statistically significant 30% reduction in reported collisions relative to the rest of Philadelphia and a 50% reduction relative to other three- and four-lane road segments.

While traffic fatalities along Roosevelt Boulevard increased slightly after the installation of speed cameras, this can be attributed to the impact COVID-19 had on traffic. Traffic fatalities have been increasing nationwide and many cities, including Philadelphia, experienced a significant increase in fatalities. In the summer of 2020, there were 55 traffic fatalities in Philadelphia compared to 22 in 2019. As depicted in Table 13, average monthly fatalities on Roosevelt Boulevard increased by 25%, while average monthly fatalities in Philadelphia increased by 124%.

Finally, when considering the PennDOT cost of collision estimates, Dr. Guerra estimates the annualized safety benefits of the program to be about \$70 million.

Table 14: Average Monthly Collisions and Fatalities Before and After Speed Cameras

	Before ASE (June 1 to December 30, 2018 and 2019)	After ASE (June 1 to December 30, 2020)	Percent Change
Reported Collisions			
Roosevelt Boulevard	39	25	-37%
Rest of Philadelphia	936	891	-5%
Other 3+ Lane Road Segments	261	320	+23%
Traffic Fatalities			
Roosevelt Boulevard	1.1	1.4	+25%
Rest of Philadelphia	7.2	16.1	+124%
Other 3+ Lane Road Segments	3.1	7.9	+153%

Source: Philadelphia Vision Zero Conference Presentation by Dr. Erick Guerra (2022)

It is important to note that the amount of publicly available crash data at the time of the presentation and was limited to only the first seven months of the program (June to December 2020). The time to pass the City of Philadelphia Ordinance 190184, establish the program, and install speed cameras spanned about one year. In addition, the COVID-19 pandemic delayed the startup by a few months. Ideally, a larger dataset would have been available for Dr. Guerra’s analysis, but regardless, the analysis shows that the ASE program along Roosevelt Boulevard is having a positive impact in reducing crash and fatality risk.



Appendix F – References

AAA Foundation for Traffic Safety. (2011). *Impact Speed and a Pedestrian's Risk of Severe Injury or Death*. <https://aaafoundation.org/wp-content/uploads/2018/02/2011PedestrianRiskVsSpeedReport.pdf>

AAA Foundation for Traffic Safety. (2021). *2020 Traffic Safety Culture Index (Technical Report)*. <https://aaafoundation.org/wp-content/uploads/2021/09/2020-Traffic-Safety-Culture-Index-October-2021.pdf>

City of Philadelphia. (2021). *Roosevelt Boulevard Route for Change Program Final Report*. <https://www.phila.gov/media/20210514084533/Route-for-Change-final-report.pdf>

Federal Highway Administration. (2021, November 19). *Speed Safety Cameras*. <https://safety.fhwa.dot.gov/provencountermeasures/speed-safety-cameras.cfm>

Federal Highway Administration. (2022, February 8). *Bipartisan Infrastructure Law*. <https://www.fhwa.dot.gov/bipartisan-infrastructure-law/hsip.cfm>

Federal Highway Administration and National Highway Traffic Safety Administration. (2008). *Speed Enforcement Camera Systems Operational Guidelines* (Publication No. DOT HS 810 916). <https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/810916.pdf>

Guerra, E. (2022, April 30). *Roosevelt Boulevard Speed Camera Effects on reported collisions and traffic fatalities* [PowerPoint slides]. City and Regional Planning, University of Pennsylvania.

Hu, W., McCartt, A. T. (2015). *Effects of automated speed enforcement in Montgomery County, Maryland, on vehicle speeds, public opinion, and crashes*. Insurance Institute for Highway Safety. https://nacto.org/wp-content/uploads/2016/04/4-2_Hu-McCartt-Effects-of-Automated-Speed-Enforcement-in-Montgomery-County-Maryland-on-Vehicle-Speeds-Public-Opinion-and-Crashes_2015.pdf

Insurance Institute for Highway Safety. (2022, September). *Automated enforcement laws*. <https://www.iihs.org/topics/red-light-running/automated-enforcement-laws>

Maryland Department of Public Safety and Correctional Services. (2021). *2020 Report to the State of Maryland – Speed Monitoring Systems Use*. [http://dlslibrary.state.md.us/publications/Exec/DPSCS/PTC/TR21-809\(k\)_2020.pdf](http://dlslibrary.state.md.us/publications/Exec/DPSCS/PTC/TR21-809(k)_2020.pdf)

National Highway Traffic Safety Administration. (2007). *Speed-Measuring Device Performance Specifications: Across-the-Road Radar Module* (Publication No. DOT HS 810 845). <https://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810845.pdf>

National Highway Traffic Safety Administration. (2013). *LIDAR Speed-Measuring Device Performance Specifications* (Publication No. DOT HS 809 811). <https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/809811-lidarspeedmeasuringdevice.pdf>



National Highway Traffic Safety Administration. (2016). *Speed-Measuring Device Specifications: Down-the-Road Radar Module* (Publication No. DOT HS 812 266).

<https://www.nhtsa.gov/sites/nhtsa.gov/files/812266-downroadradarmodule.pdf>

Pennsylvania Department of Transportation. (2020). *2020 Pennsylvania Crash Facts & Statistics*.

https://www.penndot.pa.gov/TravelInPA/Safety/Documents/2020_CFB_linked.pdf

Pennsylvania Department of Transportation. (2021, December 10). *Governor Wolf Announces New Funding for Eight Philadelphia Projects to Improve Traffic* [Press release].

<https://www.dot.state.pa.us/public/Bureaus/BOMO/Portal/TSPortal/PressReleaseASE2021.html>

Pennsylvania Transportation Advisory Committee. (2017). *Pennsylvania Automated Red-Light Enforcement 2017 Program Evaluation*.

<https://talkpatransportation.com/perch/resources/documents/arle-2017-report-06-15-2017.pdf>

Philadelphia Parking Authority. (2020). *Roosevelt Boulevard Automated Speed Camera Annual Report*.

<https://philapark.org/wp-content/uploads/2020-Speed-Report.pdf>

Philadelphia Parking Authority. (2021). *Automated Speed Enforcement Pilot Program – Roosevelt Boulevard*.

<https://philapark.org/wp-content/uploads/PPA-ASE-Report.pdf>

Philadelphia Parking Authority. (2022). *Roosevelt Boulevard Automated Speed Camera Annual Report*.

<https://philapark.org/wp-content/uploads/Automated-Speed-Enforcement-Camera-Report-FY-2022.pdf>

Philadelphia Parking Authority. (2021, January 20). *Automated Speed Enforcement Cameras* [Video].

YouTube. <https://youtu.be/tsg1oaApCn8>

Portland Bureau of Transportation. (2020). *Legislative Report Outcome Evaluation: Fixed Photo Radar System City of Portland 2019-2020*.

https://www.oregonlegislature.gov/citizen_engagement/Reports/Fixed%20Photo%20Radar%20System%20Portland%202019-20_FINAL.pdf

Redflex. (2022). *Radarcam*. <https://redflex.com/solution/radarcam/>

Tefft, B. C. (2011, September). *Impact Speed and a Pedestrian's Risk of Severe Injury or Death*. American

Automobile Association Foundation for Traffic Safety. <https://aaaafoundation.org/wp-content/uploads/2018/02/2011PedestrianRiskVsSpeedReport.pdf>

U.S. Department of Justice, Office of Justice Programs. (2018). *Contacts Between Police and the Public, 2015* (Special Report NCJ 251145). <https://bjs.ojp.gov/content/pub/pdf/cpp15.pdf>