WASHINGTON Traffic Safety COMMISSION

Automated Speed Enforcement Pilot Project Evaluation

Final Report as Submitted to the Legislature

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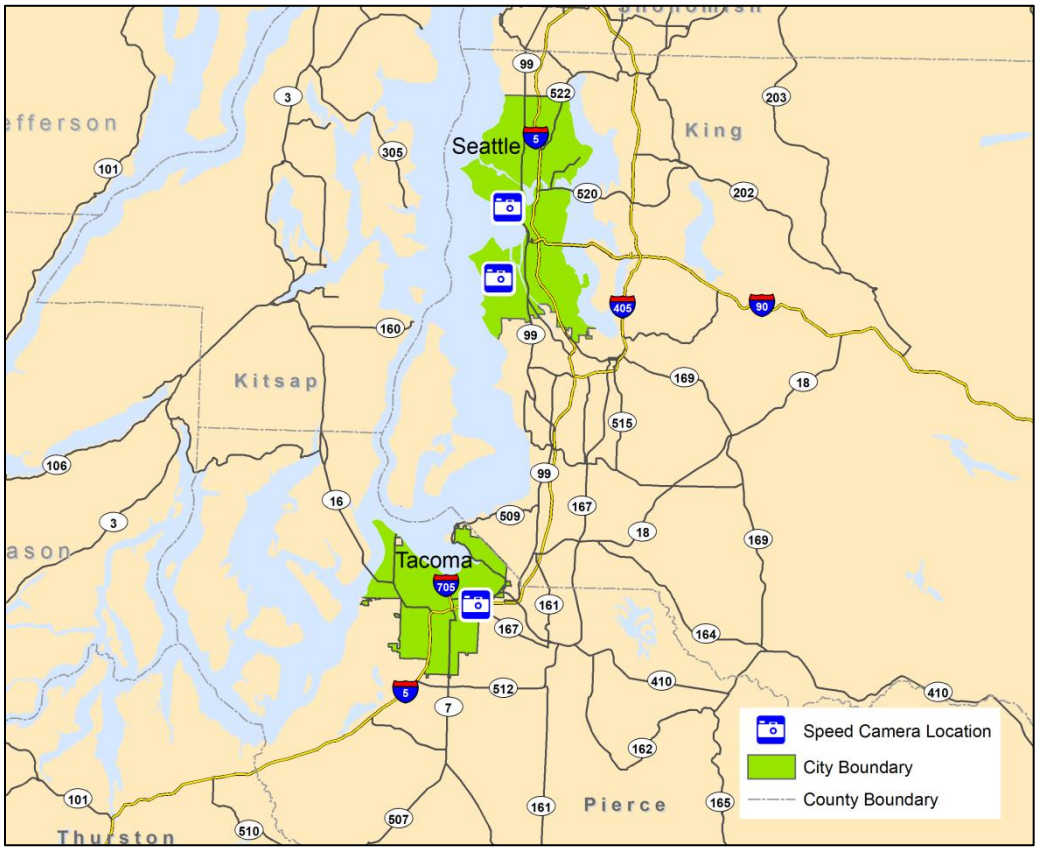


GLOSSARY OF TERMS

Mean Speed: The average (mean) speed of all vehicles during the data collection period.

85th Percentile Speed: The speed (MPH) at or below which 85% of vehicles are traveling.

Trigger Speed: The threshold speed (MPH) at which the camera is set to take a photo. A vehicle traveling at or above this speed is deemed to be in violation.

Violation: Occurs when a vehicle travels at or above the camera trigger speed.

Violation Percent: The percentage of vehicles triggering the automated enforcement camera.

Infraction: For the purposes of the automated speed enforcement pilot evaluation, when a violation occurs that meets the requirements under RCW 46.63.170(1)(e), a notice of traffic infraction is mailed to the registered owner of the vehicle.

Speed Adaptation: A well-documented phenomenon in which a driver leaving a higher-speed road (i.e., posted for 60-70 MPH) for a lower-speed road (e.g., 35 MPH) will continue to drive at a higher speed than if the same driver were leaving a 25 MPH road for a 35 MPH one. In other words, drivers become habituated to driving at a higher rate of speed and unconsciously continue driving at a higher speed.

EXECUTIVE SUMMARY

Introduction and Background

Traffic crashes involving speeding drivers are a major source of traffic fatalities and serious injuries. The total annual societal cost of speeding-related fatal and serious injury crashes in Washington is over a billion dollars each year.

Washington currently allows automated speed enforcement in school and construction zones to detect speeding vehicles. To explore the use of this technology in other types of locations, the 2009 Washington State Legislature passed a budget proviso for two automated speed enforcement pilot projects in Seattle and Tacoma. The proviso directed the Washington Traffic Safety Commission (WTSC) to evaluate the pilot projects and report to the Legislature on the use, public acceptance, outcomes, and other relevant issues regarding traffic safety cameras.

Use

Both cities passed ordinances (required under RCW 46.63.170), selected treatment and control sites, set fine schedules, planned for revenue distribution, and made additional administrative adjustments. Major differences between the Seattle and Tacoma pilot projects included the type of camera system used, camera trigger speed setting, infraction fine amount, and camera enforcement operation hours and duration.

Tacoma installed a fixed camera system on the East Bay Street curve in November 2009. Full speed enforcement operations began December 1 after an initial two-week warning period. The camera takes photos of vehicles traveling 10 MPH or more over the posted speed limit of 35 MPH and has operated around-the-clock up to the present, thereby providing continuous speed enforcement at that site.

Seattle has used one mobile speed camera unit and has alternated enforcement monthly between the two pilot project locations, Elliot Avenue W and 35th Avenue SW, since beginning operations in March 2010. The camera takes photos of vehicles traveling 8 MPH or more over the posted speed limit of 35 MPH. The mobile camera unit has been deployed on weekday mornings only between the hours of 9 AM and 11 AM.

Outcomes

Initial project outcomes for Seattle sites demonstrated a reduction in average speed and a decrease in the percentage of vehicles triggering the camera (i.e., violations). Although speed data was unavailable for the Tacoma site, the number of speeding infractions issued dropped.

- At the Elliott Avenue site in Seattle, mean speed decreased 5.6 MPH (from 36.0 MPH in March 2010 to 30.4 MPH in August 2010).
- At the 35th Avenue site in Seattle, mean speed decreased 2.5 MPH (from 37 MPH in March 2010 to 34.5 MPH in September 2010).
- At the East Bay Street site in Tacoma, the number of monthly speeding infractions decreased by 53% (from 4,913 in December 2009 to 2,308 in October 2010).

Public Acceptance and Other Relevant Issues

A survey of Seattle and Tacoma residents measured public knowledge and attitudes about the use of automated speed enforcement in their cities. Survey results indicated:

- 74.9% of respondents favored using speed cameras on roads with a high number of speeding deaths or serious injuries. 72.8% also favored using speed cameras in school zones.
- 35% of respondents felt excess infraction revenues should go into a 'City Traffic Safety Project Fund', 23% chose a 'City Law Enforcement Fund', and 21% wanted the revenues directed to a 'City General Fund'.

Table 1. Overview of Automated Speed Enforcement Pilot Project Requirements

Requirement under RCW 46.63.170	Seattle	Tacoma
Authorizing ordinance enacted by city	Yes	Yes
Vendor compensation based only on value of equipment and services provided or rendered in support of system	Yes	Yes
Camera location clearly marked by signs indicating traffic laws enforced by automated traffic safety camera	Yes	Yes
Photos only of vehicle and vehicle license plate and only while infraction occurs	Yes	Yes
Law enforcement officer review of photos prior to issuing infraction notice	Yes	Yes
Photos used only for speeding violation enforcement	Yes	Yes
Photos retained no longer than necessary to enforce law	Yes	Yes
Infraction not part of registered owner's driving record	Yes	Yes
Pilot project fine amount—cannot exceed city parking fine (note: state standard speeding fine range is $124 – $411)	$124 – $247	$101
City parking fine range	$24 – $250	$15 – $450
Infraction notice mailed within 14 days	Yes	Yes
Photo made available for inspection and admission into evidence in a proceeding	Yes; on infraction notice and online	Yes; on infraction notice and online

Table 2. Overview of Automated Speed Enforcement Pilot Projects

Site Description	Seattle	Tacoma
Site selection criteria	Speed, crashes, roadway design and class, traffic volume, posted speed, and land use	Speed, crash severity, roadway design and class, traffic volume, enforcement difficulty
Type of camera system	One mobile camera unit	One fixed camera
Enforcement period	Weekdays, 9-11 AM	Continuous, 24/7
Infraction Processing		
Speed setting for violation	43 MPH or higher	45 MPH or higher
Vendor reviews violations	Yes	Yes
Law enforcement reviews violations	Yes	Yes
Percent of violations rejected	Elliott Ave W: 25.8% total 35th Ave SW: 25.9% total	18% total (6% by vendor and 12% by law enforcement)
% appealed % successful	Estimate 10-15% appealed	3.4% of infractions contested 61% of those were dismissed
Revenue and Expenses		
Infraction revenue (monthly avg.)	$14,000	$158,838
Vendor charges (monthly avg.)	$3,500	$7,000
Other project costs (monthly avg.)	law enforcement: $5,670 court: $4,170	law enforcement: $6,000 (est.) court: $16,500
Where do funds exceeding project costs go?	General Fund	Traffic Enforcement, Engineering and Education Fund
Outcomes		
Change in average speed	Elliott Ave W: - 5.6 MPH 35th Ave SW: -2.5 MPH	Unavailable at this time
Change in infractions or violations	Elliott Ave W: 67% decrease in violations 35th Ave SW: 64% decrease in violations	53% decrease in infractions
Change in total crashes	Unavailable at this time	-7 (from 43 to 35 crashes)
Public Acceptance (Survey of City Residents)		
Types of locations where residents favor use of automated speed enforcement	High-injury locations School zones Difficult enforcement area	High-injury locations School zones Difficult enforcement area
Opinions on where excess revenue should go	Traffic Safety Fund Law Enforcement Fund	Traffic Safety Fund Law Enforcement Fund
Automated Speed Enforcement Research		
A 2010 Cochrane Review of the 35 strongest studies conducted worldwide found the following:	• 11% to 44% reduction in fatal and serious injury crashes • 1% to 15% relative reduction in average speed • 14% to 65% reduction in the proportion of vehicles speeding	

INTRODUCTION AND BACKGROUND

Introduction

In April 2009, the Washington State Legislature passed a transportation budget with a proviso specifying that the Washington Traffic Safety Commission "may oversee pilot projects implementing the use of automated traffic safety cameras to detect speed violations within cities west of the Cascade mountains that have a population over two hundred thousand". This language effectively designated Seattle and Tacoma as the only cities eligible to conduct such pilot projects. The proviso required the WTSC to "comply with RCW 46.63.170 in administering the projects," limited qualifying cities to "one traffic safety camera" each, and further directed that "[b]y January 1, 2011, the commission shall provide a report to the legislature regarding the use, public acceptance, outcomes, and other relevant issues regarding automated traffic safety cameras demonstrated by the projects" (ESSB 5352, §201(2)).

Accordingly, on May 11, 2009, WTSC employees met in Olympia with staff members from the House and the Senate Transportation Committees as well as a representative of OFM. At that meeting, attendees discussed and agreed upon a number of operational definitions, legal requirements, and other issues pertinent to the proposed projects, including the following items:

- Before a pilot project could begin in Seattle or Tacoma, each city must enact a city ordinance incorporating the requirements spelled out in RCW 46.63.170;
- Only one camera would be permitted for use in each of the cities involved, and photographs must be focused on vehicle and license plate only;
- Photo-enforcement locations must be clearly marked;
- Infraction notices must be sent to registered vehicle owners within 14 days of a violation;
- Infractions would not appear on driver abstracts, and fines would be limited to the highest current level for a parking infraction in each city;
- Both cities would need WTSC approval of their respective projects no later than December 31, 2009;
- WTSC would be responsible for delivering a report to the legislature (by January 1, 2011) documenting and discussing the "use, public acceptance, outcomes, and other relevant issues regarding automated traffic safety cameras demonstrated by the projects" (ESSB 5352, §201(2)).

On May 19, 2009, WTSC Director Lowell Porter and two other agency staff members met at the Tacoma Police Department with representatives of the law enforcement, budget, and data operations sections from Tacoma and Seattle to discuss how best to proceed with this project. Director Porter reviewed the project requirements laid out in both the proviso and in RCW 46.63.170, and attendees discussed potential problems and solutions related to those requirements (e.g., successful passage of the city ordinances, proper selection of both treatment and control sites, and how to obtain relevant data).

During the remainder of 2009, WTSC Speeding Program Manager Penny Nerup worked closely with both project coordinators, Michael Quinn, the Seattle Police Department's Strategic Advisor, and Lieutenant Pete Cribbin, Traffic Unit Commander for the Tacoma Police

Department, in order to coordinate the planning of project operations acceptable under the terms of the budget proviso. WTSC Research Investigator Dick Doane contributed to this discussion and clarified guidelines for project design and data acquisition in order to facilitate a clearer analysis of project outcomes.

WTSC Deputy Director Steve Lind made a presentation at the January 27, 2010 House Transportation Committee workshop on automated traffic enforcement, which included an update on the Seattle and Tacoma speed-camera pilot projects.

Background

Traffic injuries and fatalities related to speeding drivers have long been a major public safety problem in Washington. Speeding-involved deaths rank second only to impaired driving-involved deaths as a major source of traffic fatalities in Washington state, and speeding-involved collisions rank first as a source of serious injuries. Between 1994 and 2009, 3,777 people lost their lives in speeding-involved crashes on Washington roadways, an average of 236 fatalities every year. Forty percent of those deaths resulted from crashes on roads with posted speed limits of 35 MPH or less. In all, 60% of Washington's speeding-involved deaths stemmed from crashes on local roads (city streets and county roads). Likewise, 58% of serious traffic injuries attributed to speeding occurred on local roads as well.

The trend in speeding-involved fatalities has changed little over the past fifteen years. In order to meet our Target Zero goal of zero traffic deaths by 2030, Washington must pursue initiatives that will successfully mitigate the harmful effects of speeding. Moreover, speeding-involved crashes are expensive. Using collision-cost estimates provided by the Federal Highway Administration (FHWA), we calculate that speeding-involved fatality and serious-injury crashes cost Washingtonians more than a billion dollars in 2009 alone.[1]

Although enforcement of speeding laws by police in the course of normal traffic operations have proven to be a very effective deterrent in areas receiving regular and ample patrols, major problems exist with this traditional approach to speed enforcement. In essence, law enforcement patrols can amply and regularly cover only a small portion of the roadway miles needing their attention because very few police agencies have sufficient manpower and other resources to deter speeding effectively. As public agency budgets shrink further, this problem will only become magnified. Consequently, in recent years the use of automated speeding enforcement systems has become increasingly attractive to law enforcement agencies around the world because it offers the lure of more-effective deterrence coupled with the inherent attractiveness of requiring offenders themselves to pay for the enforcement program.

[1] The FHWA cost figure is based on a 2006 base estimate of $1,231,769 for each serious-injury or fatality crash, which is then multiplied by an implicit price deflation factor of 1.06242 for a per-crash cost estimate of $1,308,656. In 2009, Washington incurred 191 fatality and 673 serious-injury crashes that were speeding involved, or 864 total crashes. Thus, the total cost burden in Washington State for those crashes would be 864 crashes times $1,308,656, or $1.131 Billion. For further explanatory information, see Bureau of Economic Analysis Table 1.1.9, Implicit Price Deflators for Gross Domestic Product.

USE

Tacoma Project

On July 21, 2009, the Tacoma City Council passed an ordinance authorizing the Tacoma Police and Public Works Departments to conduct a pilot automated speed enforcement project in cooperation with the WTSC under the terms laid out in the budget proviso. The Tacoma Police Department designated Lieutenant Pete Cribbin to coordinate Tacoma's pilot speed-camera project. Several e-mail and telephone conversations between Lieutenant Cribbin, personnel at Tacoma Public Works, and staff members of the WTSC resulted in the formulation of a reasonable site-selection process. Lieutenant Cribbin indicated to WTSC Program Manager Penny Nerup that he would work with the Tacoma Public Works Department to help identify information for a strategic selection of both pilot and control sites.

SITE SELECTION

In their site-selection process, the Tacoma Police Department reviewed arterial roadways to select a fixed-camera site based on the following criteria:

- A high frequency of excessive vehicle speeds;
- A large number of collisions and injuries compared to similar arterials;
- The impracticality of using other traffic calming strategies;
- The impracticality of deploying traditional law enforcement patrols;
- The "channeling" of traffic in the site corridor prevents "displacement' of speeding vehicles onto adjacent roadways.

As a result, the Tacoma Police Department chose to install a fixed-camera on East Bay Street (westbound), a divided connector arterial with two lanes in each direction, at a site just beyond where East Bay emerges from River Road (see Figure 1, p. 6). River Road has a posted speed of 50 MPH before slowing to 35 MPH four-tenths of a mile before the fixed camera. A 25 MPH 'advisory speed' is posted on East Bay Street just ahead of a significant (roughly 60˚) curve to the northwest where eastbound traffic from E. 28th St merges onto East Bay Street (East Bay Street is essentially the terminal section of westbound SR-167 before it merges into city traffic on E. 26th Street and E. R Street). The site does not allow for traditional law enforcement patrols because it lacks adequate roadway shoulders (for pulling violators over); it also features limited sight distance as well as heavy volumes of traffic traveling at high speeds. A 12-hour (9:30 a.m.–9:30 p.m.) speed study of the site in June 2009 documented 859 vehicles traveling above 45 MPH (10 MPH over the posted speed) in the eastbound direction but only 359 such violators in the westbound direction.

Part of this discrepancy between eastbound and westbound violation numbers certainly stems from the well-documented phenomenon of speed adaptation, in which drivers are less likely to 'adapt' their speeds to lower posted levels (i.e., 25-35 MPH) when entering them from highways than from other lower-speed roads.

ENFORCEMENT

The Tacoma Police Department decided to set the speed camera 'trigger' speed at 45 MPH, or 10 MPH above the posted speed limit. Enforcement operations on E Bay Street began on November 17, 2009, with a two-week warning period, followed by the onset of the infraction period in the first week of December 2009. The camera has operated continuously from that time through October 2010. However, the speed-camera vendor for Tacoma, Redflex, was ultimately unable to forward detailed speed and violation data to the Tacoma Police Department except for September, October, and November 2010. Tacoma officials included that information in the data they forwarded to the WTSC for analysis.

Speeding infractions recorded by the camera were reviewed three times by Redflex employees for license plate legibility, visual clarity, and other factors before being approved and passed on to the Tacoma Police Department's Traffic Division for an additional review by line traffic patrol officers. These bi-level reviews resulted in the rejection of just over 18% of all tickets issued by the speed camera sited on Bay Street between December 2009 and October 2010. Interestingly, this rejection rate dropped considerably over the course of the project, declining from 26.7% in December 2009 and 29.4% in January 2010 to a low of 7.3% in October 2010.

In terms of the fines to be assessed for photo-radar speeding violations, Tacoma decided on a single per-infraction rate of $101.

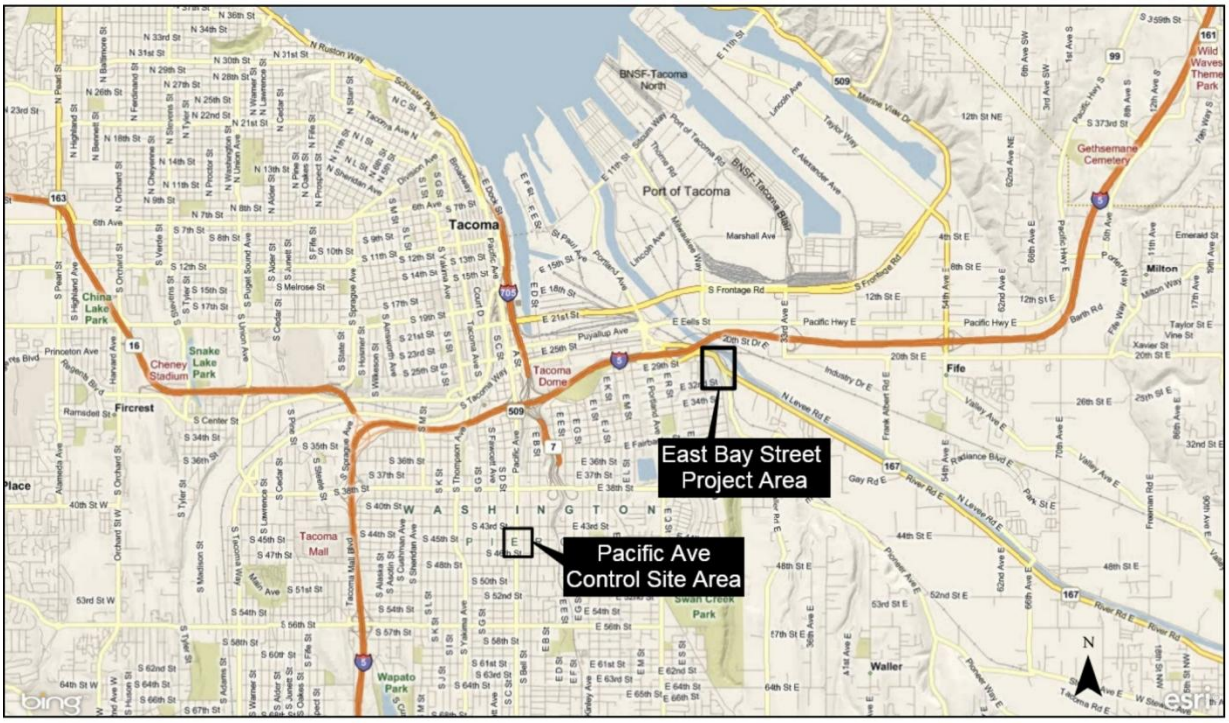
REVENUE

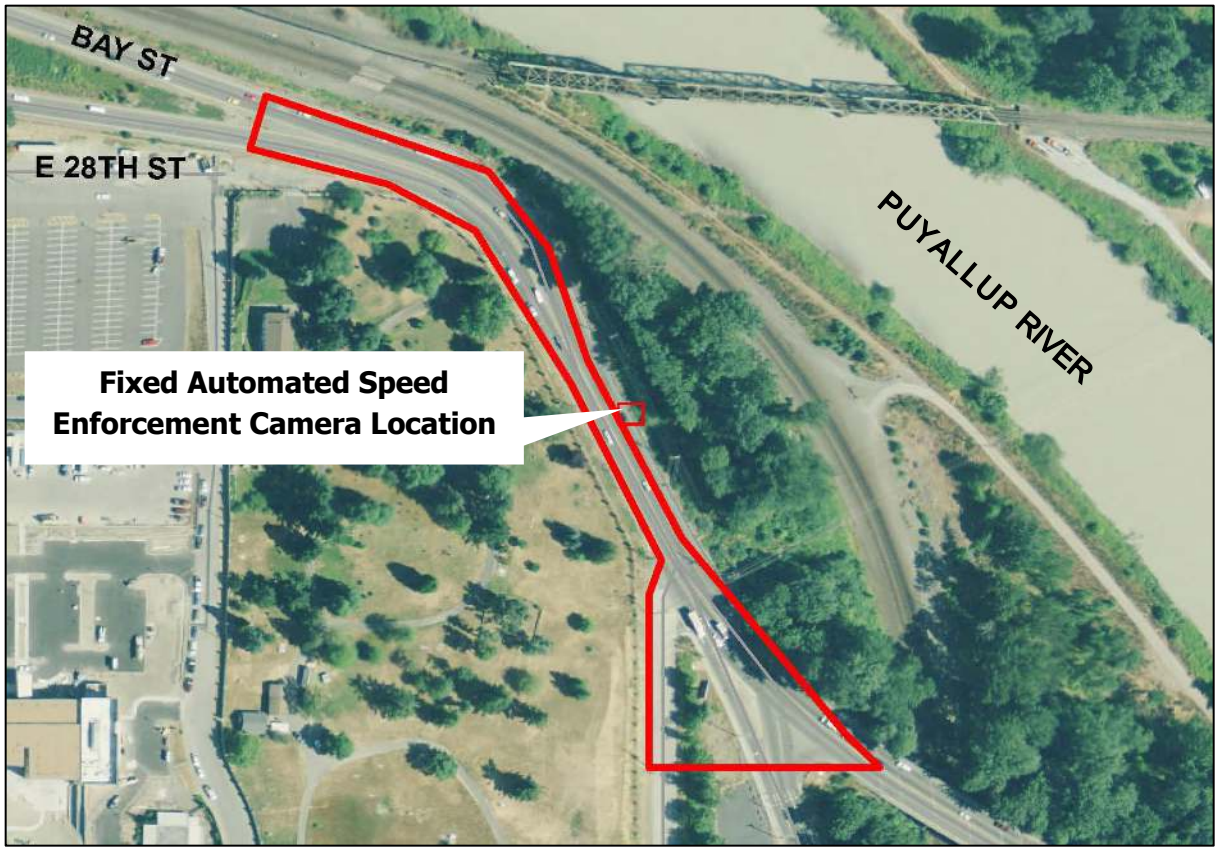
Data from Redflex, the Tacoma vendor, the Tacoma Police Department, and the Tacoma Municipal indicate that the monthly revenue generated by the pilot project in Tacoma (through October 2010) is roughly $158,000. Monthly costs for the project were about $30,000. The revenues exceeding costs have been regularly deposited into a city Traffic Enforcement, Engineering, and Education fund.

SITE VISIT

On April 21, 2010, WTSC staff traveled to Tacoma to meet with Lieutenant Corey Darlington, the Tacoma Police Department's automated speed enforcement project coordinator (Lieutenant Darlington replaced Lieutenant Cribbin as Traffic Unit Commander midway through the project period). The WTSC representatives were also able to observe Lieutenant Darlington conduct a formal review of speed-camera violation photos to determine whether they met the criteria specified in RCW 46.63.170.

Figure 1. Tacoma Automated Speed Enforcement Project Area





Source: Tacoma Police Department Crime Analysis Unit. Aerial photo 2009; plot date 12/1/2010.

Seattle Project

The Seattle City Council unanimously approved the necessary ordinance on November 23, 2009, the Mayor signed it on December 1, and the WTSC approved their project.

SITE SELECTION

While the legislative effort was proceeding, Seattle continued to plan for the deployment of its one mobile photo-radar van, which had been acquired in 2008 for speed enforcement in school zones. The WTSC-approved project was developed by a previously-created Interdepartmental Team (IDT), whose members were drawn from the police, the municipal court, the legal office, the budget office, and the transportation department. In order to maximize resources, the IDT decided to use their existing speed-camera capability, a mobile van equipped with a photo-enforcement unit. The IDT systematically reviewed arterial locations where 85th percentile speeds were well above (i.e., 10 MPH over) the posted limit. They further narrowed the search to include high-collision locations and to exclude locations where traffic-calming design features (e.g., chicanes or curb-extensions) were already in place or where the roadway configuration problems made safe deployment of the mobile van very difficult along the road side. Next, the IDT further selected for sites based on the following eight factors:

- arterial classification
- number of traffic lanes
- traffic volumes
- posted speed limits
- 85th percentile speeds
- number of collisions
- roadway section length
- adjacent land use

Based on this process, the IDT chose two treatment sites, one on Elliott Avenue W (SB) between the Magnolia Bridge and 6th Avenue W, and the other on 35th Avenue SW (NB), between SW Brandon St and SW Hudson St. The selection of two sites partly reflected a Seattle Police Department resource-management need to use the mobile unit more economically by coupling deployment at the 35th Avenue site with deployment in a nearby school zone. The IDT also picked two control sites, Aurora Avenue N (NB) between N 85th St and N 105th St, and Holman Rd NW (NWB) between 7th Avenue NW and 9th Avenue NW. All four sites are classed as 'principal arterial,' all are posted for 35 MPH, and all feature two traffic lanes in each direction except Aurora, which has three traffic lanes in each direction. One project site (Elliott) and one control site (Aurora) are situated in commercial/mixed-use areas, while the remaining project site (35th) and control site (Holman) are each located in areas zoned as residential. Thus, each treatment site was paired with a control site that is similarly zoned.

Table 1. Characteristics of Seattle Treatment and Control Sites

	Treatment Sites		Control Sites	
	35th Ave SW	*Elliot Ave W*	*Control 1*	*Control 2*
Site Description	35th Ave SW from SW Brandon St to SW Hudson St	Elliot Ave W from Magnolia Bridge to 6th Ave W	Holman RD NW from 7th Ave NW to 9th Ave NW	Aurora Ave N from N 85th St to N 105th St
Segment Length	1,300 feet	4,600 feet	1,200 feet	5,300 feet
Arterial Class	Principal	Principal	Principal	Principal
Number of Lanes	4 total – 2 general purpose each direction	7 total – 2 general purpose each direction 2 bus lanes 1 two-way left turn	4 total – 2 general purpose each direction	7 total – 3 general purpose each direction 1 two-way left turn
Posted Speed Limit	35 MPH	35 MPH	35 MPH	35 MPH
85th Percentile Speed	43 MPH (2006 & 2009)	41 MPH (2009)	43 MPH (2009)	41 MPH (2009)
Adjacent Land Use	Single-family residential	Industrial, commercial/ mixed use	Single-family/ multi-family residential	Commercial/ mixed use
Average Weekday Daily Traffic (AWDT)	23,000	~50,000	29,000	38,000
Number of Collisions	Midblock -7, Intersection - 0	Midblock - 88, Intersection - 21	Midblock - 6, Intersection - 7	Midblock - 116, Intersection - 45

ENFORCEMENT

The IDT made the decision to set the camera 'trigger', i.e., the speed at which the camera would snap a photo of the speeding vehicle's license plate, at 43 MPH, eight miles per hour above the posted speed limit.

Under the terms of Seattle's enabling ordinance, fines resulting from operation of the mobile camera unit would be graduated along the same line as standard statewide speeding fines, i.e., in terms of MPH increments above the posted speed limit. The highest fine proposed by the IDT was $247, just short of Seattle's largest parking-ticket fine of $250, whereas the statewide schedule tops out at $411 for traveling 70 MPH or more on a road posted for 35 MPH.

Table 2. Seattle project fine schedule

MPH above posted speed	*Fine Amount*
6-10 MPH	$124
11-15 MPH	$154
16-20 MPH	$195
21+ MPH	$247

Following the acquisition of baseline measurements at each project site and at control sites, Seattle's mobile speed unit initiated a 'warning' period at the Elliott Avenue site, beginning April 19, 2010, and ending May 3, 2010. Because the onset of the warning period coincided with several media stories publicizing the beginning of automated speed enforcement on Elliott Avenue, Seattle project personnel determined that no warning period would precede the start of photo-enforcement on May 14, 2010, at the 35th Avenue SW site. In addition, signs were posted at each site to inform drivers that photo-enforcement was taking place. The Seattle Police Department's mobile traffic camera unit conducted intermittent but sustained enforcement operations at this site during nineteen days over the course of the next six weeks, ending on June 29, 2010. At that point, the mobile enforcement operation resumed at the Elliott Avenue site, beginning on July 6th, 2010, and ending there on August 25, 2010 (sixteen days of actual enforcement). Speed-camera operations then moved back to 35th Avenue once more, running for about three weeks (nine days of actual enforcement) from September 8 through September 28, 2010.

Infractions in Seattle were first reviewed by the vendor and then by the Seattle Police Department. Just over 74% of all violations photographed by the speed-camera unit at both of the treatment sites combined resulted in infraction notices being sent to vehicle-owner addresses, and approximately 75% of those infractions have been paid (as of 12/15/2010).

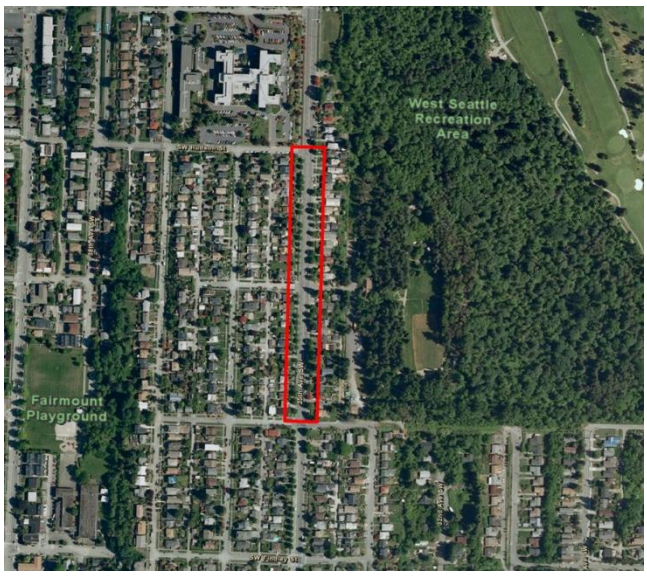
SITE VISIT

On April 21, 2010, WTSC staff traveled to Seattle to meet with Michael Quinn, the Seattle Police Department's automated speed enforcement project coordinator. The WTSC representatives were able to observe the deployment of Seattle's mobile photo-enforcement unit along Elliott Avenue W, to view individual violation photographs inside the van, and to discuss operational details with Mr. Quinn.

Figure 2. Seattle Automated Speed Enforcement Project Areas

Elliott Ave W, Seattle

35th Ave SW (& SW Dawson St), Seattle



Source: ©2010 Google

OUTCOMES

Tacoma Results

Tacoma initiated fixed camera speed enforcement at the East Bay Street site with a warning period in November 2009. Full enforcement began in December 2009, and the fixed speed camera has operated continuously up to the present time. Initial results from the number of vehicle violations and number of infraction notices issued suggest travel speeds are decreasing. Standard monthly reports from the vendor included total violations, reasons for rejecting a violation, and number of infractions issued.

Vehicle travel speed measures and percentage of vehicles triggering the camera are shown below in Table 3. At the time of this report, data for the baseline period and for the first 9 months of automated speed enforcement was unavailable. Therefore, identifying changes in average vehicle speed, 85th percentile speed, and percentage of vehicles traveling 10 MPH or more over the posted speed limit was not possible. The vendor's data retention practice prevented retrieval of these data elements once three months had passed.

Table 3. East Bay Street Treatment Site Speeds and Vehicle Violations

		East Bay Street		
Phase	*Month*	*Mean Speed (MPH)*	*85th Percentile (MPH)*	*Vehicle Violation (%)*
Baseline	Nov-09	*	*	*
Enforcement	Dec-09 to Aug-10	*	*	*
	Sep-10	30.7	35	0.5%
	Oct-10	30.4	35	0.4%
	Nov-10	29.8	34	0.3%

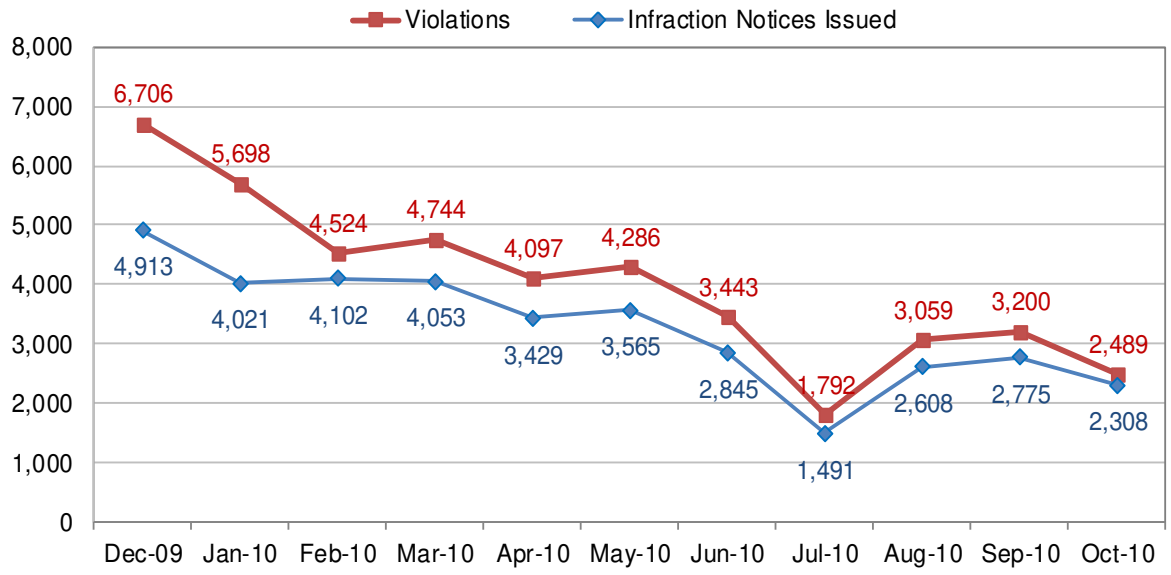
*Vehicle travel speed and volume data unavailable for this time period at the East Bay Street site.

Nonetheless, the following speed and vehicle volume data from September through November 2010 show the following:

- The average speed during these three months declined slightly, from 30.7 to 29.8 MPH;
- 85% percentile speeds remained at or below the posted speed of 35 MPH;
- Less than 1% of vehicles traveled 45 MPH or faster.

The number of violations and infractions issued declined steadily over the 11 month study period as shown in Figure 3. These declines indicate that the percentage of vehicle traveling 10 MPH or more above the posted speed decreased over that period; thus, it is not surprising that mean and 85 percentile speeds also decreased between September and November. These downward trends are also consistent with results from the majority of published studies on automated speed enforcement.

Figure 3. East Bay Street Site Speeding Violations and Infractions Notices, by Month



This is a summary of East Bay Street results between December 2009 and October 2010:

- The number of violations (vehicles triggering the camera) decreased by 62.9%, from 6,706 to 2,489;
- Correspondingly, infractions issued to speeding vehicles decreased by 53.0%, from 4,913 to 2,308;
- The violation rejection rate also decreased by over two-thirds, from 26.7% to 7.3%.

Additional reasons for the decline in violations and infractions may have included decreased traffic volumes or altered travel routes. If vehicle speeds remained unchanged but traffic volumes were lighter, fewer violations would have been recorded by the camera. It is also possible that speeding drivers selected a different route to avoid the automated speed enforcement camera. However, the East Bay Street site is not easily avoided or circumnavigated, an important criterion in the site selection process.

Seattle Results

Project data and other program information were forwarded to the WTSC for analysis on November 2, 2010. As Figures 4 through 6 indicate, data for both sites showed encouraging reductions in average vehicle speeds, 85th percentile vehicle speeds, and the percent of vehicles committing speeding violations.

Figure 4. Change in Mean Speeds

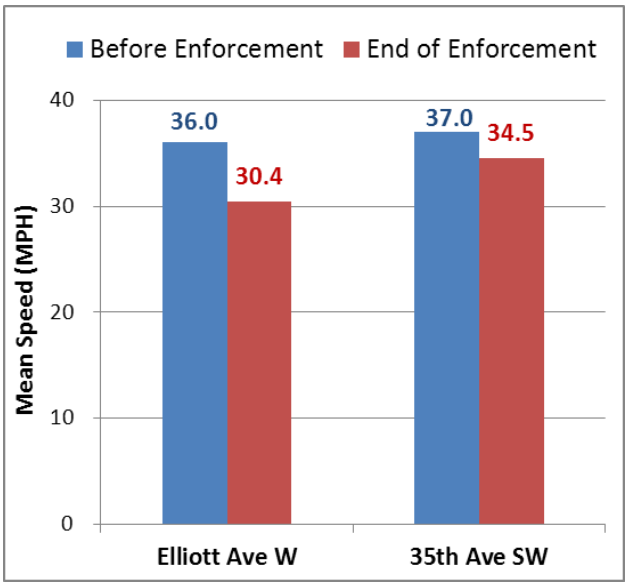


Figure 5. Change in 85th Percentile Speeds

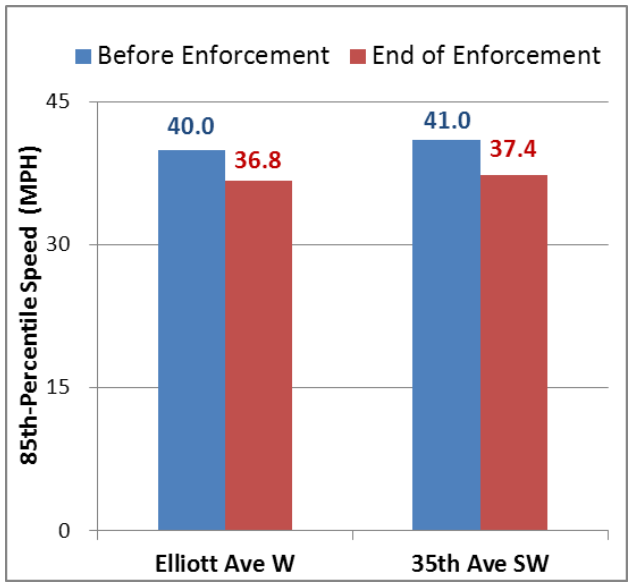
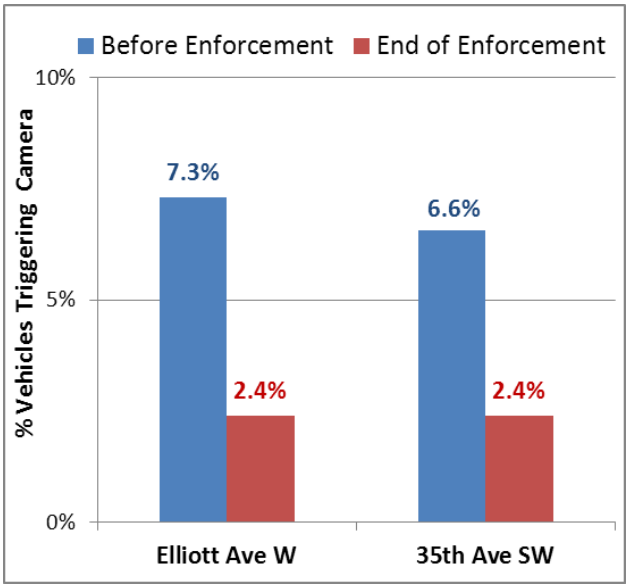


Figure 6. Change in Treatment Site Violation Rates



While all three outcome measures showed reductions (from the baseline to the end of enforcement) at both treatment sites, the reductions were larger for the Elliott Avenue site than for the 35th Avenue site except in terms of the change in 85th percentile speeds:

- 5.6 MPH (15.6%) drop in average speed at the Elliott Avenue site, versus a 2.5 MPH (6.8%) reduction on 35th Avenue;
- 3.2 MPH reduction in 85th percentile speed on Elliott Avenue, versus a 3.6 MPH 85th percentile decrease on 35th Avenue;
- 67% decrease in the percentage of vehicles triggering a violation on Elliott Avenue, versus a 64% decrease on 35th Avenue.

Table 4. Average Number of Speeding Infractions Issued Monthly

	Elliott Ave W			35th Ave SW		
Month	*Number of Infractions*	*Number of Enforcement Days*	*Infractions per Enforcement Day*	*Number of Infractions*	*Number of Enforcement Days*	*Infractions per Enforcement Day*
May	0	0	NA	167	8	20.9
June	0	0	NA	241	11	21.9
July	149	9	16.6	0	0	NA
August	153	7*	21.9	0	0	NA
September	0	0	NA	75	9	8.3

*The camera trigger was set a 45 MPH (instead of 43 MPH) during 4 of the 7 enforcement days in August.

Table 4 shows the number of speeding infractions issued each month and the total number of days the mobile speed camera unit enforced the speed limit.

Finally, owing to the brevity of the enforcement period in Seattle, as well as to the intermittent nature of the deployments, no collision data were obtained for either the Elliott Avenue W site or the 35th Avenue SW site. Should the pilot period be extended, collision data would become a more meaningful indicator of the safety effectiveness of automated enforcement at the two test sites.

OTHER RELEVANT ISSUES

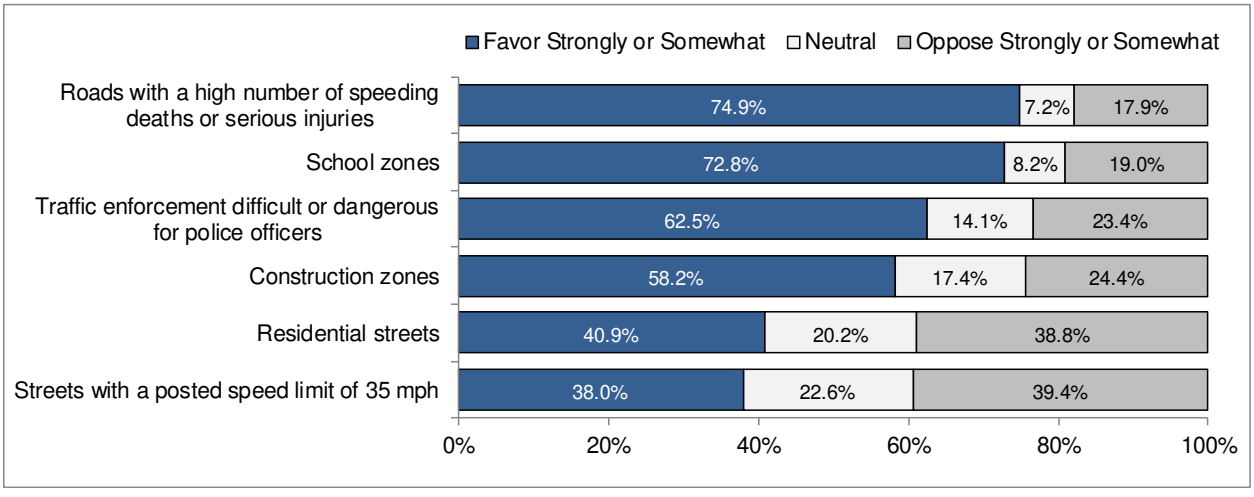
Public Acceptance

Between May and August of 2010, the WTSC worked closely with Gilmore Research to design a survey questionnaire for assessing public attitudes and opinions in Seattle and Tacoma about their automated speeding enforcement projects. After WTSC approved of a draft version of the survey, Gilmore pre-tested the survey with numerous subjects. The results of that field-testing led to further changes in the survey layout, format, and wording of the survey instrument. On September 7th, Gilmore mailed out pre-notification letters to 1,000 randomly-selected households in Seattle and another 1,000 in Tacoma. Three days after that mailing, Gilmore sent a copy of the survey instrument to each household where they had mailed a pre-notification letter. Recipients had three options to choose: (1) complete and return the survey directly back to Gilmore by mail, (2) call the Gilmore phone center and complete the survey on the phone, or (3) complete the survey online at a Gilmore-sponsored website.

When the survey collection period ended (October 18, 2010), Gilmore compiled the response information and entered the data into a database. Gilmore researchers then wrote a methodology report summarizing the sample disposition and response frequencies, which they forwarded to the WTSC along with the survey data.

Responses to each question for both cities are shown in Appendix B. About 900 citizens from both cities combined responded to at least one question in the survey, but nearly all questions received between 845 and 865 responses (about 51% of them from Seattle households and 49% from Tacoma households). Question 1 asks, "In your opinion, how much of a safety problem is speeding in the City?" About 53% of Seattle respondents (52.9%) selected 'Somewhat of a problem' while another 19.9% replied, 'A big problem'. By comparison, a slightly smaller percent of respondents from Tacoma (50.9%) selected ''Somewhat of a problem' and 26.1% selected 'A big problem'.

Figure 7. Support for Automated Speed Enforcement by Type of Location



Clear majorities of respondents in both cities favored (either 'Somewhat' or 'Strongly') the use of speed cameras in 'construction zones' (57.9% in Seattle, 58.5% in Tacoma), in locations where 'enforcement is difficult or dangerous for police officers' (61.2% in Seattle, 63.9% in Tacoma), in 'school zones' (71.6% in Seattle, 74.0% in Tacoma), and on 'roads with a high number of speeding deaths and serious injuries' (73.7% in Seattle, 76.1% in Tacoma).

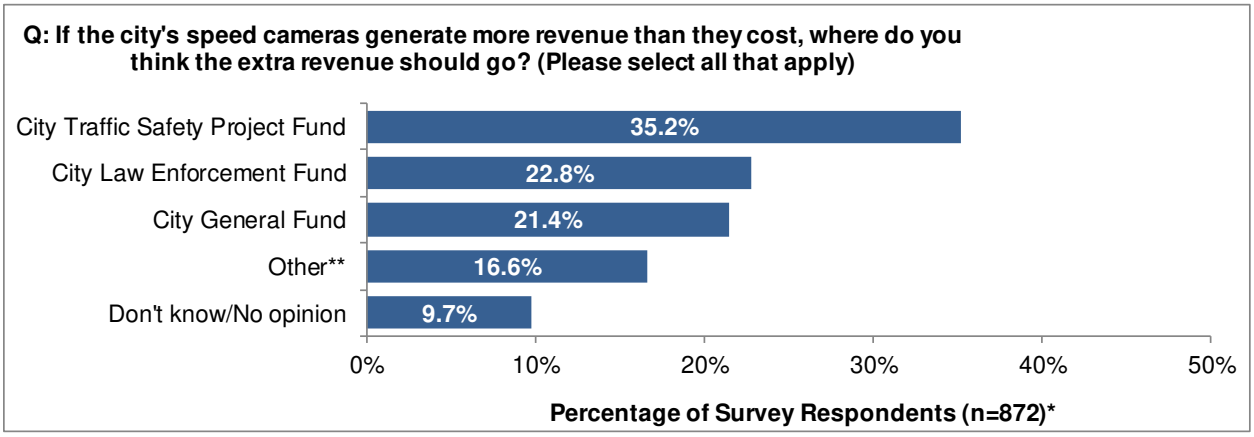
On the other hand, the proportion of respondents who *favored* using speed cameras on 'residential streets' and on 'streets with a speed limit of 35 MPH' was similar to the proportion of respondents who *opposed* using speed cameras in these areas.

Revenue

One salient issue surrounding this project specifically, and automated traffic enforcement in general, is the question of what happens to the money generated via the collection of fines resulting from violations.

It is clear from the Gilmore survey results that a majority of residents from each city believes that the speed-camera programs generate revenue in excess of what they cost to operate. Although a majority in each city (53.7% in Seattle, 53.1% in Tacoma) also acknowledges not knowing *where* the revenue actually goes, a majority in each city (58.1% in Seattle, 57.9% in Tacoma) believes that the excess revenue ought to go into either a 'traffic safety fund' or a general 'law enforcement fund'. Conversely, only about one-fourth of Seattle respondents (25.2%) and less than one-fifth of Tacoma respondents (17.5%) felt that excess revenues should go into a city 'general fund'.

Figure 8. Seattle and Tacoma Residents Opinions on Excess Revenue Distribution



*Respondents may have selected more than one response; therefore, percentages will total more than 100%.
**The most frequent "Other" responses written in by respondents were road and sidewalk maintenance (6.9%) and education/schools (4.5%)

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APPENDICES

APPENDIX A

RCW 46.63.170 Automated traffic safety cameras — Definition. (Effective until July 1, 2011.)

(1) The use of automated traffic safety cameras for issuance of notices of infraction is subject to the following requirements:

(a) The appropriate local legislative authority must first enact an ordinance allowing for their use to detect one or more of the following: Stoplight, railroad crossing, or school speed zone violations. At a minimum, the local ordinance must contain the restrictions described in this section and provisions for public notice and signage. Cities and counties using automated traffic safety cameras before July 24, 2005, are subject to the restrictions described in this section, but are not required to enact an authorizing ordinance.

(b) Use of automated traffic safety cameras is restricted to two-arterial intersections, railroad crossings, and school speed zones only.

(c) During the 2009-2011 fiscal biennium, automated traffic safety cameras may be used to detect speed violations for the purposes of section 201(2), chapter 470, Laws of 2009 if the local legislative authority first enacts an ordinance authorizing the use of cameras to detect speed violations.

(d) Automated traffic safety cameras may only take pictures of the vehicle and vehicle license plate and only while an infraction is occurring. The picture must not reveal the face of the driver or of passengers in the vehicle.

(e) A notice of infraction must be mailed to the registered owner of the vehicle within fourteen days of the violation, or to the renter of a vehicle within fourteen days of establishing the renter's name and address under subsection (3)(a) of this section. The law enforcement officer issuing the notice of infraction shall include with it a certificate or facsimile thereof, based upon inspection of photographs, microphotographs, or electronic images produced by an automated traffic safety camera, stating the facts supporting the notice of infraction. This certificate or facsimile is prima facie evidence of the facts contained in it and is admissible in a proceeding charging a violation under this chapter. The photographs, microphotographs, or electronic images evidencing the violation must be available for inspection and admission into evidence in a proceeding to adjudicate the liability for the infraction. A person receiving a notice of infraction based on evidence detected by an automated traffic safety camera may respond to the notice by mail.

(f) The registered owner of a vehicle is responsible for an infraction under RCW 46.63.030(1)(e) unless the registered owner overcomes the presumption in RCW 46.63.075, or, in the case of a rental car business, satisfies the conditions under subsection (3) of this section. If appropriate under the circumstances, a renter identified under subsection (3)(a) of this section is responsible for an infraction.

(g) Notwithstanding any other provision of law, all photographs, microphotographs, or electronic images prepared under this section are for the exclusive use of law enforcement in the discharge of duties under this section and are not open to the public and may not be used in a court in a pending action or proceeding unless the action or proceeding relates to a violation under this section. No photograph, microphotograph, or electronic image may be used for any purpose other than enforcement of violations under this section nor retained longer than necessary to enforce this section.

(h) All locations where an automated traffic safety camera is used must be clearly marked by placing signs in locations that clearly indicate to a driver that he or she is entering a zone where traffic laws are enforced by an automated traffic safety camera.

(i) If a county or city has established an authorized automated traffic safety camera program under this section, the compensation paid to the manufacturer or vendor of the equipment used must be based only upon the value of the equipment and services provided or rendered in support of the system, and may not be based upon a portion of the fine or civil penalty imposed or the revenue generated by the equipment.

(2) Infractions detected through the use of automated traffic safety cameras are not part of the registered owner's driving record under RCW 46.52.101 and 46.52.120. Additionally, infractions generated by the use of automated traffic safety cameras under this section shall be processed in the same manner as parking infractions, including for the purposes of RCW 3.50.100, 35.20.220, 46.16.216, and 46.20.270(3). However, the amount of the fine issued for

an infraction generated through the use of an automated traffic safety camera shall not exceed the amount of a fine issued for other parking infractions within the jurisdiction.

(3) If the registered owner of the vehicle is a rental car business, the law enforcement agency shall, before a notice of infraction being issued under this section, provide a written notice to the rental car business that a notice of infraction may be issued to the rental car business if the rental car business does not, within eighteen days of receiving the written notice, provide to the issuing agency by return mail:

(a) A statement under oath stating the name and known mailing address of the individual driving or renting the vehicle when the infraction occurred; or

(b) A statement under oath that the business is unable to determine who was driving or renting the vehicle at the time the infraction occurred because the vehicle was stolen at the time of the infraction. A statement provided under this subsection must be accompanied by a copy of a filed police report regarding the vehicle theft; or

(c) In lieu of identifying the vehicle operator, the rental car business may pay the applicable penalty.

Timely mailing of this statement to the issuing law enforcement agency relieves a rental car business of any liability under this chapter for the notice of infraction.

(4) Nothing in this section prohibits a law enforcement officer from issuing a notice of traffic infraction to a person in control of a vehicle at the time a violation occurs under RCW 46.63.030(1) (a), (b), or (c).

(5) For the purposes of this section, "automated traffic safety camera" means a device that uses a vehicle sensor installed to work in conjunction with an intersection traffic control system, a railroad grade crossing control system, or a speed measuring device, and a camera synchronized to automatically record one or more sequenced photographs, microphotographs, or electronic images of the rear of a motor vehicle at the time the vehicle fails to stop when facing a steady red traffic control signal or an activated railroad grade crossing control signal, or exceeds a speed limit in a school speed zone as detected by a speed measuring device. During the 2009-2011 fiscal biennium, an automated traffic safety camera includes a camera used to detect speed violations for the purposes of section 201(2), chapter 470, Laws of 2009.

(6) During the 2009-2011 fiscal biennium, this section does not apply to automated traffic safety cameras for the purposes of section 218(2), chapter 470, Laws of 2009.

[2009 c 470 § 714; 2007 c 372 § 3; 2005 c 167 § 1.]

Notes: **Effective date -- 2009 c 470:** See note following RCW 46.68.170.

RCW 46.63.170 Automated traffic safety cameras — Definition. (*Effective July 1, 2011.*)

(1) The use of automated traffic safety cameras for issuance of notices of infraction is subject to the following requirements:

(a) The appropriate local legislative authority must first enact an ordinance allowing for their use to detect one or more of the following: Stoplight, railroad crossing, or school speed zone violations. At a minimum, the local ordinance must contain the restrictions described in this section and provisions for public notice and signage. Cities and counties using automated traffic safety cameras before July 24, 2005, are subject to the restrictions described in this section, but are not required to enact an authorizing ordinance.

(b) Use of automated traffic safety cameras is restricted to two-arterial intersections, railroad crossings, and school speed zones only.

(c) During the 2009-2011 fiscal biennium, automated traffic safety cameras may be used to detect speed violations for the purposes of section 201(2), chapter 470, Laws of 2009 if the local legislative authority first enacts an ordinance authorizing the use of cameras to detect speed violations.

(d) Automated traffic safety cameras may only take pictures of the vehicle and vehicle license plate and only while

an infraction is occurring. The picture must not reveal the face of the driver or of passengers in the vehicle.

(e) A notice of infraction must be mailed to the registered owner of the vehicle within fourteen days of the violation, or to the renter of a vehicle within fourteen days of establishing the renter's name and address under subsection (3)(a) of this section. The law enforcement officer issuing the notice of infraction shall include with it a certificate or facsimile thereof, based upon inspection of photographs, microphotographs, or electronic images produced by an automated traffic safety camera, stating the facts supporting the notice of infraction. This certificate or facsimile is prima facie evidence of the facts contained in it and is admissible in a proceeding charging a violation under this chapter. The photographs, microphotographs, or electronic images evidencing the violation must be available for inspection and admission into evidence in a proceeding to adjudicate the liability for the infraction. A person receiving a notice of infraction based on evidence detected by an automated traffic safety camera may respond to the notice by mail.

(f) The registered owner of a vehicle is responsible for an infraction under *RCW 46.63.030(1)(e) unless the registered owner overcomes the presumption in RCW 46.63.075, or, in the case of a rental car business, satisfies the conditions under subsection (3) of this section. If appropriate under the circumstances, a renter identified under subsection (3)(a) of this section is responsible for an infraction.

(g) Notwithstanding any other provision of law, all photographs, microphotographs, or electronic images prepared under this section are for the exclusive use of law enforcement in the discharge of duties under this section and are not open to the public and may not be used in a court in a pending action or proceeding unless the action or proceeding relates to a violation under this section. No photograph, microphotograph, or electronic image may be used for any purpose other than enforcement of violations under this section nor retained longer than necessary to enforce this section.

(h) All locations where an automated traffic safety camera is used must be clearly marked by placing signs in locations that clearly indicate to a driver that he or she is entering a zone where traffic laws are enforced by an automated traffic safety camera.

(i) If a county or city has established an authorized automated traffic safety camera program under this section, the compensation paid to the manufacturer or vendor of the equipment used must be based only upon the value of the equipment and services provided or rendered in support of the system, and may not be based upon a portion of the fine or civil penalty imposed or the revenue generated by the equipment.

(2) Infractions detected through the use of automated traffic safety cameras are not part of the registered owner's driving record under RCW 46.52.101 and 46.52.120. Additionally, infractions generated by the use of automated traffic safety cameras under this section shall be processed in the same manner as parking infractions, including for the purposes of RCW 3.50.100, 35.20.220, 46.16A.120, and 46.20.270(3). However, the amount of the fine issued for an infraction generated through the use of an automated traffic safety camera shall not exceed the amount of a fine issued for other parking infractions within the jurisdiction.

(3) If the registered owner of the vehicle is a rental car business, the law enforcement agency shall, before a notice of infraction being issued under this section, provide a written notice to the rental car business that a notice of infraction may be issued to the rental car business if the rental car business does not, within eighteen days of receiving the written notice, provide to the issuing agency by return mail:

(a) A statement under oath stating the name and known mailing address of the individual driving or renting the vehicle when the infraction occurred; or

(b) A statement under oath that the business is unable to determine who was driving or renting the vehicle at the time the infraction occurred because the vehicle was stolen at the time of the infraction. A statement provided under this subsection must be accompanied by a copy of a filed police report regarding the vehicle theft; or

(c) In lieu of identifying the vehicle operator, the rental car business may pay the applicable penalty.

Timely mailing of this statement to the issuing law enforcement agency relieves a rental car business of any liability under this chapter for the notice of infraction.

(4) Nothing in this section prohibits a law enforcement officer from issuing a notice of traffic infraction to a person in control of a vehicle at the time a violation occurs under RCW 46.63.030(1) (a), (b), or (c).

(5) For the purposes of this section, "automated traffic safety camera" means a device that uses a vehicle sensor

installed to work in conjunction with an intersection traffic control system, a railroad grade crossing control system, or a speed measuring device, and a camera synchronized to automatically record one or more sequenced photographs, microphotographs, or electronic images of the rear of a motor vehicle at the time the vehicle fails to stop when facing a steady red traffic control signal or an activated railroad grade crossing control signal, or exceeds a speed limit in a school speed zone as detected by a speed measuring device. During the 2009-2011 fiscal biennium, an automated traffic safety camera includes a camera used to detect speed violations for the purposes of section 201(2), chapter 470, Laws of 2009.

(6) During the 2009-2011 fiscal biennium, this section does not apply to automated traffic safety cameras for the purposes of section 218(2), chapter 470, Laws of 2009.

[2010 c 161 § 1127; 2009 c 470 § 714; 2007 c 372 § 3; 2005 c 167 § 1.]

Notes: ***Reviser's note:** RCW 46.63.030 was amended by 2010 c 249 § 5, changing subsection (1)(e) to subsection (1)(d).

Effective date -- Intent --Legislation to reconcile chapter 161, Laws of 2010 and other amendments made during the 2010 legislative session --2010 c 161: See notes following RCW 46.04.013.

Effective date -- 2009 c 470: See note following RCW 46.68.170.

APPENDIX B

Budget Proviso, Engrossed Substitute Senate Bill 5352, Section 201(2)[2]

2) The commission may oversee pilot projects implementing the use of automated traffic safety cameras to detect speed violations within cities west of the Cascade mountains that have a population over two hundred thousand. For the purposes of pilot projects in this subsection, no more than one automated traffic safety camera may be used to detect speed violations within any one jurisdiction.

(a) The commission shall comply with RCW 46.63.170 in administering the projects.

(b) In order to ensure adequate time in the 2009-11 fiscal biennium to evaluate the effectiveness of the pilot projects, any projects authorized by the commission must be authorized by December 31, 2009.

(c) By January 1, 2011, the commission shall provide a report to the legislature regarding the use, public acceptance, outcomes, and other relevant issues regarding automated traffic safety cameras demonstrated by the projects.

[2] ESSB 5352 is available at http://leap.leg.wa.gov/leap/budget/detail/2009/ct0911p.asp (Accessed December 16, 2010).

APPENDIX C

Survey of Seattle and Tacoma Residents

Methods

The purpose of the survey was to ascertain public acceptance regarding the use of automated traffic safety cameras. The Washington Traffic Safety Commission contracted with Gilmore Research to conduct a multi-mode survey of households in the automated traffic safety camera pilot project cities.

The increase in cell phone-only households has made it difficult to reach a representative random sample of the population in a specific geographic area using the traditional random digit dialing (RDD) approach. To overcome phone coverage issues and provide more than one method of contact, Address Based Sampling was used. This sampling technique involves drawing a probability based sample of households within the target geographic area.

The survey contractor purchased residential mail delivery locations in the Cities of Seattle and Tacoma. The Tacoma ZIP Code service area 98421 was not included in the ABS survey sample due to its small population size (31 households). The initial survey sample consisted of 2,000 randomly selected households. In addition to name and mailing address, a phone listing was available for 1,121 (56.1%) of households in the survey sample. Mail, web, and phone survey modes were utilized to improve response rates and increase the validity and reliability of the estimates obtained.

The 20 question survey asked residents about speeding behavior, how much they favored or opposed using speed cameras by type of location, and opinions on where to place extra revenue generated. Copies of the Seattle questionnaire and cover letters are available in Appendix B. The Tacoma questionnaire and cover letters were the same as Seattle's with the exception of the city name. Survey respondents did not receive any incentive for completing the survey.

Pre-notification letters were mailed to households in the survey sample followed three days later by a questionnaire and cover letter. Respondents were given the option of completing the survey by mail, online, or phone. One week later, the survey contractor mailed a post card reminding non-responders to complete the survey and thanking those who had already completed the survey. Phone calls to non-respondents with a phone listing began one week following the reminder post cards.

The overall survey response rate was 50.1% or 872 completed questionnaires. The majority of respondents (68.9%) completed the survey by mail. The remaining respondents completed the survey by phone (16.2%) or online (14.9%). The final survey sample disposition for each city is shown in Table 1 on the next page. Seattle and Tacoma had nearly the same response rate (50.2% and 49.8%, respectively).

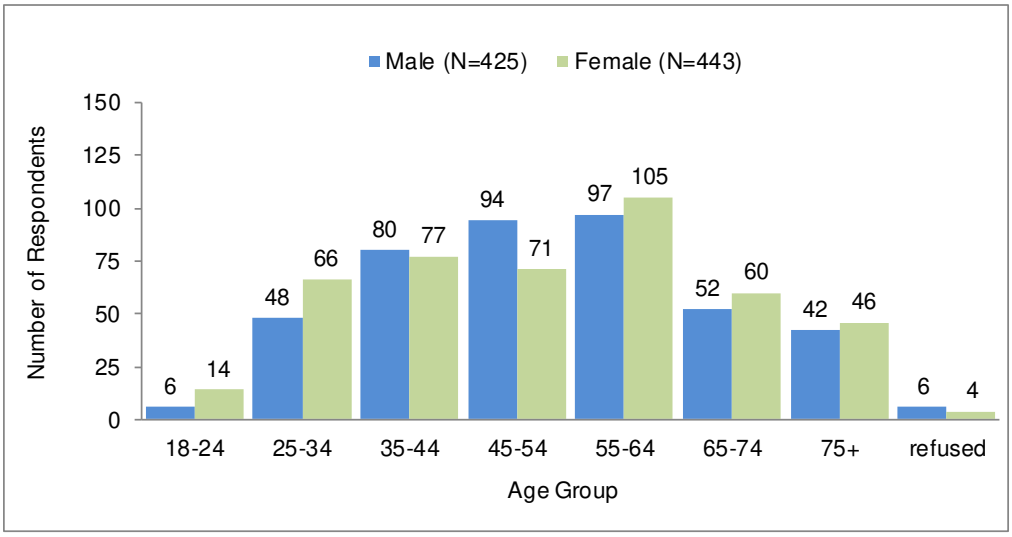
Table 1. Survey Sample Disposition by City

Survey Sample Disposition	Seattle	Tacoma	Total
Initial Survey Sample	1,000	995	1,995
Not Qualified	115	135	255
Refused	71	58	129
Not Completed*	370	374	739
Completed survey by web	70	60	130
Completed survey by mail	308	293	601
Completed survey by phone	66	75	141
Total Completed Surveys	444	428	872
Response Rate	**50.2%**	**49.8%**	**50.1%**

Response rate = completed / (refused + not completed + completed)
*Includes non-respondents with a valid address but no phone listing.

The age and gender distribution of survey respondents is shown in Figure 3 below. The proportion of female respondent was equal to that of males (51.0% and 49.0%, respectively). Almost a quarter (23.2%) of all respondents were ages 55-64.and less than 3% were ages 18-24.

Figure 1. Number of Survey Respondents by Age and Gender



As illustrated in the following maps, households from throughout Seattle and Tacoma participated in this survey about the use of automated speed enforcement in their city. Figures 2 and 3 show the tabulated number of households completing the survey by US Postal Service (USPS) ZIP Code. The Zip Code Tabulation Area (ZCTA) boundaries displayed on the maps are approximations of USPS ZIP Code service areas.[3] A camera icon (■) denotes treatment site locations where automated speed enforcement was used in this pilot study. A triangle (▲) designates the location of control sites where no automated speed enforcement was conducted.

[3] Maps or digital files showing the boundaries of U.S. Postal Service (USPS) ZIP Codes are unavailable. The U.S. Census Bureau ZIP Code tabulation areas (ZTCA) shown on the map are generalized approximations of USPS ZIP Code service areas. Therefore, the ZTCA boundaries may vary slightly from the USPS Zip Code boundary. ZCTA is a trademark of the U.S. Census Bureau and ZIP Code is a registered trademark of the USPS.

Pilot Speed Camera Locations and Number of Survey Respondents by Zip Code

Figure 2. Seattle

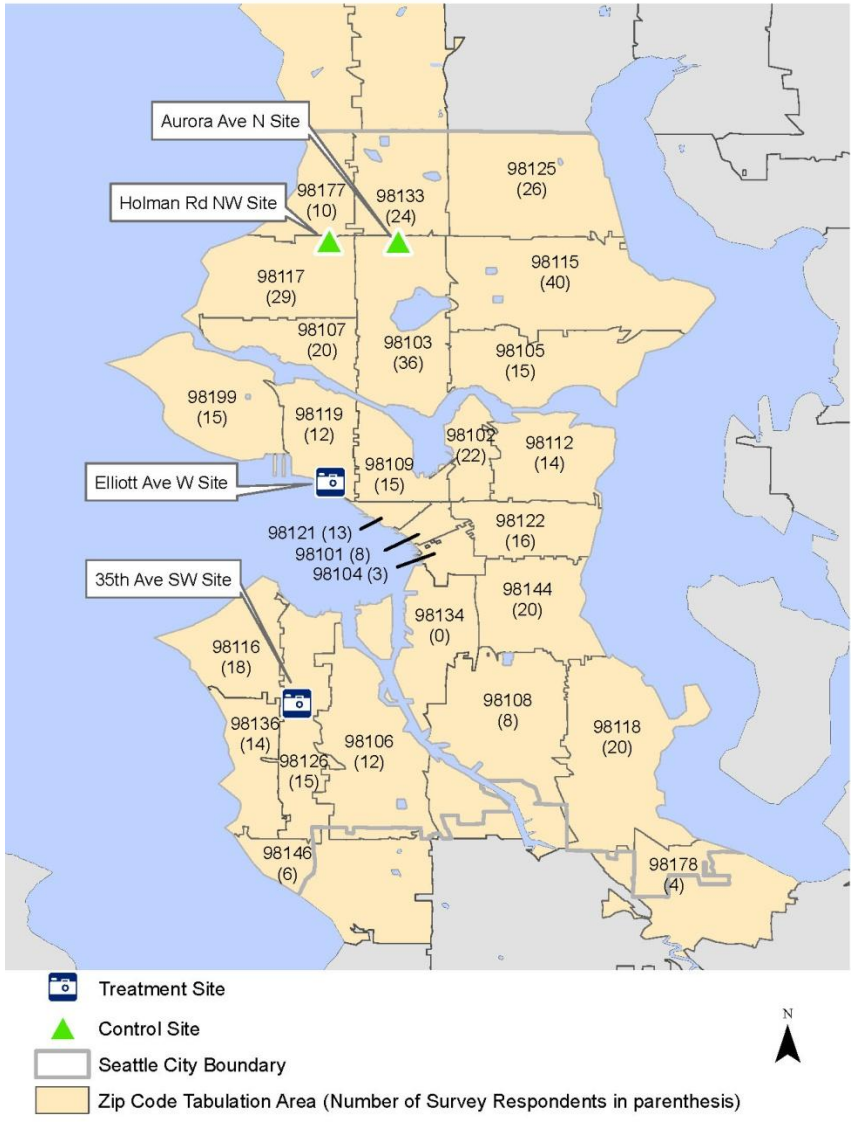


Figure 3. Tacoma

Survey Results

The number of responses, percentage, and 95% confidence intervals for each survey question are shown in the following tables. Additionally, 95% confidence intervals are included to reflect the accuracy of the survey estimates. In other words, the chances are 95 out of 100 that between 64.9% and 73.5% of all households in Seattle are aware that Seattle uses speed cameras to issue tickets to vehicles exceeding the speed limit.

Noteworthy responses include the following:

A larger percentage of Tacoma residents were aware that the city uses speed cameras to issue tickets to vehicles exceeding the speed limit than Seattle residents (78.9% compared to 69.2%, respectively).

Support for the use of speed cameras varied by the type of location. Three-quarters (74.9%) of respondents favored using speed cameras on roads with a high number of speeding deaths or serious injuries and 72.8% favored using speed cameras in school zones. The proportion of respondents who favored using speed cameras on residential streets and on streets with a speed limit of 35 MPH was similar to the proportion of respondents who opposed using speed cameras in these areas.

More than half (53.4%) of Seattle and Tacoma survey respondents who reported that speed cameras generate more revenue than they cost to operate, did not know where the additional revenue goes. This percentage was similar for Seattle and Tacoma residents (53.7% and 53.1%, respectively).

Table 2. Survey Question Responses by City

Question	Response	Seattle N	Seattle %	Seattle (95% CI)	Tacoma N	Tacoma %	Tacoma (95% CI)	Total N	Total %	Total (95% CI)
1. In your opinion, how much of a safety problem is speeding in the City?	Not a problem	84	19.0%	(15.3% - 22.7%)	59	14.0%	(10.7% - 17.3%)	143	16.6%	(14.1% - 19.0%)
	Somewhat of a problem	234	52.9%	(48.3% - 57.6%)	215	50.9%	(46.2% - 55.7%)	449	52.0%	(48.6% - 55.3%)
	Big problem	88	19.9%	(16.2% - 23.6%)	110	26.1%	(21.9% - 30.3%)	198	22.9%	(20.1% - 25.7%)
	Don't Know	36	8.1%	(5.6% - 10.7%)	38	9.0%	(6.3% - 11.7%)	74	8.6%	(6.7% - 10.4%)
	Total Responses	**442**	**100.0%**		**422**	**100.0%**		**864**	**100.0%**	
2. How likely do you think it is that a driver speeding in the City will receive a ticket?	Very Unlikely	66	15.0%	(11.6% - 18.3%)	49	11.6%	(8.5% - 14.6%)	115	13.3%	(11.0% - 15.6%)
	Somewhat Unlikely	150	34.0%	(29.6% - 38.4%)	133	31.4%	(27.0% - 35.9%)	283	32.8%	(29.6% - 35.9%)
	Somewhat Likely	157	35.6%	(31.1% - 40.1%)	164	38.8%	(34.1% - 43.4%)	321	37.2%	(33.9% - 40.4%)
	Very Likely	36	8.2%	(5.6% - 10.7%)	52	12.3%	(9.2% - 15.4%)	88	10.2%	(8.2% - 12.2%)
	Don't Know	32	7.3%	(4.8% - 9.7%)	25	5.9%	(3.7% - 8.2%)	57	6.6%	(4.9% - 8.3%)
	Total Responses	**441**	**100.0%**		**423**	**100.0%**		**864**	**100.0%**	
3. Are you aware that the City uses speed cameras (also known as photo radar or automated speed enforcement) to issue tickets to vehicles exceeding the speed limit?	Yes	306	69.2%	(64.9% - 73.5%)	332	78.9%	(75.0% - 82.8%)	638	73.9%	(71.0% - 76.9%)
	No	136	30.8%	(26.5% - 35.1%)	89	21.1%	(17.2% - 25.0%)	225	26.1%	(23.1% - 29.0%)
	Total Responses	**442**	**100.0%**		**421**	**100.0%**		**863**	**100.0%**	
4a. How do you feel about the use of speed cameras in construction zones?	Oppose Strongly	59	13.5%	(10.3% - 16.7%)	69	16.5%	(13.0% - 20.1%)	128	15.0%	(12.6% - 17.4%)
	Oppose Somewhat	41	9.4%	(6.6% - 12.1%)	39	9.4%	(6.6% - 12.2%)	80	9.4%	(7.4% - 11.3%)
	Neutral	84	19.2%	(15.5% - 22.9%)	65	15.6%	(12.1% - 19.1%)	149	17.4%	(14.9% - 20.0%)
	Favor Somewhat	115	26.3%	(22.2% - 30.5%)	82	19.7%	(15.8% - 23.5%)	197	23.1%	(20.2% - 25.9%)
	Favor Strongly	138	31.6%	(27.2% - 35.9%)	162	38.8%	(34.2% - 43.5%)	300	35.1%	(31.9% - 38.3%)
	Total Responses	**437**	**100.0%**		**417**	**100.0%**		**854**	**100.0%**	
4b. How do you feel about the use of speed cameras where traffic enforcement is difficult or dangerous for police officers?	Oppose Strongly	52	12.1%	(9.0% - 15.1%)	65	15.7%	(12.2% - 19.2%)	117	13.8%	(11.5% - 16.2%)
	Oppose Somewhat	43	10.0%	(7.1% - 12.8%)	38	9.2%	(6.4% - 11.9%)	81	9.6%	(7.6% - 11.6%)
	Neutral	72	16.7%	(13.2% - 20.2%)	47	11.3%	(8.3% - 14.4%)	119	14.1%	(11.7% - 16.4%)
	Favor Somewhat	110	25.5%	(21.4% - 29.6%)	97	23.4%	(19.3% - 27.5%)	207	24.5%	(21.6% - 27.4%)
	Favor Strongly	154	35.7%	(31.2% - 40.3%)	168	40.5%	(35.7% - 45.2%)	322	38.1%	(34.8% - 41.3%)
	Total Responses	**431**	**100.0%**		**415**	**100.0%**		**846**	**100.0%**	
4c. How do you feel about the use of speed cameras on streets with a posted speed of 35 MPH?	Oppose Strongly	98	22.4%	(18.5% - 26.3%)	98	23.3%	(19.2% - 27.3%)	196	22.8%	(20.0% - 25.7%)
	Oppose Somewhat	73	16.7%	(13.2% - 20.2%)	69	16.4%	(12.8% - 19.9%)	142	16.6%	(14.1% - 19.0%)
	Neutral	114	26.1%	(22.0% - 30.2%)	80	19.0%	(15.2% - 22.8%)	194	22.6%	(19.8% - 25.4%)
	Favor Somewhat	73	16.7%	(13.2% - 20.2%)	80	19.0%	(15.2% - 22.8%)	153	17.8%	(15.3% - 20.4%)
	Favor Strongly	79	18.1%	(14.5% - 21.7%)	94	22.3%	(18.3% - 26.3%)	173	20.2%	(17.5% - 22.9%)
	Total Responses	**437**	**100.0%**		**421**	**100.0%**		**858**	**100.0%**	

Table 2. Survey Question Responses by City (continued)

Question	Response	Seattle N	Seattle %	Seattle (95% CI)	Tacoma N	Tacoma %	Tacoma (95% CI)	Total N	Total %	Total (95% CI)
4d. How do you feel about the use of speed cameras in school zones?	Oppose Strongly	52	11.9%	(8.9% - 14.9%)	51	12.1%	(9.0% - 15.3%)	103	12.0%	(9.8% - 14.2%)
	Oppose Somewhat	35	8.0%	(5.5% - 10.6%)	25	6.0%	(3.7% - 8.2%)	60	7.0%	(5.3% - 8.7%)
	Neutral	37	8.5%	(5.9% - 11.1%)	33	7.9%	(5.3% - 10.4%)	70	8.2%	(6.3% - 10.0%)
	Favor Somewhat	116	26.5%	(22.4% - 30.7%)	79	18.8%	(15.1% - 22.6%)	195	22.8%	(19.9% - 25.6%)
	Favor Strongly	197	45.1%	(40.4% - 49.8%)	232	55.2%	(50.5% - 60.0%)	429	50.1%	(46.7% - 53.4%)
	Total Responses	**437**	**100.0%**		**420**	**100.0%**		**857**	**100.0%**	
4e. How do you feel about the use of speed cameras on residential streets?	Oppose Strongly	99	22.8%	(18.8% - 26.7%)	110	26.2%	(22.0% - 30.4%)	209	24.4%	(21.6% - 27.3%)
	Oppose Somewhat	67	15.4%	(12.0% - 18.8%)	56	13.3%	(10.1% - 16.6%)	123	14.4%	(12.0% - 16.7%)
	Neutral	100	23.0%	(19.0% - 27.0%)	73	17.4%	(13.7% - 21.0%)	173	20.2%	(17.5% - 22.9%)
	Favor Somewhat	69	15.9%	(12.4% - 19.3%)	84	20.0%	(16.2% - 23.8%)	153	17.9%	(15.3% - 20.5%)
	Favor Strongly	100	23.0%	(19.0% - 27.0%)	97	23.1%	(19.1% - 27.1%)	197	23.0%	(20.2% - 25.9%)
	Total Responses	**435**	**100.0%**		**420**	**100.0%**		**855**	**100.0%**	
4f. How do you feel about the use of speed cameras on roads with a high number of speeding deaths and serious injuries?	Oppose Strongly	45	10.3%	(7.4% - 13.2%)	50	11.8%	(8.8% - 14.9%)	95	11.1%	(9.0% - 13.2%)
	Oppose Somewhat	35	8.0%	(5.5% - 10.6%)	24	5.7%	(3.5% - 7.9%)	59	6.9%	(5.2% - 8.6%)
	Neutral	35	8.0%	(5.5% - 10.6%)	27	6.4%	(4.1% - 8.7%)	62	7.2%	(5.5% - 9.0%)
	Favor Somewhat	91	20.8%	(17.0% - 24.6%)	80	19.0%	(15.2% - 22.7%)	171	19.9%	(17.2% - 22.6%)
	Favor Strongly	231	52.9%	(48.2% - 57.6%)	241	57.1%	(52.4% - 61.8%)	472	54.9%	(51.6% - 58.3%)
	Total Responses	**437**	**100.0%**		**422**	**100.0%**		**859**	**100.0%**	
5. Do you think the City's speed cameras currently generate more revenue than they cost to operate?	Yes	229	53.0%	(48.3% - 57.7%)	226	55.3%	(50.4% - 60.1%)	455	54.1%	(50.7% - 57.5%)
	No	135	31.3%	(26.9% - 35.6%)	127	31.1%	(26.6% - 35.5%)	262	31.2%	(28.0% - 34.3%)
	Don't Know	68	15.7%	(12.3% - 19.2%)	56	13.7%	(10.4% - 17.0%)	124	14.7%	(12.3% - 17.1%)
	Total Responses	**432**	**100.0%**		**409**	**100.0%**		**841**	**100.0%**	
IF YES, where do you think the extra revenue currently goes? (Please select all that apply)	City General Fund	49	21.4%	(16.1% - 26.7%)	60	26.5%	(20.8% - 32.3%)	109	24.0%	(20.0% - 27.9%)
	City Law Enforcement Fund	24	10.5%	(6.5% - 14.5%)	27	11.9%	(7.7% - 16.2%)	51	11.2%	(8.3% - 14.1%)
	City Traffic Safety Project Fund	43	18.8%	(13.7% - 23.9%)	32	14.2%	(9.6% - 18.7%)	75	16.5%	(13.1% - 19.9%)
	Don't Know	123	53.7%	(47.2% - 60.2%)	120	53.1%	(46.6% - 59.6%)	243	53.4%	(48.8% - 58.0%)
	Other	10	4.4%	(1.7% - 7.0%)	8	3.5%	(1.1% - 6.0%)	18	4.0%	(2.2% - 5.8%)
	Total Respondents*	**229**	*****		**226**	*****		**455**	*****	
6. If the city's speed cameras generate more revenue than they cost, where do you think the extra revenue should go? (Please select all that apply)	City General Fund	112	25.2%	(21.2% - 29.3%)	75	17.5%	(13.9% - 21.1%)	187	21.4%	(18.7% - 24.2%)
	City Law Enforcement Fund	100	22.5%	(18.6% - 26.4%)	99	23.1%	(19.1% - 27.1%)	199	22.8%	(20.0% - 25.6%)
	City Traffic Safety Project Fund	158	35.6%	(31.1% - 40.0%)	149	34.8%	(30.3% - 39.3%)	307	35.2%	(32.0% - 38.4%)
	Other	68	15.3%	(12.0% - 18.7%)	77	18.0%	(14.3% - 21.6%)	145	16.6%	(14.2% - 19.1%)
	No Opinion/Don't know	39	8.8%	(6.1% - 11.4%)	46	10.7%	(7.8% - 13.7%)	85	9.7%	(7.8% - 11.7%)
	Total Respondents*	**444**	*****		**428**	*****		**872**	*****	

*Respondents may have selected more than one response; therefore, percentages will total more than 100%.

Table 2. Survey Question Responses by City (continued)

Question	Response	Seattle N	Seattle %	Seattle (95% CI)	Tacoma N	Tacoma %	Tacoma (95% CI)	Total N	Total %	Total (95% CI)
7. On a local road with a speed limit of 35 MPH, how often do you drive 45 MPH or faster?	All of the time	1	0.2%	(0.0% - 0.7%)	2	0.5%	(0.0% - 1.1%)	3	0.3%	(0.0% - 0.7%)
	Most of the time	13	3.0%	(1.4% - 4.6%)	7	1.7%	(0.4% - 2.9%)	20	2.3%	(1.3% - 3.3%)
	Some of the time	142	32.4%	(28.0% - 36.8%)	112	26.6%	(22.4% - 30.8%)	254	29.6%	(26.5% - 32.6%)
	None of the time	282	64.4%	(59.9% - 68.9%)	300	71.3%	(66.9% - 75.6%)	582	67.8%	(64.6% - 70.9%)
	Total Responses	**438**	**100.0%**		**421**	**100.0%**		**859**	**100.0%**	
8. In the past year, have you received any speeding tickets?	Yes	30	6.8%	(4.5% - 9.2%)	52	12.3%	(9.2% - 15.4%)	82	9.5%	(7.6% - 11.5%)
	No	407	92.9%	(90.5% - 95.3%)	367	86.8%	(83.5% - 90.0%)	774	89.9%	(87.9% - 91.9%)
	Don't Know	1	0.2%	(0.0% - 0.7%)	4	0.9%	(0.0% - 1.9%)	5	0.6%	(0.1% - 1.1%)
	Total Responses	**438**	**100.0%**		**423**	**100.0%**		**861**	**100.0%**	
IF YES, did you receive any speeding tickets from a speed camera?	Yes	11	36.7%	(19.1% - 54.3%)	34	65.4%	(52.2% - 78.6%)	45	54.9%	(43.9% - 65.9%)
	No	17	56.7%	(38.6% - 74.8%)	17	32.7%	(19.7% - 45.7%)	34	41.5%	(30.6% - 52.4%)
	Don't Know	2	6.7%	(0.0% - 15.8%)	1	1.9%	(0.0% - 5.7%)	3	3.7%	(0.0% - 7.8%)
	Total Responses	**30**	**100.0%**		**52**	**100.0%**		**82**	**100.0%**	
9. Are you a licensed driver?	Yes	420	95.7%	(93.8% - 97.6%)	400	94.6%	(92.4% - 96.7%)	820	95.1%	(93.7% - 96.6%)
	No	19	4.3%	(2.4% - 6.2%)	23	5.4%	(3.3% - 7.6%)	42	4.9%	(3.4% - 6.3%)
	Total Responses	**439**	**100.0%**		**423**	**100.0%**		**862**	**100.0%**	
10. What is your age?	18-24	6	1.4%	(0.3% - 2.4%)	14	3.3%	(1.6% - 5.0%)	20	2.3%	(1.3% - 3.3%)
	25-34	68	15.3%	(12.0% - 18.7%)	46	10.7%	(7.8% - 13.7%)	114	13.1%	(10.8% - 15.3%)
	35-44	91	20.5%	(16.7% - 24.3%)	66	15.4%	(12.0% - 18.8%)	157	18.0%	(15.4% - 20.6%)
	45-54	81	18.2%	(14.6% - 21.8%)	84	19.6%	(15.9% - 23.4%)	165	18.9%	(16.3% - 21.5%)
	55-64	101	22.7%	(18.8% - 26.7%)	101	23.6%	(19.6% - 27.6%)	202	23.2%	(20.4% - 26.0%)
	65-74	54	12.2%	(9.1% - 15.2%)	59	13.8%	(10.5% - 17.1%)	113	13.0%	(10.7% - 15.2%)
	75+	37	8.3%	(5.8% - 10.9%)	51	11.9%	(8.8% - 15.0%)	88	10.1%	(8.1% - 12.1%)
	unreported	6	1.4%	(0.3% - 2.4%)	7	1.6%	(0.4% - 2.8%)	13	1.5%	(0.7% - 2.3%)
	Total Respondents	**444**	**100.0%**		**428**	**100.0%**		**872**	**100.0%**	
	average age (mean)	51.5 yrs.			53.7 yrs.			52.6 yrs.		
11. What is your gender?	Male	218	49.1%	(44.4% - 53.8%)	207	48.4%	(43.6% - 53.1%)	425	48.7%	(45.4% - 52.1%)
	Female	224	50.5%	(45.8% - 55.1%)	219	51.2%	(46.4% - 55.9%)	443	50.8%	(47.5% - 54.1%)
	unreported	2	0.5%	(0.0% - 1.1%)	2	0.5%	(0.0% - 1.1%)	4	0.5%	(0.0% - 0.9%)
	Total Respondents	**444**	**100.0%**		**428**	**100.0%**		**872**	**100.0%**	
13. Do you have any comments regarding the use of speed cameras in the City that you would like to share with us?	Yes	245	55.2%	(50.5% - 59.8%)	220	51.4%	(46.7% - 56.1%)	465	53.3%	(50.0% - 56.6%)
	No	199	44.8%	(40.2% - 49.5%)	208	48.6%	(43.9% - 53.3%)	407	46.7%	(43.4% - 50.0%)
	Total Responses	**444**	**100.0%**		**428**	**100.0%**		**872**	**100.0%**	

Survey Instruments

Pre-notification Letter

STATE OF WASHINGTON

WASHINGTON TRAFFIC SAFETY COMMISSION

621 8th Avenue SE, Suite 409., PO Box 40944, Olympia, Washington 98504-0944, (360) 753-6197

September 7, 2010

Dear Seattle Resident:

The Washington Traffic Safety Commission is asking you to participate in a survey on automated speed enforcement in Seattle. Your name was selected randomly from a list of Seattle households. Within the next few days you will receive a short questionnaire in the mail from our survey contractor, Gilmore Research.

The purpose of the survey is to help public officials understand how Seattle residents feel about the use of speed cameras (also known as photo radar or automated speed enforcement) in their city. The survey is being conducted to better inform legislators, city officials, and others who must make decisions related to speed cameras and traffic safety.

We will also send instructions for completing the survey online in case you prefer that option.

We would very much appreciate your participation in this effort. If you have any questions concerning this survey, please contact Gilmore Research toll-free at 1-866-722-3134.

Sincerely,

Lowell Porter
Director

Questionnaire Cover Letter

STATE OF WASHINGTON

WASHINGTON TRAFFIC SAFETY COMMISSION

621 8th Avenue SE, Suite 409., PO Box 40944, Olympia, Washington 98504-0944, (360) 753-6197

September 10, 2010

Dear Seattle Resident:

Last week you received a letter inviting you to complete a survey about how you feel regarding the use of speed cameras (also known as photo radar or automated speed enforcement) in your city. The survey is being conducted by the Washington Traffic Safety Commission to better inform legislators, city officials, and others who must make decisions related to automated speed enforcement and traffic safety.

You have the option of either completing the survey online or completing the paper form included with this letter. If you decide to complete the paper questionnaire, please place it in the enclosed self-addressed, postage-paid envelope and deposit the envelope in the mail.

If you choose to complete the survey online, please visit **www. SpeedCameraSurvey.com** and enter your personal identification number **<PIN>** to get started. If you have any problems accessing the site or completing the survey, please email us at **wsears@gilmore-research.com**.

We encourage you to participate in this voluntary survey, and survey responses will be anonymous. Your responses will be combined with information provided by other participants, and a summary of this information will be compiled so that individual responses cannot be identified.

Thank you very much for your assistance. If you have any questions or concerns regarding the survey, any difficulties with the online survey or if you misplaced the survey form and would like a replacement please contact Gilmore at 1-866-722-3134.

Sincerely,

Lowell Porter
Director

Questionnaire

Opinions on Speed Cameras: A Survey of Seattle Residents

1. **In your opinion, how much of a safety problem is speeding in the City of Seattle?**

   ☐ Not a problem ☐ Somewhat of a problem ☐ A big problem ☐ Don't know

2. **How likely do you think it is that a driver speeding in the City of Seattle will receive a ticket?**

   ☐ Very unlikely ☐ Somewhat unlikely ☐ Somewhat likely ☐ Very likely ☐ Don't know

3. **Are you aware that the City of Seattle uses speed cameras (also known as photo radar or automated speed enforcement) to issue tickets to vehicles exceeding the speed limit?**

   ☐ Yes ☐ No

4. **How do you feel about the use of speed cameras in the City of Seattle for the following types of locations? Please circle your response.**

	Oppose Strongly	Oppose Somewhat	Neutral	Favor Somewhat	Favor Strongly
In construction zones	1	2	3	4	5
Where traffic enforcement is difficult or dangerous for police officers	1	2	3	4	5
On streets with a posted speed limit of 35 mph	1	2	3	4	5
In school zones	1	2	3	4	5
On residential streets	1	2	3	4	5
On roads with a high number of speeding deaths or serious injuries	1	2	3	4	5

5. **Do you think the City of Seattle's speed cameras currently generate more revenue than they cost to operate?**

   ☐ Yes ☐ No → **IF NO, PLEASE SKIP TO QUESTION 6 ON THE NEXT PAGE**

   If yes, where do you think the extra revenue <u>currently</u> goes? (Please select all that apply)

   ☐ City of Seattle general fund
   ☐ City of Seattle law enforcement fund
   ☐ City of Seattle traffic safety project fund
   ☐ Don't know
   ☐ Other (please tell us): _____

PLEASE TURN PAGE →

6. **If the city's speed cameras generate more revenue than they cost, where do you think the extra revenue <u>should</u> go? (Please select all that apply)**

☐ City of Seattle general fund
☐ City of Seattle law enforcement fund
☐ City of Seattle traffic safety project fund
☐ No opinion
☐ Other (please tell us): _____

7. **On a local road with a speed limit of 35 mph, how often do you drive 45 mph or faster?**

☐ All the time ☐ Most of the time ☐ Some of the time ☐ None of the time

8. **In the past year, have you received any speeding tickets?**

☐ Yes ☐ No ☐ Don't know → **IF NO OR DON'T KNOW, PLEASE SKIP TO QUESTION 9**

If yes, did you receive any speeding tickets from a speed camera?

☐ Yes ☐ No ☐ Don't know

9. **Are you a licensed driver?** ☐ Yes ☐ No

10. **What is your age?** _____ years

11. **What is your gender?** ☐ Male ☐ Female

12. **Zip code of residence:** _____

13. **Do you have any comments regarding the use of speed cameras in the City of Seattle that you would like to share with us? Please write them in the space below.**

Thank you very much for your time.

Please return your completed survey in the enclosed self-addressed postage-paid envelope.

Reminder Postcard

STATE OF WASHINGTON

WASHINGTON TRAFFIC SAFETY COMMISSION

Last week, we sent you a questionnaire seeking your opinions about speed cameras.

If you have already completed the questionnaire, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because your response will help to better inform legislators, city officials and others who make decisions related to automated speed enforcement and traffic safety.

An online version of the survey is available at **www.SpeedCameraSurvey.com**. To get started just enter your 5 digit personal identification number located above your name and address on the other side of this postcard.

If you would like to complete the survey over the phone, please call 1-800-573-4498 ext. 151.

If you have any questions about the survey, or would like to request another copy, please contact Gilmore at 1-866-722-3134. We hope you decide to participate in this study!

Gilmore Research Group
2101 4th Avenue, 8th floor
Seattle, WA 98121

<PIN>
<Contact name>
<Address>
<City, State Zip>

APPENDIX D

Speeding Research

The precise mechanisms by which speeding causes harm to motorists are well known to researchers. First, as vehicle speed increases, the probability of a crash occurring also increases (Evans L, 2004, pp. 206-236).

Second, in the event of a crash, all other factors being equal, higher vehicle speeds will result in greater injury severity owing to a rise in "the kinetic energy transferred to the vehicle occupants" (Friedman LS, Hedeker D, and Richter ED, 2009).

Rune Elvik, long-time traffic safety researcher and current Co-Editor of *Accident Analysis and Prevention*, has combined these two principles into a 'power model' that uses six equations to predict/estimate the effects of changes in speeds on both the number of crashes and the severity of injuries resulting from those crashes. His data "show that there is a strong statistical association between speed and road safety" (2004, p. 4).

Automated Speed Enforcement Research Summary

Automated speed enforcement (a.k.a. 'Speed Camera Enforcement') has been used and evaluated in numerous jurisdictions around the world. We have summarized findings from several automated speed enforcement program evaluation studies and systematic reviews.

Safety Effects

A recent 2010 Cochrane Review of 35 before and after studies on the impact of speed cameras concluded that speed cameras are effective at reducing the number of road traffic injuries and deaths. Compared to control sites, speed camera sites demonstrated an 11% to 44% reduction in fatal and serious injury crashes, 1% to 15% relative reduction in average speed, and 14% to 65% reduction in the proportion of vehicles speeding. The magnitude of this effect has not been determined due to variations in programs and lack of consistency in evaluation methods (Wilson 2010).

Similarly Pilkington and Kinra (2005) reviewed 14 speed camera studies and concluded that research consistently showed that speed cameras were effective in reducing traffic crashes and related casualties. At camera sites, reductions in crashes ranged between 5% and 69%; injuries fell 12% to 65%; and fatalities decreased by 17% to 71%.

Willis (2006) conducted a literature review of speed camera studies and concluded that speed cameras reduce crashes and injury severity. In addition to reviewing the findings of Wilson et al and Pilkington and Kinra, the review described a study by Gains, Heydecker, Shrewsbury, and Robertson (2004), which found site-specific reductions of 40% for fatalities and serious injuries, 33% for injury collisions, and 35% for pedestrian fatalities and serious injuries.

Montgomery County, Maryland, implemented the state's first automated speed enforcement on residential streets with speed limits of 35 mph or less and in school zones. The result was a 70% decrease in the proportion of vehicles traveling 10 mph or more above the posted speed (Retting, Farmer, and McCartt 2008).

In a study of mobile speed cameras in South Wales, UK found a 73% reduction in injury crashes within 328 feet of the sites. The decrease in injury crashes lessened as the distance from the site increased. Injury crashes decreased by 24% within 328 to 984 feet of the mobile camera sites (Christie et al 2003).

Other Relevant Issues

Public Opinion

Public opinion and public acceptance has been identified as a key element to an automated enforcement program's success. Public opinion surveys, conducted over the past 20 years, indicate that the majority of respondents support automated enforcement.

A 1998 national survey by NHTSA found that over two-thirds of all drivers felt it was a good idea to use photo enforcement to reduce speeding, not obeying stop signs and running red lights. Those who thought photo enforcement was a good idea said it would decrease the occurrence of these unsafe actions and that it would provide solid proof of the violation. Conversely, those who thought it was a bad idea, cited privacy concerns (26%) and a preference for personal interaction (29%). When asked about using photo enforcement in specific locations, 68% felt the devices would curtail added congestion from the "pullover" scene, particularly in places where it is hazardous to stop. An even higher number of drivers supported the implementation of the photo enforcement devices in locations where crashes frequently occurred (77%) and in school zones (89%).

A 1992 Michigan survey of 1,209 drivers in communities where automated speed enforcement was being used showed the general public favors use of automated speed enforcement in select situations, particularly in school zones (59.4%), in areas where traffic enforcement is dangerous for police (52.2%), for heavy trucks (49.5%), and in construction zones (49.3%). The survey also showed opposition to automated speed enforcement use on freeways (41.5%), on bridges (34.5%), and on all roads (46.8%). In general, observed speeders and persons who reported having multiple citations in the previous two years were in greater opposition to the use of automated speed enforcement than the general population (Streff and Molnar 1995).

Implementation Considerations

Turner and Polk (1998) identified the following key elements important to the success of automated enforcement programs worldwide: public education and awareness, involvement of the local judiciary, and the passing of enabling legislation. The authors concluded "The ultimate success of automated enforcement will not rely on the technology so much as how the technology is applied and how transportation professionals interact with state and/or local legislators, local judiciary, and most importantly the public when implementing automated enforcement."

After reviewing speed camera programs in Great Britain and New Zealand, Delany et al (2005) suggested U.S. jurisdictions planning to implement speed camera programs should draw upon lessons learned from other countries. The authors stressed the importance of educating the public about the dangers of speeding and communicating that the purpose of the program is to improve safety, not generate revenue.

Methodological Issues

The majority of studies have found speed cameras effective at reducing speeds and fatal and serious injuries. However, the magnitude of these effects is unknown, primarily due to methodological issues and varying program standards.

Several systematic reviews conducted on speed cameras have mentioned the need for more consistent study methods (Pilkington 2005, Wilson 2010). The 2010 Cochran Review suggested agreeing upon international standards for collecting and reporting speed and crash data and standard methods for controlling for bias in studies so studies can be compared across states and countries providing stronger evidence for the effects of speed cameras (Wilson 2010).

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