Alaska Red Light Running Surveys

UPDATE 2011

FINAL REPORT

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by

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ABSTRACT
The Alaska Highway Safety Office contracted with the Alaska Injury Prevention Center (AIPC) to quantify and document the red-light running prevalence in the major communities of Alaska during March and April 2005 (Final Report, *Alaska Red Light Running Surveys, May 2, 2005, Ron Perkins, AIPC, contracted by Alaska Highway Safety Office*). The results showed that Anchorage had the highest rates of red light runners per green light cycle and that the afternoon "rush hour" had the highest number of violations. The number of red light runners was related to high traffic volume and anticipated wait times at specific intersections. An inordinate number of violations occurred in the "left turn on green arrow only" lanes.

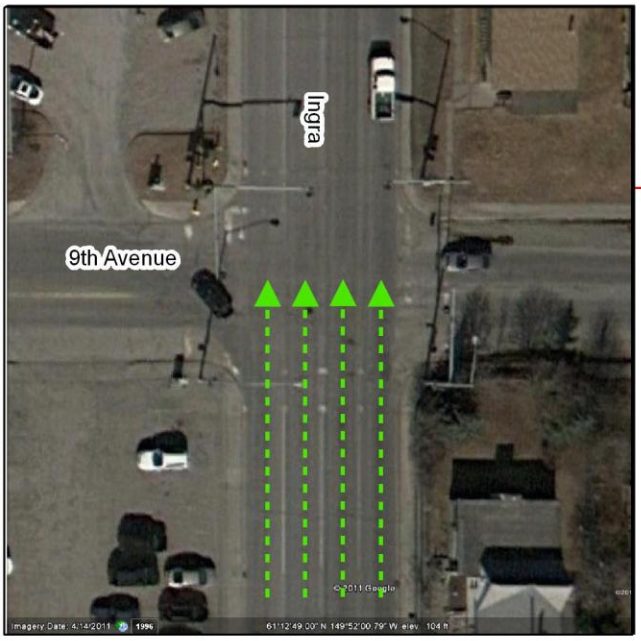
As part of a current research project to study the frequency and severity of red light running in Anchorage, the Alaska DOT&PF, and the project's Technical Advisory Committee (TAC) leveraged a cost-effective opportunity to utilize the 2005 study's principal investigator to provide assistance to the current researchers and to update the study for the three worst intersections in Anchorage as identified in the 2005 surveys. This update showed that the overall average red light running behavior was reduced by 95% from 2005 to 2011. The possible reasons for these dramatic reductions could include traffic light timing changes, additional routes to relieve traffic pressure, surveys conducted in different months, , recent installation of pedestrian countdown timers, increased enforcement, or a combination of the above.

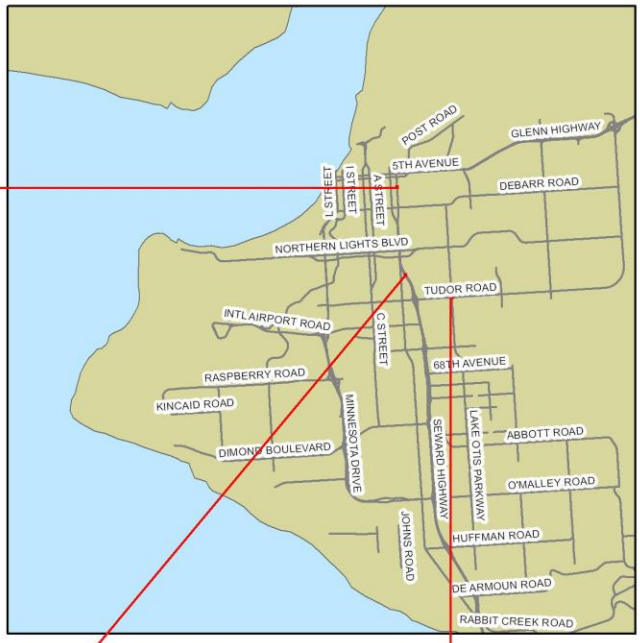
INTRODUCTION
Background
Prior to the 2005 surveys, The Alaska Injury Prevention Center (AIPC) conducted a literature review and found numerous articles that described using cameras to document red-light running behavior, but very few that documented observations made by trained surveyors. Much of the study design in 2005 had to be developed for that particular project by this researcher.

The 2005 study observed red light running behavior in Anchorage, Juneau, Fairbanks, Kenai, Soldotna, and Wasilla. Sixteen (16) different intersections in Anchorage were surveyed for 40 red light cycles each. Of all the intersections surveyed, Anchorage had the highest rate of red light running and the three highest intersections in Anchorage were:

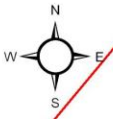
- 36th and New Seward (west bound turning left)
- Tudor and Lake Otis (west bound turning left)
- Ingra and 9th (north bound one-way)

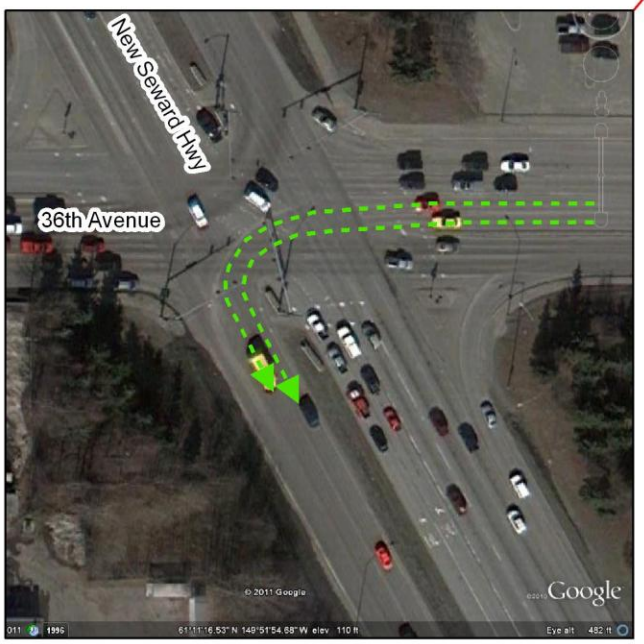
See the following maps for the intersections and traffic directions that were observed:



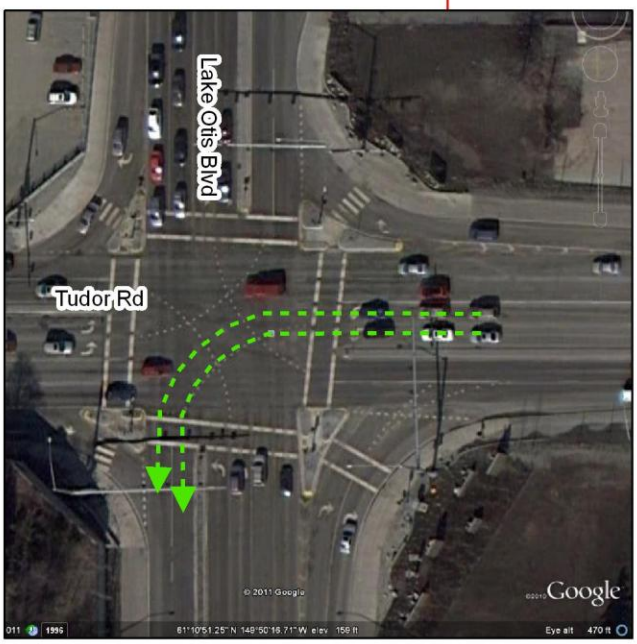


9th and Ingra





36th and New Seward Hwy



Tudor and Lake Otis

Images from Google Earth, imagery dated 4/14/2011, downloaded 7/27/2011

METHODOLOGY

Survey Design

The Anchorage intersections that had the highest rates of red light violations in 2005 were selected for re-sampling updates in May 2011. The intersections sampled in May 2011 were:

1. 36th and New Seward, west bound turning left (4-6pm).
2. Tudor and Lake Otis, west bound turning left (4-6pm).
3. Ingra and 9th, one-way traffic going north (7:30-9am).

The sampling times for the 2011 observations were chosen to coincide with the highest rate of red light running found in the 2005 study. Therefore, in 2005 Ingra and 9th had the highest rate of red light running during the morning rush hour and the other two intersections had the highest rate during the evening rush hour. The month of the original surveys could not be duplicated because the 2011 study had not been approved in March.

A total of five different observation periods were completed at each intersection, in the time frame indicated, with ten green light cycles being observed each time. This amounted to 50 green light cycles being observed at each site over a 7 day period.

A stop watch was used to measure the length of the red, amber and green light cycles as well as the overall cycle time. A voice recorder was used to document the length of each cycle, the total number of vehicles that passed through each cycle, the number of red light violations per cycle, and any comments from the surveyor. A red light violation occurs when the traffic control signal turns red and the approaching vehicle is behind the first white line of the pedestrian crosswalk, and then the vehicle continues on through the light. Severity measures how far from the pedestrian crosswalk the vehicle was when the light turned red.

RESULTS

Observations

Table 1 shows specific information related to the three highest sites in Anchorage.

Intersection	Observation Periods	Observed Green Light cycles	Total RL Runners	# of Red Light Runners per 10 light cycles	
				2005	**2011**
Ingra & 9th	5	50	6	10	1.2
36th & New Seward	5	50	3	29	.6
Tudor & Lake Otis	5	50	1	9	.2
Totals	**15**	**150**	**10**		

Table 1. Red light violations by intersection

These observations were made during peak traffic times when you would expect to have the maximum number of red light violations (as indicated by our 2005 study). However, there are approximately 540 green light cycles per day at each intersection, so the potential number of red light violations can be estimated. Some of the most deadly outcomes of red light running could be occurring during off peak hours.

Table 2 shows the average number of vehicles observed by intersection.

Intersection	Average Number of vehicles observed per green light cycle		% change
	2005	2011	
Ingra & 9th	24	47	**+ 96%**
36th & New Seward	15	10	**- 33%**
Tudor & Lake Otis	32	14	**- 56%**

Table 2. Traffic volume changes by intersection

Table 2 compares the average number of vehicles passing through the intersections during each green light cycle in 2005 and 2011. The changes shown in Table 2 had a direct correlation to the red light running rate, i.e. Ingra & 9th had the highest rate and Tudor/Lake Otis had the lowest rate.

DISCUSSION

As part of the discussion and planning for the current AK DOT&PF research project "Frequency and Potential Severity of Red Light Running in Anchorage ", the technical advisory committee members stated that they believed that the incidence of red light running in Anchorage had decreased since the 2005 surveys. Some of the initial hypotheses for this suspected decrease were the "Pedestrian Countdown Timers", increased law enforcement, green light cycle adjustment, or changing traffic flow patterns. Each of these will be addressed individually.

Pedestrian Countdown Timers are specifically designed as an aid to pedestrians crossing the intersections. Occasionally, the timers coincide with the end of the green light cycle and drivers approaching those intersections can see how long before the light will change to amber. However, many of the intersections, including Tudor/Lake Otis and 36th/New Seward had no correlation between the countdown timers and the end of the green light cycle. The countdown timer at Ingra/9th did coincide with the end of the green light signal, yet this intersection had the most red light violations in the 2011 surveys. The traffic volume at Ingra/9th had increased 96% since 2005 yet the rate of violations had decreased by 88% during the same period.

Of the three intersections studied, increased law enforcement was impractical at 36th/New Seward and at Tudor/Lake Otis because of the inaccessibility of the intersections by the "spotter vehicle", unless motorcycles could be used as spotter vehicles. Increasing law enforcement helps to increase the public's perception of the

risk of being “caught”, but it is impractical to sustain intense enforcement at many major intersections.

The intersections of 36th/New Seward and Tudor/Lake Otis have electronic sensors that allowed longer green light cycles when traffic volume was heavier. It is not known by the researcher if sensors were in place in 2005 because green light signal duration was not measured then. Of the 1,173 vehicles that passed through these two intersections, only five were left in the queue or were not able to make the green light. The Ingra/9th intersection, as well as most of downtown Anchorage, had green light signals that were preset to change the length from 105 seconds to 30 seconds at 8:30 AM. All of the red light runners at the Ingra/9th intersection occurred after the shorter green signal time started.

Since the 2005 study, two new roads have been installed off of Tudor Road to help move traffic between South Anchorage and the Tudor area. As shown in Table 2, the number of vehicles that passed through the Tudor/Lake Otis intersection (left turn only) per green light cycle was less than half the number observed in 2005. At the 36th/New Seward intersection, there were 33% fewer vehicles per green light cycle in 2011, but this may have been due to reduced traffic from the University of Alaska Anchorage during summer break. There were very few vehicles at any of the three intersections that were unable to make it through the green light cycle and were left in the queue. The exception being at Ingra/9th after the green light cycle was decreased at 8:30 AM.

When noting the severity of the violations (distance from the crosswalk when the light turns red), seven (7) of the ten (10) red light runners were estimated to be less than five feet from the crosswalk when the light turned red. One violation occurred in the middle of the red light cycle when the driver made an illegal left hand turn from Ingra (one way street) onto 9th (two way street).

The speed limit was 35 mph at 36th/New Seward and at Ingra/9th, while the speed limit at Tudor/Lake Otis was 45 mph. While having the highest speed limit, Tudor/Lake Otis had the lowest rate of red light runners per light cycle.

RECOMMENDATIONS

The survey form for the original red light running surveys in 2005 was developed by this researcher and was refined for the 2011 project. An official version of this survey form has been submitted to the Alaska DOT&PF, Technical Advisory Committee as part of this project. This new survey instrument should be very helpful in duplicating future red light running surveys or to validate red light running camera data.

The number of red light runners at Ingra/9th could probably be decreased further by keeping the “rush hour” timing of the green light cycle until 8:45 or 9:00 AM. Traffic volume is decreasing greatly when the green light cycle changes at 8:30 AM but not enough to get all the vehicles through the shorter green light.

An epidemiological analysis of the fatal and serious injury cases involving a red light violation should be conducted in Anchorage. Some of the data to be gathered should include the intersection, direction of travel, time of day, day of the week, month, DUI, etc. This analysis would give a clearer picture of the problem and how to best deploy resources.

With the above data in hand, the best use of law enforcement would be to target specific intersections at specific times to decrease red light running behavior. Running red lights for most people is a "risk – reward" situation where the risk is being caught and the reward is not having to wait for the next green light . Law enforcement can increase the public's perception of the risk of being caught by publicizing their red light running enforcement efforts.

During the 2011 surveys, the researcher noticed that there seemed to be a red light running problem for south bound traffic on Lake Otis who were turning east onto Tudor. This left turn green light seemed to be 10-12 seconds regardless of the number of cars waiting to turn. The other problem area seemed to be east bound traffic on 36th Ave. turning north onto the New Seward Highway, with traffic being backed up into the Old Seward Highway intersection.

There are no single injury prevention solutions that prevent all injuries. The best solution to the red light running problem in Anchorage is a combination of electronic sensors in the road that extend the green light when traffic volumes increase, enforcement of existing laws, changing traffic patterns to relieve pressure on high volume intersections, and modifying signal timing to traffic conditions.

Red light running surveys such as these are useful tools to provide quantitative data about the current status and trends, clarify problems, and to identify possible solutions.

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