

**NEW YORK CITY**  
**RED LIGHT CAMERA PROGRAM**  
**PROGRAM REVIEW 1994 – 2004**  
**MAY 31, 2005**

**New York City  
Department of Transportation  
40 Worth Street  
New York, NY 10013**

## OVERVIEW

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New York City's "Red Light Camera Program" (the "Program") has played a central role in the City's efforts to enhance public safety. In its ten year history, the Program has proven to be an enormously effective traffic safety measure that prevents injuries and the loss of life resulting from accidents caused by red light running. Since its inception, hundreds of thousands of vehicles have been caught going through red lights by these traffic-control signal photo-monitoring devices. Each camera in the Program now records an average of 18 red light violations per day. In 2004 alone, 325,024 tickets or Notices of Liability ("NOLs") were issued to violators. These violations are committed by passenger vehicles, buses and taxicabs running through red lights. However, the extended use of these devices has been shown to dramatically reduce the number of such violations at the intersections being monitored. NOLs have declined by as much as 40% to 60% at intersections where red light cameras have been installed. An NOL, the equivalent of a parking ticket, charges the vehicle owner with a fine, but points are not assessed against their driver's license.

Since the Program's implementation, the New York City Department of Transportation has found that red light cameras have had a demonstrable affect upon driver behavior. This correlates with studies conducted by the Insurance Institute for Highway Safety (the "Institute") a well-recognized, nonprofit, scientific and educational organization dedicated to reducing the losses from crashes on the nation's highways. Their studies found that red light cameras reduced the offense of red light running by approximately 40% (as reported in its 12/5/98 Status Report). These findings are consistent with a 2002 study conducted by Mitretek Systems (*Using Meta Analysis Techniques to Assess the Safety Effects of Red Light Running Cameras*).

In New York City, a large number of the traffic accidents resulting in bodily injury and death to motorists, passengers, pedestrians and bicyclists are due to the failure of motorists to obey traffic-control signals located at intersections. "Right angle" and pedestrian accidents attributed to red light running are among the leading causes of traffic fatalities on the City's streets.

The effectiveness of red light cameras in reducing the number of accidents and related injuries was recently highlighted in another study conducted by the Institute. In its report, the Institute reported a 32% decrease in front-into-side crashes (the type of crash most closely associated with red light running) after the introduction of red light cameras (as reported in its 4/28/01 Status Report). Further, this same report found a 68% reduction in the number of front-into-side crashes involving injuries after red light cameras were introduced.

## OVERVIEW

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The installation and operation of the traffic-control signal photo-monitoring devices have served as effective deterrents to motorists otherwise inclined to ignore traffic-control signals. Moreover, the deterrent effect of the cameras increases in direct correlation with an increase in the number of motorists aware of their placement.

In 1988, the New York State Legislature first enacted legislation that allowed cities with a population of one million or more to establish a demonstration program to install photo-monitoring devices to record vehicles going through red light signals at traffic intersections. The State Legislature has since extended the duration of the demonstration program four times: in 1991, 1993, 1995 and 1999. In 1995, the Program was also expanded to increase to fifty the number of intersections where such cities were authorized to install and operate traffic-control signal photo-monitoring devices.

New York City's Red Light Camera Program has proven to be a valuable instrument in the City's ongoing effort to enhance the overall safety of its roadways for motorists, passengers, pedestrians and bicyclists alike. It is an effective traffic safety initiative whose success has been recognized by the State Legislature and the New York City Council in their repeated authorizations to extend the initial demonstration program.

The success of the Program in enhancing public safety throughout the five boroughs has led to the City's interest in expanding the Program. The maximum number of red light cameras allowed, last increased to 50 in 1995, was reached in July 2001. While the Program has been very effective in reducing unsafe driving on the City's streets, the current limitation of 50 cameras, far less than even 1% of all the City's signalized intersections, prevents the City's Department of Transportation from implementing a broader (and much needed) application of this important public safety initiative. By further increasing the limit on the total number of red light cameras allowable, the City will be able to install this successful accident reduction tool at many more high accident locations.

## HOW THE PROGRAM WORKS

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Traffic signals control more than 11,700 intersections throughout New York City. Red light cameras are installed at 50 of these intersections and are each positioned to capture only one direction of travel at the intersection. In other words, four cameras would be needed to capture all directions at an intersection. The cameras, which photograph the rear of the vehicle, are situated approximately fifty to one hundred feet back from the stop-line. This results in a photo which shows the vehicle, the intersection, and the traffic signal all in one frame.

When a vehicle runs through a red light, sensors (magnetic induction loops and piezo tubes) embedded in the roadway trigger the camera which takes a sequence of photographs of the rear of the car. The initial photos show the vehicle before the stop-bar and the subsequent photos show the vehicle passed the stop-bar. In 2004, the program was upgraded so that all intersections had "digital" cameras as opposed to traditional "wet" film. This reduced processing time and improved the issuance of the violations. The traffic signal displaying a red light is shown in each photo. The cameras are operational at all times: 7 days per week, 24 hours per day. The NOLs are issued to the registered owner of the vehicle. An NOL, the equivalent of a parking ticket, charges the vehicle owner with a fine, but points are not assessed against their driver's license. The current red light camera fine is \$50 with a \$25 late fee. Other cities such as San Francisco charge more than \$100 per ticket.

City employees are responsible for reviewing the film and certifying tickets, staffing the Help Center and providing adjudication. The contractor for the Program provides the following: cameras, maintenance of the cameras, film retrieval, CD ROM's, film, film developing, computer software and hardware, local area network, wide area network, data processing and ad hoc reporting.

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## **THE PROCESSING STEPS**

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The contractor's technician visits each red light camera on a nightly basis to perform maintenance and retrieve the CD ROM. In 2004, the program's imaging technology was upgraded to "digital" cameras. The CD ROMs are brought to a lab for development and quality control inspection. The CD ROMs are then delivered to a New York City Department of Transportation image review team located in Queens. Here specially trained City Review Technicians review each and every photo. The technicians determine if the photos provide adequate evidence to issue an NOL.

Upon identifying a pair of photos clearly depicting a vehicle passing through a red light, a technician will enlarge the first photo in order to make the license plate clearly legible. An NOL includes three photos; the vehicle before the stop bar when the traffic signal is red, the same vehicle after the stop bar and cross walk while the traffic signal is still red, and the clear and readable enlargement of the vehicle's license plate.

Each week the license plates are sent on a tape to the New York State Department of Motor Vehicles (DMV) in Albany. One week later, DMV returns the tape to which DMV has added the vehicle registration (not driver information) and a description of the vehicle for each license plate. This information becomes the violation record which will be indexed to the corresponding three photos.

The photos that become NOLs are captured, compressed and stored in a computer system in an on-line storage array. Immediately after this capture, all three photos are printed onto an official NOL letter that will then be mailed to the registered owner at the address indicated by DMV.

The use of the on-line storage array allows the photos, the actual evidence, to be accessed and viewed in a real-time manner via computer by the New York City Parking Violations Bureau's administrative law judges, Help Desk attendants and cashiers located in the various boroughs. This feature greatly improves the efficiency of the hearings and appeals process and greatly reduces the handling of paper copies of the NOLs.

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## PROGRAM STATISTICS FOR 1994-2004

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The table on the following page represents data collected during the Red Light Camera Program's ten year history. Although the raw data shows an overall increase in the Number of Events (an Event is a pair of photographs representing a possible red light violation) and NOLs issued over the course of the Program, a more accurate statistical representation (achieved by taking into account the increased number of red light cameras) demonstrates a strong downward trend in the average Number of Events captured and NOLs. This data indicates that the Program has enhanced public safety by serving as an effective deterrent to red light running.

The overall increase in the Number of Events captured and NOLs issued evident in the raw data in 1998 and in 2001 are as a result of the Program's expansion from 18 to 30 cameras and from 30 to 50 cameras in those respective years. In addition, the advent of digital technology in 2001, along with having a total of 50 cameras for entire calendar years also added to the increase in Number of Events captured and NOLS issued.

However, an accurate representation of the impact of these cameras is achieved when the raw data is averaged out over the increased number of red light cameras. These statistics show that, over the course of the program while the number of cameras in operation (and the Number of Events and NOLs) have increased, and in addition to advances in technology, there was a dramatic decrease in the Number of Events Per Camera and NOLs Per Camera.

An analysis of the Events Per Camera Per Day over the ten year Program shows a dramatic 68.8% decline in Events from 80.11 in 1994 to 24.93 in 2004. In addition, an analysis of NOLS Per Camera Per Day shows an approximate 42% decline from 30.80 in 1994 to 17.81 in 2004.

These statistics evidence an increasing reluctance by motorists to risk running a red light and is a further testament to the success of the Program as a means of changing motorist behavior in order to enhance overall safety.

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## NUMBER OF EVENTS

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When a vehicle enters an intersection after the traffic signal turns red, and after a grace period of three-tenths of a second, the in-pavement electronics associated with the camera sends a pulse back to the camera to take a sequence of photos. The first photo selected will establish whether or not the vehicle in question had entered the intersection legally prior to the signal turning red. In New York City a vehicle may enter an intersection on amber and proceed through legally. Entering on red is a violation.

The second photo selected establishes whether the driver continued through the red light. These two photos make up an event (an Event). A 100 percent "hit rate" would mean that every set of photographs generates an NOL. Events have two possible outcomes, either they become an NOL or an exception. An exception is one of many reasons for not issuing an NOL to the registered owner of the vehicle. For example, the vehicle was a police or other emergency vehicle, a vehicle obstruction, weather (snow/rain), unreadable plates, etc.

Events are the true measure of the worth of the Red Light Camera Program as it relates to public safety. The purpose of the Program is to reduce the number of possible occurrences for accidents to happen. Therefore, as the Number of Events go down, the Program is achieving its goal, that is reducing accidents and saving lives.

The graph on the next page shows the Number of Events Per Year since the Program's inception. The data table on the following page depicts the raw data that was utilized for the graph. The spike in 1998 represents the addition of 12 more cameras (to 30) into the Program, and again in 2001 when the number was increased to 50 cameras, the maximum number allowed by law. Also, contributing to the spike was the introduction of digital cameras. In 2004, the Number of Events increased by a small amount (2.3%). We attribute this slight rise not an increase in motorists running the red lights, but the reactivation of several high violation red light camera locations that were previously inactive due to roadway construction.



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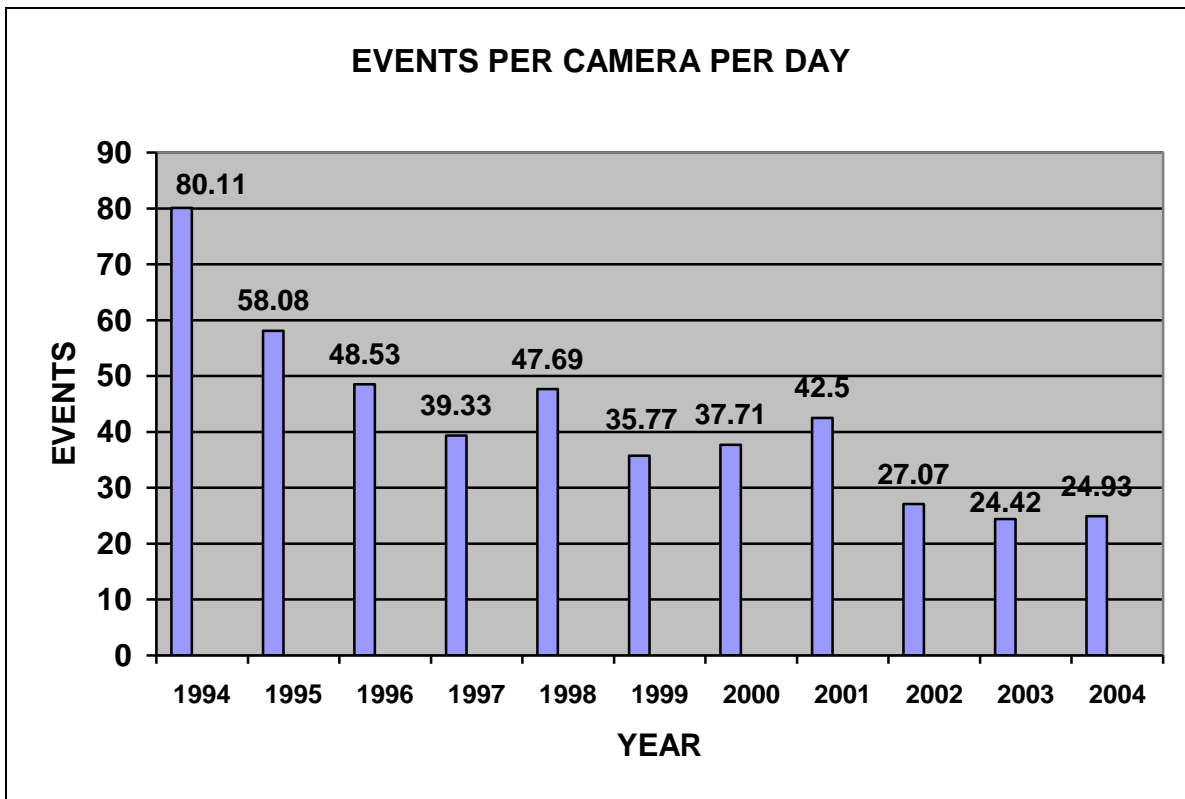


## NUMBER OF EVENTS PER CAMERA PER DAY

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New York City's Red Light Camera Program has proven to be a valuable instrument in the City's ongoing effort to enhance the overall safety of its roadways for motorists, passengers, pedestrians and bicyclists alike. Since its implementation, the number of red light violators has significantly decreased at each intersection where a photo-monitoring device has been installed.

The graph below depicts the Number of Events Per Camera Per Day. Unlike the previous chart, it shows that much of the increase in the number of daily events in 1998 and 2001 was due to the addition of 12 cameras and 20 cameras in those years, respectively. Overall, this graph demonstrates a significant drop in the Number of Events Per Camera over the course of the Program. Thus, it depicts a more accurate representation of how well the Program is working. The Number of Events went down from 80.11 to 24.93 (a decrease of 70%) over the course of the Program's ten year period which signifies that, although more drivers are being caught because there are more cameras, there are actually fewer violations per location per day. In 2004, the Events per Camera per Day slightly increased from the previous year (24.42 to 24.93). We attribute this increase to several high violation locations that were reactivated in 2004. They were inactive due to roadway construction. In addition, periodic maintenance and the general movement of cameras from location to location also influences the average.



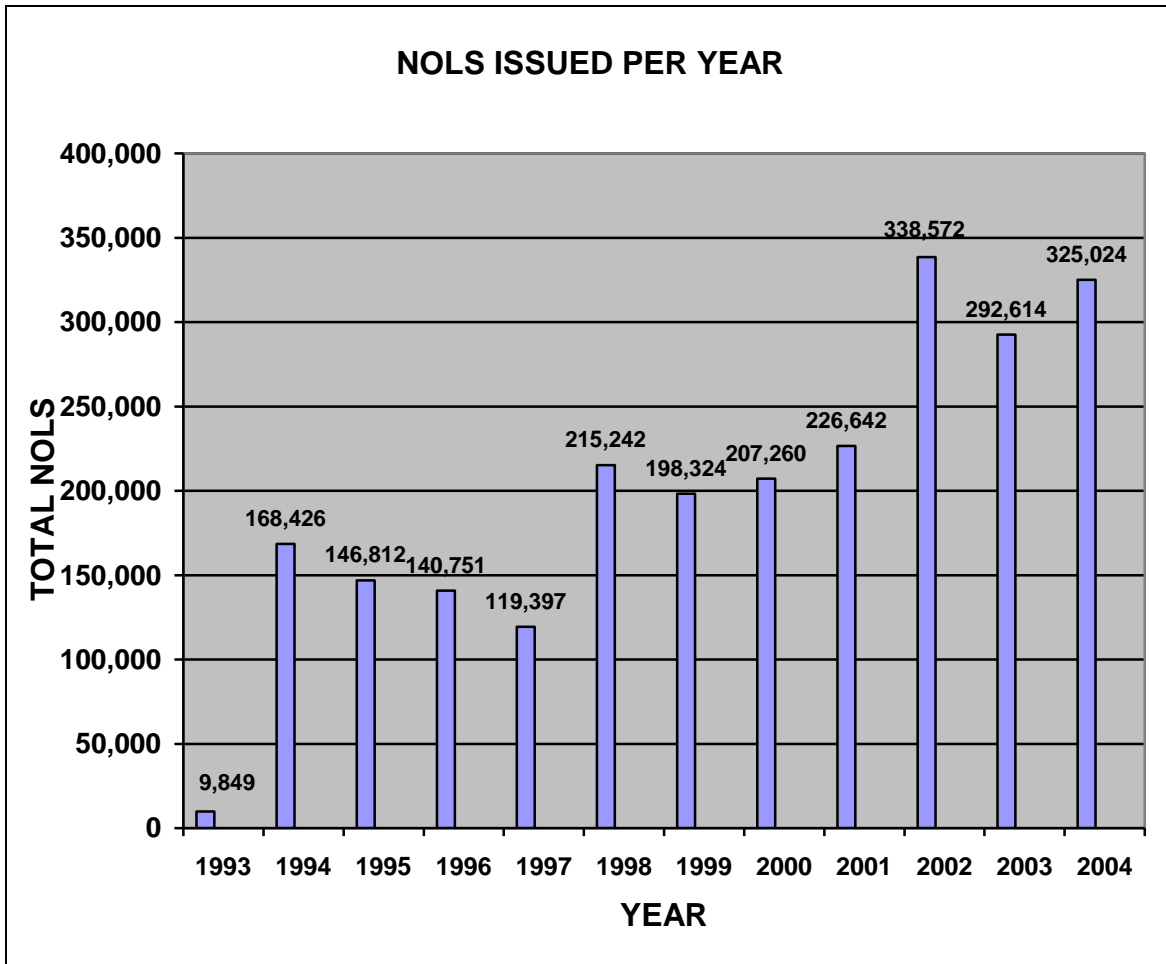

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### NUMBER OF NOLS ISSUED PER YEAR

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The Program has proven to be an effective traffic safety measure by preventing injuries and the loss of life due to accidents caused by red light running. The extended use of these devices has dramatically reduced the number of violations at the intersections being monitored.

The graph below represents the total Number of NOLs Issued Per Year during the Program's ten year history. The trend from 1994 to 1997 was downward. As the number of cameras during this period remained constant at 30, a deterrent effect is clearly shown. The increase from 1998 to 2002 is due to the increase in the number of cameras in 1998 and 2001, as well as technological changes to the Program (i.e. introduction of digital cameras). From 2003 to 2004, there was a 2.3% increase in the number of NOL's issued. We attribute this increase the completion of the technology upgrade from "wet" film to "digital" cameras. While the number of events per camera remained approximately the same, the issuance rate improved due to the technology upgrade.




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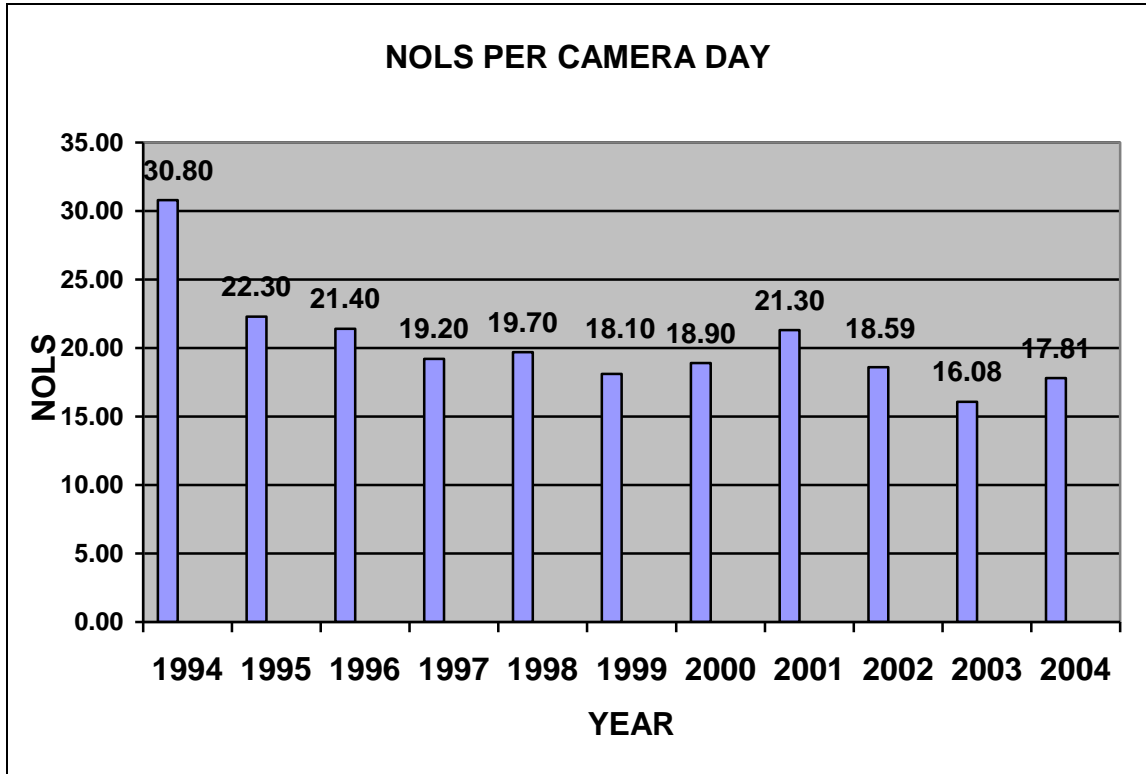
### NUMBER OF NOLS ISSUED PER CAMERA PER DAY

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As with the data representing the yearly change in the Number of Events over the course of the Program, the true value of the Program as a means of changing motorist behavior in order to enhance overall safety is best illustrated by showing an average breakdown of NOLs Issued Per Camera Per Day.

Unlike the previous chart showing a raw increase in the number of NOLs issued over the course of the Program, the chart below indicates a very strong downward trend when the number of NOLs is averaged by the number of red light cameras in operation. The data shows an overall decrease in the Number of NOLs Per Camera. In fact, over the course of the Program, the average number of NOLs issued fell from 30.8 to 17.81, a decrease of approximately 42%. Moreover, this decrease would have been even more dramatic had the improved accuracy due to the introduction of digital technology not been introduced in 2001. From 2003 to 2004 the Number of NOLS

Issued Per Camera increased from 16.08 to 17.81 NOLS. This data suggests that the upgraded technology has allowed us to improve the efficiency of the program.



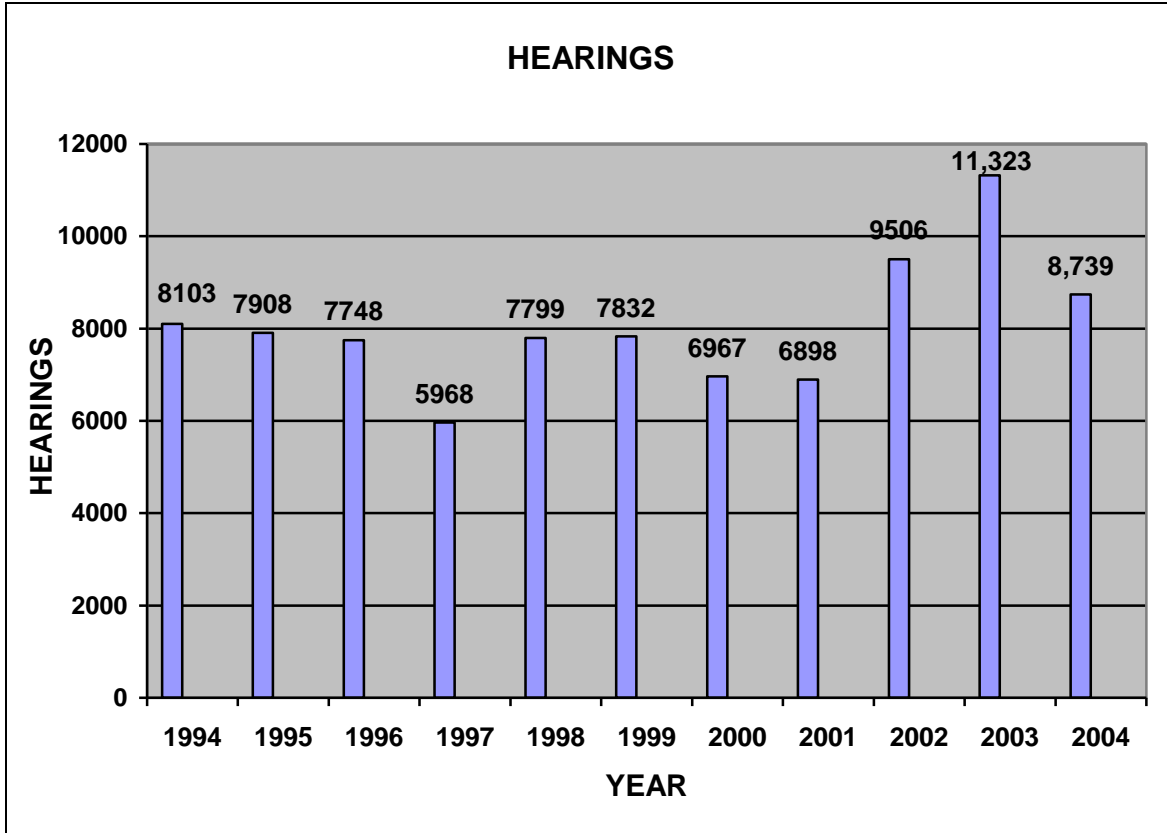
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## ADJUDICATION

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The graph below and on the following page further attest to the quality of the Program. An individual who receives an NOL has the right to appeal the violation. Over the first four years, approximately 5% of those individuals receiving an NOL requested a hearing to contest the violation. Over the next five years this number dropped to approximately 3%. While the number of requested hearings increased during the three year period from 2001 to 2003, the percentage of those receiving an NOL remained consistent during this period at 3%. The increase in the number of hearings was an expected result due to the increase in cameras from 30 to 50 during this same time period.

The City's Parking Violations Bureau employs Administrative Law Judges to review cases, either by mail (individual mails in letter contesting the ticket) or in person at a Hearing Center. The evidence is usually overwhelming and a guilty verdict is typically upheld.



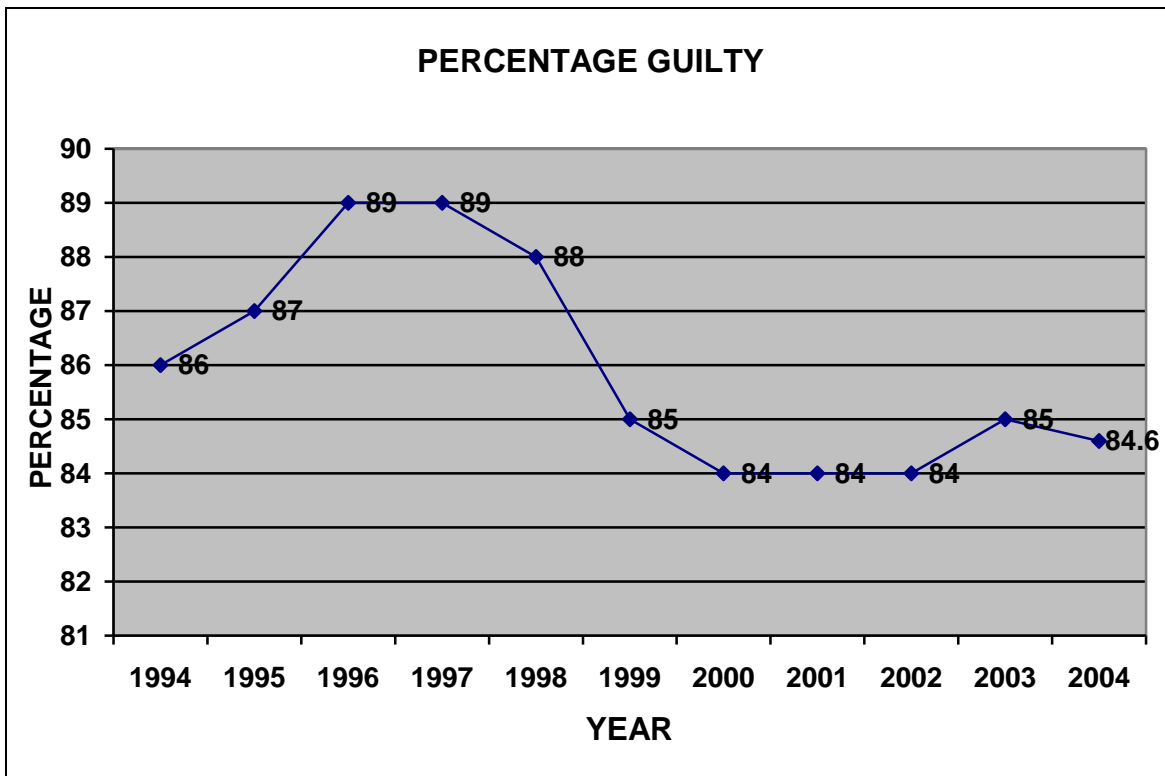

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### ADJUDICATION

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The graph below represents those individuals who appealed. In 2004, only 2.7% of the individuals who received an NOL requested a hearing. Of this percentage, 85% were found not to have any substantive evidence to overturn the issuance of the NOL they received. In other words, only 15% of the 2.7% who had asked for a hearing had legitimate pleas that resulted in the dismissal of the NOL.

This statistic also attests to the quality and integrity of the Program. Both the number of hearings and the low percentage of NOLs successfully appealed contribute to a change in driver behavior -- red light runners are now on notice that they will be caught in the act, be fined and will have difficulty having the NOL dismissed.




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### CAMERA LOCATIONS BY BOROUGH

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Since its inception in December of 1993, the Program has grown to include 50 cameras located at key intersections throughout the City's five boroughs. Locations have been selected based upon a review of several factors including; accident history of the intersection, engineering judgment and community requests. The chart below depicts the number of red light cameras operational today by borough. The City has 75 locations instrumented for cameras, with only 50 operating at any given time. In addition, as a further deterrent, 200 dummy cameras (non-functional shells) have also been installed.

The success of the Program in enhancing public safety throughout the five boroughs has led to the City's interest in expanding the Program. The number was last increased to 50 back in 1995 by the State Legislature, and as of July 2001, this maximum number was reached. By further increasing the limit on the total number of



red light cameras allowable, the City will be able to install this successful accident reduction tool at many more high accident locations.

