NEW YORK CITY'S RED LIGHT CAMERA DEMONSTRATION PROGRAM

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INTRODUCTION

The intent of this paper is to provide general information to the members of the Institute concerning New York City's Red Light Camera (RLC) program. Many municipalities, elected officials and the media have expressed interest in this year and half old program. Following is a brief guide for all interested parties.

HISTORY

Since 1983, New York City's Department of Transportation (DOT) has been researching red light camera technology. In order to obtain a better appreciation for the technology -- which had already been in use in Europe and Australia -- the City invited three vendors to demonstrate the three most popular cameras in production and use.

Each vendor was given the opportunity to demonstrate its camera and associated equipment at separate locations. The purpose of these exhibitions was to demonstrate to the City's satisfaction that a quality picture could be captured which contained sufficient data to establish a clear case for the issuance of a violation. Pictures from two cameras (technical and field problems precluded one of the companies from completing their demonstration) were received by DOT for review and consideration. They proved to be of such high quality that interest was raised at higher levels of the City's government. Armed with the information obtained from the two camera companies, DOT initiated a Request For Information (RFI).

RFI PROCESS

Before issuing the RFI, DOT established guidelines for what would be required. It was agreed that, whichever system was chosen, it had to be a stand-alone operation that did not interact with any other existing summonsing or tracking procedures. This was to avoid the possibility of being unable to track each Notice Of Liability (NOL) and the associated revenue. Each phase of this program had to be self-sufficient and trackable. DOT also stipulated that two pictures were necessary in order to present valid evidence that a violation had actually occurred. This basic premise was agreed to following discussions with those employees of DOT's Parking Violations Bureau (PVB) who would have responsibility for adjudicating all violations disputed by a recipient of a NOL. The rationale behind the need for two pictures is discussed later.

The RFI issued in March 1989 elicited feedback from ten companies in the United States and Great Britain. By having these companies exhibit their knowledge of existing photographic technologies, DOT acquired a vast amount of state-of-the-art information. Each company explained its technology and approach to DOT's request. After analyzing the presentations, DOT prepared the documents required to advertise a Request For Proposal (RFP).

THE RFP PROCESS

This procedure affords NYC agencies the luxury of selecting a solution they believe to be the most applicable rather than having to settle for the lowest bidder (the usual process for awarding a contract). This process is somewhat more complicated than the low bid method, and requires additional work on the part of the contracting agency. A selection committee must be formed prior to the RFP being advertised in order to establish evaluation criteria which will be used to select the best proposal. For this project, a six member committee was established comprised of three members from PVB, two members of DOT's Safety Unit and one from the Traffic Signal Division. The Committee was chaired by the Chief of Staff for DOT. Each responding company submitted, under separate covers, a technical and cost proposal. The cost proposal would be reviewed only after all technical proposals had been evaluated and ranked.

The RFP that was issued in July 1989 was a comprehensive document outlining exactly what

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DOT expected from this contract. Prior to its issuance, a state law had to be enacted allowing NYC to impose a monetary fine on owners of vehicles which did not stop at red traffic signals based upon information obtained from a "traffic-control signal violation-monitoring system." This newly passed law had a "Sunset Provision" clearly stating an expiration date unless extended by state legislation. The "Sunset" now stands at Dec. 1996. Some items contained in that law are: (a) the City is empowered to install and operate devices at no more than 25 intersections; (b) the registered owner of the vehicle in violation shall be sent an NOL by first class mail; (c) a liable owner may be assessed monetary fines (currently set at $50); (d) original determination of liability shall be made by a technician based upon inspection of photographs; (e) a person charged with liability shall have the opportunity to contest the alleged liability. These are but a few of the provisions and stipulations that were established to ensure that the driving public would be afforded due process under this statute.

The RFP also contained some general provisions which were germane to the operation of this demonstration program such as: (a) the cameras could be purchased or leased; (b) the installation of all equipment at a designated camera site shall be done by the contractor at DOT's direction; (c) all maintenance, both preventive and remedial with respect to the camera system, shall be the responsibility of the contractor; (d) film from each camera must be unloaded and loaded daily; (f) cameras may be rotated among locations as directed by the City; (g) the system chosen must provide a record keeping and tracking system of all NOLs from issuance through final disposition; (h) the vendor is to provide all necessary MIS control reports as required by NYC.

Six proposals were received by DOT for review. Based upon the previously established evaluation criteria, the selection committee rated each proposal on: (a) proposer's qualifications; (b) quality of technical proposal; (c) actual camera equipment; (d) film viewers and other equipment; (e) quality of training; (f) other services (mailing, data processing, film processing). Each was given a weighted value based upon the relative importance of each criterion as perceived by the committee

COST OF THE PROGRAM

The cost for this project was arrived at in a unique manner. Because of the City's fiscal constraints, no contract was awarded. Rather, each respondent received an acknowledgment letter expressing the City's gratitude for their participation, and announcing who would have been chosen. This elicited a response from the potential winner, Electronic Data Systems (EDS), saying that they could provide a program "at no cost to the City." This peaked the interest of City officials. Thus began the second major task of negotiating a contract within the original scope of the RFP. There followed nearly two years of proposals and counterproposals, including a "mini-demo," before a contract was signed.

Under the premise of "no cost to the city," the revenue realized from payment for violations was to offset the total cost (contract and City costs). Because the basis for revenue would be a function of the total number of possible violations captured by this program, a realistic expectation of the number of violations had to be determined. EDS agreed to set up two test locations for the purpose of determining this number. During this 30-day experiment, approximately 1100 NOLs were issued, thus presenting a platform from which further negotiations could proceed.

The City, realizing that there are start-up costs associated with any major undertaking of this nature, suggested to EDS that they cost-out a proposal stating how many cameras over what time period would be most cost effective. Coming back with too high a monetary gamble might turn the City against the program. On the other hand, too small a project might not be cost-effective for EDS.

After months of negotiations, an $8,440,000 contract was agreed upon. To this, a City cost of $5,460,000 was added for a total contract cost over three and a half years of $13,900,000. Included in the contract were: daily film loading and unloading; film development and delivery; camera and loop installation; camera and loop maintenance; spare cameras and parts; cameras to be operational at least 90 percent of the time; 15 cameras always in operation; rotation of cameras as directed by the City; a complete NOL tracking system (including both hardware and software); on-site support

personnel for assistance as needed; maintenance of the tracking system; training of City employees; and that the cameras and data processing system to be operating to the satisfaction of the City before acceptance.

LOOP PLACEMENT

Perhaps the single most important item that had to be addressed was what would constitute a violation, and how it could be captured on film. We already knew how the cameras functioned. Next was to have them capture enough information to satisfy the judicial branch of DOT -- the Administrative Law Judges (ALJs) at PVB. ALJs are lawyers hired by PVB to adjudicate parking summonses and, since the NOLs to be issued under the RLC program would be equivalent to a parking violation, it was determined that the ALJs should have major input as to what evidence would be sufficient to uphold an alleged violation.

New York City Traffic law states that a vehicle may not enter an intersection while facing a steady red indication. However, if the vehicle is in the intersection when the signal turns red, the vehicle may proceed through the intersection. (An intersection is defined by a crosswalk or stop bar or, if neither of these are present, by an extended building line). It was agreed that the first picture must clearly establish that the vehicle in question was **not** in the intersection while the signal was red. To satisfy this criterion, the picture must contain not only the vehicle and the pavement marking, but the red signal indication as well. This picture sets the stage for the determination that the vehicle was not in the intersection before the signal turned red and therefore was not legally entitled to proceed.

The second picture had to establish that the vehicle did not stop or attempt to stop. This was accomplished by taking the second picture a short time later (0.5 sec. to 1.5 sec.). If the second photo showed the vehicle in the intersection while the signal was still red, it was believed that there was enough evidence between the two pictures to determine that the vehicle did proceed in violation of the red signal.

The next key item was the placement of the induction loops which triggered the camera. Under the original design there was to be only one loop per lane of moving traffic. It had to be placed in such a manner as to detect a vehicle before it entered the intersection. Placing it in the crosswalk (which was the standard at that time) did not achieve the desired result. That would require the ALJs to perform speed/distance calculations to determine where the vehicle might have been "X" amount of time before the photo was taken. It was agreed that the less calculating an ALJ had to do the easier it would be for them to reach a decision. Also, adding a calculation into the decision process would open more doors of questioning to be used by respondents in defense of their claims that they had not run a red light. If the loops were placed too far back, we would be photographing many vehicles that had legally stopped. The optimum location for the loop had to be as close to the crosswalk or stop bar as possible. Three inches (3") was agreed upon.

Since this technology (loops and cameras) was so precise we could now cite any vehicle which entered an intersection the instant it did so. DOT didn't wish to go to such extremes to capture violators, since most police officers used the side street green indication to judge a violation. (An informal survey was done, of NYPD officers assigned to Red Light violations, to see what criteria were used to establish a violation. The only common parameter was the side street green indication mixed with other factors). So a three tenths of a second (.3 sec.) buffer was adopted. This now gave the driver an added thirteen (13) feet of decision zone before the camera became active. This would follow the amber phase which alerts the driver that red is about to start.

During the "mini-demo" in 1991, with single loop configurations, it was found that we were capturing too many vehicles that had legally stopped but were too close (i.e., within 3") to the stop line. This situation produced useless footage of film that had to be developed, reviewed and explained as to why it was not used. This was not acceptable to NYC and had to be addressed. The installation of a second loop was suggested and tried. This now gave us the ability to do a speed calculation and introduce a new parameter when deciding whether or not to take pictures. Since the tendency of a driver is to accelerate if they are planning to run a red light, the introduction of a minimum speed above which a pair of pictures would be taken was

now part of the logic statement to determine if the camera should activate. This theory proved to be correct and all intersections are now equipped with two loops per lane and a minimum speed criterion of fifteen miles per hour.

SITE SELECTION

As there were no previously established guidelines that had been tried and tested, several factors had to be considered before choosing the 20 locations for camera installation. First we investigated accident data, in particular right angle accidents at intersections. We also polled local police precincts to identify any locations that were receiving special attention with regard to red light violations. A review of these two lists revealed little if any correlation between accidents and police enforcement. This meant that locations on both lists had to be investigated.

We also had to determine the distribution of the twenty camera locations throughout the five boroughs of the City. Over-burdening one borough or not giving one its fair share had to be addressed in order to preclude accusations of favoritism. The final apportionment was determined by population density, traffic signal density, and vehicle miles traveled. Thus, five cameras were installed in Manhattan, Brooklyn, and Queens, three in The Bronx, and two in Staten Island. Each borough was then subdivided into smaller areas (equal to the number of camera locations). This was done by using community planning board boundaries (which are based roughly on population, similar land use, and neighborhood character). Various locations in each area were then researched until a suitable site was found.

Considering a candidate location required time and patience. It was necessary to ensure that the signal timing was correct and that the traffic signal controller was operating properly. Of utmost importance was the timing of the amber phase since a short amber could be the reason for red light runners. Two locations were identified where an adjustment to the amber phase achieved the desired result and no cameras were installed.

Also of importance were locations that had emergency-type operations in the immediate area such as fire houses, police precincts, and hospitals. These were by-passed. These types of facilities generate, on a regular basis, the type of situation that might cause a vehicle to go through a red light affording the emergency vehicle the right of way. Because this situation can also exist at non-emergency-generating locations, film reviewers were trained to review the previous violation when an emergency vehicle appears to determine if the emergency vehicle contributed to the violation. If this appears to be the case, the NOL is voided. In addition, locations that had Traffic Control Agents assigned on a regular basis were also excluded from being considered. Their function is to relieve spill back which may, on occasion, require them to pull traffic through during a red signal.

PRIVACY ISSUE

Lawmakers raised concerns on the issue of privacy. We had an unconfirmed report that one photographic monitoring system (not in New York City) had been shut down because it used frontal shots; to avoid this problem, we use only rear view photos. By so doing, we are only able to cite the registered owner of the vehicle because we cannot identify the driver. However, this has a positive side to it. If the violation had been treated as a moving violation, (driver identification needed) then all revenue would pass to the State (except for administrative fees) and points would be assessed against the driver's license. If for some reason the program proved to be unsuccessful or contained a major fault, it was conceivable that a driver could have been unfairly penalized. To reverse a wrong of this nature would not only be costly and time consuming but very difficult to rectify.

OTHER SIGNIFICANT ITEMS

Once the cameras were installed and all the major adjustments were made, the fine tuning began. Along many arteries in NYC the presence of parking lanes had an impact on the cameras ability to provide a clear picture. In some cases the camera had to provide a picture of vehicles four lanes from the camera. Also, double parked trucks often totally block the view of the camera rendering useless that time period while they were unloading.

To solve both the double parkers and the fourth lane readability, a mast arm installation was tried. This moved the camera's location sixteen feet in the air (so as not to be struck by larger vehicles)

and about eight feet out from the curb, whereas the standard installation was approximately two feet from the curb and only nine to ten feet in the air. This was achieved by fastening a bracket to the end of a two inch (2") diameter pipe approximately eleven and half feet (11'-6") long and supporting that pipe by welding and bolting it to a modified street light pole. This was all mounted on a moveable 3,000 pound concrete base. Because this installation is moveable, with the proper equipment, it is now possible to situate a camera and fine tune its exact location before digging up the sidewalk for permanent installation.

Another problem that is still being addressed is glare from the license plate as a result of the flash, rendering some plates unreadable. In an attempt to remedy this problem a slave flash unit is being introduced in order to reduce the intensity of the primary flash.

PROGRAM PURPOSE

The primary reason for this program was to test the available technology. The systems being tested were; the cameras in the street, data input storage and retrieval, user friendliness, and operational responsiveness.

The cameras have shown some wear and tear. To remedy this the contractor has rehabilitated all fifteen (15) original cameras by replacing gears, bushings rings and flash units. The camera installations as a whole have held up well during the past two winters ('93-'94 & '94-'95), exhibiting no problems that could be directly attributed to climate. The only time weather presented a problem was when it snowed. This would cover the pavement markings making vehicle location with respect to the markings were difficult to pinpoint. This was a short-term problem as vehicular movement usually melted the snow or was plowed clear during normal snow removal.

Rain at night presents a glare problem as it creates a mirror effect on the asphalt pavement. This too is usually a short term situation.

Data storage and retrieval has presented few if any problems at all. Ad Hoc reports are run when necessary as well as regularly scheduled reports needed for the administration of this program. Modifications to existing software, as was necessary to accomplish the fine structure change, were accomplished without disruption to the operating system.

THE NEXT STEPS

Some next steps have already been initiated. The number of locations at which cameras are active has gone from fifteen (15) to eighteen (18), and the fine structure was changed from forty dollars ($40) with a ten dollar ($10) penalty for non prompt payment to a fifty dollar ($50) and twenty-five dollar ($25) scale.

We expect to amend the existing enabling law which expires in December 1996. At the same time, the City is once again planning to expand the program, this time by twelve (12) more cameras, bring the total to thirty (30). Included in this expansion is the opening of more help centers throughout the City. This will give the public the ability to plead their case in the borough of their choice. At present, because of monetary constraints the City was under at the time the program began, there is only one help center, which is located in Manhattan exclusively for this program.

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