



Agenda Item # _____

Staff Report

City of Manhattan Beach

TO: Honorable Mayor Ward and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Rod Uyeda, Chief of Police
Derrick Abell, Lieutenant

DATE: March 7, 2006

SUBJECT: City Council Work Plan Item Regarding Traffic Issues and Photo Red Light Enforcement Technology

RECOMMENDATION:

Staff recommends that the City Council DISCUSS and PROVIDE DIRECTION regarding the Staff report on photo red light enforcement technology.

FISCAL IMPLICATION:

The fiscal impact of a photo red light enforcement program is discussed in the body of this report.

BACKGROUND:

The City Council's Annual Work Plan includes a task to explore various options to mitigate traffic problems and concerns in the community. One such problem is the issue of people failing to stop for red lights at intersections in the city. This problem not only leads to occasional traffic collisions, but to heightened levels of "road rage" as people lose patience when waiting to lawfully enter intersections. This report is intended to help explain the current state of photo red light technology and its application to city streets so that the City Council can provide Staff with direction.

Staff presented this report to the Parking and Public Improvements Commission (PPIC) on February 23, 2006. The Commission was divided on whether to recommend to the City Council to proceed with pursuing this technology for the City of Manhattan Beach. However, the Commission did agree that Staff should provide more information on certain issues before endorsing the program further. The issues that some of the Commissioners were concerned about are as follows:

Some of the Commissioners were not convinced that photo red light technology was needed in Manhattan Beach due to the low number of traffic collisions attributed to red light running,

especially in light of statistics that indicated that red light running was only attributed to approximately ten percent of the total number of collisions in the City. Some Commissioners felt that city resources would be better utilized in neighborhoods, rather than busy intersections and were concerned that a police officer's time would be better utilized in the field, instead of reviewing photo evidence and issuing citations from a desk. Some Commissioners were not convinced that photo red light technology would be able to effectively solve the problem of red light running at busy intersections, especially left turns, without causing additional traffic collisions or more congestion. Some Commissioners also voiced concern over the number of additional traffic devices that might be needed at the larger intersections, creating further visual pollution to already congested intersections. Many of these issues could not be easily addressed without having a vendor complete a study at any given intersection. No speakers from the audience made comment on the issue. The minutes from the PPIC meeting are attached to this staff report with more detailed information regarding the photo red light technology discussion.

DISCUSSION:

One of the largest causes of serious automobile accidents is related to red light violations. In fact, in 2004, red light violators were responsible for more than 900 deaths and an estimated 168,000 injuries nationwide. Although running red lights and failing to follow other traffic controls such as stop and yield signs is the leading cause of traffic accidents in urban areas nationwide, during the past 3 years, Manhattan Beach has had only 32 total traffic collisions caused by red light violations and the highest reported intersection was Sepulveda and 33rd Street with five.

Photo red light enforcement technology has been in operation in the United States since the mid 1980's. These devices are installed at intersections and are connected to sensors. The sensors are synchronized with the traffic signals and are able to detect vehicles driving through intersections against a red light. The sensors trigger the cameras that record the date, time and place of the violation, as well as still images. Some cameras capture video of the violation. The cameras also record the vehicle's license plate and an image of the driver. The photos are then examined for clarity and if deemed acceptable, a citation is mailed to the registered owner of the vehicle.

Conventional red light enforcement by traffic officers is difficult. Many of the busiest intersections in Manhattan Beach will have multiple offenders go through red traffic signals and the officer can only catch one. To add to the difficulty, officers often must go through the red light themselves to catch a violator as they must be in a vantage point to both observe the signal phase and where the driver was when the phase changed to red. In areas where traffic volume is high, this practice is often dangerous or simply impractical. Also, there are simply too many intersections for the police to monitor for red light violators more than just a few minutes each day as they go about their other duties. It is estimated that our busiest intersections may have in excess of 1,000 violators per month, yet in 2005, only 105 out of over 4,500 citations issued by the Manhattan Beach Police Department were for red light violations.

There are three types of cameras used for photo red light enforcement - wet film, digital and video. All of these systems have a high degree of conviction in the courts.

Wet film systems use 35mm camera film which is loaded into the traffic camera monitoring system by the vendor. The traffic camera monitoring system must be visited frequently by the vendor, often on a daily basis, to retrieve exposed film and reload. The film is then transported for processing, developing, sent to a facility for review and then converted to a digital image. Wet film has the sharpest detail and highest resolution images at almost 20 million pixels.

Digital systems have become the technology of choice for most jurisdictions. The digital camera operates much the same way as the wet film camera. A major benefit of digital cameras is in the ease of photo collection, acceleration of processing and distribution of tickets. Digital cameras can eliminate the cost of film, processing, and the personnel required for daily film handling. While a digital system can store more violation images and data than a wet film camera system, the images and data need to be collected/downloaded from a computer hard drive and processed regularly to issue citations in a timely manner. Digital images have approximately 2 million pixels of resolution, which is not as clear as wet film, but in most cases, satisfactory for prosecution.

The use of the digital *video* cameras and video processing technologies is a recent development for photo red light enforcement activities. Advantages of a video system include its ability to detect vehicle speed and predict whether or not a red light violation will occur. With this prediction, it is possible to preempt the normal signal changes and create an all-red signal, thereby preventing crossing traffic from entering the intersection when a collision is possible. Although this does not prevent the violation, it can help diminish the potential consequences. Video also captures the entire violation, making it more difficult for someone to contest the violation.

It should be noted that because of the poor resolution of video (approximately 500,000 pixels), night-time pictures require extensive lighting to capture the license plate and driver. This additional lighting is often a source of citizen complaints about photo red light systems.

Generally, for all of the described systems, only one to two thirds of the captured violations are clear enough to pursue in the courts. All captured violations are reviewed by the vendor and only those deemed clear enough for court purposes for forwarded to the law enforcement agency to review and issue a citation.

California Vehicle Code sections 21455.5, 21455.6 and 21455.7 provide specific regulations related to automated enforcement (red light traffic cameras). Requirements are outlined in the following paragraph.

A city council must conduct a public hearing on the proposed use of an automated enforcement system prior to entering into a contract with a vendor, the automated enforcement system must be clearly identified to the public, there must be a 30-day warning/advisory period prior to actual enforcement, the system must be operated by a governmental/law enforcement agency, uniform guidelines and procedures must be set up and adhered to, equipment must be regularly inspected and calibrated by a contracted agency other than the governmental/law enforcement agency involved, signs must be regularly inspected and maintained, citations must be reviewed and approved by law enforcement before being delivered to violators, all photographic records

and information created by the system must be confidential and retained for up to six months and registered owners/drivers of vehicles receiving citations must be given the opportunity to review the photographic evidence of the alleged violation, an intersection at which there is an automated enforcement system in operation, the minimum yellow light change interval shall be established in accordance with the Traffic Manual of the Department of Transportation.

Photo red light enforcement works. In 1999, the Insurance Institute for Highway Safety (IIHS) conducted a review of the Oxnard (California) photo red light enforcement program, which concluded that after the program's first year of operation, overall accidents had decreased by 7% and injury-producing crashes declined by 29% at signalized intersections. Front-to-side crashes, which are the traffic accidents most frequently associated with red light violations, decreased by 32% overall and by 68% with respect to crashes that produced injuries. The study also found that red light violations decreased by 42% across the city after cameras were introduced at only nine signal-controlled intersections. The study also concluded that there was a considerable "spillover" effect the cameras had on driver behavior. Increases in driver compliance were not limited to camera-equipped sites but also spread to non camera-equipped intersections as well.

Closer to home, Staff contacted and received feedback from Hawthorne, Gardena, Inglewood and Pasadena.

Hawthorne currently monitors 4 intersections, utilizing a total of 7 approaches. The Hawthorne Police Department administrator stated that since the inception of their program, traffic signal related accidents have increased overall in their city but decreased at intersections monitored by cameras.

Gardena currently has 10 approaches at 6 intersections and they reported that traffic signal related collisions appear to have decreased at these monitored intersections but congestion has increased. The noted increase in congestion may be attributed to motorists using extra diligence when moving through camera-monitored intersections.

Inglewood has traffic cameras currently installed at 14 intersections covering 22 approaches and they reported that after a first year when they experienced a slight increase in accidents at monitored intersections, there has been a dramatic drop in accidents at these intersections.

Pasadena monitors 3 intersections utilizing 7 approaches and is preparing to add two more intersections in the near future. Pasadena reports that red light violators account for more than 50% of all recorded automobile accidents each year and collisions at the monitored intersections appear to have remained constant since installing photo red light, although violations at these intersections have decreased.

It should be noted that the large majority of the US public supports red light cameras. A 2000 Insurance Institute for Highway Safety survey in ten cities — five with cameras and five without — reported that more than 75 percent of drivers supported camera enforcement. A 2002 nationwide survey sponsored by the National Highway Traffic Safety Administration and conducted by the Gallup Organization found that 75 percent of drivers favored the use of red light cameras. A 1996 survey by the Insurance Research Council found that the highest support for red light cameras was in large cities, where 83 percent of respondents supported their use.

Should the City of Manhattan Beach wish to pursue photo red light enforcement technology, staff felt it important to report on which city intersections had the highest occurrence of collisions.

**Traffic Collision and Enforcement Statistics
January 2003 through December 2005**

Top 5 Intersections for Traffic Collisions Caused by Red Light Violations	
Sepulveda Blvd./33rd St.	5
Manhattan Beach Blvd./Meadows Ave.	4
Sepulveda Blvd./Manhattan Beach Blvd.	3
Manhattan Beach Blvd./Redondo Ave.	3
Manhattan Beach Blvd./Pacific Ave.	3

Top 5 Intersections - Total Traffic Collisions	
Manhattan Beach Blvd./Sepulveda Blvd.	20
Sepulveda Blvd./Rosecrans Ave.	20
Aviation Blvd./Marine Ave.	18
Sepulveda Blvd./Marine Ave.	17
Sepulveda Blvd./8th St.	14

For the 5 major intersections noted above, there were a total of 89 collisions over a 36 month period. Only 18 (20%) of those collisions were related to red light violations. The majority of the traffic collisions that have occurred at these intersections have involved vehicle front/rear contact usually caused by speed violations. It should be noted that the traffic volume on these streets were in excess of 55,000 cars per day.

Costs: Should the city of Manhattan Beach decide to pursue photo red light enforcement technology, there would likely be no financial obligations to the city for installation, service or maintenance of a system. These expenses would be paid for by the selected vendor, and then the city would pay a monthly fee to the vendor for each approach (up to four directions of traffic) per intersection. Fees are generally based on traffic volume and the selected vendor would monitor suggested intersections to determine whether the number of red light violators and traffic volume would cover installation and monitoring costs. Vendors then agree to service cameras for, on average, five years, with a cost neutrality clause in their contracts in which fees are adjusted every 12 months or sooner, if needed, to protect cities from suffering a negative cash flow on approaches where citation revenue falls short of the vendor's fees. Contracts can be renewed indefinitely. It should be noted that any photo red light enforcement on a state highway, like Sepulveda, must be approved by Caltrans and the City would incur any liability associated for any equipment operated on state property.

The cost to a violator for a red light violation is \$351. The County receives \$207 of the fine while the City receives the remaining \$144. The City would have the final say at which intersections this technology may be installed. There is often a nominal fee associated with traffic monitoring by the vendor which would be selected by issuing a Request for Proposal (RFP).

One other cost to consider is the dedication of staff to facilitate the photo red light enforcement program. Should multiple intersections be monitored, the number of citations issued could number well over 1,000 per month. Each citation will have to ultimately be reviewed by a sworn officer to be issued. That officer would be responsible for mailing out the citation, following up on payment, arrange viewing of the evidence should a violator request it, and testify in court should a violator wish to present a case before a magistrate.

In instances where a violator chooses to ignore the citation, the Courts will turn the citation over to a collections agency for follow-up. Collections agencies usually continue to try to contact the registered owner through any means available with threats of additional fines being imposed.

In June of 2001, City Council received a staff report on the presentation of Technology Applications for Traffic Safety in which automated signal enforcement technology was discussed. The City Council chose not to pursue the technology at that time. The Staff report is attached to this Staff report.

CONCLUSION:

Despite the relatively low number of traffic collisions reported to the Manhattan Beach Police Department and the low number of citations issued for red light violations, Staff believes that photo red light technology can assist mitigate some of the traffic related problems in the city. Staff believes that Photo Red Light Technology improves safety, discourages red light violations and calms traffic. It is only by picking a vendor and conducting a scientific survey can Staff determine the true breadth of the red light problem at any given intersection and the effectiveness of any system to address all the aspects of red light running at that intersection. Staff therefore recommends that the City Council discuss and provide direction regarding implementing photo red light technology in the city.

ATTACHMENTS:

- February 23, 2006 Minutes for PPIC
- February 23, 2006 Staff Report for PPIC
- Traffic Collision Chart 2003 - 2005
- June 19, 2001 Staff Report

**CITY OF MANHATTAN BEACH
PARKING AND PUBLIC IMPROVEMENTS COMMISSION
MINUTES OF REGULAR MEETING
FEBRUARY 23, 2006**

A. The regular meeting of the Parking and Public Improvements Commission of the City of Manhattan Beach was held on February 23, 2006 at 6:33 p.m. in the City Council Chambers of the City Hall, 1400 Highland Avenue.

B. ROLL CALL

Members Present: Lang (arrived 6:45 p.m.), Powell, Saunders, Seville-Jones and Chairman Osterhout

Members Absent: None

Staff Present: Robert Osborne, Management Analyst
Kara Pompano, Recording Secretary
Rod Uyeda, Police Chief
Richard Thompson, Director of Community Development

C. AGENDA CHANGES

None.

D. APPROVAL OF MINUTES - January 26, 2006

Commissioner Seville-Jones and Commissioner Saunders pointed out minor changes on pages 1, 3, 4, and 5.

A motion was MADE and SECONDED (Seville Jones/Powell) to approve the minutes of January 26, 2006 as amended.

AYES: Lang, Powell, Saunders, Seville-Jones and Chairman Osterhout

NOES: None

ABSENT: None

ABSTAIN: None

E. CITY COUNCIL AGENDA

Management Analyst Robert Osborne reported that on February 21, 2006, the City Council approved the Encroachment Permit Appeal for 501 Manhattan Avenue, as recommended by the Commission. The City Council also reviewed the Mira Costa neighborhood parking restrictions and approved several minor changes.

F. AUDIENCE PARTICIPATION

None

G. GENERAL

1. City Council Work Plan Item Regarding Traffic Issues and Photo Red Light Enforcement Technology

Chief of Police Rod Uyeda introduced himself to the Commission and gave a Power Point Presentation on photo red light technology and its application on city streets. Although the City has a relatively low number of traffic collisions and a low number of citations issued for red light violations, staff believes that photo red light technology can assist in mitigating some of the traffic related problems and calm traffic.

In response to a number of inquiries from the Commission, Chief of Police Uyeda clarified the following: Statistics do indicate an initial increase in traffic congestion and accidents at the inception of the program, however, such instances reduce as drivers become aware of the cameras. Studies also concluded that there is a “spillover” effect to driver behavior; increases in driver compliance were not limited to camera-equipped sites but spread to non camera-equipped sites as well, and had an overall calming effect. There would likely be no financial obligation to the city for installation service or maintenance of a system. These expenses are paid for by the selected vendor and then the city pays a monthly fee. The inception of the program typically provides a high rate of return to the vendor which covers their initial costs. If the City decides to pursue implementation of the system, The Police, Engineering and Planning Departments will work with the vendor to select the intersections. Any photo red light enforcement on a state highway, such as Sepulveda, must be approved by Caltrans and the City would incur any liability associated for any equipment operated on state property. There are no privacy laws that prohibit use of this technology and the system only activates when a violation occurs.

Audience Participation

None.

Discussion

Commissioner Lang remarked that red light violations are not a fundamental traffic issue in the City. The Commission consistently hears concerns from residents on speeding and lack of enforcement within their neighborhoods. He questioned if this technology would free up more officers to address these concerns.

Chief of Police Uyeda confirmed that as police officers will be able to virtually ignore the intersections with this technology, they can be redirected to neighborhood streets. The Department would request an additional officer to handle the administration of the program, which will cost approximately \$110,000 including benefits.

Commissioner Seville-Jones shared that her research on these systems show that they are not perfect, especially in monitoring left-hand turns.

Chief of Police Uyeda explained that the vendor would assess such intersections to determine if the system would prove successful. Additional cameras may be necessary at some intersections.

Traffic Engineer Zandvliet agreed that left hand turns prove difficult to monitor. The assessment of an intersection would determine if the focus should be on left turn lanes or through traffic enforcement.

In response to Chairperson Osterhout, Management Analyst Osborne explained that this issue was included in the City Council's Work plan. The Commission is being asked to provide input on this system from a conceptual standpoint and whether the use of such technology should be further pursued.

Responding to Commissioner Powell, Management Analyst Osborne confirmed that this issue went before City Council in 2001. The Council was not interested in utilizing the technology at that time.

Commissioner Powell stated that this issue is worthy of further City Council consideration. While statistics don't show an overwhelming need, he believes that if the system can prevent one collision or save one life, it is worth it. He will support referring this item to City Council for further study.

Commissioner Saunders agreed that this issue warrants City Council consideration. He noted that main thoroughfare intersections are a problem, some of which are near schools. Commissioner Saunders stated that he too would support a recommendation that the City Council take the next step and examine potential vendors to obtain further information.

Commissioner Lang voiced his concern in forwarding support of this technology to the City Council as it does not relate to the City's primary traffic issues. Although the system has benefits and breakeven costs, it does not represent the concerns of speeding and lack of enforcement continually brought forth to the Commission.

Commissioner Seville-Jones shared that her thoughts are more in line with Commissioner Lang's comments. She talked of her concerns with the cost benefit analysis, stating that this system will incur costs, administrative burdens, and an extensive education program. She

believes such time and energy could be better spent on addressing traffic concerns on neighborhood streets.

Chairperson Osterhout shared that he originally thought this system would be a good idea. However, he is now concerned with the issue of monitoring left turn lanes. As he believes left turn violations are a significant issue, he is hesitant in supporting the program without additional and more specific information. Chairman Osterhout agreed with Commission Lang that an additional police officer assignment to this system is not the best allocation of resources, adding that it is not just the cost but also manpower availability.

Commissioner Saunders commented on the workshop he attended where other cities shared that they are faced with the same challenges in increasing their workforce. He stated that further exploration of this technology would support the department, takes advantage of Chief of Police Uyeda's expertise and provides further evaluation of available technology. Commissioner Saunders also talked of the Rosecrans widening project and phasing of signals, which will improve traffic congestion.

Commissioner Lang recapped that the Commission believes there can be benefits from this technology, but more information is required on which signals could be designated; monitoring left turn lanes; synchronizing of traffic lights; resource allocation, shifting of resources to address areas of concern; and a communication/education plan for the public.

Chief of Police Uyeda stated that one of his tasks is to make changes to things that need to be changed and he believes that he possess the ability to do so. He relayed that the Department does not have a strong stance on this issue but wants the City to be aware of the technology that is available.

Chairman Osterhout announced that Item #3 will be heard next on the agenda.

3. Request for Encroachment Appeal - 2220 Alma Avenue & 2221 Vista Drive

2. Consider Changes to Limited Time Parking Restrictions on Manhattan Beach Boulevard new Walnut Avenue

H. COMMISSION BUSINESS

I. ADJOURNMENT

The Meeting was adjourned at 10:20 p.m.



Agenda Item #: _____

Staff Report

City of Manhattan Beach

TO: Parking and Public Improvements Commission

FROM: Rod Uyeda, Chief of Police
Derrick Abell, Lieutenant

DATE: February 23, 2006

SUBJECT: City Council Work Plan Item Regarding Traffic Issues and Photo Red Light Enforcement Technology

RECOMMENDATION:

It is recommended that the Commission review this report and provide staff with direction.

BACKGROUND:

The City Council's Annual Work Plan includes a task to explore various options to mitigate traffic problems and concerns in the community. One such problem is the issue of people failing to stop for red lights at intersections in the city. This problem not only leads to occasional traffic collisions, but to heightened levels of "road rage" as people lose patience when waiting to lawfully enter intersections. This report is intended to help explain the current state of photo red light technology and its application to city streets so that the Commission can make a recommendation to City Council.

DISCUSSION:

One of the largest causes of serious automobile accidents is related to red light violations. In fact, in 2004, red light violators were responsible for more than 900 deaths and an estimated 168,000 injuries nationwide. Although running red lights and failing to follow other traffic controls such as stop and yield signs is the leading cause of traffic accidents in urban areas nationwide, during the past 3 years, Manhattan Beach has had only 32 total traffic collisions caused by red light violations and the highest reported intersection was Sepulveda and 33rd Street with five.

Photo red light enforcement technology has been in operation in the United States since the mid 1980's. These devices are installed at intersections and are connected to sensors. The sensors are synchronized with the traffic signals and are able to detect vehicles driving through intersections against a red light. The sensors trigger the cameras that record the date, time and place of the violation, as well as still images. Some cameras capture video of the violation. The

cameras also record the vehicle's license plate and an image of the driver. The photos are then examined for clarity and if deemed acceptable, a citation is mailed to the registered owner of the vehicle.

Conventional red light enforcement by traffic officers is difficult. Many of the busiest intersections in Manhattan Beach will have multiple offenders go through red traffic signals and the officer can only catch one. To add to the difficulty, officers often must go through the red light themselves to catch a violator as they must be in a vantage point to both observe the signal phase and where the driver was when the phase changed to red. In areas where traffic volume is high, this practice is often dangerous or simply impractical. Also, there are simply too many intersections for the police to monitor for red light violators more than just a few minutes each day as they go about their other duties. It is estimated that our busiest intersections may have in excess of 1,000 violators per month, yet in 2005, only 105 out of over 4,500 citations issued by the Manhattan Beach Police Department were for red light violations.

There are three types of cameras used for photo red light enforcement - wet film, digital and video. All of these systems have a high degree of conviction in the courts.

Wet film systems use 35mm camera film which is loaded into the traffic camera monitoring system by the vendor. The traffic camera monitoring system must be visited frequently by the vendor, often on a daily basis, to retrieve exposed film and reload. The film is then transported for processing, developing, sent to a facility for review and then converted to a digital image. Wet film has the sharpest detail and highest resolution images at almost 20 million pixels.

Digital systems have become the technology of choice for most jurisdictions. The digital camera operates much the same way as the wet film camera. A major benefit of digital cameras is in the ease of photo collection, acceleration of processing and distribution of tickets. Digital cameras can eliminate the cost of film, processing, and the personnel required for daily film handling. While a digital system can store more violation images and data than a wet film camera system, the images and data need to be collected/downloaded from a computer hard drive and processed regularly to issue citations in a timely manner. Digital images have approximately 2 million pixels of resolution, which is not as clear as wet film, but in most cases, satisfactory for prosecution.

The use of the digital *video* cameras and video processing technologies is a recent development for photo red light enforcement activities. Advantages of a video system include its ability to detect vehicle speed and predict whether or not a red light violation will occur. With this prediction, it is possible to preempt the normal signal changes and create an all-red signal, thereby preventing crossing traffic from entering the intersection when a collision is possible. Although this does not prevent the violation, it can help diminish the potential consequences. Video also captures the entire violation, making it more difficult for someone to contest the violation.

It should be noted that because of the poor resolution of video (approximately 500,000 pixels), night-time pictures require extensive lighting to capture the license plate and driver. This additional lighting is often a source of citizen complaints about photo red light systems.

LAW

California Vehicle Code sections 21455.5, 21455.6 and 21455.7 provide specific regulations related to automated enforcement (red light traffic cameras). This criteria is outlined in the California Vehicle Code:

A city council must conduct a public hearing on the proposed use of an automated enforcement system prior to entering into a contract with a vendor, the automated enforcement system must be clearly identified to the public, there must be a 30-day warning/advisory period prior to actual enforcement, the system must be operated by a governmental/law enforcement agency, uniform guidelines and procedures must be set up and adhered to, equipment must be regularly inspected and calibrated by a contracted agency other than the governmental/law enforcement agency involved, signs must be regularly inspected and maintained, citations must be reviewed and approved by law enforcement before being delivered to violators, all photographic records and information created by the system must be confidential and retained for up to six months and registered owners/drivers of vehicles receiving citations must be given the opportunity to review the photographic evidence of the alleged violation, an intersection at which there is an automated enforcement system in operation, the minimum yellow light change interval shall be established in accordance with the Traffic Manual of the Department of Transportation.

Photo red light enforcement works. In 1999, the Insurance Institute for Highway Safety (IIHS) conducted a review of the Oxnard (California) photo red light enforcement program, which concluded that after the program's first year of operation, overall accidents had decreased by 7% and injury-producing crashes declined by 29% at signalized intersections. Front-to-side crashes, which are the traffic accidents most frequently associated with red light violations, decreased by 32% overall and by 68% with respect to crashes that produced injuries. The study also found that red light violations decreased by 42% across the city after cameras were introduced at only nine signal-controlled intersections. The study also concluded that there was a considerable "spillover" effect the cameras had on driver behavior. Increases in driver compliance were not limited to camera-equipped sites but also spread to non camera-equipped intersections as well.

Closer to home, Staff contacted and received feedback from Hawthorne, Gardena, Inglewood and Pasadena.

Hawthorne currently monitors 4 intersections, utilizing a total of 7 approaches. The Hawthorne Police Department administrator stated that since the inception of their program, traffic signal related accidents have increased overall in their city but decreased at intersections monitored by cameras.

Gardena currently has 10 approaches at 6 intersections and they reported that traffic signal related collisions appear to have decreased at these monitored intersections but congestion has increased. The noted increase in congestion may be attributed to motorists using extra diligence when moving through camera-monitored intersections.

Inglewood has traffic cameras currently installed at 14 intersections covering 22 approaches and they reported that after a first year when they experienced a slight increase in accidents at monitored intersections, there has been a dramatic drop in accidents at these intersections.

Pasadena monitors 3 intersections utilizing 7 approaches and is preparing to add two more intersections in the near future. Pasadena reports that red light violators account for more than 50% of all recorded automobile accidents each year and collisions at the monitored intersections appear to have remained constant since installing photo red light, although violations at these intersections have decreased.

It should be noted that the large majority of the US public supports red light cameras. A 2000 Institute survey in ten cities — five with cameras and five without — reported that more than 75 percent of drivers supported camera enforcement. A 2002 nationwide survey sponsored by the National Highway Traffic Safety Administration and conducted by the Gallup Organization found that 75 percent of drivers favored the use of red light cameras. A 1996 survey by the Insurance Research Council found that the highest support for red light cameras was in large cities, where 83 percent of respondents supported their use.

Should the City of Manhattan Beach wish to pursue photo red light enforcement technology, staff felt it important to report on which city intersections had the highest occurrence of collisions.

**Traffic Collision and Enforcement Statistics
January 2003 through December 2005**

Top 5 Intersections for Traffic Collisions Caused by Red Light Violations	
Sepulveda Blvd./33rd St.	5
Manhattan Beach Blvd./Meadows Ave.	4
Sepulveda Blvd./Manhattan Beach Blvd.	3
Manhattan Beach Blvd./Redondo Ave.	3
Manhattan Beach Blvd./Pacific Ave.	3

Top 5 Intersections - Total Traffic Collisions	
Manhattan Beach Blvd./Sepulveda Blvd.	20
Sepulveda Blvd./Rosecrans Ave.	20
Aviation Blvd./Marine Ave.	18
Sepulveda Blvd./Marine Ave.	17
Sepulveda Blvd./8th St.	14

For the 5 major intersections noted above, there were a total of 89 collisions over a 36 month period. Only 18 (20%) of those collisions were related to red light violations. The majority of the traffic collisions that have occurred at these intersections have involved vehicle front/rear contact usually caused by speed violations. It should be noted that the traffic volume on these streets were in excess of 55,000 cars per day.

COSTS

Should the city of Manhattan Beach decide to pursue photo red light enforcement technology, there would likely be no financial obligations to the city for installation, service or maintenance of a system. These expenses would be paid for by the selected vendor, and then the city would

pay a monthly fee to the vendor for each approach (up to four directions of traffic) per intersection. Fees are generally based on traffic volume and the selected vendor would monitor suggested intersections to determine whether the number of red light violators and traffic volume would cover installation and monitoring costs. Vendors then agree to service cameras for, on average, five years, with a cost neutrality clause in their contracts in which fees are adjusted very 12 months or sooner if needed to protect cities from suffering a negative cash flow on approaches where citation revenue falls short of the vendor's fees. Contracts can be renewed indefinitely. It should be noted that any photo red light enforcement on a state highway, like Sepulveda, must be approved by Caltrans and the City would incur any liability associated for any equipment operated on state property.

The cost to a violator for a red light violation is \$351. The County receives \$207 of the fine while the City receives the remaining \$144. The City would have the final say at which intersections this technology may be installed. There is often a nominal fee associated with traffic monitoring by the vendor which would be selected by issuing a Request for Proposal (RFP).

One other cost to consider is the dedication of staff to facilitate the photo red light enforcement program. Should multiple intersections be monitored, the number of citations issued could number well over 1,000 per month. Each citation will have to ultimately be reviewed by a sworn officer to be issued. That officer would be responsible for mailing out the citation, following up on payment, arrange viewing of the evidence should a violator request it, and testify in court should a violator wish to present a case before a magistrate.

In instances where a violator chooses to ignore the citation, the officer would have to check DMV records and photos and determine whether or not it appears the registered owner is the violator. Vehicle registration renewals can be withheld by DMV should the registered owner fail to cooperate with the investigation.

In June of 2001, City Council received a staff report on the presentation of Technology Applications for Traffic Safety in which automated signal enforcement technology was discussed. The City Council chose not to pursue the technology at that time. The Staff report is attached to this Staff report.

CONCLUSION:

Despite the relatively low number of traffic collisions reported to the Manhattan Beach Police Department, and the low number of citations issued for red light violations, Staff believes that photo red light technology can assist mitigate some of the traffic related problems in the city. Staff believes that Photo Red Light Technology improves safety, discourages red light violations and calms traffic. It is only by picking a vendor and conducting a scientific survey can we determine the true breadth of the red light problem at any given intersection.

ATTACHMENTS: Traffic Collision Chart 2003 - 2005
 June 19, 2001 Staff Report

Total Traffic Collisions for Signal Controlled Intersections 2003-2005					
Intersection	2003	2004	2005	Total	How many caused by Red Light violations
Aviation Blvd./Rosecrans Ave.	1	2	2	5	0
Aviation Blvd./33rd St.	0	2	1	3	0
Aviation Blvd./Marine Ave.	7	6	5	18	1
Aviation Blvd./Space Park	0	0	0	0	0
Aviation Blvd./Manhattan Beach Blvd.	4	2	3	9	0
Aviation Blvd./2nd St.	1	2	0	3	0
Aviation Way/Artesia Blvd.	1	0	1	2	0
Aviation Blvd./Artesia Blvd.	1	1	3	5	0
Artesia Blvd./Peck Ave.	1	1	2	4	0
Artesia Blvd./Meadows Ave.	0	0	1	1	0
Artesia Blvd./Sepulveda Blvd.	5	3	0	8	0
Sepulveda Blvd./Longfellow Dr.	2	1	1	4	0
Sepulveda Blvd./2nd St.	2	4	4	10	2
Sepulveda Blvd./8th St.	4	5	5	14	1
Sepulveda Blvd./Manhattan Beach Blvd.	6	11	3	20	3
Sepulveda Blvd./18th St.	2	3	3	8	1
Sepulveda Blvd./Marine Ave.	6	3	8	17	0
Sepulveda Blvd./30th St.	4	3	3	10	1
Sepulveda Blvd./33rd St.	6	3	4	13	5
Sepulveda Blvd./Rosecrans Ave.	8	4	8	20	0
Rosecrans Ave./Redondo Ave.	3	1	1	5	1
Rosecrans Ave./Market Pl.	0	4	0	4	1
Rosecrans Ave./Park Way	1	2	0	3	0
Rosecrans Ave./Village Dr.	2	1	1	4	0
Rosecrans Ave./Pacific Ave.	0	0	0	0	0
Rosecrans Ave./Blanche Dr.	1	0	0	1	1
Rosecrans Ave./Highland Ave.	2	6	4	12	0
Marine Ave./Cedar Ave.	2	1	1	4	0
Marine Ave./Meadows Ave.	3	1	0	4	0
Marine Ave./Peck Ave.	3	2	0	5	0
Marine Ave./Redondo Ave.	2	2	1	5	1
Manhattan Beach Blvd./Manhattan Ave.	0	2	0	2	0
Manhattan Beach Blvd./Highland Ave.	3	4	1	8	1
Manhattan Beach Blvd./Ardmore Ave.	1	3	0	4	0
Manhattan Beach Blvd./Pacific Ave.	3	1	5	9	3
Manhattan Beach Blvd./Poinsettia Ave.	3	2	1	6	1
Manhattan Beach Blvd./Meadows Ave.	3	2	3	8	4
Manhattan Beach Blvd./Peck Ave.	1	3	2	6	1
Manhattan Beach Blvd./Redondo Ave.	4	7	1	12	3
Highland Ave./15th St.	3	0	2	5	0
Highland Ave./Marine Ave.	2	1	0	3	0
Highland Ave./33rd St.	1	3	0	4	0
Highland Ave./40th St.	1	1	0	2	0
Highland Ave./45th St.	1	0	0	1	1
Ardmore Ave./15th St.	1	0	0	1	0
Total Traffic Collisions	107	105	80	292	32

MANHATTAN BEACH POLICE DEPARTMENT

MEMORANDUM

TO: Honorable Mayor and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Ernest M. Klevesahl, Jr., Chief of Police
David Maggard, Captain
Andy Harrod, Police Sergeant

DATE: June 19, 2001

SUBJECT: Presentation of Technology Applications for Traffic Safety

RECOMMENDATION:

Staff recommends that the City Council **RECEIVE** and **FILE** a presentation by the Police Department discussing technology applications for traffic and provide direction.

FISCAL IMPACT:

The cost to implement automated-signal enforcement is highly variable. The cost for both the photo-based system and the video-based system range from \$90,000 - \$100,000 per intersection.

BACKGROUND:

The citizens of Manhattan Beach have, on an on-going basis, identified traffic as their number one concern. The City employs a variety of programs, equipment, and strategies to positively impact the traffic problems in Manhattan Beach. Traffic violation enforcement, the "Area Traffic Officer Program," and the "Stopper" education campaign are a few examples of these efforts.

The City also uses contemporary technology to address traffic issues. For years the Police Department has utilized conventional radar to assist with enforcing "speed law" violations. Recently, the City Council approved the purchase of laser radar technology. This relatively new technology is superior to conventional radar and enhances the accuracy and efficiency of "speed law" enforcement. The Police

Department also deploys two radar trailers throughout the City. The radar trailers provide immediate feedback to drivers regarding the posted speed limit and the speed they are traveling. Additionally, the City deploys a sophisticated mobile message board. The message board is used to educate motorists about area traffic laws, hazards, and community information.

The City is continuously searching for innovative methods to enhance traffic safety. Recently, the City Council asked the Police Department to research and evaluate new technologies that relate to traffic safety. The Police Department identified **photo-based radar** and **automated-signal enforcement** as two internationally used technologies that might have some type of application in Manhattan Beach.

DISCUSSION:

The **photo-based radar** system consists of a standard Doppler-effect radar unit which is coupled with a computer, a 35-mm main camera, a 35-mm secondary camera, and an independent testing unit. The components of the system are mounted in a sport utility vehicle which is usually parked adjacent to a roadway. The technician operating the unit enters the speed limit parameter information into the computer, adjusts the unit to a level position, and then locks it into a preset 22-degree angle across the roadway. Once this initial setup is complete, the entire operation is automatic. As a vehicle enters the radar beam, the computer starts a tracking history and internal checks are conducted to assure the accuracy of the readings. When the checks are confirmed for accuracy and if the vehicle is traveling over the speed limit entered by the technician, the main camera photographs the front of the vehicle producing an identifiable likeness of the driver. The secondary camera in the police vehicle then captures an image of the rear of the vehicle and the rear license plate. Though this technology is used successfully in Europe and certain parts of the United States, it is presently not an authorized traffic enforcement technology in California.

Automated signal enforcement is a technology gaining tremendous popularity around the country and here in Southern California. First utilized in New York City in 1993, automated signal enforcement is now utilized in several communities here in Los Angeles County. This technology was created to combat the increasing safety hazards caused by drivers who run red lights. According to the Insurance Institute for Highway Safety, drivers who run red lights kill more than 800 people each year and injure another 12,000. From 1992 to 1998, deadly crashes at traffic signals climbed 18% in the United States - more than three times the increase for fatal collisions not involving traffic signals.

There are two types of automated signal enforcement technologies currently available. The first is a photo-based system. Photo-based systems utilize 35-mm or

digital cameras, which are housed in a locked metal body and positioned at the top of a pole near the intersection. The cameras are positioned so they can photograph the front of the violator vehicle and the driver. Some systems also have a second camera positioned so that the rear of the vehicle and license plate can also be photographed. Sensors are placed in the roadway and linked to the computer that operates the camera. The computer, in turn, is connected to the processor box that controls the signal lights. Electronically controlled sensors are imbedded in the roadway, with the first sensor being located in line with the curb corner or at the limit line (which is the legal beginning of an intersection per California statues). The second sensor is located in the intersection (in front of the limit line). In most photo-based systems, violations are photographed one tenth of a second after the signal turns red.

A vehicle must pass over both active sensors before a violation occurs. Any vehicle on or past the first sensor before the light changes to red will not be photographed. In other words, any vehicle legally in the intersection prior to the light turning red will not be photographed, as a violation has not occurred. Most systems take four photographs of each violation. The first photograph is of the intersection and the red light. The second photo is of the rear license plate of the vehicle, the third is of the driver, and the fourth photo is of the vehicle continuing through the intersection. Copies of the four digital images are included with the ticket, which is sent to the registered owner of the vehicle.

The video-based automated signal enforcement is the second and most recently developed system. It combines advanced video-detection technology with roadside video cameras to provide intersection monitoring for red light violation enforcement and improved intersection safety. This system provides automated enforcement with high-resolution video clips of the red light violation. Images of the vehicle approaching the intersection, the driver, front and rear license plates, the intersection and red light are automatically converted to digital format and transmitted via telephone line to the police department. The violation can be confirmed with the video-based "playback" software that allows officials to view the captured video sequences. This data enables officials to issue quality citations and maintain evidence to defend a violation, if challenged.

Some video-based systems can also help to reduce the risk of intersection crashes caused by running a red light. Through advanced video-detection technology, certain video-based systems are able to track approaching traffic to predict whether or not a driver will stop for the red light. If the system predicts that the vehicle will not stop, the system begins recording the violation and sends a message to the signal light control box to briefly extend the red light for cross traffic. Not only is the violation captured on video and the signals placed on red for all directions, but also a collision is possibly avoided.

Certain video systems utilize PC-based components that meet installation requirements of an intersection. This allows the system to be installed above ground with no in-ground loops to install or maintain. The cameras are mounted on roadside poles and a PC is installed in the traffic control box, or in an enclosure by the roadside. Phone line communications are used for the transmission of video and data between the intersection and the police department. Agencies that utilize video-based systems are equipped with a server PC that receives and stores violation data, and allows viewing of the violation.

SYSTEMS COMPARISON

PHOTO-based system	VIDEO-based system
System active 24 hours a day, 7-days a week.	System active 24 hours a day, 7-days a week.
Photographs the red light, the vehicle entering the intersection, the driver and front license plate. A second camera is needed to photograph the rear license plate.	Video captures the vehicle entering the intersection, the red light, the driver, the front license plate, and the rear license plate, and the vehicle leaving the intersection.
Installation of a 10-foot pole and camera housing required.	Installation of a 30-foot pole and video housing required.
Installation of the loop system requires the roadway to be cut and the sensor system embedded near the roadway surface.	Does not require a loop system.
35mm film is used to record the violation.	Digital video technology used to record the violation.
A technician is required to retrieve film from camera housing every 3-4 days.	No film to retrieve.
Photos are processed at the vendor's laboratory.	Video requires no processing.
Film processing costs \$35.00 per citation issued.	No film or video processing fees.
A police officer is assigned to review photographs of the violations and represents the City in traffic court.	A police officer is assigned to review video of the violations and represents the City in traffic court.
The vendor and police department log all citations.	The vendor and police department log all citations.
No sensor to turn signals to red in all four directions.	When a driver runs a red light, sensor will phase all signals to red avoiding a collision with the violating driver.
Cameras can be moved to another intersection that is equipped with camera housings.	Not portable since connected to phone lines at original site which form links to PD and the vendor.
No remote viewing.	System allows for remote viewing of the intersection.

LOCAL APPLICATION:

The following Southern California cities currently utilize some type of automated-signal enforcement:

Beverly Hills	Culver City	El Cajon	Garden Grove
Indian Wells	Irvine	Los Angeles (city)	Los Angeles County
Oxnard	San Diego	Ventura	West Hollywood

The city of Oxnard began issuing automated signal violation citations on July 1, 1997. A recent study in Oxnard showed that running red light violations dropped 42% after cameras were introduced at nine intersections. This study was supported by the Insurance Institute for Highway Safety and is the first scientific study of camera enforcement in the United States. Moreover, an Oxnard city survey reported that 79 % of the residents polled support photo enforcement. The city of West Hollywood began their photo-based enforcement program at eight locations in 1999. Operators of the program in West Hollywood report a decrease in collisions where photo-enforcement equipment is present. Beverly Hills also reports a decrease in traffic collisions where photo enforcement is utilized. The city of Los Angeles started their program last year and is using a photo-based system. Though this program is relatively new, those managing the program in Los Angeles have noted decreases in collisions where photo enforcement is deployed.

The city of San Diego has recently placed a moratorium on the 19 photo-based systems deployed throughout the city. The moratorium was implemented after the Police Chief discovered the city's vendor had moved three photo-based camera sensors, therefore altering the accuracy of many citations generated by the camera. 5,000 citations have been dismissed by the City as a result of this problem. The issues in San Diego have raised questions about the need for government entities to increase oversight of private vendors. It has also sparked the debate over privacy issues and whether cities are installing the technology simply to increase local revenues.

MANHATTAN BEACH APPLICATION:

Manhattan Beach has a number of busy intersections throughout the City. In order for either automated-signal enforcement technology to be considered for application in our community, a number of issues must be addressed.

NECESSITY: Most jurisdictions have initiated automated signal enforcement technology in order to reduce the amount of collisions caused by red light violators. When compared to comparable size cities, Manhattan Beach experiences a fairly low number of traffic collisions. This is notable when you consider the volume of

traffic that passes through the City on a daily basis. From April 1, 2000, to April 1, 2001, there were 25% documented traffic collisions where running a red light was identified as the primary collision factor.

LEGAL ISSUES: The State of California allows the use of automated-signal enforcement technologies under the following parameters:

The limit line, the intersection, or other places designated in section 21455 CVC where a driver is required to stop may be equipped with an automated enforcement system if the system is identified by signs, clearly indicating the system's presence, visible to traffic approaching from all directions. Any city utilizing an automated traffic enforcement system at intersections shall, prior to issuing citations, commence a program to issue only warning notices for 30 days.

The South Bay branch of the Los Angeles County Court System has committed to support the concept of automated-signal enforcement technology should the City wish to adopt such a strategy. The South Bay Court Traffic judge has also committed his conceptual support for the program. There are presently no cities within the jurisdiction of the South Bay Court that currently utilize automated signal enforcement technology. Though a recent article in the Daily Breeze indicated that the city of Gardena would be implementing an automated-signal enforcement program, the program is still in the developmental phase.

LOGISTICS: Regardless of the technology type, additional City resources would be needed to manage the program, interface with the court, and meet with violators who contest their citation.

CONCLUSION:

The Police Department is prepared to make a presentation tonight regarding this issue. In addition, Mr. Robert Young of Nestor Traffic Systems will discuss his company's video-based Red Light Enforcement technology.

At the conclusion of this presentation, Police Department staff and Mr. Young will gladly answer any questions the Council may have on this topic.