

**The Bill Blackwood
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Fiscal Responsibility in Fleet Replacement for Law Enforcement

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ABSTRACT

The purpose of this research is to identify and set guidelines for vehicle replacement based on age, mileage, repair, maintenance costs, and the vehicle's monetary resale value. Many departments maintain high mileage, unreliable, unsafe vehicles due to the lack of a fleet replacement program. A nationwide review of various size agencies maintenance records and current replacement programs was conducted to provide definitive guidelines for vehicle replacement. The author found that replacing vehicles at a lower mileage provides a fleet of newer vehicles less prone to mechanical failures and a higher return on the investment when selling the vehicle. Older units are prone to mechanical failures, extended down times, require additional vehicles as spare units to compensate, and give little return on the initial investment incurred.

Research demonstrates that the appropriate time to replace fleet vehicles is at 60,000 miles, or when the vehicle is five years of age. This will provide the highest return on the initial investment, which be used toward the purchase of new vehicles and help a police department maintain a newer fleet. Moreover, with a newer fleet in place, there is decreased down time and spare or back up units are not as necessary.

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INTRODUCTION

Fleet replacement is often a complex subject that for many departments involves large sums of money and difficult decisions. The decision to replace fleet vehicles is often made and based on a best guess and available funds. However, this methodology can result in higher maintenance costs, reduced safety and fleet availability. The fleet is the backbone of any department and requires the highest levels of attention. Older units that have less value, units with re-occurring problems and high mileage units can be a budgetary nightmare. In the times of tight budgets and rising fuel cost, every option in saving your fleet budget should be examined.

So when is the appropriate time to replace your fleet vehicles? A department should continually evaluate their fleet based on its age, miles, downtime, accident history, as well as operating and maintenance cost. The idea is that when a vehicle reaches a point where there is a significant increase in repair costs, the expense of maintaining, or when either one exceeds the vehicles monetary value; it's time for that vehicle to be replaced. Another factor when considering replacement is the vehicles fair market value. If a vehicle can be sold while in good mechanical condition bringing a high price at sale and keeping in consideration the future maintenance and inevitable repair cost, you could feasibly save hundreds, if not thousands in your budget.

This research will examine vehicle age, mileage, condition, value and which of these factors will determine when a vehicle should be replaced. Another area that will be kept in consideration in this research will be the makes and models of vehicles used by various agencies. Another important consideration in a fleet replacement program is knowing which vehicles are prone to mechanical failure and which ones hold a higher

value at the time of sale. An examination of both large and small agencies fleet records will be examined to provide detailed facts of service records. State and nationwide post sale results of police department fleet vehicles will be combined with the maintenance records to provide a base line for fleet replacement.

The outcome of this research will provide guidelines and benchmarks for vehicle makes and models and at what age, mileage and service / maintenance cost a vehicle should be replaced. In short, when it is feasible and fiscally appropriate to remove a vehicle from service.

Police, fleet and city administrators will benefit from this research by being able to put a comprehensive vehicle replacement program in place that will work for all departments within their cities. With a working replacement program in place, a city should be able to maintain an operational fleet with a minimal amount of down time and save a considerable amount of money.

REVIEW OF LITERATURE

During research on this topic the author found that there has been minimal research done in the area of vehicle replacement and that only a few large agencies have done anything at all to address this issue. In July 2005, York County, Pa was the first county in the entire state to adopt a fleet management policy. The author surveyed numerous small to mid size agencies in the State of Texas and found that most do not have any type of vehicle replacement guidelines in place and have little to no idea what they have actually spent per unit. It was found that these agencies manually track general maintenance such as oil changes and tires, but their files were incomplete with blocks of data missing. In some instances, major expenses such as transmissions,

motors and accidents were not part of their records and there was no set age or mileage for vehicle replacement. The one determining factor for these agencies seemed to be if there was enough money for a new car in the budget and if not, money was spent to maintain the existing fleet.

Large agencies such as the State of Texas and the United States Air Force have set guidelines for vehicle replacement and have done a considerable amount of research in the area of vehicle replacement. The State of Texas utilizes a uniform process in its approach to determine vehicle replacement criteria and provides reports every two years on the status and operation of the vehicles in their fleet. TX Dot continually evaluates the suitability of units in their fleet based on age, miles (or hours) of operation, downtime, as well as operating and maintenance cost. In 1991 the State of Texas came up with a model they call "TERM", which stands for TX Dot Equipment Replacement Model. This model was formed after an extensive search of printed material and software of vehicle repairs and maintenance to provide a guideline for identification of vehicles that were candidates for replacement. Their logic is that each vehicle reaches a point where there are significant increases in repair cost and that vehicle replacement should occur prior to this point.

The TERM system along with a subsystem called the Equipment Operations System (EOS) captures extensive information on all aspects of equipment operation and provides historical data for vehicles in their fleet. EOS historical cost data is then processed against three preset standards 1) vehicle age, 2) mileage, 3) life repair cost (adjusted for inflation) relative to original purchase cost (including net adjustment to capital value). Example: A Ford Crown Victoria Police Interceptor this is four years old,

has accumulated 100,000 miles of usage, and whose life repair cost has exceeded fifty percent of the original purchase cost, including net adjustments to capital value, meets all three criteria for replacement. This approach identifies vehicles meeting the criteria one year in advance of the actual time that replacement is needed. This allows for sufficient time for a new replacement vehicle to be ordered and outfitted.

The State of Texas has a current guide in place, which suggests the majority of general passenger cars be replaced after six years or 100,000 miles. This changes based on the use of the vehicle though. Law enforcement vehicles are replaced more often due to their use and the current average is four years. In 2005 and 2007 the Office of Vehicle Fleet Management - Texas Building and Procurement Commission provided reports of the Status and Operation of Vehicles within the State of Texas. In 2005, the OVFM provided data that law enforcement vehicles were replaced on an average of every 3.5 years and in 2007 reported an average of every four years.

The United States Air Force has another completely different approach to fleet replacement. Vehicle records from the Air Force - Office of Special Investigations Division. These records reflect their current fleets age and mileage. The Air Force OSI is currently utilizing leased vehicles from General Motors with a 3-year or 32,000 mile replacement program. While they do maintain records of repairs and service for these vehicles, the factory warranty covers repairs under the 3-year / 36,000 mile warranty. At 3-years or 32,000 miles they replace the vehicle with a new one while never having to endure the cost of vehicle repairs.

Vehicle records were also obtained from small local agencies too. The author found that when compared to large agencies, these smaller agencies do not have or

have incomplete service records. For the most part vehicles are replaced as the budget gets approved for new vehicles. If there was no budget, that meant old units were maintained, regardless of cost. The mileages that vehicles where replaced is averaging around 105,000 miles with a car averaging 4 years of age. The area sheriffs departments kept good maintenance records, but had no set guidelines or replacement program. The miles ranged from 130,000 to 150,000 miles on them and the sale prices on these cars (the ones that actually ran) was an average of \$1500.00 in a local auction. One of the sheriff's offices traded in their old units when they bought new cars.

METHODOLOGY

This research focuses on the problems of maintaining a ready fleet and when it is fiscally appropriate to replace a vehicle. The idea is that a vehicle needs to be replaced before it reaches a point where there is a significant increases in repair cost, the expense of maintaining, or when either one exceeds the vehicles monetary value. The vehicles monetary value or current fair market value is one of the biggest factors to consider when trying to set guidelines for vehicle retirement and replacement. It is important to look at the resale value of your fleet to get a larger monetary return on your initial investment.

Due to the availability of records and subject vehicles, I focused my research around Ford Crown Victoria Police Interceptors. Based on my review of service records and reports from multiple agencies, the author proposes that a Ford Crown Victoria Police Interceptor should be set for replacement at 60,000 miles with an age of no more than five years. Factors that also need to be considered are the vehicles daily use,

such as if it was used as a patrol vehicle or investigations / administration, any re-occurring mechanical problems or any accident history.

The author researched and reviewed fleet maintenance records of various size departments from various locations throughout the United States to complete this study. What the author looked for were complete service records for individual vehicles, which reflected a break down of individual expenses per vehicle. Records reflected that most smaller to mid size agencies had blocks of information missing and some had no idea what they had actually spent on a vehicle during its service with their agency. The large agencies such as the State of Texas and the United States Air Force were very precise and organized in their record keeping and had set guidelines for vehicle replacement, which are strictly followed.

A review of recent fair market values from local and nationwide auctions sales to get a baseline for what used police vehicles are actually selling for. Figures were taken from Manheim Auto Auctions, which is a nationwide auction firm, Lone Star Auctions, which is a Texas Auction firm, and recent sales from local police departments fleet sales. The author also took NADA (National Auto Dealers Association) vehicles values to compare against the auctions sales.

The fleet service records obtained, vehicle status / operation reports and vehicle auction sales reports will be compiled and compared against each other to provide a baseline at what age and mileage a vehicle should be replaced.

FINDINGS

Upon completion of the research, it was found that many agencies do not keep in consideration the age and condition of their fleet as long as they can keep the units running and on the road. Many small and mid-size agencies have no idea what they have actually spent per vehicle during its life and usually don't get any return on their investment once the unit is sold. There are few agencies that actually consider or mention the safety of an aging fleet. Most are concerned with just keeping the car in service for as long as they can. This can be a financially risky and potentially unsafe manner to manage a fleet. The goal is to maintain a fleet of vehicles that are capable of fulfilling their mission, have minimal downtime, are in safe condition and can provide a good return at sale to offset the cost of replacement vehicles.

The resale prices of vehicles vary based on the location and manner in which they were sold. The larger nationwide auction houses provided more buyers per sale than individual town auctions; therefore bring a higher price on the auction block. One other factor that increases the sale price is the larger auctions ability to offer auctions via the internet, once again bringing many more potential buyers to the cars being sold. The following market report reflects average sale prices of Ford Crown Vic Police Interceptors by year and mileage. Some units will bring a higher price if care for and obviously some will bring less if not cared for.

A review of current retail prices for Ford Crown Victoria Police Interceptors was also conducted in order to compare actual auction sale prices to NADA retail prices.

As shown below, the newer model Ford Police Interceptors are holding close to a retail price at sale.

Auction Market Report

	YEAR	120k	100k	80k	60k
S	1996	\$800.00	\$1,350.00	\$1,850.00	\$1,850.00
A	1997	\$1,000.00	\$1,600.00	\$1,950.00	\$1,950.00
L	1998	\$1,225.00	\$1,825.00	\$2,000.00	\$2,250.00
E	1999	\$1,700.00	\$2,850.00	\$3,725.00	\$3,725.00
	2000	\$2,600.00	\$3,800.00	\$4,200.00	\$4,200.00
P	2001	\$2,325.00	\$3,425.00	\$4,500.00	\$4,625.00
R	2002	\$850.00	\$1,825.00	\$2,800.00	\$3,750.00
I	2003	\$3,050.00	\$4,125.00	\$4,975.00	\$4,975.00
C	2004	\$5,500.00	\$6,550.00	\$7,575.00	\$8,350.00
E	2005	\$7,475.00	\$8,175.00	\$8,975.00	\$9,775.00

NADA Retail Prices

	YEAR	120k	100k	80k	60k
S	1996	\$2,725.00	\$3,000.00	\$3,775.00	\$4,087.00
A	1997	\$3,300.00	\$3,600.00	\$4,450.00	\$5,000.00
L	1998	\$3,525.00	\$4,425.00	\$5,300.00	\$6,100.00
E	1999	\$3,525.00	\$4,425.00	\$5,300.00	\$6,675.00
	2000	\$5,625.00	\$6,375.00	\$7,450.00	\$8,425.00
P	2001	\$5,700.00	\$6,425.00	\$7,675.00	\$8,600.00
R	2002	\$5,950.00	\$6,675.00	\$7,800.00	\$8,925.00
I	2003	\$6,275.00	\$6,975.00	\$8,100.00	\$9,250.00
C	2004	\$6,775.00	\$7,475.00	\$8,550.00	\$9,700.00
E	2005	\$7,450.00	\$8,125.00	\$9,175.00	\$10,300.00

It is more feasible to replace a car that is newer with lower mileage due to the fact that newer units have less down time due to mechanical failures and bring a higher

sale price at auction. Based on the current national auction sales rates, a 2005 Ford Crown Victoria Police Interceptor at 60,000 miles will give you more than a 50% return on your initial investment and close to 100% of the retail value. When replacing a car at 60,000 miles, the unit will have more than 60% of its service life covered by factory warranty. A unit that is two years older, with an adjusted mileage of 100,000 will only bring you 21% back on your initial investment and only 59% of the retail value due to extended wear and tear. Only 36% of the vehicles life is covered by warranty and the expense of maintaining an older unit is increased.

CONCLUSIONS

Many departments throughout the United States fail to recognize the need and purpose of a fleet replacement program. There must be replacement guidelines set when dealing with vehicles to avoid increased maintenance cost, increased down times and possible safety hazards with older vehicles. With everything in departments revolving around budgets, there must be consideration for what kind of return you will get back on a vehicle once it sales. The purpose of this study is to provide a set of guidelines or benchmarks for vehicle replacement based on age, mileage and resale value.

So when is the appropriate time to replace your vehicles? Based on maintenance records, current fleet management programs and market reports from auction sales, a guide can be put in place for agencies to follow when considering vehicle replacement. This guide will cover vehicle age, mileage and values. The author feels that replacing vehicles at 70,000 miles or less that are no older than five years of

age is the appropriate benchmark to follow. This will bring you the best monetary return on the vehicle, minimize downtime and reduce the need for spare units.

The maintenance records and market reports obtained from various agencies both large and small supported my hypothesis. There has been minimal research done in the area of vehicle replacement and that only a few large agencies have done anything at all to address this issue. From the service records obtained, many departments are still servicing vehicles as old as 10 years of age and really have no idea what the expense has been to maintain the unit over the years. What the author found was that on several occasions, the money spent on vehicle repairs often exceeded the vehicles monetary value because maintenance staff had no idea what had been spent on a vehicle during its life. Many departments are maintaining high mileage, unreliable and unsafe vehicles due to the lack of a fleet replacement or management program.

It was found agencies that retired or replaced their vehicles at lower mileages, such as 60,000 did spend less on maintenance, had less vehicle down time, maintained a newer fleet and got back more when they sold the vehicles at auction. The author did find limited information on vehicles when trying to obtain a baseline for vehicle age, mileage and at which point vehicle repairs start to increase in frequency. Many departments failed to maintain proper records for their fleet and had blocks of information missing.

This study is relevant to law enforcement due to the vast numbers of vehicles that departments maintain. This research provides a guide for vehicle replacement, which can help keep a healthy fleet and budget. If a department is to adopt a fleet

replacement program and follow the set guidelines, they should be able to avoid increased maintenance expense and provide a fleet of vehicle able to fulfill their mission with minimal down time.

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