Addressing the Need for Emergency Fleet Replacement Planning for the West Covina Fire Department

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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Abstract

The City of West Covina Fire Department does not currently have an emergency fleet replacement plan. Guidelines for recommended vehicle replacement do not exist. Apparatus purchases are only made when absolutely necessary. Currently the annual budget does not set aside funds for future vehicle purchases which creates a fiscal crisis when a piece of equipment needs replacement.

The purpose of this research was to develop recommendations for the implementation of an emergency fleet replacement plan for the City of West Covina Fire department.

The descriptive research method was utilized to answer the following three research questions, What guidelines or standards exist regarding the recommended replacement of emergency vehicles?, What alternative funding options are available to the City of West Covina Fire department?, What financing options are available to the City of West Covina Fire department for emergency vehicle replacement?.

A combination of literature review, interview, and a questionnaire were utilized to answer the research questions.

The research revealed that front line fire apparatus should not be in service past 15 years and that no apparatus should be in service longer than 25 years. It was also noted that actual vehicle life expectancy is greatly affected by numerous factors. The research identified that a thorough preventative maintenance plan is the most important way to maximize vehicle life expectancy.

Alternative funding options are available locally, and at both the state and federal level. In addition, financing for apparatus has never been more creative although each

program has its pros and cons. Jurisdictions must evaluate their own current situation to determine which funding and financing options are best for them.

Recommendations were made to form a committee to establish department replacement guidelines, create a replacement plan, and work with city officials to secure sustainable future funding.

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Introduction

Over the last several years our Country and a majority of the world have suffered from a global recession that has effected governments at all levels. Reduced property taxes, decreased consumer spending, and double digit unemployment has pushed budgets to the breaking point. Particularly effected are the local City governments that rely, at least in part, on Federal, State, and County funding and tax revenue dispersement to make ends meets. As the last in line to receive funding, City governments are quite often the first to have their funding or tax revenues delayed or confiscated by their larger counterparts. In times such as these only those City governments that plan ahead and forecast large purchases will be able to meet the challenge to provide reliable services to their citizens. With City governments of any size, one of the largest capital expenses is the purchase of fire department apparatus and support vehicles. This is the case for City of West Covina California.

For decades the City of West Covina has enjoyed a robust local economy which has allowed it to meet the needs of the citizens while placing millions of dollars in reserve accounts. During this time the City failed to adopt a planned emergency fleet replacement program for fire apparatus replacement instead opting to replace apparatus when it was absolutely necessary. On two different occasions this practice has forced the City to replace multiple pieces of apparatus over a short period of time. Submitted as a capital purchase requests, apparatus purchases were made possible by utilizing monies from the City's vast reserves without effecting the annual operating budget.

The problem that prompted this research is that the recession has impacted the City of West Covina as hard as any City and the aging fire department fleet will soon need replacement. Property values are down considerably which has decreased property tax revenue. Consumer spending is down which greatly effects a City that relies heavily on sales tax revenue from its two large shopping malls and numerous automobile dealerships. In addition, the state of California has refused to release gasoline tax revenue, earmarked for the City, in an attempt to solve its' own budget problems. The City of West Covina has been required to use millions of dollars from the once vast reserves to balance the budget for several years in a row. Each day the fire department's apparatus fleet gets older and still no emergency fleet replacement program currently exists. This lack of planning may result in increased operational and maintenance costs, the need to replace multiple pieces of apparatus at the same time, and possible safety issues for the firefighters and citizens of West Covina. It is the concern of the West Covina Fire Department and this researcher that the next time that an Fire apparatus purchase is necessary the money will not be available to make the purchase.

The purpose of this research is to identify guidelines or standards for the replacement of our department's emergency fleet and potential options for both alternative funding and financing.

This research utilized a descriptive research method. A combination of literature review, a questionnaire, and an interview were employed to answer the following research questions, What guidelines or standards exist regarding the recommended replacement of emergency vehicles?, What alternative funding options are available to

the City of West Covina Fire department?, and What financing options are available to the City of West Covina Fire department for emergency vehicle replacement?.

Background and Significance

The West Covina Fire Department provides Fire, EMS, and Fire Prevention Services to the residents and businesses of the City of West Covina California. West Covina is located in the County of Los Angeles approximately 20 miles due east of the City of Los Angeles. The City of West Covina covers 17 square miles and has a population of 115,000 residents. The City employs a City Manager/City Council style of government with an operating budget of approximately $56,000,000 (Bachman, 2009). The City's budget is funded almost entirely from sales, property, and other local taxes. As the State and Federal economy goes so does the City of West Covina.

The West Covina Fire Department (WCFD) operates on a budget of $14,421,000 (Bachman, 2009), staffing five strategically placed fire stations and a fire administration facility, which contains the fire prevention unit. WCFD responds to approximately 8,000 calls for service each year. An organizational chart is included in Appendix A.

The West Covina Fire Department's fire suppression and emergency medical services are delivered by 5 front-line engine companies and 1 Truck Company each staffed with three personnel. The Department also deploys 3 rescue ambulances each staffed with two personnel. All engine companies and the truck company are staffed with at least 1 paramedic and each rescue ambulance is staffed with two paramedics. Each shift (A, B, and C) is supervised by an Assistant Chief on a 56 hour/week shift schedule bringing the total daily staffing to 25 personnel.

The Department's front line fire apparatus consists of 3-2002 Saulsbury (1250 gpm) engines, 1-2004 Saulsbury (1250 gpm) engine, 1-2006 Pierce (1500 gpm) engine, and 1-2000 Saulsbury truck with 100 ft. aerial ladder. The Shift Commander (Assistant Chief) responds in a 2001 Ford Excursion, which is utilized as the incident command vehicle.

The department's reserve fire apparatus consists of 1-1994 Seagrave (1500 gpm) engine and 2-1990 Seagrave (1500 gpm) engines. WCFD does not currently have a reserve truck company as the 1984 Seagrave we had been using was finally retired for safety reasons.

The West Covina Fire Department began an ambulance transport service in October of 2004. The front line rescue ambulances include, 2-2004 Leader ambulances (van style) on a Ford chassis, and 1-2008 North Star ambulance (box style) also on a Ford chassis. Reserve ambulances consist of 2-2004 Leader ambulances (van style) on a Ford chassis.

In addition to the front line and reserve fire/rescue apparatus the WCFD also deploys several non-staffed support vehicles. These vehicles include, 1-2002 Freightliner Light/Air unit, 1-2002 Ford flatbed/stake bed utility vehicle, 1-2003 Hummer (H2) utility vehicle (vehicle was donated by a local dealership), and 1-2003 Ford Expedition utility vehicle (obtained with grant money).

The West Covina Fire Department's fire administration facility is staffed by the Fire Chief, a Senior Administrative Assistant, a Senior Account Clerk, and a part time office assistant. The Fire Prevention Bureau is currently staffed with only 1 Assistant Chief and 1 Fire Protection Specialist. Vehicles assigned to fire administration are as follows,

1-2002 Ford sedan, 1-2003 Ford sedan, 1-2000 Ford sedan, 1-2008 Ford van, and 1-2007 Ford hybrid vehicle.

A complete list of all WCFD vehicles denoting the year, make, description, unit number, location, mileage, and color code is located in Appendix B.

In the past the City and fire department have had no set plan or guidelines for apparatus replacement and more importantly no set funding earmarked for this replacement on a scheduled basis. Fire apparatus replacement has been subjective and replacement usually occurs when a vehicle is completely unreliable and one final major repair is required (i.e. new engine needed). The cost of replacement is always unexpected and a large burden on the City's budget. Utilizing this type of system has also created a situation in which apparatus moved to reserve status are many times unreliable when placed into service to temporarily replace front line units. In past years, West Covina has been fortunate enough that the economy has eventually allowed for funds to be appropriated to purchase the needed apparatus prior to a complete mechanical meltdown of the fleet. On two occasions since I have joined the Department in 1989 the entire fleet has had to be replaced over a short period of time (2-4 years). With this behind us it is imperative that we learn from these lessons and not repeat them in the future.

In reviewing the makeup of the department's current fleet it is a microcosm of how our Department has always purchased fire apparatus. Our current reserve apparatus are between 16-20 years old and our current front line engines, with the exception of 1-2006 Pierce, are between 8-10 years old. The only reason that we have the 2006 is because it was purchased with a Community Development Building Grant, basically

with found money and not through any organized planning. With the exception of this engine the City replaced the entire fire engine and truck fleet within the four year period 2000-2004. This is the same situation that occurred 1990 and 1994.

Currently the front line fleet is functional and reliable. But based on the annual increase in responses, the rising mileage being put on our apparatus, and the current age of the fleet I feel it is safe to say that most of our apparatus are past the half way point of what should be their anticipated service life. WCFD's reserve engines are old and unreliable. Many times reserve engines will break down while being utilized temporarily in a front line capacity. We do not currently have a reserve truck which requires us to switch into a two piece apparatus configuration (Light/Air unit and a stake bed utility pick up) to carry the needed truck company equipment whenever repairs or routine maintenance is required on our truck. In addition and we lose all truck based ground ladder and aerial capabilities and must rely on mutual aid requests for true truck services..

In the future, something must be done to schedule the replacement of fire apparatus and set aside funding and/or seek out creative financing options for this purpose. Criteria must be established to indicate when a piece of apparatus is to be placed into reserve status and a new piece of apparatus purchased to replace it. Planning for and securing funding/financing options for the replacement of apparatus must be paramount concern. As is the case across the nation, the current economy has hit the City of West Covina extremely hard over the past few years. With a great deal of our budget based on sales and property taxes the City faces a budgetary crisis like no other in Its history. Almost assuredly, even if the economy has turned around by the time that apparatus

replacement is required, the City government will be reluctant to spend the capital resources needed to update the entire fire department fleet in a timely manner. This will result in utilizing apparatus longer than should be expected, skyrocketing maintenance costs, and safety and reliability concerns that will place both department personnel and the citizens of West Covina at unacceptable risk.

If our City and department fail to work together to accomplish this task and embrace the concept of planning for this large capital expense we will once again face the mass replacement of fire apparatus in the next 5-8 years.

This research paper is a requirement of the Executive Development class in the National Fire Academy's Executive Fire Officer Program. Developing and implementing an emergency fleet replacement plan for our department and City will take a creative, collaborative approach to institute a change in the behavior of not only the fire department but also the City's vehicle maintenance division and current City government. Organizational change is covered extensively during Executive Development class not only Chapters 6, 7, and 8 of the student workbook but also in many of the group exercises. All involved with need to look at this topic from a different view than they typically would. It will require all involved to "Get on the Balcony" as described in chapter 3 of the book "Leadership on the Line", by Ronald A. Heifetz and Marty Linsky which was required reading for the Executive Development class. In addition to the linkage between the Executive Development class and this research topic, there is also a link between this research topic and two of the four United States Fire Administration's operational objectives. This research hopes to bring to light the need to "Improve local planning and preparedness" and to "Improve the fire and

emergency services' capability for response to and recovery from all hazards", both of which are operational objectives of the USFA.

Literature Review

A literature review was completed to answer the research questions and address the issue of emergency fleet replacement planning for the City of West Covina Fire department.

The first topic addressed in the literature review was to identify any published guidelines or standards that recommend when an emergency vehicle should be replaced. In addition to the literature review, a questionnaire was sent to 187 fire departments across the Country inquiring as to their current vehicle replacement practices. Forty-six responded to request and this information will be covered in the results section of this paper.

Finding published information related to the recommended replacement of any large fleet proved to be more challenging than expected. This is due in part to the fact that so many factors exist that effect the life expectancy of an emergency vehicle or any vehicle for that matter. In the fire service there are vehicles that can be worn out in 8 to 10 years when purchased by one fire department but the same vehicle may last 20 years when deployed by another agency (National Fire Protection Agency, 2009). Factors effecting the life expectancy of an emergency vehicle are, the type of climate or conditions in which the vehicle is used, the quality of the parts used in the manufacture of the vehicle, the number of incidents to which the vehicle is expected to respond, and most importantly is the quality and timeliness of the maintenance program employed by the jurisdiction operating the vehicle (National Fire Protection Agency, 2009). With

preventative maintenance being the greatest factor effecting apparatus life expectancy, a jurisdiction must also have a process in place to determine when a vehicle is a candidate for repair/refurbishment or when it should be replaced (National Fire Protection Agency, 2009).

Preventative maintenance is the most important factor relating to the timeline for emergency vehicle replacement. Fire apparatus that won't start, breaks down on the way to an emergency scene, or fails while crews are in the interior of a burning building can have deadly consequences (Ballam, 2010). For this reason, a preventative maintenance program must be a priority even from the time the vehicle is newly purchased. Glenn Davis, the founder and owner of Lakes Region Fire Apparatus Inc. states in Firehouse magazine that, "It is never too early to start an apparatus maintenance program." He also explains that front line pumpers can cost between $350,000 to $500,000 an up. He recommends a budget of at least $3000 for preventative maintenance in the first year. This should be a built in cost of doing business (Ballam, 2010). "Preventative maintenance begins with delivery. It is an investment that pays dividends in the long run", Davis states (Ballam, 2010). A successful preventative maintenance program includes the need to document all repairs and maintenance on all department vehicles and checking the credentials of those individuals completing the maintenance and repairs (Ballam, 2010).

A prime example of how the lack of a preventative maintenance program can dramatically affect the operational efficiency of a jurisdiction, the safety the citizens, and annual budgeting occurred 10 years ago in Houston, Texas. Featured on NBC's Dateline, The Houston Fire Department was criticized for substandard maintenance

practices that lead to the death of a young boy. An investigation revealed stories of leaking water tanks, rusted aerial ladders, and other numerous unsafe maintenance issues (Wilmoth, 2009). A subsequent internal investigation was launched to determine the root causes into the decline in department wide maintenance. It revealed some very common problems which had begun back in the 1980's.

In the 1980's the Houston Fire Department began to run EMS calls in addition to fire calls. Call volume increased exponentially and the City lacked an apparatus replacement program. This depleted Houston's emergency vehicle fleet (Wilmoth, 2009). Budget cuts continued to take dollars from preventative maintenance accounts. The number of mechanics was reduced and then the remaining mechanics were moved to a 4 day work week which further hindered maintenance and repair activities. Firefighters began to complete some minor repairs on their own to keep vehicles on the road. Newly purchased vehicles would go for up to two years without any maintenance at all. Maintenance records were non-existent (Wilmoth, 2009). Chris Conneally who served as both a District Chief and Fire Chief during the 1990's, and early 2000's stated, "The lack of consistent replacement caused havoc in the department. We had trucks with leaks that would run out of water before they got to the incident" (Wilmoth, 2009). At one point the Houston Fire department was forced to lease new ladder trucks when 86 of their trucks did not pass third party testing (Hill, 2008).

This is just one example of how a lack of preventative maintenance standards can affect the efficiency of a agency, put their citizens and employees at risk, and sabotage budgeting. But at some point all apparatus must be removed from front line service or retired. NFPA 1901 recommends that fire departments should seriously consider the

value or risk to firefighters of keeping fire apparatus older than 15 years in front line service. If properly maintained vehicles 15 years or older and properly maintained can be placed in reserve status. National Fire Protection Agency also recommends that any vehicle regardless of condition should be removed from service after 25 years (National Fire Protection Agency, 2009). But these recommendations are not absolutes and whether or not a vehicle remains in service should be based on the individual vehicle. In addition a process should be in place to fairly evaluate the condition of the vehicle. The National Fire Protection Agency has a recommended checklist which is included in Appendix C. In the 2009 edition of National Fire Protection Agency, standard 1901, page 178, item D.5 states that the following questions should be asked when deciding whether to refurbish or replace an emergency vehicle.

1. What is the true condition of the vehicle? Has it been in a major accident or is it in need of a costly repair?

2. Does the current apparatus meet the program needs of the area it is serving? Is it designed for the way the department currently operates?

3. If the apparatus is refurbished, will it provide the level of safety and operational capability of a new fire apparatus?

4. What is the anticipated cost per year to operate the apparatus if it were to be refurbished vs. the cost of operating a new apparatus? Don't forget insurance costs.

5. Is there a current trade-in value that will be gone tomorrow? Are there creative financing plans or leasing options that can provide a new apparatus for the same cost of refurbishing the old one?

Published standards and guidelines are a moving target in the determination when an emergency vehicle should be replaced. The National Fire Protection Agency, standard 1901, does recommend the removal of apparatus from front-line service after 15 years and from all emergency service after 25 years but these are very subjective numbers based on the quality of the original vehicle, the usage of the vehicle over its lifetime, and most importantly the quality and quantity of the preventative maintenance that the vehicle received over its years of service (National Fire Protection Agency, 2009). As evidenced in Houston, when a lack of preventative maintenance guidelines exist and no set standards are followed for the removal of an emergency vehicle from service the results can be catastrophic.

The next question researched was to identify potential alternative funding options for a vehicle replacement program for West Covina Fire department. Budget constraints are currently a huge issue for all agencies. Fireman's Fund Insurance Co. recently surveyed 9,500 fire agencies nationwide inquiring as to core challenges of the current economic crunch. The survey results returned 6 core issues. Three of the six core issues involved either the delays in replacing old equipment or the need to increase fund-raising and/or grant writing efforts (Roberts, 2009).

Alternative funding sources are numerous and can be categorized into 3 main sources, Local Government Funding Mechanisms, State and Federal Programs, and Private Sector Sources (Federal Emergency Management Agency, 1999).

Per the Federal Emergency Management Agency, in their publication Funding alternatives for fire and emergency services, Local Government Funding Mechanisms include the following options and definitions,

- **Taxes**-These include general property taxes, local income taxes, and general sales tax. Special transient taxes and other taxes can be earmarked specifically for fire and EMS services.
- **Borrowing**-Regular bonds for capital equipment purchases are called "certificates of participation" (COPs). These bonds operate like home mortgages.
- **Leasing**-Another way to avoid a large capital outlay and will be discussed in greater detail later in the paper.
- **Benefit Assessment Charges**-Like property taxes, these charges factor in not only size and type of property but also "benefits" from being close to fire stations, reduced insurance rates, etc.
- **Fees-**Small revenue producers such as fees for new construction, special events, etc.
- **Strategic Alliances**-Departments joining forces with surrounding jurisdictions to pay for new, shared, facilities or services.
- **Cost Sharing and Consolidation**-Two or more departments joining together to reduce redundancy and share emergency services.
- **Fines and Citations**-Fire and EMS departments can charge fees for negligent fires or other actions not consistent with local laws.
- **Sales of Assets and Services**-Some agencies sell surplus equipment or bid to provide services to surrounding jurisdictions.
- **Subscriptions**-Most commonly used for emergency medical services. A flat fee is paid by the resident or business to avoid usage fees throughout the year.

- **Impact Development Fees**-New developments with the jurisdiction can be required pay for the initial costs of new equipment that has been made necessary due to the new development. (Federal Emergency Management Agency, 1999).

In addition to the local government resources, local fire and EMS agencies can also obtain considerable funding from state and federal programs (FEMA,) These state and federal programs include,

- **Fire Insurance Surcharges**-Ranging from a fraction of a percent to a few percent of fire-related premiums to pay for fire and EMS protection. These monies are not directly accessible to the local agency but come back to them through various state and federal programs.
- **Vehicle-Related Fees**-Vehicle registration and traffic citation may have fees added to help pay for EMS services from traffic accidents.
- **Special State Grant Programs**-Many states have crime, health, or fire programs in which grants are given to local governments for specific safety purposes.
- **General State Revenues**-Many states allocate part of the taxes they raise to help support the local fire service, especially in rural areas.
- **State Provided Services**-Many states provide services that can be used in lieu of local services and funds.
- **Federal Grant Programs**-There are a wide array of programs across the federal agencies. Some are specific to fire and EMS such as Firefighter Assistance Grants while other are not specifically earmarked for such but may be used. A prime example of this is a community development block grant (CDGB) which is

used to improve cities. Funds for this can often be used for arson programs, military surplus vehicles, etc. (Federal Emergency Management Agency, 1999).

The last type of alternative funding source is Private Sector Sources. They include,

- **Private Foundations**-Some communities are fortunate enough to have local foundations whose funds can be used for providing special public safety services.
- **Corporate Donations**-Departments have been successful in soliciting grants and services from local and national corporations.
- **Public/Private Partnerships**-Public/Private co-development and the sharing of resources and cost trade-offs. (Federal Emergency Management Agency, 1999).

Alternative funding sources are numerous but it must be mentioned that not all alternative funding sources are available for all jurisdictions. Some state and local laws may prohibit certain taxes or fees. In addition, some sources of revenue will take voter approval which may not be an option.

The final question that was researched was to identify the available emergency vehicle financing options for the City of West Covina Fire Department.

The price of emergency vehicles continue to rise an average of 5% per year. In addition, 2010 federal Environmental Protection Agency standards will mandate changes to diesel engines that will increase to cost of apparatus by as much as $20,000 to $30,000 (Brown, 2009). These factors, in conjunction with the downturn in the economy, is forcing most departments to seek out creative financing options to limit the huge up-front capital outlay of a traditional purchase. Most apparatus companies utilize third party financing companies to provide financing to their customers. Although each

financing company may call their financing programs something slightly different there are basically three financing options available for customers not electing to pay cash up front for their apparatus purchase (Aguirre, personal communication). Each option has pros and cons associated with it. It is up to the department or municipality making the purchase to determine which option best suits them at the time of the purchase. According to Aguirre, some of the issues that a customer must consider are,

- What is the life expectancy of the vehicle?
- Will the needs of the agency change over the life expectancy of the vehicle?
- Future replacement of additional apparatus?
- Future outlook of the budget?

The three financing options available from most capital financing companies are the following, a lease/purchase option, a turn-in lease program, or a “walk-away” lease program (Pierce, 2009).

A traditional lease/purchase or acquisition option is designed for a department or municipality that is absolutely certain that they want to own the vehicle and expect that it will remain in service for many years (Pierce, 2009).

The advantages of this type of financing are that the total purchase price is split evenly over the life of the lease, usually 5 to 7 years but some companies offer up to 10 years. This aids in annual budget planning. Interest rates are relatively low but due increase as the terms of repayment are extended. There is no residual amount due at the end of the agreed upon terms the vehicle can be purchased in most cases for $1. The vehicle is now owned free and clear and the only associated costs would be for fuel, maintenance, and repairs. Some companies even include a “non-appropriation”

clause that enables a department get out of the lease without penalty if monies are not appropriated for the payment of the life of the lease (Aguirre, personal communication). Although there is a disadvantage to this option that is discussed in the following paragraph.

There are a few disadvantages of a lease/purchase option. As opposed to a “paying cash” up-front, added interest on the lease can add up to 10’s of thousands of dollars especially during the longer terms. Interest rates quoted at the time of this research ranged from 4.6% to 5.2% depending on the length of the terms (Aguirre, personal communication). Another disadvantage to the lease/purchase option is if a change should occur in a jurisdiction which makes the apparatus ineffective or inefficient. This is particularly the case in the purchase of special use apparatus (i.e. Haz Mat, Wildland, USAR, etc.) (Pierce, 2009). Lastly, if an agency should “opt out” with the non-appropriation clause, that vehicle cannot be replaced until the terms of the lease would have completed. This potentially ties the hands of the customer if operations change or monies previously unavailable become available (Aguirre, personal communication).

The second financing option is turn-in lease program. This option, usually a 5 to 7 year contract, is written with a balloon payment and the end of the agreed upon term. At the end of the term a customer may either finance the balloon payment and continue to operate the vehicle or turn the vehicle back into the manufacturer for a new vehicle from the same manufacturer. This manufacturer guarantees to buy the vehicle back for the residual amount owed (Pierce, 2009).

There are several advantages to a turn-in lease. With a balloon payment due at the end of the terms this dramatically lowers the annual payment over a traditional

lease/purchase option. This also increases a customers buying power enabling them to maintain a newer or larger fleet at all times. A newer fleet correlates to an increase in apparatus dependability and lower maintenance and repair costs. An agency is not "locked in" to a vehicle over an extended time if operational changes or changes in apparatus requirements occur. This program still offers the flexibility to own the vehicle if they desire. There is no pre-payment penalty (Pierce, 2009).

According to Aguirre, there are also a few disadvantages to the turn-in lease program as well. As with the lease purchase, the turn-in lease option, requires the purchaser to pay a sizeable amount of interest over the life of the lease. In addition to the interest paid, this option also has a balloon payment due at the end of the lease. At the end of the lease the buyer basically has 3 options. If the customer turns in the vehicle they truly only rented the apparatus and have no equity to show for their payments. If the customer decides to buy the vehicle then the will also incur finance charges when they re-finance the balloon payment unless they have the cash on hand for the residual amount. Financing the balloon at the end of the lease will bring the overall cost of the vehicle to a much higher amount then had they simply utilized a lease/purchase option in the first place. The third option is if the customer decides that they will sell the vehicle back and purchase a new vehicle, but they are then locked in to purchasing the vehicle from the same manufacturer (Aguirre, personal communication).

The third financing option is a walk-away option. This option is ideal for those agencies with a "pay only for what you use" mentality. It also benefits customers who find themselves in a constantly changing financial condition with fluctuating budgetary

needs. This option is a 102 month lease/purchase term with two maturity dates at 60 and 84 months which gives the buyer the ability to “walk-away” from the lease at these two times. If the purchaser chooses to continue on until the end of the 102 months they will own the vehicle after the 8 ½ term. The financing company will agree to buy the vehicle back at either 60 or 84 months for a predetermined value which is only affected by excessive wear and tear (Pierce, 2009).

According to Pierce Manufacturing and Sales, they are several advantages to the “walk away” financing option. This option allows the buyer to pay for the use of the asset without the commitment of a long term acquisition. Buyers can lock into a favorable price and rate but opt out in the future if terms improve or the financial condition of the agency improves or deteriorates. The buyer can “walk-away” without recourse at two separate times during the purchase which provides great financial flexibility. This option allows for planned replacement of the fleet and guarantees the value of the apparatus throughout the term of the contract. There is no penalty for pre-payment.

Disadvantages of the walk away option are the same as the other lease options. Interest is accrued which adds to the overall cost of the vehicle.

In summary, tough economic times have opened the doors to many creative financing options. Each agency, department, or jurisdiction needs to evaluate their current and projected financial situation as well as their current and future apparatus needs to determine which financing program is best for them. All of the financing options have advantages and disadvantages but only an individual entity can determine at what level a “disadvantage” is too much to stomach. Many agencies must allow for

some fiscal imperfection to provide emergency equipment for its citizens that is reliable and trustworthy.

Procedures

Research for this paper began in January of 2010, while the researcher was attending the National Fire Academy (NFA) in Emmitsburg, MD. The researcher was attending the Executive Development (ED) course as the first component of the Executive Fire Officer Program (EFOP). After a potential topic for the research was chosen in class, the initial research was conducted at the Learning Resource Center (LRC) on the campus of the NFA. Through the use of LRC and internet searches, it was determined that sufficient research material existed, problem and purpose statements for the research were finalized, and research questions were developed. During the remainder of the Executive Development course additional research was conducted at the LRC during non class hours.

After the completion of the ED course the researcher returned home to continue the research on the topic. The researcher completed a combination of internet searches, and a review of industry periodicals, magazines, and journals to adequately research the issue. As the research progressed the researcher determined that the use of a feedback instrument and an expert interview would also be necessary to answer the questions appropriately.

A questionnaire was prepared using the website Survey Monkey (www.surveymonkey.com). A link to this survey was sent via email to all Los Angeles area Fire Chiefs, colleagues from the researcher's Executive Development class, and several other EFOP class rosters both past and current. The questionnaire was sent

out to 187 known recipients. Additional individuals may have been forwarded the questionnaire without the knowledge of the researcher. The questionnaire was open for response for a period of two months and contained 9 questions designed to gather data which provided additional assistance in answering research question one. The questionnaire elicited 46 responses. The questionnaire appears in Appendix D of this research.

To adequately answer research question number three, an interview was conducted by the researcher of Mr. Arcadio Aguirre. Mr. Aguirre is the owner of California Seagrave based in Artesia, CA. Mr. Aguirre was selected for his expertise in the field of fire apparatus sales, primarily for his knowledge, reputation, and experience of purchasing/financing options for local governments. There were no set questions prior to the interview.

Creation of this document began using the American Psychological Association format, 6th edition. When information was insufficient, additional research was conducted until the researcher was satisfied that the questions were answered completely and accurately. The Executive Development textbook and the Applied Research Guidelines were continually referenced to ensure compliance in each section of the research paper.

There are a few limitations noted to the research. The researcher did not find the anticipated amount of published guidelines to answer question number 1 to the extent that was originally anticipated. This prompted the use of the questionnaire to gain further information on the topic. Only limited, current sources (within the past 5 years)

were available to answer question two although the researcher believes that the primary source used was adequate to completely and accurately answer the research question.

The results were then compiled and then checked to ensure that they accurately and completely answered the research questions and addressed the purpose of the research.

Results

The purpose of this research was to address the identify the following, guidelines or standards for the replacement of the City of West Covina's emergency fleet, alternative funding options, and financing options to enable the City to eventually implement an emergency fleet replacement plan. A plan that the City does not currently have in place. Three research questions were developed to support the purpose of the research. The results of the research will be addressed in this section.

Research question #1 proposed the following question,

What guidelines or standards exist regarding the recommended replacement of emergency vehicles?

The researcher found that no published, set, absolute standards exist on this topic with the exception of the NFPA recommendation that any emergency vehicle should serve no longer than 15 years in front line service and no longer than 25 years in total. This is due to the fact that in the fire service there are vehicles that can be worn out in 8 to 10 years when purchased by one fire department but the same vehicle may last 20 years when deployed by another agency. There are many factors that affect the life expectancy of an emergency vehicle. These include, the type of climate or conditions in which the vehicle is used, the quality of the parts and workmanship in the manufacture

of the vehicle, and the number of incidents to which the vehicle is expected to respond. But the most important factor that determines the life expectancy of an emergency vehicle is the quality and timeliness of the maintenance program employed by the jurisdiction operating the vehicle. Preventative maintenance must be started from the time of purchase until the vehicle is retired to ensure the longest length of service regardless of the other stated limiting factors.

A questionnaire was developed on Survey Monkey.com to determine how agencies across the country are currently handling the issue of emergency fleet replacement. The results of the questionnaire are as follows.

Question #1

What is your Department Name, City, and State?

This question provided only general information and was included to determine if jurisdictions in different regions of the country tended to have similar responses to the questions or different practices from other regions.

Question #2

What is your number of personnel and annual budget ?

This question was included to determine if different sized departments addressed the issue differently.

Question #3

Is your department full time paid, volunteer, or a combination?

Of the responding jurisdictions 60.9% were full time paid, 0.0% were solely volunteer, and 39.1% were from a combination department.

Question #4

Does your department have a current vehicle replacement plan?

Of the responding jurisdictions 95.7% said that they did have a current plan and only 4.3% did not have such a plan.

Question #5

Does your department replace vehicles based on mileage, age, NFPA 1901 recommendations, maintenance costs, or other?

Of the responding jurisdictions the breakdown is as follows,

- Mileage 17.4%
- Age 56.5%
- NFPA 1901 0.0%
- Maintenance costs 4.3%
- Other 21.7%

Of those jurisdictions stating that they used something other than the mentioned indicators, all respondents used a combination of the indicators and not just one. None of the respondents utilized any other indicator than those provided in the questionnaire.

Question #6

How often or at what mileage does your department replace engines, trucks, ambulances (if applicable), staff vehicles, and utility vehicles?

Of the responding jurisdictions the results were as follows,

- Engines-Those using age varied between 10 and 20 years with most around 15 years.. Those utilizing mileage ranged between 100,000 and 125,000 miles.
- Trucks-Those using age varied between 10 and 20 years with most around 15 years. Those utilizing mileage were at 125,000.

- Ambulances-Those utilizing age were mostly at 5 years with a couple of agencies stating 6 to 7 years. Mileage replacement was between 150,000 and 250,000 miles.
- Staff vehicles-Those using age ranged between 5 to 10 years with the majority around 5 years. Mileage responses were between 100,000 and 120,000 miles.
- Utility vehicles-Those using age were between 5 to 10 years with the majority closer to 10 years of service. Mileage responses were set at 125,000 miles.

Question #7

How is funding secured for you department's vehicle replacement purchases?

- Capital improvement requests submitted as replacement is needed-30.4%
- A set funding amount is set aside each year t plan for future purchases-56.5%.
- Other-13.1%

Of the responding jurisdictions stating that they utilized something other than the above choices, 4 respondents did not elaborate and 2 stated that they had a local tax in place earmarked for vehicle replacement.

Question #8

Does your department lease, purchase, or both?

Of the responding jurisdictions the breakdown is as follows,

- Lease only-0.0%
- Purchase only-69.6%
- Both-30.4%

Question #9

Please provide any additional information that you feel may be helpful to the research.

Of the responding jurisdictions no additional information relating directly to this research question was revealed.

Research question #2 proposed the following question.

What alternative funding options are available to the City of West Covina Fire department?

The research into this question uncovered that funding sources are numerous and can be categorized into 3 main sources, Local Government Funding Mechanisms, State and Federal Programs, and Private Sector Sources. All potential sources of funding are listed in this results section, but it should be noted that not all sources of funding are available to all jurisdictions. Further investigation will be needed by the West Covina Fire Department to discover which of the following options are viable to our current situation.

Local Government Funding Mechanisms include the following options and definitions,

- **Taxes**-These include general property taxes, local income taxes, and general sales tax. Special transient taxes and other taxes can be earmarked specifically for fire and EMS services.
- **Borrowing**-Regular bonds for capital equipment purchases are called "certificates of participation" (COPs). These bonds operate like home mortgages.

- **Leasing**-Another way to avoid a large capital outlay and will be discussed in greater detail later in the paper.
- **Benefit Assessment Charges**-Like property taxes, these charges factor in not only size and type of property but also "benefits" from being close to fire stations, reduced insurance rates, etc.
- **Fees-**Small revenue producers such as fees for new construction, special events, etc.
- **Strategic Alliances**-Departments joining forces with surrounding jurisdictions to pay for new, shared, facilities or services.
- **Cost Sharing and Consolidation**-Two or more departments joining together to reduce redundancy and share emergency services.
- **Fines and Citations**-Fire and EMS departments can charge fees for negligent fires or other actions not consistent with local laws.
- **Sales of Assets and Services**-Some agencies sell surplus equipment or bid to provide services to surrounding jurisdictions.
- **Subscriptions**-Most commonly used for emergency medical services. A flat fee is paid by the resident or business to avoid usage fees throughout the year.
- **Impact Development Fees**-New developments with the jurisdiction can be required pay for the initial costs of new equipment that has been made necessary due to the new development.

In addition to the local government resources, local fire and EMS agencies can also obtain considerable funding from state and federal programs (Federal Emergency Management Agency, 1999) These state and federal programs include,

- **Fire Insurance Surcharges**-Ranging from a fraction of a percent to a few percent of fire-related premiums to pay for fire and EMS protection. These monies are not directly accessible to the local agency but come back to them through various state and federal programs.
- **Vehicle-Related Fees**-Vehicle registration and traffic citation may have fees added to help pay for EMS services from traffic accidents.
- **Special State Grant Programs**-Many states have crime, health, or fire programs in which grants are given to local governments for specific safety purposes.
- **General State Revenues**-Many states allocate part of the taxes they raise to help support the local fire service, especially in rural areas.
- **State Provided Services**-Many states provide services that can be used in lieu of local services and funds.
- **Federal Grant Programs**-There are a wide array of programs across the federal agencies. Some are specific to fire and EMS such as Firefighter Assistance Grants while other are not specifically earmarked for such but may be used. A prime example of this is a community development block grant (CDGB) which is used to improve cities. Funds for this can often be used for arson programs, military surplus vehicles, etc.

The last type of alternative funding source is Private Sector Sources. They include,

- **Private Foundations**-Some communities are fortunate enough to have local foundations whose funds can be used for providing special public safety services.

- **Corporate Donations**-Departments have been successful in soliciting grants and services from local and national corporations.
- **Public/Private Partnerships**-Public/Private co-development and the sharing of resources and cost trade-offs.

Research question #3 proposed the following question.

What financing options are available to the City of West Covina Fire department for emergency vehicle replacement?.

The research on this topic revealed 3 main financing options available to the West Covina Fire Department. Each option has its pros and cons. In determining what option or options will be correct the following questions must be considered,

- What is the life expectancy of the vehicle?
- Will the needs of our department change over the life expectancy of the vehicle?
- How many apparatus do we need to replace now and in the near future?
- What is the future outlook of our budget?

After those questions are answered it can be determined which of the following options is best suited for any potential purchase, the lease/purchase option, a turn-in option, and a walk-away option.

The lease/purchase option is best when it is desirable to keep the vehicle for a long period of time (i.e. 15-20 years) and a successful preventative maintenance program is in place.

There are several advantages to this option. One, the purchase price is spread out of 5-7 years with a $1 buyout at the end of the lease. Two, there is no penalty for early payoff of the lease. Three, the vehicle is owned free and clear at the end of the term

and has equity if the sale of the vehicle is desired. Some companies also include a non-appropriation clause that enables the buyer to return the vehicle if funding becomes unavailable.

The disadvantages of this option are that the payments are considerably higher than other financing options. If the department's needs change in the future they are basically stuck with the vehicle type unless they are able to sell the vehicle. Also as the vehicle gets older, the costs of preventative maintenance and repairs will begin to rise. Vehicle reliability can also become an issue with some vehicles.

Option #2 is the turn-in lease option. This lease option is usually a 5-7 year term with a balloon payment due at the end. The customer has the option finance the balloon and keep the vehicle or turn the vehicle back in to the manufacturer towards a new vehicle. The manufacturer agrees to buy the vehicle back for the balloon amount as long as there has not been unreasonable wear and tear on the vehicle.

The advantages of this option are dramatically lower annual payments due to the balloon residual amount. A customer is basically renting the vehicle and paying form what they use. This option keeps a department's fleet current, reliable, and able to change if necessary.

One disadvantage to the turn-in option includes increased interest costs especially if the balloon payment is financed at the end of the term. Another disadvantage is if it is determined that a change in manufacturer is desired there is no built in equity for the sale of the vehicle to assist in the purchase of another vehicle.

The last financing option the walk-away lease option. This option provides a great deal of flexibility and is best used for departments who find themselves in a constantly

changing financial condition. The walk-away option allows the purchaser to finance the vehicle of 102 months but allows them to opt out of the deal at both 60 and 84 months. At either of these points the customer can walk-away without penalty with a guarantee from the manufacturer to buy the vehicle back. If the customer decides to continue to make the payments they can buy the vehicle for $1 at the end of 102 month.

The advantages of the walk-away lease are mostly that of flexibility. The buyer can get out of the deal if they do not like the vehicle, operations change, or if budget issues arise. If the vehicle is reliable, in good shape, and still meets the needs of the department then they can continue to pay and eventually own the vehicle. At the end of the term they will also enjoy some equity in the vehicle although it will be 8 1/2 years old.

The main disadvantage of the walk-away lease option is the high amount of interest the customer will pay over the full term of the lease as opposed to if they would have just purchased it from the beginning or over a shorter term.

Discussion

This research was selected and conducted with the knowledge that the City of West Covina Fire Department did not have any fleet replacement plan in place and that vehicle replacement occurred only when completely necessary and never with any preplanning in place. The research conducted was descriptive and this fact, in conjunction the nature of the research questions, created a research project that was more of a fact finding mission than anything else. Therefore this research did not differ much between the literature review and the results of the research as the results were based almost in their entirety on the literature review. The only real comparisons that

the researcher can make are those between the recommendations and position of the National Fire Protection Agency, Standard 1901, regarding the replacement of emergency vehicles and the respondents to the questionnaire that was utilized as a component of the research.

In all cases the questionnaire respondents set their replacement guides within the NFPA recommendations of 15 years for front line service and 25 years for total service length. The department size, alarm load, and other factors contributed to the anticipated life expectancy for each department as discussed in the literature review as factors that would affect vehicle replacement guidelines.

This research should be very helpful to the West Covina Fire department. Armed with the results of the research the department can now go forward with the development of a emergency fleet replacement plan. In house standards and guidelines can now be developed based on our department's size, alarm load, maintenance procedures, and fiscal constraints. This can be accomplished with the knowledge and confidence that we are consistent with other department's plans and with the recommendations of the National Fire Protection Agency. It is hoped that a final document can be produced that will list the anticipated retirement of each vehicle in the fleet so that long term budgeting in this area can finally occur where it has not been an option in the past.

Recommendations

Based on the completed research the City of West Covina Fire Department should move to implement the following recommendations:

1. The City of West Covina Fire department should create a committee to review the research and develop vehicle replacement guidelines specific to the needs of the department. The guidelines should be consistent with other departments, NFPA standards, and most importantly reflect the needs of the City and fire department. The committee members should represent the fire department, members of the city's fleet maintenance, and city officials to obtain buy in on the plan.
2. After the guidelines have been established, a emergency fleet replacement schedule should be created and implemented for every vehicle in the fire department fleet.
3. Decisions must be made as to how to purchase/finance those purchases that must be made over the short term (the next 2 fiscal years), based on the current and anticipated budget for that time period.
4. A long term financial solution must be established to fund the emergency fleet replacement plan. This solution may include looking into alternative funding sources that the City does not currently pursue. Whatever the source for the funding, it must be consistent, sustainable, and not subject to budget cuts and politics.

If these recommendations are implemented the West Covina Fire Department will finally have a plan in place to ensure that safe and reliable emergency fleet takes the street on a daily basis.

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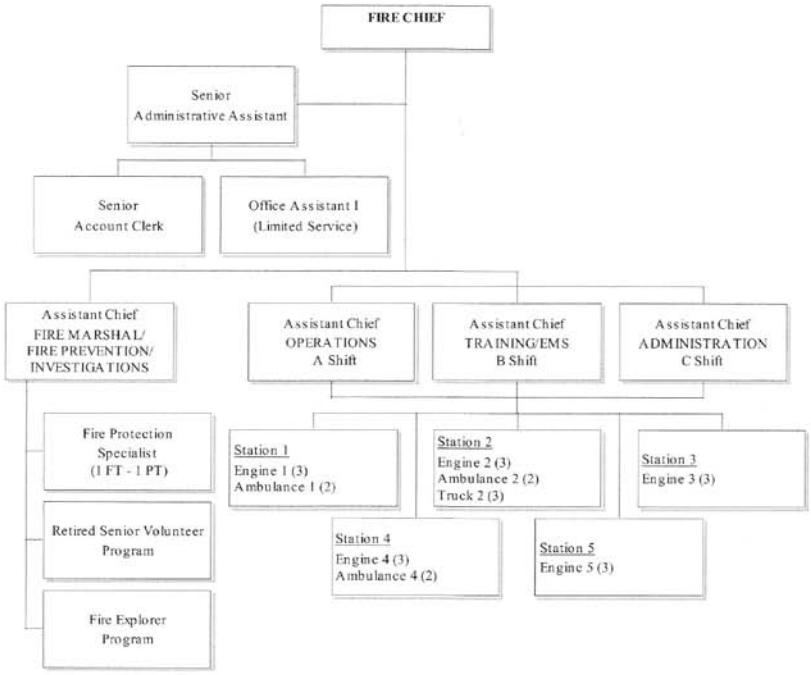
Appendix A

FIRE DEPARTMENT ORGANIZATIONAL CHART



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Appendix B

MASTER VEHICLE LIST

Jul-10

Location	Year	Make	Unit Numb	Description	Mileage	Color Code
Station 1	2004	Saulsbury	F-23	Engine 1	52,196	Red
Station 1	1994	Seagrave	F-11	Reserve Engine	95,673	Yellow/Red
Station 1	2004	Leader	F-32	Rescue Amb. 1	41,483	Blue/Red
Station 1	2004	Leader	F-30	Reserve Rescue	76,932	Blue/Green
Station 1	2004	Leader	F-31	Reserve Rescue	63537	Blue/Orange
Station 2	2002	Saulsbury	F-20	Engine 2	70,522	Orange
Station 2	2008	North Star	F-34	Rescue 2	25,422	Blue/Black
Station 2	1990	Seagrave	F-12	Reserve Engine	95,292	Yellow/Black
Station 2	2001	Ford	F-2	Asst. Chief	78,885	Orange/White
Station 2	2002	frieghtliner	F-18	Light/Air 2	17,489	Green/Red
Station 2	2003	Hummer	F-8	Utility	19,401	
Station 2	2002	Aztex	F-202	Decon Trailer	N/A	
Station 2	1982		F-200	U.S.A.R. Trailer	N/A	
Station 2	1923	La France	F-1923	Antique Engine	N/A	
Station 2	2002	Ford	F-19	Flatbed Utility	34,223	Green/White
Station 2	2001	Pace	F-201	Pub. Ed. Trailer	N/A	
Station 3	2006	Pierce	F-24	Engine 3	38,147	Black
Station 3	2002	Saulsbury	F-22	Reserve Engine	56,296	Green
Station 3	2003	Ford	F-3	R.S.V.P. Utility	59,006	
Station 3	2006	Carson	F-203	CERT/MVI. Trailer	N/A	
Station 4	2000	Saulsbury	F-5	Truck 2	55,991	Yellow
Station 4	2004	Leader	F-33	Rescue Amb. 4	71,014	Blue/White
Station 5	2002	Saulsbury	F-21	Engine 5	61,290	White
Station 5	1990	Segrave	F-10	Reserve Engine	105,384	Yellow/Blue
Admin.	2002	Ford	F-9	Chief 1	116,773	
Admin.	2003	Ford	F-1	Fire Marshal 1	100,763	
Admin.	2000	Ford	F-6	Prevention 2	124,965	
Admin.	2008	Ford	F-17	Van-Utility	3,734	
Admin.	2007	Ford	F-25	Prevention 1	13,413	

Appendix C

Driving and crew areas:

- Cracked or broken windshield that obstructs the driver's view.
- Missing or broken door latches
- Seats without seatbelts, or those with seatbelts that have torn or melted webbing, missing or broken buckles, or loose mountings, shall be taken out of service. If the driver's seat has any of these conditions, the entire apparatus shall be taken out of service.

Chassis and axles:

- GAWR that exceeds the tire manufacturer's load rating for any tire.
- Actual axle weight that exceeds the GAWR for that axle.
- Actual overall weight that exceeds the GVWR or GCWR for the vehicle.
- Loose, missing or broken suspension components.
- Tires with cuts to the cords.
- Front tires with less than 4/32-inch tread or rear tires with less than 2/32-inch tread at two adjacent major tread grooves anywhere on the tire.

Engine systems:

- Engine that won't crank or start.
- Oil that contains coolant or vice versa.
- Stop engine light that fails to turn off after engine is started.

Transmission and clutch:

- Automatic transmission that overheats in any range.
- Automatic transmission that has a "do not shift" light on.

Low-voltage electrical system:

- Warning lights that are inoperable such that no warning lights are visible from one or more locations around the apparatus. If this occurs, the apparatus may still be operated in a non-emergency vehicle status depending on department policy.
- Inoperative sirens. The apparatus may still be operated in a non-emergency vehicle status.
- Inoperative charging system.

Braking systems:

- Service brakes that have an air pressure drop of more than 2psi in one minute for straight chassis vehicles with the engine stopped and the service brakes released.
- Brakes that are out of adjustment.
- Friction surfaces, brake shoes or disc brake pads that have grease or oil on them.

Fire pump systems:

- Pump will not engage.
- Pump operator's panel throttle is not operational.
- Pump transmission components have a leak sufficient to form drops that fall to the ground.

Aerial device systems:

- Aerial device is not operational.
- Stabilizer system is not operational.
- Aerial device is structurally deformed.

Appendix D

1. Department name, City and State?

2. Number of personnel and annual budget (if unknown please approximate)?

3. Is your Department...?

- Full time paid
- Volunteer
- Combination

4. Does your Department have a vehicle replacement plan?

- Yes
- No

If so is it followed?

5. Does your Department replace vehicles based on....

- Mileage
- Age
- NFPA 1901
- Maintenance costs
- Other

Other (please specify)

6. How often or at what mileage does your Department replace...?

Engines

Trucks

Ambulances (if applicable)

Staff vehicles

Utility vehicles

7. How is funding secured for your Department's vehicle purchases?

- ○ Capital improvement requests as replacement is needed
- ○ A set Funding amount is set aside each year to plan for future purchases
- ○ Other

Other (please specify)

8. Does your Department....?

- ○ Lease
- ○ Purchase
- ○ Both

If both, what determines lease vs. purchase

9. Please provide any other information that you feel may be helpful or pertinent to this topic.

Add Question Here