DEVELOPMENT OF A SCHEDULED APPARATUS REPLACEMENT AND FUNDING PLAN FOR THE METRO WEST FIRE PROTECTION DISTRICT

EXECUTIVE DEVELOPMENT

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ABSTRACT

A scheduled apparatus replacement plan did not exist for the Metro West Fire Protection District. The purpose of this research project was to improve the process of apparatus replacement and assure funding of the plan. This project employed the action research method to determine (1) what factors motivate a fire service agency to develop an apparatus replacement plan, (2) what are acceptable life expectancies for fire and emergency medical apparatus, (3) what financial tools are available to fund a scheduled apparatus replacement plan.

The procedures employed to conduct this research were the review of information related to the research questions available from the National Emergency Training Center, Learning Resource Center at Emmitsburg, Maryland. In addition, resource and research information was reviewed from the Metro West Fire Protection District training library and financial and budget records.

The findings of the research indicated that the primary motivating factors for developing a scheduled apparatus replacement plan were to maintain a safe, reliable, and innovative fleet of apparatus. The acceptable life expectancies were shown to be 5 – 7 years for ambulances, 10 years for brush trucks, 10 – 15 years for pumpers and quints and 15 –20 years for aerial units. It is generally accepted that no apparatus should be in-service for over 25 years. The funding for the project was determined achievable through the systematic contribution of 3.5% of tax revenue on an annual basis to the replacement fund.

As a result of this research project, a scheduled apparatus replacement plan for the Metro West Fire Protection District for the next 15 years was developed. The plan was presented to the Chief and Board of Directors of the district for consideration and approval.

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INTRODUCTION

There is not a scheduled apparatus replacement plan for the Metro West Fire Protection District. As a result, future apparatus replacements as well as the funding requirements cannot be scheduled within the overall financial requirements of the district. Apparatus needs to be replaced on a continual basis to avoid the need for “crisis purchasing” or multiple purchases during an isolated period. The purpose of this Applied Research Project is to develop a planned and scheduled process for the replacement of apparatus for the Metro West Fire Protection District. The Action Research Method is used to answer the following questions:

1. What are the factors that motivate fire service agencies to develop an apparatus replacement plan?
2. What are the acceptable life expectancies for fire and emergency medical apparatus?
3. What financial tools are available to fund a scheduled apparatus replacement plan?

BACKGROUND AND SIGNIFICANCE

The Metro West Fire Protection District is a career fire department located in St. Louis County, Missouri. The district provides fire suppression and Advanced Life Support (ALS) emergency medical services to approximately 125,000 residents and business occupants. The district is a suburban community with an influx of population after the workday has ended for the majority of the residents. The district is the largest of 23 fire protection districts in

St. Louis County and encompasses a geographic area of 57 ½ square miles. Within the Metro West Fire Protection District are the municipalities of Ballwin, Ellisville, Wildwood, Chesterfield, Winchester and portions of unincorporated St. Louis County.

The district has 100 full-time employees, 97 of these are uniformed personnel. The operational staff is distributed among five stations placed strategically throughout the district.

Station #1 is located in the city of Ballwin at the eastern end of the district. It houses a 1998 Sutphen 100' aerial platform, a 1998 Saulsbury heavy rescue unit, a 1998 Ford / Osage type III ambulance and a 1987 Pierce reserve pumper. Minimum staffing for station #1 is 8 personnel.

Station #2 is located in unincorporated St. Louis County in the southern region of the district. This station houses a 1993 Sutphen pumper, a 2000 Ford / Osage type III ambulance and a 2000 Ford F-350 brush truck. Minimum staffing for station #2 is 5 personnel.

Station #3, the district's headquarters, is located in the city of Wildwood in the central region of the district. This station houses a 1994 Sutphen 75' quint, a 1999 Ford / Osage ambulance, a 1982 Ford / SEMO 3000 gallon tanker, a 2000 Ford F-350 brush truck, a 1996 Ford / Taylor Made reserve type III ambulance and a 1990 Pierce reserve heavy rescue unit. Minimum staffing for station #3 is 6 personnel.

Station #4 is located in the city of Ellisville. This station houses a 1993 Sutphen 75' quint and a 1997 Ford / Wheeled Coach ambulance. Minimum staffing for station #4 is 5 personnel.

Station #5 is located in the city of Wildwood in the far western region of the district. This station houses a 1997 Ferrara pumper / tanker, a 1989 Pierce reserve pumper and a 1982 Ford roll-up support unit. Minimum staffing for station #5 is 3 personnel.

The district responded to 4,967 alarms in 2000. Of these alarms 3530 or 71% were requests for emergency medical service. Because a significant percentage of the district's requests for service are EMS related, all first-line engine and rescue companies are staffed by paramedics and are equipped with ALS equipment.

The Metro West Fire Protection District is located within the growth corridor of St. Louis County. The year 2000 assessed valuation of the district was $1,157,078,875.00. This valuation is based on 19% of the assessed residential property value and 32% of the assessed commercial property value. The district levies a total tax rate of $1.02 per $100 of assessed valuation. The tax levy is divided into separate divisions. The general fund of the district includes fire suppression, fire prevention, training and general operations. This fund levies $.58 of the total. The emergency medical service levies $.30 of the total. The remaining tax rate goes to joint communications $.03 and the employee pension fund $.11.

The district has an approximately $10,303,648 operating budget for the year 2001. This amount reflects 98% of total tax assessment. The 2% cushion allows for delinquent or contested taxes that may be delayed or not paid.

In the past, the Metro West Fire Protection District has been very pro-active regarding the replacement of apparatus. Over the past ten years the amount of revenue that was specifically earmarked for apparatus replacement has fluctuated from 1% to 8% per year. The basis for scheduling the replacement of apparatus was driven by revenue instead of age, maintenance or performance. In general, the district has very attractive, well maintained apparatus.

Currently, the replacement of apparatus is primarily based on the age or appearance of the unit. There is no formal policy or plan to address the short and intermediate term requirements of the district. District officials have been very successful up to this point in providing the staff with new and innovative apparatus as needed. The district has been fortunate that the revenue has out paced the operational needs of the district; thereby permitting significant funding sources for apparatus replacement.

In the future, it is anticipated that the district will experience an increased draw of total revenue to maintain operation levels. While the district remains a thriving community, opportunities to develop new residential housing stock and commercial enterprises have slowed. At least one of the municipalities that lie within the district has developed a master plan to limit growth. Even with these

challenges, the replacement of apparatus on a scheduled basis is very much possible with the revenue that the district is expected to receive in the future.

The development of a scheduled apparatus replacement plan for the Metro West Fire Protection District is consistent with the principals of Managing Creativity as described in the National Fire Academy, Executive Development (ED) course.

LITERATURE REVIEW

Motivating Factors for Developing a Scheduled Apparatus Replacement Plan

The progressive fire chief, who realizes that any new apparatus must serve the municipality for an extended period of time, considers upgrading not only to the levels needed now, but to anticipated levels as well (Peters,1995). The National Fire Protection Association 1201 (NFPA 1201), *Developing Fire Protection Services for the Public*, states that the strategic planning process shall attempt to project the future fire protection needs of a community for periods of 10 and 20 years. This standard is one explanation why having a plan for replacement of apparatus is very important. To simply wait until the apparatus is no longer mechanically sound to pump efficiently or respond on emergency calls is failure to recognize what is evolving in the community.

Changes in fire load or occupancy may hasten the replacement of a seemingly otherwise appropriate apparatus. Because the purchase of apparatus is a long-term commitment to the community, the chief must have a vision of the future.

Innovations in apparatus performance, features and safety are also considerations during the procurement and replacement process. (FAMA, 2000) The National Fire Protection Association 1901 (NFPA 1901) *Standard for Automotive Fire Apparatus* details specific requirements for apparatus. Many fire departments have apparatus in service that was manufactured prior to the implementation of this standard. The ability of existing apparatus to comply with the performance and safety standards detailed in NFPA 1901 should also be a consideration for replacement. If the department is operating apparatus that was built before 1990 it may not have thermal relief valves to protect pump components. It may also not have a Class A foam system or an electronic pump governor to improve firefighting performance. Many aerial ladders built before 1990 may not have a minimum tip rating of 250 pounds to ensure that it can safely carry a fully equipped firefighter. Almost all apparatus built before 1990 won't have anti-lock braking systems, slip resistant steps or reduced noise cab interiors (Cavett, 2000).

In addition to non-compliance with new standards, escalating maintenance costs and increased downtime, the desire to increase efficiency are good reasons to replace outdated equipment. Like our personal automobiles, maintaining older vehicles tends to be more costly than maintaining modern units. The nature of the fire service taxes the mechanical components of the apparatus. Wear and metal fatigue from years of cold starts, maximum output responses and torsional stresses on the chassis, frame and body take their toll.

As new equipment and procedures are developed for fire service use, we always find a way to mount or hang the needed equipment on the apparatus. This can cause the vehicle's suspension to become overloaded and seriously affect the unit's stability. Overloaded, under-braked apparatus pose a sever threat to firefighters who respond on the unit and the general public (Peters, 1995).

Planned apparatus replacement provides the fire department with reliable apparatus at all times. Improvements in fire apparatus design can be introduced, maintenance costs become more favorable, operating efficiency increases and equipment remains reliable (NFPA, 1997).

The planned replacement of apparatus prevents the need for "crisis purchasing" and the possibility of needing to replace multiple units at one time. This purchasing process perpetuates the crisis purchasing of multiple apparatus in the future (Romines,1996).

Fire apparatus have undergone many significant improvements in the past 20 years and especially in the past 10 years. Older apparatus are labor intensive. As budget crunches limit the number of people available to respond, many departments are taking up some of the slack by replacing their older apparatus with more modern rigs that incorporate a variety of enhanced performance features. Examples of apparatus features that better utilize personnel include remote controlled monitors and self-raising light towers. With these types of innovations the apparatus operator is able to perform multiple roles without assistance (Cavett, 2000).

Whenever it is necessary to discuss the replacement of apparatus, inevitably the question of refurbishment of existing apparatus will be raised. No fire department can answer that question without thoroughly understanding the refurbishment process and the costs involved. Refurbishment is considerably more involved than just surface bodywork and a new coat of paint. With the proper research, there might be more reasons why refurbishment is not the viable alternative than why it is.

The specific motivating factors for the Metro West Fire Protection District are related to assuring the resources to provide safe, reliable and innovative apparatus for the staff and the community for many years to come.

Life Expectancies of Fire and Emergency Medical Apparatus

The Fire Chief's Handbook (1995), reports that apparatus life expectancy is not based solely on age. A unit's routine workload, it's physical condition, and the amount of preventive maintenance it has received tend to be better indicators of whether apparatus is still reliable for first-line duty. Jack Cottet, the author of an article in Fire Chief Magazine (1992) believes that every department should have a written apparatus replacement policy in which units are scheduled for replacement based on age and expected condition at a future date.

The normal life expectancy for first-line apparatus will vary from city to city, depending on the amount of use the equipment receives and the adequacy of the maintenance program. A 10 to 15 year life expectancy is considered normal for first-line pumping engines (NFPA, 1997). First-line pumpers must respond to many routine auto, brush and rubbish fires as well as perform long-duration

pumping operations; these activities take their toll on the chassis, body, engine, driveline and pump (Peters, 1995).

The *Fire Protection Handbook* (1997) reports that first-line ladder trucks should have a normal life expectancy of at least 15 years. In fire departments where ladder trucks make substantially fewer responses to alarms than engines, a planned first-line service of 20 years may be warranted. Some smaller fire departments that have infrequent alarms operate pumping engines up to 20 years with reasonable efficiency. Even if the apparatus is mechanically functional, obsolescence will make older apparatus less desirable. In some types of service, including areas of high fire frequency, a limit of 10 years may be reasonable for first-line service. The older apparatus may be maintained as part of the reserve fleet as long as it is in good condition. However, in most cases fire departments should not rely on apparatus over 25 years of age.

Other apparatus used by fire departments should have scheduled replacement also. Ambulances should be replaced every seven years. Brush and utility vehicles should be replaced every 10 years. Reliability, maintenance costs and frequency of use may reduce the service life of these vehicles also (Chatterton & Chatterton, 1994).

Financial Tools for a Scheduled Apparatus Replacement Plan

The purchase and replacement costs of fire apparatus should be a regular item of the fire department capital budget. In most cases, except for accidents, the requirements can be planned and funded on a long-range basis (NFPA,1997).

NFPA 1201, the *Standard for Developing Fire Protection Services for the Public* states that standard specifications shall be used for major purchases, and the fire department shall maintain a file of such specifications for major items including fire apparatus. An open competitive bid process should be used to ensure that the acquisition of apparatus occurs in a cost saving manner (NFPA, 1997).

Funding of major apparatus purchases is available from several sources. A comprehensive plan detailing when the apparatus will be replaced allows for the funding to be in place when the apparatus is received. The outright purchase of the apparatus from capital equipment funds, lease / purchase or bond issues are all available funding resources to fire departments.

The Metro West Fire Protection District fiscal 2001 budget includes $700,000 for the replacement of apparatus. Only the replacement of one ambulance, at a cost of $100,000 is actually planned for 2001. The balance of these funds will be carried over for future replacement needs. No specific time frame currently exists for replacement of the apparatus that is being funded in the budget. In the past, the funds would be carried over from year to year until needed. By establishing a replacement schedule for apparatus, a specific amount will be dedicated annually to fund the plan. The amount budgeted under the replacement schedule would be less than budgeted for this year (Appendix A).

In summary, the literature review supported this author's belief that fire service agencies need to develop a scheduled plan for apparatus replacement.

Innovations in new apparatus performance, non-compliance with new standards, escalating maintenance costs and increased downtimes are all considerations for apparatus replacement. However, the most significant motivator is the failure of existing apparatus to comply with safety standards thereby placing personnel at unnecessary risk.

It is demonstrated throughout the literature that an acceptable life expectancy for first-line pumping engines is 10 to 15 years. Aerial apparatus can be expected to have a first-line life expectancy of at least 15 years. Brush trucks can be expected to provide service for 10 years. Ambulances have a first-line life expectancy of 5 to 7 years.

Funding of the scheduled replacement plan is essential to its success. Several financial options are available to the fire department. Bond issues, lease / purchase plans or capital funding are all considerations for financially supporting the scheduled apparatus replacement plan.

PROCEDURES

Definitions of Terms

Aerial Ladder Platform or Ladder Tower: A vehicle equipped with an aerial ladder platform and waterway designed to support firefighting and rescue operations.

First-line Apparatus: Emergency apparatus that responds immediately from a given location when an alarm is received by the fire department.

Pumper or Pumping Engine: Fire apparatus with a permanently mounted fire pump of at least 750gpm capacity, water tank, and hose body whose primary purpose is to combat structural and associated fires.

Quint: Fire Apparatus with a permanently mounted fire pump, a water tank, a hose storage area, an aerial ladder or elevating platform with a permanently mounted waterway, and a complement of ground ladders.

Reserve Apparatus: Emergency apparatus that is moved into first-line status for a limited period of time to accommodate repairs of first-line apparatus or increased call load.

Research Methodology

This research project utilized the action research methodology to (1) determine what are the motivating factors for the Metro West Fire Protection District to develop a scheduled apparatus replacement plan, (2) to determine what are the acceptable life expectancies for fire and emergency medical apparatus, and (3) what financial tools are available to the Metro West Fire Protection District to fund a scheduled apparatus replacement plan. The procedures used to complete this project include a literary review to answer the designated research questions, and an analysis of data directly related to the Metro West Fire Protection District.

The literature review was conducted on site at the National Emergency Training Center's Learning Resource Center in August 2000 and at the Metro West Fire Protection District's administrative office in January 2001. Additional information was obtained from the author's personal experience.

The desired outcome of this research was to create a schedule of apparatus replacement for the Metro West Fire Protection District (Appendix A). In addition, a plan for funding the project was also developed (Appendix B) and a replacement cost estimate (Appendix C).

Assumptions and Limitations

The procedures used to complete this research project were based on the author's reliable and accurate research methodology during the literary review. It was also assumed that the parameters that various authors used in their literature are also applicable to the Metro West Fire Protection District.

Limitations affecting the outcome of this research were the unwillingness of the manufactures of fire apparatus engines and drive assemblies to attach a life expectancy to their products. In addition, access to archival trade publications outside of the National Emergency Training Center's Learning Resource Center is limited. Regarding the contribution schedule (Appendix B) and replacement cost estimate (Appendix C) this author relied on his personal knowledge and experience as an administrator with the Metro West Fire Protection District. This fact may make replication of the research difficult for others.

RESULTS

Answers to Research Questions

The answers to the research questions were derived from an assessment of the literature review and an analysis of the annual budget for the Metro West Fire Protection District.

Research Question 1. What are the factors that motivate fire service agencies to develop a scheduled apparatus replacement plan? The NFPA (1997) promotes a systematic replacement plan for apparatus that will provide the fire department with reliable apparatus at all times. Delaying the replacement of fire apparatus may require the fire department to replace multiple pieces of fire apparatus at one time. A scheduled replacement allows for design changes and provides newer and more reliable vehicles on hand at all times (Peterson, 1994).

Innovations in apparatus performance, features and safety are all considerations during the procurement and replacement process (FAMA, 2000). Many fire departments have apparatus in service that was manufactured before NFPA 1901 was developed. The ability of existing apparatus to comply with performance and safety standards should be a consideration for apparatus replacement (NFPA, 1999). The nature of the fire service taxes the mechanical components of the apparatus. Wear and metal fatigue from years of cold starts, maximum output responses and torsional stresses on the chassis frame and body takes its toll (Peters, 1995).

Research Question 2. What are the acceptable life expectancies for fire and emergency medical apparatus? The *Fire Protection Handbook* (1997) reports that a 10 to 15 year life expectancy is considered normal for first-line pumping engines. First-line ladder trucks should have a normal life expectancy of at least 15 years. In fire departments where ladder trucks make substantially fewer responses to alarms than pumping engines, a planned first-line service of 20 years may be warranted. The life expectancy of ambulance vehicles is

generally expected to be 7 years. Brush and utility vehicles should be replaced every 10 years. Even if apparatus is mechanically sound, obsolescence will make older apparatus less desirable.

The Fire Chief's Handbook (1995) reports that apparatus life expectancy is not based solely on age. A unit's workload, its physical condition and the amount of preventive maintenance it has received tend to be better indicators of whether apparatus is still reliable for first-line duty. Older apparatus may be maintained as part of the reserve fleet as long as it is in good condition. In most circumstances fire departments should not rely on any apparatus over 25 years old (NFPA, 1997).

Research Question 3. What financial tools are available to fund a scheduled apparatus replacement plan? The *Fire Protection Handbook* (1997) reports that the purchase and replacement costs of fire apparatus should be a regular item of the fire department budget. In most cases, except for accidents, the requirements can be planned and funded on a long-term basis. Fire departments in Missouri have the available options of purchasing apparatus from capital funds that have been reserved for purchases, lease / purchase plans that many of the manufactures make available, or bond issues approved by the voters specifically for capital expenditures.

The Metro West Fire Protection District has 18 pieces of major apparatus (Appendix A) to incorporate into the scheduled apparatus replacement plan. An assessment of the existing stock of apparatus maintained by the district reflects that none of the first-line apparatus is currently greater than 8 years old and

all units are within the age guidelines recommended by *The Fire Chief's Handbook* (1995). The current age of the district's apparatus is advantageous to the funding model that will be used for the scheduled replacement plan. None of the pumpers, quints or the ladder tower will require replacement under the guidelines of the plan for 2 years. This allows for the fund to build up assets in preparation of the scheduled replacements.

An annual contribution of 3.5% of the operational tax revenue will fund the scheduled apparatus replacement plan. For fiscal 2001, the tax revenue is expected to be $10,303,648. A contribution of $360,500 will initiate the plan.

Concluding that the Metro West Fire Protection District will benefit from a scheduled apparatus replacement plan, and that adoption of the funding schedule will support the plan. The following guidelines were incorporated to facilitate the implementation.

1. Pumper (3324), Quints (3335, 3342) and Pumper/Tanker (3354) will have a minimum first-line service of 10 years with an average first-line assignment of 12 years.
2. The Ladder Tower (3312) will have first-line service of 16 years.
3. The Heavy Rescue (3316) will serve for 14 years on first-line status.
4. The Tanker (3333) and Support unit (3356) will remain is service for 25 years.
5. Ambulances will be replaced from first-line duty after 5 years.
6. Brush trucks will be replaced after 10 years of service.

7. Selected apparatus will move to reserve status as needed by the district to maintain back-ups for the first-line units.

The replacement schedule adopted by this plan is based upon the mileage and hours placed on the districts apparatus since their original purchase. In addition, the revenue resources of the district and the historic duration of apparatus life expectancy of the district was a factor for consideration.

The scheduled apparatus replacement plan will cost the Metro West Fire Protection District $5,125,000 over the next 15 years based on year 2001 dollars (Appendix B). An annual contribution of 3.5% of the operational tax revenue per year will fund the plan and compensate for inflation. The individual apparatus estimated replacement costs are detailed in Appendix C.

The author, for this research report considered the following factors. Inflation was estimated to be at a rate of 5% per year impacting the increase in cost of apparatus over the life of the schedule. The requirement to fund the plan with 3.5% of the operational tax revenue was determined to be adequate based on two factors. First, the increase in operational tax revenue for the Metro West Fire Protection District has averaged 6% per year for the past 10 years (Metro West, 2000). Second, the balance of funds in the account will be deposited in interest bearing financial products to earn additional value. Even with these considerations, the fund will have to be monitored on a continual basis to determine if the objectives and requirements are being met.

DISCUSSION

The research supports the need to establish a scheduled apparatus replacement plan for the Metro West Fire Protection District. The necessity to implement such a plan is borne from the need to be able to provide some level of anticipation of the capital requirements of the district into the future. The district is very fortunate to be well funded with an adequate tax rate and assessed valuation. Because resources are currently available to support apparatus replacement, efforts must be directed toward planning the replacement instead of simply spending the existing funds. As Jack Cottet believes (Fire Chief, 1992) every department should have a written apparatus replacement policy in which units are scheduled for replacement based on age and expected condition at a future date.

It is well documented in the literature, and most authors agree, that acceptable life expectancies of fire department apparatus do exist. The *Fire Protection Handbook* (1995) reports that pumping engines should have a first-line life expectancy of 10 – 15 years and aerial apparatus 15-20 years. Ambulance, brush and support vehicles should have a life expectancy of 5 – 10 years. It is also reasonable to expect that apparatus over the age of 25 years should not be in-service (Peters, 1995).

The previous purchase history of the district has made the process of determining projected replacement dates in the future achievable. Because the apparatus is very well maintained and no first-line apparatus is over 8 years old, staggering the replacement from 10 to 16 years from purchase date is possible.

Future scheduled replacement dates can then be maintained at a consistent interval as determined by the research.

There was also noted, that the level of use, maintenance and the road conditions in the community could influence the life expectancy of apparatus (Romines, 1996). The Metro West Fire Protection District is a moderately active department, answering almost 5,000 alarms in 2000. The district is very fortunate to have a full time mechanic whose sole responsibility is the preventive maintenance and repair of the apparatus. The district is located in suburban St. Louis County, which has a competent road maintenance program.

The development and implementation of a scheduled apparatus replacement plan benefits the Metro West Fire Protection District, it's employees and the community. The results of the research indicate that it is possible and responsible to anticipate and schedule the replacement of the districts most important and expensive tool. The district benefits by knowing what capital assets will be necessary on an annual basis to maintain a reliable and safe fleet. As a fixed cost it becomes easier to plan the other expenditures in the budget. The employees' benefit by having the most technologically current tools available to complete their job. In addition, the district will have clearly demonstrated to the staff that employee safety is of paramount importance. The community will be assured that the service they will receive will be provided with the most innovative and reliable apparatus available. They will also know that the leadership of the organization utilized vision, forethought and fiscal responsibility to assure service delivery capabilities.

With the implementation of this scheduled apparatus replacement plan the appropriate funds can be dedicated by the district to this specific budget requirement. The concern of either allocating too little or too much revenue on an annual basis can be minimized. This will essentially protect the process of funding replacement apparatus from being overlooked or delayed as a result of other budget or employee requirements. Through this research and the subsequent plan that has been developed, the Metro West Fire Protection District has a strategic way to anticipate and fund the future apparatus replacement requirements of the district.

RECOMMENDATIONS

The Metro West Fire Protection District does not have a scheduled apparatus replacement plan. The quality, reliability and safety of the apparatus being utilized by the district's staff dictate the adoption of such a plan. The research conducted for this project clearly demonstrates that supporting information exists to define for the district what are generally accepted life expectancies of fire and emergency medical apparatus. The goal of this research is to implement a plan that will detail the scheduled replacement of apparatus as well as the funding model to support the plan.

It is recommended that the Chief of the Metro West Fire Protection District, with the approval of the Board of Directors implement this scheduled apparatus replacement plan (Appendix A). For the purposes of this plan the first-line life expectancy of pumping engines and quints will be from 10 to 15 years. The first line life expectancy of the district's ladder tower will be 16 years

and the heavy rescue unit will be 14 years. Ambulance vehicles will have a first-line life expectancy of 5 years and the brush units will be 10 years. Specialized apparatus such as the district's tanker and support unit, which have infrequent utilization and are well maintained, will have a serviceable life of 25 years.

It is recommended that the plan be initiated during the 2001 budget year, which coincides with the calendar year. From the existing budget accounts that total $700,000 for apparatus replacement, $360,500 which is 3.5% of the operational tax collections, should be re-allocated to the scheduled apparatus replacement fund. The balance of funds currently scheduled for apparatus replacement should be placed in the district's capital reserve to fund other projects.

This research project was initiated to examine the need and possibility of developing a scheduled apparatus replacement plan for the Metro West Fire Protection District. Based on the information derived from the research process it is clear that the need for such a plan exists. It is also possible to determine a functional life expectancy of the district's apparatus. The funding mechanism for the plan is achievable and would not require any additional tax burden on the community or have a negative impact on any of the districts existing programs. The community and the district would benefit from the implementation of this plan.

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APPENDIX A

METRO WEST FIRE PROTECTION DISTRICT
APPARATUS REPLACEMENT SCHEDULE 2001 - 2015

UNIT #	DESCRIPTION	MILEAGE	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	STATION #1																
3312	1998 SUTPHEN LADDER TOWER	10396														R	
3316	1998 SAULSBURY RESCUE	26480												R			
3317	1998 FORD/OSAGE AMBULANCE	48472			R					R					R		
3310	1987 PIERCE RESERVE PUMPER	77618															
	STATION #2																
3324	1993 SUTPHEN PUMPER	61771					R										
3327	2000 FORD/OSAGE AMBULANCE	7341					R					R					R
3328	2000 FORD F-350 BRUSH TRUCK	1565										R					
	STATION #3																
3335	1994 SUTPHEN QUINT	61932						R									
3337	1999 FORD/OSAGE AMBULANCE	21016				R					R					R	
3333	1982 FORD/SEMO TANKER	31949							R								
3336	1999 PIERCE RESERVE RESCUE	38017															
3338	2000 FORD F-350 BRUSH TRUCK	1430										R					
3397	1996 FORD RESERVE AMBULANCE	66467															
	STATION #4																
3342	1993 SUTPHEN QUINT	68676			R												
3347	1997 FORD W/C AMBULANCE	71524	R					R					R				
	STATION #5																
3354	1997 FERRARA PUMPER	29580											R				
3350	1989 PIERCE RESERVE PUMPER	87488															
3356	1982 FORD SUPPORT UNIT	64683							R								

R= REPLACE

RESERVE APPARATUS DOES NOT HAVE A SCHEDULED REPLACEMENT DATE. FRONT LINE APPARATUS WILL MOVE TO RESERVE UPON REPLACEMENT.

APPENDIX B

METRO WEST FIRE PROTECTION DISTRICT
APPARATUS REPLACEMENT FUNDING SCHEDULE
2001 - 2015 (2001 DOLLARS, 3.5% OF BUDGET)

YEAR	CONTRIBUTION	PURCHASES	BALANCE
2001	$ 360,500.00	$ 100,000.00	$ 260,500.00
2002	$ 360,500.00	$ -	$ 621,000.00
2003	$ 360,500.00	$ 750,000.00	$ 231,500.00
2004	$ 360,500.00	$ 100,000.00	$ 492,000.00
2005	$ 360,500.00	$ 400,000.00	$ 452,000.00
2006	$ 360,500.00	$ 750,000.00	$ 62,500.00
2007	$ 360,500.00	$ 400,000.00	$ 23,000.00
2008	$ 360,500.00	$ 100,000.00	$ 283,500.00
2009	$ 360,500.00	$ 100,000.00	$ 544,000.00
2010	$ 360,500.00	$ 200,000.00	$ 704,500.00
2011	$ 360,500.00	$ 500,000.00	$ 565,000.00
2012	$ 360,500.00	$ 600,000.00	$ 325,500.00
2013	$ 360,500.00	$ 100,000.00	$ 586,000.00
2014	$ 360,500.00	$ 925,000.00	$ 21,500.00
2015	$ 360,500.00	$ 100,000.00	$ 282,500.00
TOTALS	$5,407,500.00	$ 5,125,000.00	$ 282,500.00

APPENDIX C

METRO WEST FIRE PROTECTION DISTRICT
APPARATUS REPLACEMENT COSTS (2001 DOLLARS)

APPARATUS TYPE			2001 REPLACEMENT COSTS		
PUMPER			$	300,000.00	
QUINT			$	650,000.00	
LADDER TOWER			$	825,000.00	
PUMPER / TANKER			$	400,000.00	
TANKER			$	200,000.00	
HEAVY RESCUE			$	600,000.00	
AMBULANCE			$	100,000.00	
BRUSH TRUCK			$	50,000.00	
SUPPORT VEHICLE			$	200,000.00	