EL DORADO HILLS FIRE DEPARTMENT

TRUCK 85
REPLACEMENT AND
RESEARCH GUIDE

2012

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INTRODUCTION

The Fire Department fleet serves a critical role in El Dorado Hills Fire Department's essential emergency service. A mechanically reliable fleet of apparatus and staff vehicles are imperative to getting our staff to the location of the emergency and to efficiently operate on scene. To effectively cover and protect the El Dorado Hills community, EDHFD has 1 quint (Truck 85), 9 engines, 2 JPA ambulances, 1 air unit and 1 water tender. (Refer to Appendix 2 and 3 for a summarized explanation of fire apparatus and staff vehicles.)

By following NFPA's guidelines and researching local Fire Department replacement policies, this replacement guide was created to give a description and a life expectancy for all El Dorado Hills Fire Department apparatus. This purpose of this assessment is to investigate and develop the most appropriate replacement parameters for the 2000 Spartan Quint known as Truck 85. Early research and planning is a key element of the fire apparatus purchase process as it can take up to two years to design, specify and build.

RESEARCH FINDINGS

Research on different publications like the NFPA Fire Protection Handbook, NFPA 1901Standard for Automotive Fire Apparatus and Fire Apparatus Purchasing Handbook (Fire Engineering) resulted in no set standard for replacement or studies. One factor for the absence of these studies is that the life expectancy of a fire apparatus has many variables and regional differences. Other variables such as weather, road conditions, run loads, and maintenance are reasons for the unavailability of any clear-cut information in this area. The life expectancy of a fire apparatus is broken into two periods: front line and reserve. Front line service life is the number of years the apparatus would be a primary unit to respond to calls. Reserve service life comes after a unit has completed its front line service years and is still reliable enough to play a secondary role. The apparatus is kept as a reserve unit which can be utilized for various reasons ranging from being a "stand-in" for an out-of-service front line apparatus to being a secondary response unit for Volunteer Firefighter Personnel.

Replacement guides and policies from neighboring Fire Districts (Folsom Fire, Sacramento Metropolitan Fire, Cosumnes Fire, Roseville Fire, etc.) produced similar information that was recommended by NFPA as guidelines. These policies or replacement guides were all based on years of service and or mileage. Additionally, they also included the statement or clause that would allow for earlier replacement or a longer use life based on maintenance and reliability.

Cosumnes Fire's guide cited the need to keep up with technology for Firefighter safety and to better perform the overall mission of the District:

> *"Suppression and other specialized large apparatus are placed into reserve status based on a number of conditions. Mileage is a significant factor. The Fleet Maintenance Division will begin comprehensive inspections every 6 months or 25,000 miles, whichever comes first, once the apparatus reaches 100,000 miles.*
>
> *<u>Factors to be considered in determining service life are:</u>*
>
> - *Total Years of Service – Typically a piece of apparatus will be near the end of its service life after 15 years.*
> - *Wear and Tear – The vehicle must have a professional and functional appearance and operate safely.*
> - *General Safety Feature Upgrades – There may be safety feature upgrades over the service life of an apparatus that require the District to consider replacement to improve employee safety or major NFPA standard changes that create a significant liability for the organization.*

Due to the economic downturn as of July 2010, Roseville Fire went from operating under 10 years front line and 3 to 5 years reserve to 13 years front line and 3 years reserve for all engines,

trucks and tractor drawn aerials (TDA). Folsom Fire has 10 years front line for engines and 12 years for trucks, although, it is important to note that they consider a quint as an engine using the guide of 10 years front line and 5 years reserve (refer to Appendix 2). To summarize, the local Fire District's replacement guides use 10 to15 years front line and 3 to 5 years reserve.

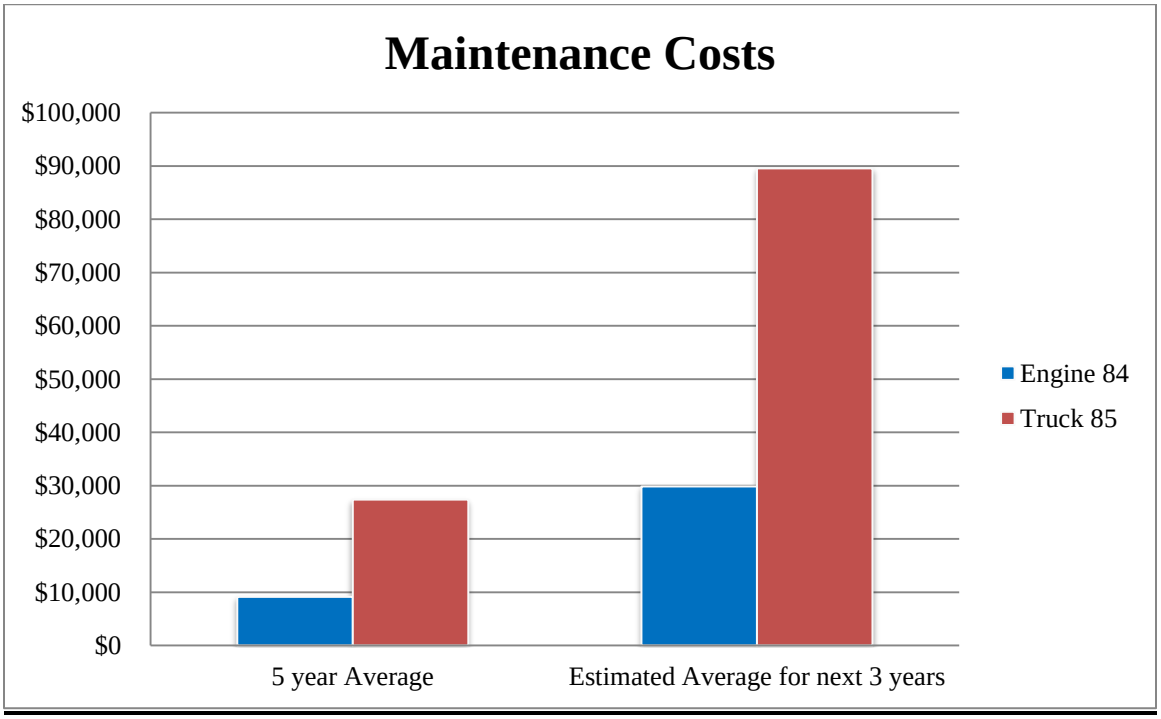
An NFPA guideline is that "no apparatus should be kept longer than 25 years based on uncertain reliability." NFPA further states the following, "In general, a 10 to 15 year life expectancy is considered normal for first line engines. First line trucks should have a normal life expectancy of at least 15 years." These requirements are based on truck companies not on quints. Truck or truck companies do not have a pump, tank or hose and are used primarily for structure fires and rescues. Quints are aerial ladder trucks with a pump, water tank and hose and are typically used on all incidents. Trucks companies will routinely only respond on about one third of the calls an engine or quint would.

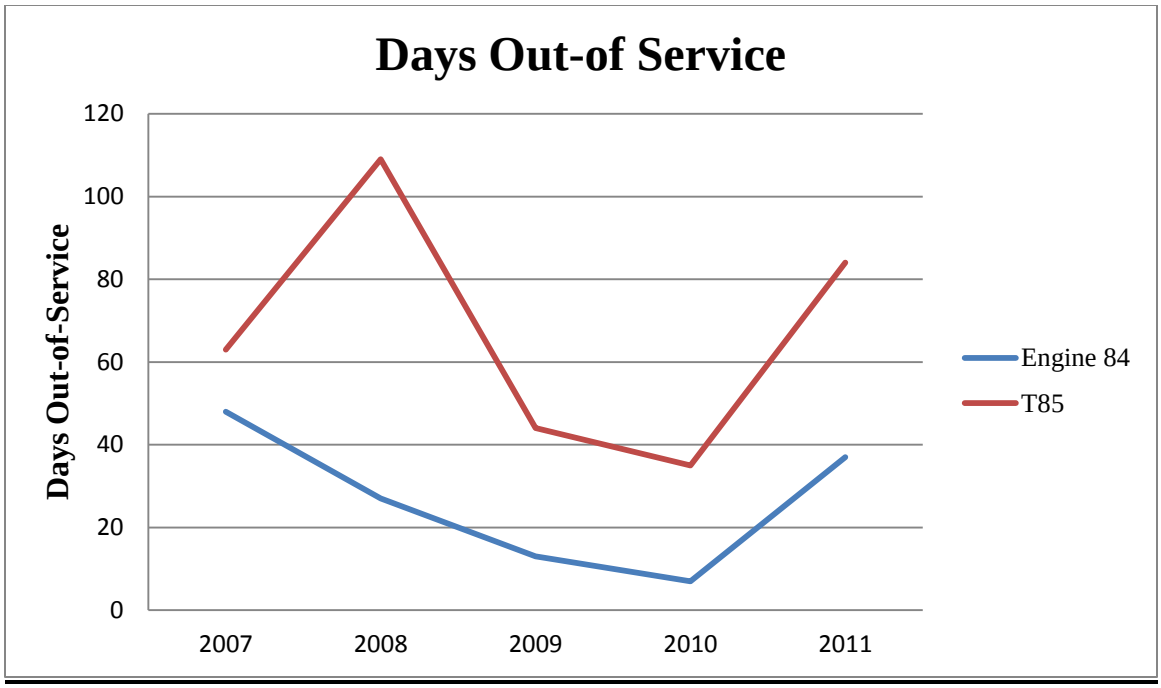
Based on the information found, EDHFD must maintain reliable, safe apparatus, provide up-to-date safety for personnel, comply with new national standards and keep maintenance costs from exceeding the value of the apparatus. EDHFD classifies the truck in the same category as an engine because of its equipment and capabilities; therefore, the replacement guide for engine companies is also used for Truck 85 (refer to Appendix 2).

ANYALSIS OF DATA

The following comparison shows the out-of-service time and maintenance costs between Truck 85 and a similar apparatus of EDHFD. Truck 85 (2000 Spartan Quint) and Engine 84 (2003 Spartan Pumper) are the most similar apparatus units owned by EDHFD. They have the same tank size, chassis and fire pump and are similar in mileage and age.

	Engine 84	**Truck 85**
Average mileage/year (Dec 2006-Dec 2011)	5,920	4,797
Mileage as of 1/1/2012	60,331	61,286
Recommended Replacement Fiscal Year	2017/18	2014/15
Average Maintenance cost/year over past 5 years	$9,126	$29,851
Out-of-service over past 5 years	132 days	335 days
Anticipated down time over next 3 years (based on 5 year history)	80 days	201 days
Anticipated maintenance cost over next 3 years (based on 5 year history)	$27,378	$89,553





The comparison shows that Truck 85's maintenance has incurred an average of 30% higher cost than Engine 84 while being out-of-service more than twice as often.

COST ANALYSIS

2000 Truck 85 (current)

- Original cost $656,000 @ 15 years of service = $43,733/year

2012 Straight Truck (Quint) w/2010 emissions

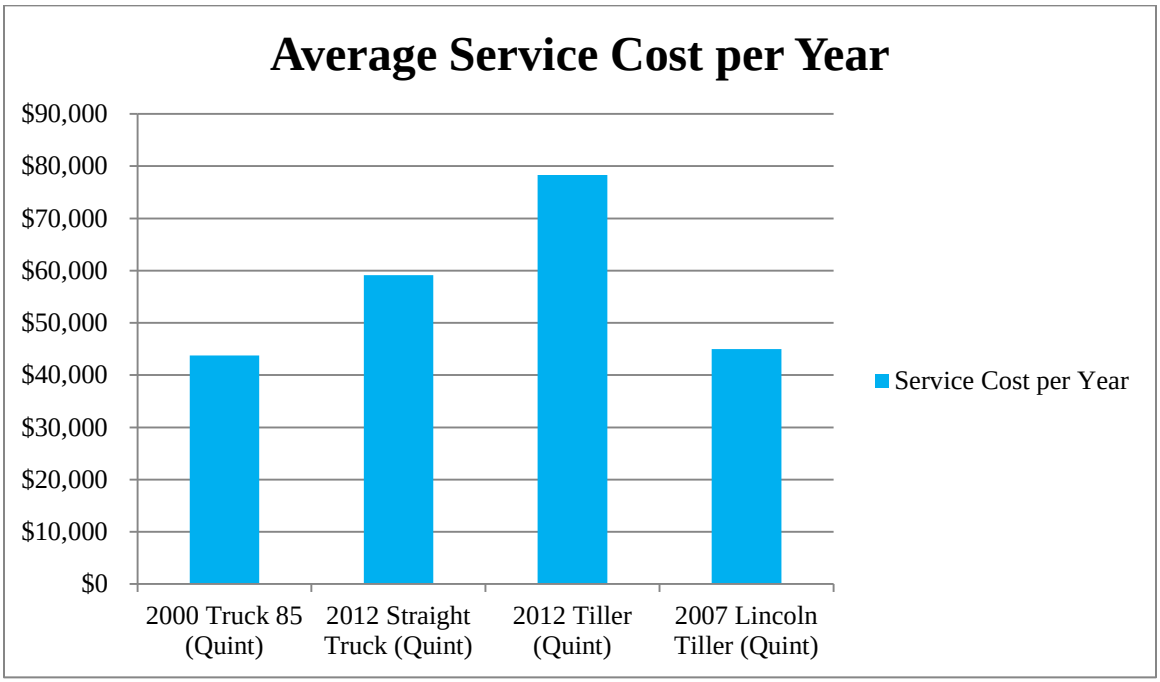
- Cost $887,000 @ 15 years of service = $59,134/year*
- *The estimated costs of a 2012 Truck was obtained from Ferrara Fire Apparatus (cost of similar 105ft. Quint sold in 2011 to Barona FD, CA).

2012 Tiller (Quint) w/2010 emissions

- Cost $1,175,000 @ 15 years of service = $78,334/year**
- **The estimated costs of a 2012 Tiller was obtained from Lincoln Fire Department (cost of the tiller as of January 2012).

2007 Lincoln Tiller (Quint)

- Potential purchase offer $450,000 @ 10 years of service = $45,000/year



VALIDATION

Apparatus is expensive but when amortized over the front line expected life, it is relatively inexpensive compared to other operational costs. This gets us back to our mission of getting Firefighters to the incident and fixing our customer's problem.

This Department's mission, "To Serve the Community of El Dorado Hills With Integrity and Excellence," requires trucks, engines, ambulances and staff vehicles along with all the equipment and personnel required to safely mitigate the wide variety of emergencies that occur within the District. The Apparatus Committee is tasked with evaluating all apparatus being replaced and purchased and understands the District's dynamics.

Prior to recommending a purchase, the Apparatus Committee will fully research all options and validate that the final recommendation meets all the needs of the District currently and into the future. It is recognized that any purchase of a new quint between now and 2015 would be slightly earlier than standard but considering current and projected maintenance costs and down-time, a purchase may be warranted. The Fire Chief and the Apparatus Committee make the replacement determinations based on the information researched. EDHFD's goal of arriving at scene 90% of the time at an established response time should also be the goal for apparatus dependability. An apparatus should be in service 90% of the time or greater. Based on historical records, our current Truck 85 is projected to be out of service almost 20% of the time over the next 3 years. All indicators are showing that Truck 85 is aging and the replacement process needs to begin now, not after our service to the community is affected.

CONCLUSION

This brings us to the conclusion that under normal circumstances, whether we place the quint into reserve status or simply replace it, both should take place between now and the Fiscal Year 2014/15.

The process for a truck replacement would normally start sometime in 2013 based on a development timeline of at least one year.

The Apparatus Committee is still processing all of the information, including the pros and cons of a TDA (tractor drawn aerial/tiller) vs. straight standard truck and what the current and future needs of the District are as it pertains to a new truck/quint (refer to Appendix 1 for Tractor Drawn Aerial Analysis).

The Apparatus Committee will have a Committee/Staff recommendation by the March Board of Directors' meeting.

APPENDIX 1

TRACTOR DRAWN AERIAL ANALYSIS

Qualifications for Operating:

1) Two personnel are required to operate a tiller (TDA): an Engineer driving in the cab and a tiller driver in the rear. Per California DMV, the Engineer only needs to possess a valid California Commercial or Firefighter restricted Class B license in order to operate the vehicle. Since the tiller driver is steering a non-drive axle, a Class C license is required by California DMV.

2) With research conducted through several other fire agencies, it seems that a majority of the agencies have similar means of training their Engineers and tiller driver. A few of the agencies, Los Angeles County and West Sacramento, have had a program in existence for quite some time as where other agencies, such as Rocklin and Lincoln, have had to start from the beginning. Once an agency has a program established, it seems that the transition to a smooth tiller training schedule works out well.

3) All agencies who were contacted stated they have a rigid training plan that is in place for the success of their employees. Most of the agencies interviewed had similar training requirements. Orange County Fire Authority (OCFA) has the following training requirements:

   A written test, general performance tasks, driving performance exercise, 20 hours of driving practice and incident response driving. A comprehensive 80% or better is required for passing. All training is to take place at the Battalion or station level. The program is composed of 3 basic components: A reading assignment, a rodeo/code 2 driving (day & night) and a written exam. In addition, a task book must be completed.

4) Los Angeles County has a 40 hour classroom and 40 hour Task Book training similar to OCFA's set up. *More information regarding LA County's training will be later in the report.*

Training Time and Costs:

1) Because this will possibly be a new program for the EDHFD, the initial costs will be higher until the program is well established. With the exception of one current line Firefighter (a tiller driver with a previous agency), this agency does not have anyone qualified to drive a TDA. In order to have a safe, rigid and productive training plan, our agency would have to contract with another agency to be educated on this type of program.

2) Chief John Heilmann and Liam McGregor with the City of West Sacramento Fire were instrumental in providing information, suggestions and general training cost statistics. Their recommendation was to invite as many as 5 EDHFD personnel to a 2 day, 16 hour class in West Sacramento utilizing their reserve Truck. They suggested a goal would be to cover a large amount of material to get each individual oriented to TDA driving and able to start an in-house training program at EDHFD. They also mentioned that they can provide a longer class with the goal set more along the lines of proficiency. The above recommendation is the bare minimum amount of time to get started. Ideally, EDHFD would have 15 personnel trained which would result in 3 of these courses.

   Cost breakdown:

(2) West Sacramento Trainers on OT X 48 hours	$ 4,565.00
360 gallons of Diesel @ $4.05/gallon	$ 1,458.00
15 EDHFD Firefighters OT @ two days	$11,002.00
Initial training cost for 15 EDHFD personnel	**$17,025.00**

3) Sacramento Regional EVOC training was another point of contact utilized to research TDAs. They currently do not have a structured TDA training plan but with the experience and knowledge level of the instructors, they are eager to work with us and provide a class. At this time, the actual cost of the program was not determined other than the cost would be similar to the price per student for an EVOC course (cost per person for 2008 EVOC was $350.00 per student).

   Cost breakdown:

Estimated course cost for 15 EDHFD Firefighters	$5,250.00
EDHFD Firefighters OT @ two days	$11,002.00
Initial training cost for 15 EDHFD personnel	**$16,252.00**

4) Los Angeles County Fire Department (LACFD) was another source used for researching this project. Engineer Tim McIntyre has developed a successful TDA curriculum for his agency and the California State Fire Marshal is looking to adopt it for the upcoming Driver/Operator 2A program. Currently, LACFD calls the TDA program D/O 1C. Engineer McIntyre stated that he applied for a grant that would allow his Department to teach the TDA curriculum to 330 students at no cost. The grant was approved and is underway. For more information, visit www.lacountyFirefighters.org. The last class will be held on May 14 and 15 and either May 21 and 22 or May 23 and 24, 2012. The class is a 40 hour course; 20 hours academic and 20 hours manipulative. It covers vehicle accident prevention, maintenance and lubrication, aerial apparatus operation, pre-trip inspection procedures, ladder operations and apparatus placement.

5) Whether a TDA is recommended or not for the EDHFD, this class could be an excellent training opportunity. Since the course is free and Los Angles is within driving distance, the only costs associated with this training would be fuel, food, lodging and overtime. It would be beneficial if several Firefighters or Engineers and the 2 EDHFD EVOC instructors attended. Then EDHFD could have a Train-the-Trainer Program and the costs could be reduced if we continue the training in-house. Note: EDHFD has secured four positions in this class.

Estimated cost to send four EDHFD personnel:

Overtime	$11,760.00
Food/Lodging	$ 4,450.00
Fuel	$ 1,350.00
Total	**$17,560.00**

Reduced Staffing Options:

1) The current staffing for the EDHFD Truck Company is four personnel. NFPA (National Fire Protection Agency) states that this is the recommended staffing level for this type of apparatus (truck or quint) based on safety and work performance. Although technically only two people are needed to operate a TDA, four person staffing is paramount and still the recommended staffing to safely and efficiently operate per NFPA. With that said, operating a TDA or a quint can be accomplished with three personnel as per the staffing option in the current MOU.

Cross-staffing:

1) Currently, at Station 85, if a wildland response is dispatched, the truck crew will cross-staff to the Type 1 Engine and respond.

2) OCFA stated that they have a TDA/engine house (full time staffing for both apparatus at one station) so the engine responds while the TDA stays in quarters. LACFD explained that if it's a TDA/Engine house, just the engine will respond. If it's a TDA/Paramedic Squad house, the truck will go; however, they will park out of the affected area and be used as manpower only. Basically, LACFD only use their TDA's for structure fires. West Sacramento stated they will cross-staff to another engine.

3) After researching cross-staffing during wildland season with several agencies, it appears that the purchase of a TDA will not eliminate cross-staffing, particularly at Station 85. We would continue to operate as we have in the past.

Alternative Staffing:

1) Just like the Water Tender and Air Unit, an individual would need to be qualified in order to drive in the tiller position. If we decided to go with a TDA, it is this Committee's recommendation that we require all four station 85 Paramedic Firefighters on each shift to be tiller qualified. This would alleviate the majority of scheduling issues. We would also require all Engineers to become TDA qualified.

2) If on the rare occasion a callback, specifically for a tiller driver was required, EDHFD would need to establish verbiage in Telestaff so that only qualified people are called in to operate the TDA.

3) Regarding wildland incidents, it appears that operations would stay the same; cross-staff to the Type 1 Engine.

4) Volunteer coverage would be similar as to what it is now, baring a few changes. It appears that a Volunteer would be able to fill in the Firefighter seat in the main cab until a paid Firefighter comes to relieve him/her.

Impact on Future Labor Negotiations and Cost:

Agencies were questioned about the following impacts: labor negotiations, pay increase for the tiller driver and, if budget cuts occurred, what would happen to the TDA program. The following were the responses:

1) OCFA stated that they have never had a problem with labor negotiations in regards to the tiller program. The tiller driver's position is a Firefighter's spot; there is no pay increase or special rating for that seat. If budget cuts were to occur, there would not be an issue. Since they have always run with a least 4 person Truck, they have constant staffing so they are compliant with NFPA.

2) LACFD stated no labor issues have occurred nor do they see any in the future. The tiller driver is also a Firefighter and no pay increase or bonus is involved. They mentioned that since the TDA/trucks were so important to their operations, if cuts were to occur, they would not be affected.

Detailed Cost of Operations/Uptime Analysis:

1) All Departments stated that obtaining this information is a very time-consuming task and they would not be able to provide due to time constraints and budgetary issues.

Advantages or Disadvantages Over Traditional Quint:

1) Nine agencies* were interviewed and gave two main reasons why they would choose a TDA versus a traditional quint:

    a) The turning ability/access:
        i. The Committee confirmed that the TDA can access all areas that our current quint can.

    b) The advantage of more cubic feet for equipment storage:
        i. Ours is an equipment intensive job. We need to have it all there when we need it. There is no way to plan for what equipment will be needed on an emergency call. Having it all there at one time is a definite benefit to our operations.

c) The TDA is designed to do what we are asking it to do.
    i. It is built for hauling the weight and more importantly stopping the weight.
    ii. Lower profile – the overall height of the TDA is lower.

*Only 3 of the 9 were quints (tank and pump) while the rest were straight trucks (no tank or pump).

Common Maintenance Issues:

Whether it's a TDA or a command vehicle, there will always be maintenance issues and associated costs.

1) Most agencies have stated that the most common and expensive maintenance issue with a TDA is the tire replacement which is also a major cost on a quint.

2) OCFA had an issue where the tiller driver, on several occasions, had clipped a vehicle or an object while responding to emergencies. They also stated that it was a training issue and not a maintenance issue. After installing small cameras above the tiller wheel wells so the tiller driver has a better view below him, the issue has been resolved.

3) Lodi Fire stated that they are not fans of all the plastic parts because they seem to break often. They explained that they also realize that plastic is cheap to make and lightweight and that any apparatus purchased today will have these issues.

APPENDIX 2

ENGINE – TYPE 1

A Type 1 is a vehicle with a permanently mounted fire pump, water tank and hose. The primary purpose of this type of apparatus is to combat structural and associated fires. This vehicle also responds to hazardous conditions, medical aids, vehicle accidents, and public service calls. This apparatus is normally staffed with three or four personnel.

This vehicle meets all the requirements of NFPA 1901 Standard for Automotive Fire Apparatus.

This unit has 15 years front line and 5 years reserve with an estimated 80,000 mile operational life. A maximum service life of 20 years with a replacement cost of $450,000 each has been established.

ENGINE – TYPE 3

A Type 3 is a vehicle with pump and roll capabilities, a water tank, and hose and various hand tools for fighting wildland fires. Primary purpose of this vehicle is to respond to wildland fires. This vehicle also has limited abilities for structural or other types of fires and responds seasonally to medical aids or public service calls.

This vehicle meets all the requirements of NFPA 1906 Standard for Wildland Fire Apparatus.

This unit has 15 years front line and 5 years reserve with an estimated 80,000 mile operational life. A maximum service life of 20 years with a replacement cost of $350,000 each has been established.

TRUCK – QUINT

Truck 85 is a vehicle equipped with an aerial ladder or platform, numerous ground ladders and tools that are designed to support firefighting and rescue operations. This unit may also have a fire pump, water tank and hose. The primary purpose of this apparatus is to combat structural fires, perform rescues and vehicle extrication. As a quint, it also responds to hazardous conditions, medical aids and public service calls. This apparatus is staffed with four personnel. This vehicle meets the requirement of a quint under NFPA 1901, Chapter 9.

This unit has 15 years front line and 5 years reserve with an estimated 80,000 mile operational life. A maximum service life of 20 years with a replacement cost of $850,000 has been established.
*Note: If this unit is not used in a reserve status, the replacement should be at 15 years.

AIR / LIGHT SUPPORT

The Air Unit is a vehicle used to refill self-contained breathing apparatus or supply breathing air for other functions. This vehicle is also used for lighting and as a support/rehab unit.

This unit is expected to have a 20 to 25 year operational life, approximately 15 to 20 years front line and 5 years in reserve with a replacement cost of $250,000.

ADMINISTRATIVE SUPPORT / STAFF VEHICLES

These vehicles include pick-ups, utilities, SUV's, etc. in a configuration necessary to meet the needs of the District.

These vehicles generally have a 10 year or approximately 100,000 mile operational life with an average replacement cost of $45,000 each.

ADDITIONAL / MISCELLANEOUS

The District operates two SA-7 County ambulances. The ambulances are replaced by the County and under their guidelines.

The District also operates an OES water tender. The water tender is replaced by the State and under State guidelines.

APPENDIX 3

El Dorado Hills Fire Department
Apparatus/Equipment List

Apparatus

	Year	Chassis	Builder	Engine	EDH ID#	Replacement
Engine 284	1995	International	West-Mark 4x4	Int	8560	2011/12
*Engine 285	1996	International	West-Mark 4x4	Int	8561	2011/12
Engine 85	1996	HME	Hi Tech	Detroit	8571	2010/11
*Engine 385	1999	HME	Westates	Cummins	8572	2013/14
Truck 85	2000	Spartan	Marion105'AI	Detroit	8591	2014/15
Air 85	2002	International	Hackney air/light	Int	8551	2017/18
Engine 84	2003	Spartan	Ferrara	Cummins	8570	2018/19
Engine 287	2004	International	West-Mark 4x4	Int	8562	2019/20
Engine 286	2007	International	West-Mark 4x4	Int	8563	2022/23
Engine 86	2007	Spartan	Ferrara	Cummins	8574	2022/23
Engine 87	2010	Ferrara/Igniter	Ferrara	Cummins	8576	2024/25

Utilities

	Year	Make/Model	Details	EDH ID#	Replacement
Utility	1999	Ford F350	Utility bed	8542	2009/10
Staff	2003	Ford Exp		8544	2013/14
Staff	2003	Ford Exp		8546	2013/14
Staff	2003	Ford Exp		8548	2013/14
Duty Chief	2003	Ford Exp	Command	8549	2013/14
Utility	2005	Ford F350	Pick-Up	8539	2015/16
Staff	2005	Ford Exp		8540	2015/16
Utility	2006	Ford F350	Pick-Up	8541	2016/17

SA 7 Ambulance

	Year	Make/Model	Builder	EDH ID#
Medic 285	2004	Ford F450	Wheeled Coach 4x4	0201
Medic 85	2010	Dodge	Med Tech 4x4	3246

CAL EMA Water Tender

	Year	Make/Model	Builder	Engine	EDH ID#
Water Tender	2002	Freightliner	Westates	Mercedes	OES41

APPENDIX 4

Additional Information

EDHFD's mechanic, Doug Veerkamp General Engineering, Inc., recommended replacing/selling the 1999 HME at the earliest convenience and also recommended replacing/selling the 1996 International before replacing/selling the 1995 International.

8571/Engine 85, a 1996 HME-HiTech, is the first due engine from Station 85 and can be cross-staffed with Truck 85. Engine 85's current mileage is 67,825 and is 16 years old.

8573/1990 Spartan, with approximately 79,730 miles and was 20 years old, was sold to Sutter Creek Fire Department during 2010/11 fiscal year.