



LOS ANGELES FIRE DEPARTMENT

RALPH M. TERRAZAS
FIRE CHIEF

August 19, 2019

BOARD OF FIRE COMMISSIONERS FILE NO. 19-091
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TO: Board of Fire Commissioners

FROM:  Ralph M. Terrazas, Fire Chief

SUBJECT: LAFD FLEET METRICS

FINAL ACTION:	<input type="checkbox"/> Approved	<input type="checkbox"/> Approved w/Corrections	<input type="checkbox"/> Withdrawn
	<input type="checkbox"/> Denied	<input type="checkbox"/> Received & Filed	<input type="checkbox"/> Other

SUMMARY

The Los Angeles Fire Department (LAFD) Board of Fire Commissioners requested an update on metrics used by the Maintenance Section that gauge how long LAFD vehicles are in service, the fleet maintenance workload, mechanic staffing levels, and whether or not the Department's fleet maintenance targets are being met. This report presents the information requested and provides a status update on the condition and operational readiness of the LAFD fleet.

RECOMMENDATION

That the Board receive and file.

FISCAL IMPACT

There is no fiscal impact associated with this report.

DISCUSSION

Fleet metrics measure fleet resources and fleet-related activities. One key metric the Maintenance Section uses is a scoring matrix called **Apparatus Asset Assessment** which assigns delineated values to a set of condition factors that, when combined, produce a numerical score that represents a vehicle's over-all condition. Another key metric used by the Maintenance Section is the **Fleet Availability Index** which is a score based on the total number of days vehicles are in service and available divided by the total number of days vehicles are in the fleet. Together, these metrics provide an "at-a-glance" appraisal of the LAFD fleet and fleet maintenance operations.

As of today, the overall condition score of the LAFD fleet indicates 61% of LAFD vehicles with replacement thresholds are due for replacement based on miles, age, and/or condition and the overall fleet availability index is trending slightly up, but is still below the target of 95% uptime.

The chart below shows the current condition scores for LAFD vehicles with replacement thresholds that are now at or exceed their threshold limits based on mileage and/or age. By applying the aforementioned fleet scoring matrix the Supply and Maintenance Division can establish a prioritized list of vehicles to be replaced. The full list is formatted in Microsoft Excel and can be sorted and manipulated as needed thereby allowing fleet managers to identify and prioritize vehicles for replacement fleet-wide or by apparatus type.

Fleet Condition Scores (as of 8/05/2019)				
Apparatus type	Number in fleet	Due for replacement	Not due for replacement	Percentage due for replacement
Ambulance	237	127	110	0.54
Triples	216	136	80	0.63
Aerials	58	43	15	0.74
Light Vehicles	728	398	330	0.55

Exhibit A (Attached) shows the average **Fleet Availability Index** from July 1, 2017 to August 2, 2019. The data shows that the Department must have sufficient reserve vehicles of every type to compensate for deficits in fleet availability due to routine maintenance. Best in class highway fleets strive for 95% fleet availability. However, LAFD's fleet availability ranges between 74% and 85% for Triples, Aerial Ladder Trucks (Aerials), and Rescue Ambulances (RA) which is understandable given the complexity, rigorous use, and high condition standards common with fire department vehicles.

Contributing elements of the **Apparatus Asset Assessment** and the **Fleet Availability Index** are the following sub metrics which are discussed in more detail below:

Vehicles Down

Vehicles Down measures the number of vehicles out of service for mechanical repair at any given time and is expressed as a percentage of vehicles in the fleet or in a sub group of the fleet. Vehicles that are out of service contribute to lower fleet assessment scores and, conversely, lower fleet assessment scores portend increased vehicle break downs resulting in more days out of service. Likewise, the number of vehicles down also affects the fleet availability index. *Vehicles Down* is influenced by the number of vehicles in the fleet and the vocation, age, condition, and utilization of these vehicles including accidents and driver wear and tear.

Vehicles Down communicates operational readiness of the LAFD fleet and is monitored daily by Fleet Maintenance Supervisors and the Supply and Maintenance Division Commanders in the format of the Daily Progress Report. The Supply and Maintenance Division's target for the *Vehicles Down* metric is no more than 50% of the number of reserve apparatus, by type.

The information in the tables below contains data showing average *Vehicles Down* data for Fiscal Year (FY) 2018-19 and comparison data for 6 years prior. Current *Vehicles Down* data indicates greater reliance on reserve apparatus which, anecdotally, is attributed to a growing fleet, an aging fleet, and more complex vehicles.

Daily Progress Report – Vehicles Down Summary (as of 8/05/19)				
Apparatus Type	7 Year Average Out of Service Reserves	FY 2018-19 Average Out of Service Reserves	7 year average No. of Front Line Vehicles to (1) Reserve	FY 2018-19 No. of Font Line Vehicles to (1) Reserve
Triples	80.79%	90.25%	35	49
Trucks	80.74%	85.73%	20	20
RA's	70.42%	92.94%	12	21

Vehicles Out of Service as of June 30, 2019		
Bureau	Number of Vehicles Out of Service	Average Number of Days in Shop
Operations Central Bureau	24	252
Operations South Bureau	20	157
Operations Valley Bureau	42	249
Operations West Bureau	19	146
Other Bureaus	21	180

Workload and Staffing

The first indicator of workload is the dynamic number of pending trouble tickets and the second indicator or workload is the estimated labor hours required to perform these repairs.

Currently, for calendar year 2019, there are 931 trouble tickets in queue for all vehicles. The Maintenance Section does not have a target number for how many trouble tickets are appropriate. However, the maintenance section constantly strives to address all mission critical and safety critical repair requests immediately to minimize vehicles down and maximize apparatus availability.

The chart below shows trouble ticket statistics for the LAFD fleet for calendar years 2018 and 2019:

Trouble Ticket Statistics				
Period	Total No. of Repair Requests	Priority No. 1 Repair Requests	Completed Repair Requests	Completion Rate
2018 (actual)	12211	2488	10167	83%
2019 (trending)	6284	1532	4347	69%
As of 8/02/19 the Maintenance Section has 986 trouble tickets in queue, of which 106 are priority No. 1.				

The fleet maintenance workload and the requisite labor is expressed in Mechanical Repair Units (MRU's), where (1) MRU represents the number of labor hours (performed by a Journey Level Mechanic) that are required to accomplish the totality of maintenance and repairs on a base fleet vehicle for one year. At LAFD, (1) MRU equates to 13.5 labor hours which is the current average number of labor hours needed to maintain (1) LAFD sedan for one year. Total annual labor hours for the entire fleet or a portion of the fleet are determined and then divided by 13.5 hours, which gives the required number of MRU's to maintain those vehicles. In similar fashion, the total number of available employee hours is also divided by 13.5 hours which produces a score of MRU's of available labor.

The MRU's needed for a group of vehicles and the MRU's of labor by the available workforce are then examined and compared to determine workload and required staffing. MRU's are an effective way to quantify workload and required labor for different types of vehicles across a varied fleet. Exhibit B (Attached) displays the required MRU's for all LAFD vehicles and the available MRU's from LAFD's current fleet maintenance workforce. Additional data for this metric will be available after the full implementation of the City's new fleet information management system.

CONCLUSION

The Fire Department fleet is unique in that its vocation is to be ready when it is needed regardless of whether or not it is actually used. Other fleets can measure their operational readiness against how much the vehicle is actually used. For LAFD, "use" is not just responding to incidents, but also being ready to respond if and when a vehicle is needed. All LAFD emergency apparatus, whether in frontline service or in reserve status, are expected to be ready and available whenever they are needed. The mission of the Maintenance Section is to provide a safe, reliable, and fully functional fleet of fire apparatus in support of LAFD's public safety mission to preserve life and property.

Board report prepared by Mark Clark, Equipment Superintendent, Supply and Maintenance Division.

Attachments: Exhibit A, Exhibit B

EXHIBIT A

Fleet Availability Index (3 year average as of 7/1/17 - 8/02/19)				
Vehicle Type	Total Days in Fleet (7/1/17 to 8/2/19)	Total Days Out of Service (7/1/17 to 8/2/19)	Total Days Available (Days in fleet minus days out of service) (7/1/17 to 8/2/19)	Average Availability (Total days available divided by total days in fleet (7/1/17 to 8/2/19)
Ambulance	179832	44111	135721	75.47%
Triple	160782	23703	137079	85.26%
Aerial	46482	11496	34986	75.27%
Combined	387096	79310	307786	79.51%

EXHIBIT B

Labor Requirements		Labor Available	
Vehicle Type	Yearly MRU Requirements		Positions filled
Aerial Ladder Trucks	804	Journey level Mechanics/Tech	
Triples	1782		
Ambulances	1274	Equipment Mechanics	19
Sedans	349		
SUV's	319	Heavy Duty Equipment Mechanics	28
Pick up trucks	117		
Vans	53	Auto Body Builder Repairs	5
Airport Crash Rigs	44		
Fire Boats	136	Senior Mechanics	4
Patient Gurneys	140		
Heavy Special Vehicles	335	Mechanical Repairers	2
Breathing Air Compressors	69		
Earth Moving Equipment	45	Total No. Staffed Positions	58
Trailers	26		
Generators	11	Yearly MRU's Produced per Mechanic	100
Forklifts	18		
		Total Annual Workforce MRU's	5800
Total LAFD Fleet	5522		
Workload/Staffing Summary: Workload = 5522 MRU's - Staffing = 5800 <i>potential</i> MRU's			