Department New Request Form
Fiscal Year 2020

Major Department	**Central Services**
Division/Sub-Department	Fleet Maintenance
Request Category	**New**
Request Rating	**Maintain Level of Service**

Rank: 1

Title of New Request: New Fleet Technician

Funded?

1. Request Rationale:

The City of Missoula Fleet Maintenance Dept. is undermaned and needs more employees. With the addition of Missoula Water, Garden City Compost, Fort Missoula Regional Part, as well as expansions in every other dept. throughout the City the fleet has grown by over 20% in vehicles and equipment alone not to mention all the small engine equipment. These units are high use and require significant maintenance requiring considerable manpower and time to maintain.

2. Service Delivery Impact:

Without the addition of additional FTE's the Fleet Maintenance dept will no longer be able to sustain the level of service the City of Missoula currently enjoys. we will need to cut support to all enterprise fund equipment and vehicle so that we can keep up with the demand of non enterprise fund equipment and vehicle break downs and maintenance.

3. Personnel Requirements (# FTE's required):

1 FTE

4. Cost Impact of New Program:

Account #	Item	Qnty	Unit Cost	Requested One-Time	Requested Ongoing	FY 2020 Unfunded	FY 2020 Funded	Proposed FY 2021 Ongoing
1000.321.431330.110	Salaries & Wages	2088	25.93		54,142	-	54,142	
1000.321.431330.130	Standby/ Call-in Pay	1	3820		3,820	-	3,820	
1000.321.431330.140	Fringe	2088	10.1384		21,169	-	21,169	
1000.321.431330.220	Allowance	1	1045		1,045	-	1,045	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
			Expense Sub-Total	**-**	**80,176**	**-**	**80,176**	**-**

Revenue Offset:

Account #		Revenue Description	Proposed Onetime Revenue	Proposed Ongoing Revenue
1000.000.342022.00	N	Other Agencies - Veh Maint		81,000
		Revenue Sub-Total	**-**	**81,000**

Net Cost of Impact for New Program	**(824)**

Labor Hours						
		FY16	FY17	FY18	FY19	FY19 Projection
Billable hours WWT and Water		922	609	2,090	631	2,522
Billable hours all Enterprise		1,183	971	2,420	696	2,783
Total shop hours		12,890	11,350	12,734	3,452	12,800
% of time spent on WWT and Water		7 %	5 %	16 %	18 %	20 %
% of time on all Enterprise		9 %	9 %	19 %	20 %	22 %
Labor in Dollars						
		FY16	FY17	FY18	FY19	FY19 Projection
WWT and Water Labor in $		$ 58,570.08	$ 45,606.88	$143,88.97	$ 41,271.08	$ 165,084.31
All Enterprise Labor in $		$ 74,967.30	$ 71,287.48	$ 167,433.47	$ 47,054.75	$ 188,218.99
Total all City Labor in $		$ 736,402.83	$ 748,613.25	$ 843,263.72	$ 229,501.51	$ 918,006.03
Non Enterprise labor in $		$ 661,435.53	$ 677,325.77	$ 675,830.25	$ 182,446.76	$ 729,787.01

MRU Computation Table			
Class	MRU Factor	Vehicles	MRUs
Passenger Cars (non-police)	1	23	23
Pickups, Vans and other light trucks	1.5	201	301.5
Police Patrol vehicles	1.5	33	49.5
Motor Cycles	0.9	4	3.6
Non-pursuit vehicles	1	11	11
Brush Trucks	3.9	2	7.8
Tandem dump trucks	4	9	36
Single axle trucks	3.2	6	19.2
Single axle plow/sander	6.4	8	51.2
Single axle plow/deicer	6.4	8	51.2
Street sweeper	14	14	196
Water tanker, Flusher	4.3	4	17.2
Refuse compactor	1.9	1	1.9
Sewer Trucks	5.4	8	43.2
Graders	4	2	8
Loaders	4.5	9	40.5
Backhoes	2.7	4	10.8
Skid Steer	2.4	4	9.6
Paver	3.8	1	3.8
Chip Spreader	2.3	1	2.3
Rollers	1.8	2	3.6
Distributor trucks	4	2	8
Patch Trucks	3.5	3	10.5
Crack sealer	1.5	1	1.5
Road stiper trucks, paint trucks	4.8	2	9.6
Sign truck	2.7	1	2.7
Bucket Trucks	3.2	1	3.2
Forklift	0.9	5	4.5
Large Mowers	5.4	20	108
Small Mowers	1.8	2	3.6
Chippers, Stump Grinder	1	4	4
Tub Grinders	3.25	2	6.5
Compost Mixer	2.4	1	2.4
Large Generators	1	6	6
Trommel Screens, Screening plant	4.1	3	12.3
ATV's, UTV, utility Vehicles	0.6	14	8.4
Trailers less than 10,000 GVW	0.6	44	26.4
Trailers more than 10,000 GVW	1.2	13	15.6
Weedeaters, Edgers, hedge trimmers, push mowers, blowers, chain saws, concrete saws, small generators	0.3	149	44.7
Total		628	1168.8

Simple Ratio calculations for fleet size to tech	
Transit bus	10:1
School bus	20 to 30:1
Fire departments	30:1
Small towns	35:1
Counties & cities	55 to 60:1
Utilities	55 to 75:1

Estimated Workload and Technician Needs	
Total MRUs (From table 1)	1168.8
Total Hours @ 14.2 hours per MRU	16596.96
In house Hours @ 98 percent in house	16265.02
Estimated number of Technicians needed @ 1560 hours/tech (75- percent utilization)	10.43

In determining the staffing needs for the City of Missoula Fleet Maintenance Department, I took into account a number of different techniques to determine the proper level of technician support that we need for our current fleet. Throughout this document, you will see the three different methods I used and the explanation of those findings. Each of these methods are commonly used in the fleet management industry as well as government sectors to determine proper fleet technician levels today.

Simple Ratios

The most simplistic approach stipulates that a specific number of technicians is needed to support a fleet of a given size. The following table summarizes typical ratios used for different fleet types:

Fleet Size to Technician Simple Ratios	
Transit bus	10:1
School bus	20 to 30:1
Fire departments	30:1
Small towns	35:1
Counties & cities	55 to 60:1
Utilities	55 to 75:1

This is the most fundamental and rudimentary type of staffing ratio and has the advantage of being easy to use. When applied to a specific vehicle type, such as a police car, fire truck, school bus, or trash compactor, this approach can be used in situations where quick and approximate comparisons must be made. In this ratio type calculation, if we take the County and City ratio of 55 to 60:1 and extend that into the City of Missoula Fleet of 628 units, the result is the City of Missoula fleet requires 10.46 technicians to properly maintain the fleet.

Vehicle Equivalency Ratio

A more precise approach takes into account the size and composition of the fleet by applying vehicle equivalents. Most notable are Maintenance and Repair Unit (MRU) factors, which index the maintenance and repair requirements of a vehicle class relative to a base vehicle class, typically a passenger car. Thus, a heavy truck, which has greater maintenance and repair needs than a basic passenger sedan, has a greater MRU factor than a passenger sedan. MRU factors by class are then multiplied by the number of vehicles in each class to produce the number of MRUs. When applied to a "mixed" fleet, such as a local government fleet operation, these factors are summed for the entire fleet to result in the total MRUs, or vehicle equivalents, of the fleet. Through this process, a mixed fleet size is converted to its vehicle equivalent size, which in turn can be used to estimate technician as well as indirect staffing requirements for the fleet operation.

MRUs represent a proxy for workload (See MRU Table below). Once the number of MRUs has been determined, the maintenance and repair workload of the fleet is established. This workload can be converted into staffing requirements in two ways. The first option is the direct ratio approach, in which the number of fleet MRUs is divided by an MRU technician to vehicle ratio. Based on recent public

service benchmarking surveys, this ratio is typically about 78 in-house MRUs per technician, with a basis of 20 hours per.

MRU Computation Table

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With this ratio of MRU to the number of technicians taken into account for the City of Missoula's fleet, then we would divide the fleet size in MRUs and divide that by 78 for in-house MRUs per technician. This equation then says the City of Missoula requires 14.97 technicians to properly maintain its fleet.

Weighted MRUs and Hourly Equivalents

The second option is converting the MRUs into hourly equivalents by multiplying the fleet size expressed in MRUs times the number of hours needed to maintain the base unit. Thus, if the MRU factors had a basis of 12.5 hours per passenger car, a fleet of 400 MRUs would require 5,000 technician hours for maintenance and repair. By dividing these hours by the estimated number of hours a technician has during the year for direct work, the estimated number of needed technicians can be calculated. For example, if technicians average 1,350 direct hours per year, 3.7 technicians would be required for proper maintenance.

The weighting factors used in MRU analysis can be derived in multiple ways. One is to survey fleet managers to obtain their best estimates of the annual total technician hours needed to maintain a particular vehicle class. The median values of their responses are then calculated for each vehicle class. Next, the passenger car is set as the base unit by dividing its technician hour requirement into the technician hour requirements for each vehicle and equipment class. This division yields the respective weighting factors by vehicle and equipment class. The passenger car has a factor of unity (1.0). Another approach is to study the maintenance histories of specific vehicle classes. This is where it gets a little tricky, as typical base rates can average anywhere from 12-20 hours per MRU. Average rates are determined by factoring in fleet age, vehicle type and condition. In a mixed fleet like the City of Missoula, we have to factor these across all different departments and average them to determine one single MRU rate for a base vehicle. With an average MRU base rate of 14.2, the City of Missoula is well below the national average of hours per MRU for our fleet size and age.

After determining the base rate MRUs and the required number of MRUs for each type of vehicle in the fleet, there are a couple more things that determine staffing needs. The first is what percentage of the work performed on the fleet is performed in-house. To account for such differences, the number of MRUs should be reduced in proportion to the percentage of work performed in-house, before any MRU staffing ratios are applied. Similarly, if MRUs were converted to hours, these hours should also be reduced beforehand, dividing by the number of hours per year a technician has available for direct work. The City of Missoula Fleet Maintenance division boasts a 98% in-house repair rating. That means that 98% of the work done on the City of Missoula Fleet is done in our own facility, conversely only 2% is done in other facilities.

The second requirement to determine proper fleet staffing is to determine technician utilization which is presented as a percent of time the technician is actually available to work on the fleet. There are a

number of different factors when determining this percentage. The biggest of these factors is vacation time, holiday pay, sick time, training time, safety meetings, and travel time. When added up on a yearly basis and divided by the number of hours in a work year minus overtime, you come up with a percentage of time utilization. With a national average of 60-65%, the City of Missoula is above average in time utilization for technicians at 75%.

After factoring in the City of Missoula Fleet MRUs (1168.5), our base MRU rate (14.2), while also considering the 98% in-house repair rate and a 75% technician utilization rate, the City of Missoula's fleet maintenance technician level should be about 10.43 technicians. (See Workload table below).

Estimated Workload and Technician Needs	
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