



201 San Antonio Circle, Suite 148
 Mountain View, CA 94040
 v.650.858.0507 f.650.917.2310

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TO: Kevin Willis, Equipment Manager
FROM: Courtney Ramos, Project Manager

SUBJECT: FY16 BILLABLE EQUIPMENT RATES

Currently, the City of Richland annually updates its billable rates for vehicles, in order to recover costs for when the public uses those vehicles for any services. While the actual rates have been changing annually, the methodology used to derive those rates has not been assessed. Additionally, the City has a different billable rate for all of its vehicles, regardless of whether they are the same make, model, and year. This leads to confusion and inconsistency in application of billing rates. Therefore, the City hired Matrix Consulting Group to reevaluate the current methodology and develop streamlined billable rates for its vehicles. The following memo provides an analysis of the methodology used by the project team including the streamlining of vehicle types, the direct costs involved, the indirect overhead, and the resulting billable rates.

1. VEHICLE / EQUIPMENT TYPES

As aforementioned, the City had over 200 different billable rates for vehicles. These rates varied from a low of pennies (\$0.21) for a trailer to a high of \$89.82 for a Cat Compactor. During discussions with staff it was determined that there are only certain pieces of equipment / vehicles that need to be broken out, but other vehicles can be streamlined into category types. The year-end vehicle report classifies all vehicles into the following 10 categories:

Vehicle / Equipment Types	Sample Vehicles
Amb	(Medic Units)
Fire Trucks	(Fire Engines)
Special Equip	(Excavator, Backhoes, Scraper, Dozer)
Heavy Truck	(Dump Trucks, Sweepers, Manlifts, Derricks)
Small Car/Truck	(F-150's, Impalas, Blazers, Explorers)
Small Equip/Trailers	(Trailers, Bldg Gensets, Mowers, Sanders)
Med Size Trucks	(F-350's, Smaller Man Lifts, Flatbed, Svc Body)
Police Patrol	(Caprices, Tahoes, Ford Interceptors)
Refuse	(Roll-Offs, Front Loaders, Automated, Rear Loader)
Small Equip	(Small Generators, Chain Saws, Pumps, Wackers)

The project team initially streamlined all vehicles to be classified as noted above. However, project staff identified an additional category known as specialized equipment that is rented out to private citizens. As such, the project team expanded the vehicle types list to break out these additional categories. The following table shows the list of vehicle types utilized by the project team:

Vehicle / Equipment Type
Ambulance
Backhoe
Bomb Squad
Compost Turner
Construction Loader
Dump Truck
Excavator
Fire Trucks
Grinder
Heavy Truck
Med Size Trucks
Police Patrol
Refuse
Sewer Jet
Small Car / Truck
Small Equipment
Special Equipment

The table above shows that there are now 17 different vehicle types. One vehicle type of Small Equipment and Small Equipment / Trailers was consolidated into one category and there were eight new vehicle categories added. These categories ranged from Backhoe and Bomb Squad to Grinder and Sewer Jet.

2. DIRECT COSTS

There are several cost components that directly affect the cost associated with vehicles and equipment, and which are incorporated into the calculation of a billable rate for vehicles: Annual Depreciation, Annual Vehicle / Equipment Maintenance, and Annual Fuel Cost. The following subsections discuss the direct cost components of the billable rates developed by the Matrix Consulting Group.

(2.1) Annual Depreciation

The primary cost component of a billable rate is the actual cost of the equipment, or its annual depreciation. The project team gathered the City’s current equipment log for all of its vehicles, including purchase price and lifespan. This information was then used to calculate the average annual cost of the vehicle, by spreading the purchase price across the lifespan of vehicle or equipment. Each of those vehicles was then classified into the 17 different categories noted in the previous section. The following table shows the average annual depreciation by vehicle type.

Vehicle Type	Annual Depreciable Cost
Ambulance	\$17,390
Backhoe	\$7,655
Bomb Squad	\$9,559
Compost Turner	\$19,328
Construction Loader	\$9,908
Dump Truck	\$10,381
Excavator	\$4,442
Fire Trucks	\$18,102
Grinder	\$16,629

Vehicle Type	Annual Depreciable Cost
Heavy Truck	\$9,124
Med Size Trucks	\$4,359
Police Patrol	\$11,216
Refuse	\$13,623
Sewer Jet	\$13,408
Small Car / Truck	\$3,157
Small Equipment	\$2,081
Special Equipment	\$4,764

As the table above shows, the annual depreciation for each type of vehicle / equipment varies greatly. The lowest annual depreciation is associated with small equipment at approximately \$2,000 and the highest annual depreciation is associated with a Compost Turner at \$19,000.

(2.2) Annual Vehicle / Equipment Maintenance

In addition to depreciation costs, there are annual maintenance costs that are associated with each type of equipment and vehicle. The Equipment Maintenance staff keeps track of all maintenance performed on each vehicle within the City. The project team gathered equipment maintenance data from the last six years (2010, 2011, 2012, 2013, 2014, and 2015) and utilized that information to generate an average annual maintenance cost. Similar to depreciation each vehicle was classified into its primary type and then the average maintenance cost for that vehicle throughout the years was calculated based upon its type. The following table shows the average annual maintenance cost by vehicle type:

Vehicle Type	Annual Maintenance Cost
Ambulance	\$7,112
Backhoe	\$4,996
Bomb Squad	\$1,106
Compost Turner	\$17,162
Construction Loader	\$8,432
Dump Truck	\$4,802
Excavator	\$1,927
Fire Trucks	\$11,509
Grinder	\$29,068
Heavy Truck	\$5,335
Med Size Trucks	\$2,545
Police Patrol	\$2,484
Refuse	\$13,230
Sewer Jet	\$8,659
Small Car / Truck	\$1,720
Small Equipment	\$1,897
Special Equipment	\$6,474

As the table above shows the average annual maintenance cost is much higher for larger vehicles and equipment such as Grinders, Compost Turners, and Refuse Trucks. This is due to the parts for those equipment being much more expensive comparative to annual maintenance costs of trucks or police patrol vehicles. It is important to note that the average annual maintenance cost also accounts for labor cost associated with repairing the vehicles.

(2.3) Annual Fuel Cost

The final direct component associated with billable rates is the annual fuel cost. Depending upon how many miles a vehicle has traveled it is fueled fairly frequently. The cost of fuel has varied greatly in the last several years, therefore to normalize the fuel costs, the project team took an average of the last three years and the current year (2013-2016 YTD) to calculate the average fuel cost per vehicle type. The following table shows the annual fuel cost by vehicle type:

Vehicle Type	Annual Fuel Cost
Ambulance	\$5,887
Backhoe	\$1,996
Bomb Squad	\$719
Compost Turner	\$5,014
Construction Loader	\$817
Dump Truck	\$2,914
Excavator	\$332
Fire Trucks	\$2,949
Grinder	\$9,422
Heavy Truck	\$2,675
Med Size Trucks	\$2,422
Police Patrol	\$39,897
Refuse	\$6,452
Sewer Jet	\$2,919
Small Car / Truck	\$2,173
Small Equipment	\$1,384
Special Equipment	\$11,971

As the table above shows annual fuel cost is highest for the Police Patrol vehicles as they are used and thereby fueled much more frequently relative to vehicles such as a Bomb Squad or Construction Loader.

(2.4) Total Direct Cost

Combining each of the direct cost components: depreciation, maintenance, and fuel results in the total average annual direct cost of each vehicle. The following table shows the total average direct cost by vehicle type.

Vehicle Type	Total Direct Cost
Ambulance	\$30,388
Backhoe	\$14,647
Bomb Squad	\$11,385
Compost Turner	\$41,504
Construction Loader	\$19,157
Dump Truck	\$18,098
Excavator	\$6,701
Fire Trucks	\$32,560
Grinder	\$55,119
Heavy Truck	\$17,133
Med Size Trucks	\$9,326
Police Patrol	\$53,597
Refuse	\$33,305

Vehicle Type	Total Direct Cost
Sewer Jet	\$24,986
Small Car / Truck	\$7,050
Small Equipment	\$5,362
Special Equipment	\$23,208

As the table above shows, the average total annual direct cost of the vehicles range from a low of \$5,362 for Small Equipment to a high of \$55,119 for the Grinder. The average annual cost of Police Patrols is significantly high at \$53,597 as a direct result of the annual fueling costs of each police patrol vehicle.

3. INDIRECT OVERHEAD

The total cost of any vehicle or equipment must also factor in indirect overhead costs associated with managing that vehicle or equipment. The project team utilized the results from the Citywide Cost Allocation Plan to develop an indirect overhead rate percentage to be applied to each vehicle type's total direct costs. The indirect overhead rate is calculated by taking the total indirect costs associated with Equipment Maintenance (FY16 Cost Allocation Plan) and dividing it by the total direct costs (FY16 Budgeted Expenditures) for Equipment Maintenance. The following table shows the calculation of the indirect overhead rate percentage:

Cost Category	Amount
FY16 Cost Allocation Indirect Charge for Equipment Maintenance	\$276,792
FY16 Budgeted Expenditures for Equipment Maintenance	\$3,534,169
INDIRECT OVERHEAD RATE	7.83%

As the table above shows, the indirect overhead rate for Equipment Maintenance is 7.83%. This indirect overhead rate was applied to the total direct annual cost of each of the vehicles to arrive at the Annual Indirect Cost of each vehicle. The following table shows the indirect overhead cost associated with each vehicle type:

Vehicle Type	Indirect Overhead
Ambulance	\$2,380
Backhoe	\$1,147
Bomb Squad	\$892
Compost Turner	\$3,251
Construction Loader	\$1,500
Dump Truck	\$1,417
Excavator	\$525
Fire Trucks	\$2,550
Grinder	\$4,317
Heavy Truck	\$1,342
Med Size Trucks	\$730
Police Patrol	\$4,198
Refuse	\$2,608
Sewer Jet	\$1,957
Small Car / Truck	\$552
Small Equipment	\$420
Special Equipment	\$1,818

As the previous table shows, the indirect cost based on vehicle type varies and is much higher for those vehicle types with a higher annual cost such as Grinders and Police Patrol and lower for Small Equipment and Medium Sized Trucks.

4. BILLABLE HOURLY RATES

The following subsections detail the calculation of the billable hourly rates by showing the total annual cost (direct and indirect) and the annual productive hours used to calculate the billable rates.

(4.1) Total Annual Cost

The direct and indirect cost components are combined together to derive the average total annual cost for each vehicle. The following table shows the average total annual cost by vehicle type:

Vehicle Type	Annual Total Cost
Ambulance	\$32,768
Backhoe	\$15,794
Bomb Squad	\$12,276
Compost Turner	\$44,754
Construction Loader	\$20,658
Dump Truck	\$19,515
Excavator	\$7,226
Fire Trucks	\$35,110
Grinder	\$59,436
Heavy Truck	\$18,475
Med Size Trucks	\$10,057
Police Patrol	\$57,795
Refuse	\$35,913
Sewer Jet	\$26,942
Small Car / Truck	\$7,602
Small Equipment	\$5,781
Special Equipment	\$25,026

The table above shows that the total annual cost varies dramatically by equipment / vehicle with items such as Grinders having an annual cost of nearly \$60,000 and Refuse Trucks having costs closer to \$36,000.

(4.2) Annual Productive Hours

The calculation of an hourly rate requires dividing the total annual cost by the number of productive hours for each equipment type. Typically the productive use of equipment requires an employee to use that equipment either by operating it or driving the vehicle. Therefore, the project team calculated the annual productive hours for each vehicle type based on the productive hours of an employee.

A full-time employee typically has 2,080 hours (40 hours per week at 52 weeks) available to work in a year. However, not all of these hours are productive, as there is vacation, leave, breaks, holidays, trainings, and meetings. Accounting for all of these “unbillable” hours results in approximately a 23% percent reduction that can be applied to the 2,080 hours. Therefore, the annual productive hours calculated for this study resulted in 1,600 annual productive hours.

(4.3) Billable Hourly Rates

The billable hourly rates calculated for equipment for FY16 takes the total annual cost by each vehicle type and divides it by the total annual productive hours. The following table shows the resulting billable rates by vehicle type:

Vehicle Type	Annual Total Cost	Annual Available Hours	Fully Burdened Hourly Rate
Ambulance	\$32,993	1,600	\$20.48
Backhoe	\$15,902	1,600	\$9.87
Bomb Squad	\$12,361	1,600	\$7.67
Compost Turner	\$45,062	1,600	\$27.97
Construction Loader	\$20,799	1,600	\$12.91
Dump Truck	\$19,649	1,600	\$12.20
Excavator	\$7,275	1,600	\$4.52
Fire Trucks	\$35,351	1,600	\$21.94
Grinder	\$59,844	1,600	\$37.15
Heavy Truck	\$18,602	1,600	\$11.55
Med Size Trucks	\$10,126	1,600	\$6.29
Police Patrol	\$58,192	1,600	\$36.12
Refuse	\$36,160	1,600	\$22.45
Sewer Jet	\$27,128	1,600	\$16.84
Small Car / Truck	\$7,655	1,600	\$4.75
Small Equipment	\$5,821	1,600	\$3.64
Special Equipment	\$25,198	1,600	\$15.64

As the table above shows the Fully Burdened Hourly Rate for the vehicle varies depending upon its annual total cost. The hourly rate for small equipment is \$3.64 compared to \$20.62 for an ambulance or \$37.40 for a Grinder. The project team compared the fully burdened hourly rates to the current average hourly rates charged by the City for these categories. The following table shows the fully burdened hourly rate, the current rate, and the associated surplus / deficit.

Vehicle Type	Fully Burdened Hourly Rate	Current Rate	Surplus / (Deficit)
Ambulance	\$20.48	\$24.16	\$3.68
Backhoe	\$9.87	\$17.58	\$7.71
Bomb Squad	\$7.67	\$14.74	\$7.07
Compost Turner	\$27.97	\$75.30	\$47.33
Construction Loader	\$12.91	\$24.65	\$11.74
Dump Truck	\$12.20	\$7.18	\$(5.02)
Excavator	\$4.52	\$5.35	\$0.83
Fire Trucks	\$21.94	\$48.96	\$27.02
Grinder	\$37.15	\$75.30	\$38.15
Heavy Truck	\$11.55	\$5.49	\$(6.06)
Med Size Trucks	\$6.29	\$5.49	\$(0.80)
Police Patrol	\$36.12	\$4.50	\$(31.62)
Refuse	\$22.45	\$0.48	\$(21.97)
Sewer Jet	\$16.84	\$11.01	\$(5.83)
Small Car / Truck	\$4.75	\$2.70	\$(2.05)
Small Equipment	\$3.61	\$2.66	\$(0.95)
Special Equipment	\$15.64	\$0.69	\$(14.95)

As the previous table shows, the City is under-recovering its cost for 9 out of the 17 categories or nearly half of the vehicle types. In other cases the City is over-recovering for vehicle types such as Compost Turner or Grinder.

5. SUMMARY

Overall, the City is under-recovering for the majority of its vehicles based upon the fully burdened cost calculated by the project team. Utilizing a streamlined equipment and billable rates schedule will promote consistency in billing as well as make it easier for City employees to internally update the billable rates based on changes in direct and indirect costs.