



Agenda Item # _____

Staff Report

City of Manhattan Beach

TO: Honorable Mayor Montgomery and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Jim Arndt, Public Works Director
Juan Price, Maintenance Superintendent
Guy Mescheder, Equipment Maintenance Supervisor

DATE: October 7, 2008

SUBJECT: Consideration of the City Council Work Plan Item to Discuss the Vehicle Replacement Options

RECOMMENDATION:

Staff recommends that the City Council review the report and refer this issue to the Environmental Task Force for consideration along with other strategies for reducing the City's carbon emissions.

FISCAL IMPLICATION:

Total fleet replacement would consist of six sedans, six mini-vans/small SUV's, eight small pickups, 33 light/medium duty utility/pickups, eight heavy duty trucks, and 30 other various pieces of equipment. Total fleet replacement would cost an estimated \$1,958,000 (Cost of replacement vehicles, less resale value of vehicles replaced).

BACKGROUND:

The current fleet consists of passenger sedans, light to heavy duty trucks, passenger vans and light buses, in addition to miscellaneous specialized powered equipment (asphalt rollers, brush chippers, rubber tire loaders, etc.). Some of these vehicles are specialized and do not have alternative fueled equivalents, particularly those associated with Police and Fire services. City Council, as part of their annual Work Plan, directed staff to estimate the cost of replacing the current fleet with alternative fueled replacement vehicles.

DISCUSSION:

Matrix "A" details replacement candidate vehicles and potential alternative fueling. Matrix "B" lists the current contingent of alternative fueled and hybrid vehicles, and Matrix "C" lists the vehicles that have no equivalent alternative fuel replacement at this time. Police and Fire Department vehicles are not included because of their special operational needs such as pursuits, long periods of idling, mutual aid, and lack of a comprehensive area wide alternative fuel infrastructure. More importantly, alternative vehicle technologies are not available that offer operationally equivalent performance at this time

The acquisition of alternative fueled vehicles runs the gamut from simple to complex, especially as it relates to light and heavy duty trucks. Acquiring alternative fueled vehicles can require arranging third-party installation of the fuel systems depending on fuel such as CNG (compressed natural gas) or LNG (liquefied natural gas). In most cases hybrid or electrically powered alternatives are not available for the vehicles needed by the City. Utility body and work trucks pose the largest hurdle. Right-sizing of vehicles and moving to electric types are the priorities while keeping in mind the needs of the user. CNG installations, in most cases, require the need for a large tank of compressed natural gas to be mounted in the working area of the truck bed. In some cases, if space is available, tanks are mounted under the bed. When mounted under the bed, these tanks tend to be smaller, which lowers fuel capacity and ultimately range and usability. Bed mounted tanks, the most frequently encountered arrangement, take up much of the cargo space usually reserved for tools and equipment. (See attached photographs)

Departments utilizing these specialized trucks may lose some operational effectiveness. Instead of one truck two may be necessary, or inefficiencies may result, i.e., multiple trips due to reduced cargo capacity. Technology is improving and more hybrids in the medium duty truck arena are coming to market. One such vehicle is a new Ford E450 Van which will be offered in a van style cut-away chassis version. Depending on the placement of the battery pack, this could be an answer to the replacement of utility trucks. Even though a hybrid vehicle is not technically considered an alternative fuel vehicle, it does have a reduced emissions footprint and lower fossil fuel demand.

Initial investigations reveal that “right-sizing” could open up additional replacement possibilities, but embedded prejudicial perception and safety concerns would have to be overcome. To illustrate the point, there are several all electric vehicles that are classified as a Neighborhood Electric Vehicles (NEV) that could be used in the City’s fleet. These vehicles are limited by law to a top speed of 25 miles per hour (although they are capable of higher speeds), approximate 30 to 60 mile driving range, and have reduced safety features. Hilly terrain and length of top speed use, as well as payload, can diminish the range. The reason for the 25 miles per hour speed limitation is due to an abbreviated safety feature set (these vehicles are currently designed without airbags). Though they can legally drive on roads posted as 35 miles per hour zones, the vehicles limited top speed of 25 mph could negatively impact traffic flow, especially during peak traffic periods. These vehicles are widely available in several configurations, including mini-sedans and small utility bodies. If vehicles of this type were incorporated into the current fleet, a smaller number of larger conventional alternative fuel vehicles would be used only in those instances where a larger vehicle had to be employed.

FUELING INFRASTRUCTURE

Electric

The Public Works yard is currently at capacity for electrical recharging infrastructure. To facilitate additional electrical vehicles, new service drops and upgrades to the existing electrical system would be needed. In addition, dedicated parking/charging stations will need to be added both at the yard and targeted City facilities. These charging stations could prove useful for plug-in hybrids as well. A complete battery recharge can take anywhere from four to twelve hours depending on the make and model of vehicle. Connection devices are often proprietary and final installation costs, specific layouts, and infrastructure needs will be manufacturer specific.

CNG and LNG

CNG has been the preferred choice of the City for true alternative fueled vehicles. The current fueling system is based on proven technologies. Service and repair of these compressed gas systems is readily available and the system has proven relatively trouble free. CNG has a travel range that is less than that of a comparable gasoline powered vehicle. Due to the abbreviated distances typically encountered during a workday by maintenance and other crews, the limited range is not a significant factor. Average range for a CNG vehicle ranges between eighty (80) to one hundred and twenty (120) miles on a full tank. Acquiring a full tank would require a compressor capable of delivering the full amount of pressure and utilizing a slow fill station. The time needed would be a minimum of six (6) hours to fill to capacity depending on the tank amount and size.

The City currently has the physical capability to easily double its existing fueling station at the Public Works Facility. Appropriate spare fuel and electrical lines were added at the time of initial installation. However, operational factors would have to be factored into the decision as to whether the current compressor and fueling system would be adequate if the City made the decision to wholly or in large part invest in a CNG fleet. Matrix "B" lists the current (11) natural gas vehicles. If the decision were made to continue to expand the fleet beyond a simple doubling of capacity, a system expansion would be necessary. Additionally, for extended trips outside the limited range, other vehicles might provide a better choice.

An additional factor in making a decision to invest on either LNG or CNG is whether a regional or inter agency fueling station could be constructed. The ideal scenario would be one where LNG became the fuel of choice. LNG is natural gas in a liquefied form. LNG addresses many of the limitations of using compressed natural gas, as the smaller tanks carry similar amounts of fuel and do not require the large payload reducing compressed gas cylinders of CNG. This liquefied gas is delivered via truck in a similar manner to diesel or gasoline fuels. Large insulated storage cylinders maintain the LNG in liquid form to be dispensed into individual vehicles. The LNG is a "perishable" product, i.e., the liquid slowly converts into a gaseous state and is vented, therefore regular turnaround is required to ensure efficiency. In plain speaking, the fleet must consume sufficient quantities of LNG to make it a viable fueling source. Typically, LNG terminals are higher volume installations serving large heavy duty fleets such as trucks and buses and it would be difficult to ensure a fleet large enough to justify a City owned LNG fueling station.

Diesel Fueled Vehicles

The City's diesel powered fleet is one hundred (100) percent compliant regarding the installation of diesel particulate traps for the exhaust systems. These traps reduce emissions by collecting the particulate matter and soot in the filters and then burning them off at high temperatures which results in a cleaner exhaust. Emergency vehicles are exempt from these traps since the traps have been known to fail on occasion. When a trap becomes clogged, it causes the vehicle to have engine failure. This could prove to be fatal if the vehicle was responding to or actively engaged in an emergency call. Diesel technologies are evolving rapidly; however diesel exhaust technologies lag behind gasoline equivalents, primarily due to the difficulties in reducing nitrogen oxides.

CONCLUSION:

Alternative fuel technologies are rapidly evolving, and there is considerable debate as to which

technologies will continue to evolve and be refined versus those which will prove either temporary or dead ends. A percentage of the City's current fleet can and has been replaced with alternative fueled vehicles as part of our current vehicle replacement program. It is very unpredictable as to what, if any, suitable alternative fuel source will ultimately become the best choice. Investment today in a single source of fueling could prove to be premature and misdirected until sources of energy, vehicles, and their uses are better defined. Whichever decision is made, it is clear that both infrastructure development and training of fleet staff to maintain these newer technologies should be considered. Both of these factors could significantly impact budgetary estimates beyond the base costs of simple vehicle replacement.

Staff believes that our current process of evaluating every vehicle at its regular replacement interval for replacement with an alternative fuel vehicle is appropriate. However, we also believe that this report should be forwarded to the Environmental Task Force for consideration along with other strategies for reducing the City's carbon emissions.

Glossary

- CNG – Compressed Natural Gas
- LNG – Liquefied Natural Gas
- NEV – Neighborhood Electrical Vehicle
- LEV- Low Emissions Vehicle
- ULEV- Ultra Low Emissions Vehicle
- SULEV- Super Ultra Low Emissions Vehicle

FLEET ELIGIBLE FOR ALTERNATIVE FUEL

Matrix "A"

VEHICLE NO.	DEPT NAME	EXISTING VEHICLE MAKE/MODEL	YEAR	MILEAGE	FUEL TYPE	FAIR VALUE	RECOMMENDED REPLACEMENT FUEL TYPE	ESTIMATED REPLACEMENT COST
328	BLDG MAINT	FORD F250	2008	229	R/UNL	\$13,300	CNG Conversion	\$43,000
525	BLDG MAINT	FORD PICKUP F250	1992	77,342	R/UNL	\$2,600	CNG Conversion	\$43,000
324	BLDG MAINT	FORD UTILITY F250 3/4 TON	1994	44,671	R/UNL	\$4,195	CNG Conversion	\$43,000
326	BLDG MAINT	FORD F250 SUPER DUTY	2007	2,617	R/UNL	\$13,300	CNG Conversion	\$43,000
327	BLDG MAINT	FORD F250 SUPER DUTY	2007	130	R/UNL	\$13,300	CNG Conversion	\$43,000
251	BLDG. INSP.	CHEVROLET BLAZER 4X4	1998	62,641	R/UNL	\$3,725	Hybrid/LEV/ULEV/SULEV	\$30,000
250	BLDG. INSP.	FORD RANGER	2006	10,600	R/UNL	\$10,665	Hybrid/LEV/ULEV/SULEV	\$30,000
253	BLDG. INSP.	CHEVROLET S10 BALZER	1999	50,070	R/UNL	\$4,915	Hybrid/LEV/ULEV/SULEV	\$30,000
103	BLDG. INSP.	FORD TAURUS	2001	52,335	R/UNL	\$3,680	Hybrid/LEV/ULEV/SULEV	\$27,000
002	CITY MANAGER	TOYOTA AVALON	2007	10,988	P/UNL	\$22,720	Electric	\$30,000
1003	DIAL A RIDE	GLAVAL 13 PASSENGER	2006	25,600	R/UNL	\$58,000	CNG Conversion	\$100,000
1004	DIAL A RIDE	GLAVAL BUS 13 PASSENGER	2006	22,935	R/UNL	\$58,000	CNG Conversion	\$100,000
1006	DIAL A RIDE	FORD E350	2003	44,797	R/UNL	\$10,280	CNG Conversion	\$70,000
243	ENGINEERING	FORD RANGER PICK UP	2005	16,103	R/UNL	\$5,935	Hybrid/LEV/ULEV/SULEV	\$30,000
391	GARAGE	FORD F250 UTILITY	1996	49,525	R/UNL	\$4,670	CNG Conversion	\$43,000
186	GARAGE	FORD TAURUS 4 DOOR	1993	71,905	R/UNL	\$1,455	Hybrid/LEV/ULEV/SULEV	\$27,000
240	P.W. ADMIN	CHEVROLET BLAZER	2001	48,651	R/UNL	\$5,485	Hybrid/LEV/ULEV/SULEV	\$30,000
200	P.W. ADMIN	FORD EXPLORER	2004	13,657	R/UNL	\$9,160	Hybrid/LEV/ULEV/SULEV	\$30,000
254	PURCHASING	FORD AEROSTAR CARGO VAN	1995	37,859	R/UNL	\$1,860	Hybrid/LEV/ULEV/SULEV	\$30,000
003	RECREATION	NISSEN FRONTIER 4X4	200	31,948	R/UNL	\$8,615	Hybrid/LEV/ULEV/SULEV	\$37,000
106	RECREATION	TOYOTA SIENNA	2006	16,480	R/UNL	\$18,735	Hybrid/LEV/ULEV/SULEV	30,000
104	RECREATION	CHEVROLET CAVALIER LS	2002	36,900	R/UNL	\$4,685	Hybrid/LEV/ULEV/SULEV	\$27,000
318	RECREATION	FORD E350 CARGO VAN	1994	27,642	R/UNL	\$2,570	CNG Conversion	\$43,000
310	RECREATION	FORD F150	2003	25,944	R/UNL	\$6,870	CNG Conversion	\$43,000
124	RECREATION	CHEVROLET MALIBU	2001	61,378	R/UNL	\$4,785	Hybrid/LEV/ULEV/SULEV	\$27,000
123	RECREATION	FORD TAURUS LX	2000	67,769	R/UNL	\$3,000	Hybrid/LEV/ULEV/SULEV	\$27,000
364	SEWER MAINT	CHEVROLET 2500 3/4 TON	2000	75,392	R/UNL	\$6,000	CNG Conversion	\$43,000
523	SEWER MAINT	GMC 3500 MINI DUMP	1989	42,065	R/UNL	\$5,500	CNG Conversion	\$43,000
524	SEWER MAINT	GMC HYDRO TOPKICK	1991	56,137	DIESEL	\$30,000	CNG Conversion	\$80,000
363	STREET MAINT.	CHEVROLET 3/4 TON PICK UP	2000	35,896	R/UNL	\$6,200	CNG Conversion	\$43,000
554	STREET MAINT.	GMC C 7500 DUMP BED	2000	32,450	DIESEL	\$27,000	CNG Conversion	\$120,000
555	STREET MAINT.	FORD F750XL SUPER DUTY	2000	22,823	DIESEL	\$29,000	CNG Conversion	\$120,000
369	STREET MAINT.	CHEVY C2500	2000	95,187	R/UNL	\$6,640	CNG Conversion	\$43,000
314	STREET MAINT.	FORD F250 HEAVY DUTY PICKUP	1997	46,458	R/UNL	\$5,075	CNG Conversion	\$43,000
381	STREET MAINT.	FORD F250 SUPER DUTY PICKUP	1999	26,295	R/UNL	\$5,895	CNG Conversion	\$43,000
518	STREET MAINT.	FORD F350 SUPER DUTY	1997	18,845	R/UNL	\$5,335	CNG Conversion	\$52,000
371	STREET MAINT.	FORD F350 SUPER DUTY CREW	2003	22,563	R/UNL	\$14,310	CNG Conversion	\$52,000
511	STREET MAINT.	GMC DUMP BED TOPKICK	1994	37,231	DIESEL	\$24,000	CNG Conversion	\$120,000
354	STREET TRAFFIC	FORD F250 SUPER DUTY UTILITY	1999	52,647	R/UNL	\$6,595	CNG Conversion	\$43,000
322	STREET TRAFFIC	FORD F350 STENCIL	1993	37,350	R/UNL	\$3,945	CNG Conversion	\$52,000
325	STREETS PARKS	FORD F250 3/4 TON UTILITY	1995	39,684	R/UNL	\$4,670	CNG Conversion	\$43,000
513	STREETSCAPE	FORD F350	2006	9,380	R/UNL	\$7,285	CNG Conversion	\$52,000
512	STREETSCAPE	CHEVROLET W4500	1999	30,780	R/UNL	\$29,360	CNG Conversion	\$55,000
312	UTILITIES ELECT	FORD F250 UTILITY BED	1995	50,510	R/UNL	\$3,725	CNG Conversion	\$43,000
375	WATER SYS MAINT	FORD F250	2005	18,180	R/UNL	\$6,310	CNG Conversion	\$43,000
360	WATER SYS MAINT	FORD F250 SUPER DUTY	2003	32,275	R/UNL	\$9,080	CNG Conversion	\$43,000
362	WATER SYS MAINT	FORD F250 SUPER DUTY	2006	44,997	DIESEL	\$16,870	CNG Conversion	\$43,000

FLEET ELIGIBLE FOR ALTERNATIVE FUEL

Matrix "A"

VEHICLE NO.	DEPT NAME	EXISTING VEHICLE MAKE/MODEL	YEAR	MILEAGE	FUEL TYPE	FAIR VALUE	RECOMMENDED REPLACEMENT FUEL TYPE	ESTIMATED REPLACEMENT COST
367	WATER SYS MAINT	FORD F250 SUPER DUTY UTILITY	2000	48,143	R/UNL	\$7,100	CNG Conversion	\$43,000
380	WATER SYS MAINT	FORD F250 UTILITY	1997	83,817	R/UNL	\$5,930	CNG Conversion	\$43,000
247	WATER SYS MAINT	FORD RANGER	2002	83,626	R/UNL	\$4,175	Hybrid/LEV/ULEV/SULEV	\$30,000
241	WATER SYS MAINT	FORD RANGER	2002	12,652	R/UNL	\$4,470	Hybrid/LEV/ULEV/SULEV	\$30,000
248	WATER SYS MAINT	FORD RANGER	2002	17,172	R/UNL	\$4,470	Hybrid/LEV/ULEV/SULEV	\$30,000
249	WATER SYS MAINT	FORD RANGER XL	2004	20,848	R/UNL	\$7,255	Hybrid/LEV/ULEV/SULEV	\$30,000
374	WATER SYS MAINT	FORD F250	2005	23,727	R/UNL	\$12,230	CNG Conversion	\$43,000
377	WATER SYS MAINT	FORD F250	2008	1,825	R/UNL	\$13,865	CNG Conversion	\$43,000
TOTALS						\$608,795		\$2,567,000

COST OF REPLACEMENT VEHICLES, LESS SALVAGE VALUE OF VEHICLES REPLACED

\$1,958,205

55 VEHICLES ELIGIBLE FOR REPLACEMENT

GLOSSARY OF FUEL TYPES

- CNG Compressed Natural Gas
- LNG Liquefied Natural Gas
- NEV Neighborhood Electrical Vehicle
- LEV Low Emissions Vehicle
- ULEV Ultra Low Emissions Vehicle
- SULEV Super Ultra Low Emissions Vehicle

EXISTING ALTERNATIVE FUEL FLEET**Matrix "B"**

VEHICLE NO.	DEPT NAME	VEHICLE MAKE	YEAR	MILEAGE	FUEL TYPE
401	BLDG MAINT	HONDA CIVIC 4 DOOR N.G.V	1998	51,580	CNG
305	BLDG. INSP.	ESCAPE HYBRID	2008	97	HYBRID
306	BLDG. INSP.	ESCAPE HYBRID	2008	125	HYBRID
1007	DIAL A RIDE	BUS CNG	2009	575	CNG
404	ENGINEERING	HONDA CIVIC 4 DOOR N.G.V	1998	21,850	CNG
304	ENGINEERING	FORD E250 VAN C.N.G.	2000	11,167	CNG
311	P.W. ADMIN	FORD F150	2003	22,620	CNG
402	P.W. ADMIN	HONDA CIVIC 4 DOOR N.G.V	1998	26,480	CNG
011	PARKING ENFOR.	GEM LONG BED	2002	1,231	ELECTRIC
107	RECREATION	HONDA CIVIC HYBRID	2003	35,130	R/UNL
108	RECREATION	HONDA CIVIC HYBRID	2003	10,716	R/UNL
010	RECREATION	GEM SHORT BED	2002	1,091	ELECTRIC
013	STREET MAINT.	TOYOTA 42-5FG25 PROPANE FORK LFT	1989	14,251 HRS..	R/UNL
373	STREET MAINT.	FORD F150 CNG	2002	36,189	CNG
321	STREET MAINT.	FORD F150 XL CNG	2002	30,488	CNG
370	STREET MAINT.	FORD F250 PICKUP CNG	1998	36,440	CNG
521	STREET MAINT.	FORD F600 CONCRETE	1986	6,168	PROPANE
368	STREET MAINT.	PATCH TRUCK	2008	ON ORDER	R/UNL
W60	WATER SYS MAINT	GRIMMERSCHMDIT 165 CNG	2000	560 HRS.	CNG
109	WATER SYS MAINT	HONDA CIVIC HYBRID	2006	8,989	R/UNL
403	WATER SYS PUMP	HONDA CIVIC 4 DOOR N.G.V	1998	37,540	CNG
801	WHAREHOUSE	TOYOTA FORK LIFT 4K	2008	9,091 HRS.	R/UNL

TOTAL OF 22 VEHICLES ALREADY REPLACED

VEHICLES NOT ELIGIBLE FOR REPLACEMENT**Matrix "C"**

VEHICLE NO.	DEPT NAME	EXISTING VEHICLE MAKE/MODEL	YEAR	MILEAGE	FUEL TYPE	FAIR VALUE
527	SEWER MAINT	STERLING L7501	2004	25,831	R/UNL	\$190,000
1065	STREET MAINT.	TANDUM DRUM ROLLER	2008	100 HRS.	DIESEL	\$27,000
553	STREET MAINT.	FORD F700 CRANE&DUMP	1985	17,614	R/UNL	\$15,000
551	STREET MAINT.	FREIGHTLINER FL70	1997	23,107	DIESEL	\$38,000
382	STREET MAINT.	FORD F350 HYDRO LIFT	2003	10,268	R/UNL	\$10,805
863	STREET MAINT.	BOBCAT 863 TURBO HI FLOW	2002	1,170 HRS.	DIESEL	\$8,000
S61	STREET MAINT.	GRIMMERSCHMIDT 175 CFM	2001	604 HRS.	R/UNL	\$2,500
862	STREET MAINT.	CASE 721D LOADER	2006	578 HRS.	DIESEL	\$60,000
006	WATER DEPT.	580L EXTEND A HOE (BACK HOE)	1996	3,538 HRS.	DIESEL	\$18,000

TOTAL OF 9 VEHICLES NOT ELIGIBLE FOR REPLACEMENT



CNG pickup – cylinder in bed



CNG Honda abbreviated trunk due to cylinder



CNG Compressor – City Yard