



7.0 FLEET REVIEW

For the purpose of this report the fleet of the Sarnia Fire Rescue Services was examined in August of 2006.

7.1 Existing Fleet

Overall the fleet was found to be relatively modern, with the exception of three older models - Engine 2, Engine 4 and Engine 5. A 15-year apparatus age is generally accepted in the industry as the life expectancy of a front line vehicle, with a potential for an additional five years of service as a reserve vehicle. Two of the three older engines noted above would generally be considered over-age for their role.

There are eight heavy apparatus currently in use within the Sarnia Fire Rescue Services, as listed in the *Table 7.1*.

Table 7.1 Apparatus at each Station and Model Year

Station	Vehicle	Description	Year
Station 1	Engine 1	E-One Superior Class A Pumper	1998
	Rescue 1	Hackney Spartan Rescue Pumper	2003
	Engine 4	Amertek Pumper (Reserve)	1989
Station 2	Telesquirt-Engine 2	Superior Pierce Arrow Class A Pumper/Telesquirt	1991
Station 3	Engine 3	E-One Superior Class A Rescue/Pumper	1998
Station 4	Ladder 4	Pierce Class A Pumper/Aerial	1999
	Tanker 4	S&S Fire Apparatus Co. Freightliner Tanker	2003
Station 5	Telesquirt -Engine 5	Superior Pierce Arrow Class A Pumper/Telesquirt	1989

Engine 2 is a Class A Pumper/Telesquirt currently operating as front line apparatus in Station 2 and fulfilling a role as a pumper and aerial device. It was manufactured in 1991 and has reached an apparatus age of more than fifteen years. A service incident was reported in 2005 where the rear wheels and axles fell off while the vehicle was in motion. This problem has since been repaired, but is indicative of a vehicle approaching the end of its useful life as a front line vehicle and where expensive repairs become more likely.

Engine 5 is also a Class A Pumper/Telesquirt operating out of Station 5 in a front line capacity as both a pumper and aerial device. It is a 1989 model with 17 years of service.



Engine 4 is currently maintained as a reserve vehicle and is located at Station 1. It is over-age for a front line vehicle and has many problems such as; compartment doors that can be difficult to open and occasionally are jammed shut, corrosion level, leaky valves, outdated lighting, air horns on roof and more. Furthermore, this vehicle features an open crew cab, which poses a health and safety concern for firefighters, especially in winter driving conditions. The refurbishment of this vehicle is not considered a financially viable option; especially given the number of defects noted during its assessment.

It is estimated that both engines (Engine 2 and Engine 5) could be maintained as reserve vehicles for an additional 2 to 5 years. Both are strong candidates for replacement given their status as front line apparatus. Given its condition, Engine 4 is the most likely candidate for retirement once a suitable replacement has been identified.

Table 7.2 Remaining Service Years

Vehicle	Model Year	15-year Mark	Remaining years (2007)
Engine 4	1989	2004	“over age”
Telesquirt-Engine 5	1989	2004	“over age, but suitable as a reserve”
Telesquirt-Engine 2	1991	2006	“over age, but suitable as a reserve”
Engine 1	1998	2013	6
Engine 3	1998	2013	6
Rescue 1	2003	2018	11
Tanker 4	2003	2018	11
Ladder 4	1999	2014	7

7.2 Future Fleet Considerations

The risks faced by the department include the challenges associated with a significant petro-chemical sector, an aging population, as well as an increase in high rise and commercial buildings within the downtown area. Under these circumstances it would be prudent to have at least two and preferably three apparatus equipped with ladder capability, as is the current practice. In the event that one aerial device is out of service, either for service or maintenance or in the event of a failure during deployment, an additional replacement front line aerial device would be a sound addition to the fleet.



Sarnia's front line fleet currently includes two quints, Engine 2 and Engine 5 (the older vehicles mentioned above) as well as a ladder (Ladder 4). A "quint" is essentially a vehicle that has five (i.e. quintuple) functions as provided by pump, tank, fire hose, aerial device and ground ladders. Given that the two oldest front line vehicles are quints, it follows that the apparatus that will be purchased to replace these should also be quint type apparatus. It provides the ability to operate alone as a front line vehicle. Additional consideration should be given to size and manoeuvrability.

Replacing Engine 2 and Engine 5 with new quint vehicles gives the opportunity to retire Engine 4, the fleet's oldest vehicle (as shown in **Table 7.2**). Both Engine 2 and Engine 5 could be kept as reserve vehicles.

It should be noted that some problems have been associated with buying demonstrator apparatus. The 2004 purchase of the rescue truck is an example where revisions by the mechanic and firefighters are still underway two years after the initial purchase. Details such as covers over pump panels and fender liners that prevent freezing and corrosion are not considered on demonstrator apparatus that might be designed and purchased from service areas with warmer climates. This has resulted in increased operating costs, which could have been avoided with the purchase of a truck meeting suitable specifications.

A mechanic can provide key insight into components that have a poor history of breakdown and can suggest specifications that will allow ease of repair, thereby decreasing out of service time and operating costs. As such, it is recommended that specifications be developed by the department with input from the mechanic and firefighters. Once the specifications are complete, they should be used as the acceptable "minimum" guidelines for the purchase.

A potential demonstrator model should only be considered if it meets the minimum criteria that have been established. If no suitable demonstrator can be found, a truck which meets "minimum" specifications should be ordered. Bearing this last point in mind, purchasing a replacement vehicle should be a priority and take place as soon as possible in order to avoid delays and unnecessary or unfortunate service gaps.

When purchasing a new vehicle, Fire Rescue Services should consider including all the relevant small equipment that is required by the crew. This would present a small increase to the capital budget expenditure, but would allow a reduction in the department's operating budget expenditures. There may be a financial advantage to capitalizing the purchase of the small equipment that will be required for the new vehicle.

7.3 Maintenance and Equipment

Currently the department's vehicles are maintained by a City mechanic. Department maintenance takes place in a garage facility at the back of Station 1. The garage is adjacent to the apparatus bays and includes an office and sufficient space for one fire truck. Most apparatus fit within the garage with the larger ones being maintained at the City garage. If more than one vehicle is in need of repair, the second vehicle is sent the City garage. Specialty work (e.g. aerial certification) is contracted out.



The mechanic responsible for fire department apparatus is not assigned exclusively to the fire department and is sometimes called away to other corporate fleet matters at the City's main garage. This results in preventative maintenance schedules that are not adhered to as closely as they could be.

A department mechanic should be assigned solely for fire department apparatus, given the size of the fleet and the unique challenges associated with these vehicles. If the workload proves too demanding then additional assistance should be sought through the City's corporate fleet or through an external garage that has the ability to perform preventative maintenance or emergency repairs on fire department apparatus.

The department has sufficient small equipment for its fleet of apparatus. The only exception is Rescue 1. This vehicle should operate with more hose and equipment to allow it to be categorized as a Class A pumper, as suggested by insurance underwriters' specifications. The department should continue its practice of replacing small equipment as it ages and/or breaks.

The department's smaller vehicle fleet includes approximately a dozen vehicles at various ages and conditions. The Fire Chief and Deputy Chief both make use of department sedans for emergency response while the Platoon Chief operates a pick up truck.

Other vehicles are used for fire prevention and public education staff as well as training. There are no specific industry guidelines for vehicle age limits and/or mileage thresholds for smaller department vehicles; however, the department should ensure that adequate replacement schedules are being followed. More attention should be paid to vehicles used in response-type situations.

7.4 Recommendations

The following recommendations relate to the deployment option selected for the City of Sarnia as a result of the fire station location analysis. These recommendations combine an immediate opportunity to improve the overall condition of fleet with the need to plan for station relocations and the addition of a sixth station in the future.

Purchase Two Quints to Replace Engine 2 and Engine 5

Sarnia's two existing telesquirts (Engine 2 and Engine 5) are over age and past their 15-year apparatus life cycle. Engine 5 was manufactured in 1989 and should be replaced first. Both should eventually be removed from front line service once new apparatus have been purchased. These replacements have already been identified within the City's capital plan.

Both engines currently provide front line aerial functions and the department also needs at least one 'class A' pumper per station. The purchase of quintuple combination vehicles (i.e. "quints") which include aerial ladder would be able to function as a pumper or aerial, resolving both requirements with the purchase of one vehicle. Ladder 4 is a new vehicle that would remain in front line service as the City's main aerial device, as it is 30 metres (100 feet) in length and equipped with a basket at the end of its ladder.

Engine 5 should be replaced immediately with a new quint. It should then be used as a reserve vehicle, allowing Engine 4 to be retired. Another quint should be purchased as soon as feasible to allow Engine 2 to be replaced and used as a second reserve vehicle. These two replacements will



bring the department's fleet up to an acceptable level. No further adjustments are foreseen until new staff is added.

Additional staff should be added to a new Station 6, located in the future growth area adjacent to Blackwell Sideroad and Confederation Line when this area is sufficiently built out. A new pumper rescue and related equipment should be purchased for Station 6.

In trying to achieve a better level of service for depth of response, there is a need to provide additional fire suppression resources within Sarnia's built up core. Depending on the timing of construction and occupancy of Station 6, a new half-company of two firefighters would ideally be located at Station 4 to provide this depth. Suitable auxiliary vehicles for this half-company include a mini-pumper, an air-supply unit or a command unit. Either would be appropriate for responding to calls and would also be capable of towing the department's hazardous material trailer. The department should monitor trends in types of calls received and determine which vehicle would best compliment its situation.

Summary of Recommendations

1. Purchase a new quint vehicle to replace Engine 5. Use Engine 5 as a reserve vehicle and retire Engine 4 (replacement for Engine 5 in City's 2007 approved budget).
2. Purchase new quint vehicle to replace Engine 2 and use Engine 2 as a reserve vehicle (replacement for Engine 2 included in City's capital plan).
3. Purchase a new rescue pumper for the new Station 6 once development has sufficiently advanced.
4. Purchase an auxiliary vehicle for Station 4 to address depth of response issues. Vehicle type should match trends in call types. Options include mini-pumper, air-supply unit or command unit.
5. A group comprised of department mechanics and firefighters should have input into vehicle specifications to ensure that operating and maintenance needs are met. Demonstrator models should only be considered if minimum requirements are met. The department should consider whether there is a financial advantage to capitalize the purchase of related small equipment required for the new vehicle.
6. Monitor the small vehicle replacement plan to ensure that adequate replacement schedules are being followed.