



January 12, 2022

Re: Guide to Service Levels – Pumper Fire Apparatus Lifespan – 1st Edition

The Office of the Fire Commissioner in consultation with the Association of Manitoba Municipalities and the Manitoba Association of Fire Chiefs has prepared the Guide to Service Levels: Pumper Fire Apparatus Lifespan reference document to assist municipalities in determining the capability of their fire apparatuses and to support you in apparatus retirement planning.

This Guide highlights documents and resources available to municipalities for maintaining, testing, and record keeping on pumper apparatuses, which in turn will extend the life of the fire apparatus in your community and help keep your community safe.

In particular, this document aims to assist municipalities in:

- Meeting their fire service operational requirements;
- Understanding and following design and service standards; and,
- Conducting proactive budget planning and apparatus retirement planning.

The Guide to Service Levels: Pumper Fire Apparatus Lifespan reference document is available in hard copy by request through the Office of the Fire Commissioner. Moreover, the [Guide to Service Levels: Fire Fighting Organization and Deployment](#) is available for further reference.

We hope that this Guide serves as a valuable tool to municipalities as you navigate asset and resource planning for your municipal fire service. We thank you for the important work you do to safeguard all Manitobans from fire and life safety hazards.

Sincerely,

A handwritten signature in black ink that reads "R Schenk".

Ryan Schenk
Fire Commissioner

OFFICE *of the* FIRE COMMISSIONER



GUIDE TO SERVICE LEVELS: **PUMPER FIRE APPARATUS LIFESPAN**

First Edition, 2021

Manitoba The logo features the word "Manitoba" in a bold, white, sans-serif font next to a stylized white bison head silhouette.

GUIDE TO SERVICE LEVELS: PUMPER FIRE APPARATUS LIFESPAN

November 2021

This Guide to Service Levels is meant to assist local authorities in determining fire apparatus capability and assist with retirement planning.

Documents setting duty performance, retirement planning standards, and other conditions exist to ensure apparatus performance, reliability and safety. Maintenance and regular testing is integral to the apparatus and are significant factors in its capability and lifespan.

The Guide is for triple-combination pumper apparatus and does not include other types such as water tenders, rescue, or wildland fire fighting units.

Summary

A reference document published on behalf of the Insurance Industry of Canada, by the Fire Underwriters Survey (FUS) entitled "***Insurance Grading Recognition of Used or Rebuilt Fire Apparatus***" is available to the Canadian fire service and local authorities. This Grading Recognition speaks to risk affecting the municipality by having triple-combination pumper trucks that are reaching end-of-service life.

The FUS document describes the requirements for pumper truck construction, performance and life expectancy based on use and age of the apparatus, as well as capability relative to community size. The FUS Grading of fire apparatus is one the factors used by the FUS to provide recommendations on the insurance ratings of properties within a community.

No legislation exists in Manitoba that states fire department apparatus need to be replaced within a certain time. A municipality will be referred to the FUS document and advised to complete it's own assessment of performance, reliability and safety to reduce risk to fire fighters and the public.



ACTIONS – Steps to Determine Rating, Capability and Condition of Apparatus

Fire Underwriters Survey credits a pumper on a scale of 0-100 per cent for continuous testing of its condition and reliability.

Review ***Apparatus Acceptance Terms of Reference for Fire Insurance Grading and Public Fire Protection*** available from the Fire Underwriters Survey website.

If the apparatus is designed, built and tested to Underwriters Laboratories of Canada (ULC), or National Fire Protection Association (NFPA) standards; maintained throughout its life; and of an appropriate age, then it can receive full credit.

Credit is based on its condition and reliability with respect to:

- apparatus design standard and specifications
- age of apparatus
- results of apparatus acceptance and service testing (including, but not limited to, weight, road and pump performance tests)
- accident history
- out of service history
- frequency of testing and indications of apparatus reliability
- frequency of maintenance and indications of apparatus reliability (records)



Review ***Insurance Grading Recognition of Used or Rebuilt Fire Apparatus*** available from the Fire Underwriters Survey website.

APPLICATION – General Condition Assessment

The General Condition Assessment of fire department pumper apparatus includes the type, age and condition of apparatus.

Apparatus design standard and specifications – Standards accepted throughout Canada by Fire Underwriters Survey (FUS) for the manufacture and acceptance of pumbers are:

- Underwriters Laboratories of Canada (ULC) *Standard S515: Automobile Fire Fighting Apparatus*
- *National Fire Protection Association (NFPA) 1901: Standard for Automotive Fire Apparatus*; and
- fire apparatus should be built by recognized manufacturers and tested by a suitably accredited third party

Age of apparatus – Safety is the prime concern in the retirement of apparatus. Fire apparatus, like all types of mechanical devices, have a finite life. Importantly, age status in each jurisdiction is conditional; hazards and risks play a significant role.

- Fire Underwriters Survey Table 1 - Service Schedule for Fire Apparatus for Fire Insurance Grading Purposes.
 - Grading Recognition Table 1 details apparatus age for First Line Duty, Second Line Duty, and Reserve status. The Service Schedule defines Major Cities, Medium Sized Cities, Small Communities, and Rural Centres. The definitions are based on population.
- National Fire Protection Association NFPA 1911: *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus* notes apparatus more than 15 years old might include only a few of the safety upgrades required by recent editions of NFPA or ULC standards.
 - Changes and upgrades have been truly significant, especially in the area of safety; fire departments should seriously consider the value (or risk) to fire fighters of keeping fire apparatus more than 15 years old in first-line service.



- It is recommended that apparatus more than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status; be upgraded; and incorporate as many features as possible of the current fire apparatus standard.
- Apparatus that were not manufactured to the applicable NFPA fire apparatus standards or that are over 25 years old should be replaced.

Results of apparatus acceptance and service testing (including, but not limited to, weight, road and pump performance tests) – Pumper apparatus must maintain Manitoba Public Insurance Periodic Mandatory Vehicle Inspections i.e., “Safeties”.

Pumper apparatus also need other service tests and maintenance to ensure performance, reliability and safety. These include:

- chassis load balance test
- pumper acceleration test
- braking test
- pump hydrostatic (pressure) test
- pump priming and suction capability test
- pump vacuum test
- pump capacity test
- pump pressure test
- pump suction capability test
- inspection and maintenance of the pump, plumbing, operator panel, valving, warning devices and safety systems, fittings, caps
- inspection and maintenance of low-voltage electrical systems
- inspection and maintenance of water and foam tanks
- inspection, maintenance and testing of aerial devices
- inspection and maintenance of foam proportioning systems
- inspection and maintenance of the chassis, driving and crew compartment, and body
- body and water tank mounts
- inspection and maintenance of the equipment, ladder mounts, hose storage; covers, latches, doors, external and internal equipment mounts
- steps, handrails, step & panel lighting, scene lighting, warning lighting

Accident history – Maintained securely & completely throughout service life.

Out of service history – Maintained securely & completely throughout service life.

Frequency of testing and indications of apparatus reliability:

- daily/weekly visual and operational checks
- maintained securely & completely throughout service life

Frequency of maintenance and indications of apparatus reliability (records):

- insurance grading recognition notes the requirement for documentation verifying that the apparatus has successfully passed the specified tests.
- records for maintenance, daily/weekly visual and operational checks are maintained securely & completely throughout service life

Safety – Specific inspections to ensure capability and reliability, and ensure minimum risk to responders and the public. These include:

- vehicle road mileage
- engine operating hours
- vehicle restraints, seatbelts, open-cab seating
- seating with inherent SCBA and helmet locking compatible with seatbelt use
- emergency lighting, scene lighting and reflective markings
- step services, grab handles, ladder, hose and equipment locks and covers
- removal of loose equipment in cab
- the quality of the preventative maintenance program
- the quality of the driver-training program
- whether the fire apparatus was used within its design parameters
- whether the fire apparatus was manufactured on a custom or commercial chassis



- The quality of workmanship by the original manufacturer
- The quality of the components used in the manufacturing process
- The availability of replacement parts

In the past two decades, critical enhancements in design, safety and technology have been added by manufacturers in response to changes in ULC S515, NFPA 1901 and customer demands.



Retirement Planning

Examples of budgeting tools can be found online: Examples of budgeting tools can be found on the Office of the Fire Commissioner website.

Closing

A fire apparatus is an emergency vehicle relied on to transport fire fighters safely, and operate reliably and properly to support the mission of the fire department. An old, worn-out, or poorly maintained fire apparatus has a limited role in providing emergency services to a community.

The Fire Underwriters Survey has developed a standard for the acceptance of apparatus as the apparatus becomes less reliable with age and use. The standard notes the apparatus is subject to considerable mechanical stress due to the nature of its function. This stress does not normally manifest itself on the exterior of the equipment. It is effectively masked in most departments by a higher standard of aesthetic care and maintenance.

Underwriters Laboratories of Canada and the National Fire Protection Association have means for governments, departments, and individuals to provide input and suggest changes to upcoming editions of the standards. The standards development process is a full, open, consensus-based process.

All of these listed factors should influence fire service leaders to assess the performance, reliability and safety of apparatus to reduce risk to fire fighters and the public. This includes evaluating the technology and performance gap when considering apparatus maintenance, testing, repair and replacement plans.

A piece of fire apparatus that breaks down at any time during an emergency operation not only compromises the success of the operation, but might jeopardize the safety of the fire fighters relying on that apparatus.



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APPENDIX – Community Motion

Template Pumper Replacement Schedule

TEMPLATE RE: PUMPER REPLACEMENT SCHEDULE VERSION #1 (2021)	
	THE JURISDICTION OF
To:	
From:	
Date:	
Subject:	

Having safe, effective fire apparatus provides for less risk, and increased reliability, safety, capability, and sustainability of the municipality and fire department.

RECOMMENDATIONS

The Director of Fire and Emergency Services/Fire Chief, in consultation with the Chief Administrative Officer and the Senior Management Team, recommends:

BE IT RESOLVED THAT a report as to the needs of community fire protection and risk reduction consider fire apparatus replacement be undertaken (regularly, timeframe).

AND THAT staff be directed to incorporate the fire department fleet replacement schedule into future capital budget program/forecasts in accordance with the provisions of this report,

AND FURTHER THAT staff be directed to include the costs associated with the replacement of the(year) capital budget program for consideration.

PURPOSE

The purpose of this report is to provide (Council, CAO, Senior Management Team, Fire Chief, Committee, etc) members with information relative to the fire department pumper fleet replacement requirements such that future needs can be appropriately forecasted, scheduled and budgeted for on a go-forward basis.

Refer to other fleet documents for rescues, tankers and support units.

BACKGROUND AND ANALYSIS

As part of their overall assessment of theFire Department's current and future needs, the jurisdiction should maintain a schedule that complies with the Fire Underwriters Survey (FUS) recommendations on the replacement of pumbers; and considers factors such as reliability, safety, capability and sustainability to provide for forecasted fire & rescue operations.

The members consider reference documents in making this specific recommendation, listed as formal plans, guiding legislation and standards.

Documents provide that for a community the size of apparatus be kept in first line duty for a period of 15 years, and then assessed to be placed in 2nd line duty for an additional 5 years, and reserve for an additional 5 years. It should be noted that the FUS document specifically refers to only “pumping” apparatus, (not tankers, rescue vehicles, etc.) while the NFPA document suggests this replacement cycle regardless of vehicle type. Small, passenger type vehicles are not addressed in either standard and staff are recommending a replacement cycle of ____ years or as a condition assessment indicates.

As the standards reference life cycling fire department apparatus based on the 15 year/20 year/25 year replacement schedule, staff recommends that this schedule be formally adopted on a go forward basis and that future capital budget allocations reflect this schedule subject to the budget approval practices of the day.

The following table illustrates and details current fire department pumper fleet information along with the replacement schedule recommended (listed by current age and recommended year of replacement).

GENERAL CONDITION ASSESSMENT - January 1, 2022

Unit Number	Year of Manufacture and Type	Current Age	Due for Replacement	General Condition Assessment	Comments
1	2001 Pumper	21	2023 (budgeted replacement costs \$xxx)	Poor	Station 2 – RESERVE ONLY (RFQ to be issued 2022)
4	2007 Rescue/Pumper	17	2025 (est. replacement costs \$xxx)	Fair	Station 1 (call volume of truck determined 20 years)
2	2007 Pumper	15	2027 (est. replacement costs \$xxx)	Good	Station 2
3	2009 Pumper	13	2029 (est. replacement costs \$xxx)	Good	Station 1 (call volume, residential & commercial development increasing)
5	2015 Pumper/Tanker	7	2030 (est. replacement costs \$xxx)	Good	Station 2 (continuous load for tankers and planned larger tank size)

NOTES:

As noted and highlighted in Table 1,.....

As noted in the chart,

The replacement of large fire department vehicles represents a substantial investment in the community. Replacement costs in [2022] dollars for triple-combination pumbers approach the \$xxx-xxx - \$xxx-xxx range. Prudent life cycle replacement planning combined with the proper funding of regular and preventative maintenance programs are essential to ensure that the department is able to meet and maintain current service levels as established by Council.

CONSULTATION

The following individuals were consulted during the preparation of this report:

- the CAO
- the senior management team including the Director of Corporate Services
- the Fleet Coordinator
- Fire Chief and Officers
- Chief Planning Officer

ECONOMIC IMPACT

COMMUNICATIONS PLAN

CONCLUSIONS

The establishment of a formal pumper fleet replacement schedule for the fire department will ensure that the department is able to meet the needs of the community in accordance with Council's direction and levels of service that have been established to date.

RELATION TO OTHER FORMAL PLANS, GUIDING LEGISLATION AND REFERENCES

- Fire Department Regulating By-law
- Jurisdiction Fire Protection and Community Risk Reduction Plan
- Fire Underwriters Survey *Apparatus Acceptance Terms of Reference for Fire Insurance Grading and Public Fire Protection*
- Fire Underwriters Survey *Insurance Grading Recognition of Used or Rebuilt Fire Apparatus*
- Underwriters Laboratories of Canada (ULC) Standard S515: *Automobile Fire Fighting Apparatus (latest edition)*
- National Fire Protection Association (NFPA) 1901: *Standard for Automotive Fire Apparatus (latest edition)*
- National Fire Protection Association (NFPA) 1911: *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus (latest edition)*
- National Fire Protection Association (NFPA) 1201: *Standard for Providing Fire and Emergency Services to the Public (latest edition)*

ATTACHMENTS

As applicable

RESPECTFULLY SUBMITTED BY:

Author: , Approved by:..... Date.....

