Ladder Truck

Content Layout

- Budgeting / Financing
- Current Ladder Truck 2416
- Regulations and Standards
- ISO Rating
- Requested Replacement

Budget Ask

- Original Ask was for $600,000 over three years to have a cash balance to pay for the truck instead of financing.

- New Request is for financing the 1.8M for 10-years at an estimated rate of 4%. Which will yield a fixed monthly payment of $18,224.12

- Or if we can qualify for a low or 0% interest cost would reduce from 18k a month to 15K Monthly based on a 10-year 0% Rate.

Financing Snapshot

- **Loan Details at 4% Interest**
- **Principal:** $1,800,000.00
- **Term:** 10 years (120 months)
- **Fixed annual rate:** 4.00%
- **Exact monthly payment:** $18,224.12
- **Total payments:** $2,186,894.98
- **Total interest paid:** $386,894.98

- **Loan Details at 0% Interest**
- **Principal**: $1,800,000.00
- **Term**: 10 years (120 months)
- **Interest rate**: 0.00% fixed
- **Monthly payment**: **$15,000.00** (fixed; 100% principal)
- **Total payments over 10 years**: **$1,800,000.00**
- **Total interest paid**: **$0.00**
- **10-Year Amortization Schedule (Annual Summary) at 0%**

Current Ladder Truck 2416

- Age – 27yo (1999)
- **Idle Hours: 586**
- 1 hour of idle time is equivalent to 25-30 miles idle hours x 30miles = Mileage = **17,580 miles**
- Mileage – 80,576 = 98156
- Ladder Size – 75ft
- Water Tank Size – 300 Gal
- Pump Capacity – 1500 GPM
- Price at Purchase - $350,000

NFPA®

NATIONAL FIRE PROTECTION ASSN.

OSHA®

Occupational Safety and Health Administration

OFFICE OF STATE FIRE MARSHAL

NC DEPARTMENT OF INSURANCE

OSHA (29 CFR 1926.453)

- Daily Checked
- Capable of supporting the maximum load
- An aerial device and 85’ of ground ladders.
- Must include one extension ladder, one straight ladder w/ roof hooks, and one folding attic ladder.
- OSHA frequently references NFPA standards

NFPA 1901, Chapter 9

- An aerial device and 85’ of ground ladders.
- Must include one extension ladder, one straight ladder w/ roof hooks, and one folding attic ladder.
- Minimum Pump capacity of 1,000 GPM
- Minimum Water Tank size of 300 Gallons
- 800’ of 2 ½” or larger hose, 400’ of 1 ½” to 2” hose
- Minimum of 40 Cubic Ft of enclosed compartmentation.

NFPA 1900

- NFPA recommends that a combination pumper/aerial be moved from front-line service to reserve status after 15 years
- It also recommends that the unit be retired after 10 years of reserve service (25 years total)
- Older units lack modern safety features
- Apparatus exceeding 20 years should pass rigorous annual, service, and acceptance level tests

What is ISO?

Background Information

Introduction

Office of State Fire Marshal (**OSFM**) collects and evaluates information from communities in North Carolina on their structure fire suppression capabilities. The data is analyzed using our Fire Suppression Rating Schedule (**FSRS**) and then a Public Protection Classification (**PPC**™) grade is assigned to the community. The surveys are conducted whenever it appears that there is a possibility of a PPC change. As such, the PPC program provides important, up-to-date information about fire protection services throughout the country.

The FSRS recognizes fire protection features only as they relate to suppression of first alarm structure fires. In many communities, fire suppression may be only a small part of the fire department's overall responsibility. OSFM recognizes the dynamic and comprehensive duties of a community's fire service, and understands the complex decisions a community must make in planning and delivering emergency services. However, in developing a community's PPC grade, only features related to reducing property losses from structural fires are evaluated. Multiple alarms, simultaneous incidents and life safety are not considered in this evaluation. The PPC program evaluates the fire protection for small to average size buildings. Specific properties with a Needed Fire Flow more than 3,500 gpm are evaluated separately and assigned an individual PPC grade.

A community's investment in fire mitigation is a proven and reliable predictor of future fire losses. Statistical data on insurance losses bears out the relationship between excellent fire protection – as measured by the PPC program – and low fire losses. So, insurance companies use PPC information for marketing, underwriting, and to help establish fair premiums for homeowners and commercial fire insurance. In general, the price of fire insurance in a community with a good PPC grade is substantially lower than in a community with a poor PPC grade, assuming all other factors are equal.

OSFM's expert staff collects information about the fire suppression efforts in communities throughout North Carolina. In each of those communities, OSFM analyzes the relevant data and assigns a PPC grade – a number from 1 to 10. Class 1 represents an exemplary fire suppression program, and Class 10 indicates that the area's fire suppression program does not meet OFSM's minimum criteria.

OSFM's PPC program evaluates communities per a uniform set of criteria, incorporating nationally recognized standards developed by the National Fire Protection Association and the American Water Works Association. A community's PPC grade depends on:

- **Needed Fire Flows**, which are representative building locations used to determine the theoretical amount of water necessary for fire suppression purposes.
- **Emergency Communications**, including emergency reporting, Telecommunicators, and dispatching systems.
- **Fire Department**, including equipment, staffing, training, geographic distribution of fire companies, operational considerations, and community risk reduction.
- **Water Supply**, including inspection and flow testing of hydrants, alternative water supply operations, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires up to 3,500 gpm.
- **Community Risk Reduction**, community efforts to reduce the risk of fire, including fire prevention codes and enforcement, public fire safety education, and fire investigation programs.

Fire Dept: Ladder Company, Engine Companies, Staffing, Training, Equipment, Deployment Analysis, Operational considerations, Community Risk Reduction

Water Supply:

Supply System, Hydrant Size Types and Installation, Inspection & Flow Testing of Hydrants

Fire Flow Categories:

Residential(1-2 Family Dwellings)Minimum Required Flow 500 GPM for a 30-minute duration

Comm/Other Buildings: Based on Construction Type, Building Size, and Occupancy

Maximum Needed Flow: The maximum Required Water supply for ISO evaluation is 3500 GPM

Emergency Comms:

Reporting: Effectiveness of the phone system and methods used for the public to report

Dispatch: Capabilities, Redundancy, speed of dispatching

Staffing: training, adequacy of staffing

Data Collection and Analysis

OSFM has evaluated and classified over 1,200 fire district across North Carolina using the FSRS. A combination of meetings between trained OSFM field representatives and the dispatch center coordinator, community fire official, and water superintendent is used in conjunction with a comprehensive questionnaire to collect the data necessary to determine the PPC grade. For a community to obtain a grade better than a Class 9, three elements of fire suppression features are reviewed. These three elements are Emergency Communications, Fire Department, and Water Supply.

A review of the **Emergency Communications** accounts for 10% of the total classification. This section is weighted at **10 points,** as follows:

- Emergency Reporting 3 points
- Telecommunicators 4 points
- Dispatch Circuits 3 points

A review of the **Fire Department** accounts for 50% of the total classification. OSFM focuses on a fire department's first alarm response and initial attack to minimize potential loss. The fire department section is weighted at **50 points,** as follows:

- Engine Companies 6 points
- Reserve Pumpers 0.5 points
- Pump Capacity 3 points
- Ladder/Service Companies 4 points
- Reserve Ladder/Service Trucks 0.5 points
- Deployment Analysis 10 points
- Company Personnel 15 points
- Training 9 points
- Operational considerations 2 points
- Community Risk Reduction 5.5 points (in addition to the 50 points above)

A review of the **Water Supply** system accounts for 40% of the total classification. OSFM reviews the water supply a community uses to determine the adequacy for fire suppression purposes. The water supply system is weighted at **40 points,** as follows:

- Credit for Supply System 30 points
- Hydrant Size, Type & Installation 3 points
- Inspection & Flow Testing of Hydrants 7 points

There is one additional factor considered in calculating the final score – **Divergence**.

Even the best fire department will be less than fully effective if it has an inadequate water supply. Similarly, even a superior water supply will be less than fully effective if the fire department lacks the equipment or personnel to use the water. The FSRS score is subject to modification by a divergence factor, which recognizes disparity between the effectiveness of the fire department and the water supply. The Divergence factor mathematically reduces the score based upon the relative difference between the fire department and water supply scores. The factor is introduced in the final equation.

The **ISO** Public Protection Classification (PPC) is a 100-point scale (with some community risk reductions), heavily weighted toward fire department capability.

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Fire Department (≈50 points total)

Apparatus (≈10 points within this section)

Old ladder truck (30 years)

May receive **partial or zero credit**

Reliability and obsolescence reduce scoring

New ladder truck

Receives **full apparatus credit**

Meets modern NFPA/ISO expectations

Estimated gain: +3 to +6 points

Equipment & Tools (part of apparatus scoring)

Modern aerial devices include:

Higher flow master streams

Updated pump/aerial controls

Integrated safety systems

Estimated gain: +1 to +2 points

Fire Suppression Rating Schedule (FSRS) Factors

Needed Fire Flow / Building Capability

Ladder trucks are critical for:

Multi-story structures

Elevated coastal homes

Commercial occupancies

Without a compliant ladder:

ISO may **limit credit for structure fire capability**

With a new ladder:

Full recognition of **effective fire suppression capacity**

Estimated gain: +2 to +4 points

Real-World Impact

Even a **1-class improvement** can:

Reduce residential and commercial insurance premiums

Improve community attractiveness for development

Particularly important in a **coastal, rental-heavy market**

North Topsail Beach Fire Dept. ISO Rating by the numbers

ISO IS BASED ON A 100-POINT SCALE – NTBFD SCORED 69.11
CLASS 1 = 90.00 OR MORE
CLASS 2 = 80.00 TO 89.99
CLASS 3 = 70.00 TO 79.99
CLASS 4 = 60.00 TO 69.99
CLASS 5 = 50.00 TO 59.99
CLASS 6 = 40.00 TO 49.99
CLASS 7 = 30.00 TO 39.99
AND SO ON

NTB FIRE'S BIGGEST DEDUCTION WAS THE WATER SUPPLY SYSTEM SCORE OF 17.42 OUT OF 30

So, Why Replace a 30 year ladder

A FIRE APPARATUS LOOSES 50% OF ITS VALUE IN THE FIRST FIVE YEARS OF SERVICE. THEN 5%-7% EVERY YEAR AFTER.

MAINTENANCE COST: OVER THE LAST TWO FISCAL YEARS, THE TOWN HAS SPENT ROUGHLY 50K ON MAINTENANCE FOR 2416.

THIS YEAR, 2416, WILL HAVE A VALUE OF ROUGHLY $56,000, ASSUMING A 5% DEPRECIATION RATE AFTER THE INITIAL 50% DEPRECIATION, FOLLOWED BY A 5% YEARLY ADJUSTMENT.

DOWN TIME: 2416 IS OUT OF SERVICE ONCE A QUARTER FOR MAINTENANCE, MAKING IT LESS RELIABLE AND HARDER TO MAINTAIN. IN AN EMERGENCY, EQUIPMENT FAILURE IS NOT AN ACCEPTABLE RISK.

ANTIQUATED EQUIPMENT AND TECHNOLOGIES: EQUIPMENT AND TECHNOLOGIES HAVE EVOLVED TO CREATE A SAFER OPERATING APPARATUS. ELECTRICAL SYSTEMS ARE NOT DESIGNED TO BE UPGRADED WITH NEWER TECHNOLOGIES AND ARE ERODING DUE TO OUR ENVIRONMENTAL CONDITIONS.

How can a New Apparatus Assist the town

- **Operational Improvements**
- **Greater reliability**
  - New apparatus reduces breakdown risk during critical incidents
  - Older trucks (30+ years) have higher failure rates and parts scarcity
- **Faster deployment**
  - Modern engines, hydraulics, and electronics improve response efficiency
  - Less time lost to mechanical issues = faster fire attack and rescues
- **Improved reach & access**
  - New aerial ladders often have greater vertical and horizontal reach
  - Better access to multi-story homes, condos, and oceanfront structures
- **Enhanced safety for firefighters**
  - Modern stabilization systems and ladder controls reduce accident risk
  - Enclosed cabs, airbags, and rollover protection improve crew safety
- **Better water flow capability**
  - New aerials often include higher-capacity master streams
  - Supports quicker knockdown of large or wind-driven coastal fires

- **Impact on ISO / NCDOI Fire Rating**
- **Equipment Credit (Major Factor)**
- Fire departments are graded on **age, condition, and type of apparatus**
- A **30-year-old ladder truck may receive reduced or no credit**
- A **new ladder truck earns full credit** under ISO/NCDOI standards
- **Key Rating Categories Improved**
- **Apparatus Inventory**
  - Properly equipped ladder companies are required for better ratings
  - New aerial helps meet minimum ladder service requirements
- **Equipment Condition & Modernization**
  - ISO/NCDOI evaluates whether the apparatus is functional and up-to-date
  - Replacement eliminates penalties tied to obsolete equipment
- **Response Capability**
  - Ladder trucks are essential for structure fires beyond 2–3 stories
  - Improves grading in built-up or higher-risk zones
- **Fire Suppression Effectiveness**
  - Better tools = improved fire control outcomes
  - Directly influences scoring under suppression capabilities

How can a New Apparatus Assist the town

- **Specific Risk Reduction for North Topsail Beach**
- **Coastal environment durability**
  - New trucks are built with corrosion-resistant materials
  - Salt air significantly accelerates deterioration in older apparatus
- **Tourism & seasonal population**
  - Higher occupancy in peak seasons increases life safety risk
  - Ladder trucks are critical for rescues in multi-story rental properties
- **Limited access areas**
  - Beachfront and elevated homes require aerial access
  - Newer apparatus improves reach over dunes, setbacks, and tight layouts

- **Risk Mitigation Summary**
- Reduces **mechanical failure risk during emergencies**
- Improves **rescue capability in multi-story structures**
- Enhances **firefighter and civilian safety**
- Supports **better fire ratings → lower insurance costs**
- Increases **resilience in a coastal, high-exposure environment**