Managing Tire Expenses

A Guide of Tire Best Practices

An RTA white paper

RTA THE FLEET SUCCESS COMPANY

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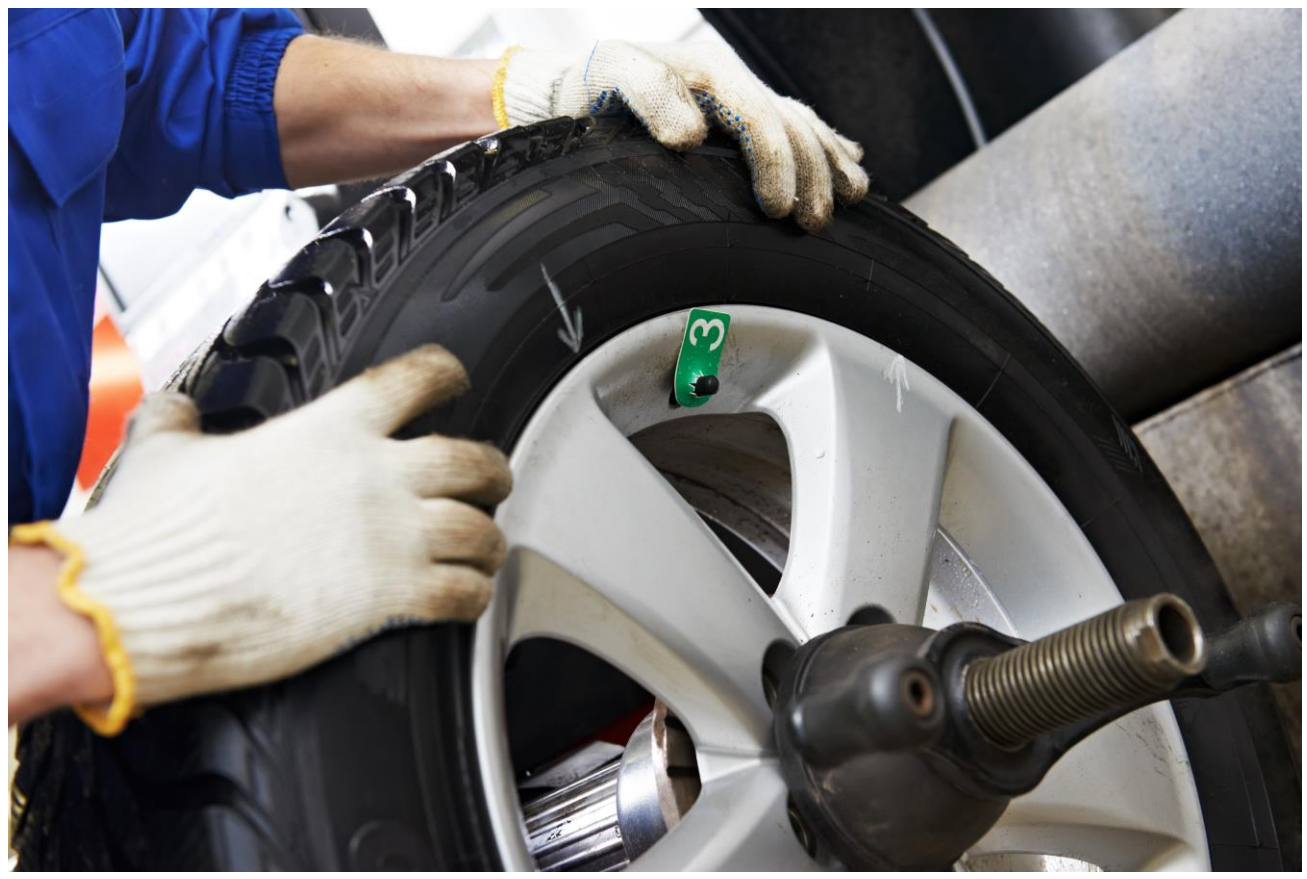
Introduction

This white paper is a collection of insights, best practices, tips and tricks that Ron Turley developed by consulting with thousands of fleet supervisors, managers, mechanics and drivers over several decades.

These insights represent methods of controlling and maintaining fleet systems and expenses.



CHAPTER 1
Tires 101

Tire expense is the third-greatest expense of most fleets, typically following fuel and payroll. This, of course, will depend upon the type of operation.

To control tire expenses, several things must be done:

1. Purchase tires with greater carrying capacity than is needed.
2. Purchase brand name tires with the fewest known flat tire histories.
3. Purchase tires at the lowest price available.
4. Purchase tires with the least rolling resistance. Fuel lost by improperly maintained tires can cost more than tire waste.
5. Purchase tires with the greatest recap potential.
6. Maintain air pressures by a rigorous maintenance program.
7. Maintain excellent tire matching capabilities.
8. Purchase wheel systems that run true. Spoke wheels, when not aligned, are devastating to tire costs!
9. Maintain axle alignment for highway tires, particularly on highway trailers or on double-drive axles.
10. Keep tires balanced.

Even if a fleet manager follows these steps, he or she must devise a control system to make certain that tires are being charged out properly. Some fleets brand all tires and keep individual records on all tires. If one looks at these records, however, there are often enough discrepancies that the resulting reports will not give an accurate result.

For example, if it is costing $2,000 per month to keep records on tires and the records are less than accurate, then a great amount of money is wasted. Records in themselves will not reduce expenses. Following practices and policies will reduce maintenance expense.

Carrying Capacity

If more tire failures are experienced in the summer than in the winter, the carrying capacities are probably insufficient or proper inflation is not being maintained. Both of these conditions create similar results; extreme heat can cause thrown cap separation and other related failures. The best way to find desired capacity is to design the unit to run on one flat out of the four tires that may be on an axle. This provides the ability to run the equipment short distances on flat tires.

Running a tire 10% overloaded can rob the user of 16% of its tire life. The $200 tire will now deliver only $168 worth of service.

The carrying capacities of tires are listed in manuals provided by the manufacturers. This book also lists rolling radii, etc. The over-specing of tires provides the ability to carry the load with a flat. It also gives tire costs of about the same cost per mile since the tire with more rubber generally lasts longer. It will also result in far fewer flats. Tires loaded to capacity are penetrated by foreign objects more frequently than those less heavily loaded.

If a shop persists in using tube-type tires, there should be stem locks on all tires installed on equipment that will be traveling at high speeds. Stem locks keep the tube from ruining the tire. They also keep the tube from causing the tire assembly to catch fire. In the past, this fire has been known to result in the complete destruction of the equipment.

Flat Tires

It is a known fact that steel-belted radial tires have far fewer flats than conventional designs. They resist punctures more readily and have greater carrying capacities. Any fleet that is not using steel-belted radials is having at least twice the number of flat tires they would have with steel-belted radials.

If conventional tube-type is compared with conventional tubeless, tubeless tires will have about one-third the flat tires as do tube-type tires. If there is a flat tire problem, steel-belted radial tubeless tires, properly maintained, will substantially decrease the problem and cost.

Recappability

Again, the tire that has the greatest recap potential is the steel-belted radial. The only tire with greater recappability is the tube-type rayon conventional. Since it is also the most prone to flats, it isn't worth the extra trouble.

Pricing

Generally, large companies can obtain 50-55% off list on major brand tires. These prices should be negotiated on a bid basis. Recapping should also be bid.

Air Pressures

If audits show that air pressures are down substantially on over 10% of the tires in the fleet, then the airing of tires must be increased in frequency. Generally, airing every 2-4 weeks is sufficient to keep tires maintained if the tires are tubeless, and if low tires that are found are removed.

Axle Alignment

The alignment of axles is critical. Trailers have been known to wear out four of eight tires in a 700-mile trip. When axles are not aligned, tires are being dragged sideways. For every half inch out of alignment, the tire must be dragged sideways 28 feet each mile driven. Many trailer axles checked are out of alignment by one-half inch and more.

New vehicles are being delivered with the front and rear axles not in alignment. This is a more recent problem. A recent fleet wore out the front rear axle in 1/4 of the normal wear rate wasting nearly $1,200 of rubber. The axle was out of alignment by 3/8”.

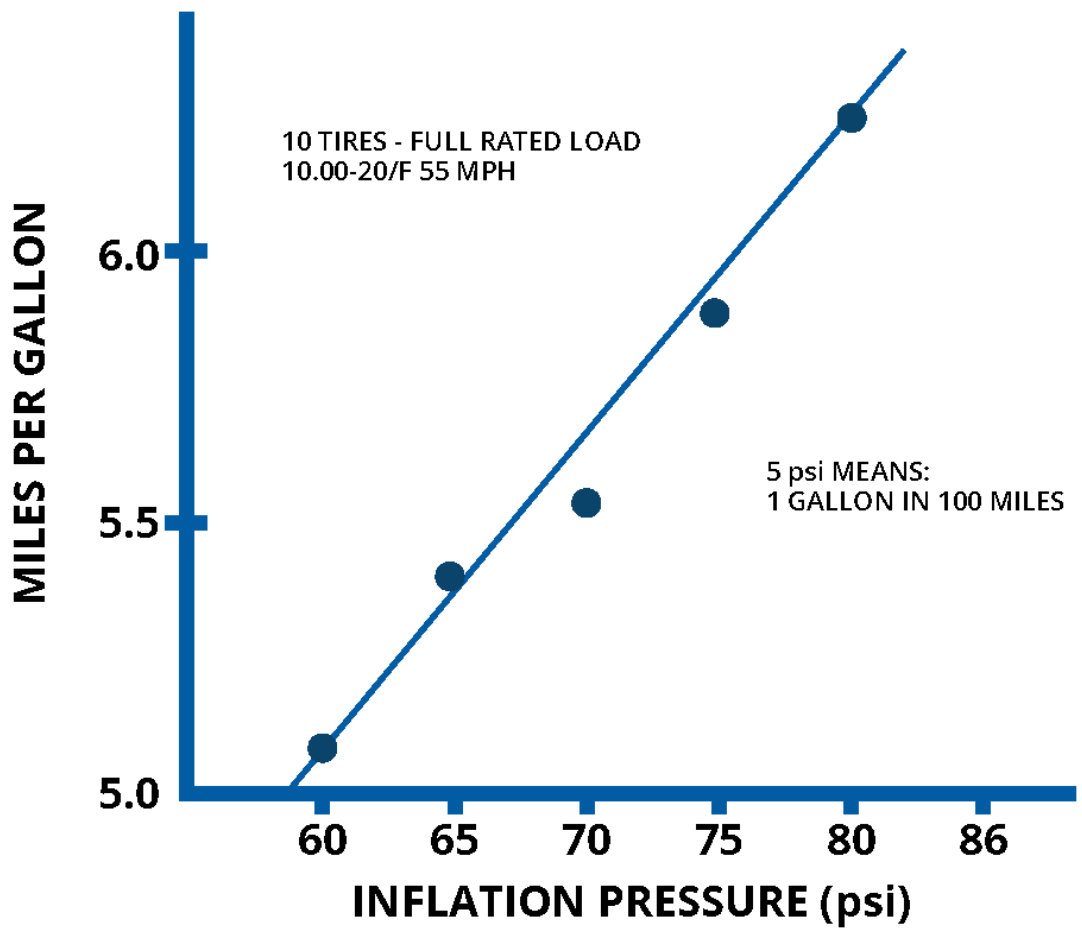
Wheel Systems

Spoke wheels wear out tires and reduce horsepower. Dynamometer tests of tractors first equipped with disc wheels and later equipped with spoke wheels show this dramatically. So, special care must be taken with a spoke wheel by checking the run-out every time one is installed. Follow any spoke wheel equipped unit down the highway and watch the tires fight the pavement.

CHAPTER 2

Fuel

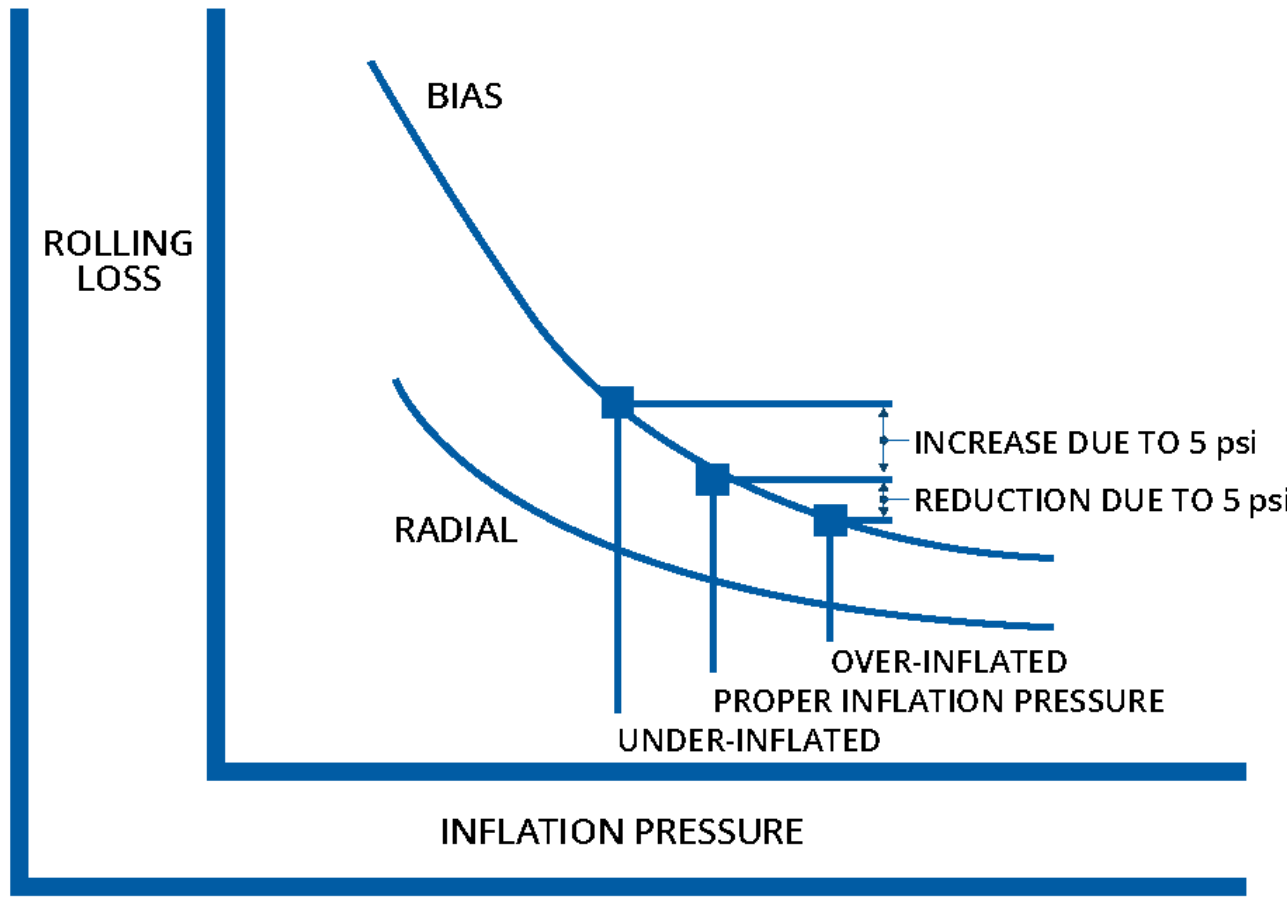
Fuel consumption from low tires costs more than the actual waste of tires due to low pressure. It has been estimated by a major tire manufacturer that five pounds of air pressure equals one gallon of fuel every 100 miles on ten-wheeled equipment loaded to maximum loads on 11” x 22.5” tires. For each $1.00 per gallon of fuel cost, that results in about one cent per mile.



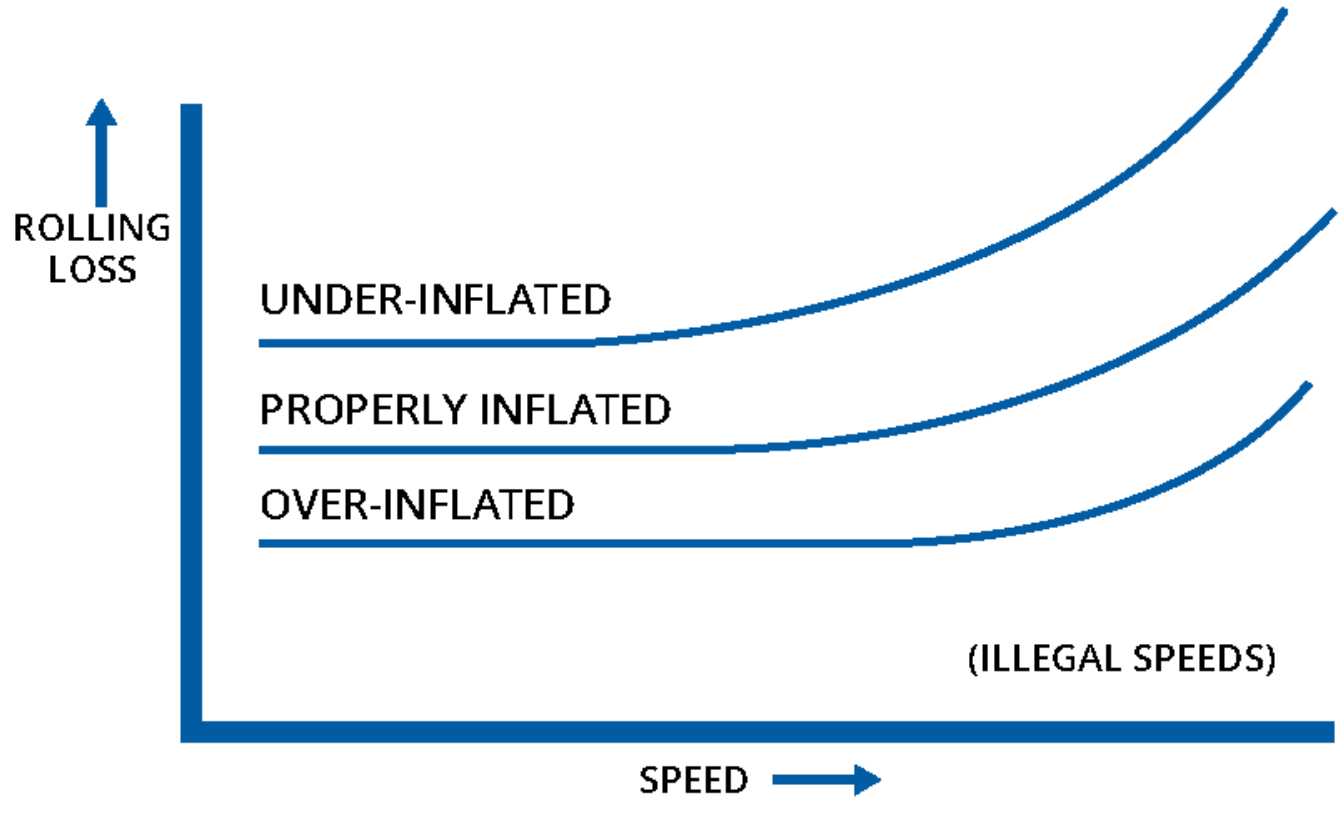
If the tires were an average of twenty pounds low when the tires would have been 95 pounds, the company would loose 50% of the tire wear. On the other hand, the twenty pounds of air pressure will cost more than double the amount of tires wasted in dollars but obviously not in percentage of fuel costs.

This is a substantial amount of fuel and highlights the fact that tires and fuel are directly related in the expense of operation. Each fleet should have maintenance practices sufficient to obtain good inflation. First on the priority list would be to make sure that all tires are checked on every piece of equipment that comes into the shop.

Since all power equipment needs some attention about three times or so per month, that would be a sufficient amount of time. Some fleets still just put replacement air in low tires, so they are maintaining flat tires. Some fleets air tires nearly weekly but do not remove leakers, so they are constantly airing leaking tires.



Valve caps are critical in maintaining air pressures. The valve core should be considered as the secondary seal, with the valve cap being the primary seal. Valve caps should be either quality plastic, or preferably steel with a good internal gasket. Valve caps should be replaced on wheel assemblies after each air check.



Over-inflation can also be devastating, but to a lesser degree than under-inflation. If over-inflation is severe, the tire can cause the rim to separate. This is extremely dangerous. Increasing inflation pressures will increase the load-carrying capacity of the tire up to a certain point, which is listed on the side of the tire. Over-inflation tires also cause tire damage due to the fact that the tire is unable to absorb shock. Slight over inflation can result in fuel savings.

Running a tire just 10% under-inflated can rob the tire user of 7% of its tire life. On a $400 tire, the user will receive only $372 worth of service.

CHAPTER 3
Tire Matching

One of the most important items in a tire shop is the matching. Manufacturers of tires say that tires should be matched to half inch diameter (1/4” in radius), but this just not close enough. If two tires were traveling down the highway and one is 1/2” taller than the companion tire, the smaller one will attempt to travel approximately 1 1/2” less distance per revolution, or 63 feet per mile! The smaller one will increase the mismatch because it will get smaller and smaller. This also will increase the fuel usage. It takes a great deal of fuel to wear tires out early.

Radial Versus Bias

The radial versus bias controversy has been raging for many years. Now there are more radials than bias on the road. Longer life, better recappability and better fuel mileage have always been the advantages as well as better traction on ice, snow, and wet pavement.

Radial Wear Patterns

Radial tires on steering axles have earned a questionable reputation because of river wear patterns. Due to the stiffness of the belt, the tire has very little squirming. When a load is applied, the rubber tries to squeeze out to the grooves and so moves on the pavement and wears out in grooves or rivers. It is not dangerous and should be ignored for the most part.

Starting new tires on power axles has helped to reduce this occurrence. The problem with rotating tires, which appears to be an answer to this problem, is that the labor in doing so can easily eat up all savings.

CHAPTER 4
Tire Selection

Many fleet managers believe the myth that traction depends on the appearance of the tire. Traction appears to be related to how much rubber is on the road. A good three-rib or a good five-rib tire will place more rubber on the road than most lug tires and produce better traction. The only possible time that a lug tire may have more traction is on soft snow, where it digs holes rather than staying on top. If the snow is packed, then the rib tire has the lead. Rib design tires have better shoulder areas and are more recappable in many tire designs.

B.F. Goodrich conducted two tests of tire configuration on both wet and dry pavement. As shown on the dry traction test, the three-rib tire received the highest rating, followed by the seven-rib tire.

Radial Wear Patterns

Tires: 1122.5 12 ply rating
Load: Maximum T and RA singles (static)
Surface: Dry course asphalt
Surface: u = 0.75 @ 40 mph ASTM tire

Tire	uPEAK 20 mph	uPEAK 60 mph
BFG Extra High Miler	0.81	0.79
BFG Custom Line Haul 7 Rib	0.77	0.74
BFG Traction Express Custom (LUG)	0.74	0.70
BFG Extra Traction (M&S LUG)	0.68	0.66

CONCLUSIONS

1. Dry traction varies proportionately with the surface area on the road.

2. When water was applied, the the three-rib was best. The other three were close in co-efficiency of friction, which is directly related to stopping distances.

Wet Traction

Tires: 1122.5 12 ply rating
Load: Maximum T and RA singles (static)
Surface: Dry course asphalt
Surface: u = 0.75 @ 40 mph ASTM tire

Tire	uPEAK 20 mph	uPEAK 60 mph
BFG Extra High Miler	0.69	0.60
BFG Custom Line Haul 7 Rib	0.59	0.48
BFG Traction Express Custom (LUG)	0.58	0.49
BFG Extra Traction (M&S LUG)	0.58	0.51

CONCLUSIONS

1. Compounding affects wet traction.

2. At higher speeds, wet traction varies with unit pressure and the tire's ability to eliminate water in footprint.

CHAPTER 5
Recapping

Most fleets are using cold capping processes although there are improvements being made in the hot capping processes even as we speak. It used to be that we could sell carcasses at a reasonable price on the larger tires, but apparently this market is drying up as the cost of new tires fall.

Tire prices have not changed appreciably for the last 12 years. More and more companies and organizations are not capping more than once. This is flooding the market. More and more companies are capping longer due to this.

There is nothing wrong with capping. Large fleets have been doing it successfully for years. If the carcass is sonic tested for blemishes, the numbers of failures are not high. Most cap failures can be attributed to poor inflation pressures. The fleets that keep them inflated have little problems with separations.

There is one brand name that insignificant from coast to coast. It is the current leader in the cold capping process. Two other names are coming forward and are gaining part of the capping process back. There are some capping franchises that are less than professional in their approach in some good capping systems with too high of failure rates. These have to be weeded out by trail and error.