

Summary Statement

This report explores the benefits and challenges of fleet adoption regarding wide base tires. More than a couple decades ago, fleets around the world were introduced to a tire technology that was intended to replace the conventional dual truck tire assembly that had been the industry standard since its introduction in 1908. Due to the larger overall size of these tires, they came to be known as "Super Single" or "Wide Base" tires. Through the recent use of wide base tires, fleets are realizing fuel savings of 3% to 6% depending on the adoption at both the tractor and trailer wheel positions. In addition, this report will discuss serviceability, weight savings, compliance with North American States and Provinces as well as driver acceptance. Fleets utilizing this technology are realizing immediate fuel, cost and weight savings. This technology is readily available today in all tractor & trailer OEM's data books and offers a simple retrofit opportunity for existing equipment.

Background

While originally designed for use on steer positions of vocational trucks such as mixers and dumps, in the 1980's, some industry innovators found that these tires could eliminate the dreaded inside dual tire while still carrying the payload needed to accomplish their daily activities. Many drawbacks were present during this time as fleets investigated the commercial viability of this technology on drive and trailer positions. Fleet managers found that these drawbacks were too great to overcome at the time. For example, the vehicle height and center of gravity were raised, leading to a less stable piece of equipment. Air pressures were higher than traditional dual tires which lead to a less comfortable ride and a greater risk of impact damage to the tire. Retread-ability was in question and poor service availability provided a final and crushing blow to many fleets' initial evaluation of this technology.

Fast-forward 20 years to the introduction of the "New Generation Wide Single" tire in late 2000. Manufacturers were very careful to distinguish between the first iteration of the 1980's, which were more closely aligned with a "steel-toed" work boot than the present day "running shoe" intended to deliver superior vehicle stability, improved handling, reduced vehicle weight (allowing for increased payload) and improving fuel efficiency for the over-the-road trucking fleet. Many tire displays clearly demonstrated the substantial size differential between the old "Super Single" and the new "Wide Single". With a dramatically lower overall height and the ability to carry up to 22,000 pounds across an axle, the new "Wide Single" can easily meet the needs of the vast majority of U.S. loads on the road today without the drawbacks many innovative fleets were faced with years earlier.

As with any radically new technology, time and trial provide further opportunities for refinement. The present-day "Wide Single" tire has extensive road availability and dramatically improved retread-ability over its fore-fathers. Manufacturing processes

and improved tire design techniques offer today's fleet all the advantages that were envisioned so many years ago.



Industry Segment Applicability

Data used to create this report was obtained from several fleets based in North America and operating in the 48 contiguous states, Canada & Mexico, in all seasons and weather conditions. Not all fleets may find this technology applicable to their operation.

Technical Summary

- Decreased fuel consumption – Due to the lower rolling resistance of the tire, immediate fuel use improvement of 3% to 6% is gained.
- Fewer tires & wheels to manage - An advantage for fleets managing tires and wheels at all positions can be reduced by as much as 44% when converting from 18 to 10 wheel positions.
- Weight Reduction – When combined with single wide aluminum wheels, a weight reduction of 100 lbs. per wheel end can be realized.
- Increased brake life – Depending on axle width and wheel offset, more of the brake drum is exposed to open air, allowing the drum and shoe to stay cooler and last longer.
- Resale / Convertible back to dual tire configuration – Unless wide track axles are specified with a zero offset wheel, tractors and trailers can easily be converted back to a dual tire set up.
- Availability – After nearly ten (10) years of use in the industry, fleets report that wide base tires are readily available although not always in the exact tread design that matches the many available configurations.
- Improvement in cost per 32nds of tread – Fleets report that as a cost per 32nd of tread life, the cost compared to dual tire operations is equal to or better than duals.
- Lower cost than dual tire set up – Due to fewer wheels being purchased per vehicle, wide base offers an advantage in total purchase cost than specifying dual tires and wheels.

- Improved ride and handling – Drivers for the fleets adopting this technology report improved ride and handling due to the large solid tread footprint that is created with the wide base tire.
- Especially applicable to converter dollies – Fleets that operate twin and triple trailer combinations have adopted the wide base tire for their converter dollies to reduce weight, lower fuel consumption and reduce work related injuries when manually moving a converter dolly. The lower rolling resistance of two wide base tires versus four tires on a dolly converter makes this the ever growing choice of fleets operating multiple trailers in combination.
- Wheel bearing wear – Some fleets and wheel end manufacturers have reported concerns with standard width axles and offset wheel configurations as to the increased wheel bearing load being created. At least one fleet surveyed, that has over 8 years experience with standard width axles and 2” offset wheels has reported no bearing failures.
- Breakdowns and increased costs – It is a fact that when a wide base tire goes down, the vehicle is down and cannot be “limped in” to the nearest point of service. However, with the implementation of new CSA rules, “limping in” may no longer be accepted practice in the industry. Fleets that have adopted this technology report that breakdowns with wide base tires occur less frequently because the driver can visually see when they have a low tire and address the issue before they would have with a dual tire setup.
- Damage to one = damage to both – Due to the increased cost of one tire versus two duals, when a tire failure does occur due to low pressure or other road hazards, the cost to replace one wide base tire versus one half of a dual set up is increased. On-road failures of wide base tires may result in increased breakdown costs compared to a dual set up that may be able to limp in.
- Traction myths – Testing by tire manufacturers and fleets have proven that there is no loss of traction when adopting wide base tires.
- Driver acceptance – Early adopters of wide base tires found it difficult to achieve driver satisfaction until a majority of their fleet was converted / equipped. Driver education through the manufacturers is highly recommended before adopting this technology.
- Acceptance by government / Special permits required – There is virtual acceptance in North America with only a few provinces in Canada that disallow or require special permitting for the use of wide base tires.
- Spread axle applicability – Fleets attempting to adopt wide base tires on spread axle trailers, especially the flat bed industry, have reported that excess tire wear due to “scrub” from turning does not make wide base tires acceptable from a cost standpoint.
- Is Tire Pressure Monitoring needed? – Some fleets feel that tire pressure monitoring or tire pressure inflation systems are necessary to avoid low tire pressure and prevent on-road failures. Other fleets have reported that the

advantage of a visual inspection with one tire versus two tires is enough of an advantage and cannot justify the additional cost of tire inflation or monitoring devices.

- Ease of Maintenance – Manually checking tire pressure on one wide base tire is considerably easier and more likely to occur compared with doing the same for two tires at each wheel end. Wide base tires eliminate the need for the driver or technician to fish for the inside valve stem.
- Duals not perfectly matched – Equipment owners should consider that a dual tire setup will result in higher rolling resistance due to the fact that two tires mounted back to back are never exactly the same dimension (circumference) and are working against each other, creating friction and resistance.

Economics

- Fuel consumption decrease – A decrease of 3% for the tractor and an additional 3% for the trailer will result in fuel savings per year per truck of \$3,962. (Based on annual mileage of 120,000 miles and fuel at \$3.50 per gallon.)
- Initial purchase price less by \$130 – Fleets have reported that the average truck purchase price is \$130 less when equipped with wide base tires and wheels versus dual tires and wheels due to purchasing fewer wheels.
- Brake life gains – An improvement of 20,000 miles in brake life per tractor is reported by fleets due to the increased air being pulled across the brake drum since more of the drum is exposed in a wide base tire/wheel configuration.
- Increased blue book value – The Truck Blue Book® as of the December 1, 2010 release, gives an additional \$1,250 of value for a set of wide base tires. Tires must meet DOT requirements to receive the credit. www.truckbluebook.com

Real World Application

- Numerous fleets and owner operators have already adopted this technology. One major tire supplier has produced and sold over 1,000,000 of the wide base tires in use today.
- Some fleets have chosen to carry a spare wide base tire and wheel assembly to offset the delay in obtaining replacement tires of the same make and model when a failure does occur.
- At least one fleet is experimenting with automatic chains, similar to those outfitted on fire trucks, ambulances and other emergency service vehicles. This fleet is also working with two automatic chain companies to prove how this technology can fit with wide base tires.
- Gaining driver acceptance of this technology is difficult without proper training. Fleets and owner operators should become educated by the tire manufacturers and other fleets to understand what is necessary to gain the full benefit of wide base tires.

Government / Regulatory issues

There are no known obstacles in the U.S. Federal operating territories or states that would prohibit adoption/use of this technology. Some provinces in Canada may require a special permit before operating in their regions.

Want more information?

The North American Council for Freight Efficiency is a Non-profit organization dedicated to doubling the freight efficiency of North American goods movement. We pursue this goal in two ways: Improving the quality and reliability of Information and Highlighting the success of high efficiency technologies. This Executive Report is the highest level of study that the Council creates in delivering to this mission. This information is directional in nature and limited in scope to an analysis of a few US fleet operators. Performance results and costs will vary depending on specifications, duty cycle, geography and other criteria. The information contained in this report and the underlying data supportive of the report are intended for the benefit of NACFE members and their fleets. Contact the Council at contact@nacfe.org for more information or simply to comment on this report.