

RETREAD PERFORMANCE STUDY

**Smithers Scientific Services, Inc.
Akron, Ohio**



**CONSULTANT'S REPORT
FOR
RETREAD PERFORMANCE STUDY**

Prepared for:

**THE NORTH CAROLINA GENERAL ASSEMBLY
JOINT LEGISLATIVE TRANSPORTATION
OVERSIGHT COMMITTEE**

Prepared by:

**Michael L. Bair and Thomas M. Dodson
Smithers Scientific Services, Inc.
425 West Market Street
Akron, OH 44303-2099 USA**

Smithers Scientific Services File No. 4000C/0706

April 10, 2008

"Creative Solutions Since 1925"

RETREAD PERFORMANCE STUDY

Contents

Introduction to study and background information Page 3

Section One:

Mold-cure and pre-cure retread processes comparison,
marketplace utilization information and statement
regarding comparative, expected performance Page 7

Section Two:

Monetary Value of the State Contract and related
survey result Page 11

Section Three:

Comparative performance analysis from the field (miles per 32" and
cost per mile)
Physical, mechanical and chemical analysis results & comments
Dynamic laboratory testing analysis results & comments
Spot repair analysis of DOT and LEA casings
Comparative appearance analysis Page 13

Section Four:

Discussion concerning safety and quality comparisons and other
studies related to retreading Page 59

Section Five:

Comments on failure rate information learned from
NCDOT and LEA fleets Page 60

Section Six:

Analysis of current North Carolina retread
contract RFP specifications Page 62

Section Seven:

Survey of the retreading and new tire procurement and
retread process usage practices of other states Page 66

Conclusions Page 129

Appendix Page 133

Sources For Tire/Retread Terminology and Technical Reference

LEA fleet survey results spreadsheet

Survey of Tire Debris on Metropolitan Phoenix Highways – Phoenix Arizona

Need For Standards For Recapped Tires – Commonwealth of Virginia

Bridgestone – How Long Do Commercial Truck Tires Last

RETREAD PERFORMANCE STUDY

Introduction to Study and Background Information

Smithers Scientific Services Inc. (Smithers) was contracted by the Joint Legislative Transportation Oversight Committee (JLTOC) of the North Carolina General Assembly “to conduct a comparative analysis of quality, safety and cost-effectiveness for the types of retread processes purchased through the State’s statewide contract.” (Language in quotation marks from the State’s RFP dated November 21, 2006). The study was limited to size 11R22.5 medium truck tires; a predominant size common to both NCDOT and LEA fleets.

Prior to submitting its response to the above RFP, Smithers held discussions with Ms. Lisa Hollowell, of the Fiscal Research Division. The agreed-upon approach to the work was to study performance; the end product of the analysis of which would inherently include both reliability (safety) and cost effectiveness and would provide the JLTOC with what it required for its purposes.

Based upon those discussions, an independent, third-party, business and technical analysis was therefore undertaken, utilizing a multi-pronged, observation-to-conclusion methodology. The investigation involved both primary investigational research at various NCDOT and LEA fleets, fleet management centers and entities related to contracting/purchasing matters (including independent tire dealers/retreaders), as well as conducting various objective, laboratory analyses. At the conclusion of the data collection and analysis, a detailed report was completed.

PLEASE NOTE: Based on information provided in the RFP package, Smithers was aware of the ongoing controversy over some of the provisions of the current state contract. Smithers concentrated its efforts in this study on the technical and practical issues that could be considered and analyzed and any comments in this report concerning the existing contract were limited to that discreet area of focus.

LEA and NCDOT locations visited by Smithers during the course of the study:

In addition to DPI Transportation Services in Raleigh, Smithers visited the following LEA fleet locations:

- Alamance – Graham, NC
- Buncombe – Asheville, NC
- Durham – Durham, NC
- Forsyth – Winston-Salem, NC
- Guilford – Greensboro, NC
- Henderson – Hendersonville, NC
- Mecklenburg – Charlotte, NC
- Rockingham – Reidsville, NC
- Wake – Raleigh, NC

Smithers visited the following NCDOT locations:

RETREAD PERFORMANCE STUDY

- Director's Office and Central location – Raleigh, NC
- Division 4 – Wilson, NC
- Division 5 – Durham, NC
- Division 9 – Winston-Salem, NC
- Division 10 – Charlotte, NC
- Division 12 – Shelby, NC
- Division 13 – Asheville, NC

Individuals in North Carolina that Smithers visited in person and/or consulted with during the course of the study:

- Lisa Hollowell – Legislative Services
- Giles Perry – Legislative Services
- State Senator Jenkins - JLTOC
- State Representative Cole - JLTOC
- Ralph Edelberg – Quality Engineer, State Purchasing
- Mike Mangum – State Purchasing Officer
- Bahaa Jizi – Contract Administrator, State Purchasing
- Jim Westbrook – State Purchasing
- Derek Graham – Section Chief, Department of Public Instruction Transportation Services
- Craig Warren – Transportation Consultant, Transportation Services, DPI
- Kevin Harrison – Computer Consultant, Transportation Services, DPI
- Benjamin P. Matthews, Ph.D. – Director, School Support Division, DPI
- Al Smith – Alamance-Burlington SD
- Harold Laflin – Buncombe SD
- Scott Denton – Executive Director of Transportation Services, Durham Public Schools
- Donna Hudson – Durham Public Schools Fleet Manager
- Todd Simme – Durham Public Schools Tire Service Technician
- Rhonda Fleming – Operation Manager, Transportation Department. Forsyth SD
- Daryl Ritchie – Forsyth SD
- Jeff Harris – Guilford SD
- Larry Lassiter – Guilford SD
- Fred Klumpp – Henderson SD
- Carol Stamper – Charlotte Mecklenburg SD
- Herman Hiers - Charlotte Mecklenburg SD
- J. C. Porter – Charlotte-Mecklenburg SD
- Robert Gauldin – RockinghamSD
- Mr. Troy Bullard - Wake SD
- Jeff Moore – Wake SD
- Drew Harbinson – Director, Equipment & Inventory Control, NCDOT
- Mark Walker – NCDOT Division Equipment Superintendent and chairman of NCDOT Tire Committee
- Quince Watson – NCDOT equipment and tire expert

RETREAD PERFORMANCE STUDY

- John Strickland – NCDOT Inventory Systems Analyst
- Thomas E. Satterwhite – NCDOT Purchasing Agent
- Larry Brodie – NCDOT Deputy Purchasing Officer
- G. K. Dozier – NCDOT Division 4 (2)
- Joe Patterson – NCDOT Division 7
- G. E. Morris – NCDOT Division 9 (2)
- R.R. Mabry – NCDOT Division 10
- Jake McDaniel – NCDOT Division 10
- Bob Waterhouse – NCDOT Division 10
- B.S. Sisk – NCDOT Division 12
- G.M. Wilson – NCDOT Division 13
- Fran Hemphill – NCDOT Division 13
- James E. White, Sr. – White's Tire & Rubber Company
- Bobby White – White's Tire & Rubber Company
- Graham White – White's Tire & Rubber Company
- Sandra White – White's Tire & Rubber Company
- Russ Hunt – Snider Tire Inc.
- Terry Oliver – Bandag, Inc.

Smithers' Methodology and Approach

Smithers approach for this work was comprised of two, distinct and complimentary processes: 1) collection of field and business facts and data and 2) laboratory and dynamic testing analyses.

1. Collection, development and extraction of field tire performance data for size 11R22.5 medium truck tires in the fleets. This required visiting fleet locations to meet knowledgeable NCDOT and LEA people, in order to gain a firsthand understanding about each fleet's retread/tire performance and any issues or concerns, both present and historical. These visits also involved examining vehicle maintenance records, inspecting tires on representative vehicles, and inspecting tires in the scrap tire pile (if tires were available). These visits also involved learning about what information would be accessible in the fleets' vehicle maintenance records as to dates/mileages that tires were installed/removed. (Ultimately, and with the cooperation of the fleets, this proved to be our best source of current miles per-32nd inch tire performance data).
2. The second prong of our methodology was to undertake very objective, technical, product benchmarking analyses of 11R22.5 size medium truck tires from the fleets. These analyses were carried out in two phases.

Phase 1 employed laboratory benchmarking to compare various physical/chemical and mechanical properties of the components of the Contract-supplied and competitors' retreads. These tests were conducted to assess properties known to be related to tire performance and durability.

RETREAD PERFORMANCE STUDY

Phase 2 utilized dynamic benchmarking; during which Contract-supplied and competitive products were compared with regard to their ability to withstand a dynamometer protocol, that equally placed speed/load performance demands on each of the products. The NCDOT and DPI arranged to make available representative tires (from the field) for this testing. In addition, Smithers procured retreaded tires manufactured in Northeast Ohio, so as to have a third group of tires for comparison (the Ohio retreads were placed on actual field casings from the NCDOT and LEAs).

Sections 1 through 7 of Smithers' report follow, along with Conclusions and Appendix.

RETREAD PERFORMANCE STUDY

SECTION ONE

Mold-Cure and Pre-Cure Retread Process Comparison, Marketplace Utilization and Statement Regarding Comparative, Expected Performance

There are two widely recognized types of retreading processes available for medium duty truck tires. The two processes are generally described as pre-cure and mold-cure. Pre-cure retreads are often referred to as “top caps”, “cold caps”, etc. Mold-cure retreads are frequently spoken of as “orbitreads”, which refers to the Orbitread system that is often used for applying uncured rubber to the casing, prior to curing the rubber in the mold. For the purposes of our report, including this section, we will utilize only the terms pre-cure and mold-cure, which are technically accurate and sufficiently descriptive to differentiate between the two retread process categories. (Mold cure includes the veneered sidewall “bead to bead” retread manufactured by White’s).

Either process requires the addition of time, temperature and pressure to vulcanize (cure) some amount of rubber. In either process, the newly applied rubber is adhered to the casing through the use of both adhesive and mechanical retention.

1. **Pre-cure** methods apply already-cured tread rubber stock (tread design already molded in) to the buffed tire casing. With pre-cure retreading, a thin layer of uncured rubber (very often called “cushion gum”) and cement are placed between the casing and bottom of the new tread. That thin layer of cushion gum is the rubber that is actually cured in the pre-cure process, resulting in the bond between the new (pre-cured) tread and the casing. The curing occurs in a chamber that holds a number of tires; each tire in its own rubber “envelope”, for the purpose of creating a vacuum. Some in the industry refer to this process as a “cold cap” although the curing process requires temperatures in the range of 200° F.

2. **Mold-cure** processes, require that uncured, rubber and cement be applied on top of the buffed tire casing, frequently (though not necessarily) in a “strip wound” fashion. This requires a thick layer of uncured rubber, as the tread design will be impressed into that uncured rubber during the curing process. After application of the uncured rubber, the tire is placed in an individual mold, where the rubber is cured and thus bonded to the casing. Since this process requires temperatures more in the range of 300° F, many in the industry will refer to a mold-cure retread as a “hot cap”.

Precured Retreading Description

As with all retreading processes, pre-cure begins with the inspection, selection and proper repair of the tire casing which is to be retreaded.

The first step is to visually inspect the tire casing to be sure that it is in fact suitable. Visual and tactile examination of the casing as well as other non-destructive inspection techniques, are utilized. X-ray is often used for non-destructive examination purposes.

RETREAD PERFORMANCE STUDY

Ultrasonic evaluation may also be used, providing electronic images of damage that may exist in the tire's structure. Static discharge of an electrical current is also used, in which the current is passed through the casing and variation in resistance is observed (indicating anomalies, the presence of metal objects, etc). Shearography has become a popular tool as well and this process creates images of a casing's interior, while the tire is in a vacuum chamber. The vacuum produces some deformation where a separation may exist. Still another method is the use of overpressure, wherein the tire is mounted on a wheel and inflated to very high inflation pressure; with the particular goal of exposing casing ply damage.

After the initial screening, the casing will then proceed to the tread buffing process where the original tread will be removed to provide an appropriately-textured surface onto which the pre-cured retread will be attached. After buffing, with the majority of the tread rubber now removed, any damage that has extended through the tread to the buffed surface (or deeper) can be evaluated.

Any puncture injuries, cuts or other damage that extends into (or through) the steel belt package of the tire will be assessed. These areas are ground out until the total size of the damaged area is identified and a determination can be made as to the nature and type of repair that the damage requires or, whether the casing must be discarded at this point. These repairs are often called buzz-outs and/or spot repairs. As the severity of the service which the tire is subjected to increases, the number of spot repairs would be expected to increase. Even injuries that extend completely through the tire structure can potentially be repaired (if within specifications) by the installation of the appropriate repair system.

Once the casing is deemed suitable for further processing, it will be sprayed with a liquid adhesive and covered with a thin, unvulcanized, layer of cushion gum, onto which the pre-cured tread will be applied. Once the tread is applied and the cut ends are spliced, the tire is placed in a rubber envelope or bag and mounted on a special wheel. Through differential pressure, the new pre-cured tread is forced down against the casing, while the assembly is heated, usually in an electric oven or curing chamber along with a number of other tires. After the specified time elapses, the tire is removed, inspected, cleaned and (often) "painted" to give it a like-new look, and is ready for sale.

"Wing tread" pre-cure, or similar terminology, describes a refinement in the pre-cure process that extends the tread rubber slightly down the upper sidewall area, covering the buffing striations and providing a nicer finished appearance. Depending upon the process and operator skill level, this feature can result in a tire with an appearance approaching that of the original new tire, and very close to that of a well made veneered-sidewall, mold-cure retread.

Mold-Cure Retreading Description

Mold-cure retreading requires the exact same inspection and preparation process as in pre-cured retreading, as described above. The mold-cure retread process does differ very significantly from the pre-cure process in one major area – all of the new rubber that is applied to the casing is uncured.

RETREAD PERFORMANCE STUDY

After the casing has been inspected, buffed and any repairs have been made, the rubber is laid up on the prepared carcass, which has been sprayed with adhesive. In the mold-cure process, uncured tread rubber is ordinarily strip-wound onto the crown area of the tire, in a process that mimics the way in which a deep-sea fishing reel evenly positions the line back and forth on the spool as it is wound in. Not all uncured rubber is strip-wound, however, and may be applied in a single strip. After the uncured rubber has been placed, the tire is then inserted in a clam-shell mold, which has the appropriate tread pattern for the given application the tire will be used in. This mold will be placed in the appropriate heating chamber for the proper time and temperature to vulcanize the rubber. At the completion of the curing process the tire will be removed from the mold, inspected, processed and prepared for sale or delivery.

In the unique (and very unusual in North America) case of “bead to bead” mold-cure retreading, the sidewall area of the tire must also be prepared to accept new rubber. The sidewalls will be buffed and adhesive applied in anticipation of the application of a thin layer or “veneer” of rubber that will be applied and cured to the tire. In the case of bead-to-bead mold-cure, the mold itself will have been engraved so as to place the desired markings and information into the newly veneered sidewall rubber. The new sidewall veneer plays no structural role in the retreaded tire. Depending upon what information and decorative designs are engraved into the mold, the sidewalls of a bead-to-bead retread may take on a very different appearance; compared to what the sidewalls looked like when the tire was originally manufactured. This process will essentially eliminate the original manufacturer’s markings, that are molded onto the tire’s sidewalls.

Marketplace Utilization

The medium truck retread market in North America is large. Michelin, in its *Factbook 2007*, estimates that 22 million replacement market medium truck tires (does not include tires on new equipment) were sold in North America in 2006. In the same publication, Michelin estimated that around 18.5 million medium truck retreads were sold in North America, during that year. The retread to new tire medium truck sales ratio is higher in North America than in any other geographic region in the world, according to Michelin’s publication. This high retread utilization figure generally speaks to a good highway system with enforced load and speed limits, maintenance practices motivated by the desire to be able to retread, widely available, high- quality retread processes, as well as high-quality new truck tires designed with retreading in mind.

Mold cure retreading has existed since the early part of the 1900s. During the late 1950s, an Iowa businessman brought the early technology for pre-cure retreading to the USA, where he further developed, tested and proved its viability. It can be seen that mold-cure retreading has about a half-century head start on pre-cure retreading in the US.

Actual marketplace usage of the two types of retreads can of course only be estimated. *Modern Tire Dealer* magazine published an article concerning last year’s acquisition of Bandag Inc. by Bridgestone-Firestone North American Tire.

RETREAD PERFORMANCE STUDY

The above-mentioned *Modern Tire Dealer* article pointed out that Bandag Inc. has a US market share of 45% and produces only pre-cure retreads. The next two US retread market share leaders are Goodyear and Michelin, whose shares are whose shares are 26.5% and 12%, respectively. (As a point of interest, Michelin is a relative newcomer to the US retreading market). The combined market shares of Bandag, Goodyear and Michelin = 83.5%, with the remaining percentage spread out among other retread process manufacturers and independent retreaders.

The industry uses 15%-20% as its estimate of the portion of the market that is mold-cure. The *Michelin Factbook* indicates 18.5 million retreads sold in North America in 2006, so the mold-cure market share would have been between 2.78 and 3.7 million units in that year

Anticipated performance of retread systems

In terms of comparative actual or expected performance, the information we have gathered from the NCDOT and LEA fleets clearly indicates that there is little or no difference in durability performance, based upon the broad categories of pre-cure and mold-cure. As will be stated elsewhere in this report, the fleet managers are very pleased with retreads generally, find them to be entirely reliable and are very comfortable using them. Overall, these attitudes mirror Smithers' knowledge and experience with medium truck retread usage.

Smithers experience, both in this study and over the years, bears out that it is not pre-cure versus mold-cure (or veneered mold cure) that determines retread performance. Rather, the two main variables that will in fact determine retread performance are:

1. The original quality of the casing. Its physical condition (damage, repairs, etc), the maintenance it has received to date and the type of the service it has been subjected to.
2. The retreader doing the work. Using well-trained technicians, a market-proven process and having stringent in-the-plant control of the process itself.

With the above two qualifications in mind, it is likely that, broadly speaking, state or private sector users of retreads will have a satisfactory result with any of the several, well-known and established National or regional retreading companies and their owned or franchised operations. Our experience and belief in this regard is reinforced by the performance information conveyed to Smithers by NCDOT and LEA fleet personnel. Namely, the fleet managers are getting good service and reliable performance from a variety of retreaders (more information to follow in subsequent sections of this report).

This is not to say that certain products of one retread manufacturer or the other won't offer some incremental performance advantage in certain vehicle applications, etc., because this may well be the case. Competition in the marketplace naturally drives innovation and improvement. Therefore, it should be anticipated that product evolution and improvement in a given retread process, may, at any point in time, result in slightly improved product performance; one retread process versus another.

RETREAD PERFORMANCE STUDY

SECTION TWO

MONETARY VALUE OF THE CONTRACT AND RELATED RESULTS FROM THE LEA SURVEY OF RETREAD CONTRACT USAGE

Background

In order to determine the approximate total annual value of the state retread contract, information has been gathered from two distinct sources.

The first source was Mr. Bahaa Jizi, State Procurement Specialist in the Department of Administration, Division of Purchase & Contract. Mr. Jizi provided sales volume figures, for both the LEAs and the NCDOT, as provided by the vendor, White's Tire Service. These figures are the sum of the actual tires and spot repairs sold on-contract by the vendor in the year 2006.

In order to secure actual information from the LEAs as to any off-contract retread purchases, it was necessary for Smithers to conduct a survey. The complexity of this effort was reduced by the kind assistance of the Department of Public Instruction, whose Kevin Harrison assisted in the electronic survey distribution and collection of data from that survey.

Sending out the LEA survey presented a unique opportunity to enquire as to matters other than contract usage. Additional questions were designed to simply gauge the LEAs' level of interest in the details of tire performance in the fleets. The additional questions focused on:

1. Whether the fleets are keeping mileage or performance records
2. The estimated number (or percentage) of tires that are returned to the vendor due to performance issue
3. Whether any retread comparison tests are being run

(The survey responses to these questions are presented on a survey synopsis spreadsheet, which is included in the Appendix Section of this report).

2006 Contract Usage

The "N.C. School Bus Garage" (LEAs) contract usage for 2006 was:

Pre-cured retreads -	\$ 9,593.45
Bead to Bead retreads -	\$2,129,534.16
Repairs (spot repairs only)	<u>\$ 518,499.29</u>
Total	\$2,657,577.20

The NCDOT fleets contract usage for 2006 was:

Pre-cured retreads -	\$ 63,957.29
Bead to Bead retreads -	\$ 408,016.84
Repairs (spot repairs only)	<u>\$ 225,119.31</u>
Total	\$ 697,093.44

RETREAD PERFORMANCE STUDY

Annual Off-Contract Purchases as Per the 2007 LEA Survey:

Total reported purchases from all non-Contract vendors in this survey amounted to \$716,261.90

Total value of retread purchases

\$2,657,577.20 – 2006 LEA on-contract purchases

\$ 697,093.44 – 2006 NCDOT on-contract purchases

\$ 716,261.90 - LEA-reported annual off-contract purchases

\$4,070,932.54 – Combined total retread purchases (approximate).

Please note that the State contract purchases listed spot repairs as a separate line item and the LEAs' off-contract purchases included spot repairs in the price (which is the industry pricing practice).

*The off-contract vendors/retread brands mentioned by the various LEAs were:

Bandag

Goodyear

Snider

Michelin

Clark Tire

Piedmont Tire

Wingfoot

Best Tread

Parrish Tire

Tire Centers Inc. (TCI)

Black's Tire

Maness Tire & Recapping

RETREAD PERFORMANCE STUDY

SECTION THREE

Comparative Performance Analyses

1. Field Miles per 32nd Inch and Cost-Per-Mile Projections
2. Physical/Mechanical and Chemical Analysis
3. Dynamic Laboratory Testing and Analysis
4. Spot Repair Analysis of LEA and NCDOT Casings
5. Comparative appearance analysis
6. Reported return rates from NCDOT and LEA fleets
7. Project Data Collection Map

1. Field Miles per 32nd Inch and Cost Per Mile Fleet Performance Data

Tires are the second highest variable maintenance cost in fleet operation (after fuel). Therefore, miles per 32nd inch of tread depth and tire cost per mile are important measures of the field performance of tires in a particular application. For the purposes of this study, miles per 32nd inch of tread depth and cost per mile calculations were determined from actual field performance data gathered from NCDOT and LEA fleet locations.

With the kind cooperation of NCDOT and LEA fleet location managers, we were able to gather real-world miles-per-32nd inch performance; either from vehicles presently in service, or in some cases from historical vehicle maintenance records.

By tradition, tread depth measurements in the US are typically made in 32nd of an inch increments. For reference purposes, 8/32" of an inch = 1/4" of tread depth.

For purposes of this study, miles per 32nd inch of tread depth were calculated based on the average reported number of miles of operation, as reported by the particular fleet, on an individual tire basis, divided by the average amount of tread depth consumed during that period of operation. Cost-per-mile calculations were formulated based on the following two assumptions: 1) the reported new-tire tread depths and 2) that all tires were considered to be worn out at 4/32nds inch tread depth. The tire prices were determined either from the State contract and/or information gained from the various fleets using/testing non-contract tires.

RETREAD PERFORMANCE STUDY

Tread Depth Assumptions:

White's bead to bead drive	24/32"
White's bead to bead rib	19/32"
White's pre-cure CB-W200 drive	19/32"
White's pre-cure wing tread	16/32"
Bandag BRM	26/32"
Bandag BDV	22/32"
Goodyear Wingfoot pre-cure	16/32"
Michelin pre-cure	15/32"

Because tire prices can vary slightly for the same tire in different markets, and at different points in time, the following prices for Bandag BDV and Bandag BRM have been averaged.

For consistency, Contract pricing has been used in all cases for White's products (though some fleets had slightly varying White's pricing in their records). Bead to Bead pricing includes 3 spot repairs, which appeared to be the typical custom and practice

Bead to Bead Highway	\$117.40 (Contract)
Bead to Bead Traction	\$132.14 (Contract)
Pre-cured Highway Wing Tread	\$70.76 (Contract)
Pre-cured Traction Wing Tread CB-W200	\$70.46 (Contract)
Bandag BRM	\$114.00 (Average)
Bandag BDV	\$112.00 (Average)
GY Wingfoot pre-cure rib	\$92.30 (Reported)
Michelin pre-cure rib	\$93.26 (Reported)

Cost-per-mile calculations may also take into consideration vehicle down time, repair costs and cost of replacement tires. Based on our experience, and information gained during the course of this project, these three factors were not deemed to be significant contributors to cost per mile in either the NCDOT or LEA fleets. An example of a typical cost-per-mile calculation follows:

For example:

If a new retread or new tire was mounted 13,500 miles ago, is still in service on the vehicle and has worn off 6/32" of tread, the rate of wear is 2,250 miles per 32nd inch of tread depth (13,500/6).

Next, having determined miles per 32nd inch rate of wear, total anticipated mileage figures were projected. The projections were made by multiplying miles per 32nd inch wear rate x the tire's usable tread depth.

For example:

RETREAD PERFORMANCE STUDY

19/32" original tread depth - 4/32" (tread depth at removal from service) = 15/32" usable tread depth:

15/32" x 2,250 miles per 32nd" (from the earlier example) = 33,750 projected miles.

Continuing the above example, we determined the projected cost per mile for a given retread; using the Contract price of an 11R22.5 Bead to Bead rib, including 3 spot repairs at \$117.40 as follows:

\$117.40 cost of retread

33,750 projected miles = .347 cents per mile

Please Note:

- In all of the calculations for this report, the tire was considered to be worn out at 4/32" tread depth (a very common point of removal for the fleets we visited).
- Tread depths used in the calculations for the White's various retread products were the tread depths that were provided in the contract. Tread depths for the various off-contract retread products were as determined as measured by Smithers.

Representative photographs of tires and vehicles from the fleets visited

Alamance County – Burlington School District.



Alamance-Burlington casing "Returned As Received" by retreader (Belt Separation was identified).

RETREAD PERFORMANCE STUDY



Alamance-Burlington bus.



Buncombe County School District used tires.

RETREAD PERFORMANCE STUDY



Buncombe SD bus.



Charlotte – Mecklenburg School District – Smithers checking tread depth.

RETREAD PERFORMANCE STUDY



Charlotte-Mecklenburg used tires.



Common tread depth gauge.

RETREAD PERFORMANCE STUDY



Guilford County School District bead to bead retread.

RETREAD PERFORMANCE STUDY



Guilford County School District.



Henderson County School District.

RETREAD PERFORMANCE STUDY

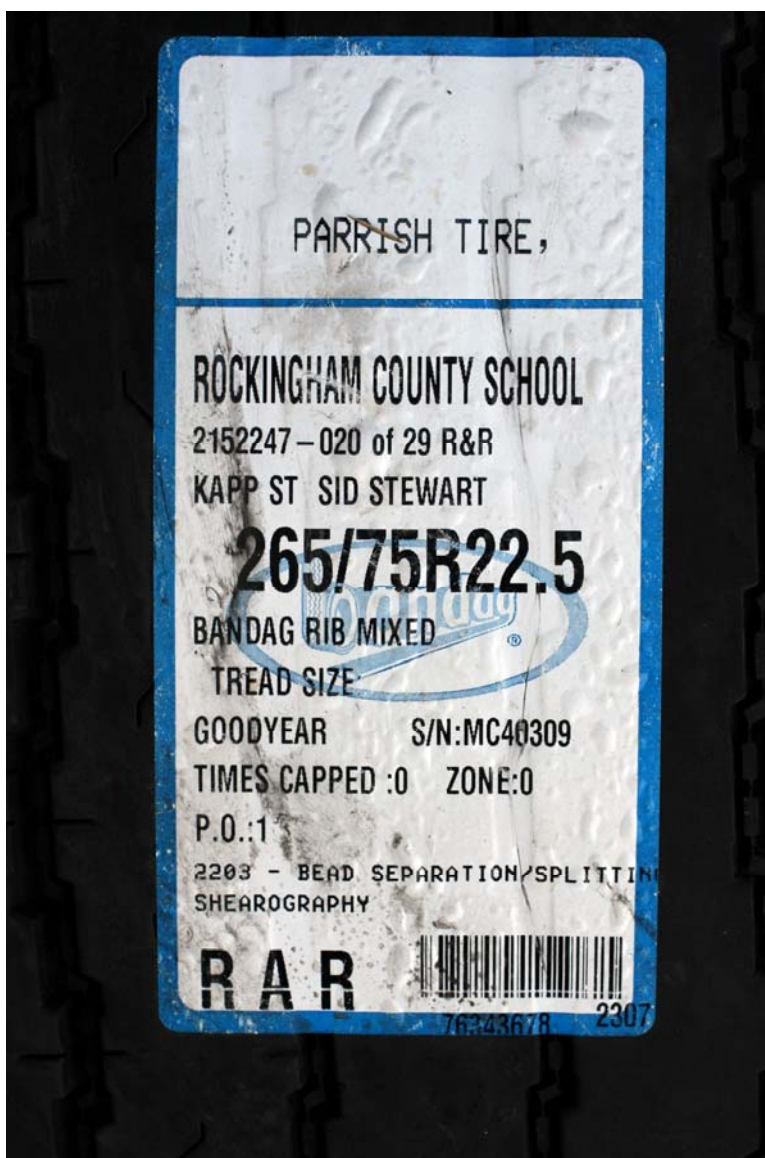


Henderson County School District – New Michelin MRT retread.



Rockingham County School District.

RETREAD PERFORMANCE STUDY



Rockingham casing “Returned As Received” by retreader (Identified problem in bead are of tire).

RETREAD PERFORMANCE STUDY



Wake County School District.



NCDOT Division 9 – Forsyth.

RETREAD PERFORMANCE STUDY



NCDOT Division 9 – Forsyth – White’s pre-cure traction.



NCDOT Division 10 Charlotte.

RETREAD PERFORMANCE STUDY



NCDOT Division 10 Charlotte – White's pre-cure traction.



NCDOT Division 13 – Asheville.

RETREAD PERFORMANCE STUDY



NCDOT Division 12 – Shelby.



NCDOT small dump truck.

RETREAD PERFORMANCE STUDY



NCDOT White's 24/32" traction on small dump truck.

RETREAD PERFORMANCE STUDY

Representative (retread only) Cost Per Mile Figures

Below are representative, projected cost-per-mile figures from each of the 8 LEA and 7 NCDOT fleet locations where miles-per-32nd inch wear rate data were collected for this study. We have utilized both State Contract and local market pricing, depending on the fleet. Again, these figures are representative and are approximate, developed with the intent of providing the JLTOC with directionally demonstrative information, for its purposes.

Fleet	Type Tire	Type Service	Orig. Tread Depth	Avg. Miles Per 32"	Cents Per Mile
Alamance Burlington SD	White's Bead to Bead	Urban	19	776	.010
Alamance Burlington SD	White's Bead to Bead	Rural	19	1133	.007
Alamance Burlington SD	Bandag BRM	Urban	26	913	.006
Alamance Burlington SD	Bandag BRM	Rural	26	1373	.004
Buncombe SD	White's Bead to Bead		19	904	.009
Charlotte-Mecklenburg	White's Bead to Bead		19	1422	.006
Durham SD	White's Bead to Bead	Urban	19	1668	.005
Durham SD	White's Bead to Bead	Rural	19	1200	.007
Durham SD	White's Bead to Bead	Both	19	1484	.005
Guilford SD	White's Bead to Bead	Urban	19	1044	.008
Guilford SD	White's Bead to Bead	Rural	19	1289	.006
Henderson SD	White's Bead to Bead *Based on 2 data points only	Rural	19	431	1.8
Henderson SD	Goodyear Wingfoot pre-cure	Rural	16	981	.008
Henderson SD	Goodyear Wingfoot pre-cure *Based on 1 data point only	City	16	1378	.006
Rockingham SD	Bandag BDV		22	1021	.005
Rockingham SD	White's Bead to Bead		19	1409	.006
Rockingham SD	Bandag BRM		26	1132	.005
Wake SD	White's Bead to Bead		19	1163	.007

RETREAD PERFORMANCE STUDY

Fleet	Type Tire	Type Service	Orig. Tread Depth	Avg. Miles Per 32"	Cents Per Mile
NCDOT Div. 4 Wilson	White's Bead to Bead	Road Oil	24	1314	.005
NCDOT Div. 9 Forsyth	White's Oliver pre-cure Traction		19	2167	.002
NCDOT Div. 9 Stokes	White's Oliver pre-cure Traction		19	1165	.004
NCDOT Div. 10 Charlotte	White's Oliver pre-cure Traction	Single Dump	19	1530	.003
NCDOT Div. 10 Charlotte	White's Oliver pre-cure Traction	Dual Axle Dump	19	972	.005
NCDOT Div.12 Shelby	White's Bead to Bead		24	1199	.006
NCDOT Div. 13 Asheville	White's Bead to Bead		24	858	.008

2. Physical, mechanical and chemical analysis results & comments

The evaluation of medium truck tire performance was not limited to in-service assessment in the fleet. Much was learned in the laboratory as well. For this part of our performance analysis, Smithers cut 10 retreaded and 2 new tires that were obtained from the NCDOT and the DPI subjected them to various laboratory test procedures. These tires were as follows:

1. DPI-1 – White's Marangoni Ring Tread pre-cure retread
2. DPI-4 – White's Bead-to-Bead mold-cure retread
3. DPI-7 – New Goodyear G149
4. DPI-10 – Snider's Bandag BDV pre-cure retread
5. DPI-13 – Goodyear Wingfoot pre-cure retread
6. DPI-16 – Ziegler's XZA pre-cure retread*
7. DOT-1 – Colony's Bandag UDR pre-cure retread
8. DOT-4 – New Goodyear G287
9. DOT-7 – White's Oliver HMT pre-cure retread
10. DOT-12 – Ziegler's XDHT pre-cure retread*
11. DOT-16 – White's Bead-to-Bead mold-cure retread
12. DOT-19 – Snider's Bandag Megatrek pre-cure retread

*Ziegler Tire is a North East Ohio area tire dealer and retreader. They utilize the MRT (Michelin Retread Technologies) processes, which include both pre-cure and mold-cure products. Smithers utilized Ziegler to place their pre-cure retreads on several of the NCDOT and DPI/LEA casings received from the field, in order to have representative test tires from yet another, well-known retread process, for comparison with the products

RETREAD PERFORMANCE STUDY

of the North Carolina retreaders in the evaluation. Ziegler's retread facility and trained technicians were also utilized to assist in our spot repair analysis of several NCDOT and DPI/LEA casings that were provided for that purpose.

In our Akron laboratories, we subjected cut samples of each of the above tires to chemical/physical properties analyses. The tests performed were as follows:

1. Infrared Analysis – Type Polymer ASTM D297-93 (2002) e1, 3677-(2004). This testing is conducted to identify the polymer type.
2. Compositional Analysis by Thermogravimetry, ASTM E1131-03. This testing continuously monitors the weight of a sample during isothermal or dynamic temperature scans over the range from 30° to 1000°C. This identifies the bulk composition (portions of the components, by %) of the rubber compound.
3. Adhesion to Flexible Substrates ASTM D413-98 (02) e1. This test assesses the pound inches of peel force between the retread and the original tire casing.



NCDOT and LEA tires cut for lab analysis.

RETREAD PERFORMANCE STUDY



NCDOT and LEA sections ready for testing.



Sample ready for ply pull machine (pull apart at interface of casing and retread rubber).

RETREAD PERFORMANCE STUDY



Tear resistance being measured (casing/retread interface).



Tear resistance being measured (additional view).

RETREAD PERFORMANCE STUDY

Lab Comments on NCDOT Tires

1. The retreaded tires tended to exhibit higher styrene butadiene rubber content than the exemplar new tire. This difference could be expected to potentially offer more freedom for the tread compounder to formulate for increased abrasion resistance, but perhaps at the cost of increased heat generation and reduced fuel economy.
2. Polymer and carbon black percentages tended to be similar among the retread types. Ash contents were also similar among the retread recipes, but considerably lower than the new tire. This finding would be consistent with usage of silica in the new Goodyear exemplar tire, but not in the retread tires. Significant variations in plasticizer usages between the different retread compounds are routine and expected.
3. The Colony Bandag UDR tread exhibited the highest peel force at the buff line interface, and slightly higher than the other retreaded tire groups, which were comparable with one another.

Lab Comments on DPI Tires

1. Retreaded tires tended to exhibit higher styrene butadiene rubber content than the exemplar new tire. This difference could be expected to potentially offer more freedom for the tread compounder to formulate for increased abrasion resistance, but perhaps at the cost of increased heat generation and reduced fuel economy.
2. Polymer and carbon black percentages tended to be similar among the retreaded tires, and lower than the new Goodyear exemplar tire. Higher polymer content may be associated with lower energy losses in service. The ash contents were also similar between the retread recipes, but considerably lower than the new tire. This finding would be consistent with usage of silica in the Goodyear exemplar tire, but not in the retread tires. Significant variations in plasticizer usages between the different tread caps are routine and expected.
3. The Marangoni Ring Tread tire exhibited the highest peel force at the buff line interface, and significantly higher than the other retreaded tire groups. The retreaded groups were comparable with one another with the exception of the Snider's Bandag BDV tread buff line interface, which exhibited lower peel force.

3. Dynamic laboratory testing analysis results and comments

Another key element in Smithers' multi-phase testing protocol for this project involves the use of dynamometer, or roadwheel testing. This is the long-standing industry method to dynamically evaluate tire performance, in controlled laboratory conditions, indoors. For this phase of the testing, 14 additional NCDOT and DPI/LEA tires were evaluated and were identified as follows:

RETREAD PERFORMANCE STUDY

DPI-2 – White’s Marangoni pre-cure retread
DPI-5 – White’s Bead-to-Bead mold-cure retread
DPI-8 – Goodyear G149 (new tire)
DPI-11 – Snider’s Bandag BDV pre-cure retread
DPI-14 – Goodyear Wingfoot pre-cure retread
DPI-18 – Ziegler’s XZA pre-cure retread
DPI-20 – Ziegler’s XZA pre-cure retread

DOT-2 – Colony’s Bandag UDR pre-cure retread
DOT-5 – Goodyear G287 (new tire)
DOT-8 – White’s Oliver HMT pre-cure retread
DOT-10 – Ziegler’s XDHT pre-cure retread
DOT-14 – Ziegler’s XDHT pre-cure retread
DOT-17 – White’s Bead-to-Bead mold-cure retread
DOT-20 – Snider’s Bandag Megatrek pre-cure retread

Each of the tires was tested first to the standard FMVSS 119 step-load, 47-hour endurance test protocol. At the completion of the 47 hour test protocol, the tires were inspected and then reinstalled on the roadwheels, with the intention of completing as much as possible of an additional 13 hours of stepped-load endurance testing.

DOT FMVSS 119 minimum performance testing is not presently required for retreaded tires, but may be considered as a reasonable benchmark with which to compare and contrast dynamic laboratory performance of medium duty truck tires, both new and retreaded.

All of the tires successfully completed the initial 47-hour FMVSS 119 protocol. Twelve of the 14 tires completed the additional 13 hours of testing, with the exception of DOT 17 and DPI 11.

DOT 17 was a White’s bead to bead drive tire which suffered a casing disablement during the extended (post-FMVSS 119) portion of the test protocol. Such a casing disablement is not unusual in extended FMVSS 119 testing of this nature.

DPI 11 was a Snider’s Bandag BDV that also suffered casing damage (separation between top working belt and the protector ply) during the extended (post-FMVSS 119) portion of the test protocol. This type of damage is likewise not unusual during extended FMVSS 119 protocols.

Representative dynamic testing photographs follow:

RETREAD PERFORMANCE STUDY



Tire DOT 10 moving toward dynamometer.



Post-test appearance of original tread tire (DOT-4).

RETREAD PERFORMANCE STUDY



Tire casing DOT-17 did not withstand extended protocol; completed 47.9 hours.



Tire casing DOT-17 did not withstand extended protocol; completed 47.9 hours (additional view).

RETREAD PERFORMANCE STUDY



Tire DPI-5 approaching dynamometer.

4. Spot repair analysis of NCDOT and DPI/LEA casings

The term spot repair is used to describe a repair that is made to the casing that is not so extensive, or so deep into the structure, as to require a structural repair such as a nail hole repair or section repair.

After a tire's tread has been buffed away, there may be minor damage to the underlying rubber, or tire structure that is now exposed. This damage could be the result of stone drilling, cutting or other conditions that extended through the tread but did not penetrate into the tire cavity. Spot repairs to the exterior sidewall could also be made, again repairing damage that does not into the tire cavity. In either case, the technician uses a pneumatic grinding tool to "buzz out" the damage. The buzzed-out area is then filled with pliable strip rubber, which is trimmed back to match the contour of the surrounding surface. After the spot repairs are completed, the casing continues on its way to the next step of the retreading process.

The necessity to make spot repairs to a casing during the retread process is universal. The number of repairs is generally correlated to the service in which the tire has been used. The more difficult the service, the greater the number of anticipated spot repairs. (We have commented on the practice of separately billing spot repairs in Section Five of this report).

RETREAD PERFORMANCE STUDY

It should be noted that no two, trained and experienced technicians, will always see the need to make the exact same number of these kinds of repairs. There is subjectivity involved, and a blending of experience with the art of the work.

We have included in this Section, our results from the buffing of 12 NCDOT and DPI/LEA original tread tires. These tires came to us from various parts of the state, and were worn down to the point that they were ready for retreading. The tires were taken by Smithers to Ziegler tire, where they were placed in line for retreading, received all of their pre-retread inspections and progressed to the buffing station. Smithers personnel were present to observe and document the process, recording the number of spot repairs that each casing required. The table below shows the results.

Tire ID	Region	Crown Spots	S/W Spots	Total Spots
DPI 16	Eastern-Sampson	1	0	1
DPI 17	Eastern-Sampson	1	1	2
DPI 18	Central-Guilford	2	1	3
DPI 19	Central-Guilford	0	7	7
DPI 20	Western - Ashe	0	0	0
DPI 21	Western - Ashe	3	0	3
DOT 10	Mountain	2	1	3
DOT 11	Mountain	1	0	1
DOT 12	Coastal	15	5	20
DOT 13	Coastal	16	4	20
DOT 14	Piedmont	4	1	5
DOT 15	Piedmont	1	4	5

NOTE TO READER: The above tires were buffed on September 5, 2007 at Ziegler Tire in Massillon, OH. For the benefit of the reader, a DVD is included in this report (in enclosed jewel box) which shows the initial inspection process, buffing off the remaining tread, shearography, and the process of identifying and buzzing out damaged areas of the above tires that required spot repairs.

RETREAD PERFORMANCE STUDY

Spot Repair/Inspection Process Photos.



Initial visual tactile inspection.



Electrostatic discharge evaluation.

RETREAD PERFORMANCE STUDY



Probing for object located by electrostatic discharge.



Metal object removed from tread area.

RETREAD PERFORMANCE STUDY



X-ray analysis device.

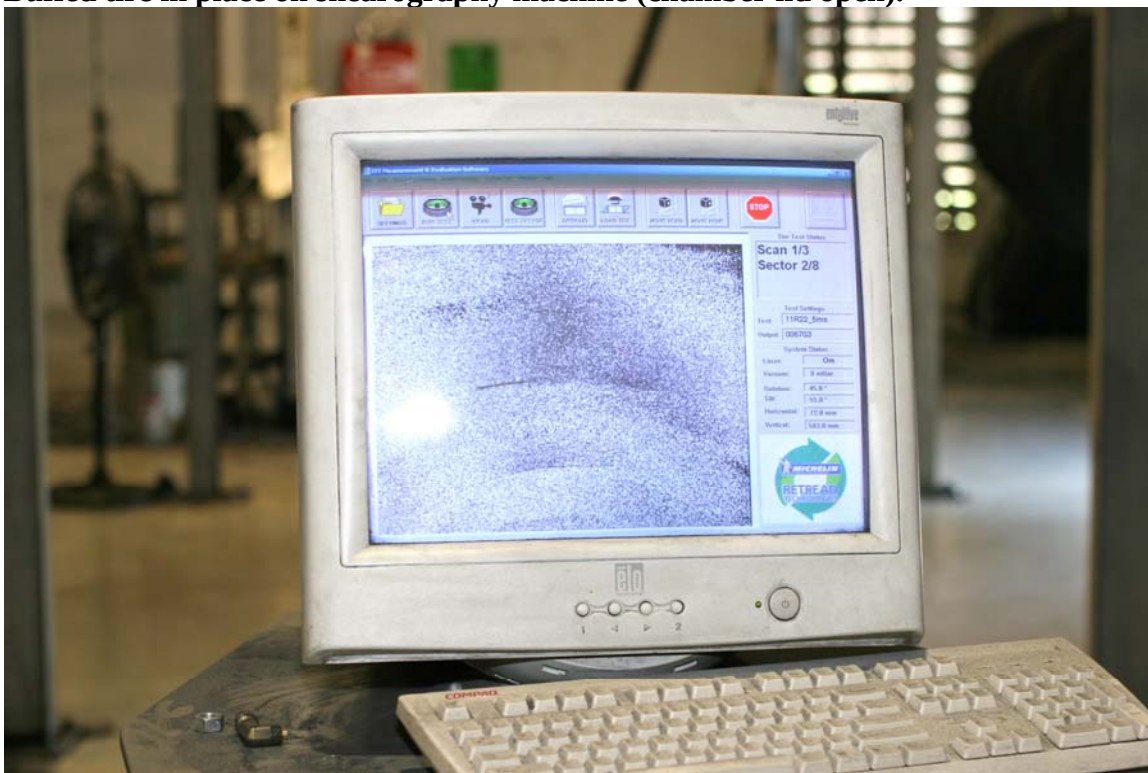


Tire placed on buffing rim.

RETREAD PERFORMANCE STUDY

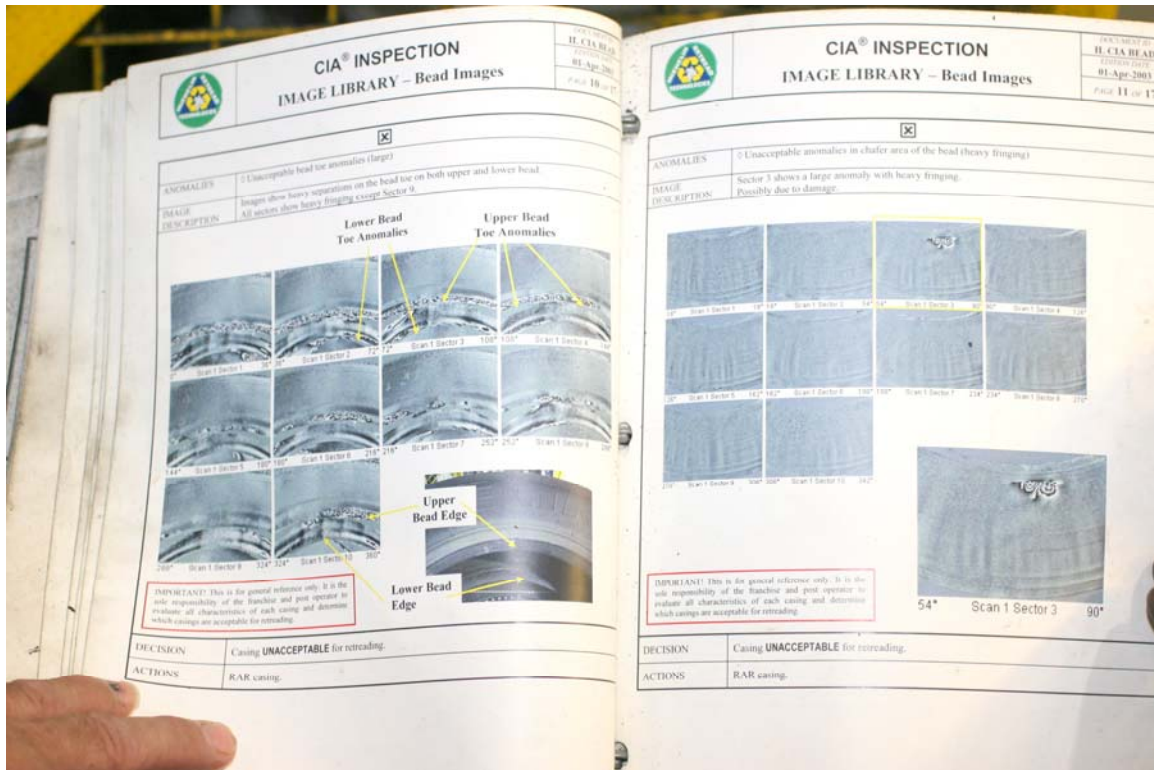


Buffed tire in place on shearography machine (chamber lid open).



Shearography image (operator's view).

RETREAD PERFORMANCE STUDY

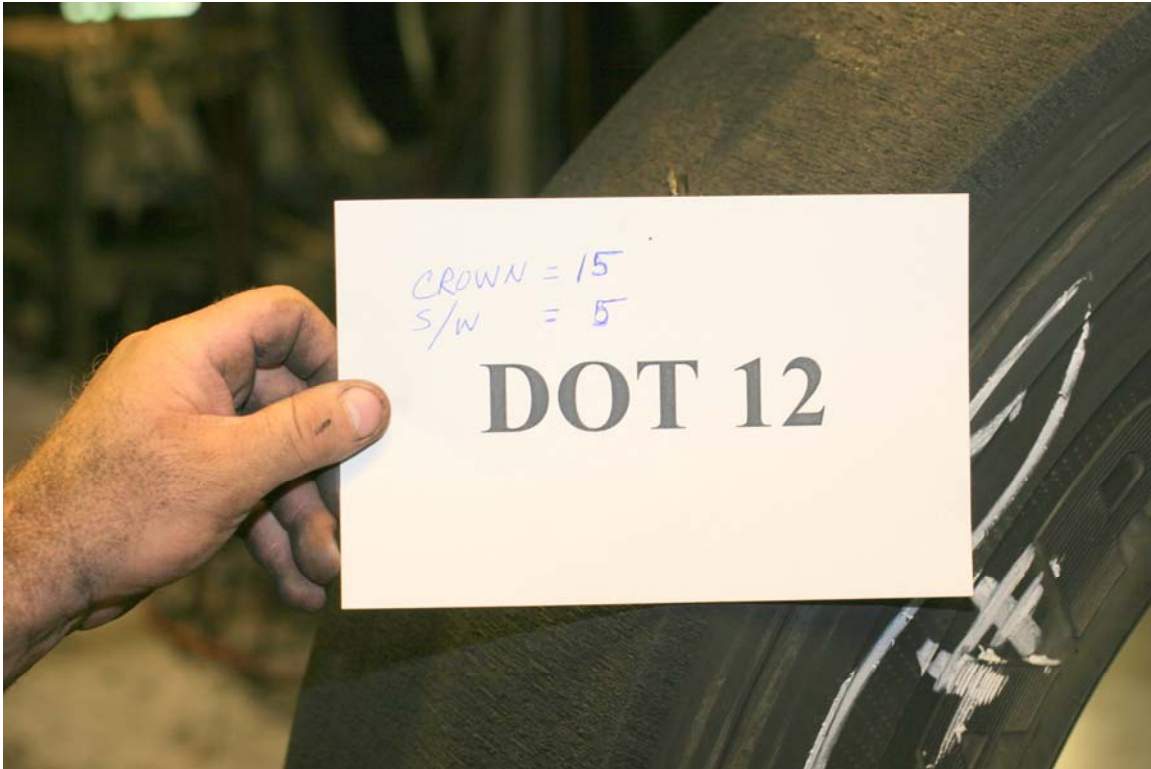


Shearography process reference manual.



DOT 12 Ready for buffing.

RETREAD PERFORMANCE STUDY



DOT 12 Spot repair total count.

5. Comparative appearance analysis

Based upon the comments of several knowledgeable NCDOT and LEA individuals, who have the advantage of familiarity with retreading usage in the fleets over a lengthy period of time, Smithers learned that the physical appearance of retreaded tires was historically a significant issue. Apparently, there was a problem with some of the drivers, who were upset at the prospect of having to drive on retreads in any case, and the obvious retreaded appearance of pre-cure retreads in particular (in that time frame) was troublesome to them. Our understanding is that the veneered sidewalls of the White's mold-cure retreads significantly mitigated the issue, since these retreads had more of a "new tire" appearance.

The significant progress in performance of retreads that has been achieved over time includes markedly improved physical appearance. This improvement has much to do with a product improvement that Bandag originally called "Wingtread". This incorporates rubber at the edges of the tread (at the shoulder of the tire) which covers the traditionally- exposed buffing striations that were variously apparent; again particularly with pre-cure retreads. Today, each of the well-known and established retread manufacturers incorporates some type of technology to cover the buffing striations with rubber at the shoulder and blend the appearance of this area into the upper sidewall of the original casing. The improvement in appearance is quite noticeable.

To demonstrate this, Smithers took close-up images of the various retreaded (and new Goodyear) tires that were provided to us by the NCDOT and the DPI/LEAs for our

RETREAD PERFORMANCE STUDY

testing. These photographs appear below. There are two close up images of each tire, with a good light source available. Each photograph is labeled.



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



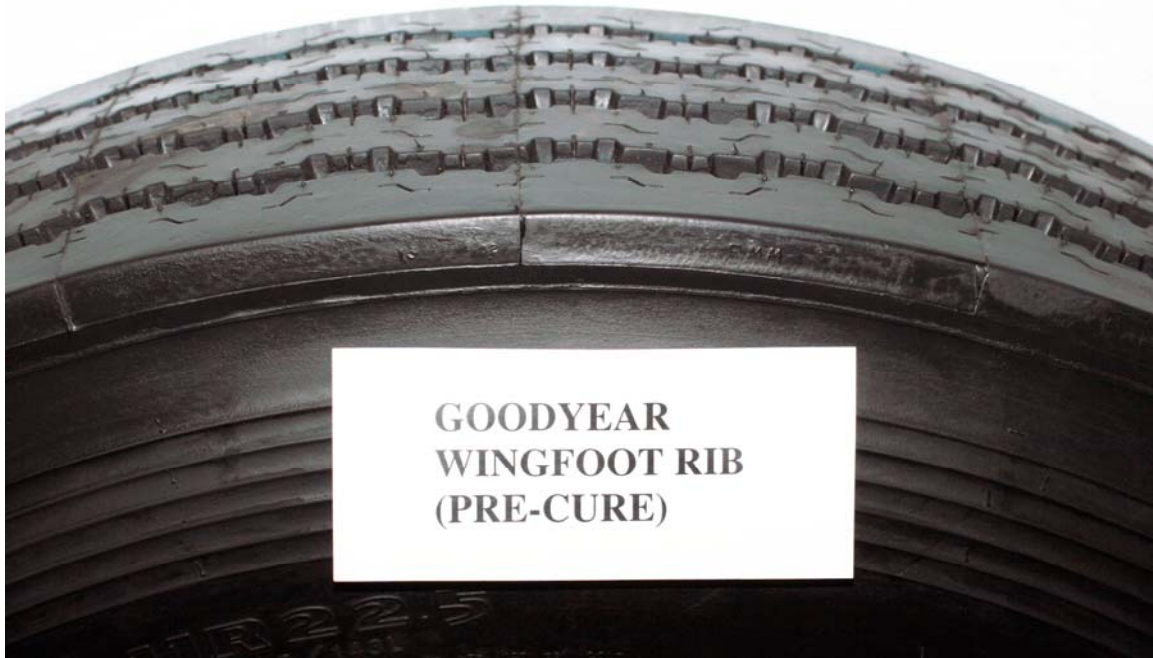
RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY



RETREAD PERFORMANCE STUDY

Finally, in order to provide the client with the ability to actually “touch” the various products in order to compare and examine them, Smithers has provided a complete set of finished cut sections of the actual tires. These cut sections also reveal the internal components typical of all-steel, radial, medium truck tires. **NOTE: care should be taken in handling these cut sections as any exposed steel filaments can puncture the skin.**

6. Reported retread return rates from Smithers’ LEA survey and field survey spreadsheet

The survey queried the LEA respondents as to whether they occasionally had to return retreaded tires, and the vast majority indicated that this was so. The follow-up question in the survey asked about the approximate percentage of retreads that were returned. The highest return rate estimate indicated was 1-2%. The remaining responses were either 1%, or less than 1%. These responses were associated with a variety of Contract and off-contract retread products that the respondents were using in their fleets.

These percentages are generally consistent with the information that the various NCDOT and LEA personnel provided during our in-person visits. Management personnel at NCDOT in Raleigh provided similar information (less than .5% returns), during our visit at the outset of our work in this project.

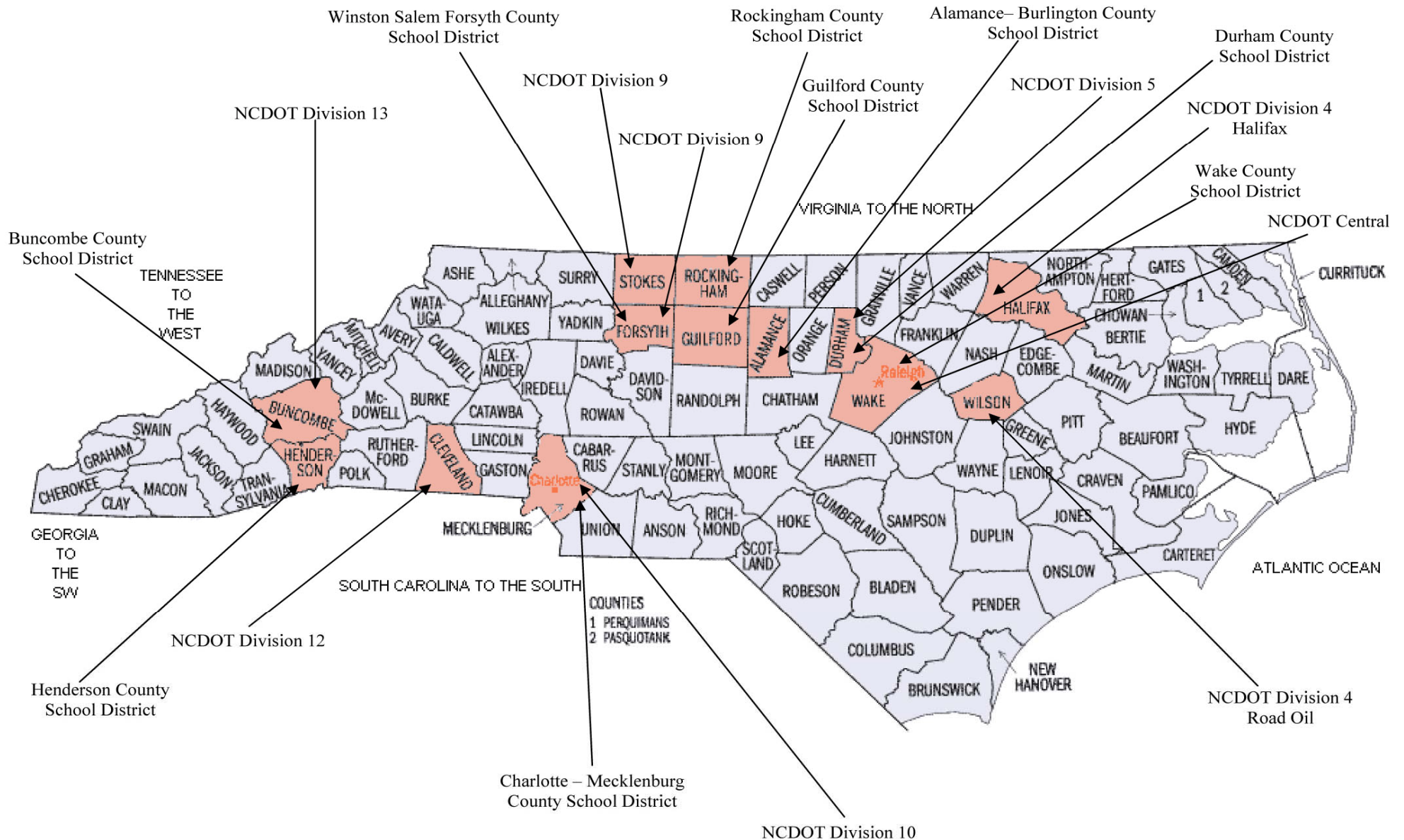
The reported rates of return from all sources were consistently low. Furthermore, regardless of the type of tire being utilized, or the vendor supplying the tire, great satisfaction was conveyed by the customer in every instance.

Included here is a consolidated spreadsheet of the LEA survey results, which was undertaken primarily to acquire off-contract purchasing information. The entire spreadsheet is presented here, since some tire performance questions were responded to, and may be of interest to the reader.

RETREAD PERFORMANCE STUDY

Project Data Collection

7. Project Data Collection Map



RETREAD PERFORMANCE STUDY

SECTION FOUR

DISCUSSION CONCERNING SAFETY AND QUALITY COMPARISONS AND OTHER STUDIES RELATED TO RETREADING

Background

As previously explained and agreed upon, Smithers has provided in this project information that focuses on performance. As stated in our introductory letter it is our position that *“Performance is measurable and quantifiable. Tire/retread “performance”, as we will propose to measure and determine it, inherently includes both reliability (safety) and cost effectiveness.”* Smithers’ performance comparison information and data are presented elsewhere in this report.

Other studies and information of interest

Smithers conducted a search of the literature for relevant studies, etc., that may be useful for the JLTOC’s purposes. Two studies were conducted in the past, both of which focus on the area of the tire debris that is found on the roadways. Any study of tire debris will of course include the issue of retreads. The studies were conducted in 1999 and 2000, in the Commonwealth of Virginia and Phoenix, Arizona, respectively. Both studies are included in the Appendix of this report. The summary language in the first few pages of each report gives a good overview of the findings and conclusions, and may be of interest to the JLTOC because, again, these studies deal, in part, with the topic of retreaded tires. Though unable to comment on this work, since Smithers was not involved in it, we do believe that this kind of information can potentially provide the Committee members with a further tire industry/tire performance context, which may be of value in their present deliberations, and in the future as well.

We have provided an additional document which may also be of interest to the JLTOC in connection with this report, and perhaps for future reference. The information may also be of interest to individuals responsible for tires at the DPI and NCDOT and perhaps also State commercial vehicle enforcement personnel. The information was presented at the Clemson Tire Conference in 2006, by an engineer from Bridgestone/Firestone. The report provides information from the study of over 10,000 scrap truck tires, many of which were of course retreaded. Again, Smithers cannot comment on work we were not involved in, but we do believe this kind of information may be of use to the JLTOC, in terms of industry context.

Additionally, Smithers has just completed a very large tire debris analysis project for the University of Michigan Transportation Research Institute (UMTRI), which will ultimately become part of a larger report commissioned by the US Department of Transportation (NHTSA). At some point in the next few months, this report should be in the public domain, and may also be of interest to the JLTOC, since, as previously stated, any tire debris study will include the topic of retreaded tires. If the Committee has an interest in reviewing a copy of this document, Smithers will be happy to inform Ms. Hollowell when it becomes available. We may also be able to assist her in obtaining a copy.

RETREAD PERFORMANCE STUDY

SECTION FIVE

Comments on failure rate information learned in the NCDOT and LEA fleets that were either visited or surveyed

As an absolutely essential part of its work on this project, Smithers made visits to field locations of the NCDOT and LEA fleets. These visits, and subsequent follow up work with fleet personnel, provided core information and data. These data were then analyzed and considered in the context of our laboratory and other analyses. Specifically, our field visits were made in order to:

- Gain a hands-on familiarity with the equipment and both new and retreaded tires that are in use.
- Work with knowledgeable NCDOT and DPI/LEA personnel in order to gain an appreciation of any real-world, field performance and field tire and retread issues, first-hand. Particularly also to determine whether any significant durability issues existed, and if so whether they were more prevalent in one retread process, compared to another.
- Examine available vehicle maintenance records – with the anticipation that there will be information as to dates/mileages that tires were installed/removed.
- Examine any actual tire records that may exist at the fleet locations - specific records, separate from the vehicle maintenance records (as anticipated, this kind of information was not generally available, except in limited cases where testing or special product performance comparisons were going on).
- Look through vehicle maintenance records to find mounting date/mileage – determine if a mileage projection for those tires would be valid
- Initiate our own tire performance records as necessary in order to supplement existing information or, determine a better way to gather good, “snapshot” tire performance information for tires presently on vehicles. *(The approach developed gathers data from tires currently on vehicles and the information that was collected is presented in Section Three of this report).*

Smithers’ Comments Concerning Failure Rates

In all of its visits to 7 NCDOT and 9 LEA fleet locations and in all of its conversations with knowledgeable personnel at administrative, management, and operational levels, Smithers did not learn of a single, significant performance or durability issue related to the use of any of the variety of retreads in service in these fleets.

We did hear anecdotal recollections about poor retread performance of many years ago, but we were not able to find any actual documentation or records that still exist as to the nature and extent of those issues. For example, Mark Walker, NCDOT Division 7 fleet manager and tire committee chairman for the NCDOT, recalled that up to 30% of the pre-cure retreads from L&N Tire were failing in the early to mid 1980s, and the contract was cancelled as a result. Mark also recollected a tire test (4 or 5 sets of tires – late 1990s) he did in Division 7 wherein, over a 2 year period, the bead-to-bead product from White’s

RETREAD PERFORMANCE STUDY

Tire Service gave better mileage than both new tires and the White's pre-cure tires that were in the evaluation. (At this considerably later point in time, Mark no longer had any written record of the results).

Issues in the present that Smithers became aware of are generally those that would be anticipated, such as road hazard failures, mileage received, etc. Various fleets expressed a preference for White's bead-to-bead, others for White's pre-cure, or a particular Bandag or Goodyear Wingfoot retread or other brand of retread product that a fleet was either testing, or routinely purchasing. This is to be expected. Where records are kept, there may be incremental performance variations detected, among different retread products in the same or similar fleet applications.

The fleets utilizing White's Tire Service products (bead-to-bead, Oliver HMT pre-cure or Marangoni Ringtread pre-cure) were universally pleased not only with the retread products, but also with the way in which White's takes care of the very rare instances when there has been a concern or question about a particular tire's performance. Namely, White's picks up the tire and replaces in at zero cost to the fleet. Mark Walker and Drew Harbinson of the NCDOT pointed out that the White's bead-to-bead tires had a failure rate of less than .5% in 2004 and 2005.

Further, as was mentioned in Section 3 of this report, LEA fleet survey respondents indicated that very, very few retreads (of any brand in use) are returned to the dealer.

LEA fleets that were testing or otherwise using various retreads other than those from White's Tire Service, were likewise pleased with product performance and durability. They also seemed very content with the service that White's competitors are providing in their fleets.

In summary, Smithers is aware of no durability, performance or failure issues at all on the part of either the contract (White's) retreads or among those retreads that some LEA fleet locations are procuring from various other sources. This is not surprising, and in fact is really to be anticipated. In today's marketplace, if a retread product from any of the prominent manufacturers is correctly applied to a sound casing (assuming good maintenance in the fleet), the product should perform reliably.

RETREAD PERFORMANCE STUDY

SECTION SIX

SMITHERS ANALYSIS OF CURRENT NC RFP SPECIFICATIONS, ALONG WITH RECOMMENDATIONS

Background

Retreading technology, like tire technology per se, continues to advance, driven primarily by the competitive forces in the marketplace.

Fleets using only the Whites bead-to-bead retreads were universally very pleased with their performance. Users of the White's Oliver pre-cure retread and the White's Marangoni Ringtread pre-cure retread were equally satisfied.

We also spoke with a number of fleet users who have different retread products running; manufactured by various North Carolina retreaders, other than White's. These users were likewise completely satisfied with the high level of retread performance and reliability they were experiencing.

Although some users expressed a preference for one retread over another, not one person we spoke with in the NCDOT or LEA fleets was displeased with, or had any serious concerns about, the use of retreaded tires in their operations.

When viewed in the aggregate, and notwithstanding the fact that some NCDOT and LEA applications can be somewhat punishing, when you compare these operations with commercial fleets, both the NCDOT and LEA fleets run relatively few miles annually. The low mileage (low flex cycle) nature of these fleets and, in the case of the LEAs, low gross vehicle weights and operating speeds, were among the chief factors that resulted in the universal satisfaction with retreading that was expressed by the fleet managers. Obviously, the utilization of good retread products and processes, along with good fleet maintenance, were likewise major factors in the State's very successful use of retreaded tires.

CURRENT NC SPECIFICATION

(Reference - November 21, 2005 version of Draft IFB)

Many of the various technical provisions and requirements were not unlike those seen during our investigation into the retread contracting practices of other states. We will discuss (below) five State contract specifications that materially differ from the retread specifications of others states surveyed, and will provide technically-based comments or suggestions as appropriate.

1. The NC practice of requiring a certain, very specific type of retreading method (for sections 3 and 4) was not something we saw in the retread specifications of other states that had retread contracts. The Utah specification was an exception, wherein only pre-cure retreads were to be purchased, with mold-cure retread purchasing requiring case-by-case approval. As a practical matter, it is possible that being overly restrictive as to what type of retread may be procured could

RETREAD PERFORMANCE STUDY

- result in a kind of technical stagnation; denying the opportunity to take advantage of industry improvements resulting from competitive market forces.
2. The Retread Rubber Specifications section in the DRAFT NC IFB should be mentioned, in terms of its value and relevance to current-day retread rubber formulations. The specification requires a certain percentage of polybutadiene elastomer (PBR), when in fact all of the retread rubber compounds analyzed by Smithers for this study used styrene butadiene (SBR), or a blend of SBR and NR (Natural Rubber), and zero PBR. As a practical matter, rubber formulations can and do change as manufacturers' work to attain optimal desired performance characteristics and also in response to marketplace price swings for the various types of rubber and other ingredients. As a result, this is really something that is not in the state's control and providing such a specification may be of little practical benefit to the State, in terms of the performance of the retread products it procures. Therefore, Smithers' recommends that the State take under consideration whether the rubber compound formulation portion of this specification is useful and should continue. We would suggest concentrating on specifying things that are under the State's control and rely upon the retread manufacturers to provide physical/mechanical properties and rubber compounds that keep their retread performance competitive in the marketplace.
 3. The fairly detailed "Information Required On Sidewall" section of the DRAFT NC IFB, presumably present because of the procurement of retreads that utilize sidewall veneer rubber (Bead to Bead products) as part of the process, should be commented upon. We are aware of recent attention that has been directed to the NC contract with regard to a number of veneered-sidewall tires that were manufactured and sold with incorrect Load and Inflation information (we understand this has been corrected for some time now). In light of the heightened sensitivity to tire regulatory/safety issues since the Firestone/Ford Explorer issue and the advent of the TREAD Act, the State's further consideration to the matter of which markings appear on the veneered sidewall may be worthwhile. Specifically, even though all of the FMVSS 119 – required markings may appear correctly on the new veneer, the issue of whether there may be any State-assumed liability for not requiring the manufacturers' warnings and instructions to likewise be present, may be worthy of study.
 4. The DRAFT NC IFB specification requiring final-inspection overpressure testing (Matussi machine) is unique among the various state purchasing requirements/specifications reviewed. No other contract required overpressure testing at any point in the inspection process. The State contract's requiring non-destructive inspection such as shearography or x-ray as part of the final inspection process was likewise unique. As a normal practice and as described in the *Industry Recommended Practices for Tire Retreading & Tire Repairing* these various non-destructive examination technologies are employed at the beginning of the retreading process, generally immediately following the initial inspection, which is visual and tactile.

RETREAD PERFORMANCE STUDY

A worthwhile change to the specification might be to include language such as “In addition to the normal visual and tactile examination by a trained operator, all casings will receive state-of-the art inspection with the use of shearography, ultrasound, electro-static discharge, etc.” If the state wishes to also require overpressure testing, that could be added as well. Again it should be kept in mind that these are initial inspections, not final inspections, so they would more appropriately appear under a heading such as “Required Casing Acceptance Inspections”.

5. The provision in the DRAFT NC IFB that provides for billing spot repairs as a separate line item from the retread price is decidedly not an ordinary industry practice. Smithers’ experience, along with information gathered from other states for this project, suggests that this type of minor repair is included in the price of the retread, in both government and private sector retread procurement. The cost of a more extensive repair, however, is customarily billed as a separate line item. Since this practice has been the source of considerable controversy within the state and is not likely to ultimately have an affect on the price per retread actually paid (all fleet users queried by Smithers have stated that 3 spot repairs are universally billed as part of the cost of each and every tire), Smithers’ recommends that the state consider whether this is a worthwhile practice to continue.

As a general rule in developing a retread specification, concentrating on the things that are in the state’s power to control is probably a good idea. Certainly that has been done, to some extent, in the current DRAFT NC IFB. Some other things that would fall into this category are:

1. Certification that the retreader has a “controlled process” that is periodically verified by the retread manufacturer, or other entity that is acceptable to the State
2. Number of retreads permissible on a casing (if not determined by the agencies, LEAs)
3. Acceptable casing brands
4. Casing age limitation
5. Number of nail hole repairs permissible
6. Whether (or how many) section repairs may be done
7. Assurance of getting back only the fleet’s own casings
8. Minimum tread depths per category/application of the retread product.

Smithers suggests that consideration be given to stating in an RFP that “All required users of the State contract, have the option to keep up to 10% (percentage is for example only) of the fleet wheel positions open to test and evaluate retreads that are not on the contract”. (Management approval and other controls could be established, as may be necessary).

The State’s authors of the RFP specification requirements need to have a reliable source of basic knowledge that will provide guidance for the development of important, relevant specifications. The specifications in turn should of course serve to assure the suitable, reliable products will be procured. We recommend the State keep on hand the current

RETREAD PERFORMANCE STUDY

version of *Industry Recommended Practices for Tire Retreading & Tire Repairing* as a primary source of this information. The publication is presently collaboratively written, and published by the Tire Industry Association (TIA), the Tread Rubber & Tire Repair Material Manufacturers' Group (TRMG) and the Rubber Manufacturers Association (RMA). The member companies of these organizations participating in the development of the publication include names such as Bandag, Michelin, Oliver, Goodyear, Bridgestone-Firestone and others. Their consensus opinions as to proper retreading practices correct repair procedures, etc. should be a very practical and valuable guide. Importantly, this publication is presently in the "Draft" stage of its traditional 5 or 6 year update cycle and will be available soon. The publication can be obtained through the Tire Retread and Repair Information Bureau (www.retread.org).

As a final item with regard to specification suggestions, we offer the following procurement proposal for the state's consideration, for its acquisition of both new tires and retreads. From the practical perspective, based upon our overall knowledge of and fleet usage of pneumatic tires, and in part also on the current experience in other states surveyed, a "multi-award" contract could, arguably, provide the state the following advantages:

- a) Government-level pricing for an extensive "menu" of products, allowing fleet managers the opportunity to select the tire that performs best in a particular application, in the same way that private-sector fleet managers are able to do. In turn, it then becomes feasible to achieve the lowest life cycle cost likely obtainable, on a per-application basis.
- b) Fleet operational issues associated with one manufacturer's products or product shortages, retread shop down time, etc., can be mitigated.
- c) The tire manufacturers on the contract will tend to compete for the business, through customer service and technical support; as in the private sector.
- d) Any issues related to the lack of speedy service could be mitigated, as more points of sale/service would be available.
- e) The administrative costs associated with the traditional process of going out for bids could be reduced.

A representative from the State of Texas TXMAS (Texas Multiple-Award Schedule) explained to Smithers that it is their practice to request Federal GSA Pricing for their tires, so as to assure that they are receiving the lowest marketplace price. This, he explained, is because most federal contracts require that the price that a vendor bids is the lowest price that the vendor offers anyone for the particular product. Smithers mentions this only anecdotally, and cannot verify its veracity, but we have included the comment as it was a unique specification/purchasing insight provided by one of the state entities surveyed.

RETREAD PERFORMANCE STUDY

SECTION SEVEN

SURVEY OF OTHER STATES' PROCUREMENT PRACTICES FOR TIRES AND RETREADING, PLUS RETREAD USAGE

In this Section, Smithers has presented information on the above topic as it was provided to us. In the process, we have communicated with a number of individuals from various states, as well as the individual responsible for tire purchasing for a multi-state purchasing association. We have accepted the information from these sources in good faith and believe it to be accurate. However, Smithers is not in a position to absolutely verify its accuracy.

Also included in this section is Smithers' analysis of the means by which tires and retreading are procured by the government entities that were contacted..

Colorado

Individuals who provided information were:

Michelle Rivera - Assistant to the Executive Director, CDOT

Mike Moore – state purchasing office

Jim Hanson – Fleet Manager, Denver Public Schools

New Tires

According to Mr. Moore, in recent years, the State of Colorado has utilized its own *multi-award type contract for new tires. At the present time, Colorado is in the process of associating with the Western States Contracting Alliance's multi-award tire purchasing contract. The WSCA tire contract provides member states access to the products of Bridgestone-Firestone North American Tire, Goodyear and Michelin. (Further information on the WSCA organization is provided later in this section)

* "Multi-award" in general terms, describes a contract in which more than one vendor is an approved source for a particular product or service. The reader will note herein, that different states may utilize a multi-award contract in slightly different ways; more, or less restrictive.

Retreading

Colorado does not have a retreading contract. The CDOT Maintenance Sections that choose to use retreaded tires make their own local arrangements with a retreader. We were told that whether or not to use retreads is a management preference. On the school bus side, Jim Hanson of the Denver Public Schools believes that 95% + of the school districts in Colorado do use retreads. The Denver school bus fleet has its own contract for retreading services and presently uses the Bandag pre-cure process (no particular process is specified in their solicitation). Any other school district would either have its own local retreading contract or would piggy-back off of another district's contract.

RETREAD PERFORMANCE STUDY

Florida

Individuals who provided information were:

Bill Shroyer – Fleet Manager Florida Department of Education

Angel Birriel – FDOT Fleet Maintenance Supervisor

New Tires

Florida utilizes a multi-award contract for new tire procurement. State agencies, plus all political subdivisions, public universities, etc., can utilize the contract. The tires available on the contract are those produced by Goodyear and Bridgestone-Firestone North American Tire. Contract users are free to select from the catalogs of both manufacturers.

Retreading

Florida does not have a state retreading contract. According to Mr. Shroyer, about 64 of Florida's 67 school bus fleets do use retreads. Each school district is responsible for its own retread purchasing arrangements, and each must do so on an RFP/contract basis. Presently, the two largest suppliers of retreads to the Florida school districts are Davis Bandag and Goodyear. In the FDOT fleet, retreaded tires are not used at all, according to Mr. Birriel. High ambient temperatures and/or liability considerations may have been factors in this decision. Used, original casings from the FDOT fleet go to the landfill, according to Mr. Bierriel.

Kentucky

Individuals who provided information were:

Mike Gustafson – purchasing agent

Dave Mangum – pupil transportation

Steve Kelly – KDOT

New Tires

Kentucky utilizes a multi-award type contract for new tire procurement for all state vehicles and the contract may also be used by counties, cities, public universities, etc. The Florida multi-award contract provides its users with the catalog of tires from four manufacturers; Bridgestone-Firestone North American Tire, Michelin, Goodyear and Continental-General

Retreading

The State of Kentucky does not have a retread contract. Kentucky does, however, have a retread specification in place - based upon ITRA criteria. The ITRA was the former International Tire & Rubber Association, which has since merged into a new trade organization, TIA (Tire Industry Association). The Kentucky retread specifications are contained in a document entitled "*2008 Kentucky Minimum Standards for School Buses*" and can be found on pages 101 through 108 of that document. These pages are included at the end of this Section, for reference.

RETREAD PERFORMANCE STUDY

In their individual bid solicitations/RFPs, Kentucky school districts or other users who require retreads, must include language that requires responding retreaders to provide engineering-level assurance that their process meets these minimum criteria.

The minimum requirements of the Kentucky specification are quite detailed; certainly by comparison with the other retread contracts that we have examined in connection with our work in this project.

Minnesota

Individual providing information:

Jackie Finger – Materials Management Division

Tom Duerr – MNDOT

John Scharffbillig – MNDOT Transportation Program Supervisor

New Tires

Minnesota utilizes a multi-award type contract. They put out a new-tire specification, that is based on the tire portion of the specification for their new vehicles. The present multi-award makes available the products of Michelin, Bridgestone-Firestone, Goodyear and Continental-General. A copy of their new tire specification is included at the end of this section, for reference.

Retreading

Minnesota does have a retreading contract. The use of the contract is optional at the discretion of the various state agencies, which are free to use their “delegated local purchasing authority to procure similar products and services from other vendors”. Ms. Finger estimates the annual contract usage volume is in the range of \$500,000. The contract has been inserted at the end of this section, for the client’s reference. Note that it does not specify any type of retread or retread process; only the retreader is specified. You will also note that the retread specification itself is somewhat general and the repair specification is a bit more detailed. Please also note that pricing is included. It is not known if that pricing is current as of the date of this report.

Pennsylvania

Consulted were:

The INTERNET

Robert Eisenberg – Department of General Services (new tire and retread contracts)

New Tires

Pennsylvania utilizes what it calls a “Best Value Supplier/Multi-Award” contract for its new tire procurement. The Best Value Supplier (lowest price) for passenger, light truck, medium truck and off-the-road tires is Goodyear. The Best Value contract vendor for police pursuit and farm tires is Bridgestone-Firestone.

When Goodyear does not manufacture a needed tire, or when Goodyear cannot supply a tire in the required time frame, the state agency can go to Bridgestone-Firestone and make the purchase. The contract is lengthy (142 pages) so was not inserted into this

RETREAD PERFORMANCE STUDY

report. The contract may be accessed at

<http://www.dgsweb.state.pa.us/comod/contracts/cn00026542.pdf>

Retreading

Pennsylvania does have a separate contract for retreading and repair services. The present contract lists three vendors, which are: Oliver Rubber Company; Goodyear Tire & Rubber Company and Bandag, Inc. No particular type of retread is specified. Any agency or other authorized user can buy from any of the three vendors, without restriction. Mr. Eisenberg explained that the “open” multi-award nature of this contract was done for a specific reason, which was to make certain that agencies and other users anywhere in the state have assured access to at least one of the three vendors and their service support. This contract is included at the end of this Section, for reference.

Texas

Individual consulted:

Richard San Jose – Purchasing

New Tires

Texas uses its Multi Award System (TXMAS) to procure new tires. Michelin North America, Inc and Bridgestone Firestone North American Tire both have all of their products available on the contract. TXMAS required the two vendors to submit their “GSA” pricing (federal General Services Administration). The reason for this, according to Mr. San Jose, is that by law, vendors selling to the GSA cannot sell to other government entities for less than the GSA price. This, again according to Mr. San Jose, assures TXMAS that they are getting the best pricing level. In the field, local Michelin and Bridgestone-Firestone dealers provide the delivery of tires and any needed service. This TXMAS contract runs from 12-19-06 to 12-5-2011 and is automatically renewed on the date the State General Services Administration exercises the renewal option, with all terms and conditions continue to apply, by mutual agreement.

Retreading

There is no state contract for retreading. Agencies can go out on their own to procure retreads if they want to use them.

Wisconsin

Individual consulted:

Brian Luther – Purchasing

New Tires

Wisconsin utilizes a multi-award contract with a different wrinkle. First, they have all of the products from Goodyear, Michelin, Bridgestone-Firestone and Continental-General available. Since all passenger tires (and light truck size tires beginning with a “P”) sold in the USA carry Uniform Tire Quality Grading System (UTQG) rating values, Wisconsin places a Life Cycle Cost (LCC) restriction on the purchase of all tires in this category. State agencies must buy the passenger tire with the lowest Life Cycle Cost, based upon the mathematical relationship between the price for the tire and the UTQG mileage value

RETREAD PERFORMANCE STUDY

(which is also numerical value). The contract lists passenger tires ranked by their LCC. For all other new tires, agencies may purchase tires from the four manufacturers at their discretion.

Retreading

Retreads are on the same contract as new tires. Presently, only Goodyear and Michelin have retread pricing on the contract. No retread process is in any way specified. Users may procure retreads from either vendor.

Wyoming

Individuals consulted:

Hans Hehr – Purchasing

Bernie Kushnir – DOT Equipment Superintendent

Bruce Hennings (& Mr. Malone) – Laramie County School District

New Tires

Wyoming has a multi-award type contract that makes available tires from Michelin, Bridgestone-Firestone, Goodyear and Continental-General to its agencies, political subdivisions and other authorized users. The agencies go to a manufacturer's local dealer, who in turn provides the tires, and any needed services, from the particular manufacturer's contract.

Retreading

There is no state contract for retreading services. Any agency or entity that does buy retreads does their own solicitation/contracting. The various school districts utilize retreads, according to what was learned from the Laramie County SD, and again they do their own solicitations and contracting as necessary.

Western States Contracting Alliance

Individual contacted:

Frank Volk – a Utah state purchasing executive

The WSCA is a cooperative arrangement involving a number of Western states (as mentioned earlier, Colorado is presently joining WSCA to purchase tires). Their mission is to achieve cost-effective and efficient acquisition of quality products and services. According to Mr. Volk, 8 of the 15 WSCA members use the WSCA tire contract. Each state takes on the responsibility of a particular commodity such as tires, computers, industrial supply, printing, etc. Each of the other "member states" can then elect to be added to the contract for the particular commodity or product. Some of the participating states go in turn to local dealers who wish to participate and secure hold-harmless agreements, etc.

New Tires

The WSCA tire contract has Master Agreements with Goodyear, Bridgestone-Firestone and Michelin. The various state agencies and other authorized entities buy whatever tire

RETREAD PERFORMANCE STUDY

they wish to buy from the three vendors, through a local dealer. The manufacturers make their entire catalogue of products available.

Retreading

Retreading services are not made available through the WSCA

Utah

Frank Volk – Purchasing agent

New Tires

The State of Utah utilizes the WSCA (multi-award) tire contract. Utah (Frank Volk) has the WSCA responsibility to maintain the tire contract, and acts as administrator for the contract in behalf of all of the member states.

Retreading

Utah has two retreading contracts in force. One is with Tire Distribution Systems, Inc, (Bandag) and the other with Desert Tire, Inc. (Goodyear). Agencies and other authorized users are free to select which vendor will provide their retreading and related services. These contracts contain retread specifications, which are germane, but not extensive. The pricing between the two contracts varies substantially. Copies of the contracts are included for reference at the end of this Section. Pre-cure only may be purchased, although mold-cure retreads that are “equal in performance” can be approved on a case-by-case basis.

General summary and comment on the purchasing practices from states contacted

These states surveyed procure retreads by a variety of means. The most prominent method was through some form of multi-award contract. Multi-award was, likewise, clearly the preferred means to procure new tires.

The attitude toward the desirability of retread utilization varied somewhat from state to state, and from agency to agency within those states.

Among the states contacted were those who do have in place some form of retread specification; Kentucky’s specification being the most detailed.

In no circumstances, did any of the states surveyed specify the use of a particular retread process as the only permissible retread that could be procured. The State of Utah did, by its retread contract, directionally restrict retread usage to pre-cure processes; while allowing mold-cure retreads with case-by-case approval. Not all states that had a retread contract mandated that it be actually utilized; instead leaving its usage up to the agencies, who retained the option to procure retreads by other means. Several of the states contacted had no retread contract at all, leaving the appropriate acquisition of retreading services up to the state agencies, school districts, and other users, individually.

RETREAD PERFORMANCE STUDY

Retread contract usage among states contacted

- Colorado – no contract
- Florida – no contract
- Kentucky – no contract, but use a specification that vendors must affirm they meet
- Minnesota – contract with one dealer; no mandatory usage
- Pennsylvania – contract with 2 dealers for statewide coverage
- Texas – no contract
- Wisconsin – on same contract as new tires
- Wyoming – no contract
- Utah – 2 retreading contracts ; 1 each for 2 authorized retreaders

PLEASE NOTE: Purchasing (contracting) and specification documentation obtained from the states contacted is provided for the reader's reference, and is located in the Appendix of this report.

KENTUCKY - TIRES (RETREAD)

Kentucky school districts may install retread tires on the rear axle ONLY of Kentucky school buses. The Kentucky Minimum Specification for School Bus Retread Tires, Revised 2000, herein presented were developed as a generic specification to be used by all Kentucky school districts purchasing retread tires for application on Kentucky school buses.

These specifications were developed through the cooperative efforts of a retread tire specification committee comprised of Kentucky Department of Education, Pupil Transportation Branch staff, representatives from local school districts, and representatives of retread tire manufacturers.

GENERAL PROVISIONS

SCOPE: It is the intent of these specifications to establish minimum standards through which all Kentucky school districts may purchase retread tires which meet the wet traction specification as listed in the Kentucky Minimum Specifications for School Buses, Revised 2003. In addition to meeting the traction performance requirement, this specification establishes minimum standards dealing with tire rubber physical properties, minimum tread dimensions, casing acceptance, and casing preparation for tread.

Tread Splices

Retread tires shall not have more than two (2) splices in top cap. No more than one (1) splice per quadrant shall be permitted.

Minimum Tread Dimensions

Tire Size	Tread Depth (Inches)
9.00R20	16/32
265/75R22.5	16/32
295/75R22.5	16/32

UNDER TREAD RUBBER THICKNESS

Under tread rubber thickness shall be twenty (20) percent minimum to twenty-five (25) percent maximum of tread depth. Casing shall be prepared to receive under tread rubber thickness of 3/32" to 5/32" maximum.

CASING ACCEPTANCE

The qualifying retreader shall be the party in all cases making determination with regard to casing acceptance or rejection. Previously retreaded tires having retread installed improperly with regard to dimensional requirements of the original tire manufacturer and/or have casings rounded to receive a retread of a different dimensional width shall be rejected. Rejected casings shall be returned to the local board of education.

It is recommended that a non destructive inspection method be used to analyze grade casings to find hidden anomalies, separations, injuries, etc... and to determine whether or not a casing is acceptable for a given application and operation.

CASING PREPARATION

The casing shall be buffed to dimensions compatible to the retread system used. The worn tread surface shall be removed to a symmetrical profile in accordance with the procedure and new tire manufacturer specifications. The buffed area of the casing shall be free of contamination and oxidation. All buffing shall be done with the casing inflated. Casing preparation shall be performed to require original tire manufacturer tread width installation only when applying a retread dimensionally.

Casing Repair (Radial Only)

All casings shall be repaired in accordance with International Tire and Retreaders Association (ITRA) tire repair standard. (Exceptions to repair size listed below)

REPAIR TYPE

1. Nail Hole (puncture) cannot exceed one-fourth (1/4) inches diameter. Nail hole repairs IN THE CROWN OF THE TIRE ONLY!
2. Spot Repair – Spot repair is limited to cuts or crack in rubber with no damage body plies.
3. Section Repair – Section repair shall be limited to virgin casings only. Section shall be performed to International Tire and Retreaders Association (ITRA) specifications with the exception of limiting repair size to one-inch in crown area and maximum of two cables in the sidewall area with a maximum of three-inch

length. All section repairs shall require prior approval of the respective board of education.

4. Bead Repair – The following conditions will be considered repairable in the rubber covering the bead area.
 - a. Cuts or tears in the rubber covering the bead area that do not damage the body piles or expose bead wires;
 - b. Limited in size to that which will assure duplication of original bead contours;
 - c. Repairs that can be performed at a cost low enough to be practical.
5. Sealant Materials - Sealant Materials for tire repairs shall be approved by International Tire and Retreaders Association (IRTA).
6. Repair Identification – (Sections) Retreaders shall affix a permanent identification label in the area of the section repair and subsequent section repairs.

CASING IDENTIFICATION

Board of Education shall identify casings by brand name, size, and serial number on the enclosed form prior to pickup by retreaders. Retreader shall designate on the form the acceptance or rejection. Casings being returned shall be designated on the form at time of return by date and signature of returning agent.

DOT NUMBER

DOT numbers shall be affixed to all tires per federal standards. On pre-cured retreads, DOT numbers shall be affixed in close proximity to existing DOT numbers reading from the left to the right.

(On mold cure retreads, pre-existing DOT numbers may be removed during the succeeding process.)

WARRANTY

Retreaders shall warrant workmanship and materials one hundred (100) percent for the first ten (10) percent of tread wear. Workmanship and materials shall be prorated from the first ten (10) percent of tread wear to 2/32 inches remaining tread depth.

Casing failures shall be warranted one hundred (100) percent through the first twenty-five (25) percent of tread wear and fifty percent (50) for the next twenty-five (25) percent of tread wear. Warranty cost is applicable only as it relates to retreading and/or casing repair cost and not to casing replacement.

LONGEVITY

Retreaders supplying retread tires to Board of Education shall supply retreads designed to provide tread life no less than ninety (90) percent on a per one-thirty second (1/32) inch basis as compared to original equipment tires for respective duty cycles.

SURETIES

A qualifying retreader shall furnish to the Board of Education a non-revocable assurance of having product liability insurance in the minimum amount of \$3,000,000.

Retreaders shall be required to provide a performance and/surety bond in amount deemed necessary by a contracting Board of Education.

CERTIFICATION

The qualifying retreader shall have been certified by a retreader trade association, franchiser, and/or the International Retreaders Association for quality within a twelve (12) month preceding the award of a contract.

DELIVERY

Under the agreement of this specification after notification from a Board of Education, the qualifying retreader shall be required to pick up casings, retread and return to the Board of Education within ten working days.

APPROVAL OF QUALIFICATION

Retread tires purchased by local Boards of Education for use on Kentucky school buses shall have been qualified for use by the Kentucky Department of Education, Pupil Transportation Branch. Qualification shall require wet traction test (ASTM F403-98 Modified for medium duty truck tires) comparison to a control tire with all pertinent

testing information, technical data, tire description, and a tread footprint on file within the Kentucky Department of Education, Pupil Transportation Branch. For the purpose of this test the Goodyear G159 shall be used as the control tire.

9.00:20 treads previously qualified with a Unisteel II control tire shall meet the intent of this specification.

WET BRAKING TRACTION TEST PROCEDURE SPECIFICATIONS

Wet braking traction testing will be conducted in accordance with the applicable sections of ASTM F 408-96, Standard Test Method for Wet Traction Straight-Ahead Braking, Using a Towed Trailer, except as modified herein:

The vehicle is an instrumented truck with a load cell installed on the left rear drive axle position, not a separate tow vehicle and instrumented trailer. The responses are similar to that of a towed trailer; therefore, when the trailer or tow vehicle is referenced in this procedure, it is assumed that the truck test vehicle is appropriate.

- A. The test vehicle shall be a semi-tractor or straight truck with a single drive axle and the capacity to allow the test wheel position to be loaded from twelve hundred fifty (1250) to eight thousand (8000) pounds. The test vehicle will have an instrumented load cell installed on the drive axle. The braking system must be modified to allow braking on only the test wheel position. Brakes are applied firmly until the test tire is locked and then held locked for a period of one and one-fifth (1.5 seconds).
- B. Testing will occur at test speed of twenty (20) mph.
- C. All un-mounted tires must be stored at the same conditions at least twenty-four (24) hours prior to mounting.
- D. All tires must be conditioned by mounting them on the drive wheel positions of a vehicle loaded such that the tires have a load similar to the load under which they will be tested. The purpose of the tire break-in will be to remove mold lube from all tires, give tires a worn appearance, and stabilize tire compounds. The conditioning for medium truck tires will require the following:
 - 1. Mount tires on vehicle and run fifty miles on test track.

2. Reverse direction and run fifty additional miles.
 3. Rotate all tires.
 4. Run fifty additional miles in either direction.
 5. Reverse direction and run fifty additional miles.
- E. Test tires will be run two hundred (200) miles on paved roads on the test track location.
1. Mounted test tires shall be placed outside near the test site at least twelve (12) hours prior to testing so that they will have the same temperature. Storage should be such that test tires are shielded from the sun under a tent to avoid heating by solar radiation.
 2. Test loads for medium truck tire testing will be according to the following table.

Tire size Metric	Tire size (Conventional)	Load per tire (± 5%)	Inflation (± 2%)	Reference tire size
<u>Light Truck</u>			50 psi	(Based on ASTM 1805-98 specs)
225 through 265	8 and 9	4525 lbs.	90 psi	(Based on 10R22.5 @ 90 psi)
275 through 295	10 and 11	5260 lbs.	90 psi	(Based on 11R22.5 @ 90 psi)
305 through 325	12	5197 lbs.	100 psi	(Based on 315/80R22.5 @ 100 psi)
365 through 445		7500 lbs.	110 psi	(Based on 385/65R22.5 @ 110 psi)

Table applies to tubeless truck tires only (not applicable for off-road or agricultural tires). Loads and inflation for any tires not listed should be reviewed prior to testing.

- F. Water depth will be maintained at a minimum of .050 inches and a maximum of .10 inches throughout the testing period.
- G. Test vehicle must maintain a ground speed of twenty (20) mph $\pm$.5 (target) mph. Data acquired with a ground speed beyond one mph from the twenty (20) mph specification will be removed.

-
- H. Fifteen lockups will be completed for each variable. Data beyond 1.5 standard deviations

Refer to ASTM F1805, “Standard Test Method for Single Wheel Driving Traction in a Straight Line on Snow- and Ice- Covered Surfaces”, Section 13, “Data Adjustment Procedures” for a description on the procedures used for wet braking traction data adjustments. Specifically, the gradient correction method and average correction method are used. F1805 also references ASTM F 1650, “Practice for Evaluating Tire Traction Performance Data Under Varying Test Conditions.”

MISCELLANEOUS SPECIFICATIONS

1. All tests should be conducted over the period of at least three (3) days (one pass of the test sequence per “24 hour period” for three (3) consecutive days.)
2. Three tires per test variable will be used for testing, and each tire will be used for one run only. Test sequence will be randomized within each test run.
3. A maximum coefficient of variation (CV) of fifteen (15) percent will be maintained for each test run. No test run should be repeated when the (CV) is less than fifteen (15) percent.

PROGRAM CONTROL TIRES

As much as possible, a standard control tire will be used whenever wet braking traction testing is conducted. This tire will be retread onto a casing of similar size, series, load range, and age as the test tires for that test group. Testing will be conducted under the same conditions as the test tires, and the coefficients obtained for the test tires will be compared to the coefficients obtained for this control tires to obtain the test tire ratings.

Before Kentucky school districts may install retreads on any Kentucky school buses, retread manufacturers shall be required to certify, to local school districts as part of their bid, their tire traction performance using ASTM Standard F403-74 testing procedures.

CERTIFICATION

Prior to the sale of retread tires to Kentucky school districts, retreads shall qualify their retread tires to the local school districts as a part of their bid submission and as meeting the above mentioned performance standards

Admin Minnesota

Materials Management Division

Room 112 Administration Bldg., 50 Sherburne Ave., St. Paul, MN 55155; Phone: 651.296.2600, Fax: 651.297.3996
For TTY/TDD communication, contact us through the Minnesota Relay Service at 1.800.627.3529.

CONTRACT RELEASE: T-549(5)

DATE: DECEMBER 26, 2006

PRODUCT/SERVICE: TIRES: RETREAD TYPE

CONTRACT PERIOD: JANUARY 1, 2007, THROUGH DECEMBER 31, 2008

EXTENSION OPTIONS: UP TO 36 MONTHS

ACQUISITION MANAGEMENT SPECIALIST: JACKIE FINGER

PHONE: 651.201.2436 **E-MAIL:** jackie.finger@state.mn.us **WEB SITE:** www.mmd.admin.state.mn.us

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
ROYAL TIRE INC. 3955 Roosevelt Road St. Cloud, MN 56201	437139	NET 30	7 DAYS ARO

REMIT TO: NW 7828, P. O. Box 1450, Minneapolis, MN 55485-7828

VENDOR NO.: 071733005-00 **CONTACT:** Paul Duinick **PHONE:** 877.454.7070 or 320.257.2965
FAX: 320.257.3055

CONTRACT USERS. This Contract is available to State agencies and to members of the State's Cooperative Purchasing Venture (CPV) program at the same prices, terms, and conditions.

STATE AGENCY CONTRACT USE. This Contract does not prohibit State agencies from using their delegated local purchasing authority to procure similar products and services from other vendors.

AGENCY ORDERING INSTRUCTIONS. Orders are to be placed directly with the Contract Vendor. State agencies should use a contract release order (CRO) or a blanket purchase order (BPC). The person ordering should include his or her name and phone number. Orders may be submitted via fax.

SPECIAL TERMS AND CONDITIONS

SCOPE. The purpose of this Contract is to provide a source for retreading tires.

PRICES. Prices shall be firm for the first year of the Contract. After the first year, escalation may be allowed based upon a demonstrable industrywide or regional increase in the Contract Vendor's costs. No price increase will be effective until approved by the Acquisition Management Specialist and set forth in a fully executed amendment.

NOTE: At no time should the ordering entity pay more than the Contract price. Agencies must contact the AMS immediately and fill out a Vendor Performance Report if there is a discrepancy between the price on the invoice and the Contract price.

Contract Release 6 (09/02))

Prices include all costs associated with the Contract Vendor picking up of casing and delivering and/or shipping the retreaded tire to the purchaser.

SHIPPING TERMS. All shipments must be FOB Destination. The minimum order shall be two tires. Prices include all costs associated with the Contract Vendor picking up any casings and delivering and/or shipping the retreaded tires to the purchaser.

DELIVERY. Retread tires are required within five to ten days after receipt of order. All shipping papers must contain tire make, size and serial numbers.

SPECIFICATIONS. This specification describes methods, procedures and acceptable commercial practices for retreading tires for off the road tires.

Casing Retention. Casings to be retreaded shall be furnished by the using agency. The Department of Transportation and Department of Natural Resources will accumulate a minimum of four casings before calling the Contract Vendor for pickup; other agencies will accumulate a minimum of two casings. All retreaded tires will be returned only on the casings provided by the agency.

Rejected casings must be returned with a written report indicating reasons for rejection. Rejected casings remain the property of the State agency, which is responsible for disposal. Casings provided by the agency and retreaded tires provided by the Contract Vendor are to be equivalent in size and construction method.

Retreading Process. The retreading process shall be a pre-cure, mold-cure or hot cap method. Written manufacturing and processing standards conforming to industry-accepted procedures and as specified in Federal Procurement Specification ZZT-4414 shall be followed in the performance of each step of operation. Copies of the written retread process procedures adopted shall be available at the appropriate manufacturing location and shall be furnished to the agency for reference as requested.

Standards. Operating procedure conforming to industry-recognized standards shall be followed and shall consist of the minimum functions:

- a. Conditioning of casings (drying, etc.)
- b. Inspection and casing grading
- c. Tire repairing
- d. Buffing
- e. Cementing
- f. Tread rubber application
- g. Curing
- h. Trimming and finishing
- i. Final inspection, including minimum standards are service applications.

Materials. All materials (rubber) used in the retreading process shall be of the same manufacturer as stated with the response upon submission.

Tread Design/Tread Depth Requirements. The State of Minnesota will specify the minimum tread depth requirement.

Tread Design. The State of Minnesota will select the tread design. Some of the consideration are as follows: vehicle type; speed, load, operation, tire type, ply rating, casing conditions, etc.

Tread Width. The tread width shall be determined by the requirements of the casing. The maximum acceptable width shall be used unless otherwise requested. New tire manufacturers specifications will be the determining factor.

RETREADING PROCEDURES

General. All casings for retread service shall be provided by the State agency and the Contract Vendor must record casing information by brand, serial numbers and size. All retreaded tires shall be returned on casings provided by the purchaser. Rejected casings shall remain the property of the agency which is responsible for disposal. The following are minimum process specifications shown for specific areas:

Initial Inspection. Casing inspection shall be made by a trained, certified operator. The Contract Vendor shall use either electronic, ultrasonic or holographic casing inspection equipment to aid in determining casing integrity. Casings accepted for retreading shall not contain any defects that would render it unsuitable for service. The following are examples of some of these defects:

- a. Ply separation
- b. Broken, damaged, kinked or exposed bead wire
- c. Injuries to plies in the bead area
- d. Flex breaks
- e. Loose cords on the inside ply or evidence of overload, under-inflation or run flat
- f. Tread separations that cannot be removed during buffing
- g. Sidewall separation
- h. Weather cracking extending into body plies
- i. Non-repairable damage to the inner liner or bead seating area on a tubeless tire
- j. Nail hold or injuries of sufficient sizes and numbers that cannot be repaired using acceptable commercial practices
- k. Radial belt separations (unless rebelting is considered)
- l. Bias tires worn to the extent that require more than 10 percent of the circumference of the top ply to be removed during buffing.

All casings are to be inspected prior to recapping.

NOTE: REJECTED TIRES. Written RAR (returned as received) reports will be provided by the Contract Vendor and shall outline all pertinent information regarding why tires were not accepted for retreading.

Repairing. Operators shall be trained to industry-recognized standards, and work must be carried out using prescribed methods and tools. Final determination of repairability, type of repair, and repair material shall be made after skiving and inspection, and in accordance with the recommended tables and criteria of the manufacturer. **All materials used must be compatible.**

BIAS TIRE REPAIRS.

- a. **Nail Hole Repair.** A nail hole injury can be repaired either before or after the tire is buffed. Any number of nail holes in a bias tire can be repaired; the only limiting factor is that the repairs do not touch.

Nail Hole Repair Limitations. An injury up to 3/8" (9mm) in diameter in the repairable area of a tube type or tubeless bias tire will require a repair unit and plug repair. If the injury is larger after all damage has been removed, the injury will require a section repair.
- b. **Spot Repair.** This is the removal and replacement of rubber in an injury. An injury can be treated as a spot repair in the repairable area of a bias tire if less than 25 percent of the actual body plies are damaged. Any number of spot repairs can be made.
- c. **Reinforcement Repair.** (For off the road use tires). This is the repair of an injury through 25 percent but less than 75 percent of the body plies of a bias tire. The repair will require both hole filling materials and a reinforcing repair unit.
- d. **Selection Repair.** (For off the road use tires.) A repair made to an injury area that extends beyond 75 percent of the body plies, in either the tread or sidewall, in the repairable area.
- e. **Bead Repair.** Allowable repairs in the rubber covering the bead area.
 - (1) Cuts or tears in the rubber covering the bead area that do not damage the body ply or expose bead wires,
 - (2) limited in size to that which will assure duplication of original bead contours, and
 - (3) repairs that can be performed at low enough cost to be practical.

NOTE: All repairs shall be finished with an approved repair sealant material.

RADIAL REPAIRS.

- a. **Nail Hole.** Any number of nail holes may be repaired in the repairable area of a radial truck tire. Patches may not touch. Injuries 3/8" (9mm) and smaller in the crown area shall be repaired using the plug and repair unit method. If the injury is larger than 3/8" after the damage and rust have been removed, the tire will require a section repair. If the injury is larger than 1/16" (1.5mm) in the sidewall area of the tire after damage and rust have been removed, the tire will require a section repair.
- b. **Spot Repair.** (Not allowed except for off the road use tires.) This repair is limited to cracks and cuts in the rubber with no exposed body plies. Any damage found on the fret wires will require a full section repair.
- c. **Section Repair.** (For off the road use tires.) Any number of these repairs can be made in the repairable area as long as the repairs do not touch, but no more than one repair is allowed that will affect the same radial casing plies.
- d. **Bead Repair.** The following conditions will be considered repairable in the rubber covering the bead area:
 1. Cuts or tears in the rubber covering the bead area that do not damage the body ply or expose bead wires,
 2. limited in size to that which will assure duplication of original bead contours, and
 3. repairs that can be performed at low enough cost to be practical.

NOTE: All repairs shall be finished with an approved repair sealant material.

FINAL INSPECTION. The retreader shall make a final inspection of the retreaded tire. The inside of the tire shall be checked on a tire spreader with adequate lighting to assure quality workmanship. The outside shall have received the same quality workmanship, and the cosmetic appearance shall be considered good commercial practice. If the tire shows any defects that will result in less than optimum performance, the retread shall be rejected and reworked. The defective tire shall remain the property of the State which is responsible for disposal. Defective tires will be logged completely with make and serial numbers. A light coat of tire paint shall be applied to all finished tires.

WARRANTY, SERVICE AND LIABILITY

LIMITED WARRANTY. Every retread and/or repair shall bear a valid Mn/DOT shop number and shall be warranted to be free from defects in workmanship and materials and to give satisfactory service under normal operating conditions for the tread life of applicable period set forth under (coverage) described.

COVERAGE.

1. **Workmanship/Material Failure.** A retread and/or repair failing to deliver satisfactory service, due to conditions related to workmanship or materials, under the terms of this warranty, shall be credited at the agency's current buying price according to the following percentage table:

TREAD LIFE REMAINING	% OF CREDIT TO AGENCY
100-80%	100%
79-60%	75%
59-40%	50%
39-20%	25%
19 & Below	0%

If the tread separates from the casing and no measurable tread remains, the following percentage table applies:

Purchase date to adjustment date - 120 days & less	100%
Purchase date to adjustment date - 121 days to 240	75%
Purchase date to adjustment date - 241 days to 360	50%
Purchase date to adjustment date - 361 days to 480	25%
Purchase date to adjustment date - 481 days or more	0%

Adjustment credit will be issued for the retread and/or repair only to the agency.

CASING FAILURE. A retread and/or repair failing to deliver satisfactory service due to casing-related conditions under the terms of this warranty, shall be credited at the agency's current buying price according to the following percentage table:

TREAD LIFE REMAINING	% OF CREDIT TO AGENCY
100 - 75%	100%
74 - 50%	50%
49 & below	0%

If retread separates from the casing and no measurable tread remains, the following percentage table applies:

Purchase date to adjustment date - 120 days & less	100%
Purchase date to adjustment date - 121 days to 240	50%
Purchase date to adjustment date - 241 days or more	0%

Adjustment credit will be issued for the retread and/or repair only.

PRODUCT OR SERVICE	COMMODITY CODE	KLIN	ENV. CODE**
Tires, Retread Type	260-01-000000	00001	TO
Tire, Tube Repair Maintenance Service	260-04-000000	00002	NO
Freight, if applicable	010-02-000000	00003	NO

TO = Other Specify: Reducing Scrap Tires

The primary users of the Contract are listed for the three regions.

REGION I - Northern Area - include but is not limited to:

- 1A - Duluth
- 1B - Virginia, Grand Rapids
- 2A - Bemidji
- 3A - Brainerd
- 4A - Detroit Lakes, Fergus Falls
- 4B - Morris

REGION II -- Metro Twin City Area - include but is not limited to:

- 3B - St Cloud
- Metro - St. Paul/Minneapolis and surrounding area

REGION III - Southern Area - include but is not limited to:

- 6A - Rochester
- 6B - Owatonna
- 7A - New Ulm
- 7B - Windom
- 8A - Willmar

**PRICE SCHEDULE - Page 1 of 6
RETREAD TIRES**

REGION I - NORTHERN AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 1 - LIGHT TRUCK</u>					
LT215/85R-16E	M&S	16/32"	\$ 75.95	\$ 69.63	No Charge
LT225/70R-16E	M&S	16/32"	\$ 77.54	\$ 70.99	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
<u>GROUP 2 - MEDIUM TRUCK</u>					
1000R20 G14	M&S	18/32"	\$ 182.38	\$ 98.40	No Charge
1000R20 G-14	M&S	22/32"	\$ 191.07	\$107.80	No Charge
1100R20 H-16	M&S	22/32"	\$ 158.66	\$112.50	No Charge
1200R20 H-16	M&S	22/32"	\$ 161.53	\$115.62	No Charge
11Rx24.5 G-14	M&S	18/32"	\$ 195.22	\$104.56	No Charge
11Rx24.5 G-14	M&S	22/32"	\$ 198.23	\$113.50	No Charge
275/80R245 G-14	M&S	18/32"	\$ 139.51	\$ 98.55	No Charge
275/80R245 G-14	M&S	22/32"	\$ 150.50	\$108.56	No Charge
285Rx24.5 G-14	M&S	22/32"	\$ 150.50	\$108.56	No Charge

PRICE SCHEDULE - Page 2 of 6
RETREAD TIRES

REGION I - NORTHERN AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 3 - ON AND OFF THE ROAD</u>					
1400R/24	Grader	L-2 Traction 26/32"	\$ 535.00	\$ 360.00	No Charge
1300/24	Grader	L-2 Traction 28/32"	\$ 318.79	\$ 256.19	No Charge
1400/24	Loader	L-2 Traction 28/32"	\$ 435.00	\$ 360.00	No Charge
12.4/24	Tractor	L-2 Traction 31/32"	\$ 416.78	\$ 366.78	No Charge
16.9/24	Tractor	L-2 Traction 32/32"	\$ 414.79	\$ 364.79	No Charge
16.9/28	Tractor	L-2 Traction 32/32"	\$ 470.74	\$ 420.74	No Charge
<u>GROUP 4 - OVER THE ROAD</u>					
17.5/25	Loader	L-2 Traction 31/32"	\$ 536.87	\$ 466.87	No Charge
20.5/25	Loader	L-2 Traction 35/32"	\$ 950.47	\$ 850.47	No Charge
17.5Rx25	Loader	L-2 Traction 32/32"	\$ 694.77	\$ 494.77	No Charge
20.5Rx25	Loader	L-2 Traction 35/32"	\$1,342.00	\$ 942.00	No Charge

For other size tires not listed Groups - 3 and 4,
discount from price list - Wholesale Price

Price list number: January 2006/November 2W6 Issue
Dated: November, 2006
Manufacture : Royal Tire/Bandag OTR Prices

Groups 1 and 2
Wholesale Price

#1140
November 1, 2005
Bandag, Inc.

**PRICE SCHEDULE - Page 3 of 6
RETREAD TIRES**

REGION II - METRO AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 5 - LIGHT TRUCK</u>					
LT215/85R-16E	M&S	16/32"	\$ 75.96	\$ 69.63	No Charge
LT225/70R-16E	M&S	16/32"	\$ 77.54	\$ 70.99	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
<u>GROUP 6 - MEDIUM TRUCK</u>					
1000R20 G14	M&S	18/32"	\$ 182.38	\$ 98.40	No Charge
1000R20 G-14	M&S	22/32"	\$ 191.07	\$107.80	No Charge
1100R20 H-16	M&S	22/32"	\$ 158.66	\$112.50	No Charge
1200R20 H-16	M&S	22/32"	\$ 161.53	\$115.62	No Charge
11Rx24.5 G-14	M&S	18/32"	\$ 195.22	\$104.56	No Charge
11Rx24.5 G-14	M&S	22/32"	\$ 198.23	\$113.50	No Charge
275/80R245 G-14	M&S	18/32"	\$ 139.51	\$ 98.55	No Charge
275/80R245 G-14	M&S	22/32"	\$ 150.50	\$108.56	No Charge
285Rx24.5 G-14	M&S	22/32"	\$ 150.50	\$108.56	No Charge

PRICE SCHEDULE - Page 4 of 6
RETREAD TIRES

REGION II - METRO AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 7 - ON AND OFF THE ROAD</u>					
1400R/24	Grader	L-2 Traction 26/32"	\$ 535.00	\$ 360.00	No Charge
1300/24	Grader	L-2 Traction 28/32"	\$ 318.79	\$ 256.19	No Charge
1400/24	Loader	L-2 Traction 28/32"	\$ 435.00	\$ 360.00	No Charge
12.4/24	Tractor	L-2 Traction 31/32"	\$ 416.78	\$ 366.78	No Charge
16.9/24	Tractor	L-2 Traction 32/32"	\$ 414.79	\$ 364.79	No Charge
16.9/28	Tractor	L-2 Traction 32/32"	\$ 470.74	\$ 420.74	No Charge
<u>GROUP 8 - OVER THE ROAD</u>					
17.5/25	Loader	L-2 Traction 31/32"	\$ 536.87	\$ 466.87	No Charge
20.5/25	Loader	L-2 Traction 35/32"	\$ 950.47	\$ 850.47	No Charge
17.5Rx25	Loader	L-2 Traction 32/32"	\$ 694.77	\$ 494.77	No Charge
20.5Rx25	Loader	L-2 Traction 35/32"	\$1,342.00	\$ 942.00	No Charge

For other size tires not listed Groups - 7 and 8,
discount from price list - Wholesale Price

Price list number: January 2006/November 2W6 Issue
Dated: November, 2006
Manufacture : Royal Tire/Bandag OTR Prices

Groups 5 and 6
Wholesale Price

#1140
November 1, 2005
Bandag, Inc.

**PRICE SCHEDULE - Page 5 of 6
RETREAD TIRES**

REGION III - SOUTHERN AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 9 - LIGHT TRUCK</u>					
LT215/85R-16E	M&S	16/32"	\$ 75.96	\$ 69.63	No Charge
LT225/70R-16E	M&S	16/32"	\$ 77.54	\$ 70.99	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
LT235/85R-16E	M&S	16/32"	\$ 80.35	\$ 72.82	No Charge
<u>GROUP 10 - MEDIUM TRUCK</u>					
1000R20 G14	M&S	18/32"	\$ 182.38	\$ 98.40	No Charge
1000R20 G-14	M&S	22/32"	\$ 191.07	\$ 107.80	No Charge
1100R20 H-16	M&S	22/32"	\$ 158.66	\$ 112.50	No Charge
1200R20 H-16	M&S	22/32"	\$ 161.53	\$ 115.62	No Charge
11Rx24.5 G-14	M&S	18/32"	\$ 195.22	\$ 104.56	No Charge
11Rx24.5 G-14	M&S	22/32"	\$ 198.23	\$ 113.50	No Charge
275/80R245 G-14	M&S	18/32"	\$ 139.51	\$ 98.55	No Charge
275/80R245 G-14	M&S	22/32"	\$ 150.50	\$ 108.56	No Charge
285Rx24.5 G-14	M&S	22/32"	\$ 150.50	\$ 108.56	No Charge

PRICE SCHEDULE - Page 6 of 6
RETREAD TIRES

REGION III - SOUTHERN AREA

<u>TIRE SIZE</u>	<u>TREAD</u>	<u>MINIMUM TREAD DEPTH</u>	<u>PRICE RETREAD TIRE w/VENDOR CASING</u>	<u>PRICE RETREAD TIRE w/CUSTOMER CASING</u>	<u>COST PER MILE - PICKUP & DELIVERY</u>
<u>GROUP 11 - ON AND OFF THE ROAD</u>					
1400R/24	Grader	L-2 Traction 26/32"	\$ 535.00	\$ 360.00	No Charge
1300/24	Grader	L-2 Traction 28/32"	\$ 318.79	\$ 256.19	No Charge
1400/24	Loader	L-2 Traction 28/32"	\$ 435.00	\$ 360.00	No Charge
12.4/24	Tractor	L-2 Traction 31/32"	\$ 416.78	\$ 366.78	No Charge
16.9/24	Tractor	L-2 Traction 32/32"	\$ 414.79	\$ 364.79	No Charge
16.9/28	Tractor	L-2 Traction 32/32"	\$ 470.74	\$ 420.74	No Charge
<u>GROUP 12 - OVER THE ROAD</u>					
17.5/25	Loader	L-2 Traction 31/32"	\$ 536.87	\$ 466.87	No Charge
20.5/25	Loader	L-2 Traction 35/32"	\$ 950.47	\$ 850.47	No Charge
17.5Rx25	Loader	L-2 Traction 32/32"	\$ 694.77	\$ 494.77	No Charge
20.5Rx25	Loader	L-2 Traction 35/32"	\$1,342.00	\$ 942.00	No Charge

For other size tires not listed Groups - 11 and 12
discount from price list - Wholesale Price

Price list number: January 2006/November 2W6 Issue
Dated: November, 2006
Manufacture : Royal Tire/Bandag OTR Prices

Groups 9 and 10
Wholesale Price

#1140
November 1, 2005
Bandag, Inc.

ROYAL TIRE LOCATIONS

City	Address	Phone #	Toll Free #	Vendor No.
Brainerd	615 Washington Street	218.829.8769	800.479.8769	071733005-11
Fergus Falls	1960 College Way	218.739.1085	888.519.8473	071733005-17
Hibbing	1910A 4th Avenue East	218.262.5258	800.794.5258	071733005-20
Marshall	1740 E. College Drive	507.537.1930	877.537.1930	071733005-05
Minneapolis	1910 NE Broadway	612.617.0211	800.643.6997	071733005-03
Monticello	1280 Cedar Street	763.295.3020	N/A	071733005-09
Montevideo	1020 Town Road	320.269.2181	800.568.5411	071733005-06
New Ulm	1604 Westridge Road	507.354.7373	877.354.7373	071733005-19
St. Cloud	4021 Roosevelt Road	320.252.5421	800.892.7018	071733005-01
St. Cloud	535 South Highway 10	320.252.1760	800.892.8571	071733005-02
St. Cloud	3955 Roosevelt Road	320.257.2987	888.847.3663	071733005-00
St. Paul	1695 University Avenue	651.644.4905	N/A	071733005--08
Shakopee	1315 Maras Street	952.252.0302	888.798.0689	071733005-21
Virginia	619 6th Avenue	218.741.5145	800.336.8473	071733005-16
Waite Park	65 10th Avenue South	320.257.3079	N/A	071733005-04

Overview for Contract CN00021069 (2610-09)

Prior to utilizing a contract, the user should read the contract in it's entirety.

DESCRIPTION

► Contract to provide retreading and repairing of truck tires including off road and loader grader.

CONTRACT INFO

Contract Number & Title	CN00021069 2610-09 Tire Retreading-Repair Truck Off Road-Grader-Loader
Number of Suppliers	3
Validity Period	8/1/2006 to 7/31/2008
DGS Point of Contact	Robert L. Isenberg
Contact Phone #	(717) 703-2930
Email	risenberg@state.pa.us

PRICING HIGHLIGHTS

► Tire costs shall include up to two spot and nail repairs required for retreading. For additional repairs the vendor must contact the using Agency for approval prior to making the repair.

All prices include pick up from and return to the ordering Agency.

Read contract to determine discounts offered by Bandag, Inc, Goodyear Tire & Rubber Co and Oliver Rubber Company.

Fees for mount/dismount/balance, valve stem replacement, tire disposal and spot/nail repair fees are included in the contract.

No Minimum purchase.

PROCESS TO PURCHASE

► SAP orders by State Agencies
P-Card purchases are allowable based on Agency policy.

4600010415 Oliver Rubber Company

4600010416 The Goodyear Tire & Rubber Co

4600010418 Bandag Inc

COSTARS Program for eligible local public procurement units

SPECIAL CONTRACT TERMS AND CONDITIONS

1. CONTRACT SCOPE/OVERVIEW: This Collective No.CN0002169 (identified here and in the other documents as the "Contract") will cover the requirements of Tires, Retreading and Repairing Trucks, Truck Off/Road for All Using Agencies within the Commonwealth.

2. ORDER OF PRECEDENCE: These Special Contract Terms and Conditions supplement the Standard Contract Terms and Conditions For Statewide Contracts for Supplies. To the extent that these Special Contract Terms and Conditions conflict with the Standard Contract Terms and Conditions For Statewide Contracts for Supplies, these Special Contract Terms and Conditions shall prevail.

3. TERM OF CONTRACT: The Contract shall commence on the Effective Date no earlier than August 1, 2006 and expire on July 31, 2008.

4. OPTION TO EXTEND: The Department of General Services reserves the right, upon notice to the Contractor, to extend the Contract or any part of the Contract for up to three (3) months upon the same terms and conditions. This will be utilized to prevent a lapse in Contract coverage and only for the time necessary, up to three (3) months, to enter into a new contract.

5. OPTION FOR SEPARATE COMPETITIVE BIDDING PROCEDURE: The Department of General Services reserves the right to purchase supplies covered under this Contract through a separate competitive bidding procedure, whenever the department deems it to be in the best interest of the Commonwealth. The right will generally be exercised only when a specific need for a large quantity of the supply exists or the price offered is significantly lower than the Contract price.

6. ADDRESS OF PURCHASE ORDER: Commonwealth agencies may issue purchase orders against this Contract for supplies required by the agencies (using agencies). Please state below where the Purchase Orders should be sent (name, address, city, state, zip code).

Contact person:

Telephone Number:

E-mail Address:

7. COOPERATIVE PURCHASING PROGRAM

The awarded contractor(s) will be required to provide Tires, Retreading and Repairing Trucks, Truck Off/Road to independent agencies and state affiliated entities as well as entities under the COSTARS (Cooperative Sourcing to Achieve Reduction in Spend) program. COSTARS is a service provided by the Department of General Services for Local Public Procurement Units located in Pennsylvania. Local Public Procurement Units are authorized by law to participate in or purchase from Department of General Services' statewide requirements contracts. Eligible Local Public Procurement Units are defined as:

- Any political subdivision
- Any public authority
- Any tax exempt, nonprofit educational or public health institution or organization
- Any nonprofit fire, rescue or ambulance company
- And to the extent provided by law, any other entity, including a council of governments or an area government that expends public funds for the procurement of supplies, services, and construction.

Contractors should consider not only this potential additional volume when responding to this Invitation to Bid (ITB), but CWOPA's intent to strongly encourage local public procurement units to take advantage of the expected low prices available under the contract. There are in excess of 2,000 local public procurement units that participate in the COSTARS Program and the potential for additional thousands to participate.

8. MONTHLY PURCHASE REPORTS

The contractor shall furnish to the Department of General Services monthly electronic reports no later than the fifteenth calendar day of the month for the previous month's purchasing activity. Failure to provide this information may result in termination of the contract.

Each report shall indicate name and address of the contractor, contract number, and period covered by the report. The following information shall be listed on the report for each order received.

SAP Item No.
Material Number
COMMONWEALTH Agency
Public Procurement Unit
Manufacturer
Part Number
Product Description
Size
Quantity
Catalog Unit Price
PA Discount
PA Unit Price
Total Purchase Price
Order Date
Delivery Date

All such reports shall be created using a template provided by the Department. The final format and types of data to be included must be approved by the Department. Reports shall be sent to:

Department of General Services
Attn: Robert Isenberg
555 Walnut Street

6th Floor, Forum Place
Harrisburg PA 17101
risenberg@state.pa.us

9. TAXES: All participating Local Public Procurement Units will be required to indicate on their purchase orders the Internal Revenue Service Registration Number for exemption from Federal Excise Tax, if applicable.

10. SCOPE OF CONTRACT: Covers all Truck, Off Road, Grader and Loader Tire Retreading and Repairing. Retreading, tire costs shall include up to two spot and nail repairs required for retreading. For any additional repairs, the awarded vendor is required to contact the Using Agency for approval prior to making the repair. Tire casings that fail to meet retread acceptability requirements may be disposed of with the approval of the Using Agency. All awarded vendors shall dispose of scrap rubber in accordance with the Department of Environmental Protection regulations and the Commonwealths Waste Tire Recycling Act 190 as Amended by Act 111 of 2002. Section 106 regulates the disposal of whole waste tires, it Prohibits Landfill Disposal unless the Landfill Operator provides Shredding, Chopping or Splitting of whole used or waste tires prior to disposal. The Commonwealth must receive a Certificate of destruction provided by the Landfill Operator.

11. REQUIREMENTS: All retreaded tires delivered to Commonwealth agencies pursuant to this contract shall conform to contract specifications. Manufacturers and their authorized dealers shall comply with contract provisions. **Manufacturers cannot discontinue any retreads, or make substitutions without the knowledge and approval of the Department of General Services.** The manufacturer shall notify the Department of General Services in writing, within fifteen (15) days of any such change. Upon receipt and approval, the Department of General Services will issue a contract change notice to the manufacturer and all using Commonwealth agencies. Failure to comply with this provision may result in termination of this contract for default. The Commonwealth Contractor Responsibility Program will be used to report and monitor vendors' products and performance.

12. ADDITIONAL REQUIREMENTS: Awarded contractors shall provide technical sales representation for all using agencies, or provide a toll free 1-800 number to contact for technical questions on new and current products, and manufacturing/inventory availability. The name, phone number, Fax# and Email Address of this representative shall be listed below:

NAME:
PHONE:
FAX #
EMAIL ADDRESS:

Any product information newsletter or quarterly published material by the manufacturer shall be sent to the Department of General Services within thirty (30) days of publication.

Manufacturers shall notify the Department of General Services within fifteen (15) days of additions or deletions to the "Authorized Dealer List", as well as revisions to their published price list.

13. SPECIFICATIONS: The following specifications and standards of the issues and amendments in effect on the date of the Invitation to Bid form a part of this specification except as modified or noted herein.

1. Tire Retreading Institute.
2. National Tire Dealers & Retreaders Association (NTDRA).
3. All retreaded/repared tires shall conform to applicable Federal Motor Vehicle Standards.
4. The retreaded/repared tires furnished on these specifications will be inspected and tested as deemed necessary to ensure compliance with these specifications.
5. All retreads shall be of current production and of the latest design and construction and be equivalent to retreads currently being produced and currently used as original equipment by the manufacturers.
6. All retreads shall be warranted to be free from defects in material and workmanship.
7. A copy of the manufacturer's standard guarantee/warranty shall accompany and become a part of this bid.

Contractors will be required, at no additional cost to the Commonwealth or its Agencies, to provide a copy of the manufacturer's current published price list to all agencies within ten (10) days after request.

14. UPDATE OPTION: The successful bidders may update the contract price lists at renewal time only to reflect new products, manufacturer's price changes, and deletion of discontinued products.

Vendors shall submit a letter to the appropriate buyer requesting review and approval of the updated price list. The vendor shall itemize all changes in a clear and concise fashion. It is the responsibility of the vendor to adequately justify changes. All requests for updates must be accompanied by the manufacturer's latest, official, published price list along with a letter of verification from the manufacturer. Vendors will be notified in writing by the buyer indicating approval or disapproval of the requested update. If approved, a contract change notice will be issued putting the updated price list on contract it will then be the responsibility of the vendor to distribute the price list to the users.

15. PICK UP AND DELIVERY: All prices shall include pick up from and return to ordering agency. All tires shall be picked up within five (5) working days after receipt of Purchase Order and thereafter shall be retreaded and returned within ten (10) working days. Tires to be retreaded/repared shall be listed on awarded vendor's pick up slip by size, ply, brand, type of construction, letter, and last four (4) digits of tire serial number and specific work to be performed. A copy of vendor's pick up slip is to be retained by the Using Agency at time of pick up. When tires are returned, all tires shall be accounted for and identification information checked to verify return of Using Agency's tires. Retreaded/repared and/or rejected tires are to be returned to the Using Agency within ten (10) working days of pick up.

16. CERTIFICATION OF PICKUP: The awarded vendor shall furnish the Using Agency one (1) copy of a letterhead-type receipt showing the total number of tires serviced. The receipt and copy shall be signed in ink by representatives of both the awarded vendor and the Using Agency. Each representative shall include their title and the date.

17. RETREADING LOCATIONS: The shop to do the work shall be of the same quality and materials as bid and shall be responsible for pickup, delivery, accountability, and resolution of any warranty problems. The operator shall be certified by the manufacturer.

18. WARRANTY: Awarded vendors shall provide a standard warranty for failures of retreads or repairs provided under this contract. Copies of the standard warranty shall be included with the bid.

19. SPECIAL NOTE: Failure of the manufacturer's authorized dealer to comply with the terms and conditions of the contract when purchase is requested by a Using Agency will show cause for the authorized dealer to be removed from the contract on a permanent basis during the contract period.

20. SALES OUTLETS: Bidders should have adequate Franchised Dealers and/or Company Owned Stores throughout the Commonwealth from which retreads may be procured by operators of state vehicles at the contract price. The local Franchised Dealers and/or Company Owned Stores must also be able to make on the spot adjustments according to the manufacturer's standard warranty. It is therefore necessary for bidders to submit with bids, a list of the name, address, and phone number of their Franchised Dealer and/or Company Owned Stores handling and maintaining an inventory of the products they are bidding.

21. MINIMUM ORDER: The minimum order shall be one (1) tire.

22. OPTION TO RENEW: The contract(s) or any part of the contract(s) may be renewed for an additional two (2) year(s) term by mutual agreement between the Commonwealth and the Contractor(s). If the Contract(s) is/are renewed the same terms and conditions shall apply.

23. INQUIRIES: Direct all questions concerning this proposal to the appropriate Commodity Specialist named herein.

Robert L. Isenberg, Sr.
Bureau of Procurement
Forum Place 6th Floor
555 Walnut Street
Harrisburg PA 17101-1914
Telephone: 717-703-2930
E-mail: risenberg@state.pa.us
Fax: 717-783-6241



All using Agencies of the Commonwealth, Political Subdivision,
Authorities, Private Colleges and Universities

REPRINT
Contract Number: 4600010418
Creation Date: 07/05/2006

Page 1 / 1

Purchasing Agent:
Name: Robert Isenberg
Phone: 717-703-2930
Fax: 717-783-6241
E-mail: risenberg@state.pa.us
Valid from/to: 08/01/2006 - 07/31/2008

Please Deliver To:

*** TBD AT TIME OF PURCHASE ORDER ***

*** UNLESS SPECIFIED BELOW ***

Your vendor number with us: 164476

Vendor Name/Address:
BANDAG INCORPORATED
2905 N HIGHWAY 61
MUSCATINE IA 52761-5809

Your Quotation: Date:
Collective No.: CN00021069
Our Quotation: 6000110556

Payment Terms: NET 30

The Commonwealth of Pennsylvania, through the Department of General Services, accepts the submission of the Bidder/Contractor for the awarded item(s) at the price(s) set forth below in accordance with: 1) the RFQ submitted by the Bidder/Contractor, if any; 2) the documents attached to this Contract or incorporated by reference, if any, and 3) the contract terms and conditions stored on the website address at www.dgs.state.pa.us for this type of Contract as of the date of the RFQ, if any, or other solicitation for this Contract, all of which, as appropriate, are incorporated herein by reference. When the Bidder/Contractor receives an order from a Commonwealth agency, the order constitutes the Bidder/Contractor's authority to furnish the item(s) to the agency at the time(s) and place(s) specified in the order. RFQ, as used herein, means Request for Quotations, Invitation for Bids, Invitation to Qualify, or Request for Proposals, as appropriate.

Item	Description	Quantity	UOM	Price	Per Unit	TOTAL
00010	TIRE, RETREAD, BANDAG	0	EA	0.50	EA	0.00
243567						

Item text

Price List Name and Date as Follows:

Bandag Tire & Retread Technology Suggested Truck / Light Truck Price List (Item #1140)
dated 11/1/2005 at 50% discount.

-----SUPPLEMENTAL INFORMATION-----

Header text

VENDOR INFORMATION:

Company Name: Bandag Inc.
SAP Vendor Number: 164476-001
Contact Person: Michael Walsh
Address: 2905 N. Hwy 61, Muscatine, IA, 52761-5886
Phone Number: (800)548-9721 Ext.5475
Fax Number: (563)262-1039
E-mail Address: mwalsh@bandag.com

NO FURTHER INFORMATION FOR THIS CONTRACT

Currency: USD

500,000.00
ESTIMATED VALUE

Standardized Service Fees (\$) Attachment B					
		Grader/Loader Tires	Light Truck	Medium & Larger Truck	
Mount/Dismount/Balance		according to local market pricing	\$20.00	\$35.00	
Valve Stem Replacement (Rubber)		according to local market pricing	\$6.50	\$8.00	
Valve Stem Replacement (Metal)		according to local market pricing	\$6.50	\$8.50	
Tire Disposal Fee		\$195.00 per ton	\$7.00	\$12.00	
Spot/Nail Repair Fees		according to local market pricing	\$5.00	\$5.00	
Manufacturer Name: See list of Bandag, Incorporated Franchised Dealers (Authorized Dealer List)					

Authorized Dealers List-Attachment C

Manufacture Name: Bandag, Incorporated

Indicates a retread shop facility.

Company Name	Address	Phone Number	Fax Number	Contact Person	SAP Vendor #	Federal I.D Number
McCarthy Tire Service Company	340 KIDDER ST WILKES BARRE, PA 18702-5606	(570) 822-3151	(570) 825-9669		141013	24-0780800
McCarthy Tire	1004 Stony Battery RD Lancaster, PA 17601	(717) 898-0114			131635	
McCarthy Tire	111 Agnes St. Harrisburg, PA 17104	(717) 939-8054 x1940	(717) 939-8068		157307-001	
McCarthy Tire	Airport Beltway Rd. Hazleton, PA 18202	(570) 455-4968	(570) 455-8986		190805	
McCarthy Tire	411 Gilligan St. Scranton, PA 18508	(570) 558-0820	(570) 558-0823		125344	
McCarthy Tire	4225 5th ST. Temple, PA 19560	(610) 777-6511	(610) 796-1410		184353	
McCarthy Tire	583 Jefferson Lane Williamsport, PA 17701	(570) 326-1576	(570) 321-0414		125574-001	
VALLEY TIRE CO., INC.	2107 GIBSONTON RD BELLE VERNON, PA 15012	(724) 930-7660			147510-002	
Valley Tire Co., Inc.	100 Southpointe Dr, Southpointe Ind. Park BRIDGEVILLE, PA 15017-1293	(412) 257-2940	(412) 257-2944		147510-001	
Valley Tire Co., Inc.	15 McKean Ave Charleroi, PA 15022	(724) 489-4483	(724) 489-1106		147510-004	
VALLEY TIRE CO., INC.	RT.764, 3324 6TH AVE DUNCANSVILLE, PA 16635	(814) 696-7475			147510	
Valley Tire Co., Inc.	1122 Weschler Ave Erie, PA 16501	(814) 454-7999			147510-014	
VALLEY TIRE CO., INC.	2700 IND. PRK, RTE 422 W INDIANA, PA 15701	(724) 349-0636			147510-007	
Valley Tire Co., Inc.	954 Franklin Rd Jackson Center, PA 16133	(724) 662-1597	(724) 662-1599		147510-005	
Valley Tire	1583 Phillipsburg-Bigler Hwy Phillipsburg, PA 16866	(814) 343-9340	(814) 343-9366		147510-009	
VALLEY TIRE CO., INC.	517R E. MAHONING STREET PUNXSUTAWNEY, PA 15767	(814) 938-4055			147510-008	
ELLIOTT'S TIRE SERVICE, INC.	236 E Cunningham St BUTLER, PA 16001-6019	(724) 287-3701			184761	25-1208662
DICE'S TIRE SERVICE	7061 CARLISLE PIKE CARLISLE, PA 17013-8897	(717) 766-0447			202398	25-1688117
HENISE TIRE SERVICE, INC.	558 E PENN AVE CLEONA, PA 17042	(717) 272-2102	(717) 272-4687		118251	23-1517061
GREENSBURG TIRE SERVICE	RR11, EVERGLADE RD GREENSBURG, PA 15601-9811	(724) 837-8383	(724) 837-4175		176041	25-1645949
COMMERCIAL TIRE, INC.	7478 National Pike Uniontown, PA 15401-9055	(724) 437-9891	(724) 437-4460		144955	25-1213249
Twin Tier Tire	3160 Lake Rd, Horseheads NY 14845-3103	(607) 733-7044			104491	16-0958025
FAY L. WAGNER, INC.	N Main St YEAGERTOWN, PA 17099-0375	(717) 248-6210			146120	25-1290948



All using Agencies of the Commonwealth, Political Subdivision,
Authorities, Private Colleges and Universities

Your vendor number with us: 161302

Vendor Name/Address:
GOODYEAR TIRE & RUBBER CO
1144 E MARKET ST # D709
AKRON OH 44316-1000

Vendor Fax Number: 215-462-9511

Your Quotation: Date:
Collective No.: CN00021069
Our Quotation: 6000110555

The Commonwealth of Pennsylvania, through the Department of General Services, accepts the submission of the Bidder/Contractor for the awarded item(s) at the price(s) set forth below in accordance with: 1) the RFQ submitted by the Bidder/Contractor, if any; 2) the documents attached to this Contract or incorporated by reference, if any, and 3) the contract terms and conditions stored on the website address at www.dgs.state.pa.us for this type of Contract as of the date of the RFQ, if any, or other solicitation for this Contract, all of which, as appropriate, are incorporated herein by reference. When the Bidder/Contractor receives an order from a Commonwealth agency, the order constitutes the Bidder/Contractor's authority to furnish the item(s) to the agency at the time(s) and place(s) specified in the order. RFQ, as used herein, means Request for Quotations, Invitation for Bids, Invitation to Qualify, or Request for Proposals, as appropriate.

Item	Description	Quantity	UOM	Price	Per Unit	TOTAL
	Material/Service No.					
00010	TIRES, RETREAD/REPAIR, GOODYEAR					
	286922	0	EA	0.36	EA	0.00
Item text						
Price List Name and Date as Follows:						
Goodyear Authorized Retread Price List B252 dated 1/1/2006 at 64% discount.						
Goodyear Authorized Retread Price List B253 dated 1/1/2006 at 64% discount.						
Wingfoot Commercial Tire System OTR Price List dated 6/1/2006 at 64% discount.						
*** SEE LAST PAGE FOR TOTAL VALUE OF CONTRACT ***						

REPRINT
Contract Number: 4600010416
Creation Date: 06/30/2006

Page 1 / 2

Purchasing Agent:
Name: Robert Isenberg
Phone: 717-703-2930
Fax: 717-783-6241
E-mail: risenberg@state.pa.us
Valid from/to: 08/01/2006 - 07/31/2008

Please Deliver To:

*** TBD AT TIME OF PURCHASE ORDER ***

*** UNLESS SPECIFIED BELOW ***

Payment Terms: NET 30



REPRINT

Page 2 / 2

Contract Number: 4600010416

Creation Date: 06/30/2006

Vendor Name:

GOODYEAR TIRE & RUBBER CO

Item	Description	Quantity	UOM	Price	Per Unit	TOTAL
-----SUPPLEMENTAL INFORMATION-----						

Header text

VENDOR INFORMATION:

Company Name: The Goodyear Tire & Rubber Company
AP Vendor Number: 161302
Contact Person: Debbie Frear, Contract Manager
Address: 1144 E Market Street D/709
Phone Number: 330-796-4603
Fax Number: 330-796-3404
E-mail Address: Debbie_Frear@Goodyear.com

NO FURTHER INFORMATION FOR THIS CONTRACT

Currency: USD

500,000.00
ESTIMATED VALUE

Standardized Service Fees (\$) Attachment B					
		Grader/Loader Tires	Light Truck	Medium & Larger Truck	
Mount,/Dismount		\$68.15	\$15.40	\$25.50	
Mount/Dismount/Balance		N/A	\$25.70	\$36.45	
Valve Stem Replacement (Rubber)		N/A	\$11.80	\$11.80	
Valve Stem Replacement (Metal)		\$14.50	\$11.80	\$11.80	
Tire Disposal Fee		\$40.00	\$5.00	\$5.00	
<u>Spot/Nail Repair Fees</u>		\$41.00	\$8.00	\$8.00	
Manufacturer Name: The Goodyear Tire & Rubber Company					

Authorized Dealers List-Attachment C						
Manufacture Name:						
Company Name	Address	Phone Number	Fax Number	Contact Person	SAP Vendor #	Federal I.D Number
Appalachian Tire Products Inc	248 Seanor Road Windber, Pa 15963	814-467-6320	304-744-1959	Roger Howells	182517	55-0339216
Purcell Tire Company	Clearfield-Curwensville Rd Rt 879 Clearfield, Pa 16830	814-765-1774	814-765-5384	Mike Skripek	148316-002	25-1411405
Purcell Tire Company	4100 N Amercian Philadelphia PA	215-324-1556	215-324-3393	John Agudio	148316	25-1411405
Purcell Tire Company	10662 Rt 422 Hwy W Shelocta Pa 15774	724-324-4929	724-354-3372	Debbie Blystone	148316-003	25-1411405
Wingfoot Commercial Tire	5 Pineville industrial Rd Orwigsburg, Pa 17961	570-366-8584	570-366-8580	John Macmullin	160941-009	25-1735402
Wingfoot Commercial Tire	925 Byers Road Somerset, Pa 15501	814-444-0243	814-444-1136	Raymond Robinson	160941	25-1735402
Wingfoot Commercial Tire	698 Rocky Glen Road Avoca Pa 18641	800-900-4687	570-457-7783	John Moran	160941-002	25-1735402
Wingfoot Commercial Tire	1002 Rt 315 Plain Twp Wilkes-Barre, Pa 18705	800-724-6046	570-829-4361	Randy Paraschak	160941-008	25-1735402
Wingfoot Commercial Tire	210 Keystone Rd Chester, Pa 19013	610-494-2160	610-494-6955	Mike Deeley	160941-005	25-1735402
Wingfoot Commercial Tire	30 Progress Ave Cranberry Twp, Pa 16066	724-776-3271	724-776-3276	Mike Shaver	160941-003	25-1735402
Wingfoot Commercial Tire	181 & Rt 39 Harrisburg, Pa 17112	717-657-1005	717-657-3728	James Fleming	160941-001	25-1735402
Wingfoot Commercial Tire	10-A & B Runway Rd Levittown, Pa 19057	215-945-7790	215-945-0551	Steve Boone	160941-006	25-1735402
Wingfoot Commercial Tire	1966 Lincoln Wy Rt 30 N Versailles, Pa 15137	412-825-0555	412-825-0866	Randy Kester	160941-007	25-1735402
Walters Tire Service Inc	241 E Garrett St Somerset, Pa 15501	814-445-4124	814-445-8015	Jim Walters	142852	25-1735402



All using Agencies of the Commonwealth, Political Subdivision,
Authorities, Private Colleges and Universities

REPRINT
Contract Number: 4600010415
Creation Date: 06/30/2006

Page 1 / 1

Purchasing Agent:
Name: Robert Isenberg
Phone: 717-703-2930
Fax: 717-783-6241
E-mail: risenberg@state.pa.us
Valid from/to: 08/01/2006 - 07/31/2008

Please Deliver To:

*** TBD AT TIME OF PURCHASE ORDER ***

*** UNLESS SPECIFIED BELOW ***

Your vendor number with us: 172175

Vendor Name/Address:
OLIVER RUBBER COMPANY
701 LIMA AVE
FINDLAY OH 45840-2315

Your Quotation: Date:
Collective No.: CN00021069
Our Quotation: 6000110554

Payment Terms: NET 30

The Commonwealth of Pennsylvania, through the Department of General Services, accepts the submission of the Bidder/Contractor for the awarded item(s) at the price(s) set forth below in accordance with: 1) the RFQ submitted by the Bidder/Contractor, if any; 2) the documents attached to this Contract or incorporated by reference, if any, and 3) the contract terms and conditions stored on the website address at www.dgs.state.pa.us for this type of Contract as of the date of the RFQ, if any, or other solicitation for this Contract, all of which, as appropriate, are incorporated herein by reference. When the Bidder/Contractor receives an order from a Commonwealth agency, the order constitutes the Bidder/Contractor's authority to furnish the item(s) to the agency at the time(s) and place(s) specified in the order. RFQ, as used herein, means Request for Quotations, Invitation for Bids, Invitation to Qualify, or Request for Proposals, as appropriate.

Item	Description	Quantity	UOM	Price	Per Unit	TOTAL
	Material/Service No.					
00010	TIRE, RETREAD, OLIVER					
	243568	0	EA	0.35	EA	0.00
Item text						
Price List Name and Date as Follows:						
Oliver Suggested Price List for Commercial Products dated 2/1/2006 at 65% discount.						
-----SUPPLEMENTAL INFORMATION-----						
Header text						
VENDOR INFORMATION:						
Company Name: Oliver Rubber Company						
SAP Vendor Number: 172175						
Contact Person: Gregory Simmons						
Address: 701 Lima Ave. Findlay, Ohio 45840-2315						
Phone Number: 443-255-0198 cell						
Fax Number: 410-574-0954						
E-mail Address: gsimmons@olivererrubber.com						
NO FURTHER INFORMATION FOR THIS CONTRACT						
						Currency: USD
						500,000.00
						ESTIMATED VALUE

Standardized Service Fees (\$) Attachment B					
		Grader/Loader Tires	Light Truck	Medium & Larger Truck	
Mount/Dismount/Balance		\$40	\$15	\$30	
Valve Stem Replacement (Rubber)		N/A	\$2.50	N/A	
Valve Stem Replacement (Metal)		\$15	\$3.00	\$3.00	
Tire Disposal Fee		\$60	\$3.50	\$8.00	
<u>Spot/Nail Repair Fees</u>		0	0	0	
Manufacturer Name:					
Oliver Rubber Company					

Authorized Dealers List-Attachment C						
Manufacture Name:						
Company Name	Address	Phone Number	Fax Number	Contact Person	SAP Vendor #	Federal I.D Number
Bastian Tire	2603 Reach Rd Williamsport, PA 17701	570-323-5279	570-323-5279	Freddie Mercer	141-456	24-0860566
Bastian Tire	Rte 11 & 15 Box 262 Shamokin Dam, PA 17876	570-743-1571	570-743-6767	Sam Miriello	141-456-005	24-0860566
Bastian Tire	RR7 Box 264 Wellsboro, PA 16901	570-724-2461		Sam Miriello	141-456-001	24-0860566
Bastian Tire	232 W. Main St. Bloomsburg, PA 17815	570-784-5920	570-784-0868	Sam Miriello	141-456-006	24-0860566
Bastian Tire	260 W. Hamilton Ave. State College, PA 16801	814-238-4955	814-238-3463	Sam Miriello	141-456-003	24-0860566
Flynn's Tire	155 Butler Rd. Kittanning, PA 16201	724-543-1418		Howard Woodcock	182-266-005	25-1158715
Flynn's Tire	718 B Hope Hollow Rd Carnegie, PA 15106	800-344-0645		Howard Woodcock	182-266-004	25-1158715
Flynn's Tire	Rte.62 Sharon Mercer Rd. Hermitage, PA 16148	724-346-3559		Howard Woodcock	182-266-008	25-1158715
Flynn's Tire	20 Lincoln Hwy RTE 30 Jeanette, PA 15644	888-484-5260		Howard Woodcock	182-266-009	25-1158715
Flynn's Tire	1158 Park Ave. Meadville, PA 16335	814-337-2427	814-337-5441	Howard Woodcock	182-266-007	25-1158715
Good Tire	401 S Water St. Kittanning, PA 16201	724-543-2010		Lynn Best	145-453	25-124-981
Good Tire	PO Box J Exit 7 Knox, PA 16232	814-583-5886		Lynn Best	145-453-001	25-124-981
Good Tire	RD#1 Rte. 219S Dubois, PA 15801	814-583-5886		Lynn Best	145-453-002	25-124-981
Tire Clinic	57 Cooper Ave. Johnstown, PA 15644	814-535-3107		Rich Rambish	193-529	25-153-0060

Sandone Tire	730 Wyoming Ave Scranton, PA 18509	570-346- 5111		Tom Ritterbeck	141-216	24-0810402
WB Wagner	25 Main St. Yeagertown, PA 17099	717-248- 3737		Steve Wagner	176-139	25-1767999

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010415
Change Number: 1
Change Effective Date: 9/07/2006

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair Truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Change notice prepared to correct vendor information for Flynn's Tire. Flynn's Tire is a partnered supplier for Oliver Rubber Company on SAP contract number 4600010415.

Address	Phone #	FAX #	SAP #
Flynn's Tire, 7464 W Market St, Mercer, PA, 16137	(724) 346-3559	(724) 346-2812	144154-004
Flynn's Tire, 155 Butler Rd, Kittanning, PA, 16201	(724) 543-1418	(724) 545-1974	144154-007
Flynn's Tire, 1158 Park Ave, Meadville, PA, 16335	(814) 337-5441	(814) 337-0478	144154-008
Flynn's Tire, 718B Hope Hollow Rd, Carnegie, PA, 15106	(800) 344-0645	(412) 276-1909	182266-004
Flynn's Tire, 1000 Broad St, Greensburg, PA, 15601	(888) 484-5260	(724) 834-1274	182266-013

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Numbers: 4600010415 & 4600010416
Change Number: 2
Change Effective Date: 10/02/2006

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair Truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Change notice prepared to add or correct Authorized Dealers List information for Oliver Rubber Company, SAP contract number 4600010415 and Goodyear Tire & Rubber Co, SAP contract number 4600010416.

Oliver Rubber Company Authorized Dealers List Changes

Company Name	Address	Phone #	FAX #	SAP #
Bastian Tire Sales, Inc	2603 Reach Rd, Williamsport, PA 17701-4181	570-323-8651	570-323-9786	141456-002
Bastian Tire Sales Inc.	417 Tioga Street, Wellsboro, PA 16901-6779	570-724-2461	570-723-1240	141456-001
Good Tire Service Inc.	401 S Water St, Kittanning, PA 16201-1712	724-543-2010x6	724-545-2213	145453
Tire Clinic Inc.	57 Cooper Ave, Johnstown, PA 15906-1539	814-535-3107	814-535-3108	193529
Sandone Tire & Battery	730 Wyoming Ave, Scranton, PA 18509-3018	570-346-2004	570-347-4678	141216

Goodyear Tire & Rubber Co. Authorized Dealers List Changes

Company Name	Address	Phone #	FAX #	SAP #
Purcell Tire Company	P O Box 789, Clearfield, PA 16830-0789	814-765-1774	814-765-4384	148316-002
Wingfoot Commercial Tire	PO Box 6153, Harrisburg, PA 17112-0153	717-657-1005	717-657-3728	160941-001
Wingfoot Commercial Tire	7565 Rt 30 Ste 200, Irwin, PA 15642-4533	724-861-8283	412-825-0866	160941-007
Walters Tire Service Inc	PO Box 348, Somerset, PA 15501-0348	814-445-4124	814-445-8015	142852

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010415
Change Number: 3
Change Effective Date: 11/13/2006

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Change notice prepared to correct the SAP # for the below listed authorized dealer of Oliver Rubber Company, SAP contract number 4600010415.

Sandone Tire & Battery
730 Wyoming Ave
Scranton, PA 18509-3018
Phone: 570-346-2004
FAX: 570-347-4678
SAP #: 141216-001

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010416
Change Number: 4
Change Effective Date: 11/16/2006

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Please add the following item for Goodyear Tire and Rubber Co. Contract 4600010416

254-087-416 12R22.5 PC G338 2015T 27 State net price is \$137.69/ea (base price before discount is \$382.48)

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010416
Change Number: 5
Change Effective Date: 12/14/2006

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair Truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

The vendor listed below is being added as a Goodyear Authorized Dealer, Contract Number 4600010416:

Mar Mac Tire Co, Inc
345 Main Street
New Kensington, PA 15068-6020
SAP vendor: 190569

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010415
Change Number: 6
Change Effective Date: 2/12/2007

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Please add the following items to Oliver Rubber Company contract 4600010415:

Rev Lug II

Size	mm	Tread	List Price	Contract Price
245/75R17.5	180	6	\$243.22	\$158.09
245/75R17.5	195	7	\$253.35	\$164.68

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010415
Change Number: 7
Change Effective Date: 2/27/2007

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Please add the following items to Oliver Rubber Company contract 4600010415:

Rev Lug II

Size	mm	Tread	List Price	Contract Price
245/75R17	180	6	\$243.22	\$158.09
245/75R17	195	7	\$253.35	\$164.68

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010415
Change Number: 8
Change Effective Date: 5/23/2007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

Please add the following items to Oliver Rubber Company contract 4600010415:

RoughNeck

Tube/Tubeless	m m	Sugg Price	Contract Price
10-16.5	220	\$296.23	\$103.68
	240	\$319.05	\$111.67
12-16.5	240	\$343.45	\$120.21
	275	\$396.09	\$138.63
10.00R20	220	\$409.37	\$143.28
11R22.5	240	\$441.03	\$154.36
10.00R22	220	\$432.00	\$151.20
11R24.5	240	\$465.48	\$162.92
11.00R20	220	\$425.56	\$148.95
12R22.5	240	\$458.46	\$160.46
11.00R22	220	\$441.69	\$154.59
12R24.5	240	\$475.89	\$166.56
11.00R24	220	\$451.38	\$157.98
	240	\$486.36	\$170.23
12.00R20	220	\$438.50	\$153.48
13R22.5	240	\$472.44	\$165.35
12.00R24	220	\$477.26	\$167.04
1400R20	240	\$514.27	\$180.00
	275	\$569.59	\$199.36

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010416
Change Number: 9
Change Effective Date: 7/05/2007

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair Truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

The vendor listed below is being added as a Goodyear Authorized Dealer, Contract Number 4600010416:

Parmenter, Inc
P O Box 427
Odessa, NY 14869
Phone: 607-594-7106
SAP vendor: 104584

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.

Contract Reference Number: 2610-09
Collective Number: CN00021069
SAP Contract Number: 4600010418
Change Number: 10
Change Effective Date: 10/23/2007

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG**

For: All using Agencies of the Commonwealth
Subject: Tire Retreading/Repair Truck/Off Road/Grader/Loader
Contract Period: Effective date of 8/01/2006 and Expiration date of 7/31/2008
Commodity Specialist Name: Robert L. Isenberg, Sr (717) 703-2930 risenberg@state.pa.us

CHANGE SUMMARY:

The vendors listed below are being added as Bandag Authorized Dealers, Contract Number 4600010418:

Good Tire Service
13616 Indiana Road
Kittanning, PA 16201
Phone: 724-543-2010
SAP vendor: 145453

Good Tire Service
RD1, Box 99A
DuBois, PA 15801
Phone: 814-583-5941
SAP vendor: 145453-002

Good Tire Service
I-80, Exit 53
Knox, PA 16232
Phone: 814-797-2591
SAP vendor: 145453-001

Good Tire Service
71 Jennifer Road
Duncansville, PA 16635
Phone: 814-696-9644
SAP vendor: 145453-003

ALL OTHER TERMS AND CONDITIONS OF THIS AGREEMENT NOT CHANGED BY THIS CHANGE NOTICE REMAIN AS ORIGINALLY WRITTEN.



Revision number:

Purchasing Agent: Frank Volk

Item: TIRE RECAPPING, RETREADING & SERVICE

Vendor: 029761 A DESERT TIRE INC.
1810 WEST FORTUNE ROAD
SALT LAKE CITY, UT 84104

Remit to: 102761 DESERT TIRE INC.
HC 76 BOX 90
BERYL UT 84714-0090

Internet Homepage:

Telephone: (801) 975-9841

Fax number: (801) 975-0369

Contact: DAVID WILBERG

Email address: deserttire@integraonline.com

Brand/trade name: GOODYEAR

Price: SEE ATTACHED

Terms: NET 30

Effective dates: 05/02/06 through 05/01/08

Days required for delivery: 7 DAYS

Price guarantee period: 1 YEAR

Minimum order: ONE UNIT

Min shipment without charges: N/A

Other conditions: 3 (1) year renewal options.

NOTE: THIS IS A NEW CONTRACT AWARDED TO THE SAME VENDOR.

Bid No. FV6922

ALSO CHECK MA1528

This contract covers only those items listed in the price schedule. It is the responsibility of the agency to ensure that other items purchased are invoiced separately. State agencies will place orders directly with the vendor (creating a PG in Finet) and make payments for the same on a PV referencing the original PG. Agencies will return to the vendor any invoice which reflects incorrect pricing.

DESERT TIRE INC. WILL SERVICE ALL AREAS OF THE STATE

PRODUCT FURNISHED TO THE STATE OF UTAH MUST MEET CURRENT STATE AND FEDERAL SAFETY REGULATIONS INCLUDING DISPOSAL OF TIRE CASING.



OTHER SERVICE SHOP LOCATIONS:

DESERT TIRE
1810 WEST FORTUNE ROAD
SALT LAKE CITY UTAH
801-975-9841

DESERT TIRE
10 NORTH HWY 18
BERYL, UTAH
435-439-5580

DESERT TIRE
765 REDROCK ROAD
ST. GEORGE UT 84770
CONTACT: KIRK BRACKEN
(435) 656-4633

PHEARSON TIRE
640 SOUTH MAIN ST.
RICHFIELD UT 84701
CONTACT: DAVE SMITH
(435) 896-5494

CACHE VALLEY TIRE
13415 NORTH HWY 91
LEWISTON, UTAH
435-258-5390

GENERAL SPECIFICATIONS

ALL RETREADS SHALL BE OF CURRENT PRODUCTIONS AND OF THE LATEST DESIGN AND CONSTRUCTION AND BE EQUIVALENT TO RETREADS CURRENTLY BEING PRODUCED AND CURRENTLY USED AS ORIGINAL EQUIPMENT BY THE MANUFACTURER.

ALL RETREADS SHALL BE WARRANTED TO BE FREE FROM DEFECT IN LABOR, MATERIAL AND WORKMANSHIP FOR THE FIRST 25% OF TREAD WEAR, DURING THE FIRST 12 MONTHS INCLUDING CASINGS AT NO CHARGE REPLACEMENT. OTHER ADJUSTMENTS, BEYOND BASE WARRANTY ON A PRO-RATED BASIS.

\$40.00 ORIGINAL CASINGS ONLY

TIRE DISMOUNTING/MOUNTING BALANCING:

DESERT TIRE SHALL, WHEN REQUIRED, PROVIDE TIRE MOUNTING AND BALANCING FOR AN ADDITIONAL AMOUNT, NOT TO EXCEED THE MAXIMUM FEE ALLOWED UNDER THE STANDARDIZED SERVICE FEES LISTED IN THIS CONTRACT.

DESERT TIRE SHALL PROVIDE THE SERVICES REQUIRED BY THIS CONTRACT WITHIN A TIMELY MANNER.

NOTE: MINIMUM TREADS DEPTH TO 22/32

- | | |
|--|-----------------|
| - <u>315/80R22.5 (10.5) TRACTION-RADIAL MODEL # LUG LOGGER</u> | <u>\$90.00</u> |
| - <u>315/80R22.5 (12) TRACTION - RADIAL MODEL # LUG LOGGER</u> | <u>\$90.00</u> |
| - <u>11R22.5 DRIVE TRACTION - RADIAL MODEL # RDA</u> | <u>\$84.00</u> |
| - <u>1400X24</u> <u>MODEL # DOUBLE GRIPPER</u> | <u>\$175.00</u> |
| (WIDE-WIDTH BASE RADIAL WITH SHOULDER BUILT-UP TO RUN FLAT) | |

DETAIL SPECIFICATIONS:

DESERT TIRE SHALL PROVIDE COMPLETE PRE-CURE METHOD RETREADING SERVICES FOR ACCEPTABLE CASINGS, AS REQUIRED. CURING TIME SHALL MEET THE REQUIREMENTS OF THE MANUFACTURER OF THE RUBBER. ALTERNATIVE METHOD(S) OF RETREADING (MOLD CURE)



WHICH ARE APPROVED EQUAL SHALL BE ON A CASE-BY-CASE BASIS ONLY. IN ALL INSTANCES, CASINGS MUST BE RETREATED WITH CORRECT TREAD WIDTH APPROPRIATE FOR THE CASING. CASING TO BE FIRST TIME CAPS OF HIGHEST STANDARD AND QUALITY, UNLESS AGENCY PRIOR APPROVAL.

MANUFACTURER(S) OF ALL TIRES MUST HAVE A QUALITY CONTROL SYSTEM PROVIDING SUFFICIENT TESTING AND CONTROL TO CERTIFY COMPLIANCE WITH DEPARTMENT OF TRANSPORTATION (DOT) SPECIFICATIONS TO THE SATISFACTION OF THE STATE. **THE LATEST IN NON-DESTRUCTIVE INSPECTION TECHNOLOGY LIKE BANDAG 7400 OR GOODYEAR NDT TO BE USED.**

INCLUDING:

- PRE-BUFFING INSPECTION
- BEAD INSPECTION
- ANIMATED DISPLAY
- INSTANT DISPLAY PLAYBACK

THE CASING SHALL HAVE ALL ORIGINAL TREAD RUBBER BUFFED AWAY. THE FINISHED SURFACE TEXTURE SHALL CONFORM TO THE REQUIREMENTS OF THE RUBBER MANUFACTURERS; SUBJECT PROCESS MUST BE COMPLETELY FREE FROM CONTAMINATION. THE BUFFED RADIUS SHALL CONFORM TO SPECIFIED TIRE MANUFACTURERS.

DESERT TIRE SHALL PROVIDE ON SITE (U.D.O.T.4501 S 2700 W. SALT LAKE CITY AND 708 S 100W. RICHFIELD, UT) DISPOSAL OF WASTE TIRE AND TIRE SCRAP ON A WILL-CALL BASIS, WITHIN (5) DAYS OF NOTIFICATION FROM AGENCY.

PER TIRE:

- LIGHT TIRES UNDER 19"
- MEDIUM/HEAVY TRUCK TIRES OVER 19"
- FARM TIRES OVER 6'
- LAWN/GARDEN TIRES

COST PER TIRE:

\$ 2.00
\$ 3.50
\$10.00
\$1.00

SHOP SERVICE AT CONTRACTOR SERVICE CENTER

LIGHT TRUCK TIRES UNDER 19"	MOUNTED	\$ 5.50
	INSTALL	N/C
	BALANCE	\$ 7.00
MEDIUM/HEAVY TRUCK TIRES OVER 19"	MOUNTED	\$14.00
	INSTALL	N/C
FARM TIRES OVER 6'	MOUNTED	\$22.50
	INSTALL	N/C
LAWN/GARDEN TIRES	MOUNTED	\$ 5.00
	INSTALL	N/C
VALVE STEM REPLACEMENT RUBBER UNDER 19"		N/C
VALVE STEM REPLACEMENT METAL OVER 19"		\$ 2.00
24-HOUR ROADSIDE EMERGENCY SERVICES	CALL-OUT	\$25.00
	HOURLY RATE	\$35.00
	MILEAGE OVER 25 MILES	\$0.75/MILE



OPTIONS:

RECONDITIONED RIMS, INCLUDING CHECKING FOR RIM STRAIGHTEST, SHOT BLASTING AND PAINTING, POWDER-COAT PAINTING PREFERRED.

LIGHT TRUCK TIRES LESS THAN 19"	\$ 7.50
MEDIUM/HEAVY TRUCK TIRES OVER 19"	\$17.50
FARM TIRES OVER 6'	\$25.00
LAWN/GARDEN TIRES	\$ 7.50
FOAM FILLING - PER POUND (INCLUDING FOAM)	\$ 1.10/LB
ANTIFREEZE FILLING PER POUND (INCLUDING ANTIFREEZE)	\$ 1.20/LB
CALL OUT	\$25.00
HOURLY RATE	\$35.00
MILEAGE OVER 25 MILES	\$0.75/MILE

PAYMENT

INVOICES WILL BE APPROVED FOR PAYMENT WHEN THE RETREADING/SERVICE IS COMPLETE AND APPROVED.

FINET COMMODITY CODE(S): (**FOR AGENCY USE ONLY**)

90634000000 - FREIGHT HANDLING; MATERIALS HANDLING

92882000000 - TIRE AND TUBE MOUNTING, REPAIR AND RETREADING (INCLUDING TIRE FOAM FILLING SERVICES)



Revision number:

Purchasing Agent: Frank Volk

Item: TIRE RECAPPING, RETREADING & SERVICE

Vendor: 54283H A TIRE DISTRIBUTION SYSTEMS, INC.
5345 WEST 2400 SOUTH
WEST VALLEY CITY, UT 84120-1264

Internet Homepage:

Telephone: (801) 487-1087

Fax number: (801) 487-1092

Contact: Doug Deans

Email address: 822@tdstires.com

Brand/trade name: BANDAG

Price: SEE ATTACHED

Terms: NONE

Effective dates: 05/02/06 through 05/01/08

Days required for delivery: 7 DAYS

Price guarantee period: 2 YEARS

Minimum order: NONE

Min shipment without charges: N/A

Other conditions: 3 (1) year renewal options.

NOTE: THIS IS A NEW CONTRACT AWARDED TO THE SAME VENDOR.

Bid No. FV6922

ALSO CHECK MA1527.

This contract covers only those items listed in the price schedule. It is the responsibility of the agency to ensure that other items purchased are invoiced separately. State agencies will place orders directly with the vendor (creating a PG in Finet) and make payments for the same on a PV referencing the original PG. Agencies will return to the vendor any invoice which reflects incorrect pricing.



TIRE DISTRIBUTION SYSTEMS, INC. WILL SERVICE ALL AREAS OF THE STATE.

PRODUCT FURNISHED TO THE STATE OF UTAH MUST MEET CURRENT STATE AND FEDERAL SAFETY REGULATIONS INCLUDING DISPOSAL OF TIRE CASING.

PICKUP SERVICE PROVIDED WITHIN 2 HOURS OF BEING CONTACTED.
MAXIMUM TURNAROUND TIME FOR RECAPPING SERVICE SHALL BE WITHIN 7 WORKING DAYS.

OTHER SERVICE SHOP LOCATION:

TIRE DISTRIBUTION SYSTEMS, INC.
1630 WALL AVENUE
OGDEN, UTAH 84404
801-627-5833

TIRE DISTRIBUTION SYSTEMS, INC.
461 W 300 S
PROVO, UTAH 84601
801-374-2800

TIRE DISTRIBUTION SYSTEMS, INC.
288 E RIVERSIDE DR.
ST GEORGE, UTAH 84790
435-673-4163

TIRE DISTRIBUTION SYSTEMS, INC.
385 S MAIN
RICHFIELD, UTAH 84701
801-896-8605

TIRE DISTRIBUTION SYSTEMS, INC.
5354 W 2400 S
WEST VALLEY, UTAH 84120
801-487-1087

GENERAL SPECIFICATIONS:

ALL RETREADS SHALL BE OF CURRENT PRODUCTIONS AND OF THE LATEST DESIGN AND CONSTRUCTION AND BE EQUIVALENT TO RETREADS CURRENTLY BEING PRODUCED AND CURRENTLY USED AS ORIGINAL EQUIPMENT BY THE MANUFACTURERS.

ALL RETREADS SHALL BE WARRANTED TO BE FREE FROM DEFECT IN LABOR; MATERIAL AND WORKMANSHIP FOR THE FIRST 25% OF TREAD WEAR, DURING THE FIRST 12 MONTHS INCLUDING CASINGS AT NO CHARGE REPLACEMENT. OTHER ADJUSTMENTS, BEYOND BASE WARRANTY ON A PRO-RATED BASIS.

WORKMANSHIP/ MATERIALS FAILURE W/TREAD 4 YR AGE LIMIT.
100-75% USEABLE TREAD DEPTH REMAINING - 100%.
74% DOWN TO 5/32'S - PRORATED CREDIT.
4/32'S AND BELOW - 0% DUE.

CASING FAILURE W/TREAD, 2 YR AGE LIMIT APPLIES
100 - 75% USEABLE TREAD DEPTH - 100% CREDIT
74% - 50% - PRORATED CREDIT
49% AND BELOW = NO CREDIT

CASINGS CAN BE TRADED IN (CONDITIONAL) DEPENDING ON CONDITION OF CASING.
CASINGS PURCHASED BY CUSTOMER AT THE FOLLOWING PRICES:

TRADE-IN PURCHASE



315/80R22.5	\$75.00	\$90.00
11R22.5	\$50.00	\$80.00

TIRE DISMOUNTING/MOUNTING/BALANCING:

TDS SHALL, WHEN REQUIRED, PROVIDE TIRE MOUNTING AND BALANCING FOR AN ADDITIONAL AMOUNT, NOT TO EXCEED THE MAXIMUM FEE ALLOWED UNDER THE STANDARDIZED SERVICE FEES LISTED IN THIS CONTRACT.

TDS SHALL PROVIDE THE SERVICES REQUIRED BY THIS CONTRACT WITHIN A TIMELY MANNER.

NOTE: MINIMUM TREADS DEPTH TO 22/32:

315/80R22.5 (10.5) TRACTION - RADIAL MODEL #BDM	\$174.25
31580R22/5 (12) TRACTION - RADIAL MODEL #BDM	\$174.25
11R22.5 DRIVE TRACTION - RADIAL MODEL #BDM	\$136.25
1400X24 MODEL #23	\$361.50
(WIDE-WIDTH BASE RADIAL WITH SHOULDER BUILT-UP TO RUN FLAT)	

OTHER RECAPPED TIRES:

10R22.5 D4300 SIPED	\$115.50
255/70R22.5 D4300	\$112.00
385/65R22.5 WBR	\$130.85
315/80R22.5 HI-SPEED	\$99.75
11R22.5 D4300 SIPED	\$126.00

DETAIL SPECIFICATIONS:

TDS SHALL PROVIDE COMPLETE PRE-CURE METHOD RETREADING SERVICES FOR ACCEPTABLE CASINGS, AS REQUIRED. CURIG TIME SHALL MEET THE REQUIREMENTS OF THE MANUFACTURER OF THE RUBBER. ALTERNATIVE METHOD(S) OF RETREADING (MOLD CURE) WHICH ARE APPROVED EQUAL SHALL BE ON A CASE-BY-CASE BASIS ONLY. IN ALL INSTANCES, CASINGS MUST BE RETREATED WITH CORRECT TREAD WIDTH APPROPRIATE FOR THE CASING. CASING TO BE FIRST TIME CAPS OF HIGHEST STANDARD AND QUALITY, UNLESS AGENCY PRIOR APPROVAL.

MANUFACTURER(S) OF ALL TIRES MUST HAVE A QUALITY CONTROL SYSTEM PROVIDING SUFFICIENT TESTING AND CONTROL TO CERTIFY COMPLIANCE WITH DEPARTMENT OF TRANSPORTATION (DOT) SPECIFICATIONS TO THE SATISFACTION OF THE STATE. **THE LATEST IN NON-DESTRUCTIVE INSPECTION TECHNOLOGY LIKE BANDAG 7400 OR GOODYEAR NDT TO BE USED.**

INCLUDING:

PRE-BUFFING INSPECTION.
BEAD INSPECTION.
ANIMATED DISPLAY.
INSTANT DISPLAY PLAYBACK.

THE CASING SHALL HAVE ALL ORIGINAL TREAD RUBBER BUFFED AWAY. THE FINISHED



SURFACE TEXTURE SHALL CONFORM TO THE REQUIREMENTS OF THE RUBBER MANUFACTURERS; SUBJECT PROCESS MUST BE COMPLETELY FREE FROM CONTAMINATION. THE BUFFED RADIUS SHALL CONFORM TO SPECIFIED TIRE MANUFACTURERS.

TDS SHALL PROVIDE ON SITE DISPOSAL OF WASTE TIRE AND TIRE SCRAP ON A WILL-CALL BASIS, WITHIN (5) DAYS OF NOTIFICATION FROM AGENCY, AT THE FOLLOWING LOCATIONS:

UDOT - 4501 X.2700 W. SALT LAKE CITY, UT.
UDOT REG. 3 - 658 N. 1500 W. OREM, UTAH
UDOT PRICE - 940 S. CARBON AVE. PRICE,UT

UDOT - 708 S. 2700 W. RICHFIELD, UTAH
UDOT REG. 1 - 169 N. WALL AVE. OGDEN
CEDAR CITY = 1470 N. AIRPORT RD.,
CEDAR CITY, UTAH

PER TIRE:

LIGHT TIRES UNDER 19"	\$5.00
MEDIUM/HEAVY TRUCK TIRES OVER 19"	\$5.00
FARM TIRES OVER 6'	\$25.00
LAWN/GARDEN TIRES	\$5.00

COST PER TIRE:

SHOP SERVICE AT CONTRACTOR SERVICE CENTER:

LIGHT TRUCK TIRES UNDER 19"	MOUNTED	\$15.00
	INSTALL	N/C
	BALANCE	\$12.00
MEDIUM/HEAVY TRUCK TIRES OVER 19"	MOUNTED	\$22.50
	INSTALL	\$5.00
FARM TIRES OVER 6'	MOUNTED	\$55.00
	INSTALL	\$10.00
LAWN/GARDEN TIRES	MOUNTED	N/A
	INSTALL	N/A
VALVE STEM REPLACEMENT RUBBER UNDER 19"		\$1.95
VALVE STEM REPLACEMENT METAL OVER 19"		\$3.95
24-HOUR ROADSIDE EMERGENCY SERVICES	CALL-OUT	
	HOURLY RATE	\$55.00
	MILEAGE OVER 25 MILES	\$1.25/MILE

OPTIONS:

RECONDITIONED RIMS, INCLUDING CHECKING FOR RIM STRAIGHTEST, SHOT BLASTING AND PAINTING, POWDER-COAT PAINTING PREFERRED.

LIGHT TRUCK TIRES LESS THAN 19"	\$16.50
MEDIUM/HEAVY TRUCK TIRES OVER 19"	\$18.00
FARM TIRES OVER 6'	N/A
LAWN/GARDEN TIRES	N/A

ALIGNMENTS

PASSENGER CARS	\$40.00 FRONT END ONLY
LIGHT TRUCK, 1/2-3/4 TON	\$40.00 + PARTS
4X4 LIGHT TRUCK, 1/2-3/4 TON	\$40.00 + PARTS/AXLE
MEDIUM/HEAVY TRUCK TIRES OVER 19"	\$65.00 TOE SET, \$50.00 CASTER TWIST, \$50 CAMBER ADJ./AXLE



TRAILERS OVER 23,000 GVW, AXLE BENDING LABOR & MISC.
PER HOUR RATE \$75.00/ AXLE.

FOAM FILLING - PER POUND (INCLUDING FOAM) \$1.40
ANTIFREEZE FILLING PER POUND (INCLUDING ANTIFREEZE) N/A
CALL OUT N/A
HOURLY RATE N/A
MILEAGE OVER 25 MILES N/A

PAYMENT

INVOICES WILL BE APPROVED FOR PAYMENT WHEN THE RETREADING/SERVICE IS COMPLETE AND APPROVED.

FINET COMMODITY CODE(S): **(FOR AGENCY USE ONLY)**

90634000000 - FREIGHT HANDLING; MATERIALS HANDLING
92882000000 - TIRE AND TUBE MOUNTING, REPAIR AND RETREADING (INCLUDING TIRE
FOAM FILLING SERVICES)

RETREAD PERFORMANCE STUDY

CONCLUSIONS

User satisfaction

The information gathered from the NCDOT, DPI and LEA fleet management personnel, reinforced by tire and vehicle inspections during field visits, our review of fleet tire testing data when available, plus our review of mileage performance information collected from selected fleets, all lead us to one conclusion. Namely, the fleets are universally receiving good performance from the retreaded tires that are presently utilized, and good service from the business entities that provide those retreads. This high level of overall satisfaction holds true, regardless of the brand of retread in use. No dissatisfaction was expressed, or implied, concerning retread performance, including durability and safety issues in any of the NCDOT and LEA fleets; again, notwithstanding the brand of retread in use. We did note, however, some concern with the level of confidence that that fleets had in getting back their own casings – this was particularly mentioned with regard to bead to bead retreads.

Maintenance and repair

Though not a major focus of this study, Smithers, during its fleet visits, did not observe, or become aware of, any maintenance issues, repair procedures, etc., either on the part of the fleets or outside providers of these services, that would be inconsistent with good industry practice. Among those vehicles inspected during our field visits, Smithers noted no unique vehicle maintenance issues affecting tire life.

Retread durability

Based upon its work in this project, Smithers has concluded that durability performance among the various brands of modern, state-of-the art retreads, in use in the NCDOT and LEA fleets, when placed on carefully inspected, sound casings that are well maintained in service, did not differ by any order of magnitude. Certainly, there will be applications in which one retread process can provide an incremental performance advantage, and this is to be expected, in an industry segment as competitive as retreading; particularly now due to the increasing availability of very application-specific products.

Laboratory chemical and peel force analyses

The various polymer ratios among the retread rubber formulations were similar, as would be expected in a competitive marketplace. The peel forces of the various products at the retread-casing interface were quite similar as well, with the exception of the Snider Bandag BDV, which was lower. A single event of lower peel force, in a limited sampling such as done for this study, does not allow any significant conclusions to be made.

Laboratory roadwheel performance testing

All of the tires that Smithers tested passed the minimum performance requirements of the Federal Motor Vehicle Safety Standard (FMVSS) 119 test protocol for new tires. Two tires, one a White's bead to bead traction design mold-cure and the other a Snider's Bandag BDV pre-cure, developed casing separations in the crown area during the

RETREAD PERFORMANCE STUDY

extended portion of the stepped-up load test. This type of extended testing is specifically designed to eventually take the tire to the point that it will become unserviceable, and therefore the two subject disablements were not indicative of any systemic weakness in either retread process. Although the FMVSS 119 protocol is not currently required for retreaded tires, it can be a valid tool to benchmark tire performance.

Miles-per 32nd inch and cost-per-mile data results

The results of the miles-per-32nd inch treadwear rate, and projected cost-per-mile portions of the study were remarkably consistent across typical NCDOT and LEA school bus applications. The most economical tire on a cost-per-mile basis was the White's Oliver pre-cure traction tire in use in NCDOT Divisions 9 and 10 (average of .35 cents per mile). The White's bead to bead tire, whether in NCDOT or LEA service, averaged .7 cents per mile, which was the same cost per mile as the Goodyear Wingfoot pre-cure retreads. The Bandag BRM and BDV pre-cure retreads were nearly identical at .5 cents per mile. Within the scope of this study, these cost-per-mile data were very consistent, reproducible and representative of the performance anticipated from quality retread products.

Multi-award purchasing

The State should consider a multi-award type contract for both new tires and retreading. Purchasing and fleet operations people from other states, with whom we spoke, were enthusiastic about the fact that this kind of purchasing arrangement provides access to the well-known and respected brands of products – with the additional advantage of government pricing. In turn, it is possible to seek out the best new tire or retread solution for a particular fleet's requirements, both in terms of best life cycle cost performance and the local servicing of the product.

Other states' retread contract practices

No other state mandated the use of bead-to-bead process, mold-cure retreads. No other state mandated the use of any particular type of retread, with the exception of Utah, which encourages the use of pre-cure retreads and requires case-by-case approval to purchase mold-cure retreads. Several of the states surveyed leave the acquisition of retreads up to the agencies (Colorado, Florida, Texas, and Wyoming). Minnesota has a retread contract, but its use is not mandatory. Wisconsin has a multi-award retread contract. Pennsylvania has a multi-award retread contract. Kentucky does not have a retread contract, but has a specification that retread vendors must certify to.

Monetary value of the State's retread contract (plus reported off-contract LEA purchases)

\$2,657,577.20 – 2006 LEA on-contract purchases

\$ 697,093.44 – 2006 NCDOT on-contract purchases

\$ 716,261.90 - LEA-reported annual off-contract purchases

\$4,070,932.54 – Value of NC State retread purchases (assuming all LEA off-contract purchases were reported accurately).

RETREAD PERFORMANCE STUDY

Ongoing tire and retread testing

Smithers recommends that the State encourage the NCDOT and LEAs to keep open 10% (for example) of wheel positions for the expressed purpose of testing and evaluating different new tire and retread products. Such a practice could provide the State with some assurance that, going forward, it has a good level of informed, current insight into tire and retread issues.

Spot repairs

During this study, Smithers found, and knows of, no compelling reason that would justify additional (or separate) charges for spot repairs made during the retreading process. Smithers' own spot repair study of 6 geographically-distributed NCDOT and 6 LEA casings, conducted for this work, showed an average of 9 (NCDOT) and an average of 2.6 (LEA) spot repairs required, respectively. Numerous NCDOT and LEA personnel volunteered the information that they have never seen a contract tire invoiced with less than 3 spot repairs. If this is generally true, the conclusion could be reached that there is no savings to the state as a consequence of this very controversial contract provision. If, on the other hand, a significant portion of the tires were invoiced with fewer than three spot repairs, the contract provision could be cost effective for the State. Industry custom and practice includes these charges in the price of the retread.

Charges for nail hole repairs, section repairs, other major repairs outside the crown area of the tire, would customarily be invoiced as separate line items.

Retread specification

Continuing to have a reasonable retread specification for use in the State retread contract (or other buying arrangement) is potentially worthwhile. Smithers suggests that the any such specification focus only on the things that are *under the State's control. For example, the number of retreads permitted, the maximum age of the casing, the number and type of nail hole repairs allowed, whether section repairs will be accepted for use and establishing minimum acceptable tread depths for a given application. Additionally, an initial product submission for durability testing may be worthwhile (at the vendor's expense), particularly in the case of a retread vendor that is without an established reputation for offering reliable, durable products. Initial product submission testing for well-known, established entities, such as those presently providing retreads to the NCDOT and LEA fleets, arguably may not be necessary. The State could also consider a requirement that its retread vendors certify that their shops meet any process standards requirements of the particular retread manufacturer(s) with whom they do business.

*The present contract's very specific cured physical properties requirements are arguably of somewhat limited value, inasmuch as it is not necessarily correct to assume that good in-service performance can only be achieved with compounds meeting the contract-specified cured physical properties. Rubber compounders take varying paths to achieve desired field performance characteristics. Furthermore, the competitive nature of the retreading industry is such that tread compounds are highly protected, trade-secret information and as such are not shared among competitors. It is probably not feasible, at

RETREAD PERFORMANCE STUDY

any cost, to develop a cured physical properties standard that would be inclusive of all of the potential formulations that would provide good retread performance in the field.

Again, Smithers suggests concentrating any specification on the things that are under the State's control and let the retread manufacturers worry about how to formulate their products to perform to the State's satisfaction.

RETREAD PERFORMANCE STUDY

Appendix

Sources for tire/retread terminology and technical reference

Below, Smithers has provided a useful list of Internet resources that contain tire and retreading information, and terminology.

Also, we again recommend to the State the publication *Industry Recommended Practices for Tire Retreading & Tire Repairing*, which is undergoing a revision and should be available soon at The Tire Retread & Repair Information Bureau website www.retread.org. This is not only a good technical/procedural manual for the State's purposes, but also contains a listing of useful terminology that will complement the information contained at the websites below.

<http://www.discounttire.com/dtcs/infoTireTerm.dos>

<http://www.bigotires.com/default.aspx?Page=tireterms>

<http://www.retread.org/Glossary/>

<http://www.rma.org/sitemap/>

<http://tireindustry.org/>

<http://www.michelintruck.com/michelintruck/tires-retreads/tiresRetreads-landing.jsp>

<http://www.goodyear.com/truck/>

<http://www.oliverrubber.com/us/en/retread.asp>

<http://www.oliver.co.za/high/process.html>

http://www.bandag.com/download/TireProducts/Bandag_Retread_System.pdf

http://www.goodyear.com/truck/pdf/radialretserv/Retread_S11_V.pdf

<http://www.costco.com/Tires/Glossary.aspx?cat=3961&lang=en-US>

RETREAD PERFORMANCE STUDY

LEA fleet survey results spreadsheet -
See attached.